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MEMORANDUM

ATTENTION	Senate	DATE	November 17, 2022
FROM	Jeff Derksen, Dean of Graduate and Post-Doctoral Studies and Associate-Provost, and Acting Chair, SCUP on behalf of Wade Parkhouse, Provost and Vice-President Academic	PAGES	1/2
RE:	SCUP 22-26 Centres and Institutes Renewal Applications		

At its meeting on November 16, 2022, SCUP did the following:

- A. Reviewed and approved the renewal of the following Research Centres and Institutes for a five-year term:
 1. Centre d'études francophones Québec-Pacifique
 2. David Lam Centre for International Communication
 3. Institute of Governance Studies
 4. Centre for Corporate Governance and Sustainability
 5. Centre for Research on Early Child Health and Education
 6. Centre for Natural Hazards Research
 7. Centre for Wildlife Ecology
 8. International Cybercrime Research Centre (ICRC)
 9. Science and Technology for Aging Research Institute (STAR)
 10. The Institute on Violence, Terrorism, and Security
- B. Reviewed and approved the renewal of the following Research Centres for a two-year term:
 1. Centre for Collaborative Action on Indigenous Health Governance
 2. Centre for Operations Research and Decision Sciences
- C. Reviewed and approved the renewal of the following Research Centre for a three-year term:
 1. Centre for Studies in Print and Media Cultures

- D. Reviewed and approved the termination of the David Wheeler Institute for Research in Mathematics Education.
- E. Reviewed and approved the dissolution of the Centre for Global Political Economy.
- F. Reviewed and approved the dissolution of the Behavioural and Cognitive Neuroscience Institute.
- G. Reviewed and approved the extension of the renewal date of the following Research Institute until February 28, 2023:
 - 1. Institute for Black and African Diaspora Research and Engagement
(formally known as the Institute for Diaspora Research and Engagement)

C: M. Richards



Memorandum

From: Michael Richards, Associate Vice-President, Research

Date: Nov 02, 2022

Re: Centres and Institutes – Renewal Applications 2021/2022

To: Wade Parkhouse, Chair, *Ex-Officio*, Senate Committee on University Planning (SCUP)

As per Policy R40.01, Research Centres and Institutes will be renewed upon application via the Dean and the Vice President, Research and International, to SCUP, based on accomplishments, impact and alignment with priorities. Enclosed please find documents submitted by the following Centres and Institutes:

Centres:

1. Centre d'études francophones Québec-Pacifique
2. David Lam Centre for International Communication
3. Institute of Governance Studies
4. Centre for Corporate Governance and Sustainability
5. Centre for Research on Early Child Health and Education (CRECHE)
6. Centre for Collaborative Action on Indigenous Health Governance
7. Centre for Natural Hazards Research
8. Centre for Wildlife Ecology

Institutes

1. Centre for Operations Research and Decision Sciences
2. Centre for Studies in Print and Media Cultures
3. International Cybercrime Research Centre (ICRC)
4. Science and Technology for Aging Research Institute (STAR)
5. The Institute on Violence, Terrorism, and Security

Motion 1: That SCUP approve the renewal of the seven Centres numbered #1-5, 7-8 above, and the three Institutes numbered #3-5 above, each for a five-year term.

Motion 2: That SCUP approve the renewal of Centre for Collaborative Action on Indigenous Health Governance for a 2-year term.

Motion 3: That SCUP approve the renewal of Centre for Operations Research and Decision Sciences for a 2-year term.

Motion 4: That SCUP approve the renewal of Centre for Studies in Print and Media Cultures for a 3-year term.

The following Centre has requested discontinuation. Termination is recommended.
David Wheeler Institute for Research in Mathematics Education

Motion 5: That SCUP approve the termination of the David Wheeler Institute for Research in Mathematics Education.

The following Centre did not request for renewal. As per Policy R40.01, dissolution is recommended.
Centre for Global Political Economy

Motion 6: That SCUP approve the dissolution of Centre for Global Political Economy.

The following Institute has requested discontinuation. Dissolution is recommended.
Behavioural and Cognitive Neuroscience Institute (BCNI)

Motion 7: That SCUP approve the dissolution of the Behavioural and Cognitive Neuroscience Institute (BCNI).

The following Institute has requested extension. Extension is recommended.
Institute for Black and African Diaspora Research and Engagement

Motion 8: That SCUP approve the extension of the Institute for Black and African Diaspora Research and Engagement until February 2023.



Attachments: Submissions status summary
Renewal Applications
Memo to terminate the David Wheeler Institute for Research in Mathematics Education
Memo to dissolve the Centre for Global Political Economy
Memo to dissolve the Behavioural and Cognitive Neuroscience Institute (BCNI)
Memo to extend the renewal of the Institute for Black and African Diaspora Research and Engagement

Faculty of Arts and Social Sciences:

CENTRE	STATUS	RENEWAL YEARS	DIRECTOR(S)
Centre d'études francophones Québec-Pacifique	Reviewed (Approved)	5	Christian Guilbault (Director)
Centre for Global Political Economy	Not Submitted	-	Geoff Mann (Director)
David Lam Centre for International Communication	Reviewed (Approved)	5	Michael Hathaway (Co-director) Shuyu Kong (Co-Director)
Institute of Governance Studies	Reviewed (Approved)	5	Patrick Smith (Director) Aude-Claire Fourot (Acting Director)

Beedie School of Business:

CENTRE	STATUS	RENEWAL YEARS	DIRECTOR(S)
Centre for Corporate Governance and Sustainability	Reviewed (Approved)	5	Stephanie Bertels (Director)

Faculty of Education:

CENTRE	STATUS	RENEWAL YEARS	DIRECTOR(S)
Centre for Research on Early Child Health and Education (CRECHE)	Reviewed (Approved)	5	Maureen Hoskyn (Director)

Faculty of Health Sciences:

CENTRE	STATUS	RENEWAL YEARS	DIRECTOR(S)
Centre for Collaborative Action	Reviewed (Approved)	2	Jeff Reading (Director)

on Indigenous Health Governance			Angela McIntyre (Co-Director)

Faculty of Science:

CENTRE	STATUS	RENEWAL YEARS	DIRECTOR(S)
Centre for Natural Hazards Research	Reviewed (Approved)	5	Brent Ward (co-Director) Glyn Williams-Jones (co-Director)
Centre for Wildlife Ecology	Reviewed (Approved)	5	Ronald Ydenberg (Director)

Institutes:

INSTITUTE	STATUS	RENEWAL YEARS	DIRECTOR(S)
Behavioural and Cognitive Neuroscience Institute	Reviewed (Declined)	-	Urs Ribary (Director)
Centre for Operations Research and Decision Sciences	Reviewed (Approved)	2	Alexander (Sandy) Rutherford (Acting Director) Tamon Stephen (Director)
Centre for Studies in Print and Media Cultures	Reviewed (Approved)	3	Rebecca Dowson (Director)
Institute for Black and African Diaspora Research and Engagement	Not Submitted	-	June Francis (Director)
International Cybercrime Research Centre (ICRC)	Reviewed (Approved)	5	Richard Frank (Director)
Science and Technology for Aging Research Institute (STAR)	Reviewed (Approved)	5	Andrew Sixsmith (Director)
The Institute on Violence, Terrorism,	Reviewed (Approved)	5	Raymond Corrado (Director)

and Security			Garth Davies (Associate Director)

Report Type: Renewal Application

Reporting Year: 2022

General Information

Name of the Centre/Institute: Centre d'études francophones Québec-Pacifique
Website: <https://www.sfu.ca/french/fr/research/centre-d-etudes-francophones-quebec-pacifique.html>
Faculty: Arts and Social Sciences
Director: Christian Guilbault
Director's term end: 2021-04-01
Renewal date: 2027-11-01

Details

Description of the Centre/Institute:

-

The Centre/Institute's membership and organization structure:

-

Rationale for the renewal of the Centre/Institute:

-

How has the Centre/Institute enhanced research over and above what would have been accomplished by an individual faculty member?

-

How has the Centre/Institute accomplished its goals?

-

Changes planned upon renewal (e.g. membership, organization structure, etc.):

The Centre has largely been idle for the last few years without a Director (despite having the Chair acting as the de facto Director of the Centre). The main reason is that its very mandate was defined according to a single faculty member's research areas who has left a few years ago. The membership and, more importantly, the entire organization structure was also very closely tied to his research area and regular research network.

Because the Department of French offers a comprehensive, yet quite diversified curriculum,

all faculty members have very different areas of specialization and none of them closely matching the previous Director's area. The Centre has not been able to properly function due to this divergence between its research mandate and the areas of specialization of any of the current faculty member.

The Department of French has undergone an external review in the spring of 2022. The Action Plan currently being drafted by all faculty members in the department will include items pertaining to the revitalization of the Centre. The first one of these items will be to redefine its mandate to better match the researchers' current research and include elements of Equity, Diversity and Inclusion. It is the intention to embark on this exercise as soon as the fall of 2023 in order to get the Centre up and running as soon as possible. Faculty members in the department agree that it is important to keep this Centre and make it a hub for research about the Francophone populations on the Pacific Coast.

My recommendation is to apply for a 2 year renewal so that the new Mandate can be defined which, in turn, will give a new direction and structure to properly function.

Significant accomplishments:

-

Notable media successes:

-

Events, workshops, public outreach events:

-

The Centre/Institute's multi-year goals for the next renewal term:

-

Supporting documents:

-

Financial Summary

Does your Centre/Institute receive direct financial support from the university?

No

Was the Centre/Institute leveraged to attract external funding (donations, grants, contracts) which were only made possible by its existence?

No

Confirm policy review:

Yes

Submitted by:

Christian Guilbault, Director

Director's comments:

Dear

Reviewer's Section

Reviewed by:

Mary-Ellen Kelm, Associate Dean, Research & International

Reviewer's decision:

Approved for 5 years

Reviewer's comments:

This application for a two-year renewal opens the door for a much-needed revisioning of the Centre. Quite rightly, the current Director sets no precise goals for this two year period, apart from the most critical one – to develop an Action Plan for the department that will include the revitalization of the Centre. The intent of this process is to develop a Centre that more closely aligns with the French department's research interests, that works towards greater equity, diversity and inclusion and that will become a hub for research on Francophone populations of the Pacific Coast.

Report Type: Renewal Application

Reporting Year: 2022

General Information

Name of the Centre/Institute: David Lam Centre for International Communication

Website: <http://sfu.ca/davidlamcentre.html>

Faculty: Arts and Social Sciences

Director: Shuyu Kong (Co-Director)
Michael Hathaway (Co-director)

Director's term end: 2021-08-31

Renewal date: 2027-04-01

Details

Description of the Centre/Institute:

David See-chai Lam Centre for International Communication (DLC) is an interdisciplinary centre under the Faculty of Arts and Social Sciences. It began operation in 1989, and integrates university, government, professional and business resources for research, education, training and development and community outreach activities. The mandate is to promote research and organize related activities with a focus on the interface between Canada and the Asia-Pacific region. These activities extend across a broad spectrum of social, cultural and economic issues from both contemporary and historical perspectives. The Centre supports and facilitates research collaboration, networking and building the community of Asia-related scholars across campus and internationally. The Centre furthers the involvement of students in educating and researching the Asia-Pacific region. Lastly the Centre mobilizes and transfers knowledge from the academic research community to the Canadian public.

The Centre/Institute's membership and organization structure:

Personnel of the Centre includes the two co-directors, one full-time administrative support staff and one part-time communicator. The Centre is governed by a Steering Committee comprised of 6-10 faculty members. Forty-seven Asia-related researchers at SFU are DLC Members. These members are eligible for funding up to \$7,000 for research projects.

Since the last 5-year renewal application in 2017, the Centre has hosted 10 visiting scholars and research fellows who stayed at SFU to collaborate with researchers of SFU and organize events for the SFU community as well as the community-at-large.

Rationale for the renewal of the Centre/Institute:

David Lam Centre is financially independent from the University. We are self-sustained through an endowment established in 1989. From our endowment interest revenue, we have been able to support not only our staffing and office expenses but also external organizations that share our same mission as well as SFU researchers' projects and activities. Through the organization of over 100 events in the past five years, we have contributed financially to SFU Meeting & Events (MECS) in the form of venue rentals and catering charges. Perhaps more valuable to both MECS and SFU, our activities enrich the vibrant outreach of SFU's downtown campus by hosting events at Harbour Centre, Goldcorp Centre for the Arts, the Segal Building and a variety of urban venues.

David Lam Centre strives to play the pivotal role in Asia-related research activities at SFU. Our goals in the coming years are: 1) to fund Asia-related research; 2) to contribute to the process undoing of anti-Asian racism through community events and 2) to promote the histories and cultures of Asian indigenous peoples to the SFU community as well as the public.

How has the Centre/Institute enhanced research over and above what would have been accomplished by an individual faculty member?

Over a third of our annual operating budget is allocated to provide seed funding for research projects conducted by faculty members across SFU. We funded 33 major projects (over \$2,000) and about 20 small projects (up to \$2,000) in the last five years.

How has the Centre/Institute accomplished its goals?

Through our research grants, we bring Asia-related researchers from different departments together to engage in dialogues and collaborate on projects.

We co-organize with other units at SFU to bring events, not limited to the academic world but as well as the public.

We sponsor cultural programs and events including annual festivals organized by community groups to promote greater awareness and understanding between different ethnic groups in our society.

We host researchers from Canada and beyond as visiting scholars to share knowledge and ideas in classes and public events in addition to exploring research ideas with SFU academicians.

Changes planned upon renewal (e.g. membership, organization structure, etc.):

We will continue to maintain a rotation of steering committee members, expand and improve our funding programs.

Significant accomplishments:

1) In partnership with the School for International Studies, we launched a social colloquium series to invite participants to think about China, particularly Greater China, not as a self-contained entity, but as part of the global world system, not in terms of exceptions, but in terms of intersections.

2) While the pandemic increased the incidents anti-Asian racism, the David Lam Centre has already been actively involved in supporting a range of programs and speakers addressing these issues in Canada and the world. From 2017, we co-sponsored 49 such events. The most significant ones include "Together: Explore the Past and the Present, and Visualize the Future" film screening and panel that tells the story of shared struggles among Indigenous peoples and migrants of Chinese and African descents in the past and today, in the city of Vancouver, an online workshop "Anti-Asian Racism During COVID and the Model Minority Myth Workshop" organized by the Vancouver Asian Film Festival, "Invisible Indigenous descendants in Hokkaido" co-organized with the Center for Ainu and Indigenous Studies at Hokkaido University, and an event co-organized with Labour Studies of SFU and the Asian Canadian Labour Alliance entitled "Anti-Asian Racism in British Columbia and the Community Organizers Who Stand Against It".

3) David Lam Centre hosted our Distinguished Visiting Professor, Mr. Kingsley Ng of Hong Kong Baptist University in 2019-2020. Mr. Ng presented one lecture and one workshop on urban media art. With the help of SFU International, a faculty exchange resulted. Hong Kong Baptist University hosted Professor Stuart Poyntz of the School of Communication in return in 2020-21.

4) In 2018, we co-organized with the Consulate General of the Republic of Korea, we presented the MIKTA workshop Middle Powers' Role in the Era of the Confrontations Among Major Powers with scholars specializing in Mexico, Indonesia, Republic of Korea, Turkey, and Australia.

5) Our co-director, Shuyu Kong, organized in cooperation with Vancouver Public Library, a speaker series on Chinese Canadian Writing consisting of four virtual talks took place between March and June 2021, as well as four related reading events took place between March and June 2022.

6) Co-director Michael Hathaway received the Guggenheim Fellowship in March 2022 on the basis of prior achievements and exceptional promise in his academic realm.

7) David Lam Center, with the support of MECS, hosted a two day international workshop on "Global Art Exchange and Modernism in Socialist China (1949-1979)," with twelve scholars from Australia, China, United States and Germany presenting papers virtually. A large number of attendees (144 for Oct. 30 and 125 for Oct. 31, 2020) around the world joined this online event and actively engaged in Q & A session. The conference volume will be published by the academic publisher, Brill.

Notable media successes:

1) Michael Hathaway, along with the other awardees of the 2022-23 Guggenheim Fellowship, was listed in a full-page ad in the New York Times in April 2022.

2) Chinese/Canadian writing speaker series, co-organized with Vancouver Public Library, was featured in SFU News (May 20, 2020) “Chinese/Canadian writing series builds bridge for cross-cultural understanding” <https://www.sfu.ca/sfunews/stories/2021/05/chinese-canadian-writing-series-builds-bridge-for-cross-cultural.html>. It was also a cover story in The Source: Forum of Diversity (Volume 22, Issue 01 - June 8–22, 2021) “Cultural Spotlight – Cross-cultural writing: the exchange and combination of writing and knowledge”

<https://thelasource.com/en/2021/06/07/cultural-spotlight-cross-cultural-writing-the-exchange-and-combination-of-writing-and-knowledge>

Events, workshops, public outreach events:

From April 2017 to March 2022, David Lam Centre presented 125 events. Even during the pandemic which considerably slowed down the number of events, we were still able to support 28 events. A list of events with detailed descriptions was submitted annually with our centre report. Please see attached document for the entire list including events we supported in 2021-22.

In April 2022, we began a new speaker series on Asian labour and activism. This series will help the public understand past and current challenges faced by the Asian working people, many of them are new immigrants.

The Centre/Institute's multi-year goals for the next renewal term:

Our goal is to continue to grow the David Lam Centre by exploring new initiatives in assisting Asia-related scholars and graduate students at SFU to thrive in their research area, while maintaining our current successful community activities. We will continue to forge new alliances and coordinate efforts to expand Asia-related research and Asia-related events in Vancouver. We aim to become a clearing house and incubator for this research and outreach with the local community.

On the international level, the Centre will attempt to build connections with international organizations and foundations to expand research activities and graduate students' career opportunities. We aim to use the DLC to create exchange opportunities overseas for both faculty members and graduate students at SFU.

KPI:

Our endowment budgets are financially sound. We plan to use the interest income in a

responsible and accountable manner to expand our programs and outreach efforts by including a wider array of scholars and community members in the broader Asian community.

- to build upon our current strengths in community engagement, nurture existing relationships with local community groups as well as expand our connections
 - to involve more SFU researchers in initiatives with other academic institutions overseas
 - to expand our current visiting scholar initiative and create a fiscally sustainable visiting scholar exchange program
 - to continue funding faculty to organize speaker series on Asia-Pacific related research at SFU
 - to refine our funding policy to support more research activities by Asia-related faculty members and graduate students
 - to serve as a resource hub of information on SFU and external grants, fellowships, travel funds for faculty members and graduate students
 - to continue our support for the annual Pacific Regional Forum to bring in lectures on contemporary business topics of Asia by prominent business leaders and scholars
- We believe we can contribute to SFU through our grants and other intangible support to researchers and students. Our sponsorships to community groups help them promote reconciliation, awareness and kindness for the greater good.

Supporting documents:

- 1) Outreach_Activities_from_2017-2022_SQ2xRVe.pdf (See attachment below)
- 2) 2021-22_Annual_Report_-_Outline_of_DLC_Activities_OH2Tvjq.docx (See attachment below)

Financial Summary

Does your Centre/Institute receive direct financial support from the university?

No

Was the Centre/Institute leveraged to attract external funding (donations, grants, contracts) which were only made possible by its existence?

No

Confirm policy review:

Yes

Submitted by:

Michael Hathaway, Co-director

Director's comments:

I am pleased to submit this renewal. Thank you.

Reviewer's Section

Reviewed by:

Mary-Ellen Kelm, Associate Dean, Research & International

Reviewer's decision:

Approved for 5 years

Reviewer's comments:

Up for renewal this year. The David Lam Centre is self-supporting through its endowments and offers important research opportunities to Asia-related scholars, including graduate students, from within SFU and internationally. It has a regional presence as a host of speakers series and events that focus attention on anti-Asian racism. The research focus of one of its Directors, Michael Hathaway, on Indigenous Asians is also in line with FASS's support of and desire to implement the recommendations of the ARC report. The goals for the next five year plan are in line with the Centre's previous successes and entirely achievable within the current state of its finances and remit within the University. The Faculty looks forward to a greater international presence for the Centre as the restrictions of the pandemic continue to lift.

Outline of DLC Activities in 2021-22

FINANCES

Three endowment funds (\$4.3M)

Annual Budget (approx. \$225K)

- DLC Members' Research Initiatives and Events: \$80K
- DLC Administration (including co-directors' course buyouts): \$85K
- Scholarship and RA Support: \$20K
- SFU/Community Programs and Events: \$30K
- Speakers Series to Schools/Departments: \$10K

ACTIVITIES

- Co-directorships of Dr. Shuyu Kong (Humanities) and Dr. Michael Hathaway (Anthropology) renewed for a 2-year term from September 2021 to August 2023
- Held three Steering Committee virtual meetings in Spring 2021, Fall 2021, and Spring 2022
- Sponsored fourteen SFU researchers' virtual events as well as community arts and cultural events between April 2021 and March 2022
- A speaker series of the theme on Asian labour and activism organized by Dr. Anushay Malik (IS/GA) and co-sponsored by DLC and LBST is scheduled between April and July 2022

Improvement of SFU at large

- Provided five awards for a total of \$6,715 to graduate students to conduct research and present papers at conferences
- Funded six Asia-related research projects (>\$2K) between April 2021 and March 2022
- Provided RAs and training opportunities at DLC for one student

Promotion and Outreach

1. DLC Website

- Website migrated to SFU's new template with improvements of navigation and content expansion in progress

2. Increased awareness of SFU David Lam Centre

- Eight SFU faculty became DLC Members in 2021-22 to bring the total to 47

3. Increased student's awareness as demonstrated by the number of applications for the Paul Tai Yip Ng Memorial Award

- 2021: 4 applicants from 3 departments in Faculty of Arts and Sciences
- 2020: 7 applicants from 7 departments in 4 faculties
- 2019: 6 applicants from 4 departments in 2 faculties

4. Visiting Scholars

- One new visiting scholar (Vivian Lee from Hong Kong) came to the DLC in January 2021; the Centre is expecting two new visiting scholars in the summer and winter of 2022
- Current research fellows: Scott Harrison, Asia Pacific Foundation; and Zheng Shengtian, artist and curator

Current Community Partners

- 1) Asia-Pacific Foundation (APF)
 - o Connected APF with SFU FASS researchers conducting research on indigenous people
- 2) Centre for Asia-Pacific Initiatives (CAPI) of the University of Victoria
- 3) Taiwan Economic & Cultural Office (TECO)
 - o Ongoing communication between DLC Director and TECO
- 4) DOXA
 - o Sponsored 2021 DOXA Film Festival (online)
 - o Sponsoring 2022 DOXA Film Festival (hybrid)
- 5) Indian Summer Festival (2020)
 - o Provided sponsorship for 2021 Indian Summer Festival (hybrid)
 - o Sponsoring 2022 Indian Summer Festival (hybrid)
- 6) Powell Street Festival Society
 - o Sponsored the Paeuru Gai Dialogues (9 monthly virtual seminars)
 - o Sponsoring 2022 Powell Street Festival
- 7) Hokkaido University (HokkaidoU)
- 8) SFU International (SFUi)
 - o Continual collaboration between SFUi and the DLC
- 9) Centre A Art Gallery
 - o Sponsored an exhibition entitled “A Living Room” in February 2022
- 10) Vancouver Public Library
- 11) UBC
- 12) Vancouver Asian Heritage Month Society
 - o Sponsored explorAsian Heritage Month in 2021
 - o Sponsoring 2022 explorAsian Heritage Month (May 2022)
- 13) Vancouver Asian Film Festival (VAFF)
 - o Sponsored “Anti-Asian Racism During COVID and the Model Minority Myth Workshop”
- 14) DTES Heart of the City Festival
- 15) Sound of Dragon Society and Orchid Ensemble

Past Events Sponsored/Organized by the DLC

April 1, 2021 – March 31, 2022: 14 virtual and in-person events

Highlights:

- 1) Vancouver Public Library (VPL) “Chinese Canadian Writing” speaker series, sponsored and organized by co-director Shuyu continued from March 2021. Monthly lectures hosted by VPL in April, May and June were each attended by 60-80 people from Canada, China, the States and Australia.
- 2) A second lecture, after the March 2021 event, on Ainu traditions and culture took place on National Indigenous Peoples Day was attended by 80 attendees around the world. DLC co-organized this online event with the Asia Pacific Foundation of Canada.
- 3) In November, David Lam Centre held its first hybrid event in partnership with the School for International Studies and Department of History. The event “China Unbound & In the Camps: Inside Beijing’s High-Tech Global Policing” was attended by 30+ people physically and joined by 50 virtually.
- 4) An expert panel discussed topics surrounding challenges faced by immigrant families and the stigma of mental illness portrayed in the film “The World is Bright”. The panelists also covered the importance of cultural competence in mental health care. “The World is Bright” was made virtually available to the SFU community by the DLC.
- 5) Two events on the histories and economy of Uyghurs are being planned for August 2022.

List of Past Events Sponsored/Organized by the DLC in 2021-22

Date	Event	Speaker/Organization	Description
April 23, 2021	Chinese Canadian Writing Speaker Series #2: Writing a Chinese Story as World Literature	Ling Zhang, Writer and Xueqing Xu, Associate Professor, York University	Ling Zhang and Xueqing Xu discussed the challenges and advantages of writing in Canada, and the cultural identity of being a Chinese writer in Canada.
April 24, 2021	The Paueru Gai Dialogues #4: Old Roots and New Relationships on Indigenous Lands	Powell Street Festival Society	How can Japanese Canadians request the return of lost property in the Powell Street neighbourhood without perpetuating colonial practices? Guest host Jeff Masuda and panelists Doris Chow, Justin Sekiguchi, and Chris Livingstone shifted the white-centered colonial lens on housing, racial discrimination, and dispossession to an exploration of what it means to live and work on behalf of the multiracial and diverse community that dwells today on the unceded and occupied Indigenous territories of the Downtown Eastside. Participants were invited into breakout groups to share their thoughts and experiences of building allyships across communities.
May 1-31, 2021	explorAsian 2021 Virtual Festival	Vancouver Asian Heritage Month Society (VAHMS)	explorASIAN celebrates national Asian Heritage Month each May by building bridges between mainstream and Asian Canadian communities in promotion of multiculturalism and diversity.

Date	Event	Speaker/Organization	Description
May 6-16, 2021	2021 DOXA Documentary Film Festival (Virtual)	Documentary Media Society	The 20th Annual DOXA Festival featured 64 films (shorts and features) from across Canada and around the world streaming online, as well as special live events. DLC sponsored screenings of one Filipino film: ASWANG (Alyx Ayn Arumpac)
May 21, 2021	Chinese Canadian Writing Speaker Series #3: Writing Humanities for the Transcultural Reader	Shuyu Kong, Professor, SFU Ruoyun Bai, Associate Professor, University of Toronto	Professors Kong and Bai discussed how a humanities scholar could introduce World Literature to Chinese general readers, and bridge the gap between creative writing and the academic world.
June 18, 2021	Chinese Canadian Writing Speaker Series #4: The Cross-cultural Story of Three Chinese Women Aviators	Patty Gully, Writer and Historian Songyu Lin, Senior Editor and Lecturer	Patti Gully and Songyu Lin talked about how <i>Sisters of Heaven: China's Barnstorming Aviatrices</i> was introduced to China and enthusiastically received by Chinese readers, with a film adaptation on the way.

Date	Event	Speaker/Organization	Description
June 21, 2021	What does it mean to be Ainu in the twenty-first century? - Ainu authenticity -	Kanako Uzawa	People of Northern Japan, the Ainu once described as a “dying race,” continue to remain and develop their culture even today. Throughout the nineteenth to mid-twentieth centuries, the Ainu were targeted as a fascinating research object for both Japanese and foreign researchers. This was a result of the discourse of “race” together with Social Darwinism. Such history continues to affect Ainu communities negatively, and various challenge remain. In this lecture, Dr. Uzawa highlighted the living experiences of the Ainu today by sharing her personal stories on her ongoing website project and an artistic project, which expresses contemporary Ainu authenticity through dance and song.

Date	Event	Speaker/Organization	Description
July 17, 2021	Indian Summer Festival: A Night at the Orpheum	Indian Summer Festival Society	In a double bill featuring nine internationally recognized musicians, this was a celebration of the diverse artistic talent in our city. The evening featured the world premiere of two new musical works. The Naadaleela Ensemble creates a musical conversation between ancient cultures that span the Silk Road – from Iran to India and China – and which have been influencing each other for over 2,000 years. Mohamed Assani and Friends present ‘Watersmeet’ – a project that imagines musical collaboration between Hindustani and Western musicians as a metaphoric meeting between rivers. Individually, rivers are distinct, with their specific sources, discernible shapes, and colors, but when they meet (as in this collaboration), they come together in a way that makes it impossible to deconstruct.

Date	Event	Speaker/Organization	Description
October 16, 2021	The Paueru Gai Dialogues #8: Reconsidering Land, History and Belonging	Powell Street Festival Society	In the eighth Paueru Dialogues event, Ayumi Goto was in conversation with Andrea Fatona, Peter Morin, and Abedar Kamgari. Coming from diverse communities of culture, art, and activism, the panelists all had in common the profound capacity to move between multiple worlds and to create interlinkages so that others are invited to participate. In this dialogue, conversations weaved between building Indigenous and non-Indigenous relations, the pleasures and gifts of engaging with unexpected others, and the prismatic scatter of diasporic states of affairs. Participants engaged with the invited speakers, to share their life experiences of bridging lives and communities, and to forge new paths and conversations.

Date	Event	Speaker/Organization	Description
November 3, 2021	China Unbound & In the Camps: Inside Beijing's High-Tech Global Policing	Joanna Chiu, Senior Journalist, Toronto Star Darren Byler, Assistant Professor of International Studies, SFU Jeremy Brown, Professor and Chair of Department of History, SFU	Joanna Chiu's book China Unbound: The New Global Disorder portrays Beijing's use of high-tech police surveillance and aggressive human rights violations against those who challenge its power in China and around the globe. Byler's book In the Camps: China's High-Tech Penal Colony reveals the way global developments in automated surveillance have been utilized in the mass internment of religious minorities in Northwest China. This discussion focused on the global implications of their two books and what these developments mean for vulnerable peoples like the Uyghurs.

Date	Event	Speaker/Organization	Description
February 12 – May 25, 2022	Exhibition and Film Screening: The Living Room	Centre A	Centre A's first experiential project "The Living Room" in 2022, the gallery space is transformed into a furnished living room space. Visitors have the opportunity to sit down in the makeshift living room to watch a series of curated films and videos. By converting the gallery rooms into a (semi-)domestic space, Centre A hopes to demystify and challenge the oftentimes inaccessible, highly curatorial nature of a contemporary art gallery. Through this project, the gallery hopes to host a space in which visitors can reconnect with each other after almost two years of isolation. There are two series of films programmed as part of The Living Room project: The first one, addressing reconnection, lineage, and exile, takes place from February to March 2022, and the second series will run from April to May 2022. The second series is built upon an examination of Canada's role in the Multicultural discourses in terms of inequality, intermediacy, and extraction. Bringing together an array of approaches, through documentary or futuristic lens, this program points to the making of a nationhood and its discontents from a

			sociopolitical perspective.

Date	Event	Speaker/Organization	Description
March 2, 2022	Migration, Emotion, and Digital Economies	Beatrice Zani, Postdoctoral Research Fellow, McGill University	In this talk Dr. Zani drew on her multi-sited ethnographic work in China and Taiwan, where she explores the mobilities of women who have moved from the countryside to the city in China and who re-migrate to Taiwan through marriage. Broadly, this talk illuminated how, in the digital age of migration, Chinese women's migratory paths are growing more complex and are increasingly characterized by the use of digital platforms. Looking at the e-entrepreneurship produced by Chinese women in Taiwan, we will delve into the new digital, emotional, and commercial geographies of interconnection between China and Taiwan.

Date	Event	Speaker/Organization	Description
March 9, 2022	History Written in Advance	Justin Haruyama, PhD candidate, University of California, David	Over the last decade, Mandarin-language Jehovah's Witness congregations have proliferated across Zambia. These congregations are almost exclusively composed of local Zambians who have learned Mandarin as a second language, but count few to no ethnic Chinese congregants. Though they find little success in converting Chinese people, these Witnesses transgress common Zambian social norms by befriending Chinese migrants, eating Chinese food, and expressing appreciation for Chinese culture. Explaining their actions, Witnesses invoke and elide history in ways that erase national and racialized differences between themselves and Chinese migrants. They instead act upon a temporal horizon in which Biblical truths must be quickly spread before the rapidly approaching dissolution of the current system of things. In doing so, they enact a diffracted modernity that appropriates modernity's totalizing tropes while challenging the secular liberalism of the nation-state, as they anticipate the world entering its final years before Jehovah God vanquishes all human-governed polities.

Date	Event	Speaker/Organization	Description
March 10, 2022	The World is Bright: Panel Discussion on Mental Illness	Ying Wang, Director Jaswant Guzder, Professor of Transcultural Psychiatry Martin Mroz, Director of SFU Health & Counseling Services Anthony Swan, Impact Director and Moderator	When Qian Hui Deng and Xue Mei Li are notified by the Canadian government about their son Shi-Ming's sudden death and burial on Canadian soil, they decide to travel from Beijing to Vancouver to search for answers. The documentary film <i>The World is Bright</i> chronicles the journey of the grieving parents as they navigate a new culture and a complex web of bureaucracy to uncover the truth behind their son's death by suicide. An expert panel discussed some of the themes explored in the film, such as the stigma surrounding mental illness, resources available to immigrant families, the dislocation and disconnection arising from global migration, and the importance of cultural competence in mental health care.

List of Past Events Sponsored/Organized by the DLC in 2021-22

Date	Event	Speaker/Organization	Description
April 23, 2021	Chinese Canadian Writing Speaker Series #2: Writing a Chinese Story as World Literature	Ling Zhang, Writer and Xueqing Xu, Associate Professor, York University	Ling Zhang and Xueqing Xu discussed the challenges and advantages of writing in Canada, and the cultural identity of being a Chinese writer in Canada.
April 24, 2021	The Paueru Gai Dialogues #4: Old Roots and New Relationships on Indigenous Lands	Powell Street Festival Society	How can Japanese Canadians request the return of lost property in the Powell Street neighbourhood without perpetuating colonial practices? Guest host Jeff Masuda and panelists Doris Chow, Justin Sekiguchi, and Chris Livingstone shifted the white-centered colonial lens on housing, racial discrimination, and dispossession to an exploration of what it means to live and work on behalf of the multiracial and diverse community that dwells today on the unceded and occupied Indigenous territories of the Downtown Eastside. Participants were invited into breakout groups to share their thoughts and experiences of building allyships across communities.
May 1-31, 2021	explorAsian 2021 Virtual Festival	Vancouver Asian Heritage Month Society (VAHMS)	explorASIAN celebrates national Asian Heritage Month each May by building bridges between mainstream and Asian Canadian communities in promotion of multiculturalism and diversity.

Date	Event	Speaker/Organization	Description
May 6-16, 2021	2021 DOXA Documentary Film Festival (Virtual)	Documentary Media Society	The 20th Annual DOXA Festival featured 64 films (shorts and features) from across Canada and around the world streaming online, as well as special live events. DLC sponsored screenings of one Filipino film: <i>ASWANG</i> (Alyx Ayn Arumpac)
May 21, 2021	Chinese Canadian Writing Speaker Series #3: Writing Humanities for the Transcultural Reader	Shuyu Kong, Professor, SFU Ruoyun Bai, Associate Professor, University of Toronto	Professors Kong and Bai discussed how a humanities scholar could introduce World Literature to Chinese general readers, and bridge the gap between creative writing and the academic world.
June 18, 2021	Chinese Canadian Writing Speaker Series #4: The Cross-cultural Story of Three Chinese Women Aviators	Patty Gully, Writer and Historian Songyu Lin, Senior Editor and Lecturer	Patti Gully and Songyu Lin talked about how <i>Sisters of Heaven: China's Barnstorming Aviatrices</i> was introduced to China and enthusiastically received by Chinese readers, with a film adaptation on the way.

Date	Event	Speaker/Organization	Description
June 21, 2021	What does it mean to be Ainu in the twenty-first century? - Ainu authenticity -	Kanako Uzawa	People of Northern Japan, the Ainu once described as a “dying race,” continue to remain and develop their culture even today. Throughout the nineteenth to mid-twentieth centuries, the Ainu were targeted as a fascinating research object for both Japanese and foreign researchers. This was a result of the discourse of “race” together with Social Darwinism. Such history continues to affect Ainu communities negatively, and various challenge remain. In this lecture, Dr. Uzawa highlighted the living experiences of the Ainu today by sharing her personal stories on her ongoing website project and an artistic project, which expresses contemporary Ainu authenticity through dance and song.

Date	Event	Speaker/Organization	Description
July 17, 2021	Indian Summer Festival: A Night at the Orpheum	Indian Summer Festival Society	In a double bill featuring nine internationally recognized musicians, this was a celebration of the diverse artistic talent in our city. The evening featured the world premiere of two new musical works. The Naadaleela Ensemble creates a musical conversation between ancient cultures that span the Silk Road – from Iran to India and China – and which have been influencing each other for over 2,000 years. Mohamed Assani and Friends present ‘Watersmeet’ – a project that imagines musical collaboration between Hindustani and Western musicians as a metaphoric meeting between rivers. Individually, rivers are distinct, with their specific sources, discernible shapes, and colors, but when they meet (as in this collaboration), they come together in a way that makes it impossible to deconstruct.

Date	Event	Speaker/Organization	Description
October 16, 2021	The Paueru Gai Dialogues #8: Reconsidering Land, History and Belonging	Powell Street Festival Society	In the eighth Paueru Dialogues event, Ayumi Goto was in conversation with Andrea Fatona, Peter Morin, and Abedar Kamgari. Coming from diverse communities of culture, art, and activism, the panelists all had in common the profound capacity to move between multiple worlds and to create interlinkages so that others are invited to participate. In this dialogue, conversations weaved between building Indigenous and non-Indigenous relations, the pleasures and gifts of engaging with unexpected others, and the prismatic scatter of diasporic states of affairs. Participants engaged with the invited speakers, to share their life experiences of bridging lives and communities, and to forge new paths and conversations.

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List of Past Events Sponsored/Organized by the DLC in 2020-21

Date	Event	Speaker/Organization	Description
April 18, 2020	Online Artist Talk: Pixy Liao	Pixy Liao, Artist / Centre A	In this talk, Pixy discussed her practice and inspirations, in connection with her exhibition at Centre A, which stems from her ongoing exploration of the dynamic of a romantic relationship. Pixy is known for her staged photography, where she poses with her boyfriend-turned-muse, Moro. Her works challenge traditional gender roles within heterosexual relationships, humorously revealing a multitude of ways of being together.
May 1-31, 2020	explorAsian 2020 Virtual Festival	Vancouver Asian Heritage Month Society (VAHMS)	explorASIAN celebrates national Asian Heritage Month each May by building bridges between mainstream and Asian Canadian communities in promotion of multiculturalism and diversity.
May 16, 2020	Indian Summer Festival: Beginnings – Sonic Tributes	Indian Summer Festival Society	Nine local musicians were brought together virtually in a special event to kick off ISF's 10th anniversary season. This was an ode to the city and a tribute to the wealth of musical languages that exists here.

Date	Event	Speaker/Organization	Description
June 18-26, 2020	2020 DOXA Documentary Film Festival	Documentary Media Society	The 19th Annual DOXA Festival featured 64 films (shorts and features) from across Canada and around the world streaming online, as well as special live events. DLC sponsored screenings of two Asia-related films: <i>Forget Me Not</i> (Sun Hee Engelstoft) and <i>Overseas</i> (Sung-A Yoon)
August 1, 2020	Powell Street Festival 2020 (Online Telethon)	Powell Street Festival Society	The Telethon streamed on PSFS website and featured appearances from local Japanese Canadian (JC) artists, vendors and booths, and community stakeholders who are the heart of the festival. Telethon proceeds went toward PowellStFest Community Kitchen program to cook 200 meals for the unhoused and precariously housed in the DTES.

Date	Event	Speaker/Organization	Description
October 2-24, 2020	Conference on "Indigenous Struggles and the Ideology of Development"	Institute for Humanities, SFU	The struggles of Indigenous people against the assault of extractivism, under the banner of development, is the most important struggle in the world today, not only for the survival of what remains of them but for humanity as a whole facing the existential crisis of climate change and the devastation of life on this planet by the inexorable logic of capital. The goal of the conference was to bring together knowledge on the issues addressed by the speakers, create connection between localized struggles to establish their global character, share the knowledge of experts with activists and the community, and subject the hegemonic ideology to critical scrutiny.

Date	Event	Speaker/Organization	Description
October 30-31, 2020	Global Art Exchange and Modernism in Socialist China (1949-1979)	Shuyu Kong, Co-director, David Lam Centre and Professor, Department of Humanities, SFU	Fourteen researchers and artists presented in this workshop as part of the series “Art and Modernism in Socialist China,” an international cooperative research and publication project launched in 2017 at Taikang Space, Beijing. This workshop focused on global exchanges among left-wing artists and their impacts on Chinese art during the most rigid period of Socialist China. From artistic exchanges with Latin America to the Romanian school in Chinese art education; from discreet international exhibitions in China to underground artist groups during the Cultural Revolution; together the panelists presented a complex contemporary Chinese art history, in which artists thirsted after alternative aesthetic inspiration, and international cultural dialogues continued amidst revolutionary turmoil, albeit in discreet and distorted guises.

Date	Event	Speaker/Organization	Description
December 4, 2020	Anti-Asian Racism During COVID and the Model Minority Myth Workshop	Vancouver Asian Film Festival	This online workshop unpacked the model minority myth and the role it plays on anti-Asian racism that has been amplified during the COVID-19 pandemic. Presenters and participants shared and reflected on their own experiences with the myth, and developed different strategies to support those who disclosed experiences of anti-Asian racism within intersecting communities. While this workshop was geared towards building a collective and diverse memory of anti-Asian racism and developing tools to challenge it, participants also had the opportunity to question their privilege and how this myth was being used to divide communities of colour.
January 30, 2021	The Paueru Gai Dialogues #1: Catalyzing Social Equity through Culture & Connection to Place	Powell Street Festival Society	Guest host Izumi Sakamoto facilitated a discussion with three panelists — Ayumi Goto, Kathy Shimizu and Terry Watada — as they shared their perspectives on how cultural heritage and connection to place impact their artistic practice. Participants joined breakout groups to share their own experiences and to consider how Japanese Canadian art and culture might advance social justice. To wrap up the event, everyone reconvened to offer questions for further contemplation.

Date	Event	Speaker/Organization	Description
February 27, 2021	The Paueru Gai Dialogues #2: On Food & Culture for Community Building	Powell Street Festival Society	Guest host erica hiroko isomura facilitated a discussion with panelists Carmel Tanaka, Kage, and Ingrid Mendez de Cruz as they shared stories on how food and culture contribute to their experiences of building community in Japanese Canadian, DTES communities, and beyond. Panelists talked about how they use food to build relationships across differences, create inclusive food and garden spaces for community, and support agricultural migrant workers who grow the food that so many of us eat.
February 28, 2021	New Empirical Contributions to Cantonese Linguistics and Language Processing	John Alderete, Department of Linguistics, SFU	Recent work at Simon Fraser University, the University of British Columbia, and the Chinese University of Hong Kong makes new empirical contributions that support both linguistic and psycholinguistic research on Cantonese. Seven researchers from these three universities presented in this online micro-workshop.

Date	Event	Speaker/Organization	Description
March 9, 2021	Myanmar, Once Again?	Bob Anderson, School of Communication, SFU	Following the 8 November election, some of the losing candidates appear to have planned protests and even a court case about their perception that the election process was full of 'irregularities' and 'fraud'. They vowed to confront the Election Commission in court. Their prolonged agitation inspired and enabled the senior General to warn that there must be changes in the process. Then in the early morning of 1 February, when Parliament was reassembling, he had Ang San Suu Kyi and a number of election-winners arrested. Day by day the restrictions of a martial law were put into place, restrictions quite familiar to people over 30 but a shock to the 15 year olds who expected something quite different. The speaker looked back at the martial law which lasted 49 years, starting from 1962, and discussed the current situation.

Date	Event	Speaker/Organization	Description
March 25, 2021	Invisible Indigenous descendants in Hokkaido	Mai Ishihara, Center for Ainu and Indigenous Studies at Hokkaido University in Sapporo, Japan	In this presentation, Dr. Mai Ishihara introduced the previously unexplored case of the silent Indigenous descendants in Hokkaido, Japan, and talked about the process of putting the pain of silence into words for those who could not inherit historical and social connections to indigeneity. In this age of diversity, mutual understanding has become increasingly essential. Yet, it remains a difficult task in many situations, such as the one highlighted in this presentation. It is not always easy to understand others' pain, especially when there is no social consensus on each individual's suffering or pain as they may be transparent and invisible. This presentation on Invisible Indigenous Descendants in Hokkaido aimed to break the silence, confront the associated pain, and shed light on some of the challenges of understanding indigeneity.
March 26, 2021	Chinese Canadian Writing Speaker Series #1: Finding the East by Going to the West: on Discovering the Hidden History of Missionaries and Modern China	Jia Shen, writer and historian; Jiawei Shen, artist and historian	Jia Shen and Jiawei Shen discussed how they discovered historical sources and artistic inspiration in Canada and Australia, and how their historical writing consequently had a profound influence in China.

Date	Event	Speaker/Organization	Description
March 27, 2021	The Paueru Gai Dialogues #3: On Memory, Mythmaking and Community Resilience	Powell Street Festival Society	What, if anything, have we learned from our past? Are there ways we can harness this renewed sense of connection to heal a fractured community and open the future to new possibilities? Guest host John Endo Greenaway facilitated a discussion with panelists Bryce Kanbara, Sherri Kajiwarra, and Michael Prior exploring their work and these questions. The COVID-19 pandemic and ensuing lockdowns have us looking back at the 1940s internment, dispossession and dispersal of Japanese Canadians through a new lens, bringing up questions of community resilience and cultural values and how they may have been passed down through the generations.

Date	Event	Speaker/Organization	Description
March 30, 2021	Fake Churches and False Unification: the Anthropology of Conversion in the Divided Koreas	Angie Heo, University of Chicago	Since the 1990s, the sums of faith-based aid to North Korea have been so vast as to stir speculations that Protestant Christians are the ones secretly propping up the North Korean regime. The irony is that Evangelicals in South Korea and the Korean diaspora remain the most strident proponents of anticommunism and the South's total conquest of the North. What is the relationship between Christianity, communism, and capitalism in the divided Koreas? How do South Korean perceptions of religion in North Korea entwine theologies of mission with ideologies of unification? In this lecture, Angie Heo explored the contradictions of economic aid and religious freedom in a unique geopolitical zone where the Cold War never ended. Drawing inspiration from Sonja Luehrmann's writings on religion, atheism, and communism, Angie further specified how Christianity in the divided Koreas presents a challenge to current anthropological scholarship on conversion and sectarianism.

List of Past Events Sponsored/Organized by the DLC in 2019-20

Date	Event	Speaker/Organization	Description
April 1, 2019	Vancouver as the Gateway to Asia: How Chinese Art and Artists Have Come to Our City	Zheng Shengtian, Artist, Scholar and Curator	Members of the local art circle as well SFU Asia-related researchers attended this artist talk and social organized by David Lam Centre at Centre A Vancouver International Asian Art in Chinatown.
April 6, 2019	Canadian South Asian Youths Conference: Identity, Gender, Sexuality, Employment, and Activism	Habiba Zaman, Professor of Gender, Sexuality and Women's Studies, SFU	A one-day conference organized by Habiba Zaman to discuss challenges faced by South Asian youths in Canada
April 27, 2019	explorAsian 2019 Opening Ceremony	Vancouver Asian Heritage Month Society (VAHMS)	explorASIAN celebrates national Asian Heritage Month each May by building bridges between mainstream and Asian Canadian communities in promotion of multiculturalism and diversity.
April 30, 2019	Paul Tai Yip Ng Memorial Award for 2018 Best Graduate Student Paper	SFU David Lam Centre	Ms. Daniella Silva, an MA student in the Global Communication program, was the winner of our 2018 Best Graduate Student Paper award. Daniella received her BA in international communications with an emphasis in French and a minor in biology from Walla Walla University (WA). Her winning paper is a case study exploring how the forces of neoliberalism and global IP regulations shape power relations between Huawei, Canadian universities, and nation-states.

Date	Event	Speaker/Organization	Description
May 2019	2019 DOXA Documentary Film Festival	Documentary Media Society	The 18 th Annual DOXA Festival featured 82 films from across Canada and around the world, representing some of the very best in contemporary documentary cinema.
May 6, 2019	In the Claws of a Century Wanting	Jewel Maranan, Director	David Lam Centre sponsored this film screening and dialogue at DOXA 2019. Filmmaker Jewel Maranan observes the contradictions in the changing landscape and their effect on the lives of various characters who share the same fate in this film.
May 6-7, 2019	Person-Centred Care for Older Adults with Dementia in BC and Hong Kong	Habib Chadhury, Professor of Gerontology, SFU	Co-sponsored by David Lam Centre, this 2-day symposium brought together researchers from Hong Kong and BC to share research results and insights on dementia care.
June 1, 2019	International Workshop on Gender Diversity & Inclusiveness	Habiba Zaman, Professor of Gender, Sexuality and Women's Studies, SFU	Researchers participated in this 1-day workshop co-organized by SFU and Hohai University in China.

Date	Event	Speaker/Organization	Description
June 20, 2019	The Acquisition of Lexical Tone by Cantonese-speaking Children	Peggy Mok, Associate Professor, Department of Linguistics and Modern Languages, Chinese University of Hong Kong	Cantonese tone acquisition, contrary to the general principle that perception precedes production in child language, while some recent studies demonstrated that Cantonese tone acquisition is a protracted process. This study revisited the acquisition of lexical tone by Cantonese-speaking children, exploring the possible link between production and perception in first language acquisition with data from over 100 children aged between 2 and 6. The speaker shared the findings call for a wider perspective on how to define successful phonological acquisition.
July 2019	Indian Summer Festival	Indian Summer Festival Society	Twelve days with 31 events featuring 195 artists celebrated the festival's theme 'Tricksters, Magicians and Oracles'. The festival was attended by 8,675.
July 7, 2019	Pico Iyer on Love, Life and Mortality	Pico Iyer, Thinker, Writer and World-traveller	Pico Iyer reminded audience of this talk and readers of his book "Autumn Light" never to take the people and things we hold dear for granted. The writer undertakes a life-affirming investigation into the human condition, inspired by the wisdom of the cultural traditions of his adopted country of Japan.
July 13, 2019	Vancouver Art Gallery Keynote Lecture: Sunil Gupta	Sunil Gupta, Artist, Educator and Curator	The speaker critically addressed issues of race, migration and queer identity in India.

Date	Event	Speaker/Organization	Description
August 2019	The 43rd Annual Powell Street Festival	Powell Street Festival Society	The Powell Street Festival is the largest Japanese Canadian festival in the country and the longest running community arts celebration in Vancouver! Enjoy traditional and contemporary Japanese Canadian performances and demonstrations, including taiko drumming, sumo wrestling, martial arts, bonsai and ikebana, folk and modern dance, alternative pop/rock/urban music, visual arts, film/video, as well as historical walking tours, tea ceremonies, and a fantastic array of Japanese food, crafts, & displays.

Date	Event	Speaker/Organization	Description
September 10, 2019	Taiwan's Politics in Action: Elections Past and Future	John Franklin Copper, Stanley J. Buckman Distinguished Professor of International Studies (emeritus), Rhodes College	Elections in Taiwan have an interesting and colorful history. They have been critical to Taiwan's successful democratization. Taiwan held local elections in the 1950s after the United States afforded it protection. In the 1960s Taiwan's miracle economic growth provided the basis for a middle class—essential to democracy. In 1986 a new party formed and became a competitive party; two-party elections followed. In 1996 Taiwan had its first direction presidential election. In 2000 the opposition party won the presidency. Since then there have been three more changes of ruling parties. Professor Copper assessed how the 2020 election campaign would proceed and what were the factors to understand to grasp this election's importance.
September 19, 2019	Wisdom Amidst Crisis: the Case for Ecodharma in the Anthropocene	David R. Loy, Professor of Buddhist and Comparative Philosophy	The speaker discussed the profound parallels between our perennial personal predicament, according to Buddhist teachings, and the predicament of our now-global civilization today in relation to the rest of the biosphere. Is the ecological crisis also a spiritual crisis?

Date	Event	Speaker/Organization	Description
September 25, 2019	2019-20 Social Science Colloquium on China: Economic Origins and Geopolitical Limits of China's Belt and Road Initiative	Ho-fung Hung, Henry M. and Elizabeth P. Wiesenfeld Professor in Political Economy, Department of Social and the Nitze School of Advanced International Studies at the Johns Hopkins University	Professor Hung kicked off the first lecture of the Social Science Colloquium on China by arguing that China's export-oriented developmental miracle is in fact a constitutive part of the global neoliberal order, and is made possible by unique conditions difficult to be replicated in other places. At the same time, China's overseas economic interests are still relatively small if we discount capital flight in the outgoing flow of investment. Having that said, China's rise as a capital exporter is still making it follow in the footsteps of preceding capitalist-hegemonic powers to protect its global economic interests by projecting its military power and political influence overseas.

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September 26, 2019	Chinese State Capitalism in Hong Kong	Ho-fung Hung, Henry M. and Elizabeth P. Wiesenfeld Professor in Political Economy, Department of Social and the Nitze School of Advanced International Studies at the Johns Hopkins University	In his second talk at SFU, Professor Hung's presentation discussed the role of Hong Kong as China's offshore financial market amidst the rise and faltering of the China Boom, as well as its implications to the local politics and society of Hong Kong. While China continues to maintain a lot of restrictions on foreign financial capital, Hong Kong's financial sector has been fully open to the world. In the meantime, US and other developed countries treat Hong Kong as a separate entity on import-export control and capital control, offering Hong Kong free access to their markets with privileges close to those enjoyed by any OECD country. One consequence of this special status of Hong Kong is the rising economic dominance and political influence of Chinese state companies and the princeling elite associated with them. Such domination, ironically, could erode Hong Kong's autonomy from Beijing and jeopardize Hong Kong's special status in the world economy.

Date	Event	Speaker/Organization	Description
October 1, 2019	Urban Media Art as Social Mediation in Hong Kong	Kingsley Ng, Assistant Professor in Academy of Visual Arts, Hong Kong Baptist University	Interest in urban media art has been on the rise over the last decade. The form has been used in art festivals such as <i>Lumiere Vancouver</i> and <i>Lumiere Hong Kong</i> as large-scale spectacles and tourism promotion campaigns. This lecture used the emerging discourse on urban media as its point of departure and contextualise it with the situation of Hong Kong. In a city known for its sensory overload, can urban media art take an alternative path?

Date	Event	Speaker/Organization	Description
October 2, 2019	Reanimating the Mammoth	Matthew Chrulew, Senior Research Fellow, School of Media, Creative Arts and Social Inquiry, Curtin University	The woolly mammoth has often appeared as a figure of lost connection, of ecological immersion and reciprocity from which we have become alienated. Its distinctive significance lies both in its prehistoric overlap with emerging humans, and its centrality to scientific controversies around questions of extinction, geological time and climate change. Debates over the cause of Pleistocene megafauna extinctions weighed up theories of overkill (human hunting), overkill (climate change) and overkill (disease), informed by differing conceptions of the extent and limits of human agency within the natural world. Current rewilding projects (such as the ecological experiment of Siberia's Pleistocene Park) and de-extinction projects (seeking to clone and breed extinct animals back into existence) draw heavily on perceptions of culpability for the disappearance of the mammoth and other species. Fictional encounters with mammoths have drawn upon these themes, exploring both human environmental destructiveness and vulnerability to climate, histories of colonisation and survival, and the capacity for ecopolitical remediation, repair and redemption. Examples include Jean Auel's pre-historical fiction Earth's Children series (1980-2011), Stephen Baxter's science fiction Mammoth trilogy (1999-2001), and Eleanor Arnason's alternate history novella Mammoths of the Great Plains (2010). A burdened subject of anthropological and ecopolitical speculation, the mammoth can be considered a totem animal of the Anthropocene. What can we learn from the stories we tell about the mammoth—both scientific, and science fictional? What animates this reanimation?

Date	Event	Speaker/Organization	Description
October 4, 2019	Thai Forest Buddhism Enters the British Columbian Forest: Building Birken Monastery in the 1990s	Karen Ferguson, Professor of the Urban Studies Program, SFU Luke Clossey, Associate Professor of History and Director of the Global Asian Program, SFU	In April 1994, the Venerable Sona (ne Tom West), a Coquitlam, BC-born-and-bred Buddhist monk from the austere and orthodox Thai Forest Tradition of Theravada Buddhism, travelled to a complex of rundown shacks on the road between Mount Currie and D'Arcy in the Birkenhead River valley near Pemberton, BC. There, he succeeded in establishing a foothold of the Thai Forest tradition, the first initiated by a westerner in North America. This presentation explored the depth and meaning of these intersections, which didn't happen in the cosmopolitan environs of a Global City, like Vancouver, but rather at the periphery, in a remote and reputedly "redneck" place, where the Thai and Sri Lankan "ethnic" Buddhists who visited encountered an intensely foreign cultural and physical environment surrounding the familiar robes and rituals of a Buddhist monastery.
October 5, 2019	Media Art Workshop with Kingsley Ng	Kingsley Ng, Assistant Professor in Academy of Visual Arts, Hong Kong Baptist University	Professor Ng shared his views on media art with a group of SFU researchers in this interactive workshop as one of the two David Lam Centre's events under the new Faculty Exchange Program with Hong Kong Baptist University

Date	Event	Speaker/Organization	Description
November 6, 2019	Pacific Region Forum: Ethnic Diversity in Africa and Its Implications for Chinese Investments	Peng Zhang, Assistant Professor of Managerial Economics, Beedie School of Business, SFU	Investments from China have played important roles in regional development in Africa. However, they have also caused a lot of controversy. After the extension of China's Belt and Road Initiative to many African countries in 2018, China will continue to be a key investor in Africa in the future, but making good investment decisions and managing potential risks will require a further understanding of African society and culture. This talk provided an overview of the complexity of ethnic relations in Africa based on the speaker's research in South Africa in particular. Professor Zhang shared about how ethnic diversity affects the economic development in South Africa and other major African countries, and how it can influence Chinese investments in Africa in general.
November 12, 2019	History Matters	Linda Hoaglund, Film Producer	Organized by SFU History and co-sponsored by David Lam Centre, the bilingual filmmaker born in Japan gave a talk to students and faculty at SFU.

Date	Event	Speaker/Organization	Description
November 14, 2019	Taiwan Studies Group Speakers Series: Decolonizing Mothering: Asian Immigrant Mothers' Learning in Transnational Canada	Yidan Zhu, Postdoctoral Fellow, Faculty of Dentistry, UBC	The speaker discussed how Asian immigrant mothers in Canada learn to become "ideal mothers" and (re)construct their identities in association with the reproduction of race, gender, and class inequalities in transnational Canada. The purpose of this talk was to use <i>decolonization</i> as a theoretical framework for unpacking the colonial relations behind the knowledge of mothering through the exploration of Asian immigrant mothers' everyday lives. The researcher also discussed how knowledge has been shaped and produced through colonial relations in transnational contexts.

Date	Event	Speaker/Organization	Description
November 15, 2019	Taiwan Studies Group Speakers Series: Pirates and Publishers: A Social History of Copyright in Modern China	Fei-Hsien Wang, Assistant Professor of History, East Asian Languages and Cultures, and the Liberal Arts & Management Program, Indiana University	China has long been criticized as <i>the</i> heaven of intellectual property piracy. In mass media as well as in academic discussions, China's inability or reluctance to protect copyright is often attributed to its cultural tradition which embraces imitation over innovation. But is this the whole story? The speaker used a new conceptual framework to reveal an intertwined history of copyright and piracy in modern China. By shifting the attention from the letter of the law to the actual practices of copyright, it explores how copyright, a seemingly alien concept, was actually received, appropriated, and employed to respond to emerging issues of piracy in China's local socio-economic contexts, both within and beyond the legal institutions of the state. While Chinese publishers and authors might be labeled as ruthless pirates by their foreign counterparts, they were advocates for domestic copyright in their own ways.

Date	Event	Speaker/Organization	Description
November 19, 2019	2019-20 Social Science Colloquium on China: South-South Encounters: The Politics of Interactions Among Africans and Chinese on the Ground	Saheed A. Adejumobi, Associate Professor of History Department, Seattle University Nellie Chu, Assistant Professor of Cultural Anthropology, Duke Kunshan University Huamei Han, Associate Professor of Faculty of Education, SFU Derek Sheridan, Assistant Research Fellow, Institute of Ethnology at Academia Sinica, Taiwan	Led by the discussant, Professor Adejumobi, three researchers shared their findings and insights as well as current projects on African migrant workers in China as well as Chinese workers in Africa.

Date	Event	Speaker/Organization	Description
November 19, 2019	Eating as Moral Philosophy: A Comparison Between Singapore and the U.S.	Richard Wilk, Distinguished Professor and Provost's Professor Emeritus, Indiana University	People across the world think about foods that are “good” and “bad,” and see some kinds of eating as virtuous while others make them feel guilty. This talk contrasted such beliefs in Singapore and the United States. There is every reason for food to have a close connection with morality – every religion has something to say about what we should and should not eat, and sharing food is the most fundamental act that binds us together, starting with a mother’s breast. But how do people enact such moral precepts in practice? Professor Wilk presented his paper which is based on interviews, discussions and self-reports of college students in both the United States and the National University of Singapore's Tembesu College. The paper reveals the complexity of the negotiable valences of different foods, and the moralities involved in the ways they are consumed and their social context. For college students, the everyday morals of food turn out to be closely linked with other morally fraught behavior, including exercise, sex, drinking and work.

Date	Event	Speaker/Organization	Description
November 19, 2019	Ground Down by Growth: Tribe, Caste, Class and Inequality in 21 st Century India	Alpa Shah, Associate Professor, London School of Economics	Alpa Shah presented her co-authored ' <i>Ground Down by Growth: Tribe, Caste, Class and Inequality in 21st Century India</i> ', listed as a 2018 Book of the Year by <i>The Hindu</i> newspaper. While the world marvels at India's economic growth rates, inequality is rising and the country's 'untouchable' and 'tribal' communities – who make up a staggering one in twenty-five people across the globe – remain at the bottom of the economic and social hierarchy. How and why is this the case? In conversation with economists, a team of anthropologists lived with Adivasis ('tribes') and Dalits ('untouchables') in five different sites across India to answer this question. They show how capitalism is entrenching social difference, transforming traditional forms of identity-based discrimination into new mechanisms of exploitation and oppression. Inherited inequalities of power are merging with the super-exploitation of migrant labour, and the conjugated oppression of class, caste, tribe and gender. The struggles against these inequalities are considered.

Date	Event	Speaker/Organization	Description
November 20, 2019	Taiwan Studies Group Speakers Series: A Glimpse on Indigenous Traditional Territory Policy Through the Land Disputes from the Thao People in Taiwan	Yung-ching Lo, PhD, Institute of Cultural Anthropology and Development Sociology, Leiden University	In 2005, Taiwan has stipulated an Indigenous Basic Law to bring rights to come true. For indigenous land rights, in the Basic Law, article 21 is concerned on the principle of free prior informed consent (FPIC) and sharing about the benefit of any developments in indigenous land. But the problems come that where are indigenous lands that actually include conservation land and traditional territories. The former is clear but the traditional territories are still in the mapping process that is formulated by the Indigenous Council that insists these lands do not include private land. This policy triggers many pros and cons especially, indigenous people demonstrate private lands should be concerned, otherwise it is not transitional justice at all. The talk illustrated the case from the Thao people to see how Indigenous Traditional Territory Policy worked through disputes.

Date	Event	Speaker/Organization	Description
November 22, 2019	Night March: Among India's Revolutionary Guerrillas	Alpa Shah, Associate Professor, London School of Economics	Alpa Shah discussed <i>Nightmarch: Among India's Revolutionary Guerrillas</i>, which was shortlisted for the 2019 Orwell Prize for Political Writing and the New India Foundation Book Prize, and a 2018 Book of the Year for the New Statesman, the Hindu, the Scroll and History Workshop. <i>Nightmarch</i> refers to a seven-night trek when Shah found herself dressed as a man amidst a Naxalite guerrilla platoon, walking 250 km across the dense forests of eastern India at the peak of counterinsurgency operations in 2010. Framed by the government and the media as a deadly terrorist group, the Naxalites are Marx, Lenin and Mao-inspired ideologues and tribal combatants, seeking to overthrow a system that has abused them for decades, in what is now the world's longest running armed insurgency. Based on years of living as an anthropologist with indigenous communities, Shah explores why they have taken up arms to fight for a fairer society and asks how they may be undermining their own aims.

Date	Event	Speaker/Organization	Description
November 22, 2019	Taiwan Studies Group Speakers Series: Testing Hearing: Audiometry and Environmental Noise Control in Postwar Taiwan	Jennifer Hsieh, LSA Collegiate Fellow, Department of Anthropology, University of Michigan	As part of democratic liberalization in the late 1970s and 1980s, noise abatement signified the Kuomintang (KMT) regime's efforts to attend to the quality of life of local Taiwanese subjects. However, the use of scientific, objective indicators for noise, as decibels, had the effect of subjecting individual, human experience to the standardizing techniques of quantification and measurement. Through an analysis of audiometric testing of hearing health among deaf schoolchildren to socio-acoustic surveys that assessed one's noise tolerance levels, Dr. Hsieh examined how hearing and noise became an interest of the state—as both a continuation of surveillance practices and as a symbol of liberalization. This paper is part of a larger project in which the researcher analyzed how noise petitioners and civil servants in Taiwan mediate political engagement through the technocratic measurement of environmental noise.

Date	Event	Speaker/Organization	Description
November 22, 2019	Revisiting Indigenous Articulations: A Film Screening and Discussion with Anita Chang	Anita Chang, Assistant Professor, Department of Communication, California State University	What is at stake in generating and representing Indigenous articulations in Asia and the Pacific? Articulations in this usage encompass both attempts to generate meanings and new connections and relations that cut across the boundaries of nation-states. To help engage with this question, David Lam Centre welcomed filmmaker, educator, and writer Anita Chang for a screening and discussion of <i>Tongues of Heaven</i>, a collaboratively directed experimental documentary film project that brings together the work of four Indigenous female filmmakers: An-Chi Chen and Shin-Lan Yu from Taiwan and Leivallyn Kainoa Kaupu and Monica Hau'oli Waiau from Hawai'i. This film represents in at-times unexpected ways efforts at Indigenous language revitalization, responses to settler colonial education policies, and the impact of extreme climate variability on Indigenous communities. Following the screening, Anita discussed the film, as well as demonstrated the companion web application named <i>Root Tongue</i>.

Date	Event	Speaker/Organization	Description
November 27, 2019	Taiwan Studies Group Speakers Series: Early Cinema in Colonial Taiwan	Laura Jo-Han Wen, Assistant Professor of Chinese Studies, Department of Asian Studies, Randolph-Macon College	What was the role of cinema during the expansion of empires in East Asia? This talk introduced early film culture in colonial Taiwan and shed light on the intermediality between cinema and other popular media during the first half of the twentieth century. Inspired by media archaeology to investigate “where was cinema” in the colonial context during Sino-Japanese encounters. Professor Wen explored the techno-historical significance of cinema and examined the role of early film culture in modern discourses propagated by the Japanese empire. Rare images and archival materials concerning magic lantern shows, talkies, and eight-millimeter films were revisited in this talk in the discussion of transnational modernism, colonial propaganda, and the practice of amateur cinema.

Date	Event	Speaker/Organization	Description
December 10, 2019	Taiwan Studies Group Speakers Series: Taiwan in Dynamic Transition: Nation Building and Democratization	Ashley Esarey, Assistant Professor, Department of Political Science, University of Alberta	This talk provided an up-to-date assessment of contemporary Taiwan, highlighting Taiwan's emergent nationhood and its significance for world politics. Taiwan's path has important implications for broader themes and preoccupations in contemporary thought, such as consideration of why political transitions in the aftermath of the Arab Spring have sputtered or failed while Taiwan has evolved into a stable and prosperous democratic society. Taiwan serves as a test case for nation and state building, the formation of national identity, and the emergence of democratic norms in real time.

Date	Event	Speaker/Organization	Description
December 11, 2019	Taiwan Studies Group Speakers Series: The Portraits of a Heroine: Huang Bamei and the Politics of Wartime History in East Asia, 1930-1960	Weiting Guo, Assistant Professor, History, SFU	Professor Guo explored the life and images of Huang Bamei (1906–82)—a female bandit, guerrilla leader, and women’s organization coordinator. While films and literature revealed her past as a pirate and “Han traitor,” the Nationalist authorities granted her land, garment factory, and fund to prevent her collaboration with the Central Intelligence Agency (CIA) of the United States. Drawing on abundant sources from government archives, newspapers, memoirs, and films, this talk looked at this chameleon-like woman in light of the vicissitudes of cultural and national imaginations in WWII and Cold War. Through a close reading of the life history of this legendary woman, the presentation examined how Huang developed her survival strategies during a turbulent time and how her competing representations were embedded in the wartime politics of modern East Asia.

Date	Event	Speaker/Organization	Description
January 15, 2020 (Snow Day – CANCELLED)	Pacific Region Forum: A Balancing Act: Translating Scholarly Management Research for Chinese and English Speaking Managers	Jean M. Bartunek, Robert A. and Evelyn J. Ferris Chair and Professor of Management and Organization, Boston College Isabelle Yi Ren, Visiting Assistant Professor of Management, Adelphi University	How is knowledge in scholarly management research papers (often 30 to 50 pages long) converted into insights meant to be brief, applicable, and interesting for managers? And how does this differ for managers with different cultural backgrounds? In this presentation, the researchers examined the motivations, translation strategies, and tensions that underlie the conversion process. In particular, they discussed how research translations for Chinese-speaking managers may differ systematically from research translations for English-speaking managers. Jean and Isabelle studied this using a research translation magazine that converts management research from top journals into both Chinese and English research highlights.

Date	Event	Speaker/Organization	Description
January 29, 2020	2019-20 Social Science Colloquium on China: China and Global Ocean Governance: Opportunity or Threat?	Tabitha Grace Mallory, Affiliate Professor, Henry M. Jackson School of International Studies, University of Washington and Founder and CEO of the China Ocean Institute	China's foreign policies such as the Belt and Road Initiative and "Made in China 2025" make some observers nervous. China's investment abroad and technology planning raise concerns about possible threats to the liberal international order through the potential creation of spheres of influence, competing standards, and a protectionist economic system. Such anxieties are accompanied by apprehensions over China's stricter domestic political and social policies. Against this backdrop, China is also increasingly involved in global ocean governance thanks to domestic blue economy initiatives, the 21 st Century Maritime Silk Road, and a desire to shape international institutions in its favor. China's global fishing fleet is the largest in the world, and China participates in international negotiations over seabed mining and marine genetic resources. What are the implications of China's role in how we govern our global oceans? Dr. Tabitha Mallory provided an overview of China's strategic ocean development plans, and discussed both areas for concern as well as for future cooperation.

Date	Event	Speaker/Organization	Description
February 12, 2020	2019-20 Social Science Colloquium on China: Taiwanese Capitalism with Socialist Characteristics: Guomindang Land Reform in Cold War Taiwan	James Lin, Assistant Professor of International Studies and History, University of Washington	This presentation explored the role of imagined capitalism and socialism in constructing a new form of modernity on postwar Taiwan. GMD land reform formed the basis of a modern, Taiwanese anticommunism in a global Cold War. Its architects crafted a capitalist (and thus “non-radical”) solution centered on financial ingenuity and social welfare. By the late 1960s, Taiwan turned its experience in land reform into a Global South-South enterprise, sending land reform experts to countries like Iran and Vietnam, while hosting dozens of Third World bureaucrats over several decades at its Land Reform Training Institute founded in 1968. Ultimately, the discourse and power of capital were critical for the representation of Taiwan’s own development modernity, both at home and abroad. Its key findings demonstrate the significance of swapping land for debt in the rise of global capitalist logics that undergirded greater 20 th century social and economic transformations in Taiwan, Asia, and the Global South.

Date	Event	Speaker/Organization	Description
February 28, 2020	Mukhtiyar Ali & Friends – A Concert of Sufi and Bhakti Music		Mukhtiyar Ali represents the folk tradition of Sufi and Bhakti singing that spans the north of India and Pakistan. Singing in his native Marwari, as well as Hindi and Punjabi, Ali sings of the spirit and the worldly, of truth and of love, of passion and of reason.
February 29, 2020	South Asia Conference of the Pacific Northwest (SACPAN)	Robert Anderson, Professor Emeritus, School of Communication	Twenty-five researchers from SFU, UBC, University of Washington and Yale joined 4 panels to discuss evolving perspectives of South Asia including gender, politics, social struggles, culture, and religious frontiers and blindspots in this 1-day conference.

List of Past Events Sponsored/Organized by the DLC in 2018-19

Date	Event	Speaker/Organization	Description
April 5, 2018	Bayanihan and Belonging: Filipinos and Religion in Canada	Alison R. Marshall, Professor of Religion, Brandon University	The talk provided an overview of Filipino religiosity in Canada today. The speaker drew on research participant narratives, archival research, and fieldwork in Canada and the Philippines to explain the link between Filipino religious beliefs and practices, migration and belonging.
April 19, 2018	Paul Tai Yip Ng Memorial Award for 2017 Best Graduate Student Paper	SFU David Lam Centre	Ms. Maggie Tsang, an MA student in Humanities, was the winner of our 2017 Best Graduate Student Paper award. Maggie obtained a B.Sc. in Environmental Science & Management and an MA in Philosophy from Hong Kong. The winning paper examines the nature of knowledge of Chinese and Modern Medicine with a hermeneutic approach.
May 2018	explorAsian 2018	Vancouver Asian Heritage Month Society (VAHMS)	explorASIAN celebrates national Asian Heritage Month each May by building bridges between mainstream and Asian Canadian communities in promotion of multiculturalism and diversity.

Date	Event	Speaker/Organization	Description
May 2018	2018 DOXA Documentary Film Festival	Documentary Media Society	The 17 th Annual DOXA Festival featured 93 films and 96 screenings including the screenings of <i>From Our Eyes</i> , curated by Yi Cui and sponsored by SFU David Lam Centre
May 12, 2018	Mountain High River Flow	Sound of Dragon Society	This workshop provided hands-on opportunity for the participants to explore the inspiration from the natural world, both musically and visually. The artist Dailin Hsieh brought one zheng for everyone to take turns to play. Participants were welcomed to bring other musical instruments to play and paint mountains, trees, flowers and rivers with ink and rice paper.
May 28, 2018	Taiwan Studies Group Speakers Series: The Bamboo Union: Romance, History and Politics	Yun Xia, Associate Professor of History and International Studies, Valparaiso University	From the 1950s to the 1980s, student gangs founded by children of mainlanders in Taiwan evolved into entrepreneurial criminal organizations, against the backdrop of Taiwan's modernization and gradual democratization. This metamorphosis is best illustrated in the formation and vicissitudes of the Bamboo Union (zhulian bang). The speaker unveiled the historical realities of this often fantasied organization, its inner-workings and its intricate relations with competing gangs as well as with the Nationalist party.

Date	Event	Speaker/Organization	Description
May 29, 2018	Taiwan Studies Group Speakers Series: Gendering Masculinity: Taiwanese Households and the Japanese Colonial Courts	Tadashi Ishikawa, Postdoctoral Fellow in the Chiu Program for Taiwan Studies, Oregon State University	This talk examined the construction of Taiwanese masculinity in the Japanese colonial courts from 1919 to 1936. In the early 1920s, new Taiwanese elites emerged against the backdrop of preexisting male elitism and women's subordination to men and began envisioning new manliness within and outside the household.
June 26, 2018	2018 Canada-China Sino-Western Cultural Exchange Forum	International Multicultural Development Foundation	This forum shared examples of non-governmental protection of cultural heritages.
July 2018	Indian Summer Festival	Indian Summer Festival Society	The theme of the 11-day festival was 'Mythmaking'. People have always longed to know where we come from, why the world came to be and why things are the way they are. ISF 2018 took on this massive theme, examining ten centuries of human imagination and storytelling and presented a trans-continental range of artists, from the inheritors of ancient oral storytelling traditions to genre-defying musicians, award-winning novelists, and provocative visual artists.

Date	Event	Speaker/Organization	Description
August 2018	The 42 nd Annual Powell Street Festival	Powell Street Festival Society	The Powell Street Festival is the largest Japanese Canadian festival in the country and the longest running community arts celebration in Vancouver! Enjoy traditional and contemporary Japanese Canadian performances and demonstrations, including taiko drumming, sumo wrestling, martial arts, bonsai and ikebana, folk and modern dance, alternative pop/rock/urban music, visual arts, film/video, as well as historical walking tours, tea ceremonies, and a fantastic array of Japanese food, crafts, & displays.
September 13, 2018	Going Home	Bei Ling, poet and essayist	Beijing has changed greatly since the year 2000. Bei-Ling, exiled and not able to return to his home - Beijing, shared his impression of Beijing today.
September 18, 2018	MIKTA Workshop: Middle Powers' Role in the Era of the Confrontations Among Major Powers	Consulate General of the Republic of Korea	A 1-day workshop featuring panelists from the Royal Roads University, UBC, former Korean ambassador to Australia, Fairleigh Dickinson University, and the Asia-Pacific Foundation of Canada

Date	Event	Speaker/Organization	Description
September 18, 2018	The Future of the Asian Pacific Economy and Trans-Pacific Trade	Stewart M. Patrick, Director of the International Institutions and Global Governance Program, Council on Foreign Relations, Washington, D.C.	The speaker spoke to what the implications are or could be of the U.S.'s non-participation in the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP, formerly known as the Trans-Pacific Partnership, or TPP), especially as China proceeds to deepen trade and economic engagement around the world through the Belt and Road Initiative and Regional Comprehensive Economic Partnership (RCEP). In addition, his comments touched on what the American domestic foundations are for the re-engagement of Asia in a context of rising sovereignty, insularity, and protectionism in the United States.
September 27, 2018	The Burden of Housing Refugees: A Perspective from Rohingya Hosting Chittagong	D. Mitra Barua, Annette and Hugh Gragg Postdoctoral Fellow in Transnational Asian Studies, Rice University	This presentation warned that the delay in resolving the Rohingya crisis may trigger another refugee-generating crisis by victimizing the non-Bengali and Buddhist minority living in Chittagong. This observation, made after a month-long visit to Rohingya refugee hosting Chittagong, highlights the urgent need for international intervention so that the Rohingya refugees are repatriated in timely fashion to stop another humanitarian crisis in the region.

Date	Event	Speaker/Organization	Description
October 3, 2018	Pacific Region Forum Asian Waters: The Struggle Over the Asia-Pacific and the Strategy of Chinese Expansion	Humphrey Hawksley, former BBC correspondent	Whether on trade or tension around the Korean peninsula, America and China suspiciously circle each other while many other countries are deciding where their long-term future best lies. How these complexities are handled will have repercussions on all our lives. In this Pacific Region Forum, Humphrey Hawksley, a former BBC China and Asia correspondent, drew on decades of first-hand experience in Asia for this compelling and comprehensive analysis of the Asia-Pacific region.
October 10, 2018	Taiwan Studies Group Speakers Series: The Contentious Public Sphere: Law, Media, and Authoritarian Rule in China	Yan-wen Lei, Assistant Professor in the Department of Sociology, Harvard University	Despite ongoing censorship and repression, public opinion and debate in China has become increasingly common and consequential. How did this happen? The speaker, drawing on her new book <i>The Contentious Public Sphere</i> , discussed how the Chinese state mobilized law, the media, and the Internet to further an authoritarian project of modernization, but in so doing, inadvertently created a nationwide public sphere in China—one the state must now endeavor to control. She examined how this unruly sphere has influenced Chinese politics and the ways that the state has responded.

Date	Event	Speaker/Organization	Description
October 11, 2018	Pacific Region Forum China and the New Generation of Entrepreneurs: Is There a Lesson for Other Developing Countries?	Majid Ghorbani, Associate Professor at the Business School of Renmin University of China	Since the introduction of the open-door policy, and the shift away from extreme levels of state control of the economy, entrepreneurship in China has flourished. The speaker reported on the state of entrepreneurship in China based on the findings of three academic research projects and 30 years of experience observing China. This presentation touched upon the promotion and results of entrepreneurship among China's rural population and the creation of an uber class and middle class as well as some potential future obstacles and implications for Pacific Rim developing nations were discussed.
October 13, 2018	2018 K-Pop Competition	Consulate General of the Republic of Korea	Sponsored by the DLC to take place at SFU Goldcorp Centre for the Arts
October 16, 2018	Taiwan Studies Group Speakers Series: The Formation of Taiwanese Identity After Democratization	Shiho Maehara, Research Assistant Professor of Taiwan Studies Project at Kyushu University, Japan	Taiwan is an ethnically and culturally diverse island whose have long been asking themselves "who are we?" As Taiwan has democratized since the 1980s, the answers to this question have changed considerably. In this talk, Shiho analyzed the historical background to this shifting identity discourse, focusing especially on the influence of former Taiwanese President Lee Teng-hui.

Date	Event	Speaker/Organization	Description
October 29, 2018	Running on Empty: Canada and the Indochinese Refugees, 1975-1980	Panelists: Michael Molloy, former ambassador to Jordan David Ritchie, former Foreign Services Officer served in Pakistan, Afghanistan, India and Sri Lanka Mohammed Alsaleh, a Syrian refugee and former medical student	The story of how Canada launched this major refugee program is told in <i>Running on Empty: Canada and the Indochinese Refugees, 1975-1980</i>. The book was written by four retired federal immigration officials. It describes the efforts of their colleagues working under difficult conditions in Indochinese refugee camps and in Canadian communities to resettle those displaced by war and oppression. The lessons learned and new programs launched in this Indochinese refugee movement informed later refugee movements to Canada.
November 1, 2018	Taiwan Studies Group Speakers Series: Loyalty Marathon: Career Norms and Choices in Taiwan Law Firms	Sida Liu, Assistant Professor of Sociology and Law, University of Toronto	Lawyers often face difficult career choices in times of market uncertainty. After the global financial crisis in 2008, Taiwan law firms have experienced business downturns, which have taken a toll on lawyers' careers. Drawing on more than 60 interviews conducted in Taipei and Tainan in 2017-2018, this talk investigated how lawyers in Taiwan make career choices in an unfavourable market for professional services. The speaker argued that professional careers in Taiwan law firms is driven by an extra-long "loyalty marathon."

Date	Event	Speaker/Organization	Description
November 5, 2018	Taiwan Studies Group Speakers Series: Indigenous Taiwan: Traditional Knowledge Navigating Modernity	Michael Jacobson, rescuer of two Daowu fishing boats in Seattle	Taiwan's 16 recognized indigenous tribes daily navigate the pressures of modernity while maintaining their traditional cultures and traditions. Contemporary indigenous people must make a living, maintain their language and culture within the dominant Han culture, and deal with the negative impacts of mass tourism and environmental degradation. The speaker examined the Daowu, Paiwan, Rukai and Atayal tribes and the significance of Taiwan's indigenous communities in Taiwan's history and culture.
November 15, 2018	Pacific Region Forum: Globalization, Movement of Intellectual Capital and Innovation – The Russian Case	Daniel Satinsky, business consultant and analyst	Based on in-depth interviews with 157 Russian-speaking immigrants in the tech sectors of Silicon Valley and Boston/Cambridge, one of the authors of <i>Hammer and Silicon – The Soviet Diaspora in the U.S. Innovation Economy</i> examined the role of U.S. and Soviet, then Russian government immigration policy and the experience of immigration for the real people who comprise human intellectual capital, was discussed and summarized in this presentation.

Date	Event	Speaker/Organization	Description
November 20, 2018	Taiwan Studies Group Speakers Series: Hierarchy and Egalitarianism in Austronesia Taiwan: A Case Study of the Paiwan	Kun-hui Ku, Institute of Anthropology, National Tsing Hua University	This lecture reviewed previous attempts to characterize the nature of social differences among the Austronesian Taiwan and the theoretical roots of these efforts. Linguistic research over the past three decades has suggested that Proto-Austronesians may have already developed chiefdoms and social hierarchies and that Taiwan was one of the key sites for the migration of Austronesian speakers. Some scholars thus concluded that the “egalitarian” type of societies among the Austronesian Taiwan must have been the result of Japanese colonialism. The speaker compared this dichotomy with ethnographic material from Austronesian Taiwan, especially the Paiwan; distinguished the ideological and practical dimensions of this historical reconstruction; and examined the viability of the analytical tools which have been widely adopted in the anthropological literature on other Austronesian societies.

Date	Event	Speaker/Organization	Description
November 26, 2018	Taiwan Studies Group Speakers Series: 'Struggle for 100% Freedom': The Legacy of Nylon Cheng and Taiwan's Democratization	Ashley Esarey, University of Alberta	A provocative media entrepreneur and radical advocate of Taiwan independence in the 1980s, Nylon Cheng 鄭南榕 has since been commemorated with a "Freedom of Speech Day" and his quotations have served as rallying cries for a later generation of political activists. In a talk on Taiwan's transition from authoritarian rule. The speaker argued that the ways in which Nylon Cheng's ultimate sacrifice have been remembered can reveal much about the enduring effects of 1980s democratic activism as well as illustrate the vibrance of democracy in contemporary Taiwan.
November 28, 2018	Research Seminar	Miles Powell, Professor at Nanyang Technological University (Singapore)	The speaker shared new work on the environmental history of the Pacific shark fin trade: "How Would You Feel If Someone Were Allowed to Kill One of Your Grandparents?": Kānaka Maoli Opposition to the Hawaiian Shark Fin Trade."

Date	Event	Speaker/Organization	Description
February 11, 2019	Taiwan Studies Group Speakers Series: Fissures in the Historical Terrain: Revisit the Cold War in East Asia in the Hoover Archives	Hsaio-ting Lin, research fellow and curator of the Modern China collection at the Hoover Institution	The presentation showcased several archival treasures from the Hoover Institution Archives, Stanford University. The speaker illustrated how these archival collections might provide both evidence and opportunity for scholars to reconsider the Cold War binary thinking in Asia that has greatly simplified the intricate and intriguing political and military landscape in the region, overlooking the complicated intra-alliance between Taiwan and the United States, and across the Taiwan Strait.

Date	Event	Speaker/Organization	Description
February 27, 2019	Soundscapes of Uyghur Islam	Rachel Harris	The speaker shared her research that encompasses field-based ethnographic study of village ritual practices, and digital ethnography of mediated spheres of religious life, oral traditions of Central Asian Sufism, transnational flows of Qur'anic recitation and radical anashid, ideological debates and state interventions. In the fraught sphere of the discourse surrounding Islamic revivals, where dominant narratives privilege the visual in ways that routinely stereotype, demonize, and render Muslim subjects as passive Others, attending to the politics of voice and place may help to cut through the polarized political debates, and create new narratives about the lived experience of Islam.
March 5, 2019	Through the Looking Glass	Yi Cui, filmmaker and term lecturer SFU School for the Contemporary Arts	The speaker, Yi Cui, introduced a few works made by Tibetan herdsmen, monks and young students, and discussed her observations and analyses developed while she worked in the local Tibetan communities working with people making their own films.

Date	Event	Speaker/Organization	Description
March 9, 2019	Workshop: Identifying Challenges and Potential Solutions in Protecting Indigenous Heritage in Japan and North America	Department of Archaeology	Two faculty from the Center for Ainu and Indigenous Studies (Hokkaido University) and faculty from Canada and the US shared latest development in indigenous heritage in Japan and North America
March 14, 2019	Indigenous Worlds in Life and Death: Indigenous Worlds Beyond Borders as Seen from Victoria, BC in the 19 th Century	David Chang, Distinguished McKnight Professor of History and Chair of the Department of American Indian Studies, University of Minnesota	Coordinated with SFU History, this lecture explored how two different ways of studying the past (standard social history and interdisciplinary Indigenous study) lead to different understandings of past worlds. The standard tools of social history shed useful light on the early roots of colonial processes of hyper-policing and mass incarceration of indigenous people. Yet a study that proceeds from indigenous language sources and indigenous ideas of kinship and connection can reveal indigenous lives that transcend the boundaries that colonial powers archives impose upon them, in the past and also in the present.
March 22, 2019	Association of Asian Studies Conference	Michael Hathaway, Director of David Lam Centre	Michael presented papers on Indigenous Asia at the AAS Conference in Denver, Colorado and hosted largest known gathering of scholars of Indigenous Asia

Date	Event	Speaker/Organization	Description
March 27, 2019	Conversations with Ambedkar: Ten Ambedkar Memorial Lectures	Valerian Rodrigues, Visiting Scholar in the Department of Humanities at SFU	The speaker shared the lectures at Ambedkar University Delhi which dwell on some of the most telling concerns that our age confronts: concerns of justice, social closures, bare life and sovereign power, political agency, discrimination and affirmative action, displacement and migration, new modes and languages of command and control, social movements under the shadow of global capital, and politics of epistemic and normative frames on offer today.

List of Past Events Sponsored/Organized by the DLC in 2017-18

Date	Event	Speaker/Organization	Description
April 6, 2017	<i>Of Shadows</i> : Film Screening and Talk by Director Yi Cui	Yi Cui, filmmaker of <i>Camera Lucida</i> and <i>Shadow Puppet</i>	Filmed in China's Loess Plateau, where shadow theatre has entertained people and deities for centuries, <i>OF SHADOWS</i> follows a lively and resilient group of local shadow play performers as they navigate between the rural staging of ancient plays and the urban spectacles of national cultural heritage.
April 21, 2017	Celebration of the Chinese Canadian History Public Education Project's Book Launch	Chinese Canadian History Project Council, SFU David Lam Centre	<i>Canada's Chinatowns: Past, Present, and into the Future</i> is collection of eight Chinatown booklets. It is also a contribution to Canada's sesquicentennial celebration, Canada 150. The book is both a public information project and a statement of advocacy for maintaining the viability and integrity of Canada's historic Chinatowns.
May 2017	explorAsian 2017	Vancouver Asian Heritage Month Society (VAHMS)	explorASIAN celebrates national Asian Heritage Month each May by building bridges between mainstream and Asian Canadian communities in promotion of multiculturalism and diversity.

Date	Event	Speaker/Organization	Description
June 7, 2017	Paul Tai Yip Ng Memorial Award for 2016 Best Graduate Student Paper	SFU David Lam Centre	Ms. Tina Kong, an MA graduate in English, is the winner of our 2016 Best Graduate Student Paper award. Tina earned her BA (University of British Columbia, 2013). The winning paper examines the mechanics of white supremacy in mid-century Canada, as told through Velma Demerson's autobiography <i>Incorrigible</i> .
July 16, 2017	Border Crossing and Interaction: Evolution and Achievements of Chinese Canadian Literature	Chinese Canadian Writers' Association (CCWA)	Nearly 30 writers and scholars from Canada, the United States, China, Hong Kong, Macao, Korea and Thailand came to present their papers.
September 9, 2017	Curator's Talk with Ying Tan	Ying Tan, Curator at the Centre for Chinese Contemporary Art (CFCCA) in Manchester, UK	Ying shared in more detail on her curatorial practice, the history of CFCCA as an institution in the diverse art ecology of Manchester and its place in a global contemporary art context.

Date	Event	Speaker/Organization	Description
September 16, 2017	Researching Contemporary Topics in Asia	Asia-Pacific Foundation (APF)	A panel discussion with Asia Pacific Foundation of Canada's post-graduate research fellows, who talk about their recent short-term field work in in Asia, looking at: • East Asian youth cultures (China, Hong Kong, Japan, South Korea, Taiwan) • Women entrepreneurs in Asia's start-up scene (Pakistan, the Philippines, Vietnam) • Canadian support for LGBTQ rights groups (Myanmar, South Korea, and Taiwan)

Date	Event	Speaker/Organization	Description
September 16, 2017	Canada 150 Conference on Migration of Bengalis	Department of Gender, Sexuality, and Women's Studies	Paper presentations by speakers from both academia and the community at this 2-day conference on: • Migration and Settlement of Bengalis: History, Demography, Religion, and Health Issues • Gender Culture, Family, and Work: Stories of Migration • Multiculturalism, Bengali Organizations, and Social Justice Issues • Canadian Bengali Youths: Identity, Social, Cultural, and Family Life
September 18-20, 2017	Writing for Readers: Academic Publishing in a Time of Change	Ken Wissoker, Editorial Director of Duke University Press	This talk explores problems and discusses how to think about writing first and subsequent scholarly books at a time of change in the academy and in publishing. One-on-one workshops are held for SFU faculty with Ken.

Date	Event	Speaker/Organization	Description
September 25, 2017	The Book of Swindles	Chris Rea, Associate Professor of Asian Studies former Director of the Centre for Chinese Research at the University of British Columbia Bruce Rusk, associate professor of Asian studies at the University of British Columbia	The two authors talk about <i>The Book of Swindles</i> , compiled by an obscure writer from southern China, presents a fascinating tableau of criminal ingenuity. The flourishing economy of the late Ming period created overnight fortunes for merchants—and gave rise to a host of smooth operators, charlatans, forgers, and imposters seeking to siphon off some of the new wealth.
September 28, 2017	James Legge and the Chinese Classics: the Missionary, the Shanghai Hippie, and the Opium Taipan in the Turmoil of Colonial Hong Kog	Marilyn Bowman, Professor Emerita, SFU Department of Psychology	Marilyn presents to the audience James Legge (1815-1897), a brilliant Scots scholar and missionary famed as a translator of the Chinese Classics in Hong Kong when struggles between Britain and China included two wars, in an entertaining way.
September 28, 2017	Not-Your-Grandma's Social Movements	Aya H. Kimura, Associate Professor of Sociology at the University of Hawai'i-Manoa	This lecture explores projects after the Fukushima nuclear accident as examples of citizen science (participation by lay citizens in getting scientific information), and examines its relationship to social movements.

Date	Event	Speaker/Organization	Description
September 29, 2017	Women's Participation in Post Fukushima Radiation Monitoring: Exploring Gendered Scientization	Aya H. Kimura, Associate Professor of Sociology at the University of Hawai'i-Manoa	Citizen radiation measuring organizations (CRMO) were citizens' groups established to measure the concentration of radioactive materials in food to ensure its safety after the Fukushima nuclear accident. CRMOs had active participation by laywomen. This lecture explores the motivations of these women to get involved in CRMOs and how they understood the value of using science in the face of the nuclear accident.
October 5, 2017	Information Session on Opportunities in Hong Kong	Hong Kong Economic and Trade Office (HKETO)	The HKETO, which is the official representative office of the Hong Kong Special Administrative Region (HKSAR) Government in Canada, hosts an information session on opportunities in Hong Kong.
October 27, 2017	Taiwan Studies Group Speakers Series: Telling Tales: Tradition and Historiography in Taiwanese Comics	Nick Stember, Translation Editor of Ricepaper Magazine	Over the last three years, the Ministry of Culture of the Republic of China has sponsored the ground-breaking Books from Taiwan initiative to translate a juried selection of these works into English. Nick introduces and explains Taiwanese comics to the public in this talk.

Date	Event	Speaker/Organization	Description
November 1, 2017	Pacific Region Forum: Economic Incentives, Societal Culture, and Entrepreneurship	Joe Cheng, Professor Emeritus of Business Administration, University of Illinois at Urbana-Campaign	This presentation examines the interactive influence of economic incentives and societal culture on new business creation within the context of cultural effects. It argues that economic incentives can help promote entrepreneurship by taking on a compensatory or reinforcing role in relation to societal culture.
November 17, 2017	Taiwan Studies Group Speakers Series: Reflections on a Half-Century of Experience with Taiwan	Stevan Harrell, Emeritus Professor, University of Washington	Taiwan in the 1960s and 1970s was a very different place, almost unrecognizable to today's young people or to people who visit for the first time in the 21st century. Through the eyes of an ethnographer, this talk describes the very different worlds of urban Taipei and rural north Taiwan in the late 1960s and 1970s, contrasting them with today's Taiwan in terms of their material culture, intellectual culture, and social organization.
November 24, 2017	Taiwan Studies Group Speakers Series: Neo-colonialism or Cultural Infatuation?	Tony Tai-Ting Liu, Postdoctoral Research Fellow, National Chung Hsing University	Based on first hand observation of everyday life in current day Taiwan from restaurants to daily commodities, this talk explores the "Japanese-ness" of Taiwan and ponders over the possibility of understanding Taiwan from the somewhat curious perspective of Japan.

Date	Event	Speaker/Organization	Description
January 4, 2018	Reading Confucius Beyond the Analects	Michael Hunter, Yale University	In this talk, the speaker summarizes the findings from his recent monograph (Confucius Beyond the Analects) to argue that the Analects was first compiled under the Han dynasty (202 BCE–9 CE) as an instrument of imperial legitimacy.
January 18, 2018	The BRICS and Collective Financial Statecraft	Leslie Elliott Armijo (SFU International Studies) Yves Tiberghien (UBC Political Science) Eric Werker (SFU Beedie School of Business)	Leslie Armijo discusses her new book on the BRICS, with critical commentary by colleagues from SFU and UBC
January 20, 2018	Food Security, Culture and Urban Development in the Context of Vancouver's Chinatown	Angela Ho, Lead Author of the Vancouver Food Security Report Elvy Del Bianco, Vancity's Program Manager for Cooperative Partnerships Wes Regan, City of Vancouver's Community Economic Development Planner Andy Yan, Director of SFU City Program	At this event, the report's lead author, Angela Ho, details her findings and share insights into the impacts these changes have on the neighbourhood. The presentation is followed by a panel discussion to explore ideas on how various stakeholders can play a role to retain and revive these unique spaces where history, culture, food security, local economy, and policy intersects.

Date	Event	Speaker/Organization	Description
February 23, 2018	Labor Regimes of Indenture	Rhacel Salazar Parrenas, Professor of Sociology and Gender Studies, University of Southern California	This talk interrogates various theoretical frameworks for thinking about contemporary unfreedoms – slavery, human trafficking and structural violence – and proposes the alternative concept of “indentured mobility,” which recognizes the personal gains made by migrants in the face of servitude.
February 5, 2018	Taiwan Studies Group Speakers Series: Enduring the Long Take	Louis Lo, Professor, Department of English, National Taipei University of Technology	Louis presents his paper to show that <i>Stray Dogs</i> offers a social critique of Taipei as a neoliberal, global, consumer city and by so doing establishes a cinema of contemplation through such signature cinematic devices as the sustained long-take and slow, virtually still cinematic images.
February 9, 2018	Taiwan Studies Group Speakers Series: Crowdfunding the Hospital	Chengpang Lee, Assistant Professor of Sociology, National University of Singapore	Chengpang asks why among these three projects, only Tzu-Chi’s project succeeded while the other two failed. In contrast to the common understanding (i.e., the state sponsorship), his explanatory framework is hinged upon the role of the creation of multiple social networks during the mobilization period.
February 23, 2018	Film Screening: <i>From Our Eyes</i>	Yi Cui, filmmaker of <i>Camera Lucida</i> and <i>Shadow Puppet</i>	Three short films featuring the daily life and colorful culture in Tibet followed by a brief presentation by Yi Cui, Curator of “From Our Eyes”

Date	Event	Speaker/Organization	Description
February 25, 2018	Together: Explore the Past and the Present, and Visualize the Future (Public Film Screening and Panel)	Huamei Han, Associate Professor, SFU Faculty of Education	Three short films tell the story of shared struggles among Indigenous peoples and migrants of Chinese and African descents in the past and today, in the city of Vancouver. Screening is followed by a 10-person panel discussion with film producers/directors, community members, organizers and activists in and for the Downtown Eastside, Black Strathcona and the Historical Chinatown

Date	Event	Speaker/Organization	Description
March 8, 2018	A Discussion of Some Mistaken Notions Concerning Chinese Traditional Culture	Yang Zilu, Political Science and Public Management at Southwest University, China	SFU David Lam Centre's Visiting Scholar explains the following questions: Does the <i>Laozi (Daode jing)</i> really proclaim an anti-intellectual message entailing the ignorance of the masses? Confucian, Buddhist, and Taoist cultures all esteem gentleness and generosity, yielding and kindness; but do they not also include a heroic teaching? Concerning the core ideas of Buddhists and Daoists, what are the fundamental differences and similarities between them? Is "nourishing life" simply concerned with nourishing the body? Where does that process start? When did the <i>Taiji</i> diagram comprised of the Yin Yang "fishes" originate? And why is the semi-circular form of this diagram inaccurate? What exactly is the <i>Liezi</i> parable about Lie Gong moving the mountain talking about?
March 10, 2018	The 7 th Annual DocuAsia Forum	Cinevolution Media Arts	Film screening of "Those Who Jump" followed by a panel with Yasin Kiraga, Carla Hilario and Minah Lee

Date	Event	Speaker/Organization	Description
March 13, 2018	Taiwan Studies Group Speakers Series: Public Understanding of Climate Change in China and Taiwan	John Chung-En Liu, Assistant Professor of Sociology, Occidental College	John draws from multiple data sources, including books, online forums, social media, and surveys, to examine the factors that shape people's knowledge on climate change. In particular, he demonstrates that knowledge is often intertwined with social relations and identities.
March 15-16, 2018	Two Films (<i>Surname Viet Given Name Nam</i> and <i>Forgetting Vietnam</i>) and a Talk with Trinh T. Minh-ha	SFU Humanities; Centre A	A special two-night program of renowned Vietnamese-born artist, writer and scholar, Trinh T. Minh-ha, acclaimed film work. Subjective, self-reflexive, and intellectual, infused with feminism and anti-colonialism, and offering a dizzying array of sights and sounds, the award-winning "anti-anthropological" films of Trinh represent a startling reinvention of the documentary form.

Report Type: Renewal Application

Reporting Year: 2022

General Information

Name of the Centre/Institute: Institute of Governance Studies

Website: <https://www.sfu.ca/research/institute-governance-studies>

Faculty: Arts and Social Sciences

Director: Patrick Smith (Director)

Aude-Claire Fourot (Acting Director)

Director's term end: 2022-08-15

Renewal date: 2027-04-01

Details

Description of the Centre/Institute:

The objectives of the Centre for Urban Governance and Citizenship Studies include the following:

1. To provide a focus for collaborative research on issues related to urban governance and citizenship at Simon Fraser University, in Canada and elsewhere ;
2. To host research fellows, post-doctoral fellows and graduate students specializing in the areas of urban governance and citizenship;
3. To provide a forum within the Vancouver metropolis, British Columbia and Canada for the presentation and dissemination of research and ideas on issues of urban governance and citizenship;
4. To provide a facility in which data for the study of urban governance and citizenship can be collected, catalogued and made readily accessible through data management and exchange;
5. To ensure that in keeping with SFU strategic research plans, research on urban governance and citizenship also informs community discourse and decision-making.

The Centre/Institute's membership and organization structure:

Dr. Patrick Smith was the previous IGS Director; previous IGS membership included SFU Faculty from Urban Studies and Political Science as well as colleagues from Langara college.

Rationale for the renewal of the Centre/Institute:

The Institute of Governance Studies has been created and led by Dr. Patrick Smith, who is currently on medical leave and will retire from SFU in January 2023.

Given the current policies governing SFU Research Centres and Institutes (R 40.01), I propose to rename the Institute for Governance Studies to the Centre for Urban Governance and Citizenship Studies.

How has the Centre/Institute enhanced research over and above what would have been accomplished by an individual faculty member?

The previous Director is on leave. I was appointed Director in August 2022.

Given the pandemic, no renewal reports were generated in the last two years and I did not have access to previous IGS reports.

How has the Centre/Institute accomplished its goals?

No research activities have been carried out in the last five years.

Changes planned upon renewal (e.g. membership, organization structure, etc.):

The most significant changes upon renewal involve the research centre name and its organizational structure.

1) Name: Centre for Urban Governance and Citizenship Studies ; the description of the centre has been revised accordingly.

2) Structure: In addition to the Centre director, an advisory committee and a more formal membership mechanism will be created.

Significant accomplishments:

No research activities have been carried out in the last five years.

Notable media successes:

No research activities have been carried out in the last five years.

Events, workshops, public outreach events:

No research activities have been carried out in the last five years.

The Centre/Institute's multi-year goals for the next renewal term:

1) 1. Developing sponsored collaborative research activities on issues related to urban governance and citizenship at Simon Fraser University, in Canada and elsewhere

KPI 1:

1. Sponsored research activity KPIs

1.1 Total value of proposal submitted

1.2 Number of proposals submitted

1.3 Research outputs (publications, conferences, etc.)

Potential funding sources include: SFU/SSHRC Small Explore Research Grants, Foundation on German-American Academic Relations, France Canada Research Fund, and SSHRC Insight Development Grants.

2) 2. Hosting research fellows, post-doctoral fellows and training of graduate students specializing in the areas of urban governance and citizenship;

KPI 2:

2. Hosting & Training of Graduate Students KPIs

2.1 Number of visiting scholars, including graduate students and postdoctoral fellows

2.2 Total value of scholarships

2.3 Research outputs (publications, conferences, etc.)

Potential funding sources include: Mitacs Globalink Research Award, Accelerate Research Internships, SFU/SSHRC Small Explore Research Grants, Foundation on German-American Academic Relations, France Canada Research Fund, and SSHRC Insight Development Grants.

3) 3. To provide a forum within the Vancouver metropolis, British Columbia and Canada for the presentation and dissemination of research and ideas on issues of urban governance and citizenship;

KPI 3:

3. Events organization and participation KPIs

3.1 Number of events organized

3.2 Number of participants

3.3 Partnerships

3.4 Research outputs (publications, etc.)

Potential funding sources include: SFU VP Grants, SSHRC Connection grants, and City of Vancouver Community Grants.

4) 4. To provide a facility in which data for the study of urban governance and citizenship can be collected, catalogued and made readily accessible through data management and exchange

KPI 4:

4. Media and Public Outreach KPIs

4.1 Creating an up-to-date web/social media presence that includes at minimum a list of members and research activities;

Supporting documents:

-

Financial Summary

Does your Centre/Institute receive direct financial support from the university?

No

Was the Centre/Institute leveraged to attract external funding (donations, grants, contracts) which were only made possible by its existence?

No

Confirm policy review:

Yes

Submitted by:

Aude-Claire Fourot, Acting Director

Director's comments:

One research project (\$139073) is currently associated with the IGS and has an available balance of \$4,580.08. Moreover, once the IGS/CUGCS renewal plan has been approved, the Urban Studies Program's Initiative in Urban Sustainable Development endowment has committed seed funding to launch new IGS programming in 2022-23. Urban Studies has also offered shared office space at the Vancouver campus.

Reviewer's Section

Reviewed by:

Steeve Mongrain, Associate Dean, Research & International

Reviewer's decision:

Approved for 5 years

Reviewer's comments:

Professor Fourot, who is currently the acting director of the centre, will become Director of the IGS following Dr. Smith retirement from SFU. Professor Fourot will bring a new vision to the centre. She first plans to rename the Institute for Governance Studies to the Centre for Urban Governance and Citizenship Studies. She will also form a new steering committee and

add new members. Urban Studies has committed seed funding and has offered shared office space at the Vancouver campus. The new director clearly laid out five objectives to accomplish during the next five years. It is an ambitious plan, but a valuable one. It should fit into SFU strategic research plans. I am confident that under Professor Fourot, the newly renamed centre will contribute to enhancing SFU's research profile in an important area.

Report Type: Renewal Application

Reporting Year: 2022

General Information

Name of the Centre/Institute: Centre for Corporate Governance and Sustainability
Website: <http://beedie.sfu.ca/ccgs/>
Faculty: Beedie School of Business
Director: Stephanie Bertels
Director's term end: 2018-03-31
Renewal date: 2027-04-01

Details

Description of the Centre/Institute:

The Centre's mandate is to provide innovative, rigorous, and practically relevant research on corporate governance and sustainability. More specifically, the Centre's mandate focuses on how global companies navigate changing governance obligations including the need to address environmental and social obligations. The Centre facilitates and disseminates research through its own research program including the research of its Director, Fellows and Research Associates.

The Centre also has a mandate to bridge international research and practice in the areas of governance and sustainability through the development of resources and tools for practitioners, seminars, public dialogues, conferences, visiting scholars and the Centre's website. In executing on this mandate, the Centre also seeks to facilitate productive national and international knowledge exchange among scholars and practitioners addressing corporate governance and sustainability issues.

The Centre/Institute's membership and organization structure:

For a full list the Centre's membership and organizational structure, please see the attached document. The Centre benefits from guidance from its advisory board comprised of leading practitioners with experience in sustainability and governance.

The Centre encompasses two major research projects: the Embedding Project and the Next Generation Governance Project (sponsored by CPA Canada).

Rationale for the renewal of the Centre/Institute:

Through the Embedding Project initiative, the Centre is currently in Year 5 of our SSHRC

Partnership Grant, a \$2.45 million dollar, 7-year project that seeks to facilitate a multidirectional flow of theoretical and practical knowledge among researchers and practitioners by co-creating resources and tools that will help companies embed sustainability across their operations and decision-making. As described throughout this renewal application, we have made significant strides towards our goal to be a globally recognized source of knowledge for organizations seeking to advance their sustainability performance through collective learning grounded in high quality research. We intend to continue this important work.

Through the Next Generation Governance Project initiative, the Centre has successfully leveraged \$250,000 in funding from CPA Canada over 5 years to examine how global companies navigate changing governance obligations including the need to address environmental and social obligations.

The Centre has also further strengthened its partnerships with the Shareholder Association for Research and Education (SHARE) and the Salzburg Global Seminar Corporate Governance Forum through a series of successful joint events on environmentally and socially responsible investment and governance. These partnerships have been mutually beneficial for the past five years and are intended to continue.

We have been in conversation with our advancement team to seek out a long-term funding partner interested in helping influence board readiness around sustainability issues.

How has the Centre/Institute enhanced research over and above what would have been accomplished by an individual faculty member?

The Centre is able to seed collaborative research opportunities by bringing together academics and practitioners around topics of mutual interest, attracting funding from CPA Canada, the BC Office of the Human Right Commissioner, and Scotiabank, and building long-lasting partnerships with other institutions, including SHARE Canada, the Salzburg Global Seminar Corporate Governance Forum, and the UBC Sauder School of Business.

How has the Centre/Institute accomplished its goals?

The Next Generation Governance Project is on track to deliver on the Centre's commitment to investigate how global companies navigate changing governance obligations including the need to address environmental and social obligations. The research team has published three guidebooks and three 4-part video series on this topic. The research team has also compiled a database of leading position statements on sustainability issues by companies from across the globe.

Through the Embedding Project, the Centre is undertaking efforts to bridge international research and practice by undertaking joint research initiatives with a multilateral partnership of over three dozen private companies and research organizations working collectively to exchange knowledge on corporate governance and sustainability issues and

to develop resources and tools on these topics. In addition to the \$2.45 million SSHRC Partnership Grant, we have secured over \$2.2 million from partner organizations over the past 5 years to continue and expand this initiative. In the past five years, the Embedding Project has held successful partnerships with over three dozen global companies and we are continuously working to expand this global network. We have also produced joint resources with the World Business Council for Sustainable Development, the Cambridge Judge Business School, and the BC Office of the Human Rights Commissioner, and are currently working on a suite of resources on how companies can support decarbonization funded by Scotiabank as part of their Net Zero Research Fund program.

Through its long-term partnership with the Shareholder Association for Research and Education (SHARE) and the Salzburg Global Seminar Corporate Governance Forum, the Centre continues to bring together researchers, practitioners, and students to engage in annual events on environmentally and socially responsible investment and governance.

Changes planned upon renewal (e.g. membership, organization structure, etc.):

With the recent creation of a new Business & Society area within the Beedie School of Business and new faculty hires, the aim is to broaden the internal membership and leadership of the Centre to become a hub for research on corporate sustainability and corporate governance. For instance, Dr. Kam Phung (start date July 1, 2022) brings considerable expertise in the area of modern slavery.

Significant accomplishments:

1) PUBLICATIONS

The Embedding Project has published 14 reports, 3 case studies, and 25 blog posts to help companies embed sustainability into their operations and governance. We also curate a “resource wheel” – a selection of the best resources on embedding sustainability currently available. We offer all these resources to the public for free on our website (<https://www.embeddingproject.org/>), and collectively, they have been viewed over 100,000 times in the past five years. We have also published 14 monthly newsletters to our global subscriber network of over 600 sustainability professionals, academics, and students. Lastly, Dr. Bertels and collaborators have published 3 academic papers in top journals, and have 1 paper under review. For a detailed list of publications, please see the attached supplementary document.

2) ONLINE DATABASES

The Embedding Project launched three online databases:

Our Position Database (<https://www.embeddingproject.org/position-database>) aims to help companies develop strong, clear position statements on sustainability and governance issues and contains leading position statements articulated by large companies globally. We

have reviewed over 4,000 position statements and related documents and are actively monitoring over 1,200 companies. Our database currently includes over 200 examples of leading positions, and we actively update this each month. It has been viewed over 5,000 times in the past five years.

Our Goals Database (<https://www.embeddingproject.org/goals-database>) aims to help advance progress in credible corporate sustainability goals and contains leading sustainability goals and commitments set by large companies globally. We have reviewed over 14,000 goals and are actively monitoring over 1,300 companies. Our database currently includes over 900 active, leading goals, and we update this on a weekly basis. It has been viewed 1500 times in the past five years.

Our Issue Snapshots tool (<https://www.embeddingproject.org/issue-snapshots>) is a curated selection of the most relevant resources and tools to help sustainability practitioners better understand and address a wide range of key sustainability issues. This tool launched this year.

3) VIDEOS

The Embedding Project has published three 4-part series of videos on Climate Risk Oversight for Corporate Directors on its YouTube channel (<https://www.youtube.com/c/EmbeddingProject>). These videos aim to help corporate directors and leaders to understand the risks of climate change and their role and fiduciary responsibilities to oversee these risks.

In collaboration with Nedbank, we also developed two free online teaching modules: an introduction to business sustainability module and a climate risk module.

4) STUDENT ENGAGEMENT

The Centre had two affiliated SFU PhD Students (Sara Graves and Jordyn Hrenyk) and four additional affiliated PhD students from University of Cape Town GSB and HEC Montreal. Dr. Bertels held frequent PhD Pod meetings with research collaborators Dr. Hamann from the University of Cape Town and Dr. Cloutier from HEC Montreal that brought together these six PhD students from SFU, UCT, and HEC to exchange their research findings.

Through the Embedding Project, we have placed six MBA students as interns into our partner organizations. Those interns gained valuable career experience and were able to leverage their internships into full-time employment.

The Centre sponsored five Net Impact SFU Sustainability Challenge Case competitions hosted by the SFU Beedie NetImpact Chapter, with live cases by Vancity (April 2022), Telus (April-May 2021), QuadReal (April 2020 and March 2019), and Port of Vancouver (May

2018).

Additionally, the Centre continued to support the student SIAS and BEAM funds in integrating ESG into their processes.

5) INCLUSION IN CURRICULUM

Our research has been included in graduate and post-graduate courses at dozens of academic institutions, and academic programs at University of Toronto, Cambridge and Yale routinely refer students to our website. For a detailed list, please see the supplementary document.

Notable media successes:

The Embedding Project received 4 major awards for its performance in advancing sustainability:

2022 GBSN and EFMD Going BEYOND Awards – one of the top nominations

"2019 Innovations That Inspire", Association to Advance Collegiate Schools of Business International (AACSB) – winner

2019 Clean 50 Top Project – winner

2018 Academy of Management's inaugural International Impactful Collaboration Award - winner

We also received 14 media mentions - for a detailed list, please see the attached document.

Events, workshops, public outreach events:

1) CENTRE EVENTS

The Centre has continued its longstanding collaboration with the Salzburg Global Seminar Corporate Governance Forum. Dr. Bertels sits on the Forum's Advisory Board, is the Program Chair, and has presented at eight events hosted or co-hosted by the Forum that were attended by CEOs and Board members from across the globe.

The Centre has also continued its longstanding collaboration with the Shareholder Association for Research and Education (SHARE Canada), through co-hosting five events on responsible investment.

Additionally, the Centre has collaborated with various other partners, including UBC Sauder

School of Business, the NEXT Leaders' Council, and the Business Council of British Columbia to co-host nine events attended by students, professionals, educators, and the general public.

For a more detailed list, please see the attached document.

2) ACADEMIC CONFERENCES

Centre members and students have presented their research on embedding sustainability at three EGOS conferences (2017, 2018, and 2021), two Academy of Management conferences (2018 and 2020), and three other scholarly events. For a detailed list, please see the attached document.

3) PRACTITIONER CONFERENCES

We have also shared our research at four major practitioner conferences: GLOBE (2021), NAEM (2019), Sustainable Brands (2018), and GreenBiz (2018), as well as 34 other practitioner conferences, reaching an audience of hundreds of professionals, academics, students, and the general public. For a detailed list, please see the attached document.

4) EMBEDDING PROJECT EVENTS

The Embedding Project has hosted 42 presentations, workshops, and webinars for our global peer network of 36 companies from around the globe to discuss embedding sustainability in their operations, strategy, and governance, as well as engage in peer-to-peer sharing and mentoring. Our network has included over 100 sustainability professionals over the years, and we have also presented to dozens of board members and members of executive teams at our partner companies and more broadly in the global business community.

The Centre/Institute's multi-year goals for the next renewal term:

1) Working with Beedie's advancement team, secure long-term stable funding for CCGS.

KPI 1:

Size of endowment

2) Expand internal involvement in the CCGS to become a hub for business sustainability and sustainable governance research through the creation of Associate Director roles.

KPI 2:

#of associate directors; #of engagements led by these associate directors; #of outputs from these associate directors

3) Execute on the remaining two years of the SSHRC Partnership Grant by expanding upon the current partnerships and research initiatives undertaken by the Embedding Project and ensure the longevity of the project beyond the Grant's term by entrenching the Embedding Project as a leading global source of expertise on corporate sustainability and governance.

KPI 3:

#of corporate partners, website visits, associated events, knowledge products

4) Continue to collaborate with key external partners such as the Shareholder Association for Research and Education (SHARE) and the Salzburg Global Seminar for Corporate Governance to run events on sustainable governance. Leverage these events to further expand the Centre's connections with a global network of experts on governance, sustainability, and responsible investment.

KPI 4:

#partners, #events, and seniority of attendees (with a focus on senior executives and directors)

5) Continue to support students who wish to undertake research, participate in events, or gain practical experience in the fields of governance, sustainability, and responsible investment through research assistantship positions, scholarships, and stipends.

KPI 5:

None.

6) Continue to help facilitate and disseminate the research undertaken by the Centre's Fellows and Research Associates.

KPI 6:

None.

Supporting documents:

- 1) Membership_signoff_form_IOAYnvl.xlsx (See attachment below)
- 2) 2022_06_20_CCGS_Renewal_Supplementary_Document_zAwtsWw.pdf (See attachment below)

Financial Summary

Does your Centre/Institute receive direct financial support from the university?

Yes

SFU account number:

N876112

Opening balance:

\$19,296.02

Revenues:

\$331,943.54

Expenditures:

\$274,193.45

Closing balance:

\$77,046.11

Financial report:

CCGS_2022_Renewal_-_Financial_Report_pUWzgY6.xlsx (See attachment below)

Financial contributions from the university:

331,943.54 from donor fund.

List of major equipment provided by the university:

None.

University personnel:

Part time program assistant.

Space provided by the university:

Office space (room 4935 at Segal).

Was the Centre/Institute leveraged to attract external funding (donations, grants, contracts) which were only made possible by its existence?

Yes

External funding details:

Over the past five years, the Centre attracted \$250,000 from CPA Canada to support the Next Generation Governance Project, as well as an additional \$1.3 million in industry funding.

Confirm policy review:

Yes

Submitted by:

Alexandra Cooperman, Operations Manager

Director's comments:

I have begun to build new internal connections within Beedie to understand how we can broaden the work of the Centre and use it as focal point for research in the area of governance and sustainability. To explore possible connections, I put together two Ideas at Beedie public panels on governing in alignment with community values and on sustainable supply chains. As a result of these successful collaborations, we are welcoming three new Beedie faculty as members to the centre.

I also continue my work on trying to secure ongoing funding for the Centre. Much of the funding and the work of the Centre have been heavily intertwined with my own Embedding Project SSHRC partnership grant (and the partner funds associated with this grant). To build a Centre with a broader more inclusive research agenda, it will be important to secure ongoing funding.

Reviewer's Section**Reviewed by:**

Christina Atanasova, Associate Dean, Research

Reviewer's decision:

Approved for 5 years

Reviewer's comments:

-

	Object	Description	Budget		Total	Mar-2018		O/S	Balance
			Original	Adjustments	Budget	Cur.Month	YTD.Actuals	Encumb.	Available
0	Report Filter:	User: aca13							
1	Fund: 13	Internal Research (OR)							
2	Project: N876112	Cibc Cntre For Corp Governance							
3									
4									
5									
6	Expenses								
7	5280	Acad Salary-Internal Charge	0	0	0	0	0	0	0
8	5372	Hourly Staff - Student	0	0	0	0	0	0	0
9	5430	Sals Non-Students RA	0	0	0	6923.07	34615.35	0	-34615.35
10	5436	Sals Masters RA Cdn	0	0	0	0	0	0	0
11	5440	Sals Doctorate RA Cdn	0	0	0	0	6264.34	0	-6264.34
12	5446	Sals Post-Doc RA Foreign	0	0	0	574.71	4597.68	0	-4597.68
13	5780	Support Staff-Internal Charge	0	0	0	0	10000	0	-10000
14	5834	Stipends-Adm-Instr and Res	0	0	0	0	0	0	0
15	5911	Welfare Benefits	0	0	0	550.05	3231.77	0	-3231.77
16	6010	Computer Hardware under 5k	0	0	0	0	0	0	0
17	6092	Equipment - General over 5K	0	0	0	0	0	0	0
18	6100	Office Supplies	0	0	0	0	0	0	0
19	6116	Books and Publications	0	0	0	0	315.67	0	-315.67
20	6164	Software License and Purchases	0	0	0	0	0	0	0
21	6199	Materials and Supplies - Other	0	0	0	0	0	0	0
22	6520	Printing and Duplication Exp	0	0	0	0	0	0	0
23	6610	Consulting Services	0	0	0	0	0	0	0
24	6660	Telecommunication Charges	0	0	0	0	0	0	0
25	6662	Long Distance Phone Charges	0	0	0	0	31.48	0	-31.48
26	6910	General Program Costs	0	0	0	0	366.69	0	-366.69
27	6999	Internal Expense Transfer	0	66703.98	66703.98	0	0	0	66703.98
28	7000	Employee Travel Expenses	0	0	0	0	3252.76	0	-3252.76
29	7002	Employee Field Travel Expenses	0	0	0	0	0	0	0

30	7020	Non-Employee Travel Expenses	0	0	0	0	6557.4	0	-6557.4
31	7040	Conference Registration	0	0	0	965.67	965.67	0	-965.67
32	7050	Meals Expenses	0	0	0	0	0	0	0
33	7414	MECS Internal Charges	0	0	0	2879.79	11467.86	0	-11467.86
34	7468	Information Services Charges	0	0	0	0	25	0	-25
35	7499	Internal Charges - Other	0	0	0	0	0	0	0
36	7915	Budget Balance Forward	0	19296.02	19296.02	0	0	0	19296.02
37	Subtotal		0	86000	86000	11893.29	81691.67	0	4308.33
38	Total		0	86000	86000	11893.29	81691.67	0	4308.33
39		Total - All Pages							

	Object	Description	Budget		Total	Mar-2019		O/S	Balance
			Original	Adjustments	Budget	Cur.Month	YTD.Actuals	Encumb.	Available
0	Report Filter:	User: aca13							
1	Fund: 13	Internal Research (OR)							
2	Project: N876112	Cibc Cntre For Corp Governance							
3									
4									
5									
6	Expenses								
7	5280	Acad Salary-Internal Charge	0	0	0	0	0	0	0
8	5372	Hourly Staff - Student	0	0	0	0	0	0	0
9	5430	Sals Non-Students RA	0	0	0	0	0	0	0
10	5436	Sals Masters RA Cdn	0	0	0	0	0	0	0
11	5440	Sals Doctorate RA Cdn	0	0	0	0	0	0	0
12	5446	Sals Post-Doc RA Foreign	0	0	0	0	402.3	0	-402.3
13	5780	Support Staff-Internal Charge	0	0	0	0	10000	0	-10000
14	5834	Stipends-Adm-Instr and Res	0	0	0	0	0	0	0
15	5911	Welfare Benefits	0	0	0	0	32.1	0	-32.1
16	6010	Computer Hardware under 5k	0	0	0	0	0	0	0
17	6092	Equipment - General over 5K	0	0	0	0	0	0	0
18	6100	Office Supplies	0	0	0	0	0	0	0
19	6116	Books and Publications	0	0	0	0	0	0	0
20	6164	Software License and Purchases	0	0	0	0	0	0	0
21	6199	Materials and Supplies - Other	0	0	0	0	0	0	0
22	6512	Postage Courier and Delivery	0	0	0	0	21.67	0	-21.67
23	6520	Printing and Duplication Exp	0	0	0	0	0	0	0
24	6590	Grants to Other Organizations	0	0	0	5000	6968.09	0	-6968.09
25	6610	Consulting Services	0	0	0	0	0	0	0
26	6660	Telecommunication Charges	0	0	0	0	0	0	0
27	6662	Long Distance Phone Charges	0	0	0	0	0	0	0
28	6910	General Program Costs	0	0	0	0	0	0	0
29	6912	New Faculty Startup Expenses	0	95691.67	95691.67	0	0	0	95691.67

30	6999	Internal Expense Transfer	0	-7905.22	-7905.22	0	0	0	-7905.22
31	7000	Employee Travel Expenses	0	0	0	0	9453.52	0	-9453.52
32	7002	Employee Field Travel Expenses	0	0	0	0	0	0	0
33	7020	Non-Employee Travel Expenses	0	0	0	0	3344.93	0	-3344.93
34	7030	Visitor Travel Expenses	0	0	0	0	353.22	0	-353.22
35	7040	Conference Registration	0	0	0	0	0	0	0
36	7050	Meals Expenses	0	0	0	287.93	419.69	0	-419.69
37	7414	MECS Internal Charges	0	0	0	0	1021.39	0	-1021.39
38	7468	Information Services Charges	0	0	0	0	50	0	-50
39	7499	Internal Charges - Other	0	0	0	0	0	0	0
40	7862	Credit Card Charges	0	0	0	58.09	58.09	0	-58.09
41	7915	Budget Balance Forward	0	4308.33	4308.33	0	0	0	4308.33
42	Subtotal		0	92094.78	92094.78	5346.02	32125	0	59969.78
43									
44	Assets								
45	1300	Travel Advances Receivable	0	0	0	0	0	0	0
46	Subtotal		0	0	0	0	0	0	0
47	Total		0	92094.78	92094.78	5346.02	32125	0	59969.78
48		Total - All Pages							

	Object	Description	Budget		Total	Mar-2020		O/S	Balance
			Original	Adjustments	Budget	Cur.Month	YTD.Actuals	Encumb.	Available
0	Report Filter:	User: aca13							
1	Fund: 13	Internal Research (OR)							
2	Project: N876112	Cibc Cntre For Corp Governance							
3									
4									
5									
6	Expenses								
7	5280	Acad Salary-Internal Charge	0	0	0	0	0	0	0
8	5372	Hourly Staff - Student	0	0	0	0	0	0	0
9	5430	Sals Non-Students RA	0	0	0	0	0	0	0
10	5436	Sals Masters RA Cdn	0	0	0	0	0	0	0
11	5440	Sals Doctorate RA Cdn	0	0	0	0	0	0	0
12	5446	Sals Post-Doc RA Foreign	0	0	0	0	0	0	0
13	5780	Support Staff-Internal Charge	0	0	0	0	10000	0	-10000
14	5834	Stipends-Adm-Instr and Res	0	0	0	0	0	0	0
15	5911	Welfare Benefits	0	0	0	0	0	0	0
16	5920	Benefits - Internal Charge	0	0	0	0	724.05	0	-724.05
17	6010	Computer Hardware under 5k	0	0	0	0	0	0	0
18	6092	Equipment - General over 5K	0	0	0	0	0	0	0
19	6100	Office Supplies	0	0	0	0.25	15.52	0	-15.52
20	6116	Books and Publications	0	0	0	0	0	0	0
21	6164	Software License and Purchases	0	0	0	0	0	0	0
22	6199	Materials and Supplies - Other	0	0	0	0	0	0	0
23	6512	Postage Courier and Delivery	0	0	0	0	0	0	0
24	6520	Printing and Duplication Exp	0	0	0	0	0	0	0
25	6532	Membership Fees - Institutionl	0	0	0	0	355.77	0	-355.77
26	6590	Grants to Other Organizations	0	0	0	2500	4000	0	-4000
27	6610	Consulting Services	0	0	0	0	0	0	0
28	6660	Telecommunication Charges	0	0	0	0	0	0	0
29	6662	Long Distance Phone Charges	0	0	0	0	0	0	0

30	6910	General Program Costs	0	0	0	0	0	0	0
31	6912	New Faculty Startup Expenses	0	40030.22	40030.22	0	0	0	40030.22
32	6999	Internal Expense Transfer	0	-10000	-10000	0	7500	0	-17500
33	7000	Employee Travel Expenses	0	0	0	0	10161.25	0	-10161.25
34	7002	Employee Field Travel Expenses	0	0	0	0	0	0	0
35	7020	Non-Employee Travel Expenses	0	0	0	0	2182.58	0	-2182.58
36	7030	Visitor Travel Expenses	0	0	0	0	0	0	0
37	7040	Conference Registration	0	0	0	0	1110.61	0	-1110.61
38	7050	Meals Expenses	0	0	0	0	0	0	0
39	7414	MECS Internal Charges	0	0	0	8331.94	11425.45	0	-11425.45
40	7430	Creative Svcs Internal Charges	0	0	0	245	245	0	-245
41	7468	Information Services Charges	0	0	0	0	50	0	-50
42	7499	Internal Charges - Other	0	0	0	0	0	0	0
43	7862	Credit Card Charges	0	0	0	0	0	0	0
44	7915	Budget Balance Forward	0	59969.78	59969.78	0	0	0	59969.78
45	Subtotal		0	90000	90000	11077.19	47770.23	0	42229.77
46	Total		0	90000	90000	11077.19	47770.23	0	42229.77
47		Total - All Pages							

	Object	Description	Budget		Total	Mar-2021		O/S	Balance
			Original	Adjustments	Budget	Cur.Month	YTD.Actuals	Encumb.	Available
0	Report Filter:	User: aca13							
1	Fund: 13	Internal Research (OR)							
2	Project: N876112	Cibc Cntre For Corp Governance							
3									
4									
5									
6	Expenses								
7	5280	Acad Salary-Internal Charge	0	0	0	0	0	0	0
8	5372	Hourly Staff - Student	0	0	0	0	0	0	0
9	5430	Sals Non-Students RA	0	0	0	0	32105	0	-32105
10	5436	Sals Masters RA Cdn	0	0	0	0	0	0	0
11	5440	Sals Doctorate RA Cdn	0	0	0	0	0	0	0
12	5446	Sals Post-Doc RA Foreign	0	0	0	0	0	0	0
13	5780	Support Staff-Internal Charge	0	0	0	0	10000	0	-10000
14	5834	Stipends-Adm-Instr and Res	0	0	0	0	0	0	0
15	5911	Welfare Benefits	0	0	0	0	2322.51	0	-2322.51
16	5920	Benefits - Internal Charge	0	0	0	0	1376.04	0	-1376.04
17	6010	Computer Hardware under 5k	0	0	0	0	0	0	0
18	6092	Equipment - General over 5K	0	0	0	0	0	0	0
19	6100	Office Supplies	0	0	0	0	0	0	0
20	6116	Books and Publications	0	0	0	0	90.17	0	-90.17
21	6164	Software License and Purchases	0	0	0	0	0	0	0
22	6199	Materials and Supplies - Other	0	0	0	0	0	0	0
23	6512	Postage Courier and Delivery	0	0	0	0	0	0	0
24	6520	Printing and Duplication Exp	0	0	0	0	0	0	0
25	6532	Membership Fees - Institutionl	0	0	0	0	355.77	0	-355.77
26	6590	Grants to Other Organizations	0	0	0	2500	7600	0	-7600
27	6610	Consulting Services	0	0	0	0	0	0	0
28	6660	Telecommunication Charges	0	0	0	0	0	0	0
29	6662	Long Distance Phone Charges	0	0	0	0	0	0	0

30	6910	General Program Costs	0	0	0	0	0	0	0
31	6912	New Faculty Startup Expenses	0	57770.23	57770.23	0	0	0	57770.23
32	6999	Internal Expense Transfer	0	-10000	-10000	0	0	0	-10000
33	7000	Employee Travel Expenses	0	0	0	0	0	0	0
34	7002	Employee Field Travel Expenses	0	0	0	0	0	0	0
35	7020	Non-Employee Travel Expenses	0	0	0	0	0	0	0
36	7030	Visitor Travel Expenses	0	0	0	0	0	0	0
37	7040	Conference Registration	0	0	0	0	0	0	0
38	7050	Meals Expenses	0	0	0	0	0	0	0
39	7414	MECS Internal Charges	0	0	0	0	0	0	0
40	7430	Creative Svcs Internal Charges	0	0	0	0	0	0	0
41	7468	Information Services Charges	0	0	0	0	25	0	-25
42	7499	Internal Charges - Other	0	0	0	0	0	0	0
43	7862	Credit Card Charges	0	0	0	0	0	0	0
44	7915	Budget Balance Forward	0	42229.77	42229.77	0	0	0	42229.77
45	Subtotal		0	90000	90000	2500	53874.49	0	36125.51
46	Total		0	90000	90000	2500	53874.49	0	36125.51
47		Total - All Pages							

	Object	Description	Budget		Total	Mar-2022		O/S	Balance
			Original	Adjustments	Budget	Cur.Month	YTD.Actuals	Encumb.	Available
0	Report Filter:	User: aca13							
1	Fund: 13	Internal Research (OR)							
2	Project: N876112	Cibc Cntre For Corp Governance							
3									
4									
5									
6	Expenses								
7	5280	Acad Salary-Internal Charge	0	0	0	0	0	0	0
8	5372	Hourly Staff - Student	0	0	0	0	0	0	0
9	5430	Sals Non-Students RA	0	0	0	0	0	0	0
10	5436	Sals Masters RA Cdn	0	0	0	0	0	0	0
11	5440	Sals Doctorate RA Cdn	0	0	0	0	0	0	0
12	5446	Sals Post-Doc RA Foreign	0	0	0	0	0	0	0
13	5780	Support Staff-Internal Charge	0	0	0	0	0	0	0
14	5834	Stipends-Adm-Instr and Res	0	0	0	0	0	0	0
15	5911	Welfare Benefits	0	0	0	0	0	0	0
16	5920	Benefits - Internal Charge	0	0	0	0	1136.58	0	-1136.58
17	6010	Computer Hardware under 5k	0	0	0	0	0	0	0
18	6092	Equipment - General over 5K	0	0	0	0	0	0	0
19	6100	Office Supplies	0	0	0	0	0	0	0
20	6116	Books and Publications	0	0	0	0	254.49	0	-254.49
21	6164	Software License and Purchases	0	0	0	0	78.1	0	-78.1
22	6199	Materials and Supplies - Other	0	0	0	0	0	0	0
23	6512	Postage Courier and Delivery	0	0	0	0	0	0	0
24	6520	Printing and Duplication Exp	0	0	0	0	0	0	0
25	6532	Membership Fees - Institutionl	0	0	0	0	355.77	0	-355.77
26	6590	Grants to Other Organizations	0	0	0	0	4976.9	0	-4976.9
27	6610	Consulting Services	0	0	0	0	0	0	0
28	6660	Telecommunication Charges	0	0	0	0	0	0	0
29	6662	Long Distance Phone Charges	0	0	0	0	0	0	0

30	6910	General Program Costs	0	0	0	0	0	0	0
31	6912	New Faculty Startup Expenses	0	57747.44	57747.44	0	0	0	57747.44
32	6999	Internal Expense Transfer	0	-10000	-10000	0	0	0	-10000
33	7000	Employee Travel Expenses	0	0	0	0	0	0	0
34	7002	Employee Field Travel Expenses	0	0	0	0	0	0	0
35	7020	Non-Employee Travel Expenses	0	0	0	0	0	0	0
36	7030	Visitor Travel Expenses	0	0	0	0	0	0	0
37	7040	Conference Registration	0	0	0	0	0	0	0
38	7050	Meals Expenses	0	0	0	0	0	0	0
39	7414	MECS Internal Charges	0	0	0	0	0	0	0
40	7430	Creative Svcs Internal Charges	0	0	0	0	0	0	0
41	7468	Information Services Charges	0	0	0	0	25	0	-25
42	7499	Internal Charges - Other	0	0	0	0	0	0	0
43	7862	Credit Card Charges	0	0	0	0	0	0	0
44	7915	Budget Balance Forward	0	36125.51	36125.51	0	0	0	36125.51
45	Subtotal		0	83872.95	83872.95	0	6826.84	0	77046.11
46	Total		0	83872.95	83872.95	0	6826.84	0	77046.11
47		Total - All Pages							

Centre for Corporate Governance and Sustainability – Renewal Application 2022

Supplementary Document

Membership and organizational structure

Members

Member Name	Institution	Position
Stephanie Bertels	SFU Beedie	Director / Associate Professor, Business and Society
Eric Werker	SFU Beedie	Professor, Strategy
Dara Kelly	SFU Beedie	Assistant Professor, Business and Society
Kam Phung	SFU Beedie	Assistant Professor, Business and Society
Feyza G. Sahinyazan	SFU Beedie	Assistant Professor, Technology & Operations Management
Peng Zhang	SFU Beedie	Assistant Professor, Managerial Economics
Robert Adamson	SFU Beedie	Lecturer, Strategy

Note: upon renewal we will initiate a process to invite associate director roles to expand the leadership and impact of the Centre.

External Advisory Board

Member Name	Institution	Position
Gigi Dawe	CPA Canada	Director, Corporate Governance and Oversight
Jamie Grey-Donald	QuadReal	SVP Sustainability
Esther Speck	lululemon athletica	VP Sustainability
Nathan Maycher	Suncor	Director, Climate Change
Mark Fattedad	Jarislowsky Fraser	Director & Portfolio Manager, Institutional Management
Brigitte Burnet	Nedbank Limited	Head: Sustainability, Group Strategy

Publications

Peer Reviewed Publications

Feront, C., and Bertels, S. (2021). *The impact of frame ambiguity on field-level change*. Organization Studies volume 42, pages 1135-1165. <https://doi.org/10.1177/0170840619878467>

R. Hamann et. al. (2018). *Strategic Responses to Grand Challenges: Why and How Corporations Build Community Resilience*. Journal of Business Ethics volume 161, pages 835–853. DOI:10.1007/s10551-019-04345-y

Hamann, R., and Bertels, S. (2017). *The Institutional Work of Exploitation: Employers' Work to Create and Perpetuate Inequality*. Journal of Management Studies (online): doi: 10.1111/joms.12325

Practitioner-oriented guidebooks and reports

Bertels, S. & Dekker, R. (2022-forthcoming). *Respecting Human Rights in Your Supply Chain: A Tip Sheet for SMEs*. Embedding Project – with support from the BC Office of the Human Rights Commissioner.

Bertels, S. & Dekker, R. (2022-forthcoming). *Sustainable Procurement: A Tip Sheet for SMEs*. Embedding Project – with support from the BC Office of the Human Rights Commissioner.

Bertels, S., Watt, J. & Fabbro, A. (2022-forthcoming). *Getting Started on Incorporating Sustainability into Public Procurement: a Guide*. Embedding Project – with support from the BC Office of the Human Rights Commissioner.

Cambridge Judge Business School & Embedding Project (2021). *Engagement for Supply Chain Sustainability: A Guide*. <https://www.jbs.cam.ac.uk/wp-content/uploads/2021/07/guide-engagement-for-supply-chain-sustainability.pdf>

Bertels, S. & Dekker, R. (2021). *Scan: A Comprehensive List of Sustainability Issues for Companies*. <https://embeddingproject.org/pub/resources/EP-Scan-A-Comprehensive-List-of-Sustainability-Issues-for-Companies.pdf>

Bertels, S. & Strandberg-Salmon, M. (2021). *Climate Change and Climate Risk Oversight: A Guide for Corporate Leaders and Directors*. Embedding Project. <https://www.embeddingproject.org/resources/ep-climate-change-and-climate-risk-oversight>

Feront, C., Bertels, S., & Hamann, R. (2021). *Becoming an Agent of Change: A Guide*. Embedding Project. <https://www.embeddingproject.org/resources/becoming-an-agent-of-change>

Dekker, R. (2020). *Understanding Community Resilience: A Guide for Companies*.

https://embeddingproject.org/pub/resources/EP_Understanding-Community-Resilience.pdf

Bertels, S. & Dobson, R. (2020). *Embedded Strategies for the Sustainability Transition: Setting Priorities and Goals Aligned with Systems Resilience*. Embedding Project.

<https://embeddingproject.org/pub/resources/EP-Embedded-Strategies-for-the-Sustainability-Transition.pdf>

Schulschenk, J. & Bertels, S. (2019). *Shaping Your Organisation's Narrative Infrastructure*.

Embedding Project. <https://embeddingproject.org/pub/resources/EP-Shaping-Your-Organisations-Narrative-Infrastructure.pdf>

Bertels, S. & Toews, B. (2019). *Next Generation Governance: Developing Position Statements on Sustainability Issues – A Guidebook for Supporting your Board*. Embedding Project.

<https://embeddingproject.org/pub/resources/EP-Next-Generation-Governance-Developing-Position-Statements-on-Sustainability-Issues.pdf>

Bertels, S. & Toews, B. (2018). *Next Generation Governance: Emerging Trends in Climate Change Position Statements*. Embedding Project.

<https://embeddingproject.org/pub/resources/EP-Emerging-Trends-in-Climate-Change-Position-Statements.pdf>

Hamann, R. & Makaula, L. (2018). *Partnering for Community Resilience: South African Case Studies*.

Embedding Project. <https://embeddingproject.org/pub/resources/EP-Partnering-for-Community-Resilience.pdf>

Dobson, R. & Bertels, S. (2017). *The Road to Context: Contextualising your Strategy and Goals: A Guide*. Embedding Project. (Legacy document – discontinued).

Dobson, R & Bertels, S. (2017). *The Road to Context: Contextualising your Strategy and Goals: A Casebook*. Embedding Project. (Legacy document – discontinued).

Media mentions

Wired (Chasing Zero Series), “How to know when you can trust corporate climate targets”, June 2021. <https://link.wired.co.uk/view/60995759efe06710262561faeb3qf.oz/1fddbbb7>.

Climate 21 podcast, “The importance of climate-related goals for organizations”, January 2021.

<https://www.climate21podcast.com/1329991/7145473>

Benefits Canada, “Taking a broader view of pension sustainability”, April 2020.

<https://www.benefitscanada.com/news/taking-a-broader-view-of-pension-sustainability-144690>

World Business Council for Sustainable Development, "The Reporting Exchange", October 2019. The link to our Goal Database was disseminated to 1,500 subscribers.

SFU News, "The Embedding Project garners more international accolades", May 2019.

<https://www.sfu.ca/sfunews/stories/2019/05/the-embedding-project-garners-more-international-accolades.html>

The Globe and Mail, "Turning collective knowledge into impact", April 2019. <http://ow.ly/9yxz30owEUa>

BC Business, "It's a Good Thing: SFU's Stephanie Bertels brings sustainability to corporate boardrooms" (print & online). <http://ow.ly/xezh30nXHxG>

SFU Beedie, "SFU Beedie founded sustainability initiative wins two major awards", September 2018.

<https://beedie.sfu.ca/ideas/2018/09/sfu-beedie-founded-sustainability-initiative-wins-two-major-awards/>

Sustainable Brands, "Closing the Context Gap: How Companies Can Transform Degeneration to Regeneration", June 2018. <https://sustainablebrands.com/read/new-metrics/closing-the-context-gap-how-companies-can-transform-degeneration-to-regeneration>

Sustainable Brands, "QuadReal Property Group Navigates the 'Road to Context'", June 2018.

<https://sustainablebrands.com/read/new-metrics/quadreal-property-group-navigates-the-road-to-context>

CBC News, "Ikea, Eileen Fisher make business case for reduced waste" November 2018.

<https://www.cbc.ca/news/canada/british-columbia/vancouver-zero-waste-business-ikea-1.4890774>

Green Biz, "To chart the course of sustainability, grab the right map", September 2017.

<https://www.greenbiz.com/article/chart-course-sustainability-grab-right-map>

SFU News, "Sustainability network aims to advance globally with \$2.45 million SSHRC Partnership Grant", September 2017. <https://www.sfu.ca/sfunews/stories/2017/09/sustainability-network-aims-to-advance-globally-with--2-45-milli.html>

Sustainable Brands, "The Road to Context: What You Need to Know About Contextual Strategy and Goal-Setting (Parts 1 and 2)", May 2017. <https://sustainablebrands.com/read/new-metrics/the-road-to-context-what-you-need-to-know-about-contextual-strategy-and-goal-setting-part>

Centre collaborations and events

Salzburg Global Seminar Corporate Governance Forum

The Centre has continued its longstanding collaboration with the Salzburg Global Seminar Corporate Governance Forum. Dr. Bertels sits on the Forum's Advisory Board and is the Program Chair.

Salzburg Global Seminar Corporate Governance forum, October 2021 (Online).

Accountable to Whom? Restating the Purpose of a Corporation, Salzburg Global Seminar, July 2021 (Online).

Corporate Governance - Driving Accountability: Integrating EESG into Executive Compensation, Salzburg Global Seminar, May 2021 (Online).

Putting Directors to The Test: How Does Leadership Measure Up in Times of Crisis?, October 2020 (Online).

Climate Risk and the Role of Pension Trustees, Centre for Corporate Governance and Sustainability Forum, November 2019, (Vancouver)

Climate Risk for Directors, Corporate Governance Forum, Salzburg Global Seminar, October 2019 (Salzburg, Austria)

Brave New World: How Can Corporate Governance Adapt?, Salzburg Global Seminar, October 2018 (Salzburg, Austria)

Embedding Sustainability into Corporate Governance, Salzburg Global Seminar, October 2017 (Salzburg, Austria)

Shareholder Association for Research and Education (SHARE Canada)

The Centre also continued its longstanding partnership with SHARE Canada by co-organizing the following events over the past five years:

SHARE Pension Trustee Bootcamp: An Introduction to Pension, Investment, and Governance, February 2021 (online).

SHARE Investor Summit 2020, February 2020 (Vancouver, BC).

Democratization & Decarbonization: Imagining a New Kind of Economy: Public Dialogue with Ted Howard, February 2020 (Vancouver, BC). This event was also co-sponsored by Vancity.

Forum on Pension Fund Investing and Climate Change, October 2019 (Vancouver, BC). This event was also co-sponsored by CCLI, Peter P. Dillon School for Business Ethics, UBC Allard School of Law, and the Centre for Business Law.

Investing for 2-Degrees: How can investors make the transition?, February 2018 (Vancouver, BC). This event featured experts from the 2-Degree Investing Initiative, the Fonds de solidarité and the B.C. Investment Management Corporation (bcIMC).

The Centre has also collaborated with various other partners on the following events:

In Conversation with Mariana Mazzucato, Centre for Corporate Governance and Sustainability, October 2021 (Online).

BC CLE Corporate Governance 2020, February 2020 (Online). This content is currently available as online courses via the Continuing Legal Education Society of BC (<https://www.cle.bc.ca/>).

Economic Research into the Causes and Consequences of the U.S. Opioid Epidemic, February 2019 (Vancouver, BC). This was a talk by Molly Schnell, a postdoctoral research fellow at the Stanford Institute for Economic Policy Research.

Contracting Beyond the Market: Property Rights, Externalities, Historical Conflict, and Contractual Agreements between Firms and Nonmarket Stakeholders, November 2018 (Vancouver BC). This event featured a presentation by Dr. Sinziana Dorobantu of the New York University Stern School of Business.

How Culture Shapes the Climate Change Debate, February 2018 (Vancouver, BC). Organized by the SFU Beedie NetImpact Chapter, this event featured a presentation by Dr. Andrew Hoffman of the University of Michigan.

Academia's Emerging Crisis of Relevance and the Consequent Role of the Engaged Scholar, February 2018 (Vancouver, BC). Organized by the SFU Beedie NetImpact Chapter, this event featured a presentation by Dr. Andrew Hoffman of the University of Michigan.

Embedding Sustainability Forum, January 2018 (Vancouver, BC). Co-hosted with the NEXT Leaders' Council and the Business Council of British Columbia.

Reconciliation: A New Relationship for Investors, October 2017 (Vancouver, BC). Co-Hosted with the Peter P. Dhillon Centre for Business Ethics at UBC Sauder School of Business.

Multinationals, Sustainability and The Extractive Industries: Papers Prepared for a Special Issue of the Journal of World Business, April 2017 (Vancouver, BC) .

Academic conferences and invited talks

"Keynote address: social responsibility division", Stronger Together Conference, ASAC Canada, June 2022 (Online).

"Equipping early-career organizational researchers to become engaged scholars", AOM Impact Scholar Community event, July 2021 (online)

Feront, C., Bertels, S. & Hamann, R. 2021 *"Becoming Agents of Change: Societal Disruption, Resistance, Movements, and the Formation of Activists"*, Paper presented in Sub-Theme 16, European Group for Organization Studies, Amsterdam.

"Getting the Word Out: Translating Your Research to a Wider Audience", AOM Impact Scholar Community Event, October 2020 (online)

"Organizing for the Climate Emergency: Organizational Underpinnings of Climate Action (session 313)", Annual Meeting of the Academy of Management, August 2020 (Vancouver, BC)

"Industry/Academic Collaboration", Annual Meeting of the Academy of Management, August 2018 (Chicago, USA)

"Bridging the Knowledge Practice Gap", Annual Meeting of the Academy of Management, August 2018 (Chicago, USA)

Feront, C., Bertels, S. & Hamann, R. 2018 "How do we become hummingbirds? Exploring the volitional process of institutional change agents" Paper presented in Sub-Theme 63, European Group for Organization Studies, Edinburgh.

Pek, S., Bertels, S. & Howard-Grenville, J. 2017 "Constructing the sustainable organization from within: The role of cultural change work" Paper presented in Sub-Theme 48, European Group for Organization Studies, Copenhagen.

Practitioner conferences and invited talks

2022

Key note Address Governing the Climate Emergency Common Ground Conference, April 2022 (Online)

Building Sustainable Global Value Chains, IDEAS@SFU Beedie Speaker Series, SFU Beedie, April 2022 (online)

Companies and Communities: Governance that Addresses Community Values, IDEAS@SFU Beedie Speaker Series, SFU Beedie, March 2022 (online)

Purpose Governance, GPC ESG Conference, March 2022 (online)

Governing with a Green Lens, Synergy on Boards, February 2022 (online)

Board Training – Sustainability, Canadian Climate Law Initiative, January 2022 (online)

2021

Sustainability 101: Starting Your ESG Journey, Burnaby Board of Trade, October 2021 (online)

Roundtable on Excessive Executive Compensation, NEI Investments, October 2021 (online)

Embedding Sustainability into Procurement and Supply Chain, 2021 Supply Chain Canada National Conference, October 2021 (online)

Bank Sustainability Roundtable, September 2021 (online)

Sustainability Panel | SAP Midmarket Summit, September 2021 (online - pre-recorded)

Session Two - ESG in BC, an Opportunity for a Sustainable Economy, Business Council of British Columbia Series on ESG in BC, June 2021 (online)

Digital Transformation: Enabler or Enemy of a Resilient Future, GLOBE Conference 2021, April 2021 (Online)

2020

Engaging the Board and Executive Management, A4S Summit 2020, November 2020 (online)

International Research Round Table on-North-South, Arts, Business, and Climate Governance, Canadian Centre for Climate Law, September 2020, (online).

Governance in the New Decade: The Rise of Boardroom ESG, Governance Professionals of Canada ESG Conference, September 2020, (online).

GLOBE Advance: Turning Social Purpose Dialogue and Vision into Action, February 2020 (Vancouver)

Suncor Supply Chain Forum, February 2020 (Calgary, AB)

2019

Vancouver Institutional Investor and Corporate Issuer Forum, Hosted by Broadridge Financial Solutions Inc., December 2019, (Vancouver, BC)

Ceres annual Stakeholder Engagement with Suncor, November 2019 (Calgary, AB)

Corporate Sustainability Goal Setting, NAEM EHS Forum, October 2019 (Toronto, ON)

Best ESG Governance Practices as seen from the Perspective of Corporate Directors, Sustainability Leaders and NGOs, Governance Professionals of Canada ESG Conference, May 2019, (Vancouver)

Conference Board of Canada Sustainability Working Group, February 2019 (Toronto, ON)

Putting it all Into Context: A Follow up to Panel Discussion, CRSI, January 2019

Road to Context and the Embedding Framework, Toyota South Africa senior executive presentation, January 2019 (Johannesburg and Durban, South Africa).

2018

Social Responsibility and Social Innovation in Canadian Business Schools. November 2018 (Vancouver, BC)

Embedding Sustainability in Business: Industry Benchmarking, 2018 Teck SEA Planning Meeting, July 2018 (Vancouver BC)

Embedding Future-Fitness into Your Organization: Goal-setting and Management Tools, Sustainable Brands Conference, June 2018 (Vancouver, BC).

Embedding Sustainability, Vancouver Style, Sustainable Brands Conference, June 2018 (Vancouver).

Sustainability in the Industry, Leading Change Canada Forum, March 2018 (Vancouver, BC).

Contextualising Sustainability Performance: Tools for Corporate Strategy-making and Goal-Setting. GreenBiz 2018 Conference, February 2018 (Phoenix, AZ).

2017

ESG Valuation Panel. Responsible Investments. Responsible Disruption, hosted by Phillips, Hager & North Investment Management and RBC Global Asset Management, Canada. November 02 (Vancouver, BC).

Issue in Focus: The Road to Context-based Sustainability: Leading Tools and Applications, Sustainable Brands: New Metrics Conference, November 2017 (Philadelphia, PA)

Contextualizing Sustainability Performance: Tools for Corporate strategy-making and Goal-setting, Sustainable Brands Conference, May 2017 (Detroit, MI)

Inclusion in curriculum

Inclusion of Embedding Project resources in courses offered by University of Toronto's St. Michael's College; Cambridge Institute for Sustainability Leadership; MIT Sloan School of Business; Oxford Saïd Business School; Yale; University of Cape Town Graduate School of Business; University of Stellenbosch Business School; Warwick University and several other schools.

Introduction to Business Sustainability, Embedded Strategies Steps, and Embedded Strategies Case Studies, University of Stellenbosch Business School, November 2020.

Strategic Importance of Sustainability (session as part of MBA course), November 2020.

Business in Society, Postgraduate Diploma in Leadership Development, Stellenbosch University (Online from Cape Town, WC), September 2020.

Sustainable Competitiveness, Senior Management Development Programme, Stellenbosch University (Online from Cape Town, WC), August 2020.

Sustainability Reporting Monitoring and Evaluation Module, Sustainability Institute (Online from Cape Town, WC), June 2020.

Change Agent Guide within Supply Chain Management Course at University of Cambridge, to supplement the learning experience for enrolled students, September 2019.

How companies embed sustainability, CSR and ESG, best practices and tools, CSR program at the University of Toronto, July 2019.

Road to Context and Governance Position Statements and Partnerships work, Oxford Saïd Business School EMBA, February 2019.

Being an Effective Change Agent, University of Stellenbosch Business School Postgraduate diploma, December 2018.

Road to Context, Embedding Framework and Storytelling, University of Stellenbosch Business School Postgraduate diploma, December 2018.

MPhil in Sustainable Development at Stellenbosch University, August 2018.

Certificate in CSR/Sustainability - Embedding Project Webinar, University of St. Michael's College, University of Toronto, June 2018.

Report Type: Renewal Application

Reporting Year: 2022

General Information

Name of the Centre/Institute: Centre for Research on Early Child Health and Education (CRECHE)

Website: <http://www.creche.sfu.ca/>

Faculty: Education

Director: Maureen Hoskyn

Director's term end: 2021-04-01

Renewal date: 2027-11-01

Details

Description of the Centre/Institute:

The Centre for Research on Early Child Health and Education (CRECHE) is a multidisciplinary research group at Simon Fraser University. Current research projects focus on health, learning and the social lives of children from infancy to adolescence.

CRECHE activities unite researchers throughout the world on common issues related to the health, care and education of young children and their families. We strive to make connections among researchers and theorists from diverse schools of thought to address complex issues that directly impact the wellness of children and families living in a global community.

CRECHE researchers share the view that multiple research perspectives are needed to fully explore the diversity in children's health and educational outcomes. Consolidation of findings from studies of genetics, neurobiology and physiology with those from research on culture, society and language creates understandings of children's diversity that go beyond those gleaned from any strand of research in isolation.

The Centre/Institute's membership and organization structure:

Presently, we have one executive director (Maureen Hoskyn), two directors (Elina Birmingham; Daniele Moore) and faculty representatives from linguistics (Henny Yeung) and psychology (Grace Iarocci). Several other researchers and community partners are affiliated with the centre, depending on the projects we are running. As of June 30, 2021, we currently have projects/partnerships with researchers at UBC, Japan, France, and Brazil. We are working with community partners at SFU (SFU Community Engagement Programs), across Canada (Squiggle Park, Halifax) and internationally.

Rationale for the renewal of the Centre/Institute:

CRECHE is well known as a research centre internationally and locally. Researchers affiliated with CRECHE are currently working on large scale international partnership grants (for the next 5 years) on the topics related to multilingualism and early literacy of children in schools. The centre has been pivotal in also creating partnerships with local schools and other provinces in Canada, Australia, Europe for both research and knowledge mobilization.

How has the Centre/Institute enhanced research over and above what would have been accomplished by an individual faculty member?

The research affiliated with the Centre is enhanced because we focus on interdisciplinary collaborations among researchers and with community partners where we actively engage in projects of common interest. Our projects are larger in scale than is possible for a single faculty member to carry to fruition, and the grants we have received have recognized the benefit of this interdisciplinary, collaborative effort.

How has the Centre/Institute accomplished its goals?

Yes, over the years, the Centre has always accomplished its goals by engaging in community based research (before it was popular to do so), but creating outlets for interdisciplinary and collaborative discussion, for sharing of SFU resources in a productive way. All 3 directors of the centre have desks that are situated in the same area that our RAs work - we do not have separate offices. This organization of collaborative space has led to some of the most interesting research projects that would never have been considered if we simply met to discuss research in planned meetings.

Changes planned upon renewal (e.g. membership, organization structure, etc.):

Maureen Hoskyn will be retiring in a few years, and Elina Birmingham will become the director of CRECHE in 2023. The organizational structure will be reviewed, and as new faculty are hired, the emphasis of the partnership research projects may change slightly.

Significant accomplishments:

*completion of a partnership with Squiggle Park to create a research-based app for young emerging bilingual children learning to read and write in French.

*completion of a 5 year longitudinal study on the relations between executive functions and emerging plurilingualism of young children (involves over 25 publications co-authored with colleagues and students, 30 or more international presentations, a book.

*completion of several international projects to promote French education in Brazil, Africa and Japan. We also engaged in international collaborations with scholars in Australia.

*completion of an initial proof of concept project for a ear-piece to regulate sensitivities to sound among individuals with ASD

*training of 1 post-doc, over 25 RAs.

*currently, our faculty are PIs on over \$500,000 of national (SSHRC, NSERC) grants.

Maureen Hoskyn is also a co-PI on an national partnership grant to study technology and early bilingualism, awarded to Janet Werker at UBC (2.1 million dollars).

Notable media successes:

None.

Events, workshops, public outreach events:

1) Due to the pandemic, we have had little public outreach in the past 2.5 years. We are involved in ongoing workshops in West Vancouver and Surrey school districts and have worked closely with Squiggle Park for 2 years creating the content for an online literacy program for multilingual children in French Immersion schools.

2) We have done very little recent public outreach due to the Covid-19 pandemic restrictions on access to schools and young families. We will begin planning these activities again in the Fall of 2023.

The Centre/Institute's multi-year goals for the next renewal term:

The goal for the next 2 years is to create a 5 year strategic research plan to guide CRECHE activities from 2024-2029. We have allowed 2 years for this to occur to coincide with the hiring of 2 new faculty to support the Educational Psychology cognate in the Faculty of Education who are affiliated with CRECHE.

KPI:

*A written strategic research plan will be submitted to the Associate Dean of Research and the Dean in the Faculty of Education for review. We will also do an annual review to ascertain whether our aims and objectives of this plan are met (through key performance indicators embedded into the plan).

Supporting documents:

-

Financial Summary

Does your Centre/Institute receive direct financial support from the university?

No

Was the Centre/Institute leveraged to attract external funding (donations, grants, contracts) which were only made possible by its existence?

No

Confirm policy review:

Yes

Submitted by:

Maureen Hoskyn, Director

Director's comments:

We are very fortunate to have a space dedicated to our research activities in the Faculty of Education. All of our funding comes from external grants at the moment.

Reviewer's Section

Reviewed by:

Nathalie Sinclair, Associate Dean, Research and International

Reviewer's decision:

Approved for 5 years

Reviewer's comments:

The ongoing grant funding is fantastic and provides a good basis for the continuation of the centre. I'd like to meet with you to decide on a plan for the centre's activities this year, particularly as the post-pandemic period is now upon us and research activities across the other centres have resumed. That does not preclude a more long-range planning process for 2024-2029. Finally, while I understand the hope for 2 new faculty members, we should come up with alternate plans in case that target is not met within the next two years--with the uncertainty in hiring in the FoE, we'll need to discuss how the centre can continue its activities with fewer hires and whether the space you currently have is warranted.

Report Type: Renewal Application

Reporting Year: 2022

General Information

Name of the Centre/Institute: Centre for Collaborative Action on Indigenous Health Governance

Website: <https://www.sfu.ca/>

Faculty: Health Sciences

Director: Jeff Reading (Director)
Angela McIntyre (Co-Director)

Director's term end: -

Renewal date: 2024-11-01

Details

Description of the Centre/Institute:

I am the Interim Director for the Centre for Collaborative Action on Indigenous Health I participated on the hiring committee for the permanent director, who is scheduled to begin at SFU in July, 2022.

Interim Director Profile: As an established, respected senior Indigenous scholar I have extensive experience recognized by the broader Indigenous and mainstream research communities in Canada and abroad. I self-identify as an Indigenous person and can confirm First Nations identity with certification and other supporting references including my registration with Tyendinega First Nation and 'Indian Status' provided by Indigenous Affairs Canada.

The Centre/Institute's membership and organization structure:

The Centre is in the process of hiring a permanent director thus there are not operational resources until the permanent director is established. Two staff:

Interim Director: Jeff Reading PhD

Research Associate: Angela McIntyre PhD

Rationale for the renewal of the Centre/Institute:

Important for SFU to establish the Centre which has been delayed due to Covid 19 Pandemic and the search for the inaugural director.

How has the Centre/Institute enhanced research over and above what would have been accomplished by an individual faculty member?

My engagement in Indigenous health research demonstrated expertise in mentorship to junior Indigenous scholars, combined with wide-ranging research, teaching and community service projects and experience merged working within a healing space using a cultural foundational approach.

How has the Centre/Institute accomplished its goals?

Working in partnership with Indigenous communities and SFU Faculty and Staff to create proposals and innovation in teaching, research and community service.

Changes planned upon renewal (e.g. membership, organization structure, etc.):

Inaugural Director is scheduled to begin in July 2022, CRC Tier 2 chair application to be submitted by SFU for director

Significant accomplishments:

1) Funded research projects:

1. CIHR Telling the Story: Gathering First Nations perspectives of COVID-19 Vaccine Deployment CIHR Operating Grant: COVID-19 Vaccine Confidence \$200K 2022-2024
Co-Applicant with FNHA

2. PHAC and Covid-19 Immunity

Task Force Nuu-chah-nulth Tribal Council COVID-19 Vaccine Study into Immune Response, Effectiveness, Safety \$5.5M 2022-2023

Indigenous governance resolved Co-Principal Investigator

3. CIHR KWIIS HEN NIIP – CHANGE. Change for emergency care services in remote Indigenous communities in BC \$1,172,436. 2020-2024 Co-PI

4. CIHR BC Network Environment for Indigenous Health Research (NEIHR) \$3 Million 2019- Nominated Principal Investigator

5. CIHR HeLTI entitled “Hishuk-ish tsawalk (everything is one, everything is connected): Using two-eyed seeing to optimize healthy early life trajectories for Indigenous Peoples \$506,250 (2 year) 2020-2022- to be extended. Co-PI Ranked #1 in peer review national competition

6. CIHR When Rare Becomes Common: The impact of the AnkB p.S646F variant on heart disease in a Northern BC First Nation, Funded 2020 Co-applicant

7. Genome Canada L. Arbour, Caron, N., Wasserman, W.: Silent Genomes \$10M 2018-22 Co-Applicant

8. UBC Faculty of Medicine Dr. Jim Christenson, Strategic Funding Improving patient outcomes in BC's Indigenous communities: Assessing local needs through dialogue, engagement and community partnership. \$165K 2017-2023 Co-Investigator

2) 9. CIHR HeLTI – A developmental workshop led by the Nuuchalch Tribal Council. NPI Lynette Lucas, Jeanette Watts, Pablo Nepomnaschy \$150K Co-Investigator Ranked #1 in peer review national competition

10. CIHR NPI: K. Lee, Co-PI: Adams, Evan. A context-specific and comprehensive menu of commercial tobacco control measures for First Nation communities: A consultation intervention in British Columbia \$918K Co-Investigator

11. CIHR NPI: C Loppie, PI: N Caron, J Reading, K Clement, Co-As: L Arbour + 27 others

Training Grant : Indigenous Mentorship Network Program, “Indigenous Mentorship Network of the Pacific Northwest” \$1M Principal Investigator

Notable media successes:

Bank of Montreal \$2M donation to IHEART Centre, part of FNHA Heart Health research chair

<https://www.theglobeandmail.com/canada/british-columbia/article-st-pauls-foundation-receive-2-million-donation-from-bmo-to-support/>

Events, workshops, public outreach events:

Covid 19 limited public outreach to Zoom and email, please see research projects and the partnerships.

Critical partners are First Nations Health Authority, Providence Health Research Institute, Cardiology at St. Pauls, Universities (mainly UBC, UNBC, UVIC)

The Centre/Institute's multi-year goals for the next renewal term:

Continue research projects funded, teaching and community service to support inaugural director of Centre

KPI:

Hiring the inaugural Centre Director and submitting the CRC Tier 2 application in support of

the inaugural director.

Supporting documents:

The_Centre_for_Collaborative_Action_on_Indigenous_Health_Annual_Report_2AndRhC.docx
(See attachment below)

Financial Summary

Does your Centre/Institute receive direct financial support from the university?

No

Was the Centre/Institute leveraged to attract external funding (donations, grants, contracts) which were only made possible by its existence?

No

Confirm policy review:

Yes

Submitted by:

Jeff Reading, Director

Director's comments:

Wednesday, May 11, 2022

Subject: The Centre for Collaborative Action on Indigenous Health

Director: Jeff Reading

Research Associate: Angela McIntyre

Reviewer's Section

Reviewed by:

Robert Hogg, Associate Dean, Research

Reviewer's decision:

Approved for 2 years

Reviewer's comments:

Considering the Centre is not operational yet, Dr. Reading has done an amazing job of attracting funded research in this area.



Wednesday, May 11, 2022

Subject: The Centre for Collaborative Action on Indigenous Health

Director: [Jeff Reading](#)

Research Associate: [Angela McIntyre](#)

**RE: PFU Policy R40.01 – Centres are required to provide an annual progress report:
The Centre for Collaborative Action on Indigenous Health (CCAIH)**

Dear

As the Interim Director for the Centre for Collaborative Action on Indigenous Health I participated on the hiring committee for the permanent director, who is scheduled to begin at SFU in July, 2022.

Interim Director Profile: As an established, respected senior Indigenous scholar I have extensive experience recognized by the broader Indigenous and mainstream research communities in Canada and abroad. I self-identify as an Indigenous person and can confirm First Nations identity with certification and other supporting references including my registration with Tyendinega First Nation and 'Indian Status' provided by Indigenous Affairs Canada.

My engagement in Indigenous health research demonstrated expertise in mentorship to junior Indigenous scholars, combined with wide-ranging research, teaching and community service projects and experience merged working within a healing space using a cultural foundational approach.

1, Funded research projects:

Granting Agency	Title	Amount	Years	Role
CIHR	Telling the Story: Gathering First Nations perspectives of COVID-19 Vaccine Deployment CIHR Operating Grant: COVID-19 Vaccine Confidence	\$200K	2022-2024	Co-Applicant with FNHA
PHAC and	Nuu-chah-nulth Tribal Council	\$5.5M	2022-2023	Co-Principal

Covid-19 Immunity Task Force	COVID-19 Vaccine Study into Immune Response, Effectiveness, Safety		Indigenous governance resolved	Investigator
PHAC and Covid-19 Immunity Task Force	Indigenous Journeys through COVID-19	\$18M in 2 phases Awarded by peer review	Successful peer review and approval but project paused to resolve Indigenous governance and data sovereignty	Nominated Principal Investigator
CIHR	KWIS HEN NIIP – CHANGE. Change for emergency care services in remote Indigenous communities in BC	\$1,172,436.	2020-2024	Co-PI
CIHR	BC Network Environment for Indigenous Health Research (NEIHR)	\$3 Million	2019-	Nominated Principal Investigator (acting)
CIHR	HeLTI entitled “Hishuk-ish tsawalk (everything is one, everything is connected): Using two-eyed seeing to optimize healthy early life trajectories for Indigenous Peoples	\$506,250 (2 year)	2020-2022- to be extended.	Co-PI Ranked #1 in peer review national competition
CIHR	When Rare Becomes Common: The impact of the AnkB p.S646F variant on heart disease in a Northern BC First Nation	Funded	2020	Co-applicant
Genome Canada	L. Arbour, Caron, N., Wasserman, W.: Silent Genomes	\$10M	2018-22	Co-Applicant
UBC Faculty of Medicine	Drs. Jim Christenson, Strategic Funding Improving patient outcomes in BC’s Indigenous communities: Assessing local needs through dialogue, engagement and community partnership.	\$165K	2017-2023	Co-Investigator
CIHR	HeLTI – A developmental workshop led by the Nuuchah Nulth Tribal Council. NPI Lynette Lucas, Jeanette Watts, Pablo Nepomnaschy	\$150K	2018-19	Co-Investigator Ranked #1 in peer review national competition
CIHR	NPI: K. Lee, Co-PI: Adams, Evan. A context-specific and comprehensive menu of commercial tobacco control measures for First Nation communities: A consultation intervention in British Columbia	\$918K	2017-20	Co-Investigator
CIHR	NPI: C Loppie, PI: N Caron, J Reading, K Clement, Co-As: L Arbour + 27 others Training Grant : Indigenous Mentorship Network Program, “Indigenous Mentorship Network of the Pacific Northwest”	\$1M	2017 –21	Principal Investigator

Merck for Mothers	Maternal-Child health Intervention Project: Kind Faces, Sharing Places Indigenous maternal and Infant Morbidity and Mortality in Ontario	\$2.6M	2017 –20	Co-Investigator

2. External committee and board of directors:

BC Covid 19 Strategic Research Advisory Council (2020 to Present)

2019 - 2021 Scientific Advisory Committee, Institute for Clinical Evaluative Sciences, Toronto

2017 - 2021 Board of Directors for Genome BC, Vancouver

Heart and Stroke Foundation of Canada

- CoMPASS – National Science (2015 to Present)
- Council of Champions (2016 to Present)
- Women's Heart Health (2017 to Present)

3. Recent Selection of Peer Reviewed Refereed Publications:

- Krista Stelkia Lindsay Beck Anita Manshadi Ashlyn Jensen Fisk Evan Adams Annette J. Browne Corinne Dixon Diane McEachern Wendy Ritchie Shannon McDonald Bonnie Henry Namaste Marsden Daniele Behn-Smith Jeff Reading (2020) Letsemot, "Togetherness": Exploring How Connection to Land, Water, and Territory Influences Health and Wellness with First Nations Knowledge Keepers and Youth in the Fraser Salish Region of British Columbia International Journal of Indigenous Health. <https://doi.org/10.32799/ijih.v16i2.33206> Published 2020-12-29
- Alex Brown, Sue Crengle, Jordan Tewhaiti-Smith, Seth Westhead, Brittany Bingham, Ngiare Brown, Chenoa Cassidy-Matthews, Terryann Clark, Summer May Finlay, Ketil Hansen, Matire Harwood, Katarina Sofie Holmlund Niia, Kine Nilsen Iversen Jonill Margrethe Fjellheim Knapp, Siv Kvernmo, Crystal Lee, Ricky Lee-Watts, Melanie Nadeau, Odette Pearson, Jeff Reading, Elizabeth Saewyc, Jon Petter Stoor. Non-Indigenous allies: Peter Azzopardi, Christian Eckhoff, Miguel San Sebastian (2022) The health and wellbeing of Indigenous adolescents as a foundation to a more equitable and sustainable future: a global collective to drive evidence-based action. Lancet v.399, issue 10322, p341-343, Jan 22, 2022
- Maui Hudson, Nanibaa' A. Garrison, Rogena Sterling, Nadine R. Caron, Keolu Fox, Joseph Yracheta, Jane Anderson, Phil Wilcox, Laura Arbour, Alex Brown, Maile Tualii, Tahu Kukutai, Rodney Haring, Ben Te Aika, Gareth S. Baynam, Peter K. Dearden, David Chagné, Ripan S. Malhi, Ibrahim Garba, Nicki Tiffin, Deborah Bolnick, Matthew Stott, Anna K Rolleston, Leah L. Ballantyne, Ray Lovett, Dominique David-Chavez, Andrew Martinez, Andrew Sporle, Maggie Walter, Jeff Reading and Stephanie Russo Carroll. (2020) Rights, interests and expectations: Indigenous perspectives on unrestricted access to genomic data. Nature Reviews Genetics - NRG- 19-163V2

4. Graduate Students (All graduate students are of Indigenous ancestry)

Principal Supervisor, **Krista Stelkia** (Phd defended 2022) , Simon Fraser University

Thesis/Project Title: The influence of racism on chronic disease in First Nations of BC

Project Description: How Racism Impacts Chronic Disease Management in First Nations Communities in Canada

External Reviewer: Dr. Charlotte Loppie (UVic)

Internal Reviewer: Dr. Joy Johnson (SFU President, FHS Professor)

Committee:

Supervisor: Dr. Jeff Reading

Dissertation Committee members:

Dr. Annette Brown (UBC)

Dr. Scott Venners (SFU FHS)

Graduate Student supervision, current roster:

- Berry, Brandi. Master of Science (advisor, SFU)
- Brown, Keiten. Master of Science (advisor, SFU)
- Chutter, Leigh-Anna. Master of Science (advisor, SFU)
- Dapp, Dustin Lee. Master of Science (advisor, SFU)
- Jubinville, Danette, PhD candidate (advisor, SFU)
- Cassidy-Matthews, Chenoa, PhD candidate (advisor, UBC)
- Dickens, Rachel, PhD candidate (advisor, UBC)

5. Teaching

- 2018-2022
HSCI 842-G100: Indigenous Public Health
Course Level: Graduate course required for all Masters of Public Health students
- 2021-2022
HSCI 406 D100
Global Perspectives in Indigenous Health

I also served on numerous internal committees including:

SFU Medical School Planning Group

First Nations Health Authority Public Health and Research committees

Hiring panels for SFU Faculty including Director for the **Centre for Collaborative Action on Indigenous Health**.

In conclusion, working under the global pandemic for the last 2 years, I have initiated some critical research projects, innovative teaching and important community service as part of my role at Interim Director of CCAIH, thus I expect these projects, initiatives and relations will continue to be connected to the Centre for Collaborative Action on Indigenous Health.

Sincerely,



Professor Jeff Reading, MSc. PhD. CAHS

Jlr6@sfu.ca (604) 240-5836 (cell)

Chair - First Nations Health Authority Chair in Heart Health and Wellness at St. Paul's Hospital
Department of Cardiology,

Director - Centre for Collaborative Action on Indigenous Health, Faculty of Health Sciences SFU

Director - The I-HEART (Indigenous Health Education Access Research Training) Centre,
Providence Health Research Institute, Vancouver BC

Professor - Faculty of Health Sciences, Simon Fraser University

Emeritus Professor – University of Victoria

Adjunct Professor – University of British Columbia and University of Toronto

Report Type: Renewal Application

Reporting Year: 2022

General Information

Name of the Centre/Institute: Centre for Natural Hazards Research

Website: <http://www.sfu.ca/cnhr/index.html>

Faculty: Science

Director: Brent Ward (co-Director)

Glyn Williams-Jones (co-Director)

Director's term end: -

Renewal date: 2027-04-01

Details

Description of the Centre/Institute:

The Centre for Natural Hazards Research (CNHR) brings together a diverse group of natural hazards experts to conduct innovative research on geophysical processes that are a threat to the population and economic infrastructure of Canada. The Centre has a western Canada focus, but the research findings and developed methodologies are applicable to the whole of Canada and to the international community.

The Centre/Institute's membership and organization structure:

Hosted by the Department of Earth Sciences at Simon Fraser University, CNHR includes members from various SFU Departments as well as partner institutes in British Columbia and Europe. Other SFU departments include: Resource & Environmental Management, School of Environmental Science, Engineering Science, Communications; BC Partners include: UBC (Department of Earth, Ocean & Atmospheric Sciences, Geography, Civil Engineering, and Forestry); UVic (Earth and Ocean Science); Douglas College (Earth Sciences); Natural Resources Canada (Earthquake Seismology, Sidney office) and Minerva Intelligence; International partners include: University of Torino and University of Bologna, Italy and Mineral Resources Tasmania, Australia. The Centre also has a MOU with Minerva Intelligence located in Vancouver.

The Centre for Natural Hazard Research is a Schedule A Centre governed in accordance with University policies (R.40.01, CENTRES AND INSTITUTES) and comes under the direct authority of the Dean of Science. CNHR is governed by a Steering Committee made up of five Simon Fraser University faculty members and up to three representatives from the community. The Steering Committee includes the Co-Directors and Manager of CNHR. Members are appointed by recommendation to the Dean of Science by the Directors.

Rationale for the renewal of the Centre/Institute:

Climate change is leading to the retreat of glaciers, permafrost thawing and extreme rain events that significantly increase cascading natural hazards on Canadian mountains, particularly in Western Canada. The impacts of climate change profoundly affect Canadian communities with soaring economic costs. For example, in 2021, BC experienced a “heat dome”, the deadliest weather event in Canadian history; devastating forest fires in the interior (that wiped out most of the village of Lytton, BC at \$78M); and flooding that will likely be the most expensive Canadian weather event on record (current estimate: \$9B). As such, there is a continued and critical need for multidisciplinary fundamental and applied research.

How has the Centre/Institute enhanced research over and above what would have been accomplished by an individual faculty member?

The centre brings together a wide range of researchers that facilitates innovative solutions to the significant problems we face. For example, in order to work towards addressing the hazards related to changing climate, the CNHR is playing a significant role in a SFU proposal to the Canada First Research Excellence Fund 2022 Competition entitled Community-Centred Climate Innovation (C3I) – CNHR co-Director Williams-Jones is one of 8 co-leads in this major joint SFU-UWaterloo initiative. Furthermore, with representation from co-Director Ward, the CNHR is in preliminary discussions with colleagues from UBC, the Provincial government and industry to discuss initiatives for geohazard risk mitigation with respect to transportation infrastructure. These collaborations will set the groundwork for future research and expand networks for HQP and ECRs within the CNHR.

How has the Centre/Institute accomplished its goals?

The goals of the CNHR are to facilitate collaborative research across faculties and institutions. As noted above, this has been accomplished through collaborative initiatives (e.g., large grant proposals) as well as supporting the ongoing research of a wide range of graduate students and early career researchers.

Changes planned upon renewal (e.g. membership, organization structure, etc.):

Since its formation in 2003, the CNHR has always included members from multiple faculties and institutions (national and international) and thus functioned as an Institute rather than a Centre. As such, we would like to begin the process to transition the CNHR to an Institute over the next year. As we have significant brand recognition, we would prefer to retain the Centre moniker, but start to formally exist within the SFU framework as an institute.

Significant accomplishments:

- lead organization supporting a Sea to Sky survey of public stakeholders to assess “Effective Communication of Natural Hazards in the Era of Information Explosion” (part of ongoing PhD research by Yu Yen Pan, Earth Sciences, SFU;

<https://www.sfu.ca/cnhr/news/engagement.html>)

- key partner in the Sea to Sky corridor Fire & Ice aspiring UNESCO Geopark
(<https://fireandicegeopark.ca/>)

- led the development of a Public-Private Partnership (PPP), involving academia, industry and government agencies, to initiate and expand continuous monitoring (leveraging low-cost citizen science sensors and satellite remote sensing) of Canada's only currently active volcano, Mount Meager, NW of Pemberton, BC. This PPP model is being implemented for other complex and cascading geohazard sites in the Sea to Sky corridor of BC (e.g., Stawamus Chief, Squamish; The Barrier, Garibaldi) with information made openly accessible via the Canadian Natural Hazards Knowledge Portal (<https://nathaz.ca>).

Notable media successes:

- Great BC Shakeout at SFU Burnaby (Oct. 2021) – CNHR was the SFU host and a key partner in supporting a Natural Resources Canada initiative for Early Earthquake Warning sensors on Burnaby and Surrey campuses. This will be repeated in October 2022.

- Multiple print, radio and TV media engagements in relation to the November 2021 atmospheric river. CNHR members were also heavily involved in an issue of Engineers and Geoscientists BC Innovation magazine dedicated to the atmospheric river

<https://user-yinucac.cld.bz/INNOVATION-January-February-2022>

Events, workshops, public outreach events:

1) We produce a quarterly newsletter ("Risky Ground") posted on the CNHR webpage and distributed by email (<https://www.sfu.ca/cnhr/news/newsletter.html>).

2) As noted above, the Great BC Shakeout at SFU Burnaby in Oct 2021 and will be hosting in Oct 2022.

3) We regularly conduct numerous lectures to school and community groups on Natural Hazards and while Covid restricted our outreach this year.

The Centre/Institute's multi-year goals for the next renewal term:

- Transition to an Institute while maintaining the existing name and recognition
- Expand the Canadian Natural Hazards Knowledge Portal and real time citizen science monitoring and knowledge sharing
- Put into place stable funding to enable part-time administrative support and engagement initiatives such as annual in person natural hazards workshops

KPI:

none

Supporting documents:

-

Financial Summary

Does your Centre/Institute receive direct financial support from the university?

No

Was the Centre/Institute leveraged to attract external funding (donations, grants, contracts) which were only made possible by its existence?

Yes

External funding details:

- 1) 2021/2-2023/1: Mount Cayley mass flow hazard monitoring, UBCM Community Emergency Preparedness Funds, \$70,000
- 2) 2020/5-2022/4: Knowledge acquisition to understand precursor signs of a major event at Mt. Currie. BC. UBCM Community Emergency Preparedness Funds, \$100,000

Confirm policy review:

Yes

Submitted by:

Glyn Williams-Jones, co-Director

Director's comments:

The Centre for Natural Hazard Research has a long history at SFU. In spite of the challenges of COVID, we have continued to foster research that addresses a broad range of issues that are ever more critical to society as a whole. The CNHR has been operating as a de-facto Research Institute for many years with members from other Faculties, Universities and government agencies and as such we hope to work towards becoming an Institute over the coming year.

Reviewer's Section

Reviewed by:

Michael Silverman, Associate Dean, Research

Reviewer's decision:

Approved for 5 years

Reviewer's comments:

The CNHR is highly collaborative, as one can see from their list of participants, and the importance of their work is evident, e.g., climate change, natural disasters. Considering their expansive reach and membership (and SFU guidelines), I support their eventual transition to an Institute. Overall, keep up the great work.

Report Type: Renewal Application

Reporting Year: 2022

General Information

Name of the Centre/Institute: Centre for Wildlife Ecology

Website:

<http://www.sfu.ca/biology/wildberg/NewCWEPAGE/CWEnewTestHome.htm>

Faculty: Science

Director: Ronald Ydenberg

Director's term end: -

Renewal date: 2027-04-01

Details

Description of the Centre/Institute:

The centre fosters high quality graduate training and research, conducts basic and applied research in wildlife ecology, and provides knowledge and personnel that help Environment and Climate Change Canada (ECCC) and other agencies meet the challenges of conservation in the 21st century. The central concept is to foster synergy between mission-oriented research and management policies of the ECCC and the basic research agenda of Simon Fraser University.

The Centre/Institute's membership and organization structure:

The CWE consists of 3 SFU Biology professors, one Research Associate, several Research Scientists from Environment and Climate Change Canada who also

hold Adjunct Professorships at SFU, about 15 - 20 graduate students, and a varying number of Post-doctoral Fellows, honours undergraduate students and

research assistants. Ron Ydenberg is the director of the Centre, and he, along with Dr. David Green and Dr. Tony Williams, manage the running and budget of

the CWE.

Rationale for the renewal of the Centre/Institute:

The CWE has operated very steadily for almost 30 years. During this time we have renewed agreements with ECCC at 5 year intervals, each bringing a

core agreement worth \$0.75 - \$1.25M, plus other research funds to which our partnership with ECCC gives us access. We are now in the final year of our current agreement. I look forward to negotiating a new 5 year agreement beginning in Spring of 2023. Renewal of the Centre would send a strong signal of continued support by SFU for the structure of the Centre.

How has the Centre/Institute enhanced research over and above what would have been accomplished by an individual faculty member?

As outlined in our Mission Statement, the central concept behind the CWE is to foster synergy between mission-oriented research and management policies of the ECCC and the basic research agenda of Simon Fraser University. Since my appointment as Director in 2002 to the present, CWE records show that we have published a total of 775 papers, 22 books and book chapters, and graduated 115 graduate students. Many of the theses and publications have been directly aimed at priority issues for ECCC, but many are also better classified as 'basic research' issues that a purely applied program would not have generated on its own. The high rates of both types of publication are made possible by the synergy created between the CWE and ECCC. Three faculty members working independently would never have been able to publish this extensively, or maintain more than half a dozen ongoing major projects. The organization is complex, requires more administrative support than the department or University provides (so the CWE has several staff), and demands diverse expertise provided by networks that the Centre has built up over 20 years. The whole just is much greater than the sum of its parts.

How has the Centre/Institute accomplished its goals?

The CWE has met the mandates of its mission statement (see description of the Centre above):

Fosters high quality graduate training and research: Nine PhD degrees, 14 MScs and 3 MET degree were granted in the past five years.

Conducts basic and applied research in wildlife ecology: 186 refereed journal articles, 1 book and 6 book chapters were published.

Provides knowledge and personnel that help Environment and Climate Change Canada (ECCC) and other agencies meet the challenges of conservation in the

21st century: Several CWE graduates have been hired as research scientists, data managers, and conservationists with ECCC and Parks Canada.

Changes planned upon renewal (e.g. membership, organization structure, etc.):

We meet regularly with ECCC to review priority areas for research, and discuss how to blend the CWE's basic research agenda into helping to illuminate issues

in those areas. No major changes are planned, and we anticipate continuing to operate much as we have over recent decades. However, faculty renewal will become an important consideration, as the long serving Director (Ydenberg) will retire within the 5 year period, and further renewal beyond this term will depend on whether the CWE remains important enough for the Department of Biological Sciences to make replacements a hiring priority.

Significant accomplishments:

1) During the last five year period (Apr 2017 - present) members of the CWE published 186 refereed journal articles, 1 book and 6 book chapters. (See attached CWE Annual Reports for 2018 to 2022 for details.)

2) Over the past five years, nine PhD degrees, 14 MScs and 3 MET degrees were granted to students of the CWE. (See attached CWE Annual Reports for 2018 to 2022 for details.)

3) In June 2021, the Centre for Wildlife Ecology moved from TASC2-8540, its home on the SFU campus since 2007, back to Biology, into newly renovated, custom designed quarters. The construction of this specifically designed workspace was evidence of the value and importance of the CWE to the Department of Biological Sciences.

Notable media successes:

-

Events, workshops, public outreach events:

-

The Centre/Institute's multi-year goals for the next renewal term:

1) Continue to conduct basic and applied research in the field of Wildlife Ecology

KPI 1:

Numbers of papers in refereed journals, number of books and book chapters produced.

2) Foster high quality graduate training and research.

KPI 2:

Number of degrees granted to CWE students.

3) Continue to provide knowledge and personnel that help Environment and Climate Change Canada (ECCC) and other agencies meet the challenges of conservation in the 21st century.

KPI 3:

Number of CWE graduates working in the field of Wildlife Ecology at ECCC and other conservation agencies, including Environmental Consultant companies.

Supporting documents:

- 1) SFUCentreReportMembershipForm_x41SJgv.xls (See attachment below)
- 2) CWEFunding2017-2018_zEEFtml.doc (See attachment below)
- 3) CWEFunding2018-2019_SJxhISO.doc (See attachment below)
- 4) CWEFunding2019-2020_PY1Chnp.doc (See attachment below)
- 5) CWEFunding2020-2021_FQd3VN9.doc (See attachment below)
- 6) CWEFunding2021-2022_FIt21nf.doc (See attachment below)
- 7) 2018ARFinal_Y8V1YzU.pdf (See attachment below)
- 8) 2019ARFinal_squXWTU.pdf (See attachment below)
- 9) 2020ARfinal_NmyJgu0.pdf (See attachment below)
- 10) 2021ARFinal_d9GoyTO.pdf (See attachment below)
- 11) 2022ARFinal_3yDo33w.pdf (See attachment below)

Financial Summary

Does your Centre/Institute receive direct financial support from the university?

No

Was the Centre/Institute leveraged to attract external funding (donations, grants, contracts) which were only made possible by its existence?

Yes

External funding details:

Please see attached financial reports from the CWE annual reports 2018 - 2022.

Confirm policy review:

Yes

Submitted by:

Connie Smith, Research Technician

Director's comments:

The CWE has operated very steadily and successfully for all 30 years of its existence. Graduate student renewal has continued, and there is no reason to expect that this will not be able to continue through the anticipated 5 year renewal.

Reviewer's Section

Reviewed by:

Michael Silverman, Associate Dean, Research

Reviewer's decision:

Approved for 5 years

Reviewer's comments:

I fully support the renewal of the CWE. This Centre has the longest history, highest profile, and greatest collective productivity of any Centre in Science, and possibly across campus. Moreover, they are nationally and internationally renowned for their basic and applied ecology research, and training of highly qualified personnel.

**ANNUAL REPORT of the
CENTRE FOR WILDLIFE ECOLOGY
2017-2018**



Environment and
Climate Change Canada
Environnement et
Changement climatique Canada

**Department of Biological Sciences
Simon Fraser University**

<http://www.sfu.ca/biology/wildberg/NewCWEPPage/CWEnewTestHome.htm>

Dr. Ronald C. Ydenberg, Director

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I. HISTORY

Under the Migratory Birds Convention and Canada Wildlife Acts, the mandate of the Canadian Wildlife Service is to protect and conserve migratory bird populations. In the 21st century, this historical mandate is broadening to encompass other environmental concerns such as species at risk, biodiversity, sustainability and endangered habitats. To meet these broad and varied responsibilities, Environment and Climate Change Canada depends on sound science, and participates in cooperative ventures. In 1993, the Natural Sciences and Engineering Research Council of Canada, Simon Fraser University, and Environment Canada signed a ten year agreement to create the NSERC/CWS Chair in Wildlife Ecology at SFU. That agreement has expired, but The Centre for Wildlife Ecology (CWE) as described here continues work with ECCC and with other agencies, on a range of issues pertaining to wildlife and other environmental sciences.

II. MISSION STATEMENT

The mission of the Centre for Wildlife Ecology (CWE) is to foster high quality graduate training and research, conduct basic and applied research in wildlife ecology, and to provide knowledge and personnel that will help Environment and Climate Change Canada and other agencies meet the challenges of conservation in the 21st century. The central concept is to foster synergy between the mission-oriented research and management policies of Environment and Climate Change Canada (Canadian Wildlife Service, CWS, and Science and Technology, S&T) and the basic research agenda of the University. Information, ideas, expertise, resources and opportunity flow back and forth across this interface, giving government agencies access to a broad base of science capability that helps inform policy and decision making, while the university and its faculty and students benefit from enhanced opportunities for research and application of the ideas their disciplines generate.

III. PERSONNEL

A. Research Team

1. Faculty and Research Associates

<i>Name</i>	<i>Position</i>
Ron Ydenberg	Director, Professor
Tony Williams	Professor
David Green	Associate Director, Associate Professor
Dov Lank	University Research Associate / Adjunct Professor
Dan Esler	USGS Scientist / Adjunct Professor
Mark Hipfner	ECCC Research Scientist / Adjunct Professor
Doug Bertram	ECCC Research Scientist
Christine Bishop	ECCC Research Scientist / Adjunct Professor
Sean Boyd	ECCC Research Scientist / Adjunct Professor
Rob Butler	ECCC Research Scientist Emeritus/ Adjunct Professor
Bob Elner	ECCC Research Scientist Emeritus/Adjunct Professor
John Elliott	ECCC Research Scientist / Adjunct Professor
Rhonda Millikin	ECCC Head, Population Assessment/Adjunct Professor
Fred Cooke (retired)	Emeritus Chairholder

2. Research Group

<i>Postdoctoral Fellows</i>	<i>PhD (in progress)</i>	<i>MSc (in progress)</i>	<i>Staff</i>
Tom Flower	Marie-Hélène Burle	Seth Bennett	Kathryn Coukell, CWE Admin. Asst.
Tanya Brown	David Hope	Rachel Canham	Connie Smith, CWE Research Tech
	Richard Johnston	Alice Domanik	
	Mason King	Elizabeth Ruberg (MET)	Visitors
Undergrads	Emily McAuley	Eveling Tavera Fernandez	Pat Baird
Amanda Daeming	Michal Pavlik	Catherine Villeneuve	Laurens Berends
Aaron Walchuk	Marinde Out	Kristen Walters	Joachim Bertrands
	Florian Reurink		Lina Giraldo Deck
	Simon Valdez		Clemens Küpper
	Jeff Yap		Jasmine Loveland
			Chloris Maury
	PhD(defended)	MSc (defended)	
	Allison Cornell	Chloe Boyton	
	Philina English	Cybele Heddle (MET)	
	Sarah Thomsen	Olga Lansdorp	
		Mitchell Serota	

B. Steering Committee

<i>Name</i>	<i>Position</i>	<i>Affiliation</i>
Robert Elner	Emeritus Scientist	<i>ECCC</i>
David Green	CWE faculty (non-voting)	<i>SFU</i>
Mark Hipfner	Research Scientist	<i>ECCC</i>
Elsie Krebs	Research Manager, Western Canada	<i>ECCC</i>
Tony Williams	CWE faculty (non-voting)	<i>SFU</i>
Ron Ydenberg	CWE Director (non-voting)	<i>SFU</i>

IV. INTRODUCTION

The aim of this Annual Report is to give an overview of our activities, outline the progress on new and continuing projects, describe the personnel involved, and to give some indication of our scientific and community involvement. Previous Annual Reports are available from the CWE. Contact us via our website

<http://www.sfu.ca/biology/wildberg/NewCWEPage/CWEnewTestHome.htm>

or contact Ron Ydenberg at ydenberg@sfu.ca.

V. THE CWE IN ACTION

The accounts that follow give brief overviews of the major projects run by the CWE. More detail is available on our website (address above). Publications and theses are listed at the end of this report. The personnel also can be contacted via the website.

A. Species at Risk

1. Marbled Murrelet (Threatened, COSEWIC)

SFU's research on threatened Marbled Murrelets continues to address direct conservation and management issues for this listed species. This project was started by CWE chair emeritus Fred Cooke in 1994 and continued through the present by David Lank.

Lank continued to participate in the Canadian Marbled Murrelet Recovery team. A technical paper arising from the development of the original plan, co-authored by Lank, is being revised for publication in the BC Journal of Ecosystem Management.

Lank is collaborating with SFU statistician Carl Schwarz to complete an analysis of the effects of forest fragmentation on breeding populations in 4 regions of BC, using radar data as an index of local population size.

Lank has developed a proposal, together with a potential MSc student Sonya Pastran, to analyze Marbled Murrelet transect data gathered for the past 20 years by the Leskeek Bay Conservation Society, which has now received funding from ECCC under the Ocean Protection Plan. Fieldwork will start during the summer of 2018.

Tom Flower, a postdoctoral fellow in the CWE, completed several years of research on Steller's jays, a major predator on murrelet nests, focusing on their predation of other bird's eggs and chicks, termed nest predation. Nest predation is of general conservation concern because human-caused habitat fragmentation likely increases nest predation, yet when and why this happens remains unclear. Tom colour-banded 70 jays, and fitted 20 individuals with radio transmitters, providing a window into the predatory behaviour of these birds. With help from CWE graduates Olga Lansdorp and Philina English, Tom undertook experiments and observations to explore how changes in food abundance due to clear-cut forestry practices, can drive increased nest predation

behaviour. In addition, Tom worked with Laurens Berends, an MSc student from Wageningen University (Netherlands), to investigate whether edge effects on nest predation can be driven by risk avoidance behaviour by Steller's jays, which are vulnerable to predation in clear-cut habitats and preferentially use forest fragments and edge generated by clearcut forestry. Tom presented preliminary findings from this research as an invited speaker at a conference in Denmark (Fear: brains behaviour and society). Finally, together with Ron Ydenberg, Tom supervised a research project by undergraduate student Amanda Daemmig (BISC 498), considering how Steller's jays make decisions about when to move between foraging patches.

Together this research will improve our understanding of how and why human land use affects breeding bird populations facilitating improved management.

2. *Eastern WhipPoorWill* (Threatened, COSEWIC)

The Eastern WhipPoorWill was designated as a Threatened species by COSEWIC in 2009. Philina English addressed identified knowledge gaps for this species in her PhD thesis that was defended in April 2017. She demonstrated 1) that changes in the distribution of whippoorwill from the first and second Ontario Breeding Bird Atlas are not explained by increases in forest cover as forests regrow on abandoned agricultural land (English et al. 2017a), 2) population declines over the last century are associated with changes in the nitrogen isotope signatures in winter grown and breeding ground tissues that reflect changes in their diet (English et al 2018a), and 3) moth abundance has a positive influence on daily chick survival rates (English et al. 2018b). In collaboration with Mike Cadman (CWS), she also used geolocators to determine the migration routes of whippoorwills breeding at three sites, (QUBS in the Frontenac arch, Torrance Barrens Dark Sky Reserve in the southern Muskoka, and Long Point on Lake Erie (English et al 2017b).

3. *Yellow-breasted Chat* (Endangered, COSEWIC)

Research conducted in collaboration with Dr. Christine Bishop (EC) has examined how factors at different stages of the annual life cycle influence the annual survival of Yellow-breasted chats. Andrew Huang (CWS) demonstrated that wind conditions during spring migration best explained variation in annual apparent survival (Huang et al. 2017). This confirms the importance of conditions during this phase of the annual cycles for the successful migration of songbirds on the western flyway.

4. *Scripp's Murrelet* (Vulnerable, IUCN)

Santa Barbara Island in the Channel Islands, California, provides breeding habitat for 20% of the world's population of Scripps murrelets (global population = 2800 pairs). Scripp's murrelets on Santa Barbara may be depredated by barn owls, but barn owls also prey on deer mice that are known to be a major cause of egg failure. Sarah Thomsen explored the direct and indirect interactions between barn owls, deer mice and Scripp's murrelets, and evaluated management options for this vulnerable species in her PhD thesis that was defended in July 2017. One chapter of her thesis has been published in Ecology and another has been submitted to Proc. Roy. Soc. Lond. B. Two others are in preparation for Global Change Biology and Conservation Biology.

5. *Tuamotu Sandpiper* (Endangered, IUCN)

The CWE is lending its expertise in shorebird biology to support a conservation project on the highly endangered Tuamotu Sandpiper, in partnership with the USF&WS (Rick Lanctot, Alaska region), Island Conservation, the French Polynesian Regional Division for the Environment (DIREN), a local ornithological NGO (the Society of Polynesian Ornithologists, SOP-MANU), and the Critical Ecosystems Partnership Fund (CEPF), administered by Conservation International.

Once widespread across the South Pacific, this species is now found on only 4 atolls, with a world population of ca. 1400 individuals. PhD student Marie-Hélène Burle has spent >16 months over 4 field seasons conducting the first study of the species' basic biology. Her information on habitat usage, diet, and social behaviour is being used to support reintroduction planning for the species onto atolls where rats have been or will be removed, in addition to documenting fascinating novel adaptations by an arctic bird to a tropical environment.

6. *Cassin's Auklet* (Special Concern, COSEWIC) - see Section V.D.1, Coastal Studies of Seabirds.

7. *Barn Swallow* (Threatened, COSEWIC) - see Section V.B.3.b., Landscape-level determinants of breeding distribution, productivity and foraging in Barn Swallows and Tree Swallows

B. Human Impacts on Birds

1. Contaminants and Toxicology

a. Developmental neurotoxicity of mercury in birds

Cybele Heddle (MET student) completed the final phase of this project (year 5) with experimental work looking at the combined effect of in ovo and chick dosing. She also conducted two collaborative projects with researchers at McGill. A final report was submitted to ECCC and two papers are in progress. Two other papers were published from earlier phases of this work (Morran et al. *Ecotoxicology*; Eng et al. *Developmental Neurobiology*).

b. Chronic toxicity of petroleum hydrocarbons and other contaminants in seabird sentinel species

We initiated a new project with Drs. John Elliott (ECCC) and collaborators at the National Wildlife Research Centre (NWRC) laboratory in Ottawa as part of the Ocean Protection Plan. This research will focus on investigating the toxicity of petroleum, specifically oil sands bitumen products, to birds on the Pacific north-west coast. A new PhD student (Mason King) joined this project in April 2017, co-supervised by Williams and Elliott. In the first year of work eggs were collected from several rhinoceros auklet colonies (a sentinel species), incubated at SFU and embryos collected for gene expression analysis (using the Avian ToxChip developed by NWRC) and contaminant analysis.

c. Biomagnification of legacy and emergent persistent organic pollutants in a food-web of an avian top predator, the Cooper's hawk

The CWE continues to collaborate with Dr John Elliott (ECCC, SFU Adjunct Professor) on

studies examining the exposure and impact of persistent organic pollutants (POPs) on wildlife. Kate Fremlin, who will be completing her MSc spring/summer 2018, found that the majority of legacy POPs observed in the tissues of Cooper's hawk in previous studies are in fact biomagnifying in the terrestrial food-web of the Cooper's hawk. In addition, many emergent POPs, such as perfluorinated compounds, are also biomagnifying in this terrestrial food-web. The extent of biomagnification seen in this terrestrial system for these legacy and emergent POPs is comparable to or often higher than the biomagnification observed in aquatic systems.

2. Reservoirs and the impact of Water Use Decisions on Riparian Birds

Human activities have caused a dramatic loss in the amount of riparian habitat in North America and this habitat loss is linked to population declines of many riparian dependant songbirds. CWE, working in collaboration with BC Hydro and Cooper-Beauchesne and Associates, has examined how reservoir operations on the Columbia River between 2004-2017 impact the population dynamics of yellow warblers, a species identified by Partners in Flight as a focal species for riparian habitat. Most recently, Mathew Hepp published a paper that demonstrated that reservoir operations that flood yellow warbler habitat can reduce post-fledging survival and local recruitment (Hepp et al. 2018). This result is currently being incorporated into an individual based model that will examine how different reservoir water use decisions influence productivity on the breeding grounds.

3. Agricultural Effects

a. Breeding phenology and productivity of an invasive, agricultural specialist, the European starling

European starlings are an invasive species of considerable economic importance because of their agricultural and urban impact (as well as being the focal species for Environment Canada's terrestrial contaminant monitoring under the Chemical Management Plan). However, they are also agricultural specialists associated with less-intensive pasture (short mown or grazed fields), and are dependent on one main prey type (Tipulid larvae or leatherjackets – another introduced pest species) for successful reproduction. As such they could be a useful monitoring species for changes in agricultural land-use and intensification. Our long-term study of the ecological physiology of European starlings marked its 15th year at our Langley field site (140 nest boxes). Basic monitoring was conducted in 2017.

b. Landscape-level determinants of breeding distribution, productivity and foraging in Barn Swallows and Tree Swallows

Farmland and grassland bird species, including aerial insectivores, have been declining for decades in Europe and North America. Recent studies have cast doubt on the idea that there is a single, global cause for all population declines, e.g. there is only weak cross-correlation in population trajectories in co-occurring aerial insectivore species. This suggests there are highly variable, and complex, spatio-temporal patterns of population change perhaps related to region-specific environmental conditions (e.g. climate, land use). Two MSc students (Olga Lansdorp and Chloe Boynton) successfully defended their theses in 2017 and papers are in progress (lead by Dr. Nancy Mahony).

C. Declining Avian Populations

1. Migratory Shorebirds

Concern has been raised about apparent population declines of many species of shorebirds over the past two decades. The CWE and its ECCC associates have consistently contributed novel research findings addressing potential causes of these apparent declines. We have cooperated particularly closely with ECCC's Mark Drever (Delta), Keith Hobson (Saskatoon), and with ECCC emeritus Bob Elner, as well as Bird Studies Canada representatives.

Six CWE members participated in the 6th Western Hemisphere Shorebird Group meeting, in Paracas, Peru. Eve Taverna-Fernandez, a CWE PhD student, was the principle organizer of the meeting, which attracted nearly 200 participants from throughout the hemisphere, with strong support for participation from both northern and southern researchers and managers. CWE staff members David Lank and Connie Smith received the first award given by the group for lifetime achievement in shorebird research.

a. Shorebird Breeding Biology

Current and former CWE members contributed to four 2017-18 publications arising from participation in the Arctic Shorebird Demographic Network, a collaborative program that includes over a dozen sites in Alaska and arctic Canada, including contributions from several ECCC staff members, utilizing common protocols. These publications address effects of environmental conditions and seasonal trends on breeding success and adult survivorship.

Lank, former CWE student Sam Franks, and the CWE's first graduate student, Brett Sandercock, published a paper documenting changes in the breeding biology of shorebirds at Nome with respect to climate change. The paper used Sandercock's PhD data gathered at Nome in 1993-1998 and recent data gathered by CWE students and others during the 2010s.

Graduated MSc student Willow English published on the effects of exclosures on nest success rates of red-neck phalaropes, based on the Nome data from the 1990s and the 2010s. Exclosures have been used to promote nesting success of threatened and endangered shorebirds, with mixed results depending on ecological situation. English's paper helps to define when they will or will not be useful.

b. Non-breeding biology

PhD student Richard Johnson, from Colombia, is presented his findings breeding flight performance and aspects of the community ecology of wintering shorebirds in large riverine/estuary systems in southern Colombia. Richard submitted his first MS, describing factors influencing the location of roost sites for Whimbrels.

Eveling Tavera Fernandez conducted another successful field season at the end of 2016-spring 2017, capturing and resighting non-breeding shorebirds at Paracas, Peru. When not organizing the Western Hemisphere Shorebird meeting, she visited Cornell and worked on survivorship models with collaborators at the Lab of Ornithology.

c. Migration Biology

The CWE contributed to an analysis of migration patterns and populations connectivity based on

geolocator tracks from >140 Semipalmated sandpipers, including birds marked at our study site in Nome. PhD student Dave Hope presented his models of stopover site choice during migration, emphasizing the effects of population size and environmental danger. Fieldworkers gathered another season of data within the Salish Sea against which Hope is calibrating his model. Hope also completed analyses of historical changes in site use of Atlantic migration stopover sites by Semipalmated Sandpipers, utilizing Maritime Shorebird Survey data, curated by ECCC's Paul Smith, in Ottawa.

d. Population Biology

A paper using Audubon CBC data on Dunlin winter distributions was published by Ydenberg and CWE colleagues. The study shows that over a 35 year period, dunlin populations concentrate at larger sites when winter populations are larger, on both the Pacific and Atlantic/Gulf coasts. On the Pacific coast, dunlin populations also concentrate as falcon numbers have increased.

A highly collaborative paper addresses issues related to perceived Semipalmated sandpiper population changes, which has been of substantial concern, particularly in eastern Canada. This study brought together morphological data suggesting that wing lengths of semipalmated were longest around 1980 and have become smaller since that time. These data suggest alternative explanations for the population significance of changes in morphometrics previously reported at the Bay of Fundy. Authors and collaborators are CWE's Lank, Xu, and Ydenberg plus ECCC staff members Cheri Gratto-Trevor, Paul Smith, Julie Paquet, Christian Friis, retired ECCC biologists Guy Morrison and Peter Hicklin, as well as several students and other academics.

2. Neotropical Migrant Passerines

CWE initiated a long-term study on yellow warblers that migrate between western Canada and Mexico/Central America in 2004. This research conducted in collaboration with Dr. Elsie Krebs (ECCC) takes a whole life cycle approach and includes work on the breeding grounds in Inuvik, NT, and Revelstoke, BC, on migration and on the wintering grounds in Jalisco, Mexico. The 2017 field season in Revelstoke completed the field component of this project.

Simon Valdez (PhD candidate) is currently investigating the non-breeding portion of the yellow warbler life cycle; he will defend his PhD in the coming year. He has demonstrated that the breeding origins of female yellow warblers influences winter habitat use in Mexico (Valdez-Juarez, In press), and 2) that winter habitat use influences the condition and winter survival of Yellow warblers in Jalisco, Mexico (in prep for Conservation Biology).

Michal Pavlik (PhD candidate) is currently examining 1) how wind conditions on migration influence the physiology of warblers on their arrival on the breeding grounds, 2) how conditions on migration interact with conditions on the breeding grounds to determine the timing of breeding and local productivity, 3) how mortality rates vary across the annual cycle, and 4) the importance of density-dependent and density-independent process for population dynamics.

3. Aerial Insectivores

The widespread population declines of this guild has led to the suggestion that declines may be due to changes in the abundance and/or availability of their insect prey. Long-term declines in insect abundance have been documented in Europe but similar data is lacking from North America. Challenge experiments, that were a common tool used to test foraging theory in the 1990's provide a potential alternative approach to evaluating changes in prey availability; if prey availability has decreased parents over the last three decades we would expect to see concomitant

changes in the ability of parents to meet the challenge of provisioning experimentally enlarged brood sizes. In 2017, Catherine Villeneuve, repeated a brood manipulation on tree swallows in Creston BC that was previously conducted in 1994/5. Preliminary analyses suggest that although the rate of nest visits has not changed over the last two decades, the amount of prey delivered per visit has decreased. Catherine is repeating this experiment in 2018 to strengthen conclusions that can be made about the utility of re-purposing brood manipulation experiments to evaluate changes in prey availability on the breeding grounds.

See also section V.B.3.b. Landscape-level determinants of breeding distribution, productivity and foraging in Barn Swallows and Tree Swallows.

See also section V.A.2. Eastern WhipPoorWill (*Threatened*, COSEWIC).

D. Coastal Ecology

1. Coastal Studies of Seabirds

Coastal British Columbia supports large populations of many species of seabirds, for which Environment and Climate Change Canada has an important stewardship responsibility. The Triangle Island Seabird Research and Monitoring Station was established in 1994 as a centre for research devoted to understanding seabird ecology, aimed particularly at identifying and understanding environmental and demographic causes of population change so as to recommend appropriate conservation actions. The Anne Vallée Ecological Reserve on Triangle Island supports the largest and most diverse seabird colony in British Columbia, including the world's largest population of Cassin's Auklets, BC's largest populations of Tufted Puffins and Common Murres, and a large population of Rhinoceros Auklets, among others. As part of the Scott Island Group, Triangle Island is recognized as an Important Bird Area (IBA). Moreover, waters around the Scott Islands are being developed as a Marine Wildlife Area (MWA) under the Canada Wildlife Act, to protect critical habitat for the millions of seabirds that depend on these waters throughout the year.

Our ongoing investigations examine breeding propensity and chronology, reproductive performance, nestling diet and development, parental foraging and provisioning behaviour, among other topics. Of particular interest is the issue of how climate-induced fluctuations in the timing and availability of marine prey populations affect seabird reproduction and survival.

The 2017 season. Summer 2017 marked the 24th year of operation of the Centre for Wildlife Ecology's seabird research and monitoring program on Triangle Island. The camp was opened in late April in 2017 and the field crew consisted of **Étienne Boucher** (ECCC Volunteer, Delta) **Glenn Crossin** (Professor, Dalhousie University, Halifax), **Alice Domalik** (MSc Candidate, Simon Fraser University, Burnaby), **Ana Gonzalez** (University of Saskatchewan, Saskatoon), **Sarah Hudson** (ECCC, Delta – WRD), **Kevin Kardynal** (ECCC, Saskatoon – Wildlife Research Division), **Mark Maftai** (ECCC, Delta – WRD), and **Ken Wright** (ECCC, Delta – WRD), in addition to Hipfner. As in past years, the Triangle Island crew monitored breeding chronology, breeding success and diet in Cassin's Auklet *Ptychoramphus aleuticus*, Rhinoceros Auklet *Cerorhinca monocerata*, and Black Oystercatcher *Haematopus bachmani*. They also deployed satellite tags on Glaucous-winged Gulls *Larus glaucescens*.

But the main focus of the research effort in 2017 (including the work on Triangle) was Domalik's MSc project, co-supervised by Hipfner and **David Green** (Professor, Simon Fraser University, Burnaby). This project, which started in 2016, involves deploying GPS tags on breeding Cassin's and Rhinoceros auklets on major colonies in BC. In 2017, work on this project (and a final year of recovery of GLS tags deployed in earlier years) occurred on Triangle, Pine, and Lucy islands, and included members of the Triangle crew (Boucher, Hipfner) plus **Amos Chow** (ECCC, Delta – CWS), **Philina English** (ECCC Volunteer, Delta), **Andrew Huang** (ECCC, Delta – WRD), **Glen Keddle** (ECCC Contractor, Smithers), **Mason King** (PhD Candidate, Simon Fraser University, Burnaby), **Agathe Lebeau** (ECCC, Delta – CWS), and **Veronica Norbury** (ECCC, Delta – CWS).

Several research projects were carried out concurrently with the logger deployments in 2017. Hipfner and **Strahan Tucker** (DFO, Nanaimo - PBS), along with a host of DFO collaborators, completed the sixth year of a project investigating the consumption of salmon *Oncorhynchus* spp. by seabirds in BC waters. And Hipfner, Tucker and **Moira Galbraith** (DFO, Sidney - Institute of Ocean Sciences), along with collaborators in Washington State, completed the eighth year of a project investigating spatio-temporal variation in the diets of Pacific sand lance and Pacific herring, two forage fish of vital importance to seabirds in British Columbia. That project is also proving to be useful for monitoring variation in the ingestion of microplastics by forage fish.

2. Coastal Usage by Migratory Shorebirds

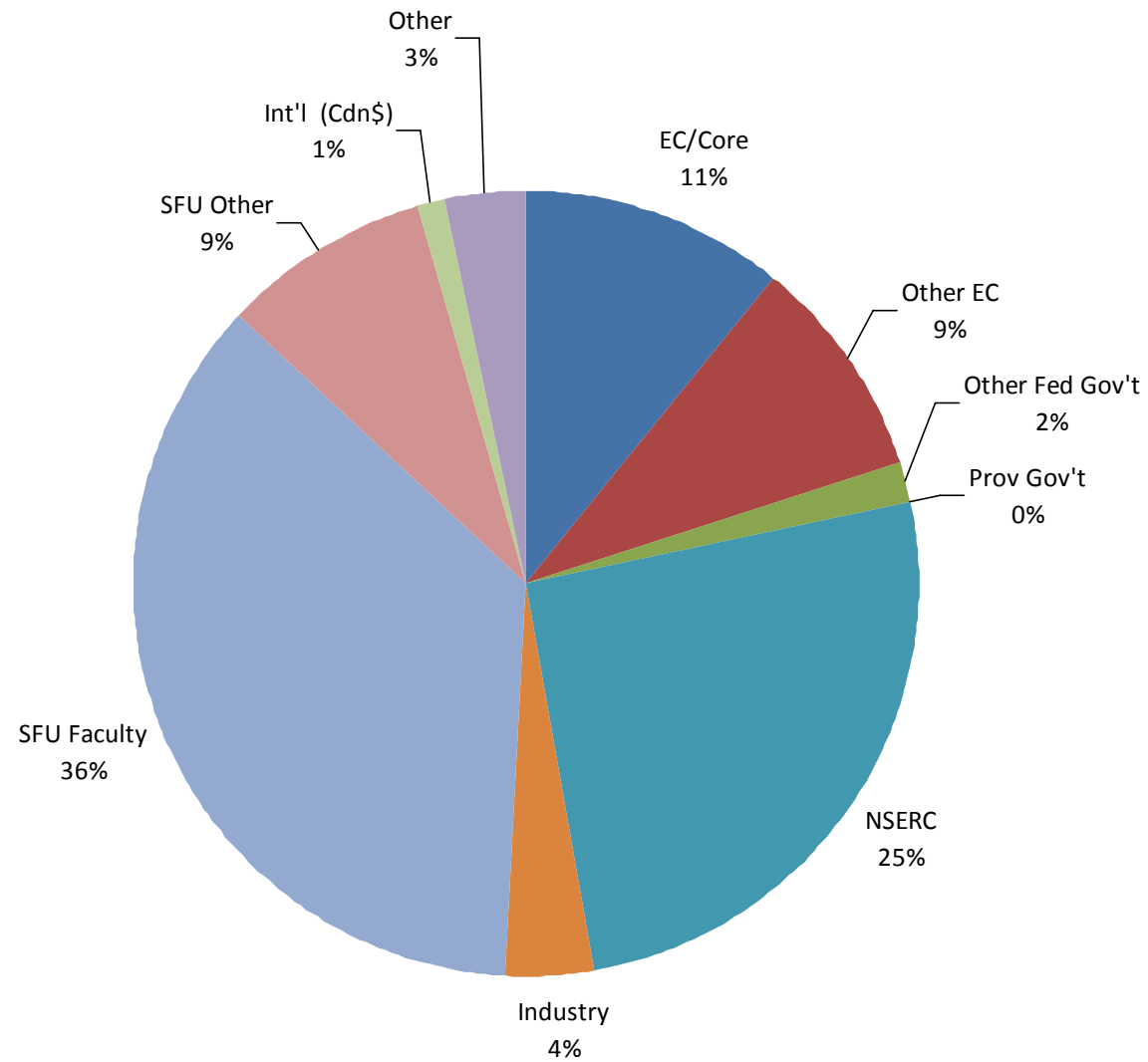
The majority of the world's three and a half to four million Western Sandpipers stop briefly to refuel in Boundary Bay or on Robert's Bank during their annual northward migration, providing a thrilling sight for local residents. Much of the species' population also stops over on southward migration, following a flight over the Gulf of Alaska. Because of this, the species is ranked in the highest priority class in the draft BC-Yukon region CWS Shorebird Management Plan. Each winter, the Fraser River Delta (FRD) hosts the most northerly wintering population of Pacific Dunlin. Local information on shorebird habitat usage, including western sandpipers and dunlin, contributes information useful for ECCC's environmental assessments as Port of Vancouver operations continue and expand.

David Hope, who obtained an MSc at the CWE, continued his PhD studies in 2016 studying stopover strategies of southward migrating western sandpipers. In collaboration with Bird Studies Canada, he organized volunteers to survey shorebird site and habitat utilization throughout the Salish Sea. This work puts the relative importance of migratory stopover sites into regional perspectives and addresses hypotheses examining the environmental causes responsible for changes in habitat usage.

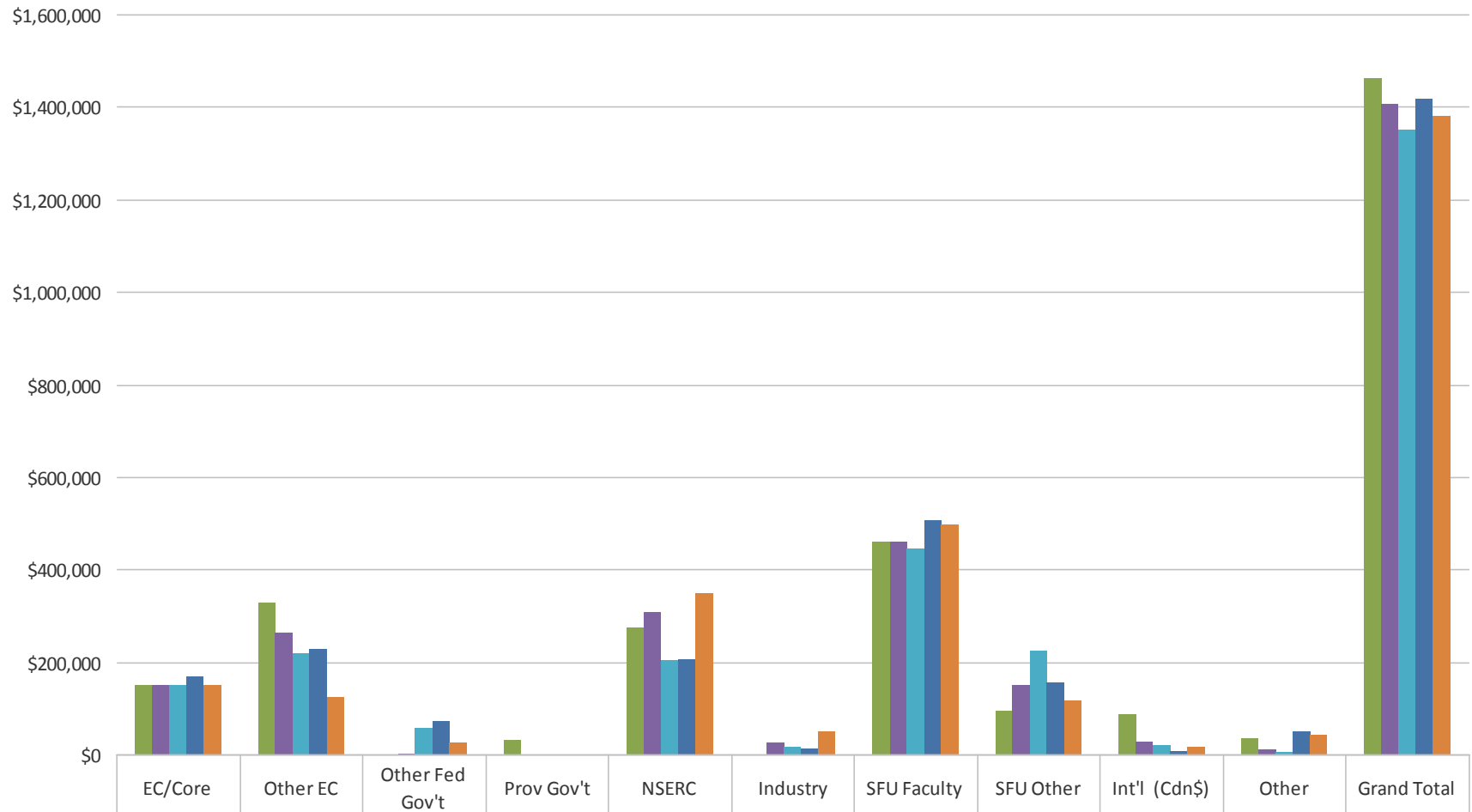
VI FUNDING

2017-2018 was the fifth year of a five year funding agreement between the Simon Fraser University (Centre for Wildlife Ecology) and Environment and Climate Change Canada (Science and Technology Division) that supplies \$150,000 per year for CWE research in priority coastal, riparian and grassland ecosystems in British Columbia. The 5 year chart compares revenue projections (formulated for this agreement) to actual revenue from Environment Canada, SFU and other industrial, provincial, federal and international sectors.

CWE Funding by Source 2017/18



CWE 5-year Funding by Source 2013/14- 2017/18



1 April 2017 - 31 March 2018

Scholarships, Fellowships, Grants for Students

PhD

NSERC	Michal Pavlik	NSERC IPS - NSERC contribution (Summer)	\$5,000
Industry	Michal Pavlik	NSERC IPS - Industry contribution (Summer)	\$2,000
SFU Fellowships etc	Michal Pavlik	Provost's Prize of Distinction	\$1,667
SFU Fellowships etc	David Hope	GF (Fall), TA (Spring), Travel Award (Spring)	\$14,033
SFU Fellowships etc	Jeff Yap	TA (Fall), GF (Spring), Travel Award (Spring)	\$15,203
SFU Fellowships etc	Marie Helene Burle	TA (Summer)	\$4,186
SFU Fellowships etc	Marinde Out	TA (Fall), Travel Award (Spring)	\$6,025
SFU Fellowships etc	Mason King	GF (Fall)	\$6,500
SFU Fellowships etc	Richard Johnson	GF (Fall), TA (Spring), Travel Award (Spring)	\$13,864
SFU Fellowships etc	Simon Valdez	TA (Spring)	\$5,525
SFU Fellowships etc	Florian Reurink	Graduate Dean's Entrance Scholarship (Spring)	\$7,000
International	Eveling Tavera	Neotropical Migratory Bird Conservation Act	\$3,990
International	Jeff Yap	Society Of Experimental Biology Travel Award (Summer, Spring)	\$710

M Sc

NSERC	Alice Domalik	NSERC PGS-M (Summer)	\$5,833
NSERC	Rachel Canham	NSERC PGS-M (Summer, Fall, Spring)	\$17,500
SFU Fellowships etc	Seth Bennett	TA (Summer, Fall, Spring)	\$16,327
SFU Fellowships etc	Rachel Canham	Travel Award (Spring)	\$500
SFU Fellowships etc	Kate Fremlin	GF (Fall), Travel Award (Fall)	\$7,000
SFU Fellowships etc	Catherine Villeneuve	GF (Fall), TA (Fall)	\$13,364
SFU Fellowships etc	Alice Domalik	GF (Spring)	\$6,500
Other	Alice Domalik	Anne Vallee Ecological Scholarship (Summer)	\$1,500
Other	Alice Domalik	Glen Geen Scholarship in Marine Biology (Fall)	\$1,100
Other	Kate Fremlin	SETAC Travel Awards x 2 (Fall)	\$931
Other	Kristen Walters	Hancock Foundation (Summer)	\$7,000
Other	Kristen Walters	Mitacs Internship	\$15,000

General Funding for CWE

EC/Core	EC	EC Annual Chair Funding (5/5 yrs)	\$150,000

SFU	SFU	SFU Contribution to Faculty Salaries (Ydenberg Williams Green)	\$500,148

Conference Funding

Other Funding

Other Federal	Lank	Canada Summer Jobs	\$1,955
International	Lank	Max Planck	\$12,000

Generated Research Funding

Species at Risk

Other Federal	Flower	Banting Postdoctoral Award (2/2 yrs)	\$23,280

Human Impact on Birds

Industry	Green DJ	BC Hydro/ Cooper Beauchesne and Associates Ltd.	\$27,300
Other	Elliott J	MITACS Elevate: Development and application of molecular tools to assess the acute and chronic impacts of petroleum hydrocarbons on birds (9 months /2 yrs - MITACS contribution)	\$18,750
Industry	Elliott J	MITACS Elevate: Development and application of molecular tools to assess the acute and chronic impacts of petroleum hydrocarbons on birds (9months /2 yrs - Northern Gateway Pipelines contribution)	\$22,500

Declining Avian Populations

Coast Ecology

Other EC	Hipfner MJ	Wildlife Research Division (A-base)	\$25,000
Other EC	Hipfner MJ	Canadian Wildlife Service (Protected Areas)	\$30,000
Other EC	Hipfner MJ	WRD (Ocean Protection Plan)	\$25,000
Other EC	Hipfner MJ	Climate Change Action Plan	\$20,000
Other EC	Hipfner MJ	STAGE	\$25,000

NSERC

NSERC	Green DJ	Overwintering ecology, migration strategies and demography of migratory birds (4/5 yrs)	\$27,000

NSERC	Lank D	Maintenance of ecological polymorphism by frequency-dependent selection (4/5 yrs)	\$27,000
NSERC	Ydenberg RC	NSERC Individual Research Grant - "Predation danger in the ecology of migration" (3/5 yrs)	\$32,000
NSERC	Williams TD	Physiological Adaptations for Breeding in Birds (6/6 yrs)	\$60,000
NSERC	Williams TD (co-applicant)	RTI: Advanced Facility for Avian Research	\$140,590
NSERC	Elliott J	Investigating sources, transport, accumulation and effects of persistent contaminants in urban environments using a top predator as indicator (2/5 yrs)	\$36,000
Grand Total			\$1,381,781
SFU In-Kind			\$120,000

VII. PUBLICATIONS

This list reflects those publications produced since our last report (publications that were “in press” or “submitted” for the last report are included and have been updated). We continue to publish actively. Three PhD students, 3 MSc students and one MET student supervised by CWE faculty successfully defended their theses. Most of our publications relate to the research carried out in the main CWE programs and most refer to work carried out in the Pacific Northwest. We are however interacting with scientists throughout Canada and beyond and some of our publications reflect this.

A. PAPERS IN REFEREED JOURNALS OR BOOKS

In press:

Hope, D.D., M.C. Drever, J.B. Buchanan, M.A. Bishop, G. Matz and M.J.F. Lemon. In press.

Divergent trends in migration timing of shorebirds along the Pacific Flyway. *Condor*.

Valdez-Juarez, S.O., A. Drake, K.J. Kardynal, K.A. Hobson, E.A. Krebs and D.J. Green. In press.

Use of natural and anthropogenic land cover by wintering yellow warblers: the influence of sex and breeding origin. *Condor*.

2018:

English, P.A., D.J. Green and J.J. Nocera. 2018. Stable isotopes from museum specimens may provide evidence of long-term change in the trophic ecology of a migratory aerial insectivore. *Frontiers Ecol. Evol.* 6: 14. doi: 10.3389/fevo.2018.00014.

Hepp, M., L. Ware, H. van Oort, S.M. Beauchesne, J.M. Cooper and D.J. Green. 2018. Post-fledging survival and local recruitment of a riparian songbird in habitat influenced by reservoir operations. *Avian Cons. Ecol.* 13: 12. Doi: 10.5751/ACE-01190-130112.

- Tricola, G.M., M.J.P. Simons, E. Atema, R.K. Boughton, J.L. Brown, D.C. Dearborn, G. Divoky, J. Eimes, C.E. Huntington, A.S. Kitaysky, F.A. Juola, D.B. Lank, H.P. Litwa, E.G.A. Mulder, I.C.T. Nisbet, K. Okanoya, R.J. Safran, S.J. Schoech, E.A. Schreiber, P.M. Thompson, S. Verhulst, N.T. Wheelwright, D.W. Winkler, R. Young, C.M. Vleck and M.F. Haussmann. 2018. Telomeres and maximum lifespan in birds. *Phil. Trans. Roy. Soc. B*. DOI: 10.1098/rstb.2016.0445.
- Weiser, E.L., S.C. Brown, R.B. Lanctot, H.R. Gates, K.F. Abraham, R.L. Bentzen, J. Béty, M.L. Boldenow, R.W. Brook, T.F. Donnelly, W.B. English, S.A. Flemming, S.E. Franks, H.G. Gilchrist, M.-A. Giroux, A. Johnson, S. Kendall, L.V. Kennedy, L. Koloski, E. Eunbi Kwon, J.-F. Lamarre, D.B. Lank, C.J. Latty, N. Lecomte, J.R. Liebezeit, L. McKinnon, E. Nol, J. Perz, J. Rausch, M. Robards, S.T. Saalfeld, N.R. Senner, P.A. Smith, M. Soloviev, D. Solovyeva, D.H. Ward, P.F. Woodard and B.K. Sandercock. 2018. Effects of environmental conditions on reproductive effort and nest success of Arctic breeding shorebirds. *Ibis* DOI: 10.1111/ibi.12571.
- Weiser, E.L., S.C. Brown, R.B. Lanctot, H.R. Gates, sixteen authors, D.B. Lank, fourteen authors and B.K. Sandercock. 2018. Life-history tradeoffs revealed by seasonal declines in reproductive traits of Arctic-breeding shorebirds. *J. Avian Biol.* 49 DOI: 10.1111/jav.01531.
- Weiser, E.L., R.B. Lanctot, S.C. Brown, H.R. Gates, R.L. Bentzen, J. Bety, M.L. Boldenow, W.B. English, S.E. Franks, L. Koloski, E. Kwon, J.-F. Lamarre, D.B. Lank, J.R. Liebezeit, L. McKinnon, E. Nol, J. Rausch, S.T. Saalfeld, N.R. Senner, D.H. Ward, P.F. Woodard and B.K. Sandercock. 2018. Environmental and ecological conditions at Arctic breeding sites have limited effects on true survival rates of adult shorebirds. *Auk* 135: 29-43. <https://doi.org/10.1642/AUK-17-107.1>.
- 2017:**
- Baird, P., D. Robinette and S.A. Hink. 2017. A remote marking device and newly developed permanent dyes for wildlife research. *Wildl. Soc. Bull.* 41: 785-795. DOI: 10.1002/wsb.832.
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**ANNUAL REPORT of the
CENTRE FOR WILDLIFE ECOLOGY
2018-2019**



Environment and
Climate Change Canada
Environnement et
Changement climatique Canada

**Department of Biological Sciences
Simon Fraser University**

<http://www.sfu.ca/biology/wildberg/NewCWEPPage/CWEnewTestHome.htm>

Dr. Ronald C. Ydenberg, Director

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I. HISTORY

Under the Migratory Birds Convention and Canada Wildlife Acts, the mandate of the Canadian Wildlife Service is to protect and conserve migratory bird populations. In the 21st century, this historical mandate is broadening to encompass other environmental concerns such as species at risk, biodiversity, sustainability and endangered habitats. To meet these broad and varied responsibilities, Environment and Climate Change Canada depends on sound science, and participates in cooperative ventures. In 1993, the Natural Sciences and Engineering Research Council of Canada, Simon Fraser University, and Environment Canada signed a ten year agreement to create the NSERC/CWS Chair in Wildlife Ecology at SFU. That agreement has expired, but The Centre for Wildlife Ecology (CWE) as described here continues work with ECCC and with other agencies, on a range of issues pertaining to wildlife and other environmental sciences.

II. MISSION STATEMENT

The mission of the Centre for Wildlife Ecology (CWE) is to foster high quality graduate training and research, conduct basic and applied research in wildlife ecology, and to provide knowledge and personnel that will help Environment and Climate Change Canada and other agencies meet the challenges of conservation in the 21st century. The central concept is to foster synergy between the mission-oriented research and management policies of Environment and Climate Change Canada (Canadian Wildlife Service, CWS, and Science and Technology, S&T) and the basic research agenda of the University. Information, ideas, expertise, resources and opportunity flow back and forth across this interface, giving government agencies access to a broad base of science capability that helps inform policy and decision making, while the university and its faculty and students benefit from enhanced opportunities for research and application of the ideas their disciplines generate.

III. PERSONNEL

A. Research Team

1. Faculty and Research Associates

<i>Name</i>	<i>Position</i>
Ron Ydenberg	Director, Professor
Tony Williams	Professor
David Green	Associate Director, Associate Professor
Dov Lank	University Research Associate / Adjunct Professor
Dan Esler	USGS Scientist / Adjunct Professor
Mark Hipfner	ECCC Research Scientist / Adjunct Professor
Doug Bertram	ECCC Research Scientist
Sean Boyd	ECCC Research Scientist / Adjunct Professor
Rob Butler	ECCC Research Scientist Emeritus/ Adjunct Professor
Bob Elner	ECCC Research Scientist Emeritus/Adjunct Professor
John Elliott	ECCC Research Scientist / Adjunct Professor
Rhonda Millikin	ECCC Head, Population Assessment/Adjunct Professor
Fred Cooke (retired)	Emeritus Chairholder

2. Research Group

<i>Postdoctoral Fellows</i>	<i>PhD (in progress)</i>	<i>MSc (in progress)</i>	<i>Staff</i>
Tom Flower	Richard Johnston	Rachel Canham	Kathryn Coukell, CWE Admin. Asst.
Tanya Brown	Mason King	Gwyn Case	Connie Smith, CWE Research Tech
	Emily McAuley	Jo Enns	
	Michal Pavlik	Tess Forstner	<i>Visitors</i>
<i>Undergrads</i>	Marinde Out	Sonya Pastran	Pat Baird
Ellery Hardy	Florian Reurink	Elizabeth Ruberg (MET)	Joachim Bertrands
	Eveling Tavera Fernandez	Catherine Villeneuve	Lina Giraldo Deck
	Simon Valdez	Kristen Walters	Jasmine Loveland
		Lena Ware	Enver Ortiz
			Stephanie Roilo
	<i>PhD(defended)</i>	<i>MSc (defended)</i>	
	David Hope	Seth Bennett	
	Jeff Yap	Alice Domalik	
		Kate Fremlin	

B. Steering Committee

<i>Name</i>	<i>Position</i>	<i>Affiliation</i>
Robert Elner	Emeritus Scientist	<i>ECCC</i>
David Green	CWE faculty (non-voting)	<i>SFU</i>
Mark Hipfner	Research Scientist	<i>ECCC</i>
Elsie Krebs	Research Manager, Western Canada	<i>ECCC</i>
Tony Williams	CWE faculty (non-voting)	<i>SFU</i>
Ron Ydenberg	CWE Director (non-voting)	<i>SFU</i>

IV. INTRODUCTION

The aim of this Annual Report is to give an overview of our activities, outline the progress on new and continuing projects, describe the personnel involved, and to give some indication of our scientific and community involvement. Previous Annual Reports are available from the CWE. Contact us via our website

<http://www.sfu.ca/biology/wildberg/NewCWEPage/CWEnewTestHome.htm>

or contact Ron Ydenberg at ydenberg@sfu.ca.

V. THE CWE IN ACTION

The accounts that follow give brief overviews of the major projects run by the CWE. More detail is available on our website (address above). Publications and theses are listed at the end of this report. The personnel also can be contacted via the website.

A. Species at Risk

1. Marbled Murrelet (Threatened, COSEWIC)

SFU's research on threatened Marbled Murrelets continues to address direct conservation and management issues for this listed species. This project was started by CWE chair emeritus Fred Cooke in 1994 and continued through the present by David Lank.

Lank took on MSc student Sonya Pastran to analyze Marbled Murrelet transect data gathered for the past 21 years by the Laskeek Bay Conservation Society, which has now received funding from ECCC under the Ocean Protection Plan. Pastran conducted a full season of fieldwork during the summer of 2018 prior to starting her MSc in Sept 2018. The project involves: creating a spatially-explicit database for seabird sightings over the full period, which is largely completed; assembling relevant environmental variable, both static and dynamic to compare with historical seabird distributions, and obtaining 2 years' data on local environmental variables to assess with respect data gathered in 2018 and 2019. The work also includes an experiment to determine whether seabirds avoid areas with coastal raptors. They appear to do so, and Pastran's poster describing the results of her 2018 experiments won a 'Best MSc Student Paper' award at the Pacific Seabird Group's meeting this year. Mark Drever of ECCC is on Pastran's committee. Pastran and Lank participated in several OPP planning sessions, and Pastran has contributed the recent Laskeek Bay data to the Emergency Response Database being assembled by ECCC staff.

Lank continued as a member of the Canadian Marbled Murrelet Recovery team, but this was minimally active during 2019. A technical paper arising from the development of the original Canadian Marbled Murrelet Recovery plan, co-authored by Lank, was published in the BC Journal of Ecosystem Management.

2. *Eastern WhipPoorWill* (Threatened, COSEWIC)

The Eastern WhipPoorWill was designated as a Threatened species by COSEWIC in 2009. Philina English addressed identified knowledge gaps for this species in her PhD thesis that was defended in April 2017. She demonstrated 1) that changes in the distribution of whippoorwill from the first and second Ontario Breeding Bird Atlas are not explained by increases in forest cover as forests re-grow on abandoned agricultural land (English et al. 2017a), 2) population declines over the last century are associated with changes in the nitrogen isotope signatures in winter grown and breeding ground tissues that reflect changes in their diet (English et al 2018a), and 3) moth abundance has a positive influence on daily chick survival rates (English et al. 2018b). In collaboration with Mike Cadman (CWS), she also used geolocators to determine the migration routes of whippoorwills breeding at three sites, (QUBS in the Frontenac arch, Torrance Barrens Dark Sky Reserve in the southern Muskoka, and Long Point on Lake Erie (English et al 2017b).

3. *Scripps's Murrelet* (Vulnerable, IUCN)

Santa Barbara Island in the Channel Islands, California, provides breeding habitat for 20% of the world's population of Scripps murrelets (global population = 2800 pairs). Scripps's murrelets on Santa Barbara may be depredated by barn owls, but barn owls also prey on deer mice that are known to be a major cause of egg failure. Sarah Thomsen explored the direct and indirect interactions between barn owls, deer mice and Scripps's murrelets, and evaluated management options for this vulnerable species in her PhD thesis that was defended in July 2017. This work has now been published in *Ecology* (Thomsen and Green 2017), *Proceedings of the Royal Society* (Thomsen et al 2018) and *Global Change Biology* (Thomsen and Green 2019).

4. *Northern Goshawk* (Threatened, COSEWIC)

The Northern Goshawk was designated as a Threatened species by COSEWIC in 2000. The Northern Goshawk is a forest raptor whose preference for breeding within late successional forest has placed it at risk from habitat loss and fragmentation, primarily due to timber harvest. Several knowledge gaps persist surrounding goshawk biology, particularly the amount, composition, and configuration of foraging habitat most beneficial to goshawk productivity. Gwyn Case (MSc student) initiated a research project that will be conducted in collaboration with FLNROD to quantify goshawk diet, examine how landscape-level forest structure relates to diet, and assess the role of diet and landscape-level forest structure on nest occupancy and reproductive success of goshawks. This project will fill substantial knowledge gaps related to this species at risk and inform habitat protection decisions in the province.

5. *Cassin's Auklet* (Special Concern, COSEWIC) - see Section V.D.1, Coastal Studies of Seabirds.

6. *Barn Swallow* (Threatened, COSEWIC) - see Section V.B.3.b., Landscape-level determinants of breeding distribution, productivity and foraging in Barn Swallows and Tree Swallows

B. Human Impacts on Birds

1. Contaminants and Toxicology

a. Developmental neurotoxicity of mercury in birds

We have completed this 5-year study. Cybele Heddle (MET student) graduated and is currently working as an Environmental Toxicologist, with SLR, Vancouver. Final papers from this project are submitted and in review.

b. Chronic toxicity of petroleum hydrocarbons and other contaminants in seabird sentinel species

This research focuses on investigating the toxicity of petroleum, specifically oil sands bitumen products, to birds on the Pacific north-west coast. We propose the development of novel approaches to assess toxicity from chronic exposure to petroleum hydrocarbons and other contaminants. Collaborators at National Wildlife Research Centre (NWRC), Ottawa have developed gene arrays of two wildlife indicator species, the Rhinoceros Auklet and Double-crested Cormorant for the purposes of assessing the effects of a range of environmental contaminants, primarily oil derived hydrocarbons, halogenated hydrocarbons, and heavy metals. These species have been selected by both ECCC Canadian Wildlife Service (CWS) and Wildlife and Landscape Science Directorate (WLS) managers as the bio-indicators of choice in relation to baseline measurements for the NGP (Northern Gateway Pipeline). The Rhinoceros Auklet (RHAU) is also one of our ECCC (Environment and Climate Change Canada) long term contaminant seabird monitoring species for the west coast. This work is funded under the Ocean Protection Plan and is a collaboration with Dr. John Elliott (ECCC).

c. Avian dilbit toxicity studies

An initiative to increase transport of an unconventional crude petroleum known as diluted bitumen (dilbit) from the Port of Vancouver will increase the risk of a major oil spill and chronic small-scale discharges. Crude petroleum is toxic to birds, yet no published scientific studies of the effects of dilbit on birds yet exist. This pilot research will establish methods for evaluating the toxicity of dilbit to birds and bird embryos, as well as establish the range of doses at which sub-lethal effects occur. Initially this projects will have two components including, i) an oral toxicity test in adult zebra finches, and ii) a chicken embryo toxicity test (i.e. using fertile, developing eggs). The tests will yield methods for future research and some data on physiological and gene expression endpoints for dilbit toxicity. Depending on the results of these initial experiments we intend to undertake more detailed experiments, for example, looking at effects of dilbit in females and in breeding zebra finches. This work is funded under the Ocean Protection Plan and is a collaboration with Dr. John Elliott (ECCC).

d. Biomagnification of legacy and emergent persistent organic pollutants in a food-web of an avian top predator, the Cooper's hawk

The CWE continues to collaborate with Dr John Elliott (ECCC, SFU Adjunct Professor) on studies examining the exposure and impact of persistent organic pollutants (POPs) on wildlife. Kate Fremlin, who is working on a Doctoral degree in the School of Resources and Environmental Management at SFU, will continue her work on this project by developing a bioaccumulation model that can be used to predict what new commercial chemicals will do in terrestrial food-webs. She will also have more wildlife samples analysed for perfluoroalkyl substances and cyclic

methysiloxanes to expand and improve the current data set from her MSc. Kate and colleagues recently submitted a manuscript on bioaccumulation and biomagnification of PBDEs to the journal *Chemosphere*.

2. Reservoirs and the impact of Water Use Decisions on Riparian Birds

Human activities have caused a dramatic loss in the amount of riparian habitat in North America and this habitat loss is linked to population declines of many riparian dependant songbirds. CWE, working in collaboration with BC Hydro and Cooper-Beauchesne and Associates, has examined how reservoir operations on the Columbia River between 2004-2017 impact the population dynamics of yellow warblers, a species identified by Partners in Flight as a focal species for riparian habitat. The final component of this project, an individual based model will examine how different reservoir water use decisions influence productivity on the breeding grounds.

3. Agricultural Effects

a. Breeding phenology and productivity of an invasive, agricultural specialist, the European starling

European starlings are an invasive species of considerable economic importance because of their agricultural and urban impact (as well as being the focal species for Environment Canada's terrestrial contaminant monitoring under the Chemical Management Plan). However, they are also agricultural specialists associated with less-intensive pasture (short mown or grazed fields), and are dependent on one main prey type (Tipulid larvae or leatherjackets – another introduced pest species) for successful reproduction. As such they could be a useful monitoring species for changes in agricultural land-use and intensification. Our long-term study of the ecological physiology of European starlings marked its 16th year at our Langley field site (140 nest boxes). Basic monitoring was conducted in 2018.

b. Landscape-level determinants of breeding distribution, productivity and foraging in Barn Swallows and Tree Swallows

This project – a collaboration with Dr. Nancy Mahony, ECCC - was completed in 2018. Chloe Boynton (MSc) is currently working as a Migratory Bird Management Biologist with Canadian Wildlife Service. One paper will be submitted shortly and two more are in preparation from this project.

C. Declining Avian Populations

1. Migratory Shorebirds

Concern has been raised about apparent population declines of many species of shorebirds over the past two decades. The CWE and its ECCC associates have consistently contributed novel research findings addressing potential causes of these apparent declines. We have cooperated particularly closely with ECCC's Mark Drever (Delta), Keith Hobson (Saskatoon), and with ECCC emeritus Bob Elner, as well as Bird Studies Canada local representatives.

a. Shorebird Breeding Biology

Current and former CWE members contributed to four 2018 publications arising from their participation in the Arctic Shorebird Demographic Network, a collaborative program that includes over a dozen sites in Alaska and arctic Canada utilizing common protocols, including contributions from ECCC staff members Grant Gilchrist, Jennie Rausch, and Paul Smith. These publications address effects of environmental conditions and seasonal trends on breeding success and adult survivorship, and the extent to which these data can provide information on population trends. This last paper, which is in large measure the culmination of this extensive work, was under development during the end of 2018 and a draft has been completed by April 2019.

b. Non-breeding biology

PhD student Richard Johnson, from Colombia, completed his Ph.D thesis entitled “The influence of predation danger on the distribution of nonbreeding shorebirds in a tropical estuary system”, in late winter 2019. During 2018, he published the first chapter of the thesis, assessing the relative importance of isolation, danger, and foraging locations as predictors of roost sites used by Whimbrels in the large tropical delta he studied on the Pacific coast of Columbia. In other chapters completed by the end of the year, Johnson concluded from analysis of 5 years of survey data that environmental predation danger overrides food abundance as a priority for most overwintering shorebirds in this tropical delta. Additional chapters highlight species differences in distributional patterns with respect to body size, foraging mode, and experimental measures of escape performance. Richard obtained a prestigious postdoctoral position in a new “Coastal Solutions Fellows Program”, which aims to pair early career shorebird biologists, coastal engineers, and others to create practical management plans for neotropical coastal areas. Lank participated in workshops in Panama early in 2018, and previously in Peru in 2017 at which this program was partially developed.

Eveling Tavera Fernandez, Ph.D student from Peru, obtained substantial new funding from the US Neotropical Migratory Bird program to continue her shorebird banding and resighting field seasons in Peru throughout 2018, including both activities in autumn 2017-spring 2018 and autumn 2018-spring 2019, and resighting ‘oversummering’ birds in between. She has collaborated with ECCC staff member Mark Drever to produce mark-recapture estimates of seasonal and annual survivorship of small shorebirds, based on her current datasets. She is involved with the generation of a Peruvian Shorebird Conservation plan, and is the chair of the Western Hemisphere Shorebird Group. The CWE hosted a 6-week visit by Eve’s field manager Enver Ortiz, during which time we completed a paper on shorebird ectoparasite prevalence in Peru.

c. Migration Biology

PhD student Dave Hope finished his PhD in December 2018, focused on factors affecting habitat use by migratory shorebirds, and how these factors affect the interpretation of shorebird counts at migration sites. An analysis of Atlantic Canada Shorebird Surveys showed that Semipalmated sandpipers steadily shifted their stopover site usage toward larger sites between 1974 and 2015). This work was done in cooperation with ECCC’s Paul Smith (Ottawa). Surveys of the northbound passage of Western sandpipers and Dunlins along the Pacific Flyway show an advance in migration timing at southern, but not northern sites (1985 – 2016), an analysis done with ECCC staff Mark Drever and others.

Hope developed a model of mortality-minimizing decisions made by southbound Western sandpipers moving through a landscape with large and small stopover sites, and used the model to simulate counts that would be observed under different scenarios of population change and habitat usage, each leaving distinct 'fingerprints' of outcomes. Simulated outcomes were compared to counts made over five years by citizen-scientists across the Salish Sea region, work coordinated in association with Bird Studies Canada staff, and the Migratory Shorebird Network headquartered at Point Blue Conservation Sciences. The results support the hypothesis that inter-annual variation in the passage timing of peregrine falcons strongly affect the distribution of sandpipers across small and large stopover sites. Other scenarios appeared less parsimonious.

Each of these approaches demonstrated that the behavioural response of shorebirds to landscape-level conditions affects counts strongly enough that the accuracy of estimated population trends can be poor. Caution should be exerted when using migratory counts to generate trends in populations.

Hope presented his findings at the Salish Sea Ecosystem Conference 2018 in Seattle, CRIMBI meetings in Bellingham, at the PWRC in Delta.

2. Neotropical Migrant Passerines

CWE initiated a long-term study on yellow warblers that migrate between western Canada and Mexico/Central America in 2004. This research conducted in collaboration with Dr. Elsie Krebs (ECCC) takes a whole life cycle approach and includes work on the breeding grounds in Inuvik, NT, and Revelstoke, BC, on migration and on the wintering grounds in Jalisco, Mexico. The 2017 field season in Revelstoke completed the field component of this project.

Simon Valdez (PhD candidate) is currently investigating the non-breeding portion of the yellow warbler life cycle; he will defend his PhD in the coming year. He has demonstrated that the breeding origins of female yellow warblers influences winter habitat use in Mexico (Valdez-Juarez et al. 2018), and 2) that winter habitat use influences the condition and winter survival of Yellow warblers in Jalisco, Mexico (Valdez-Suarez et al. 2019). Michal Pavlik (PhD candidate) is currently examining 1) how wind conditions on migration influence the physiology of warblers on their arrival on the breeding grounds, 2) how conditions on migration interact with conditions on the breeding grounds to determine the timing of breeding and local productivity, 3) how mortality rates vary across the annual cycle, and 4) the importance of density-dependent and density-independent process for population dynamics.

3. Aerial Insectivores

The widespread population declines of this guild has led to the suggestion that declines may be due to changes in the abundance and/or availability of their insect prey. Long-term declines in insect abundance have been documented in Europe but similar data is lacking from North America. Challenge experiments, that were a common tool used to test foraging theory in the 1990's provide a potential alternative approach to evaluating changes in prey availability; if prey availability has decreased parents over the last three decades we would expect to see concomitant changes in the ability of parents to meet the challenge of provisioning experimentally enlarged brood sizes. In 2017 and 2018, Catherine Villeneuve, repeated a brood manipulation on tree swallows in Creston BC that was previously conducted in 1994/5. She found that delivery rates to the nest were lower in 2018/19 than 1994/5 because load sizes at each delivery are reduced. Her work illustrates the potential for re-purposing behavioral studies on foraging behavior to

investigate long-term changes in insect abundance in the absence of long-term monitoring data. See also section V.B.3.b. Landscape-level determinants of breeding distribution, productivity and foraging in Barn Swallows and Tree Swallows.

See also section V.A.2. Eastern WhipPoorWill (*Threatened*, COSEWIC).

D. Coastal Ecology

1. Coastal Studies of Seabirds

Mark Hipfner (Environment and Climate Change Canada, Delta – Wildlife Research Division), the Scientific Director of the Triangle Island Seabird Research Station, and reports that summer 2018 marked the 25th year – a quarter century - of operation of the CWE's seabird research and monitoring program on Triangle Island. The 2018 field crew consisted of David Bradley (Bird Studies Canada), Amos Chow (ECCC, Delta – Canadian Wildlife Service), Nik Clyde (ECCC Delta - WRD), Alice Domalik (ECCC Delta – WRD, and MSc Candidate, CWE), Andrew Huang (ECCC, Delta – CWS), Kevin Kardynal (ECCC, Saskatoon – WRD), Mason King (PhD Candidate, CWE), Elsie Krebs (ECCC, Delta – WRD), Greg McLelland (ECCC, Delta – CWS), Megan Ross (ECCC, Delta – WRD), and Ken Wright (ECCC, Delta – WRD), in addition to Hipfner. As in past years, the Triangle crew monitored breeding chronology, breeding success and nestling diet in Cassin's Auklet *Ptychoramphus aleuticus*, Rhinoceros Auklet *Cerorhinca monocerata*, and Black Oystercatcher *Haemotopus bachmani*. The crew also took soil cores and collected vegetation and insect samples for stable isotope analysis for a project investigating the dynamic relationship between seabird populations and vegetation patterns on the island.

Research also continued on several other major Rhinoceros Auklet colonies in BC - in 2018, we visited Pine Island, Lucy Island, and (for the first time, at least for this purpose) Cleland Island. The primary objective of this program, which was initiated in 2006, is to study the effects of oceanographic variation on multiple trophic levels – the diets of the auklets and of their major fish prey, Pacific sand lance *Ammodytes personatus* and Pacific herring *Clupea pallasii*. We continue to collaborate on this research with researchers in Washington State, and with Fisheries and Oceans Canada in Nanaimo. The field crew for the BC portion of the work consisted of Isabelle Cellier (ECCC, Delta – CWS), Clyde, Domalik, Hipfner, Agathe Lebeau (ECCC, Delta – CWS), and Ross. While on the auklet colonies, we also deployed GPS tags on Rhinoceros Auklets for a study of at-sea distributions and habitat selection being led by Domalik, whose MSc is co-supervised by Hipfner and David Green (CWE, SFU); collected eggs and prey samples for a contaminants study being led by King, whose PhD is co-supervised by John Elliott (ECCC, Delta – Wildlife Toxicology Division) and Tony Williams (CWE, SFU); completed the seventh year of a project investigating the consumption of salmon *Oncorhynchus* spp. by seabirds in BC waters, in collaboration with Strahan Tucker (DFO, Nanaimo - PBS); and completed the tenth year of a project investigating the ingestion of microfibres/microplastics by forage fish, in collaboration with Moira Galbraith (DFO, Sidney - Institute of Ocean Sciences).

2. Coastal Ecology of Barrow's Goldeneye

Barrows goldeneye are a sea duck with a discrete western and eastern population. The majority of the larger western population winters along the Pacific, and breeds in the interior of British Columbia, Alberta and the Northwest Territories. Recent efforts, led primarily by ECCC, have focused on using satellite telemetry to determine linkages among breeding, molting and wintering

areas. These data have been used to describe the broad movements of Barrows Goldeneye throughout their annual cycle. However, the spatial scale and spatial/temporal resolution of this dataset can also be used to address research priorities of the federal Ocean Protection Plan and identified information needs of the Sea Duck Joint Venture. Tess Forstner (MSc candidate), in collaboration with Sean Boyd (ECCC) and Megan Willie (ECCC) is using the extensive satellite telemetry dataset to examine latitudinal variation in the timing of discrete stages of the annual cycle and assess the degree of migratory connectivity between wintering populations across the western range. She will also use the data to identify when and where wintering sea ducks would be sensitive to anthropogenic activities on the Pacific coasts.

3. Movement Ecology of Black Oystercatchers

CWE has initiated a new long-term study on the movement ecology and habitat use of the Black Oystercatcher, an indicator species for rocky intertidal habitat in the Pacific Northwest. This project is a collaboration involving federal agencies in BC (ECCC and Parks Canada) and Alaska (USGS and US National Parks Service) with assistance from non-governmental organisations in BC (Laskeek Bay Conservation Society and Rainforest Conservation Society). Fieldwork initiated in spring 2019 by Lena Ware (MSc candidate) will use detailed satellite telemetry data to define the movement and habitat use of black oystercatchers in relation the tidal and diurnal light cycle at different stages of the year. Her project will support the ECCC mandate, under the federal Ocean Protection Plan, to conduct research and monitoring in order to improve management of the coastal waters of the Pacific coast. Future work will assess the drivers of migration in Alaskan oystercatchers and assess how Alaskan migrants interact and shape the habitat selection of BC residents during the winter months.

4. Coastal Usage by Migratory Shorebirds

The majority of the world's three and a half to four million Western Sandpipers stop briefly to refuel in Boundary Bay or on Robert's Bank during their annual northward migration, providing a thrilling sight for local residents. Much of the species' population also stops over on southward migration, following a flight over the Gulf of Alaska. Because of this, the species is ranked in the highest priority class in the draft BC-Yukon region CWS Shorebird Management Plan. Each winter, the Fraser River Delta (FRD) hosts the most northerly wintering population of Pacific Dunlin. Local information on shorebird habitat usage, including western sandpipers and dunlin, contributes information useful for ECCC's environmental assessments as Port of Vancouver operations continue and expand.

MSc student Rachel Canham completed her thesis and defended early in 2019. Her work focused on biofilm production and grazing by migrant Western Sandpipers on Robert's Bank. Rachel measured biofilm concentration and grazing intensity on transects and concluded that found the total accumulation during tidal periods matched that removed by sandpipers during grazing visits. During the higher-intensity (10 – 100 fold, based on daily sandpiper counts) northward migration, biofilm concentration increased and grazing decreased with proximity to the shoreline. In contrast, during southward migration biofilm was uniformly high. A danger manipulation experiment supported a trade-off with biofilm concentration: grazing declined with danger, but less so where biofilm is higher. Together the results indicate that dynamic trophic interactions between danger, sandpipers and biofilm create spatial patterns in biofilm concentration.

Florian Reurink started his PhD project, following up on work done in collaboration with Ron Ydenberg during his MSc program at Wageningen University. His previous work used flight behavior of birds to make predictions about energy intake rate in birds. Shorebird food availabil-

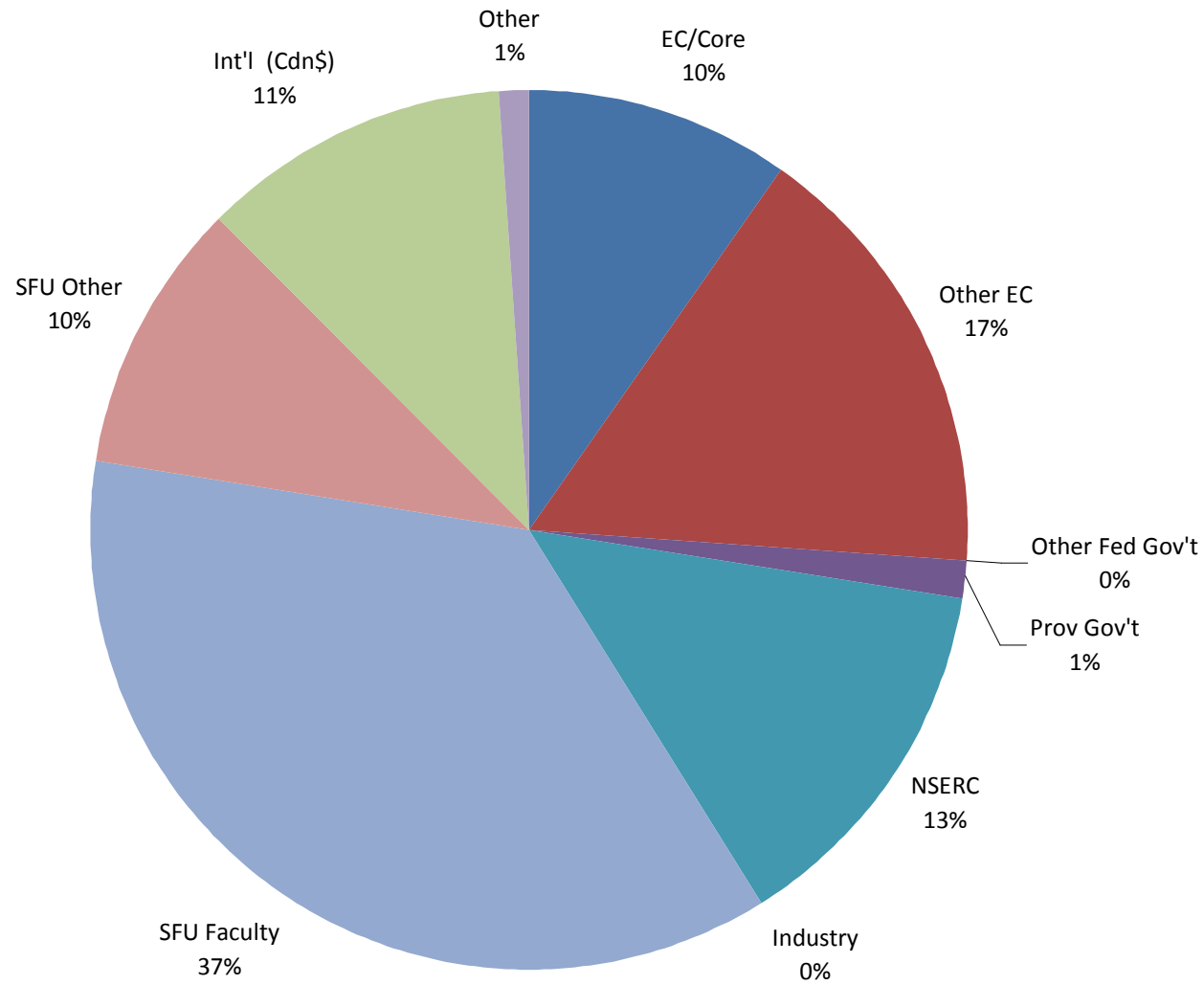
ity is time consuming and expensive to assess empirically, and these studies are testing a the potential for a behavioural measure to provide a simpler index of shorebird food availability. Behavioural ecological theory predicts that birds should adjust their foraging flight speed to the conditions in the habitat, where flight speed should increase with increased energy intake. The results from Florian's MSc work matched the predictions from the theory very well, and the Ph.D. further tests the applicability of this approach. In collaboration with ECCC's Rhonda Millikin and Ecotrack, Reurink has developed algorithms for quantifying flight speeds of dunlin and western sandpipers using a mobile radar system. Reurink and visiting MSc student Joachim Bertrand (Wageningen University, Netherlands), collected foraging flight speeds of dunlin over the course of the winter, testing the prediction that speeds would decrease as resources were depleted over the course of the winter, which was found to be the case. Reurink's research continues with planned collection of flight speeds of migrating western sandpipers at multiple sites in the Salish Sea, allowing him to look at inter- and intra-site differences.

Ydenberg continued to develop theory focusing on shorebird responses to changes in danger from increasing raptor populations over the past 30 years, and the effects these can have on shorebird populations and interpretations of census data. He and Lank are exploring contrasting directional effects on wing lengths of Western and Semipalmated sandpipers during the 1980s, following up on Lank's paper in 2016 on this subject.

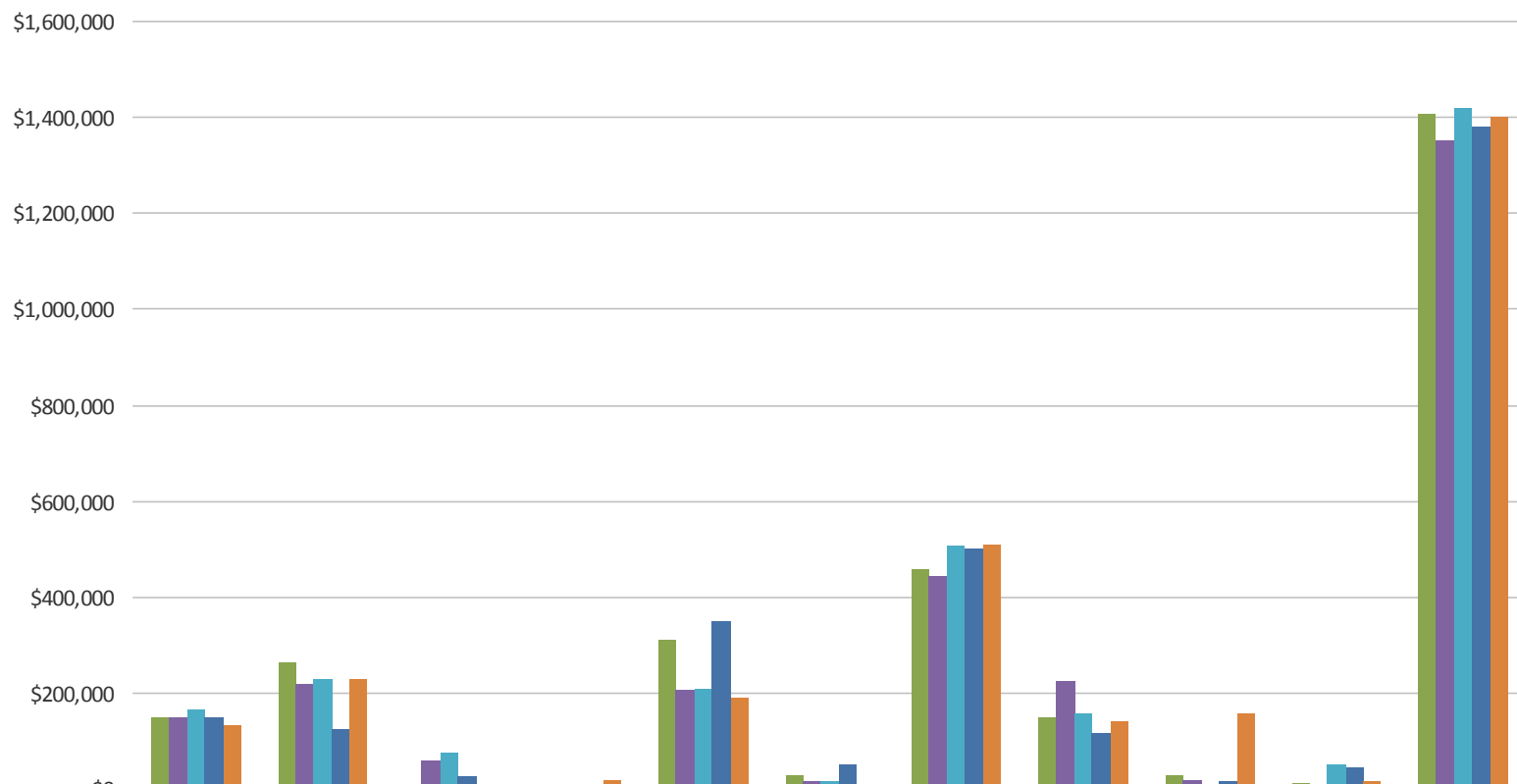
VI FUNDING

In 2018-2019 the contract between the Simon Fraser University (Centre for Wildlife Ecology) and Environment and Climate Change Canada (Science and Technology Division) was renewed for three years. This grant supplies \$150,000 per year for CWE research in priority coastal, riparian and grassland ecosystems in British Columbia. The 5 year chart compares revenue projections (formulated for this agreement) to actual revenue from Environment Canada, SFU and other industrial, provincial, federal and international sectors.

CWE Funding by Source 2018/19



CWE 5-year Funding by Source 2014/15- 2018/19



	EC/Core	Other EC	Other Fed Gov't	Prov Gov't	NSERC	Industry	SFU Faculty	SFU Other	Int'l (Cdn\$)	Other	Grand Total
2014/2015	\$150,000	\$264,773	\$3,680		\$310,111	\$27,879	\$458,732	\$150,812	\$30,673	\$11,800	\$1,408,460
2015/2016	\$150,000	\$220,442	\$59,143		\$206,000	\$16,850	\$446,337	\$225,199	\$19,591	\$7,097	\$1,350,659
2016/2017	\$168,500	\$228,250	\$73,975		\$208,667	\$16,300	\$506,394	\$156,750	\$9,805	\$51,001	\$1,419,641
2017/2018	\$150,000	\$125,000	\$25,235		\$350,923	\$51,800	\$500,148	\$117,694	\$16,700	\$44,281	\$1,381,781
2018/2019	\$135,000	\$230,333	\$1,520	\$19,541	\$188,667	\$-	\$510,633	\$139,218	\$158,478	\$16,293	\$1,399,681

1 April 2018 - 31 March 2019

Scholarships, Fellowships, Grants for Students

<u>Description</u>	<u>Name of person</u>	<u>Notes</u>	<u>Amounts</u>
<u>PhD</u>			
SFU Fellowships etc	David Hope	TA (Fall)	\$5,744
SFU Fellowships etc	Jeff Yap	TA (Summer)	\$5,744
SFU Fellowships etc	Eveling Tavera	TA (Fall)	\$7,136
SFU Fellowships etc	Mason King	GF (Fall)	\$6,500
SFU Fellowships etc	Richard Johnson	GF (Fall)	\$6,500
SFU Fellowships etc	Florian Reurink	Graduate Dean's Entrance Scholarship (Summer, Fall, Spring)	\$21,000
Other	David Hope	Salish Sea Ecosystem Conference	\$293
International	Eveling Tavera	NMBCA	\$143,030
International	Eveling Tavera	Amer Ornithol Soc Conference	\$629
International	Eveling Tavera	CONCYTEC (Peru) for AOS Conference	\$2,993
<u>M Sc</u>			
NSERC	Lena Ware	NSERC CGS-M (Fall, Spring)	\$11,667
SFU Fellowships etc	Seth Bennett	TA (Summer)	\$4,689
SFU Fellowships etc	Sonya Pastran	TA (Summer)	\$5,819
SFU Fellowships etc	Catherine Villeneuve	GF (Summer)	\$6,500
SFU Fellowships etc	Elizabeth Ruberg	GF (Fall)	\$6,500
SFU Fellowships etc	Catherine Villeneuve	TA (Fall)	\$6,051
SFU Fellowships etc	Alice Domalik	GF (Fall)	\$6,500
SFU Fellowships etc	Joanna Enns	TA (Fall)	\$2,526
SFU Fellowships etc	Tess Forstner	TA (Fall)	\$6,051
SFU Fellowships etc	Sonya Pastran	TA (Fall)	\$6,051
SFU Fellowships etc	Joachim Bertrands	TA (Fall)	\$4,689
SFU Fellowships etc	Rachel Canham	TA (Spring)	\$6,051
SFU Fellowships etc	Tess Forstner	GF (Spring)	\$6,500
SFU Fellowships etc	Sonya Pastran	Travel Award For Seabird Meeting	\$500
SFU Fellowships etc	Joachim Bertrands	Travel Award for Seabird Meeting	\$500
Other EC	Alice Domalik	EC contract (Summer)	\$7,000
Other EC	Tess Forstner	EC contract (Fall)	\$7,333
Other EC	Kate Fremlin	EC contract (Summer)	\$7,000
Other EC	Sonya Pastran	ECCC / Ocean Protection Plan	\$28,000
Other	Sonya Pastran	Society of Canadian Ornithologists	\$2,000
Other	Kristen Walters	Hancock Fdn (Summer)	\$7,000
Provincial	Gwyn Case	FLNROD (Fall, Spring)	\$19,541
<u>General Funding for CWE</u>			
EC/Core	EC	EC Annual Chair Funding (1/3 yrs)	\$135,000
SFU	SFU	SFU Contribution to Faculty Salaries (Ydenberg Williams Green)	\$510,633

Conference Funding**Other Funding**

Other Federal	Lank	Canada Summer Jobs	\$1,520
International	Lank	Max Plank Collaborative Agreement	\$11,825
Other	Ydenberg	Echotrack	\$7,000
SFU Other	Green	Ecological Restoration Supervision	\$1,000

Species at Risk

Green - FLNROD			\$0
Ydenberg - ECCC (Green)			\$0
Williams	Chair's support		\$16,667

Human Impact on Birds**Declining Avian Populations****Coast Ecology**

Other EC	Hipfner MJ	Wildlife Research Division (A-base)	\$30,000
Other EC	Hipfner MJ	Canadian Wildlife Service (Protected Areas)	\$25,000
Other EC	Hipfner MJ	WRD (Ocean Protection Plan)	\$75,000
Other EC	Hipfner MJ	Climate Change Action Plan	\$25,000
Other EC	Hipfner MJ	STAGE	\$26,000

NSERC

NSERC	Green DJ	Overwintering ecology, migration strategies and demography of migratory birds (5/5 yrs)	\$27,000
NSERC	Lank D	Maintenance of ecological polymorphism by frequency-dependent selection (5/5 yrs)	\$27,000
NSERC	Ydenberg RC	NSERC Individual Research Grant - "Predation danger in the ecology of migration" (4/5 yrs)	\$32,000
NSERC	Williams TD	NSERC Individual Research Grant "Diet or exercise? How do birds cope with transitions in workload associated with parental care or fledging?"(1/5yrs)	\$55,000
NSERC	Elliott J	Investigating sources, transport, accumulation and effects of persistent contaminants in urban environments using a top predator as indicator (3/5 yrs)	\$36,000

Grand Total	\$1,399,681

SFU In-Kind	\$120,000

VII. PUBLICATIONS

This list reflects those publications produced since our last report (publications that were “in press” or “submitted” for the last report are included and have been updated). We continue to publish actively. Two PhD students and three MSc students supervised by CWE faculty successfully defended their theses. Most of our publications relate to the research carried out in the main CWE programs and most refer to work carried out in the Pacific Northwest. We are however interacting with scientists throughout Canada and beyond and some of our publications reflect this.

A. PAPERS IN REFEREED JOURNALS OR BOOKS

Books and Book Chapters

- Mathot, K.J., T. Piersma and R.W. Elner. 2018. Shorebirds as integrators and indicators of mudflat ecology. In: *Mudflat Ecology*, Beninger, P., eds., pp. 309-338. Cham: Springer.
- Williams, T.D. 2018. Overview (wild birds). In: *Encyclopedia of Reproduction*, Knobil, E. and J.D. Neill, eds.: Elsevier Press.
- Williams, T.D. 2018. Nutrition and reproduction, birds. In: *Encyclopedia of Reproduction*, Knobil, E. and J.D. Neill, eds.: Elsevier Press.

In press:

- Grishchenko, M., H.H.T. Prins, R.C. Ydenberg, M.E. Schaepman, W.F. de Boer and H.J. de Knegt. In press. Landuse change and the migration geography of Greater White-fronted geese in European Russia. *Ecosph.*
- Pakanen, V.-M., D. Blomqvist, T. Breiehagen, L.-Å. Flodin, O. Hildén, D.B. Lank, M. Larsson, T. Lislevand, K. Nuotio, H. Pehlak, A. Pauliny, A. Rönkä, N. Rönkä, D. Schamel, M. Soikkeli, R.L. Thomson, D. Tracy, P. Tomkovich, T.a. O. and K. Koivula. In press. Low frequencies of supernormal clutches in the Southern Dunlin and the Temminck's Stint. *Ardea*.
- Studholme, K.R., J.M. Hipfner, A.D. Domalik, S.J. Iverson and G.T. Crossin. In press. Year-round tracking reveals the existence of multiple migratory tactics in Cassin's Auklet, a sentinel North Pacific seabird. *Mar. Ecol. Prog. Ser.*
- Tavera, E.A., D. Minaya, E. Ortiz Lopez, O.J. Iannaccone and D.B. Lank. In press. Cleaner in the tropics? Chewing lice occurrence, host specificity and diversity in non-breeding shorebirds in Perú. *Wader Study*. i
- Vitousek, M.N., M.A. Johnson, C.J. Downs, E.T. Miller, L.B. Martin, C.D. Francis, J.W. Donald, M.J. Fuxjager, W. Goymann, M. Hau, J.F. Husak, B.K. Kircher, R. Knapp, L.A. Schoenle and T.D. Williams. In press. Macroevolutionary patterning in glucocorticoids suggests different selective pressures shape baseline and stress-induced levels. *Amer. Nat.*

2019:

- Bos, D., E. Wymenga, R.C. Ydenberg and E.E. van Loon. 2019. De muskusrat op zijn retour. *De Levende Natuur* 120: 51-55.
- Hipfner, J.M., D.F. Bertram and M.C. Drever. 2019. Limited consequences of infestation with a

blood-feeding ectoparasite for the nestlings of two North Pacific seabirds. *J. Avian Biol.* 50: 10.1111/jav.01927.

- Macfarland, L., N.A. Mahony, M. Harrison and D. Green. 2019. Habitat-mediated breeding performance of Lewis's Woodpeckers (*Melanerpes lewis*) in British Columbia. *PLoS One* 14: e0212929.
- O'Hara, P.D., S. Avery-Gomm, J. Wood, V. Bowes, L. Wilson, K.H. Morgan, W.S. Boyd, J.M. Hipfner, J.-P. Desforges, D.F. Bertram, C. Hannah and P.S. Ross. 2019. Seasonal variability in vulnerability for Cassin's auklets (*Ptychoramphus aleuticus*) exposed to microplastic pollution in the Canadian Pacific region. *Sci. Total Environ.* 649: 50-60.
- Serota, M.W. and T.D. Williams. 2019. Adjustment of total activity as a response to handicapping during parental care in European starlings (*Sturnus vulgaris*). *Anim. Beh.* 148: 19-27.
- Valdez-Juarez, S.O., E.A. Krebs, A.E. Drake and D.J. Green. 2019. Assessing the effect of seasonal agriculture on the condition and winter survival of a migratory songbird in Mexico. *Conserv. Sci. Pract.* 1: e19. <https://doi.org/10.1111/csp2.19>.
- Williams, T.D., A. Cornell, G. Gillespie, A. Hura and M.W. Serota. 2019. Effects of an introduced, novel prey on diet and reproduction in the diet-specialist European Starling (*Sturnus vulgaris*). *Can. J. Zool.* 97: 225-231.

2018:

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- Domalik, A.D., J.M. Hipfner, K.R. Studholme, G.T. Crossin and D.J. Green. 2018. At-sea distribution and fine-scale habitat use patterns of zooplanktivorous Cassin's auklets during the chick-rearing period. *Marine Biol.* 165: 177. <https://doi.org/10.1007/s00227-018-3434-8>.
- Ellison, A.M. and R. Ydenberg. 2018. Risk allocation: Acute and chronic predator exposure have contrasting effects on song sparrow (*Melospiza melodia*) singing behaviour. *Can. J. Zool.* DOI: 10.1139/cjz-2018-0147.
- Eng, M.L., V. Winter, J.E. Elliott, S.A. MacDougall-Shackleton and T.D. Williams. 2018. Embryonic exposure to environmentally relevant concentrations of a brominated flame retardant reduces the size of song-control nuclei in a songbird. *Develop. Neurobiol.* 78: 799-806.
- English, P.A., J.J. Nocera and D.J. Green. 2018. Nightjars may adjust breeding phenology to compensate for mismatches between moths and moonlight. *Ecol. Evol.* 8: 5515-5529. doi:10.1002/ece3.4077.
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- Francis, C.D., J. Donald, M.J. Fuxjager, L.Z. Garamszegi, W. Goymann, M. Hau, J.F. Husak, M.A. Johnson, B. Kircher, R. Knapp, L.B. Martin, E.T. Miller, L.A. Schoenle, M.N. Vitousek, T.D. Williams and C.J. Downs. 2018. Metabolic scaling of stress hormones in ver-

- tebrates animals. *Integrative and Comparative Biology* 58: 729-38.
- Gaglio, D., R.B. Sherley, T.R. Cook, P.G. Ryan and T. Flower. 2018. The costs of kleptoparasitism: a study of mixed-species seabird breeding colonies. *Behav. Ecol.* doi: 10.1093/beheco/ary050.
- Garamszegi, L.Z., J. Donald, C.D. Francis, M.J. Fuxjager, W. Goymann, M. Hau, J.F. Husak, M.A. Johnson, B. Kircher, R. Knapp, L.B. Martin, E.T. Miller, L.A. Schoenle, M.N. Vitousek and T.D. Williams. 2018. Species-specific means and within-species variance in glucocorticoid hormones and speciation rates in birds. *Integrative and Comparative Biology* 58: 763-776.
- Hennin, H.L., C.J. Dey, J. Bêty, H.G. Gilchrist, O. Legagneux, T.D. Williams and O.P. Love. 2018. Higher rates of prebreeding condition gain positively impacts clutch size: A mechanistic test of the condition-dependent individual optimization model. *Funct. Ecol.* 32: 2019-2028.
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- Hipfner, J.M., E.K. Lok, C. Jardine, K.R. Studholme, A.C. Lebeau, K.G. Wright, S.A. Trefry, M.C. Drever and G. Jones. 2018. Beach-cast debris surveys on Triangle Island, British Columbia, Canada indicate the timing of arrival of 2011 Tohoku tsunami debris in North America. *Mar. Pollut. Bull.* 136: 407-413.
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- Kwon, E., W.B. English, E.L. Weiser, S.E. Franks, D.J. Hodkinson, D.B. Lank and B.K. Sandercock. 2018. Delayed egg-laying and shortened incubation duration of Arctic-breeding shorebirds coincide with climate cooling. *Ecol. Evol.* 8: 1339-1351. Doi: 10.1002/ece3.3733.
- Martin, L.B., M.N. Vitousek, J.W. Donald, T. Flock, M.J. Fuxjager, W. Goymann, M. Hau, J.F. Husak, M.A. Johnson, B. Kircher, R. Knapp, E.T. Miller, L.A. Schoenle, T.D. Williams and C.D. Francis. 2018. IUCN conservation status does not predict glucocorticoid concentrations in reptiles and birds. *Integrative and Comparative Biology* 58: 800-813.
- Morran, S.A.M., J.E. Elliott, J.W. Young, M.L. Eng, N. Basu and T.D. Williams. 2018. Ecologically-relevant exposure to methylmercury during early development does not affect adult phenotype in zebra finches (*Taeniopygia guttata*). *Ecotoxicol.* 27: 259-266.
- Nelson-Flower, M.J., T.P. Flower and A.R. Ridley. 2018. Sex differences in the drivers of reproductive skew in a cooperative breeder. *Molec. Ecol.* 27: 2435-2446. <https://doi.org/10.1111/mec.14587>.

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- Studholme, K.R., J.M. Hipfner, L.M. Romero, B.M. Gormally, S.J. Iverson and G.T. Crossin. 2018. Egg size is independent of variation in pre-breeding feather corticosterone in Cassin's Auklets during favorable oceanographic conditions. *Gen. Comp. Endocrinol.* 268: 64-70. <https://doi.org/10.1016/j.ygcen.2018.07.019>.
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- Williams, T.D. 2018. Physiology, activity and costs of parental care in birds [Invited commentary]. *J. Exp. Biol.* 221: doi:10.1242/jeb.169433.
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Reports

- Bertram, D.F., C.L.K. Robinson, M. Hennekes, M. Galbraith, N. Dangerfield, S. Gauthier and K. Woo. 2017. Plastic ingestion by Pacific Sand Lance (*Ammodytes personatus*) in the Salish Sea. In: *2016 Salish Sea Toxics Monitoring Review: A Selection of Research*, James, C.A., J. Lanksbury, D. Lester, S. O'Neill, T. Roberts, C. Sullivan and J. West, eds. Tacoma, WA: PSEMP Toxics Work Group.

Submitted:

- Hipfner, J.M., M. Galbraith, D.F. Bertram and D.J. Green. Submitted. Basin-scale oceanographic processes, zooplankton community structure, and the diet and reproduction of a sentinel North Pacific seabird over a 22-year period. Prog. Oceanogr.
- Hipfner, J.M., D. Shervill, A.D. Domalik, D.F. Bertram, M.J.F. Lemon, M.S. Rodway, C. Smith and S.A. Hudson (Trefry). Submitted. Longevity in the Rhinoceros Auklet. Marine Ornithology. Marine Ornithol.
- Ydenberg, R.C., B. Leyland, J.M. Hipfner and H. Prins. Submitted. Testing hypotheses about the relation between salmonberry (*Rubus spectabilis* L.) expansion and the decline in the number of seabirds breeding on Triangle Island, British Columbia. Marine Ornithology. Marine Ornithol.

B. THESES

- Bennett, S.G. 2018. Wintering and breeding distributions of Black Oystercatchers (*Haematopus bachmani*): long-term trends and the influence of climate. MSc, Simon Fraser University, Burnaby.
- Domalik, A.D. 2018. At-sea distribution and foraging ecology of two North Pacific seabirds revealed through GPS tracking. MSc, Simon Fraser University, Burnaby.
- Fremlin, K. 2018. Trophic magnification of legacy persistent organic pollutants and emergent contaminants within a terrestrial food-web of an avian apex predator, the Cooper's Hawk (*Accipiter cooperii*). MSc, Simon Fraser University, Burnaby.
- Hope, D.D. 2018. The role of adaptive behaviour in migratory counts of shorebirds. PhD, Simon Fraser University, Burnaby.
- Yap, K.N. 2018. Physiological basis of aerobic capacity and workload ability in birds. PhD, Simon Fraser University, Burnaby.

**ANNUAL REPORT of the
CENTRE FOR WILDLIFE ECOLOGY
2019-2020**



Environment and
Climate Change Canada
Environnement et
Changement climatique Canada

**Department of Biological Sciences
Simon Fraser University**

<http://www.sfu.ca/biology/wildberg/NewCWEPAGE/CWEnewTestHome.htm>

Dr. Ronald C. Ydenberg, Director

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I. HISTORY

Under the Migratory Birds Convention and Canada Wildlife Acts, the mandate of the Canadian Wildlife Service is to protect and conserve migratory bird populations. In the 21st century, this historical mandate is broadening to encompass other environmental concerns such as species at risk, biodiversity, sustainability and endangered habitats. To meet these broad and varied responsibilities, Environment and Climate Change Canada depends on sound science, and participates in cooperative ventures. In 1993, the Natural Sciences and Engineering Research Council of Canada, Simon Fraser University, and Environment Canada signed a ten year agreement to create the NSERC/CWS Chair in Wildlife Ecology at SFU. That agreement has expired, but The Centre for Wildlife Ecology (CWE) as described here continues work with ECCC and with other agencies, on a range of issues pertaining to wildlife and other environmental sciences.

II. MISSION STATEMENT

The mission of the Centre for Wildlife Ecology (CWE) is to foster high quality graduate training and research, conduct basic and applied research in wildlife ecology, and to provide knowledge and personnel that will help Environment and Climate Change Canada and other agencies meet the challenges of conservation in the 21st century. The central concept is to foster synergy between the mission-oriented research and management policies of Environment and Climate Change Canada (Canadian Wildlife Service, CWS, and Science and Technology, S&T) and the basic research agenda of the University. Information, ideas, expertise, resources and opportunity flow back and forth across this interface, giving government agencies access to a broad base of science capability that helps inform policy and decision making, while the university and its faculty and students benefit from enhanced opportunities for research and application of the ideas their disciplines generate.

III. PERSONNEL

A. Research Team

1. Faculty and Research Associates

<i>Name</i>	<i>Position</i>
Ron Ydenberg	Director, Professor
Tony Williams	Professor
David Green	Associate Director, Associate Professor
Dov Lank	University Research Associate / Adjunct Professor
Dan Esler	USGS Scientist / Adjunct Professor
Mark Hipfner	ECCC Research Scientist / Adjunct Professor
Doug Bertram	ECCC Research Scientist
Sean Boyd	ECCC Research Scientist / Adjunct Professor
Rob Butler	ECCC Research Scientist Emeritus/ Adjunct Professor
Bob Elner	ECCC Research Scientist Emeritus/Adjunct Professor
John Elliott	ECCC Research Scientist / Adjunct Professor
Rhonda Millikin	ECCC Head, Population Assessment/Adjunct Professor
Fred Cooke (retired)	Emeritus Chairholder

2. Research Group

<i>Postdoctoral Fellows</i>	<i>PhD (in progress)</i>	<i>MSc (in progress)</i>	<i>Staff</i>
	Josh Allen	Gwyn Case	Lesley Butler, CWE Admin. Asst.
	Kirk Hart	Jo Enns	Silven Read, CWE Admin Asst.
	Brett Hodinka	Tess Forstner	Connie Smith, CWE Research Tech
	Mason King	Catherine Lee-Zuck	
	Emily McAuley	Katie Leonard	
	Michal Pavlik	Sonya Pastran	
	Florian Reurink	Lena Ware	
<i>Undergrads</i>	<i>PhD(defended)</i>	<i>MSc (defended)</i>	<i>Visitors</i>
Emily McMann	Richard Johnston	Rachel Canham	Pat Baird
Evy Gobbens	Eveling Tavera Fernandez	Catherine Villeneuve	Joachim Bertrands
	Simon Valdez	Kristen Walters	Lina Giraldo Deck
		Elizabeth Ruberg (MET)	Jasmine Loveland

B. Steering Committee

<i>Name</i>	<i>Position</i>	<i>Affiliation</i>
Robert Elner	Emeritus Scientist	<i>ECCC</i>
David Green	CWE faculty (non-voting)	<i>SFU</i>
Mark Hipfner	Research Scientist	<i>ECCC</i>
Elsie Krebs	Research Manager, Western Canada	<i>ECCC</i>
Tony Williams	CWE faculty (non-voting)	<i>SFU</i>
Ron Ydenberg	CWE Director (non-voting)	<i>SFU</i>

IV. INTRODUCTION

The aim of this Annual Report is to give an overview of our activities, outline the progress on new and continuing projects, describe the personnel involved, and to give some indication of our scientific and community involvement. Previous Annual Reports are available from the CWE. Contact us via our website

<http://www.sfu.ca/biology/wildberg/NewCWEPage/CWEnewTestHome.htm>

or contact Ron Ydenberg at ydenberg@sfu.ca.

V. THE CWE IN ACTION

The accounts that follow give brief overviews of the major projects run by the CWE. More detail is available on our website (address above). Publications and theses are listed at the end of this report. The personnel also can be contacted via the website.

A. Species at Risk

1. Marbled Murrelet (Threatened, COSEWIC)

SFU's research on threatened Marbled Murrelets continues to address direct conservation and management issues for this listed species. This project was started by CWE chair emeritus Fred Cooke in 1994 and continued through the present by David Lank.

MSc student Sonya Pastran is analyzing the local distributions of Marbled Murrelets, using transect data gathered for the past 22 years by the Laskeek Bay Conservation Society. The work is funded largely by ECCC under the Ocean Protection Plan. Pastran conducted full seasons of fieldwork during the summers of 2018 and 2019 and has been writing up since then, planning to graduate by autumn 2020. The project involves: creating a spatially-explicit database for seabird sightings over the full period, which is largely completed; assembling relevant environmental variable, both static and dynamic to compare with historical seabird distributions, and obtaining 2 years' data on local environmental variables to assess with respect data gathered in 2018 and 2019. The work also includes an experiment to determine whether seabirds avoid areas with coastal raptors. They appear to do so, and Pastran's poster describing the results of her 2018 experiments won a 'Best MSc Student Paper' award at the Pacific Seabird Group's meeting in 2018. Mark Drever of ECCC is on Pastran's committee. Pastran and Lank participated in several OPP planning sessions, and Pastran has contributed the recent Laskeek Bay data to the Emergency Response Database being assembled by ECCC staff.

Lank committed providing ground survey data gathered during the 1990s to an effort to validate the use of lidar to evaluate forest murrelet nesting habitat suitability, lead by Louise Waterhouse, BC Ministry of Forests, Lands, and Natural Resource Operations, and UBC's Nicholas Coops.

Lank continued as a member of the Canadian Marbled Murrelet Recovery team, but this was minimally active during 2019.

2. *Northern Goshawk* (Threatened, COSEWIC)

The Northern Goshawk was designated as a Threatened species by COSEWIC in 2000. The Northern Goshawk is a forest raptor whose preference for breeding within late successional forest has placed it at risk from habitat loss and fragmentation, primarily due to timber harvest. Several knowledge gaps persist surrounding goshawk biology, particularly the amount, composition, and configuration of foraging habitat most beneficial to goshawk productivity. Gwyn Case (MSc student) initiated a research project with FLNORD in 2019 to quantify goshawk diet, examine how landscape-level forest structure relates to diet, and assess the role of diet and landscape-level forest structure on nest occupancy and reproductive success of goshawks. This project will fill substantial knowledge gaps related to this species at risk and inform habitat protection decisions in the province. The project led by Melanie Wilson (FLNORD, Surrey) was recently received \$235,000 of funding for 2020/21 through 2023/24 that will provide ongoing support for Gwyn Case and a future graduate student.

3. *Cassin's Auklet* (Special Concern, COSEWIC) - see Section V.D.1, Coastal Studies of Seabirds.

B. Human Impacts on Birds

1. Contaminants and Toxicology

a. Chronic toxicity of petroleum hydrocarbons and other contaminants in seabird sentinel species

This research focuses on investigating the toxicity of petroleum, specifically oil sands bitumen products, to birds on the Pacific north-west coast. We propose the development of novel approaches to assess toxicity from chronic exposure to petroleum hydrocarbons and other contaminants. Collaborators at National Wildlife Research Centre (NWRC), Ottawa have developed gene arrays of two wildlife indicator species, the Rhinoceros Auklet and Double-crested Cormorant for the purposes of assessing the effects of a range of environmental contaminants, primarily oil derived hydrocarbons, halogenated hydrocarbons, and heavy metals. These species have been selected by both ECCC Canadian Wildlife Service (CWS) and Wildlife and Landscape Science Directorate (WLS) managers as the bio-indicators of choice in relation to baseline measurements for the NGP (Northern Gateway Pipeline). The Rhinoceros Auklet (RHAU) is also one of our ECCC (Environment and Climate Change Canada) long term contaminant seabird monitoring species for the west coast. This work is being led by Mason King (PhD student), funded under the Ocean Protection Plan and is a collaboration with Dr. John Elliott (ECCC) and Dr. Vicki Marlatt (SFU).

b. Avian dilbit toxicity studies

An initiative to increase transport of an unconventional crude petroleum known as diluted bitumen (dilbit) from the Port of Vancouver will increase the risk of a major oil spill and chronic small-scale discharges. Crude petroleum is toxic to birds, yet no published scientific studies of the effects of dilbit on birds yet exist. We have three major components to this study: a) experimental work on effects of dilbit on physiology and health using adult zebra finches as a model system (work lead by Elizabeth Ruberg); b) experimental work on toxicity of dilbit to bird embryos via shell oiling in chicken and double-crested cormorant embryos (i.e. using fertile, developing eggs) lead by Mason King (PhD), and c) effects of external (feather oiling) and internal dilbit exposure on flight dynamics of free-living rhinoceros auklets (lead by Catherine Lee-Zuck, MSc). This work is funded under the Ocean Protection Plan and is a collaboration with Dr. John Elliott (ECCC) and Dr. Kyle Elliott (McGill).

2. Reservoirs and the impact of Water Use Decisions on Riparian Birds

Human activities have caused a dramatic loss in the amount of riparian habitat in North America and this habitat loss is linked to population declines of many riparian dependent songbirds. CWE, working in collaboration with BC Hydro and Cooper-Beauchesne and Associates, has examined how reservoir operations on the Columbia River between 2004-2017 impact the population dynamics of yellow warblers, a species identified by Partners in Flight as a focal species for riparian habitat. The final component of this project, an individual based model shows that managing reservoir operations by delaying when the reservoir fills by approximately 2 weeks would increase the productivity of yellow warblers (the average number of independent young produced) by 36%. This research and the code for the model will shortly be submitted for publication in the open-access journal PLoS ONE.

3. Agricultural Effects

a. Breeding phenology and productivity of an invasive, agricultural specialist, the European starling

European starlings are an invasive species of considerable economic importance because of their agricultural and urban impact (as well as being the focal species for Environment Canada's terrestrial contaminant monitoring under the Chemical Management Plan). However, they are also agricultural specialists associated with less-intensive pasture (short mown or grazed fields), and are dependent on one main prey type (Tipulid larvae or leatherjackets – another introduced pest species) for successful reproduction. As such they could be a useful monitoring species for changes in agricultural land-use and intensification. Our long-term study of the ecological physiology of European starlings marked its 17th year at our Langley field site (140 nest boxes). Basic monitoring was conducted in 2019.

C. Declining Avian Populations

1. Migratory Shorebirds

Concern has been raised about apparent population declines of many species of shorebirds over the past two decades. The CWE and its ECCC associates have consistently contributed novel research findings addressing potential causes of these apparent declines. We have cooperated particularly closely with ECCC's Mark Drever (Delta), Keith Hobson (Saskatoon), and with ECCC emeritus Bob Elner, as well as Bird Studies Canada local representatives.

a. Shorebird Breeding Biology

In 2019-2020, current and former CWE members contributed to two additional publications arising from their participation in the Arctic Shorebird Demographic Network, a collaborative program that included over a dozen sites in Alaska and arctic Canada utilizing common protocols, including contributions from ECCC staff members Grant Gilchrist, Jennie Rausch, and Paul Smith. These publications address effects of environmental conditions and seasonal trends on breeding success and adult survivorship. The final major paper to come out of this extensive cooperative project, which combines the data on fecundity and survivorship to generate models of population trend for 6 species of shorebirds nesting in the Canadian arctic has been submitted to the Condor. Kwon et al.'s (2019) paper quantified geographical variation in changes in timing between shorebird breeding and arctic food availability, 'phenological mismatch', which has become an issue under climate change.

b. Non-breeding biology

PhD student Richard Johnson, from Colombia, completed his PhD thesis entitled “The influence of predation danger on the distribution of nonbreeding shorebirds in a tropical estuary system”, in April 2019. During 2018, he published the first chapter of the thesis, assessing the relative importance of isolation, danger, and foraging locations as predictors of roost sites used by Whimbrels in the large tropical delta he studied on the Pacific coast of Columbia. In other chapters completed by the end of the year, Johnson concluded from analysis of 5 years of survey data that environmental predation danger overrides food abundance as a priority for most overwintering shorebirds in this tropical delta. Additional chapters highlight species differences in distributional patterns with respect to body size, foraging mode, and experimental measures of escape performance. Richard obtained a prestigious postdoctoral position in a new “Coastal Solutions Fellows Program”, which aims to pair early career shorebird biologists, coastal engineers, and others to create practical management plans for neotropical coastal areas. Lank participated in workshops in Panama early in 2018, and previously in Peru in 2017 at which this program was partially developed.

Eveling Tavera Fernandez, Ph.D student from Peru, defended her PhD thesis in March 2020, and is preparing chapters for publication, including one generating estimates of annual survivorship produced in collaboration with ECCC staff member Mark Drever (Delta). She obtained substantial funding from the US Neotropical Migratory Bird program to continue her shorebird banding and resighting field seasons in Peru throughout 2019-2020. She published a paper on shorebird exoparasites in Peru together with Lank and others. She is involved with the generation of a Peruvian Shorebird Conservation plan, and is the chair of the Western Hemisphere Shorebird Group.

c. Migration Biology

Former PhD student David Hope obtained a research biologist position with Environment Canada, and published two papers arising from his thesis. An analysis of Atlantic Canada Shorebird Surveys showed that semipalmated sandpipers steadily shifted their stopover site usage toward larger sites between 1974 and 2015 (Frontiers in Ecology and Evolution Jan 2020), done in association with ECCC’s Paul Smith (Ottawa) and Julie Paquet (Sackville). If not accounted for, this shift would affect the estimation of annual population numbers from Maritime census data. Hope also published a paper with Ydenberg considering the potential seasonal adjustment of migration speed.

Lank is a coauthor along with CWE PhD student Richard Johnston and former ECCC scientist Rob Butler on a paper submitted to ACE-EOC describing the formation and initial results of a hypothesis-driven hemispheric-wide network to monitor shorebird populations along the Pacific coast, with particular emphasis on Western sandpipers and Pacific dunlin.

2. Neotropical Migrant Passerines

CWE initiated a long-term study on yellow warblers that migrate between western Canada and Mexico/Central America in 2004. This research conducted in collaboration with Dr. Elsie Krebs (ECCC) takes a whole life cycle approach and includes work on the breeding grounds in Inuvik, NT, and Revelstoke, BC, on migration and on the wintering grounds in Jalisco, Mexico. The 2017 field season in Revelstoke completed the field component of this project. Simon Valdez investigated the non-breeding portion of the yellow warbler life cycle and defended his PhD in January 2020 (see Valdez-Juarez et al. 2018, 2019). Michal Pavlik (PhD candidate) is using the long-term dataset to 1) assess how conditions on migration interact with conditions on the breeding grounds to determine the timing of breeding and local productivity, 2) estimate true survival using a spatial-CJS model and 3) determine mortality rates across the annual cycle. The first chapter of his thesis demonstrates that female warblers

initiate the transition to a reproductive physiology while still on migration despite the energetic demands of this stage of the annual cycle.

3. *Aerial Insectivores*

The widespread population declines of this guild have led to the suggestion that declines may be due to changes in the abundance and/or availability of their insect prey. Long-term declines in insect abundance have been documented in Europe but similar data is lacking for North America. Challenge experiments, that were a common tool used to test foraging theory in the 1990's provide a potential alternative approach to evaluating changes in prey availability; if prey availability has decreased parents over the last three decades we would expect to see concomitant changes in the ability of parents to meet the challenge of provisioning experimentally enlarged brood sizes. In September 2019, Catherine Villeneuve defended her MSc that compared the response of Tree Swallow parents to brood size manipulation experiments conducted in 1994/5 and 2017/18. She found that delivery rates to the nest were lower in 2018/19 than 1994/5 because load sizes at each delivery are reduced, perhaps because of changes in the abundance and composition of the insect community.

D. Coastal Ecology

1. *Coastal Studies of Seabirds*

CWE Research Associate Dr. Mark Hipfner reports that summer 2019 marked the 26th year of operation of the Centre for Wildlife Ecology's seabird research and monitoring program on Triangle Island. The 2019 field crew consisted of Nik Clyde (ECCC Delta - WRD), Kim Dohms and Josh Green (both ECCC, Delta – Canadian Wildlife Service), Sarah Hudson (ECCC, Delta – WRD), Catherine Jardine (Bird Studies Canada, Delta), Kerrith MacKay (ECCC, Delta – WRD), Megan Ross (ECCC, Delta – WRD, now with CWS) and Ken Wright (ECCC, Delta – WRD), in addition to Hipfner. As in past years, the Triangle Island field crew monitored breeding chronology, breeding success and nestling diet in Cassin's Auklet *Ptychoramphus aleuticus*, Rhinoceros Auklet *Cerorhinca monocerata*, and Black Oystercatcher *Haemotopus bachmani*, and banded songbirds in the vicinity of the cabin. The crew also conducted a pilot project investigating the feasibility of using cameras to monitor oystercatcher nests, deployed audio recording units to index seabird nesting density and the presence/absence of bats, and deployed GPS tags on 10 Tufted Puffins, obtaining complete (24 h) tracks for six birds.

Research also continued on several other major Rhinoceros Auklet colonies in BC - in 2019, we visited Pine Island, Lucy Island, S'Gang Gwaay, and Cleland Island. The primary objective of this program, which was initiated in 2006, is to study the effects of oceanographic variation on multiple trophic levels – the diets fed to nestling auklets and the diets of their major fish prey, Pacific sand lance *Ammodytes personatus*, Pacific herring *Clupea pallasii*, and Pacific salmon *Oncorhynchus* spp. We continue to collaborate on this project with researchers in Washington State, and with Fisheries and Oceans Canada in Nanaimo. We also deployed GPS tags on 10 Rhinoceros Auklets on S'Gang Gwaay, and collected blood samples and feathers from adult auklets on all colonies visited in 2019 for baseline health assessments in collaboration with researchers with Washington Department of Fish and Wildlife and the University of California Davis. We also completed the seventh year of a project investigating the consumption of salmon *Oncorhynchus* spp. by seabirds in BC waters, in collaboration with Strahan Tucker (DFO, Nanaimo – Pacific Biological Station), and completed the tenth year of a project investigating the ingestion of microfibres/microplastics by forage fish, in collaboration with Moira Galbraith (DFO, Sidney - Institute of Ocean Sciences). The field crew for the BC portion of the work consisted of Clyde, Eric Gross (ECCC, Delta – CWS), Kirk Hart (new PhD student with the CWE and

Coast Mountain College, Prince Rupert), Hipfner, Andrew Huang and Agathe Lebeau (ECCC, Delta – CWS), Ross, and Kate Shapiro (ECCC, Delta – CWS).

2. *Coastal Ecology of Barrow's Goldeneye*

Barrow's goldeneye is a sea duck species with discrete western and eastern populations. The majority of the larger western population winters along the Pacific, and breeds in the interior of British Columbia, Alberta and the Northwest Territories. Recent efforts, led primarily by ECCC, have focused on using satellite telemetry to determine linkages among breeding, molting and wintering areas. These data have been used to describe the broad movements of Barrow's Goldeneye throughout their annual cycle. However, the spatial scale and spatial/temporal resolution of this dataset can also be used to address research priorities of the federal Ocean Protection Plan and identified information needs of the Sea Duck Joint Venture. Tess Forstner (MSc candidate), in collaboration with Sean Boyd (ECCC) and Megan Willie (ECCC) is using the extensive satellite telemetry dataset to examine latitudinal variation in the timing of discrete stages of the annual cycle and assess the degree of migratory connectivity between wintering populations across the western range. She will also use the data to identify when and where wintering sea ducks would be sensitive to anthropogenic activities on the Pacific coasts.

3. *Movement Ecology of Black Oystercatchers*

CWE has initiated a new long-term study on the movement ecology and habitat use of the Black Oystercatcher, an indicator species for rocky intertidal habitat in the Pacific Northwest (see <https://davidgreensfu.com/m3bloy/>). This project is a collaboration involving federal agencies in BC (ECCC and Parks Canada) and Alaska (USGS and US National Parks Service) with assistance from non-governmental organisations in BC (Laskeek Bay Conservation Society and Rainforest Education Society). Fieldwork was initiated in BC in Spring 2019 and Alaska in Summer 2019. Lena Ware (MSc candidate) is using the detailed data from 20 birds deployed with ARGOS satellite tags to define the movement and habitat use of black oystercatchers in relation the tidal and diurnal light cycle throughout the year. Her project will support the ECCC mandate, under the federal Ocean Protection Plan, to conduct research and monitoring in order to improve management of the coastal waters of the Pacific coast. Future work is planned to examine the drivers of variation in the migratory strategies of oystercatchers and assess how morphology and competitive interactions between migrants and residents shape the foraging ecology of oystercatchers in BC and Alaska.

4. *Coastal Usage by Migratory Shorebirds*

The majority of the world's three and a half to four million Western Sandpipers stop briefly to refuel in Boundary Bay or on Robert's Bank during their annual northward migration, providing a thrilling sight for local residents. Much of the species' population also stops over on southward migration, following a flight over the Gulf of Alaska. Because of this, the species is ranked in the highest priority class in the draft BC-Yukon region CWS Shorebird Management Plan. Each winter, the Fraser River Delta (FRD) hosts the most northerly wintering population of Pacific Dunlin. Local information on shorebird habitat usage, including western sandpipers and dunlin, contributes information useful for ECCC's environmental assessments as Port of Vancouver operations continue and expand.

MSc student Rachel Canham completed her thesis and defended early in April 2019. Her work focused on biofilm production and grazing by migrant Western Sandpipers on Robert's Bank. Rachel measured biofilm concentration and grazing intensity on transects and concluded that found the total accumulation during tidal periods matched that removed by sandpipers during grazing visits. During the higher-intensity (10 – 100 fold, based on daily sandpiper counts) northward migration, biofilm concentration increased and grazing decreased with proximity to the shoreline. In contrast, during southward

migration biofilm was uniformly high. A danger manipulation experiment supported a trade-off with biofilm concentration: grazing declined with danger, but less so where biofilm is higher. Together the results indicate that dynamic trophic interactions between danger, sandpipers and biofilm create spatial patterns in biofilm concentration.

Florian Reurink continued his PhD project, following up on work done in collaboration with Ron Ydenberg during his MSc program at Wageningen University. His previous work used flight behavior of birds to make predictions about energy intake rate in birds. Assessing shorebird food availability empirically is time consuming and expensive, and these studies are testing the potential for a behavioural measure to provide a simpler index of shorebird food availability. Behavioural ecological theory predicts that birds should adjust their foraging flight speed to the conditions in the habitat, where flight speed should increase with increased energy intake. The results from Florian's MSc work matched the predictions from the theory well, and the Ph.D. further tests the applicability of this approach. In collaboration with ECCC's Rhonda Millikin and Ecotrack, Reurink has developed algorithms for quantifying flight speeds of dunlin and western sandpipers using a mobile radar system. Reurink's research continued with collection of flight speeds of migrating western sandpipers at multiple sites in the Salish Sea, allowing him to look at inter- and intra-site differences.

Ydenberg continued to develop theory focusing on shorebird responses to changes in danger from increasing raptor populations over the past 30 years, and the effects these can have on shorebird populations and interpretations of census data. He and Lank are exploring contrasting directional effects on wing lengths of Western and Semipalmated sandpipers during the 1980s, following up on Lank's paper in 2016 on this subject. Ydenberg's working hypothesis is that differences in the relative importance of resident versus migratory raptors could explain the contrasting trends.

VI FUNDING

In 2019-2020 the contract between the Simon Fraser University (Centre for Wildlife Ecology) and Environment and Climate Change Canada (Science and Technology Division) was renewed for three years. This grant supplies \$135,000 per year for CWE research in priority coastal, riparian and grassland ecosystems in British Columbia.

1 April 2019 - 31 March 2020

Scholarships, Fellowships, Grants for Students

<u>Description</u>	<u>Name of person</u>	<u>Notes</u>	<u>Amounts</u>
<u>PhD</u>			
SFU Fellowships etc	Brett Hodinka	Graduate Dean's Entrance Scholarship (Fall, Spring)	\$14,000
SFU Fellowships etc	Mason King	GF (Fall)	\$6,500
SFU Fellowships etc	Florian Reurink	Graduate Dean's Entrance Scholarship (Summer, Fall)	\$14,000
SFU Fellowships etc	Simon Valdez	TA (Summer, Fall)	\$11,515

M Sc

NSERC SFU Fellowships etc	Lena Ware	NSERC CGS-M (Summer) GF (Fall)	\$6,000
SFU Fellowships etc	Gwyn Case Seth Bennett	TA (Summer)	\$6,500 \$4,689
SFU Fellowships etc	Sonya Pastran	TA (Summer)	\$5,819
SFU Fellowships etc	Catherine Villeneuve	GF (Summer)	\$6,500
SFU Fellowships etc	Elizabeth Ruberg	GF (Fall)	\$6,500
SFU Fellowships etc	Joanna Enns	TA (Fall)	\$4,967
SFU Fellowships etc	Joanna Enns	GF (Spring)	\$6,500
SFU Fellowships etc	Tess Forstner	GF (Fall)	\$6,500
SFU Fellowships etc	Kate Fremlin	TA (Spring)	\$5,851
SFU Fellowships etc	Kate Fremlin	GF (Fall)	\$6,500
SFU Fellowships etc	Sonya Pastran	GF (Fall)	\$6,500
SFU Fellowships etc	Joachim Bertrands	TA (Fall)	\$4,689
SFU Fellowships etc	Robert Kesic	TA (Spring)	\$4,967
SFU Fellowships etc	Tess Forstner	GF (Fall)	\$6,500
SFU Fellowships etc	Katie Leonard	GF (Fall)	\$6,500
SFU Fellowships etc		GF (Fall)	
	Lena Ware		\$6,500

General Funding for CWE

EC/Core	EC	EC Annual Chair Funding (1/3 yrs)	\$135,000
SFU	SFU	SFU Contribution to Faculty Salaries (Ydenberg Williams Green)	
			\$542,263

Conference Funding

SFU Fellowships etc	Joachim Bertrands	Travel Award for Seabird Meeting	\$500
SFU Fellowships etc	Kate Fremlin	TMRA (Fall)	\$500
SFU Fellowships etc	Kate Fremlin	TMRA (Spring)	\$500
SFU Fellowships etc	Katie Leonard	TMRA (Spring)	\$500
SFU Fellowships etc	Sonya Pastran	Travel Award For Seabird Meeting	\$500

Conference Funding	Gwyn Case	Raptor Research Foundation	\$1,000
Conference Funding	Joanna Enns	Conf. Budget	\$250
Conference Funding	Tess Forstner	Conf. Budget	\$250
Conference Funding	Mason King	SETAC North America	\$1,000
Conference Funding	Catherine Lee-Zuck		\$250
		Conf. Budget	
Conference Funding	Michal Pavlik	Conf. Budget	\$250
Conference Funding	Florian Reurink	Conf. Budget	\$250
Conference Funding	Eveling Tavera	Conf. Budget	\$250
Conference Funding	Catherine Villeneuve		\$250
		Conf. Budget	
Conference Funding	Kristne Walters	Conf. Budget	\$250
Conference Funding	Lena Ware	Conf. Budget	\$250

Other Funding

Prov. Government	Green	Ministry of Forests, Lands, Natural Resources Opr. & Rural Developm.	\$15,000
Government	Green	ECCC	\$12,000
International	Lank	Max Plank Collaborative Agreement	\$17,997
		ECCC - Seaduck Moment throughout the annual cycle: linking water and breeding habitat	\$22,855
Government	Ydenberg		
MITACS	Elliott	Elevate - A. Gonzales	\$55,000

Generated Research Funding

Government	Ydenberg	Miscellaneous CWS grants	\$3,476
SFU	Ydenberg	eBERG Director funding	\$9,489

NSERC

NSERC	Green DJ	Overwintering ecology, migration strategies and demography of migratory birds (5/5 yrs)	\$47,000
NSERC	Lank D	Maintenance of ecological polymorphism by frequency-dependent selection (5/5) yrs)	\$21,549
NSERC	Ydenberg RC	NSERC Individual Research Grant - "Predation danger in the ecology of migration" (4/5 yrs)	\$32,000

NSERC	Williams TD	NSERC Individual Research Grant "Diet or exercise? How do birds cope with transitions in workload associated with parental care or fledging?"(1/5yrs)	\$55,000

NSERC	Elliott J	Investigating sources, transport, accumulation and effects of persistent contaminants in urban environments using a top predator as indicator (3/5 yrs)	\$37,000

Grand Total	\$1,175,376

SFU In-Kind	\$120,000

VII. PUBLICATIONS

This list reflects those publications produced since our last report (publications that were “in press” or “submitted” for the last report are included and have been updated). We continue to publish actively. Three PhD students, three MSc and one MET students supervised by CWE faculty successfully defended their theses. Most of our publications relate to the research carried out in the main CWE programs and most refer to work carried out in the Pacific Northwest. We are however interacting with scientists throughout Canada and beyond and some of our publications reflect this.

A. PAPERS IN REFEREED JOURNALS OR BOOKS

Books and Book Chapters

Ydenberg, R. 2019. Baynes Sound as an important bird area. In: *Stewarding the Sound: The challenge of managing sensitive coastal ecosystems*, Bendell, L., P. Gallagher, S. McKeachie and L. Wood, eds., pp. 51-60. Boca Raton: CRC Press.

In press:

- Bos, D., E. van Loon and R. Ydenberg. In press. A large-scale experiment to evaluate control of invasive muskrats in The Netherlands. *Wildl. Soc. Bull.*
- Pakanen, V.-M., D. Blomqvist, T. Breiehagen, L.-Å. Flodin, O. Hildén, D.B. Lank, M. Larsson, T. Lislevand, K. Nuotio, H. Pehlak, A. Pauliny, A. Rönkä, N. Rönkä, D. Schamel, M. Soikkeli, R.L. Thomson, D. Tracy, P. Tomkovich, T.a. O. and K. Koivula. In press. Low frequencies of super-normal clutches in the Southern Dunlin and the Temminck's Stint. *Ardea*. in press by May 2019.
- Reiter, M., E. Palacios, D. Eusse, R. Johnston, P. Davidson, D. Bradley, R. Clay, K. Strum, J. Chu, B. Barbaree, C. Hickey, D. Lank and R. Butler. In press. A Hypothesis Driven Monitoring Framework for Non-breeding Shorebirds on the Pacific Coast of the Americas. *Avian Cons. Ecol.* accepted 13 Aug 2019.
- Studholme, K.R., J.M. Hipfner, A.D. Domalik, S.J. Iverson and G.T. Crossin. In press. Year-round tracking reveals the existence of multiple migratory tactics in Cassin's Auklet, a sentinel North Pacific seabird. *Mar. Ecol. Prog. Ser.* in press by May 2019.
- Ydenberg, R.C., E.E. van Loon, D. Bos and H. van Hemert. In press. Damage to dykes and levees in The Netherlands is extensive and increases with Muskrat (*Ondatra zibethicus*) density. *Lutra*. accepted by 18 June 2019.

2020

- Currier, H. A., K.M. Fremlin, J. Elliott, K. Drouillard, and T. Williams. 2020. Bioaccumulation and biomagnification of PBDEs in a terrestrial food chain at an urban landfill. *Chemosphere*. 238: 124577.
- Fremlin, K.M., J.E. Elliott, D.J. Green, K.G. Drouillard, T. Harner, A. Eng and F.A.P.C. Gobas. 2020. Trophic magnification of legacy persistent organic pollutants in an urban terrestrial food web. *Sci. Total Environ.*: <https://doi.org/10.1016/j.scitotenv.2020.136746>
- Hipfner JM, Galbraith M, Bertram DF, and Green DJ. 2020. Basin-scale oceanographic processes, zooplankton community structure, and diet and reproduction of a sentinel North Pacific seabird

over a 22-year period. *Progress in Oceanography* 182: 102290.

- Hope, D.D., D.B. Lank, P.A. Smith, J. Paquet and R.C. Ydenberg. 2020. Migrant semipalmated sandpipers (*Calidris pusilla*) have over four decades steadily shifted towards safer stopover locations. *Frontiers Ecol. Evol.* 8: 3. <https://doi.org/10.3389/fevo.2020.00003>.
- Maury, C., M.W. Serota and T.D. Williams. 2020. Plasticity in diurnal activity and temporal phenotype during parental care in European starlings, *Sturnus vulgaris*. *Anim. Beh.* 159: 37-45. <https://doi.org/10.1016/j.anbehav.2019.11.004>.

2019:

- Bertram, D.B. 2019. Oil spill settlement funds directed to seabird conservation. *Marine Policy* 108: <https://doi.org/10.1016/j.marpol.2019.103622>.
- Díaz A., F. Hernández, M. Ugarte, J. Salvador, E. A. Tavera, D. García, R. Kilby, T. Valqui. 2019. About international certification importance for Bird Banders in Peru. *Peruvian Biology Journal* 26(2): 283–288.
- Eng, M.L., N.K. Karouna-Renier, P.F.P. Henry, R.J. Letcher, S.L. Schultz, T.G. Bean, L.E. Peters, V.P. Palace, T.D. Williams, J.E. Elliott and K.J. Fernie. 2019. *In ovo* exposure to brominated flame retardants Part II: assessment of effects of TBBPA-BDBPE and BTBPE on hatching success, morphometrics and physiology in American kestrels. *Ecotoxicol. Environ. Safety* 179: 151-159.
- Eng, M.L., T.D. Williams, K.J. Fernie, N.K. Karouna Renier, P.F.P. Henry, R.J. Letcher and J.E. Elliott. 2019. *In ovo* exposure to brominated flame retardants Part I: assessment of effects of TBBPA-BDBPE on survival, morphometrics, and physiology in zebra finches. *Ecotoxicol. Environ. Safety* 179: 104-110.
- Grishchenko, M., H.H.T. Prins, R.C. Ydenberg, M.E. Schaepman, W.F. de Boer and H.J. de Knegt. 2019. Land use change and the migration geography of Greater White-fronted geese in European Russia. *Ecosph.* 10: e02754. [10.1002/ecs2.2754](https://doi.org/10.1002/ecs2.2754).
- Hipfner, J.M., D. Shervill, A.D. Domalik, D.F. Bertram, M.J.F. Lemon, M.S. Rodway, C. Smith and S.A. Hudson (Trefry). 2019. Longevity in the Rhinoceros Auklet *Cerorhinca monocerata*, and a comparison with other species of Alcidae. *Marine Ornithol.* 47: 225-227.
- Johnston-González, R. and E. Abril. 2019. Predation risk and resource availability explain roost locations of Whimbrel *Numenius phaeopus* in a tropical mangrove delta. *Ibis* 161: 839-853. [doi:10.1111/ibi.12678](https://doi.org/10.1111/ibi.12678).
- Kwon, E., E.L. Weiser, R.B. Lanctot, S.C. Brown, H.R. Gates, H.G. Gilchrist, S.J. Kendall, D.B. Lank, J.R. Liebezeit, L. Laura McKinnon, E. Erica Nol, D.C. Payer, J. Jennie Rausch, D.J. Rinella, S.T. Saalfeld, N.R. Senner, P.A. Smith, D. Ward, R.W. Wisseman and B.K. Sandercock. 2019. Geographic variation in the intensity of warming and phenological mismatch between Arctic shorebirds and invertebrates. *Ecol. Monogr.* 89: e01383. [10.1002/ecm.1383](https://doi.org/10.1002/ecm.1383).
- Martin, M., A. Drake, C.A. Rock and D.J. Green. 2019. Latitudinal gradients in some, but not all, avian life history traits extend into the Arctic. *Ibis* DOI: [10.1111/ibi.12789](https://doi.org/10.1111/ibi.12789).
- Tavera, E.A., D. Minaya, E. Ortiz Lopez, O.J. Iannaccone and D.B. Lank. 2019. Chewing lice richness and occurrence in non-breeding shorebirds in Paracas, Perú. *Wader Study* 126: [doi:10.18194/ws.00159](https://doi.org/10.18194/ws.00159).
- Thomsen, S.K. and D.J. Green. 2019. Predator-mediated effects of severe drought associated with poor reproductive success of a seabird in a cross-ecosystem cascade. *Global Change Biol.* 25: 1642-1652. DOI: [10.1111/gcb.14595](https://doi.org/10.1111/gcb.14595).
- Torres, R., E. Chin, R. Rampton and T.D. Williams. 2019. Are there synergistic or antagonistic effects of multiple maternally-derived egg components (antibodies and testosterone) on offspring phenotype? *J. Exp. Biol.* 222: jeb196956.
- Vitousek, M.N., M.A. Johnson, C.J. Downs, E.T. Miller, L.B. Martin, C.D. Francis, J.W. Donald, M.J.

- Fuxjager, W. Goymann, M. Hau, J.F. Husak, B.K. Kircher, R. Knapp, L.A. Schoenle and T.D. Williams. 2019. Macroevolutionary patterning in glucocorticoids suggests different selective pressures shape baseline and stress-induced levels. *Amer. Nat.* 193: 866-880.
- Yap, K.N., O.H.-I. Tsai and T.D. Williams. 2019. Haematological traits co-vary with migratory status, altitude and energy expenditure: a phylogenetic, comparative analysis. *Sci. Rep.* 9: 6351 (OA).
- Ydenberg, R.C. and D.D. Hope. 2019. Danger management and the seasonal adjustment of migratory speed by sandpipers. *J. Avian Biol.* 2019: e02202 doi: 10.1111/jav.02202.

Submitted:

- Hipfner, J.M., M. Galbraith, D.F. Bertram and D.J. Green. Submitted. Basin-scale oceanographic processes, zooplankton community structure, and the diet and reproduction of a sentinel North Pacific seabird over a 22-year period. *Prog. Oceanogr.*
- Hodinka, B.L. and Ashley, N.T. Submitted. Effect of sleep loss on executive function and plasma corticosterone levels in an arctic-breeding songbird the Lapland longspur (*Calcarius lapponicus*). *Hormones and Behavior*.
- McFarlane Tranquilla, L., J.L. Ryder, L. Blight and D.B. Bertram. Submitted. Consistent nightly colony attendance patterns for breeding Cassin's Auklet (*Ptychoramphus aleuticus*). *Marine Ornithol.*
- Reiter, M., Palacios, E., Eusse, D., Johnston, R., Davidson, P., Bradley, D., Clay, R., Strum, K., Chu, J., Barbaree, B., Hickey, C., Lank, D., Ydenberg, R., Drever, M., and Butler, R. Submitted. A monitoring framework for assessing threats to non-breeding shorebirds on the Pacific coast of the Americas. *Avian Conserv. Ecol.*
- Shaftel, R., D.J. Rinella, E. Kwon, S.C. Brown, H.R. Gates, S. Kendall, D.B. Lank, J.R. Liebezeit, D.C. Payer, J. Rausch, S.T. Saalfeld, B.K. Sandercock, P.A. Smith, D.H. Ward and R.B. Lanctot. Submitted. Predictors of invertebrate biomass and rate of advancement of invertebrate phenology across eight sites in the North American Arctic. *Polar Biology*.
- Weiser, E.L., 7 authors, W.B. English, S.A. Flemming, S.E. Franks, 8 authors, D.B. Lank, 17 authors, and B.K. Sandercock. Submitted. Annual adult survival drives trends in Arctic-breeding shorebirds but knowledge gaps in other vital rates remain. *Condor*.
- Ydenberg, R.C. and D.B. Lank. Submitted. Continental-scale falcon population recovery and contrasting, directional phenotypic changes in wing lengths of migratory sandpiper species. *Ecol. Letters*.

B. THESES

- Canham, R. 2019. Slime, safety and shorebirds: biofilm production and grazing by migrating Western sandpipers (*Calidris mauri*). MSc, Simon Fraser University, Burnaby.
- Johnston-González, R. 2019. The influence of predation danger on the distribution of non-breeding shorebirds in a tropical estuary system. PhD, Simon Fraser University, Burnaby.
- Ruberg, E. 2019. Effect of diluted bitumen on the survival, physiology, and behaviour of the Zebra finch (*Taeniopygia guttata*). MET, Simon Fraser University, Burnaby, BC.
- Tavera Fernandez, E. 2020. Survivorship and life history strategies in relation to migration distance in Western and Semipalmated sandpipers in Peru. PhD, Simon Fraser University, Burnaby, BC.
- Villeneuve, C. 2019. Repurposing historical data to investigate aerial insectivore declines. MSc, Simon Fraser University, Burnaby.
- Walters, K. 2019. Ideal free eagles: bald eagle distribution patterns and use of kleptoparasitism on salmon rivers. MSc, Simon Fraser University, Burnaby.
- Valdez-Juarez, S.O. 2020. Influence of agriculture over the condition and survival of wintering Yellow

Warblers (*Setophaga petechia*) and its implication for the Neotropical migratory community.
PhD, Simon Fraser University, Burnaby.

**ANNUAL REPORT of the
CENTRE FOR WILDLIFE ECOLOGY
2020-2021**



Environment and
Climate Change Canada
Environnement et
Changement climatique Canada

**Department of Biological Sciences
Simon Fraser University**

<http://www.sfu.ca/biology/wildberg/NewCWEPPage/CWEnewTestHome.htm>

Dr. Ronald C. Ydenberg, Director

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I. HISTORY

Under the Migratory Birds Convention and Canada Wildlife Acts, the mandate of the Canadian Wildlife Service is to protect and conserve migratory bird populations. In the 21st century, this historical mandate is broadening to encompass other environmental concerns such as species at risk, biodiversity, sustainability and endangered habitats. To meet these broad and varied responsibilities, Environment and Climate Change Canada depends on sound science, and participates in cooperative ventures. In 1993, the Natural Sciences and Engineering Research Council of Canada, Simon Fraser University, and Environment Canada signed a ten year agreement to create the NSERC/CWS Chair in Wildlife Ecology at SFU. That agreement has expired, but The Centre for Wildlife Ecology (CWE) as described here continues work with ECCC and with other agencies, on a range of issues pertaining to wildlife and other environmental sciences.

II. MISSION STATEMENT

The mission of the Centre for Wildlife Ecology (CWE) is to foster high quality graduate training and research, conduct basic and applied research in wildlife ecology, and to provide knowledge and personnel that will help Environment and Climate Change Canada and other agencies meet the challenges of conservation in the 21st century. The central concept is to foster synergy between the mission-oriented research and management policies of Environment and Climate Change Canada (Canadian Wildlife Service, CWS, and Science and Technology, S&T) and the basic research agenda of the University. Information, ideas, expertise, resources and opportunity flow back and forth across this interface, giving government agencies access to a broad base of science capability that helps inform policy and decision making, while the university and its faculty and students benefit from enhanced opportunities for research and application of the ideas their disciplines generate.

III. PERSONNEL

A. Research Team

1. Faculty and Research Associates

<i>Name</i>	<i>Position</i>
Ron Ydenberg	Director, Professor
Tony Williams	Professor
David Green	Associate Director, Associate Professor
Dov Lank	University Research Associate / Adjunct Professor
Dan Esler	USGS Scientist / Adjunct Professor
Mark Hipfner	ECCC Research Scientist / Adjunct Professor
Doug Bertram	ECCC Research Scientist
Sean Boyd	ECCC Research Scientist / Adjunct Professor
Rob Butler	ECCC Research Scientist Emeritus/ Adjunct Professor
Bob Elner	ECCC Research Scientist Emeritus/Adjunct Professor
John Elliott	ECCC Research Scientist / Adjunct Professor
Rhonda Millikin	ECCC Head, Population Assessment/Adjunct Professor
Fred Cooke (retired)	Emeritus Chairholder

2. Research Group

<i>Postdoctoral Fellows</i>	<i>PhD (in progress)</i>	<i>MSc (in progress)</i>	<i>Staff</i>
None (CoVid)	Josh Allen	Gwyn Case	Sadika Jurvic, CWE Admin. Asst.
	Kirk Hart	Jo Enns	Connie Smith, CWE Research Tech
	Brett Hodinka	Hannah Hall	
	Mason King	Catherine Lee-Zuck	
	Michal Pavlik	Katie Leonard	
	Florian Reurink	Cole Rankin	
		Hannah Roodenrijs	
		Lena Ware	
			<i>Visitors</i>
<i>Undergrads</i>	<i>PhD(defended)</i>	<i>MSc (defended)</i>	None (CoVid)
None (CoVid)	Emily McAuley	Tess Forstner	
		Robert Kesic (MET)	
		Sonya Pastran	

B. Steering Committee

<i>Name</i>	<i>Position</i>	<i>Affiliation</i>
Robert Elnor	Emeritus Scientist	<i>ECCC</i>
David Green	CWE faculty (non-voting)	<i>SFU</i>
Mark Hipfner	Research Scientist	<i>ECCC</i>
Elsie Krebs	Research Manager, Western Canada	<i>ECCC</i>
Tony Williams	CWE faculty (non-voting)	<i>SFU</i>
Ron Ydenberg	CWE Director (non-voting)	<i>SFU</i>

IV. INTRODUCTION

The aim of this Annual Report is to give an overview of our activities, outline the progress on new and continuing projects, describe the personnel involved, and to give some indication of our scientific and community involvement. Previous Annual Reports are available from the CWE. Contact us via our website

<http://www.sfu.ca/biology/wildberg/NewCWEPage/CWEnewTestHome.htm>

or contact Ron Ydenberg at ydenberg@sfu.ca.

V. THE CWE IN ACTION

The accounts that follow give brief overviews of the major projects run by the CWE. More detail is available on our website (address above). Publications and theses are listed at the end of this report. The personnel also can be contacted via the website.

A. Species at Risk

1. Marbled Murrelet (Threatened, COSEWIC)

SFU's research on threatened Marbled Murrelets continues to address direct conservation and management issues for this listed species. This project was started by CWE chair emeritus Fred Cooke in 1994 and continued through the present by David Lank.

MSc student Sonya Pastran completed her analysis of the local distributions of Marbled Murrelets, using transect data gathered for the past 22 years by the Laskeek Bay Conservation Society. Pastran conducted full seasons of fieldwork during the summers of 2018 and 2019, funded largely by ECCC through the Ocean Protection Plan. Sonya completed her MSc and graduated in October 2020. Her major findings on marine habitat usage are presented in a paper accepted by Ornithological Applications. Mark Drever of ECCC was on Pastran's committee and is a co-author on this paper. Sonya's MSc research also included an experiment to determine whether seabirds avoid areas with coastal raptors. They appear to do so, and a second paper from her MSc is in progress, with Ydenberg as a collaborator.

Sonya is currently working with ECCC's Doug Bertram, analyzing VHF radiotracking data gathered during the late 1990s by the CWE in Desolation and Clayoquot Sounds. Lank provided archival data to ECCC for these analyses.

Lank provided ground survey data gathered during the 1990s to an effort to validate the use of lidar to evaluate forest murrelet nesting habitat suitability, lead by Louise Waterhouse, BC Ministry of Forests, Lands, and Natural Resource Operations, and UBC's Nicholas Coops

Lank continued as a member of the Canadian Marbled Murrelet Recovery team, but this was minimally active during 2020–2021.

2. *Northern Goshawk* (Threatened, COSEWIC)

The Northern Goshawk (*Accipiter gentilis laingi*) was designated as a Threatened subspecies by COSEWIC in 2000. The Northern Goshawk *laingi* subspecies is a forest raptor whose preference for breeding within late successional forest has placed it at risk from habitat loss and fragmentation, primarily due to timber harvest. Management actions are hampered by knowledge gaps surrounding the breeding season diet and foraging ecology of goshawks in coastal British Columbia. Gwyn Case (MSc student) initiated a research project to quantify goshawk diet and investigate potential links between dietary variation and goshawk reproductive success in 2019 and will defend her thesis in summer 2021. She found that although goshawks consumed 33 different prey species *Tamiasciurus* squirrels made up the majority of their diet. Diet composition differed slightly between the coastal and transition zones but did not influence productivity. Gwyn also conducted a pilot study of goshawk breeding season movement using GPS-UHF transmitters that will be extended into 2023/24 with funding provided by the Habitat Conservation Trust Fund. This project led by Melanie Wilson (FLNRORD, Surrey) will fill substantial knowledge gaps related to this species at risk and inform habitat protection decisions in the Province.

3. *Cassin's Auklet* (Special Concern, COSEWIC) - see Section V.D.1, Coastal Studies of Seabirds.

B. Human Impacts on Birds

1. *Contaminants and Toxicology*

a. Chronic toxicity of petroleum hydrocarbons and other contaminants in seabird sentinel species

This research focuses on investigating the toxicity of petroleum, specifically oil sands bitumen products, to birds on the Pacific north-west coast. We propose the development of novel approaches to assess toxicity from chronic exposure to petroleum hydrocarbons and other contaminants. Collaborators at National Wildlife Research Centre (NWRC), Ottawa have developed gene arrays of two wildlife indicator species, the Rhinoceros Auklet and Double-crested Cormorant for the purposes of assessing the effects of a range of environmental contaminants, primarily oil derived hydrocarbons, halogenated hydrocarbons, and heavy metals. These species have been selected by both ECCC Canadian Wildlife Service (CWS) and Wildlife and Landscape Science Directorate (WLS) managers as the bio-indicators of choice in relation to baseline measurements for the NGP (Northern Gateway Pipeline). The Rhinoceros Auklet (RHAU) is also one of our ECCC (Environment and Climate Change Canada) long term contaminant seabird monitoring species for the west coast. This work is being led by Mason King (PhD student), funded under the Ocean Protection Plan and is a collaboration with Dr. John Elliott (ECCC) and Dr. Vicki Marlatt (SFU).

b. Avian dilbit toxicity studies

An initiative to increase transport of an unconventional crude petroleum known as diluted bitumen (dilbit) from the Port of Vancouver will increase the risk of a major oil spill and chronic small-scale discharges. Crude petroleum is toxic to birds, yet no published scientific studies of the effects of dilbit on birds yet exist. We have three major components to this study: a) experimental work on effects of dilbit on physiology and health using adult zebra finches as a model system (work lead by Elizabeth Ruberg); b) experimental work on toxicity of dilbit to bird embryos via shell oiling in chicken and double-crested cormorant embryos (i.e. using fertile, developing eggs) lead by Mason King (PhD), and c) effects of external (feather oiling) and internal dilbit exposure on flight dynamics of free-living rhinoceros auklets (lead by Catherine Lee-Zuck, MSc). This work is funded under the Ocean Protection Plan and is a collaboration with Dr. John Elliott (ECCC) and Dr. Kyle Elliott (McGill).

c. Glaucous-winged gulls and the health of the Salish Sea

In the second year of this collaborative project, 150 glaucous-winged gulls were caught in January-February 2021 at coastal sites throughout the Salish Sea. Blood samples were obtained for assessment of physiological health, contaminant, and stable-isotope analysis. In addition, a further 17 adult gulls received a GPS tag to provide fine-scale data on movement patterns and habitat use. This project is a collaboration between Dr. Mark Hipfner from the Wildlife Research Division (WRD) of Environment and Climate Change Canada (ECCC), Dr. Tony Williams and M.Sc. candidate Hannah Hall from the Centre for Wildlife Ecology at Simon Fraser University (SFU), and Dr. Theresa Burg from the University of Lethbridge. The project also involves researchers from the Ecotoxicology and Wildlife Health Division of ECCC, and Fisheries and Oceans Canada.

2. *Reservoirs and the impact of Water Use Decisions on Riparian Birds*

Human activities have caused a dramatic loss in the amount of riparian habitat in North America and this habitat loss is linked to population declines of many riparian dependant songbirds. CWE, working in collaboration with BC Hydro and Cooper-Beauchesne and Associates, has examined how reservoir operations on the Columbia River between 2004-2017 impact the population dynamics of yellow warblers, a species identified by Partners in Flight as a focal species for riparian habitat. The final component of this project, an individual based model shows that managing reservoir operations by delaying when the reservoir fills by approximately 2 weeks would increase the productivity of yellow warblers (the average number of independent young produced) by 36%. This research and the code for the model was published in the open-access journal PLoS ONE in February 2021.

3. *Agricultural Effects*

a. Breeding phenology and productivity of an invasive, agricultural specialist, the European starling

European starlings are an invasive species of considerable economic importance because of their agricultural and urban impact (as well as being the focal species for Environment Canada's terrestrial contaminant monitoring under the Chemical Management Plan). However, they are also agricultural specialists associated with less-intensive pasture (short mown or grazed fields), and are dependent on one main prey type (Tipulid larvae or leatherjackets – another introduced pest species) for successful reproduction. As such they could be a useful monitoring species for changes in agricultural land-use and intensification. Our long-term study of the ecological physiology of European starlings marked its 20th year at our Langley field site (140 nest boxes) in 2021. In addition to basic monitoring of timing of laying and breeding productivity a current focus is on habitat use and foraging behaviour during chick rearing using GPS units and accelerometers. In the context of climate warming, we are re-visiting the relationship between temperature and laying date, and whether this is mediated by effects of temperature on invertebrate prey.

C. Declining Avian Populations

1. *Migratory Shorebirds*

Concern has been raised about apparent population declines of many species of shorebirds over the past two decades. The CWE and its ECCC associates have consistently contributed novel research findings addressing potential causes of these apparent declines. We have cooperated closely with ECCC's Mark Drever (Delta), Keith Hobson (Saskatoon), and with ECCC emeritus Bob Elner, as well as Bird Studies Canada local representative David Bradley.

a. Shorebird Breeding Biology

In 2020–2021, current and former CWE members contributed to two additional publications arising from their participation in the Arctic Shorebird Demographic Network, a collaborative program that included over a dozen sites in Alaska and arctic Canada utilizing common protocols, including contributions from ECCC staff members Grant Gilchrist, Jennie Rausch, and Paul Smith. The final major paper published combines data on fecundity and survivorship to generate models of population trend for 6 species of shorebirds nesting in the Canadian arctic was published in *The Condor/Ornithological Applications*. This large study generally estimated stable population growth rates, and confirms that annual adult survival rates strongly influence shorebird demographics. A second paper utilized data gathered by the group to model levels of invertebrate biomass phenology in the arctic, an important variable for shorebird breeding ecology.

b. Non-breeding biology

Eveling Tavera Fernandez, Ph.D student from Peru, defended her PhD thesis in March 2020, with ECCC's Mark Drever on her graduate committee. Eve published a first paper from the thesis considering the fitness consequences of overwintering in Peru by juvenile and adult sandpiper, with Lank and Ydenberg. She is now working with ECCC's Kristy Gurney on shorebird breeding phenology. She is involved with the generation of a Peruvian Shorebird Conservation plan, and is the chair of the Western Hemisphere Shorebird Group.

Lank and Ydenberg are coauthors along with CWE PhD student Richard Johnston and former ECCC scientist Rob Butler on a paper published in *ACE-EOC* describing the formation and initial results of a hypothesis-driven hemispheric-wide network to monitor shorebird populations along the Pacific coast, with particular emphasis on Western sandpipers and Pacific dunlin.

c. Migration Biology

Lank co-authored a paper focusing on stopover behaviour of migrant Semipalmated sandpipers with respect to weather, seasonal timing and migration routes.

2. *Neotropical Migrant Passerines*

CWE initiated a long-term study on yellow warblers that migrate between western Canada and Mexico/Central America in 2004. This research conducted in collaboration with Dr. Elsie Krebs (ECCC) takes a whole life cycle approach and includes work on the breeding grounds in Inuvik, NT, and Revelstoke, BC, on migration and on the wintering grounds in Jalisco, Mexico. The 2017 field season in Revelstoke completed the field component of this project. Michal Pavlik (PhD candidate) is using the long-term dataset to 1) assess how conditions on migration interact with conditions on the breeding grounds to determine the timing of breeding and local productivity, 2) estimate true survival using a spatial-CJS model and 3) determine mortality rates across the annual cycle. The first chapter of his thesis, that was recently published in *Physiological and Biochemical Zoology*, demonstrates that female warblers initiate the transition to a reproductive physiology while still on migration despite the energetic demands of this stage of the annual cycle.

D. Coastal Ecology

1. *Coastal Studies of Seabirds*

CWE Research Associate Dr. Mark Hipfner reports that the regular field activities on seabird colonies in British Columbia in summer 2020 were cancelled due to CoVid-19. In winter 2020 (January, February), Hipfner, Nik Clyde, Anneka Vanderpass, Joshua Green (all ECCC-WRD, Delta, BC) and Hannah Hall (CWE MSc candi-

date) completed the first season of a new research project investigating movements and health status in relation to diet of Glaucous-winged Gulls wintering in the BC sector of the Salish Sea. This project is funded through the TMX-PIER program of ECCC, and involves deploying GPS tags and collecting blood, feather and prey samples from across the region for measurements of C, N, and H stable isotope ratios, as well as a suite of physiological traits and contaminant levels. Collaborators on the project include Tony Williams (SFU), and John Elliott and Keith Hobson (ECCC).

2. Coastal Ecology of Barrow's Goldeneye

Barrows Goldeneye are a sea duck with a discrete western and eastern population. The majority of the larger western population winters along the Pacific, and breeds in the interior of British Columbia, Alberta and the Northwest Territories. Recent efforts, led primarily by ECCC, have focused on using satellite telemetry to determine linkages among breeding, molting and wintering areas. These data have been used to describe the broad movements of Barrows Goldeneye throughout their annual cycle. However, the spatial scale and spatial/temporal resolution of this dataset can also be used to address research priorities of the federal Ocean Protection Plan and identified information needs of the Sea Duck Joint Venture. Tess Forstner (MSc 2021) used the extensive satellite telemetry dataset to describe the migratory connectivity of Barrow's Goldeneye and latitudinal variation in the timing of spring and fall migration. Jesse Kemp (a new MSc candidate in Fall 2021) will use the same dataset to examine how temperature and the timing of ice melt and ice up impact the timing of migration. Future work, in collaboration with Sean Boyd (ECCC) and Megan Willie (ECCC) will identify when and where wintering sea ducks would be sensitive to anthropogenic activities on the Pacific coasts.

3. Movement Ecology of Black Oystercatchers

CWE has initiated a new long-term study on the movement ecology and habitat use of the Black Oystercatcher, an indicator species for rocky intertidal habitat in the Pacific Northwest (see <https://davidgreensfu.com/m3bloy/>). This project is a collaboration involving federal agencies in BC (ECCC and Parks Canada) and Alaska (USGS and US National Parks Service) with assistance from non-governmental organisations in BC (Laskeek Bay Conservation Society and Rainforest Education Society). Fieldwork was initiated in BC in Spring 2019 and Alaska in Summer 2019. Lena Ware (MSc candidate) used the detailed data from 20 birds deployed with ARGOS satellite tags to define the movement and habitat use of black oystercatchers in relation the tidal and diurnal light cycle throughout the year. Her thesis that will be defended in Fall 2021 supports the ECCC mandate, under the federal Ocean Protection Plan, to conduct research and monitoring in order to improve management of the coastal waters of the Pacific coast. Incoming MSc. students Cole Rankin and Hannah Roodenrijs will examine the drivers of variation in the migratory strategies of oystercatchers and assess how morphology and competitive interactions between migrants and residents shape the foraging ecology of oystercatchers in BC and Alaska.

4. Coastal Usage by Migratory Shorebirds

The majority of the world's three and a half to four million Western Sandpipers stop briefly to refuel in Boundary Bay or on Robert's Bank during their annual northward migration, providing a thrilling sight for local residents. Much of the species' population also stops over on southward migration, following a flight over the Gulf of Alaska. Because of this, the species is ranked in the highest priority class in the draft BC-Yukon region CWS Shorebird Management Plan. Each winter, the Fraser River Delta (FRD) hosts the most northerly wintering population of Pacific Dunlin. Local information on shorebird habitat usage, including western sandpipers and dunlin, contributes information useful for ECCC's environmental assessments as Port of Vancouver operations continue and expand.

Graduated MSc student Rachel Canham published a paper from her 2019 MSc thesis validating the use of

footprints as a measure of mudflat usage by foraging shorebirds.

Florian Reurink continued his PhD project, following up on work done in collaboration with Ron Ydenberg during his MSc program at Wageningen University. His previous work used flight behavior of birds to make predictions about energy intake rate in birds. Assessing shorebird food availability empirically is time consuming and expensive, and these studies are testing the potential for using behavioural models to predict net energy intake rates from behavioural measures in the field. Behavioural ecological theory predicts that birds should adjust their foraging flight speed and power expenditure to various conditions in the habitat, where flight power expenditure should increase with increased energy intake. The results from Florian's MSc work matched the predictions from the theory well, and the Ph.D. further tests the applicability of this approach. Reurink has combined various behavioral adjustments from well established theories into a single model, allowing for more accurate predictions across a variety of conditions. Net energy intake rates have been predicted for wintering dunlin and migrating western sandpipers using flight speed estimates from a mobile radar system used in collaboration with EchoTrack (Rhonda Millikin). These field estimates are used for a qualitative test of the model predictions, while a feeding experiment with Steller's jays is used as a quantitative test of the model. Reurink continued to implement the various behavioral theories into his model while finalizing his analysis of flight speed estimates from dunlin and western sandpipers as well as his feeding experiment with Steller's jays.

Ydenberg continued to develop theory focusing on shorebird responses to changes in danger from increasing raptor populations over the past 30 years, and the effects these can have on shorebird populations and interpretations of census data. He and Lank are submitting a paper exploring contrasting directional effects on wing lengths of Western and Semipalmated sandpipers during the 1980s, testing the hypothesis that differences in the relative importance of resident versus migratory raptors could explain the contrasting trends.

VI FUNDING

Fiscal year 2020-2021 marked the conclusion of the current three year contract between the Simon Fraser University (Centre for Wildlife Ecology) and Environment and Climate Change Canada (Science and Technology Division). This grant supplied \$135,000 per year for CWE research in priority coastal, riparian and grassland ecosystems in British Columbia.

1 April 2020 - 31 March 2021

Scholarships, Fellowships, Grants for Students

<u>Description</u>	<u>Name of person</u>	<u>Notes</u>	<u>Amounts</u>
<u>PhD</u>			
SFU Fellowships etc	Allen, Josh	TA (Fall 2020, Spring 2021)	\$13,389
SFU Fellowships etc	Fremlin, Katharine	PGS NSERC (2021); GF (Spring 2021)	\$14,000
SFU Fellowships etc	Hart, Kirk	GF (Fall 2020)	\$7,000
SFU Fellowships etc	Hodinka, Brett	Dean's Entrance Scholarship (Fall 2020, Summer 2020, Spring 2021)	\$21,000
SFU Fellowships etc	King, Mason	GF (Fall 2020); President's PhD Award (Spring 2021)	\$14,000
SFU Fellowships etc	Reurink, Florian	Dean's Entrance Scholarship (Fall 2020, Summer 2020, Spring 2021)	\$21,000

M Sc

SFU Fellowships etc	Enns, Joanna	GF (Fall 2020)	\$7,000
SFU Fellowships etc	Forstner, Tess	TA (Spring 2021)	\$7,509
SFU Fellowships etc	Hall, Hannah	Salish Sea Gull Project (Summer 2020); GF (Fall 2020)	\$14,000
SFU Fellowships etc	Robert Kesic	MITACS RTA (Summer 2020); TA (Spring 2021); GF (Fall 2020)	\$19,288
SFU Fellowships etc	Lee-Zuck, Catherine	GF (Fall 2020)	\$7,000
SFU Fellowships etc	Leonard, Kathryn	TA (Fall 2020)	\$6,288
SFU Fellowships etc	Leonard, Kathryn	GF (Fall 2020, Spring 2021)	\$14,000
SFU Fellowships etc	Pastran, Sonya	GF (Summer 2020); Laskeek Project Funding	\$14,000
SFU Fellowships etc	Roodenrijs, Hannah	GF (Spring 2021)	\$7,000
SFU Fellowships etc	Ware, Lena	GF (Fall 2020)	\$7,000

General Funding for CWE

EC/Core	EC	EC Annual Chair Funding (3/3 yrs)	\$135,000
SFU	SFU	SFU Contribution to Faculty Salaries (Ydenberg Williams Green)	\$548,053

Conference Funding

SFU Fellowships etc	Allen, Josh	TMRA Summer 2020	\$500

Other Funding

Federal government	Williams	ECCC	\$73,300
Federal government	Elliott, Williams, Ydenberg	COVID Relief	\$19,200

NSERC

NSERC	Green DJ	Overwintering ecology, migration strategies and demography of migratory birds (5/5 yrs)	\$47,000
NSERC	Ydenberg RC	NSERC Individual Research Grant - "Predation danger in the ecology of migration" (4/5 yrs)	\$28,000
NSERC	Williams TD	NSERC Individual Research Grant "Diet or exercise? How do birds cope with transitions in workload associated with parental care or fledging?"(1/5yrs)	\$55,000

NSERC	Elliott J	Investigating sources, transport, accumulation and effects of persistent contaminants in urban environments using a top predator as indicator (3/5 yrs)	\$37,000
Grand Total			\$1,136,527
SFU In-Kind			\$120,000

VII. PUBLICATIONS

This list reflects those publications produced since our last report (publications that were “in press” or “submitted” for the last report are included and have been updated). We continue to publish actively despite working remotely, and being unable to conduct any fieldwork this year. One PhD student, two MSc and one MET students supervised by CWE faculty successfully defended their theses. Most of our publications relate to the research carried out in the main CWE programs and most refer to work carried out in the Pacific Northwest. We are however interacting with scientists throughout Canada and beyond and some of our publications reflect this.

A. PAPERS IN REFEREED JOURNALS OR BOOKS

Books and Book Chapters

- Williams, T.D., S. McWilliams, J.A. Clarke, E. MacDougall-Shackleton, S. MacDougall-Shackleton, F. Bonier and C. Eliason, eds. 2020. *What Is a Bird?* Princeton: Princeton University Press, 368 pp. ISBN: 9780691200163.
- Crossin, G.T. and T.D. Williams. 2021. Using physiology to infer the reproductive status and breeding performance of cryptic or at-risk bird species. In: *Conservation physiology: applications for wildlife conservation and management*, Madliger, C., C.E. Franklin, O.P. Love and S.J. Cooke, eds. Oxford: Oxford University Press.

2021

- Hepp, M., E. Palsson, S.K. Thomsen and D.J. Green. 2021. Predicting the effects of reservoir water level management on the reproductive output of a riparian songbird. *PLoS One* 16: e0247318. <https://doi.org/10.1371/journal.pone.0247318>.
- King, M.D., J.E. Elliott and T.D. Williams. 2021. Effects of petroleum exposure on birds: A review. *Sci. Total Environ.* 755(Part 1): 142834. published on 10 Feb 2021.
- Roques, S., D.B. Lank, E. Cam and R. Pradel. 2021. More than just refuelling: lengthy stopover and selection of departure weather by sandpipers prior to transoceanic and transcontinental flights. *Ibis* 163: 519–535 doi:10.1111/ibi.12891.
- Shaftel, R., D.J. Rinella, E. Kwon, S.C. Brown, H.R. Gates, S. Kendall, D.B. Lank, J.R. Liebezeit, D.C. Payer, J. Rausch, S.T. Saalfeld, B.K. Sandercock, P.A. Smith, D.H. Ward and R.B. Lanctot. 2021. Predictors of invertebrate biomass and rate of advancement of invertebrate phenology across eight sites in the North American Arctic. *Polar Biology* 44: 237-257.

2020

- Beninger, P.G. and R.W. Elner. 2020. On the tip of the tongue: natural history observations that transformed shorebird ecology. *Ecosph.*: Article ID: ECS23133.
- Bos, D., E. van Loon and R. Ydenberg. 2020. A large-scale experiment to evaluate control of invasive muskrats in The Netherlands. *Wildl. Soc. Bull.* 44: 314-322.
- Boynton, C., N. Mahony and T.D. Williams. 2020. Post-fledging habitat use and survival of Barn Swallows (*Hirundo rustica*). *Condor* 122: duz067.
- Canham, R. 2020. Comparison of shorebird abundance and foraging rate estimates from footprints, fecal droppings and trail cameras. *Wader Study* 127: 37-42. doi: 10.18194/ws.00170.

- Criscuolo, F., R. Torres, S. Zann and T.D. Williams. 2020. Telomere dynamics from hatching to sexual maturity and the multivariate egg. *J. Exp. Biol.* 223: jeb232496. [featured article in 'Inside JEB'].
- Davidson, S.C. and a. others. 2020. Ecological insights from three decades of animal movement tracking across a changing Arctic. *Science* 370: 712-715.
- De Jong, J., P. van Hooft, H.-J. Megens, R. Crooijmans, G.A. De Groot, J. Pemberton, J. Huisman, L. Bartos, L. Iacolina, S. van Wieren, R. Ydenberg and H.H.T. Prins. 2020. Fragmentation and translocation distort the genetic landscape of ungulates: a case study of red deer of the Netherlands. *Frontiers Ecol. Evol.* 8: 365. <https://doi.org/10.3389/fevo.2020.535715>.
- Forrester, T.R., D.J. Green, R. McKibbin, M. Bezener and C.A. Bishop. 2020. Riparian habitat restoration increases the availability and occupancy of Yellow-breasted Chat territories but brood parasitism is the primary influence on reproductive performance. *Condor: Ornithological Applications* 122: duaa038.
- Giraldo-Deck, L., W. Goymann, I. Safari, D. Dawson, M. Stocks, T. Burke, D. Lank and C. Kuepper. 2020. Development of intraspecific size variation in black coucals, white-browed coucals and ruffs from hatching to fledging. *J. Avian Biol.* 51: e02440.
- Gutowsky, S.E., J.M. Hipfner, M. Maftai, W.S. Boyd, M. Auger-Méthé, D.J. Yurkowski and M.L. Mallory. 2020. First insights into Thayer's Gull *Larus glaucooides thayeri* migratory and overwintering behavior along the Pacific coast of North America. *Marine Ornithol.* 48: 9-16.
- Heddle, C., J.E. Elliott, T. Brown, M. Eng, N. Basu, M. Perkins and T.D. Williams. 2020. Continuous exposure to mercury during embryogenesis and chick development affects later survival and fertility of zebra finch (*Taeniopygia guttata*). *Ecotoxicol.* 29: 1117-1127. <https://doi.org/10.1007/s10646-019-02074-6>.
- Hipfner, J.M., M.M. Prill, K.R. Studholme, A.D. Domalik, S. Tucker, C. Jardine, M. Maftai, K.G. Wright, J.N. Beck, R.W. Bradley, R.D. Carle, T.P. Good, S.A. Hatch, P. Hodum, M. Ito, S.F. Pearson, N. Rojek, L. Slater, Y. Watanuki, A. Bindoff, G.T. Crossin, M.C. Drever and T.M. Burg. 2020. Geolocator tagging links distributions in the non-breeding season to population genetic structure in a sentinel North Pacific seabird. *PLoS One* 15: e0240056.
- Hodinka, B.L. and N.T. Ashley. 2020. Effect of sleep loss on executive function and plasma corticosterone levels in an arctic-breeding songbird the Lapland longspur (*Calcarius lapponicus*). *Hormones Behav.* 122: 104764.
- Injaian, A.S., C.D. Francis, J.Q. Ouyang, D.M. Dominoni, J.W. Donald, M.J. Fuxjager, W. Goymann, M. Hau, J.F. Husak, M.A. Johnson, B.K. Kircher, R. Knapp, L.B. Martin, E.T. Miller, L.A. Schoenle, T.D. Williams and M.N. Vitousek. 2020. Baseline and stress-induced corticosterone levels across birds and reptiles do not reflect urbanization levels. *Conservation Physiology* 8: coz110; doi:10.1093/conphys/coz110.
- Jubinvile, I., C. Harvey-Clark, T.D. Williams, P.N. Trathan and G.T. Crossin. 2020. Trade-off between aerobic performance and egg production in migratory macaroni penguins. *Comp Biochem Physiol A Mol Integr Physiol.* 247: 110742.
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- McFarlane Tranquilla, L., J.L. Ryder, L. Blight, P.D. O'Hara and D.B. Bertram. 2020. Nightly colony attendance patterns of provisioning Cassin's Auklet *Ptychoramphus aleuticus* are consistent and synchronous. *Marine Ornithol.* 48: 263-272.
- Monlish, D.A., Z.J. Greenberg, S.T. Bhatt, K.M. Leonard, M.P. Romine, Q. Dong, L. Bendesky, E.J. Duncavage, J.A. Magee and L.G. Schuettelpelz. 2020. TLR2/6 signaling promotes the expansion of premalignant hematopoietic stem and progenitor cells in the NUP98-HOXD13 mouse model of MDS. *Exp. Hematol.* 88: 42-55.
- Reiter, M., E. Palacios, D. Eusse, R. Johnston, P. Davidson, D. Bradley, R. Clay, K. Strum, J. Chu, B.

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- Rennie, I.R.F., D.J. Green, E.A. Krebs and A. Harfenist. 2020. High apparent survival of Leach's Storm Petrels *Oceanodroma leucorhoa* in British Columbia. *Marine Ornithol.* 48: 133-140.
- Schnurr, P.J.D., M.C., Elner, R.W., Harper, J. and M. Arts. 2020. Peak abundance of fatty acids in intertidal biofilm coincides with Northward migration of shorebirds. *Frontiers Mar. Sci.* 7: Article 63.
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<https://movementecologyjournal.biomedcentral.com/articles/10.1186/s40462-020-00226-6>. published on line 27 Oct 2020.
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2019:

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- Pakanen, V.-M., D. Blomqvist, T. Breiehagen, L.-Å. Flodin, O. Hildén, D.B. Lank, M. Larsson, T. Lislevand, K. Nuotio, H. Pehlak, A. Pauliny, A. Rönkä, N. Rönkä, D. Schamel, M. Soikkeli, R.L. Thomson, D. Tracy, P. Tomkovich, T.a. O. and K. Koivula. 2019. Low frequencies of supernormal clutches in the Southern Dunlin and the Temminck's Stint. *Ardea* 107: 61-74.
- Schnurr, P.J., Drever, M.C., Kling, H., Elner, R.W. and M. Arts. 2019. Seasonal changes in fatty acid composition of estuarine intertidal biofilm: implications for western sandpiper migration. *Estuar. Coast. Shelf Sci.* 224: 94-107.
- Studholme, K.R., J.M. Hipfner, A.D. Domalik, S.J. Iverson and G.T. Crossin. 2019. Year-round tracking reveals the existence of multiple migratory tactics in Cassin's Auklet, a sentinel North Pacific seabird. *Mar. Ecol. Prog. Ser.* 619: 169-185.
- Verhagen, I., V.N. Laine, A.C. Mateman, A. Pijl, R. de Wit, B. van Lith, W. Kamphuis, H.M. Viitaniemi, T.D. Williams, S.P. Caro, S.L. Meddle, P. Gienapp, K. van Oers and M.E. Visser. 2019. Fine-tuning of seasonal timing of breeding is regulated downstream in the underlying neuroendocrine system in a small song bird. *J. Exp. Biol.* 222: jeb202481.
- Ydenberg, R.C., E.E. van Loon, D. Bos and H. van Hemert. 2019. Damage to dykes and levees in The Netherlands is extensive and increases with Muskrat (*Ondatra zibethicus*) density. *Lutra* 62.

Submitted:

- Domalik, A.D., M. Maftai, K.G. Wright, S.A. Hudson and J.M. Hipfner. Submitted. Migration and winter habitat use of Glaucous-winged Gulls *Larus glaucescens* breeding on Triangle Island,

British Columbia. Waterbirds.

- Fremlin, K.M., J.E. Elliott, P.A. Martin, T. Harner, A. Saini and F.A.C. Gobas. Submitted. Fugacity based trophic magnification factors characterize bioaccumulation of cyclic methyl siloxanes within an urban terrestrial avian food web: Importance of organism body temperature. *Env. Sci. Technol.*
- Kuwae, T., Elner, R.W., Amano, T. and M.C. Drever. Submitted. Human-intervention in intertidal flat ecosystems: seven ecologically-based technical attributes for shorebird recovery. *Ecol. Solutions Evidence.*
- Shimabukuro, U., A. Takahashi, J. Okado, N. Kokubun, J.B. Thiebot, A. Will, Y. Watanuki, B. Addison, S. Hatch, J.M. Hipfner, L. Slater, B.A. Drummond and A.S. Kitaysky. Submitted. Across the North Pacific Ocean, dietary-induced stress of breeding rhinoceros auklets increases with high summer Pacific Decadal Oscillation index. *Mar. Ecol. Prog. Ser.*
- Tate, H.M., K.R. Studholme, A.D. Domalik, M.D. Drever, L.M. Romero, B.M.G. Gormally, K.A. Hobson, J.M. Hipfner and G.T. Crossin. Submitted. Physiological response to "The Blob" differs between two sentinel North Pacific seabirds. *Conservation Physiology.*

B. THESES

- Forstner, T. 2021. Migratory connectivity and spatio-temporal aspects of Pacific Barrow's goldeneye (*Bucephala islandica*) migration. MSc, Simon Fraser University, Burnaby. pp. defended on 12 Jan 2021.
- Kesic, R. 2020. The continuing persistence and biomagnification of DDT and metabolites in American robin (*Turdus migratorius*) fruit orchard food chains. MET, Simon Fraser University, Burnaby. pp. defended 14 Dec 2020.
- McAuley, E.M. 2020. Disentangling the effects of biogeoclimatic factors and local stressors on breeding harlequin duck presence and abundance using field surveys, MaxEnt, and stable isotope turnover models. PhD, Simon Fraser University, Burnaby. pp. defended 10 Dec 2020.
- Pastran, S. 2020. Marine habitat preferences of Marbled Murrelet in Haida Gwaii, BC. MSc, Simon Fraser University, Burnaby. pp. defended 30 Oct 2020.

**ANNUAL REPORT of the
CENTRE FOR WILDLIFE ECOLOGY
2021-2022**



Environment and
Climate Change Canada
Environnement et
Changement climatique Canada

**Department of Biological Sciences
Simon Fraser University**

<http://www.sfu.ca/biology/wildberg/NewCWEPAGE/CWEnewTestHome.htm>

Dr. Ronald C. Ydenberg, Director

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I. HISTORY

Under the Migratory Birds Convention and Canada Wildlife Acts, the mandate of the Canadian Wildlife Service is to protect and conserve migratory bird populations. In the 21st century, this historical mandate is broadening to encompass other environmental concerns such as species at risk, biodiversity, sustainability and endangered habitats. To meet these broad and varied responsibilities, Environment and Climate Change Canada depends on sound science, and participates in cooperative ventures. In 1993, the Natural Sciences and Engineering Research Council of Canada, Simon Fraser University, and Environment Canada signed a ten year agreement to create the NSERC/CWS Chair in Wildlife Ecology at SFU. That agreement has expired, but The Centre for Wildlife Ecology (CWE) as described here continues work with ECCC and with other agencies, on a range of issues pertaining to wildlife and other environmental sciences.

II. MISSION STATEMENT

The mission of the Centre for Wildlife Ecology (CWE) is to foster high quality graduate training and research, conduct basic and applied research in wildlife ecology, and to provide knowledge and personnel that will help Environment and Climate Change Canada and other agencies meet the challenges of conservation in the 21st century. The central concept is to foster synergy between the mission-oriented research and management policies of Environment and Climate Change Canada (Canadian Wildlife Service, CWS, and Science and Technology, S&T) and the basic research agenda of the University. Information, ideas, expertise, resources and opportunity flow back and forth across this interface, giving government agencies access to a broad base of science capability that helps inform policy and decision making, while the university and its faculty and students benefit from enhanced opportunities for research and application of the ideas their disciplines generate.

III. PERSONNEL

A. Research Team

1. Faculty and Research Associates

<i>Name</i>	<i>Position</i>
Ron Ydenberg	Director, Professor
Tony Williams	Professor
David Green	Associate Director, Professor
Dov Lank	University Research Associate / Adjunct Professor
Dan Esler	USGS Scientist / Adjunct Professor
Mark Hipfner	ECCC Research Scientist / Adjunct Professor
Doug Bertram	ECCC Research Scientist
Sean Boyd	ECCC Research Scientist / Adjunct Professor
Rob Butler	ECCC Research Scientist Emeritus/ Adjunct Professor
Bob Elner	ECCC Research Scientist Emeritus/Adjunct Professor
John Elliott	ECCC Research Scientist / Adjunct Professor
Rhonda Millikin	ECCC Head, Population Assessment/Adjunct Professor
Fred Cooke (retired)	Emeritus Chairholder

2. Research Group

<i>Postdoctoral Fellows</i>	<i>PhD (in progress)</i>	<i>MSc (in progress)</i>	<i>Staff</i>
	Josh Allen	Hannah Hall	Sadika Jurvic, CWE Admin. Asst.
	Kirk Hart	Jessie Kemp	Connie Smith, CWE Research Tech
	Brett Hodinka	Catherine Lee-Zuck	
	Kate Fremlin	Katie Leonard	
	Mason King	Cole Rankin	
	Michal Pavlik	Hannah Roodenrijs	
	Florian Reurink	Rachel Sullivan-Lord	
<i>Undergrads</i>	<i>PhD(defended)</i>	<i>MSc (defended)</i>	<i>Visitors</i>
Ellery Hardy		Gwen Case	Joshua McInnes
Jonson Lee		Jo Enns	
		Lena Ware	

B. Steering Committee

<i>Name</i>	<i>Position</i>	<i>Affiliation</i>
Robert Elner	Emeritus Scientist	<i>ECCC</i>
David Green	CWE faculty (non-voting)	<i>SFU</i>
Mark Hipfner	Research Scientist	<i>ECCC</i>
Elsie Krebs	Research Manager, Western Canada	<i>ECCC</i>
Tony Williams	CWE faculty (non-voting)	<i>SFU</i>
Ron Ydenberg	CWE Director (non-voting)	<i>SFU</i>

IV. INTRODUCTION

The aim of this Annual Report is to give an overview of our activities, outline the progress on new and continuing projects, describe the personnel involved, and to give some indication of our scientific and community involvement. Previous Annual Reports are available from the CWE. Contact us via our website

<http://www.sfu.ca/biology/wildberg/NewCWEPage/CWEnewTestHome.htm>

or contact Ron Ydenberg at ydenberg@sfu.ca.

V. THE CWE IN ACTION

The accounts that follow give brief overviews of the major projects run by the CWE. More detail is available on our website (address above). Publications and theses are listed at the end of this report. The personnel also can be contacted via the website.

A. Species at Risk

1. *Marbled Murrelet* (Threatened, COSEWIC)

SFU's research on threatened Marbled Murrelets continues to address direct conservation and management issues for this listed species. This project was started by CWE chair emeritus Fred Cooke in 1994 and continued through the present by David Lank.

MSc student Sonya Pastran published a paper from her 2020 MSc thesis describing marine habitat usage by Marbled Murrelets in Leskeek Bay, Haida Gwaii, using transect data gathered for the past 22 years by the Leskeek Bay Conservation Society and additional data gathered during 2 years of her fieldwork during the summers of 2018 and 2019, funded largely by ECCC through the Ocean Protection Plan. ECCC's Mark Drever was a co-author on the paper. Sonya's MSc research also included an experiment to determine whether seabirds avoid areas with coastal raptors. They appear to do so, and a second paper from her MSc is in progress, with Ydenberg as a collaborator.

Sonya completed a manuscript analyzing VHF radiotracking data gathered by the CWE during the late 1990s from Marbled Murrelets in Desolation and Clayoquot Sounds. Lank provided archival data to ECCC for these analyses and guided the analysis and writing.

Lank continues as a collaborator on an analysis of the use of lidar to evaluate forest murrelet nesting habitat suitability, lead by Louise Waterhouse, BC Ministry of Forests, Lands, and Natural Resource Operations, and UBC's Nicholas Coops. Lank continued as a member of the Canadian Marbled Murrelet Recovery team, but this was minimally active during 2021.

2. *Northern Goshawk* (Threatened, COSEWIC)

The Northern Goshawk (*Accipiter gentilis laingi*) was designated as a Threatened subspecies by COSEWIC in 2000. The Northern Goshawk *laingi* subspecies is a forest raptor whose preference for breeding within late successional forest has placed it at risk from habitat loss and fragmentation,

primarily due to timber harvest. Management actions are hampered by knowledge gaps surrounding the breeding season diet and foraging ecology of goshawks in coastal British Columbia. Gwyn Case conducted an MSc, defended in July 2021, that quantified goshawk diet using a combination of nest cameras, prey remains and regurgitated pellets, and investigated the link between dietary variation and goshawk reproductive success. She found that although goshawks consumed 33 different prey species *Tamiasciurus* squirrels made up the majority of their diet. Diet composition differed slightly between the coastal and transition zones but did not influence productivity. The major chapter of her thesis is being prepared for publication in Raptor Research. Gwyn also conducted a pilot study of goshawk breeding season movement using GPS-UHF transmitters that is being used to determine whether further telemetry based research on goshawk movements is warranted.

3. *Cassin's Auklet* (Special Concern, COSEWIC) - see Section V.D.1, Coastal Studies of Seabirds.

B. Human Impacts on Birds

1. Contaminants and Toxicology

a. Persistent pollutant monitoring and transcriptomic effects in marine bird sentinel species

Marine birds are exposed to a broad and increasing number of anthropogenic chemical contaminants. Accordingly, the eggs of seabirds such as the rhinoceros auklet are routinely collected for long-term contaminant monitoring by Environment and Climate Change Canada (ECCC). Inside of such eggs, the developing embryos may be sensitive to maternally transferred contaminants, but inferring whether measured contaminant concentrations may result in adverse effects in wild species faces uncertainty. We are implementing molecular tools that measure mRNA transcription in marine bird embryos to better quantify how adverse effects in the organism correlate with measured contaminant residue generated by National Wildlife Research Centre (NWRC) lab services for 94 persistent organic pollutants and mercury. These gene transcript-based approaches are novel in their application to monitoring the effects of industrial contaminants or other potential environmental disasters like oil spills in marine birds. This project lead by Mason King (PhD) in collaboration with researchers including Dr. John Elliott (ECCC PWRC), Dr. Vicki Marlatt (SFU), Dr. Amy Lee (SFU), and Doug Crump (NWRC) is using a combination of qPCR gene arrays and RNA Seq tools in two wildlife indicator species, the rhinoceros auklet and double-crested cormorant. These species have been selected by both ECCC Canadian Wildlife Service (CWS) and Wildlife and Landscape Science Directorate (WLSD) managers as the bio-indicators of choice in relation to baseline measurements for past major national projects. This work is being funded under the Ocean Protection Plan and has produced data presented at several scientific meetings to date.

b. Avian dilbit toxicity studies

A national pipeline project to increase transport of an unconventional crude petroleum known as diluted bitumen (dilbit) from the oil sands region to the Port of Vancouver will increase the risk of a major oil spill and chronic small-scale discharges. We recently published three major reviews summarising the effects of petroleum toxicity in wildlife and identifying research needs on unconventional crude petroleum such as dilbit (King et al. 2021; Ruberg et al. 2021a,b). We found that crude petroleum is toxic to birds, yet no published scientific studies of the effects of dilbit on birds yet exist. We have three major components to our dilbit work: a) experimental work on effects of dilbit on physiology and health using adult zebra finches as a model system (work lead by Elizabeth Ruberg, MSc); b) experimental work on toxicity of dilbit to bird embryos via shell oiling in chicken and double-crested cormorant embryos (i.e. using fertile, developing eggs) lead by Mason King (PhD), and c) effects of external (feather oiling) and internal dilbit exposure on flight dynamics of free-living rhinoceros auklets (lead by Catherine Lee-Zuck, MSc). This work is funded under the Ocean Protection Plan, TransMountain Pipeline Expansion wildlife impacts research funding, and is a collaboration among Dr. John Elliott

(ECCC PWRC), Dr. Kyle Elliott (McGill), Dr. Vicki Marlatt (SFU), Doug Crump (NWRC), and Dr. Gregg Tomy (University of Manitoba). This year we published two papers on our laboratory studies with dilbit in zebra finches (Ruberg et al. 2022) and chicken/cormorant embryos (King et al. 2022), which together constitute the first published papers on the effect of oil sands bitumen products on avian wildlife.

c. Glaucous-winged gulls and the health of the Salish Sea

In the second year of this collaborative project, 150 adult glaucous-winged gulls were caught in January-February 2021 at coastal sites throughout the Salish Sea. Blood samples were obtained for assessment of physiological health, contaminant burdens, *Toxoplasma gondii* infections, and dietary stable-isotope analysis. Additionally, 17 adult gulls were not blood sampled, but instead received a GPS tag to provide fine-scale data on movement patterns and habitat use. This project is a collaboration between Dr. Mark Hipfner from the Wildlife Research Division (WRD) of Environment and Climate Change Canada (ECCC); also an Adjunct Professor at SFU and member of the CWE, Dr. Tony Williams and M.Sc. candidate Hannah Hall from the CWE, wildlife veterinarian Dr. Amy Wilson, and Dr. Theresa Burg from the University of Lethbridge. The project also involves researchers from the Ecotoxicology and Wildlife Health Division of ECCC, and Fisheries and Oceans Canada. All data are being uploaded to a shared, accessible database (with Allison Patterson) to ensure common approaches to movement analysis across different species. This work will help identify the most important seabird areas to inform decision making in event of an oil spill crisis. (See additional details - Section V.D.1, Coastal Studies of Seabirds.)

2. Agricultural Effects

a. Breeding phenology and productivity of an invasive, agricultural specialist, the European starling

European starlings are an invasive species of considerable economic importance because of their agricultural and urban impact (as well as being the focal species for Environment Canada's terrestrial contaminant monitoring under the Chemical Management Plan). However, they are also agricultural specialists associated with less-intensive pasture (short mown or grazed fields), and are dependent on one main prey type (*Tipulid* larvae or leatherjackets – another introduced pest species) for successful reproduction. As such they could be a useful monitoring species for changes in agricultural land-use and intensification. Our long-term study of the ecological physiology of European starlings marked its 20th year at our Langley field site (140 nest boxes) in 2021. In addition to basic monitoring of timing of laying and breeding productivity a current focus is on habitat use and foraging behaviour during chick rearing using GPS units and accelerometers. In the context of climate warming, we are re-visiting the relationship between temperature and laying date, and whether this is mediated by effects of temperature on invertebrate prey as well as looking at social factors.

b. Aerial insectivores

In 2021 we published two papers from previous research on tree swallows and barn swallows in the Lower Mainland. One was a large-scale, collaborative analysis using breeding bird survey data and breeding performance data collected at field sites in three regions across Canada (including BC with Nancy Mahony, Olga Lansdorp and Chloe Boynton) to examine long- and short-term barn swallow population trends in Canada, differences in breeding performance across regions, if average breeding performance measures or colony size predicted regional population growth rates and if local breeding performance is driven by density dependence and/or recruitment (Put et al. 2021). The second paper examined breeding productivity and phenology in relation to habitat, weather, and insect availability for co-occurring tree and barn swallows over four years on the southern coast of British Columbia, Canada (Boynton et al. 2021).

3. *Urban ecology and bird collisions with windows*

CWE, in collaboration with Elizabeth Gow and Krista De Groot (ECCC), has initiated a research project focusing on bird communities in the urban environment, under the supervision of Dr. David Green. The first project, initiated by Vanessa Hum (new MSc candidate), extends work on bird collisions on university campuses in BC by examining seasonal variation in collisions/mortality and species specific vulnerability to window collisions on SFU campus. Vanessa will also examine how architectural and landscape features influence bird-window collision risk. Future work on mitigation efforts will be conducted in collaboration with SFU Facilities.

C. Declining Avian Populations

1. *Migratory Shorebirds*

Concern has been raised about apparent population declines of many species of shorebirds over the past two decades. The CWE and its ECCC associates have consistently contributed novel research findings addressing potential causes of these apparent declines. We have cooperated closely with ECCC's Mark Drever (Delta), Keith Hobson (Saskatoon), and with ECCC emeritus Bob Elner, as well as Bird Studies Canada local representative David Bradley

a. Shorebird Breeding Biology

In 2021, current and former CWE members contributed to an additional publication arising from their participation in the Arctic Shorebird Demographic Network, a collaborative program that included over a dozen sites in Alaska and arctic Canada utilizing common protocols, including contributions from ECCC staff members Grant Gilchrist, Jennie Rausch, and Paul Smith. The 2021 paper utilized data gathered by the group to model levels of invertebrate biomass phenology in the arctic, an important variable for shorebird breeding ecology.

Dov Lank closed down his 35-year breeding population of captive ruff sandpipers by sending remaining birds to collaborators in Germany and North Carolina. He continues to work on papers on ruffs with students from the Max Planck Institute and others.

b. Non-breeding biology

Eveling Tavera Fernandez, Ph.D student from Peru, defended her PhD thesis in March 2020, with ECCC's Mark Drever on her graduate committee. Eve published a first paper from the thesis considering the fitness consequences of over-summering in Peru by juvenile and adult sandpiper, with Lank and Ydenberg. She is now working with ECCC's Kristy Gurney on shorebird breeding phenology. She is involved with the generation of a Peruvian Shorebird Conservation plan, and is the chair of the Western Hemisphere Shorebird Group.

Lank and Ydenberg are coauthors along with CWE PhD student Richard Johnston and former ECCC scientist Rob Butler on a paper published in ACE-EOC describing the formation and initial results of a hypothesis-driven hemispheric-wide network to monitor shorebird populations along the Pacific coast, with particular emphasis on Western sandpipers and Pacific dunlin.

c. Migration Biology

Lank co-authored a paper focusing on stopover behaviour of migrant Semipalmated sandpipers with respect to weather, seasonal timing and migration routes, based on reanalysis of data collected in 1977.

Ydenberg continued to develop theory focusing on shorebird responses to changes in danger from increasing raptor populations over the past 40 years, and the effects these can have on interpretations of census data and actually on population growth rates. He submitted a paper quantifying the seasonal change in predation danger to migrant raptors as a function of the timing of arctic spring. He, Lank, and Eveling Tavera submitted an opinion paper exploring the consequences of these interactions. Ydenberg and Lank submitted a second MS contrasting directional effects on wing lengths of Western and Semipalmated sandpipers during the 1980s, testing the hypothesis that differences in the relative

importance of resident versus migratory raptors could explain the contrasting trends. Ydenberg continues to develop a model of the population consequences of predation danger induced alterations in the propensity to migrate versus over-summer, which he believes could account for much of the reported population declines of shorebird species

2. Neotropical Migrant Passerines

CWE initiated a long-term study on yellow warblers that migrate between western Canada and Mexico/Central America in 2004. This research conducted in collaboration with Dr. Elsie Krebs (ECCC) takes a whole life cycle approach and includes work on the breeding grounds in Inuvik, NT, and Revelstoke, BC, on migration and on the wintering grounds in Jalisco, Mexico. The 2017 field season in Revelstoke completed the field component of this project. Michal Pavlik (PhD candidate) is using the long-term dataset to 1) assess how conditions on migration interact with conditions on the breeding grounds to determine the timing of breeding and local productivity, 2) estimate true survival using a spatial-CJS model and 3) determine mortality rates across the annual cycle. The first chapter of his thesis demonstrates that female warblers initiate the transition to a reproductive physiology while still on migration despite the energetic demands of this stage of the annual cycle. The second chapter that will soon be submitted for publication shows how strong cross winds during spring migration can both delay arrival on the breeding grounds, and increase the number of days between arrival and egg-laying with negative effects on productivity.

D. Coastal Ecology

1. Coastal Studies of Seabirds

Mark Hipfner (ECCC-WRD and Adjunct at CWE) reports that summer 2021 marked the 28th year of operation of the Centre for Wildlife Ecology's seabird research program on Triangle Island. The 2021 field crew consisted of Alice Domalik, Josh Green and Sarah Hudson. The research program in 2021 was severely restricted due to COVID-19, but the field crew was able to obtain information on growth rates and diets of nestling Cassin's Auklets *Ptychoramphus aleuticus* and Rhinoceros Auklets *Cerorhinca monocerata*, adding to long-term datasets on those species. The crew also deployed GPS tags on 10 breeding Tufted Puffins *Fratercula cirrhata*, obtaining complete (24 h) tracks for six birds. As in 2019, foraging areas for puffins were largely contained within the boundaries of the Scott Islands marine National Wildlife Area.

Research also continued on other major Rhinoceros Auklet colonies in 2021. Hipfner, Nik Clyde, Kristina Hick and Vivian Pattison (all ECCC, Delta – WRD) visited Pine Island off BC's Central Coast; Hipfner, Pattison and Ken Wright (all ECCC, Delta – WRD) along with CWE PhD candidate Kirk Hart, visited Lucy Island off BC's North Coast; and Mark Maftai (Raincoast Education Society, Tofino) visited Cleland Island off the west coast of Vancouver Island. The main goal of this program, which started in 2006, is to study the effects of oceanographic variation across multiple trophic levels – the diets fed to nestling auklets and the diets of their major fish prey, the Pacific sand lance *Ammodytes personatus* and Pacific herring *Clupea pallasii*. Field crews also deployed GPS tags on a total of 36 Rhinoceros Auklets on Pine and Lucy islands, obtaining 26 complete tracks. While on the colonies we also completed the ninth year of a project investigating the consumption of Pacific salmon *Oncorhynchus* spp. by seabirds in BC waters, in collaboration with Strahan Tucker (Fisheries and Oceans Canada (DFO), Nanaimo – Pacific Biological Station); and completed the 13th year of a project investigating the ingestion of microplastics by forage fish, in collaboration with Moira Galbraith (DFO, Sidney - Institute of Ocean Sciences).

In addition to the summer field work, there was winter field work completed in January and February

2021. Tony Williams and CWE MSc candidate Hannah Hall, assisted by Clyde, Domalik, Green, Hipfner, Hudson, Pattison, along with Elsie Krebs and Anneka Vanderpass (both ECCC, Delta), trapped Glaucous-winged Gulls *Larus glaucescens* around the BC portion of the Salish Sea (Strait of Georgia, Juan de Fuca Strait) for a study of food-web contamination and its implications for the physiological health of gulls that spend winter in the region. GPS tags were deployed on 17 of the gulls, to assess habitat use in winter, including the extent to which the gulls feed at landfills. (See also Section V.B.1.c, Glaucous-winged gulls and the health of the Salish Sea.)

2. Coastal Ecology of Barrow's Goldeneye

Barrow's Goldeneye is a sea duck with a discrete western and eastern population. The majority of the larger western population winters along the Pacific, and breeds in the interior of British Columbia, Alberta and the Northwest Territories. Recent efforts, led primarily by ECCC, have focused on using satellite telemetry to determine linkages among breeding, molting and wintering areas. These data have been used to describe the broad movements of Barrows Goldeneye throughout their annual cycle. However, the spatial scale and spatial/temporal resolution of this dataset can also be used to address research priorities of the federal Ocean Protection Plan and identified information needs of the Sea Duck Joint Venture. Tess Forstner (MSc 2021) used the extensive satellite telemetry dataset to show that adult Barrow's Goldeneye had a high degree of migratory connectivity (Forstner et al. 2022). Tess also found that the movement of first-year birds aligned with that of older birds suggesting that regional sub-populations functioned as discrete units and should be managed independently. Jesse Kemp (a new MSc candidate in Fall 2021) has used the same dataset to show how spring temperature and the timing of ice melt and ice up impact the timing of migration. Future work, in collaboration with Sean Boyd (ECCC) and Megan Willie (ECCC) will identify when and where wintering sea ducks would be sensitive to anthropogenic activities on the Pacific coasts.

3. Movement Ecology of Black Oystercatchers

In 2019 CWE initiated a new long-term study on the movement ecology and habitat use of the Black Oystercatcher, an indicator species for rocky intertidal habitat in the Pacific Northwest (see <https://davidgreensfu.com/m3bloy/>). This project is a collaboration involving federal agencies in BC (ECCC and Parks Canada) and Alaska (USGS and US National Parks Service) with assistance from non-governmental organisations in BC (Laskeek Bay Conservation Society and Rainforest Education Society). Fieldwork was initiated in BC in Spring 2019 and Alaska in Summer 2019. Lena Ware (MSc 2021) used the detailed data from 20 birds deployed with ARGOS satellite tags to define the movement and habitat use of black oystercatchers in relation the tidal and diurnal light cycle throughout the year.

In summer 2021 the Black Oystercatcher research team searched for nest sites, resighting banded birds, and collected blood samples and potential prey items for stable isotope analyses, in Pacific Rim National Park Reserve and Gwaii Haanas National Park Reserve and Haida Heritage Site. This project is led by David Green and MSc Candidate Hannah Roodenrijs (CWE, SFU), and in 2021 was supported by Clyde, Domalik, and Maftai (all ECCC). In addition, Kathryn Hargan and MSc Candidate Alex Zvezdin (Memorial University of Newfoundland, St. John's) collected cores from the bottom of a small pond on S'Gang Gwaay, in GHNPR, for assessment of decadal to centurial trends in seabird populations at this UNESCO World Heritage Site.

Ongoing satellite data supports the ECCC mandate, under the federal Ocean Protection Plan, to conduct research and monitoring in order to improve management of the coastal waters of the Pacific coast. Currently, Cole Rankin and Hannah Roodenrijs are examining the drivers of variation in the migratory strategies of oystercatchers and examining site and regional differences in morphology and foraging ecology of oystercatchers in BC and Alaska.

4. Coastal Usage by Migratory Shorebirds

The majority of the world's three and a half to four million Western Sandpipers stop briefly to refuel in Boundary Bay or on Robert's Bank during their annual northward migration, providing a thrilling sight for local residents. Much of the species' population also stops over on southward migration, following a flight over the Gulf of Alaska. Because of this, the species is ranked in the highest priority class in the draft BC-Yukon region CWS Shorebird Management Plan. Each winter, the Fraser River Delta (FRD) hosts the most northerly wintering population of Pacific Dunlin. Local information on shorebird habitat usage, including western sandpipers and dunlin, contributes information useful for ECCC's environmental assessments as Port of Vancouver operations continue and expand.

Recent CWE alumni Rachel Canham and Dave Hope published an analysis with Mark Drever (ECCC) and Scott Flemming (CWS) showing marked drops in local use of the Fraser River delta by northward migrating Western sandpipers (-54% between 1990 and 2020), and dunlin (-31%), controlling for several environmental variables. They attribute this to a broader population decrease in Pacific flyway populations, rather than to local factors.

Florian Reurink continued his PhD project, following up on work done in collaboration with Ron Ydenberg during his MSc program at Wageningen University. His previous work used flight behavior of birds to make predictions about energy intake rate in birds. Assessing shorebird food availability empirically is time consuming and expensive, and these studies are testing the potential for using behavioural models to predict net energy intake rates from behavioural measures in the field. Behavioural ecological theory predicts that birds should adjust their foraging flight speed and power expenditure to various conditions in the habitat, where flight power expenditure should increase with increased energy intake. The results from Florian's MSc work matched the predictions from the theory well, and the Ph.D. further tests the applicability of this approach. Reurink has combined various behavioral adjustments from well established theories into a single model, allowing for more accurate predictions across a variety of conditions. Net energy intake rates have been predicted for wintering dunlin and migrating western sandpipers using flight speed estimates from a mobile radar system used in collaboration with EchoTrack (with Dr. Rhonda Millikin, ECCC-Emeritus). These field estimates are used for a qualitative test of the model predictions, while a feeding experiment with Steller's jays is used as a quantitative test of the model. Reurink continued to implement the various behavioral theories into his model while finalizing his analysis of flight speed estimates from dunlin and western sandpipers as well as his feeding experiment with Steller's jays. He expects to defend his thesis in April 2022.

VI FUNDING

Fiscal year 2021-2022 marked the first year of a two year contract between the Simon Fraser University (Centre for Wildlife Ecology) and Environment and Climate Change Canada (Science and Technology Division). This grant supplied \$115,000 in 2021-2022, and will supply \$180,000 in 2022-2023 for CWE research in priority coastal, riparian and grassland ecosystems in British Columbia.

1 April 2021 - 31 March 2022

Scholarships, Fellowships, Grants for Students

<u>Description</u>	<u>Name of person</u>	<u>Notes</u>	<u>Amounts</u>

PhD

SFU Fellowships etc	Allen, Josh	TA (Fall 2021), GF (Spring 2022)	\$18,076
SFU Fellowships etc	Fremlin, Katharine	GF (Summer 2021, Spring 2022)	\$10,500
SFU Fellowships etc	Hodinka, Brett	Dean's Entrance Scholarship (Summer 2021, Fall 2021, Spring 2022; TA (Spring 2022)	\$25,620
SFU Fellowships etc	King, Mason	GF (Fall 2021)	\$7,000
SFU Fellowships etc	Reurink, Florian	GF (Summer 2021, Fall 2021)	\$14,000

M Sc

SFU Fellowships etc	Enns, Joanna	GF (Spring 2022)	\$7,000
SFU Fellowships etc	Hall, Hannah	GF (Fall 2021)	\$7,000
SFU Fellowships etc	Kemp, Jessica	TA (Spring 2022)	\$6,426
SFU Fellowships etc	Lee-Zuck, Catherine	GF (Summer 2021, Fall 2021)	\$9,700
SFU Fellowships etc	Leonard, Kathryn	GF (Fall 2021)	\$7,000
SFU Fellowships etc	Linton, Anna	TA (Spring 2022)	\$6,426
SFU Fellowships etc	Rankin, Cole	TA (Fall 2021); GF (Spring 2022)	\$12,178
SFU Fellowships etc	Roodenrijs, Hannah	GF (Fall 2021)	\$7,000

General Funding for CWE

ECCC/Core	ECCC	EC Annual Chair Funding (1/2 yrs)	\$115,000
SFU	SFU	SFU Contribution to Faculty Salaries (Ydenberg, Williams Green)	\$582,559

Conference Funding

SFU Fellowships	Hodinka, Brett	TMRA Spring 2022	\$500
eBerg	Rankin, Cole	PEEC Spring 2022	\$150
eBerg	Roodenrijs, Hannah	PEEC Spring 2022	\$150

Other Funding

Federal government	Williams	ECCC	\$36,750
Federal government	Green	ECCC	\$49,200

NSERC

	Green DJ	Overwintering ecology, migration strategies and demography of migratory birds	\$47,000
Federal government			
Federal government	Ydenberg RC	NSERC Individual Research Grant - "Predation danger in the ecology of migration" (4/5 yrs)	\$28,000
Federal government	Williams TD	NSERC Individual Research Grant "Diet or exercise? How do birds cope with transitions in workload associated with parental care or fledging?"(1/5yrs)	\$55,000
Federal government	Elliott J	Investigating sources, transport, accumulation and effects of persistent contaminants in urban environments using a top predator as indicator (3/5 yrs)	\$37,000
		Total funding:	<u>1,089,235</u>
	SFU In-Kind		\$120,000

VII. PUBLICATIONS

This list reflects those publications produced since our last report (publications that were “in press” or “submitted” for the last report are included and have been updated). We continue to publish actively despite working remotely, and having our fieldwork severely restricted this past year because of the Covid-19 pandemic. Three MSc students supervised by CWE faculty successfully defended their theses. Most of our publications relate to the research carried out in the main CWE programs and most refer to work carried out in the Pacific Northwest. We are however interacting with scientists throughout Canada and beyond and some of our publications reflect this.

A. PAPERS IN REFEREED JOURNALS OR BOOKS

In press

- Crossin, G.T., R. Filgueira, K.R. Studholme and J.M. Hipfner. In press. Phenological cues to breeding and the differential response of Pacific auks to variation in marine primary production. *Mar. Ecol. Prog. Ser.*
- Domalik, A.D., M. Maftai, K.G. Wright, S.A. Hudson and J.M. Hipfner. In press. Migration and winter habitat use of Glaucous-winged Gulls *Larus glaucescens* breeding on Triangle Island, British Columbia. *Waterbirds*.
- Fremelin, K.M., J.E. Elliott, P.A. Martin, T. Harner, A. Saini and F.A.C. Gobas. In press. Fugacity based trophic magnification factors characterize bioaccumulation of cyclic methyl siloxanes within an urban terrestrial avian food web: Importance of organism body temperature and composition. *Env. Sci. Technol.*
- Giraldo-Deck, L., J. Loveland, W. Goymann, B. Tschirren, T. Burke, B. Kempenaers, D. Lank and C. Küpper. In press. Intralocus conflicts associated with a supergene. *Nature Communications*.
- Hart, K., K.G. Wright, V. Pattison and J.M. Hipfner. In press. Successful breeding by Black-legged Kittiwakes *Rissa tridactyla* at the only colony in Canada's Pacific Ocean. *Marine Ornithol.*
- Ydenberg, R.C. and D.B. Lank. Accepted. Predation danger in the life history of long-distance migratory sandpipers. *J. Avian Biol.*

2022

- Hebert, C.E., N.M. Burgess and J.E. Elliott. 2022. Temporal trends of essential omega-3 fatty acids in Atlantic and Pacific food webs as measured in eggs of Leach's storm-petrel *Oceanodroma leucorhoa*. *Mar. Ecol. Prog. Ser.* 684: 199-210.
- Hobson, K.A., T. Kuwae, M.C. Drever, W. Easton and R.W. Elner. 2022. Biofilm and invertebrate consumption by Western Sandpipers (*Calidris mauri*) and Dunlin (*Calidris alpina*) during spring migratory stopover: Insights from tissue and breath CO₂ isotopic (¹³C, ¹⁵N) analyses. *Conservation Physiology* 10: 1.
- King, M., J. Elliott, V. Marlatt, D. Crump, I. Idowu, S. Wallace, G. Tomy and T. Williams. 2022. Effects of avian eggshell oiling with diluted bitumen show sublethal embryonic polycyclic aromatic compound exposure. *Env.Tox. Chem.* 41: 159-174. <https://doi.org/10.1002/etc.5250>.
- Lownie, T., I. Jubinville, T.D. Williams, R.A. Phillips and G.T. Crossin. 2022. Links between aerobic capacity and reproductive success in Giant Petrels (*Macronectes* spp.). *Comparative Biochemistry and Physiology Part A* 266: 111155.

Mancuso KM, H.K., Grosselet M, Elliott JE, Alexander JD, Zanuttig M, Bishop CA. 2022. Mercury toxicity risk and corticosterone levels across the breeding range of the Yellow-breasted Chat. *Ecotoxicol.* 31: 234-250.

Ruberg, E., M. King, J. Elliott, G. Tomy, I. Idowu, M. Vermette and T. Williams. 2022. Effects of diluted bitumen exposure on the survival, physiology, and behaviour of zebra finches (*Taeniopygia guttata*). *Ecotoxicol. Environ. Safety* 229: 113071. <https://doi.org/10.1016/j.ecoenv.2021.113071>.

2021

Bertram, D.F., L. Wilson, K. Charleton, A. Hedd, G.J. Robertson, J. Smith, K.H. Morgan and X.J. Song. 2021. Modelling entanglement rates to estimate mortality of marine birds in British Columbia commercial salmon gillnet fisheries. *Marine Environmental Research*. 166. *Mar. Environ. Res.* 166: 105268.

Bowman, T.D., S.G. S.G. Gilliland, J.L. J.L. Schamber, P.L. P.L. Flint, D. D. Esler, W.S. W.S. Boyd, D.H. Rosenberg, J.-P.L. J-P.L. Savard, C. Perry and O. J.E. 2021. Strong evidence for two disjunct populations of Black Scoters (*Melanitta americana*) in North America. *Wildfowl* 71: 179-192.

Boyd, W.S., N. Clyde, A. Breault, R. Di Paolo and M. McAdie. 2021. Abundance, distribution, and migration patterns of North American Eared Grebes (*Podiceps nigricollis*). *Waterbirds* 44: 76-85.

Boynton, C., N. Mahony, O. Lansdorp and T.D. Williams. 2021. Minor interspecies differences in breeding phenology and productivity between two co-occurring aerial insectivores. *Avian Cons. Ecol.* 16: 27.

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- Pearson, S.F., I. Keren, P.J. Hodum, B. Drummond, J.M. Hipfner, N.A. Rojek, H.M. Renner and S.M. Thomas. Submitted. Range-wide changes in the North American Tufted Puffin (*Fratercula cirrhata*) breeding population over 115 years. *Bird Conserv. Internat.*
- Ydenberg, R.C. Submitted. Seasonal and inter-annual variation in peregrines (*Falco peregrinus*) for southbound Western Sandpipers (*Calidris mauri*). *Movement Ecol.*

B. THESES

- Case, G. 2021. Foraging Ecology of the Northern Goshawk in Coastal British Columbia. MSc, Simon Fraser University, Burnaby.
- Enns, J. 2021. Paying attention but not coordinating: parental care in European starlings (*Sturnus vulgaris*). MSc, Simon Fraser University, Burnaby.
- Ware, L. 2021. Satellite telemetry reveals habitat selection decisions by black oystercatchers (*Haematopus bachmani*) across , diel, and tidal cycles. MSc, Simon Fraser University, Burnaby

1 April 2017 - 31 March 2018

Scholarships, Fellowships, Grants for Students

PhD

NSERC	Michal Pavlik	NSERC IPS - NSERC contribution (Summer)	\$5,000
Industry	Michal Pavlik	NSERC IPS - Industry contribution (Summer)	\$2,000
SFU Fellowships etc	Michal Pavlik	Provost's Prize of Distinction	\$1,667
SFU Fellowships etc	David Hope	GF (Fall), TA (Spring), Travel Award (Spring)	\$14,033
SFU Fellowships etc	Jeff Yap	TA (Fall), GF (Spring), Travel Award (Spring)	\$15,203
SFU Fellowships etc	Marie Helene Burle	TA (Summer)	\$4,186
SFU Fellowships etc	Marinde Out	TA (Fall), Travel Award (Spring)	\$6,025
SFU Fellowships etc	Mason King	GF (Fall)	\$6,500
SFU Fellowships etc	Richard Johnson	GF (Fall), TA (Spring), Travel Award (Spring)	\$13,864
SFU Fellowships etc	Simon Valdez	TA (Spring)	\$5,525
SFU Fellowships etc	Florian Reurink	Graduate Dean's Entrance Scholarship (Spring)	\$7,000
International	Eveling Tavera	Neotropical Migratory Bird Conservation Act	\$3,990
International	Jeff Yap	Society Of Experimental Biology Travel Award (Summer, Spring)	\$710

M Sc

NSERC	Alice Domalik	NSERC PGS-M (Summer)	\$5,833
NSERC	Rachel Canham	NSERC PGS-M (Summer, Fall, Spring)	\$17,500
SFU Fellowships etc	Seth Bennett	TA (Summer, Fall, Spring)	\$16,327
SFU Fellowships etc	Rachel Canham	Travel Award (Spring)	\$500
SFU Fellowships etc	Kate Fremlin	GF (Fall), Travel Award (Fall)	\$7,000
SFU Fellowships etc	Catherine Villeneuve	GF (Fall), TA (Fall)	\$13,364
SFU Fellowships etc	Alice Domalik	GF (Spring)	\$6,500
Other	Alice Domalik	Anne Vallee Ecological Scholarship (Summer)	\$1,500
Other	Alice Domalik	Glen Geen Scholarship in Marine Biology (Fall)	\$1,100
Other	Kate Fremlin	SETAC Travel Awards x 2 (Fall)	\$931
Other	Kristen Walters	Hancock Foundation (Summer)	\$7,000
Other	Kristen Walters	Mitacs Internship	\$15,000

General Funding for CWE

EC/Core	EC	EC Annual Chair Funding (5/5 yrs)	\$150,000

SFU	SFU	SFU Contribution to Faculty Salaries (Ydenberg Williams Green)	\$500,148

Conference Funding

Other Funding

Other Federal	Lank	Canada Summer Jobs	\$1,955
International	Lank	Max Planck	\$12,000

Generated Research Funding

Species at Risk

Other Federal	Flower	Banting Postdoctoral Award (2/2 yrs)	\$23,280

Human Impact on Birds

Industry	Green DJ	BC Hydro/ Cooper Beauchesne and Associates Ltd.	\$27,300
Other	Elliott J	MITACS Elevate: Development and application of molecular tools to assess the acute and chronic impacts of petroleum hydrocarbons on birds (9 months /2 yrs - MITACS contribution)	\$18,750
Industry	Elliott J	MITACS Elevate: Development and application of molecular tools to assess the acute and chronic impacts of petroleum hydrocarbons on birds (9months /2 yrs - Northern Gateway Pipelines contribution)	\$22,500

Declining Avian Populations

Coast Ecology

Other EC	Hipfner MJ	Wildlife Research Division (A-base)	\$25,000
Other EC	Hipfner MJ	Canadian Wildlife Service (Protected Areas)	\$30,000
Other EC	Hipfner MJ	WRD (Ocean Protection Plan)	\$25,000
Other EC	Hipfner MJ	Climate Change Action Plan	\$20,000
Other EC	Hipfner MJ	STAGE	\$25,000

NSERC

NSERC	Green DJ	Overwintering ecology, migration strategies and demography of migratory birds (4/5 yrs)	\$27,000

NSERC	Lank D	Maintenance of ecological polymorphism by frequency-dependent selection (4/5 yrs)	\$27,000
NSERC	Ydenberg RC	NSERC Individual Research Grant - "Predation danger in the ecology of migration" (3/5 yrs)	\$32,000
NSERC	Williams TD	Physiological Adaptations for Breeding in Birds (6/6 yrs)	\$60,000
NSERC	Williams TD (co-applicant)	RTI: Advanced Facility for Avian Research	\$140,590
NSERC	Elliott J	Investigating sources, transport, accumulation and effects of persistent contaminants in urban environments using a top predator as indicator (2/5 yrs)	\$36,000

Grand Total	\$1,381,781

SFU In-Kind	\$120,000

VI FUNDING

In 2018-2019 the contract between the Simon Fraser University (Centre for Wildlife Ecology) and Environment and Climate Change Canada (Science and Technology Division) was renewed for three years. This grant supplies \$150,000 per year for CWE research in priority coastal, riparian and grassland ecosystems in British Columbia. The 5 year chart compares revenue projections (formulated for this agreement) to actual revenue from Environment Canada, SFU and other industrial, provincial, federal and international sectors.





1 April 2018 - 31 March 2019

Scholarships, Fellowships, Grants for Students

<u>Description</u>	<u>Name of person</u>	<u>Notes</u>	<u>Amounts</u>
<u>PhD</u>			
SFU Fellowships etc	David Hope	TA (Fall)	\$5,744
SFU Fellowships etc	Jeff Yap	TA (Summer)	\$5,744
SFU Fellowships etc	Eveling Tavera	TA (Fall)	\$7,136
SFU Fellowships etc	Mason King	GF (Fall)	\$6,500
SFU Fellowships etc	Richard Johnson	GF (Fall)	\$6,500
SFU Fellowships etc	Florian Reurink	Graduate Dean's Entrance Scholarship (Summer, Fall, Spring)	\$21,000
Other	David Hope	Salish Sea Ecosystem Conference	\$293
International	Eveling Tavera	NMBCA	\$143,030
International	Eveling Tavera	Amer Ornithol Soc Conference	\$629
International	Eveling Tavera	CONCYTEC (Peru) for AOS Conference	\$2,993
<u>M Sc</u>			
NSERC	Lena Ware	NSERC CGS-M (Fall, Spring)	\$11,667
SFU Fellowships etc	Seth Bennett	TA (Summer)	\$4,689
SFU Fellowships etc	Sonya Pastran	TA (Summer)	\$5,819
SFU Fellowships etc	Catherine Villeneuve	GF (Summer)	\$6,500
SFU Fellowships etc	Elizabeth Ruberg	GF (Fall)	\$6,500
SFU Fellowships etc	Catherine Villeneuve	TA (Fall)	\$6,051
SFU Fellowships etc	Alice Domalik	GF (Fall)	\$6,500
SFU Fellowships etc	Joanna Enns	TA (Fall)	\$2,526
SFU Fellowships etc	Tess Forstner	TA (Fall)	\$6,051
SFU Fellowships etc	Sonya Pastran	TA (Fall)	\$6,051
SFU Fellowships etc	Joachim Bertrands	TA (Fall)	\$4,689
SFU Fellowships etc	Rachel Canham	TA (Spring)	\$6,051
SFU Fellowships etc	Tess Forstner	GF (Spring)	\$6,500
SFU Fellowships etc	Sonya Pastran	Travel Award For Seabird Meeting	\$500
SFU Fellowships etc	Joachim Bertrands	Travel Award for Seabird Meeting	\$500
Other EC	Alice Domalik	EC contract (Summer)	\$7,000
Other EC	Tess Forstner	EC contract (Fall)	\$7,333
Other EC	Kate Fremlin	EC contract (Summer)	\$7,000
Other EC	Sonya Pastran	ECCC / Ocean Protection Plan	\$28,000
Other	Sonya Pastran	Society of Canadian Ornithologists	\$2,000
Other	Kristen Walters	Hancock Fdn (Summer)	\$7,000
Provincial	Gwyn Case	FLNROD (Fall, Spring)	\$19,541
<u>General Funding for CWE</u>			
EC/Core	EC	EC Annual Chair Funding (1/3 yrs)	\$135,000
SFU	SFU	SFU Contribution to Faculty Salaries (Ydenberg Williams Green)	\$510,633

Conference Funding

Other Funding

Other Federal	Lank	Canada Summer Jobs	\$1,520
International	Lank	Max Plank Collaborative Agreement	\$11,825
Other	Ydenberg	Echotrack	\$7,000
SFU Other	Green	Ecological Restoration Supervision	\$1,000

Species at Risk

Green - FLNROD			\$0
Ydenberg - ECCC (Green)			\$0
Williams	Chair's support		\$16,667

Human Impact on Birds**Declining Avian Populations****Coast Ecology**

Other EC	Hipfner MJ	Wildlife Research Division (A-base)	\$30,000
Other EC	Hipfner MJ	Canadian Wildlife Service (Protected Areas)	\$25,000
Other EC	Hipfner MJ	WRD (Ocean Protection Plan)	\$75,000
Other EC	Hipfner MJ	Climate Change Action Plan	\$25,000
Other EC	Hipfner MJ	STAGE	\$26,000

NSERC

NSERC	Green DJ	Overwintering ecology, migration strategies and demography of migratory birds (5/5 yrs)	\$27,000
NSERC	Lank D	Maintenance of ecological polymorphism by frequency-dependent selection (5/5 yrs)	\$27,000
NSERC	Ydenberg RC	NSERC Individual Research Grant - "Predation danger in the ecology of migration" (4/5 yrs)	\$32,000
NSERC	Williams TD	NSERC Individual Research Grant "Diet or exercise? How do birds cope with transitions in workload associated with parental care or fledging?" (1/5yrs)	\$55,000
NSERC	Elliott J	Investigating sources, transport, accumulation and effects of persistent contaminants in urban environments using a top predator as indicator (3/5 yrs)	\$36,000

Grand Total	\$1,399,681

SFU In-Kind	\$120,000

VI FUNDING

In 2019-2020 the contract between the Simon Fraser University (Centre for Wildlife Ecology) and Environment and Climate Change Canada (Science and Technology Division) was renewed for three years. This grant supplies \$135,000 per year for CWE research in priority coastal, riparian and grassland ecosystems in British Columbia.

1 April 2019 - 31 March 2020

Scholarships, Fellowships, Grants for Students

<u>Description</u>	<u>Name of person</u>	<u>Notes</u>	<u>Amounts</u>
<u>PhD</u>			
SFU Fellowships etc	Brett Hodinka	Graduate Dean's Entrance Scholarship (Fall, Spring)	\$14,000
SFU Fellowships etc	Mason King	GF (Fall)	\$6,500
SFU Fellowships etc	Florian Reurink	Graduate Dean's Entrance Scholarship (Summer, Fall)	\$14,000
SFU Fellowships etc	Simon Valdez	TA (Summer, Fall)	\$11,515
<u>M Sc</u>			
NSERC SFU Fellowships etc	Lena Ware	NSERC CGS-M (Summer) GF (Fall)	\$6,000
SFU Fellowships etc	Gwyn Case		\$6,500
SFU Fellowships etc	Seth Bennett	TA (Summer)	\$4,689
SFU Fellowships etc	Sonya Pastran	TA (Summer)	\$5,819
SFU Fellowships etc	Catherine Villeneuve	GF (Summer)	\$6,500
SFU Fellowships etc	Elizabeth Ruberg	GF (Fall)	\$6,500
SFU Fellowships etc	Joanna Enns	TA (Fall)	\$4,967
SFU Fellowships etc	Joanna Enns	GF (Spring)	\$6,500
SFU Fellowships etc	Tess Forstner	GF (Fall)	\$6,500
SFU Fellowships etc	Kate Fremlin	TA (Spring)	\$5,851
SFU Fellowships etc	Kate Fremlin	GF (Fall)	\$6,500
SFU Fellowships etc	Sonya Pastran	GF (Fall)	\$6,500
SFU Fellowships etc	Joachim Bertrands	TA (Fall)	\$4,689
SFU Fellowships etc	Robert Kesic	TA (Spring)	\$4,967

SFU Fellowships etc	Tess Forstner	GF (Fall)	\$6,500
SFU Fellowships etc	Katie Leonard	GF (Fall)	\$6,500
SFU Fellowships etc		GF (Fall)	
	Lena Ware		\$6,500

General Funding for CWE

EC/Core	EC	EC Annual Chair Funding (1/3 yrs)	\$135,000
SFU	SFU	SFU Contribution to Faculty Salaries (Ydenberg Williams Green)	
			\$542,263

Conference Funding

SFU Fellowships etc	Joachim Bertrands	Travel Award for Seabird Meeting	\$500
SFU Fellowships etc	Kate Fremlin	TMRA (Fall)	\$500
SFU Fellowships etc	Kate Fremlin	TMRA (Spring	\$500
SFU Fellowships etc	Katie Leonard	TMRA (Spring)	\$500
SFU Fellowships etc	Sonya Pastran	Travel Award For Seabird Meeting	\$500
Conference Funding	Gwyn Case	Raptor Research Foundation	\$1,000
Conference Funding	Joanna Enns	Conf. Budget	\$250
Conference Funding	Tess Forstner	Conf. Budget	\$250
Conference Funding	Mason King	SETAC North America	\$1,000
Conference Funding	Catherine Lee-Zuck		\$250
		Conf. Budget	
Conference Funding	Michal Pavlik	Conf. Budget	\$250
Conference Funding	Florian Reurink	Conf. Budget	\$250
Conference Funding	Eveling Tavera	Conf. Budget	\$250
Conference Funding	Catherine Villeneuve		\$250
		Conf. Budget	
Conference Funding	Kristne Walters	Conf. Budget	\$250
Conference Funding	Lena Ware	Conf. Budget	\$250

Other Funding

Prov. Government	Green	Ministry of Forests, Lands, Natural Resources Opr. & Rural Developm.	\$15,000
Government	Green	ECCC	\$12,000
International	Lank	Max Plank Collaborative Agreement	\$17,997
Government	Ydenberg	ECCC - Seaduck Moment throughout the annual cycle: linking water and	\$22,855

MITACS	Elliott	breeding habitat Elevate - A. Gonzales	\$55,000

Generated Research Funding

Government	Ydenberg	Miscellaneous CWS grants	\$3,476
SFU	Ydenberg	eBERG Director funding	\$9,489

NSERC

NSERC	Green DJ	Overwintering ecology, migration strategies and demography of migratory birds (5/5 yrs)	\$47,000
NSERC	Lank D	Maintenance of ecological polymorphism by frequency-dependent selection (5/5) yrs)	\$21,549
NSERC	Ydenberg RC	NSERC Individual Research Grant - "Predation danger in the ecology of migration" (4/5 yrs)	\$32,000
NSERC	Williams TD	NSERC Individual Research Grant "Diet or exercise? How do birds cope with transitions in workload associated with parental care or fledging?"(1/5yrs)	\$55,000
NSERC	Elliott J	Investigating sources, transport, accumulation and effects of persistent contaminants in urban environments using a top predator as indicator (3/5 yrs)	\$37,000

Grand Total \$1,175,376

SFU In-Kind \$120,000

VI FUNDING

Fiscal year 2020-2021 marked the conclusion of the current three year contract between the Simon Fraser University (Centre for Wildlife Ecology) and Environment and Climate Change Canada (Science and Technology Division). This grant supplied \$135,000 per year for CWE research in priority coastal, riparian and grassland ecosystems in British Columbia.

1 April 2020 - 31 March 2021 Scholarships, Fellowships, Grants for Students

<u>Description</u>	<u>Name of person</u>	<u>Notes</u>	<u>Amounts</u>
<u>PhD</u>			
SFU Fellowships etc	Allen, Josh	TA (Fall 2020, Spring 2021)	\$13,389
SFU Fellowships etc	Fremelin, Katharine	PGS NSERC (2021); GF (Spring 2021)	\$14,000
SFU Fellowships etc	Hart, Kirk	GF (Fall 2020)	\$7,000
SFU Fellowships etc	Hodinka, Brett	Dean's Entrance Scholarship (Fall 2020, Summer 2020, Spring 2021)	\$21,000
SFU Fellowships etc	King, Mason	GF (Fall 2020); President's PhD Award (Spring 2021)	\$14,000
SFU Fellowships etc	Reurink, Florian	Dean's Entrance Scholarship (Fall 2020, Summer 2020, Spring 2021)	\$21,000
<u>M Sc</u>			
SFU Fellowships etc	Enns, Joanna	GF (Fall 2020)	\$7,000
SFU Fellowships etc	Forstner, Tess	TA (Spring 2021)	\$7,509
SFU Fellowships etc	Hall, Hannah	Salish Sea Gull Project (Summer 2020); GF (Fall 2020)	\$14,000
SFU Fellowships etc	Robert Kesic	MITACS RTA (Summer 2020); TA (Spring 2021); GF (Fall 2020)	\$19,288
SFU Fellowships etc	Lee-Zuck, Catherine	GF (Fall 2020)	\$7,000
SFU Fellowships etc	Leonard, Kathryn	TA (Fall 2020)	\$6,288
SFU Fellowships etc	Leonard, Kathryn	GF (Fall 2020, Spring 2021)	\$14,000
SFU Fellowships etc	Pastran, Sonya	GF (Summer 2020); Laskeek Project Funding	\$14,000
SFU Fellowships etc	Roodenrijs, Hannah	GF (Spring 2021)	\$7,000
SFU Fellowships etc	Ware, Lena	GF (Fall 2020)	\$7,000
<u>General Funding for CWE</u>			
EC/Core	EC	EC Annual Chair Funding (3/3 yrs)	\$135,000
SFU	SFU	SFU Contribution to Faculty Salaries (Ydenberg Williams Green)	\$548,053

Conference Funding

SFU Fellowships etc	Allen, Josh	TMRA Summer 2020	\$500

Other Funding

Federal government	Williams	ECCC	\$73,300

Federal government	Elliott, Williams, Ydenberg	COVID Relief	\$19,200

NSERC

NSERC	Green DJ	Overwintering ecology, migration strategies and demography of migratory birds (5/5 yrs)	\$47,000

NSERC	Ydenberg RC	NSERC Individual Research Grant - "Predation danger in the ecology of migration" (4/5 yrs)	\$28,000

NSERC	Williams TD	NSERC Individual Research Grant "Diet or exercise? How do birds cope with transitions in workload associated with parental care or fledging?"(1/5yrs)	\$55,000

NSERC	Elliott J	Investigating sources, transport, accumulation and effects of persistent contaminants in urban environments using a top predator as indicator (3/5 yrs)	\$37,000

Grand Total	\$1,136,527

SFU In-Kind	\$120,000

VI FUNDING

Fiscal year 2021-2022 marked the first year of a two year contract between the Simon Fraser University (Centre for Wildlife Ecology) and Environment and Climate Change Canada (Science and Technology Division). This grant supplied \$115,000 in 2021-2022, and will supply \$180,000 in 2022-2023 for CWE research in priority coastal, riparian and grassland ecosystems in British Columbia.

1 April 2021 - 31 March 2022 Scholarships, Fellowships, Grants for Students

<u>Description</u>	<u>Name of person</u>	<u>Notes</u>	<u>Amounts</u>
<u>PhD</u>			
SFU Fellowships etc	Allen, Josh	TA (Fall 2021), GF (Spring 2022)	\$18,076
SFU Fellowships etc	Fremlin, Katharine	GF (Summer 2021, Spring 2022)	\$10,500
SFU Fellowships etc	Hodinka, Brett	Dean's Entrance Scholarship (Summer 2021, Fall 2021, Spring 2022; TA (Spring 2022)	\$25,620
SFU Fellowships etc	King, Mason	GF (Fall 2021)	\$7,000
SFU Fellowships etc	Reurink, Florian	GF (Summer 2021, Fall 2021)	\$14,000
<u>M Sc</u>			
SFU Fellowships etc	Enns, Joanna	GF (Spring 2022)	\$7,000
SFU Fellowships etc	Hall, Hannah	GF (Fall 2021)	\$7,000
SFU Fellowships etc	Kemp, Jessica	TA (Spring 2022)	\$6,426
SFU Fellowships etc	Lee-Zuck, Catherine	GF (Summer 2021, Fall 2021)	\$9,700
SFU Fellowships etc	Leonard, Kathryn	GF (Fall 2021)	\$7,000
SFU Fellowships etc	Linton, Anna	TA (Spring 2022)	\$6,426
SFU Fellowships etc	Rankin, Cole	TA (Fall 2021); GF (Spring 2022)	\$12,178
SFU Fellowships etc	Roodenrijs, Hannah	GF (Fall 2021)	\$7,000
<u>General Funding for CWE</u>			
ECCC/Core	ECCC	EC Annual Chair Funding (1/2 yrs)	\$115,000
SFU	SFU	SFU Contribution to Faculty Salaries (Ydenberg, Williams Green)	\$582,559

Conference Funding

SFU Fellowships	Hodinka, Brett	TMRA Spring 2022	\$500
eBerg	Rankin, Cole	PEEC Spring 2022	\$150
eBerg	Roodenrijs, Hannah	PEEC Spring 2022	\$150

Other Funding

Federal government	Williams	ECCC	\$36,750
Federal government	Green	ECCC	\$4 9,200

NSERC

	Green DJ	Overwintering ecology, migration strategies and demography of migratory birds	\$47,000
Federal government			
Federal government	Ydenberg RC	NSERC Individual Research Grant - "Predation danger in the ecology of migration" (4/5 yrs)	\$28,000
Federal government	Williams TD	NSERC Individual Research Grant "Diet or exercise? How do birds cope with transitions in workload associated with parental care or fledging?" (1/5 yrs)	\$55,000
Federal government	Elliott J	Investigating sources, transport, accumulation and effects of persistent contaminants in urban environments using a top predator as indicator (3/5 yrs)	\$37,000
		Total funding:	<u>1,089,235</u>
	SFU In-Kind		\$120,000

Report Type: Renewal Application

Reporting Year: 2022

General Information

Name of the Centre/Institute: Centre for Operations Research and Decision Sciences

Website: <http://www.sfu.ca/math/research/cords.html>

Faculty: VP Research

Director: Tamon Stephen (Director)
Alexander (Sandy) Rutherford (Acting Director)

Director's term end: -

Renewal date: 2024-04-01

Details

Description of the Centre/Institute:

The Centre for Operations Research and Decision Sciences (CORDS) includes members from Business, Computing Science, Mathematics, SIAT and Statistics. It focuses on research activities in the area of operations research: the science of optimal decision-making. Members undertake applied research projects. During the past 5 years, the Centre has continued to provide support for Operations Research at SFU. The Centre's members include those responsible for the Operations Research programs. The undergraduate O.R. program is notable for its hands-on, project based courses, including the Operations Research Clinic, which produced finalists in the Canadian O.R. Society's undergraduate paper competitions from 2018-22, including one winner and one runner up.

The Centre/Institute's membership and organization structure:

Director: Tamon Stephen

Steering Committee: Tamon Stephen, Tom Loughin, Randall Pyke and Alexander Rutherford

Members: Lyn Bartram, Binay Bhattacharya, Cedric Chauve, Caroline Colijn, Matt DeVos, Luis Goddyn, Pavol Hell, Natalia Kouzniak, Ramesh Krishnamurti, Tom Loughin, Snezana Mitrovic-Minic, Bojan Mohar, Joseph Peters, Abraham Punnen, Randall Pyke, Alexander Rutherford, Tamon Stephen, Alexa van der Waall, Kay Wiese and Zhe George Zhang

Rationale for the renewal of the Centre/Institute:

The COVID-19 pandemic has highlighted the importance of mathematical modelling and Operations Research (OR) in informing public policy. During the pandemic, researchers at

CORDS collaborated with the BC Ministry of Health, Health Authorities, and the BC Centre for Disease Control to develop mathematical models to support capacity planning in acute care and critical care. The importance of OR in data-driven decision-making was recently recognized in the Mathematical and Statistical Modeling Education Act passed by the US House of Representatives. In BC and Canada, both the public and private sectors are seeking to engage with universities to build capacity in data-driven decision-making.

CORDS provides a focal point at SFU for bringing together researchers working in OR and other fields related to data-driven decision-making through its sponsorship of the OR seminars. By bringing together researchers at SFU working in OR and related fields, CORDS facilitates collaborations with government agencies and private sector companies seeking expertise at SFU in OR and data-driven decision-making. Government agencies, especially in the healthcare sector are seeking to build capacity in mathematical modelling and OR through a combination of hiring highly qualified personnel and engaging in training programmes with universities. During the pandemic, CORDS established initiatives in both areas with a particular focus on healthcare. A recent graduate of the OR MSc programme is developing simulation models at Decision Support, Vancouver Coastal Health to improve community care. A team of researchers from CORDS led by A. Rutherford recently provided a 1-year training program in simulation modelling for healthcare to the Hospital & Diagnostic Analytics Team in the BC Ministry of Health to build capacity in simulation modelling within the Ministry.

With the success of its research and training programs in OR and data analytics for healthcare during the pandemic, CORDS is engaged in a renewal phase to focus more on outreach to the public sector—especially in the healthcare sector—with the intention of playing a leading role in building capacity for data-driven decision-making in BC. Our renewal request is for two years, during which we will engage with our membership, other researchers at SFU, and the leaders from the public and private sector to build longer-term programs.

How has the Centre/Institute enhanced research over and above what would have been accomplished by an individual faculty member?

The Centre is a contact point for Operations Research at SFU, which facilitates engagement of SFU in OR consulting. Through CORDS, A. Rutherford has developed collaborations and obtained research contracts in healthcare operations research with the BC Ministry of Health, the Provincial Health Services Authority, Vancouver Coastal Health, and the BC Centre for Disease Control. Recently, T. Stephen has established collaborations with Save-on-Foods and the United Way of BC. R. Pyke, A. Rutherford, and T. Stephen have developed a consulting collaboration with Alberta Machine Intelligence Institute (Amii). These collaborations would have been more difficult for individual faculty members because CORDS allows us to present to outside stakeholders and collaborators the combined expertise of the CORDS membership.

CORDS members often jointly supervise graduate students. This allows us to involve graduate students in collaborative research contracts. In particular, the graduate students of C. Colijn, A. Rutherford, and T. Stephen have been actively involved in research contracts at CORDS. CORDS also contributes to undergraduate education in the Operations Research Program by facilitating projects for the OR capstone course (MATH 402W) and USRA projects. These projects sometimes lead to larger collaborations, which involve graduate students.

The collaborations facilitated by CORDS have also led to data sharing agreements, which have enhanced the research of CORDS members. Examples of data access facilitated by CORDS are an agreement with the Ministry of Health to obtain access to the BC Discharge Abstract Database (DAD) for hospital admissions, an agreement with the BC Critical Care Services Executive Committee for access to the BC Critical Care Database, and an agreement currently under negotiation for access to the Transparent Blood Inventory Database.

Operations Research is inherently interdisciplinary, and CORDS sponsors a seminar series to bring together faculty in different departments and faculties. The CORDS seminar series is also helpful in connecting with other institutions, notably UBC-Okanagan. During the last two years, the CORDS seminars were also offered on Zoom, which attracted participation from non-academics from health authorities and the Ministry of Health. This raised the profile in BC of SFU as a leading center for the application of Operations Research to healthcare.

How has the Centre/Institute accomplished its goals?

The centre has accomplished its goals by:

1. Organizing seminars and conferences.
2. Regular meetings with stakeholders to foster collaborations. A. Rutherford meets weekly with the Hospital and Diagnostic Analytics Group in the BC Ministry of Health to support capacity building for Operations Research and Simulation Modelling. A. Rutherford and J. Dhahan (PhD student working with Rutherford and Stephen) meet biweekly with the simulation modelling advisory group in the Provincial Blood Coordinating Office.
3. CORDS members apply jointly for research grants. C. Colijn and A. Rutherford have CANMOD funding from NSERC to support simulation modelling for planning critical care capacity in BC over the next year in the face of potential future COVID-19 waves.
4. Submitting applications for research contracts through programs such as the Partnerships for Health Innovation at the BC Ministry of Health.

Changes planned upon renewal (e.g. membership, organization structure, etc.):

Upon renewal, we plan to review the membership to bring in additional members from

other departments and faculties. The recent successes of CORDS in applying Operations Research and modelling to pandemic response and healthcare planning has highlighted the growing demand in BC for operations research and modelling applied to healthcare. We propose to target the Faculty of Health Sciences in expanding our membership to broaden the expertise of CORDS in this field.

Graduate students have been actively engaged in CORDS research projects in recent years. We will discuss with our membership proposal for formalizing graduate student membership in CORDS. This will allow graduate students to play a more active role in training opportunities supported by CORDS.

Students in the undergraduate Operations Research program and related programs at SFU participate in the Operations Research Student Union (ORSU), which publishes undergraduate papers in the journal Analytics Now. Members of CORDS have supported ORSU for many years. We will discuss with the CORDS membership the possibility of formalizing a relationship between CORDS and ORSU.

Significant accomplishments:

1) CORDS sponsors the Operations Research Seminar Series at SFU. Over the past 5 years, this seminar series has featured over 50 speakers from different disciplines and institutions.

For several years, the O.R. Seminar has been held jointly with UBC-Okanagan via videoconference. The migration to Zoom in Fall 2020 has allowed us to expand our audience to operations research practitioners at BC health authorities and the Ministry of Health.

2) CORDS sponsored and organized three West Coast Optimization Meetings in the past 5 years:

1. Fall 2017 (in-person at SFU Surrey, 53 participants).

2. Spring 2021 (on-line meeting co-organized with COCANA at UBC-Okanagan, 79 participants).

3. Spring 2022 (in-person as part of the Canadian Applied and Industrial Mathematics Society (CAIMS) annual meeting in Kelowna, 29 participants).

3) The healthcare operations group in CORDS led by A. Rutherford has been involved in a long-term project with the Ministry of Health to improve capacity for simulation modelling. This project helped to support the response to the pandemic in BC through:

1. A queuing theory model to project mechanical ventilator demand under different public health response scenarios.

[S. L. Zimmerman*, A. R. Rutherford, A. van der Waall, M. Norena, P. Dodek: A Queuing Model for Ventilator Capacity Management during the COVID-19

Pandemic. Submitted to Health Care Management Science (under revision), January 14, 2021. (medRxiv:2021.03.17.21253488, Feb 16, 2022)]

2. A large-scale simulation model of the BC Critical Care system to project demand under different scenarios for endemic COVID-19.

[A. R. Rutherford, S. L. Zimmerman*, M. Moeini*, R. Barket*, S. Ahkioon, D. E. G. Griesdale: Simulation Model of a Multi-Hospital Critical Care Network.

Invited talk at the 2022 Winter Simulation Conference, Singapore, and full paper to appear in the proceedings.]

3. A mini-course in simulation modelling given to modellers in the acute care analytics group at the Ministry of Health.

[A. van der Waall, K. Susvitasari*, S. L. Zimmerman*, J. Dhahan*, M. Moeini*, A. R. Rutherford: Acute Care Bed Utilization Models: Discrete Event

Simulations of Hospital Wards in AnyLogic. Lecture notes prepared for the BC Ministry of Health, March 1, 2022 (125 pages).]

4) CORDS promotes training of HQP by involving graduate students in research projects with external partners. During the two years of the COVID-19 pandemic, graduate students affiliated with CORDS were involved in a number of mathematical modelling collaborations to support the response to the pandemic:

1. N. Mulberry (PhD student supervised by C. Colijn & A. Rutherford) worked with the BCCDC to develop models for projecting COVID-19 cases. Her work informed the initial phase of the BC vaccine strategy.

2. K. Susvitasari (PhD student supervised by C. Colijn & A. Rutherford on this project) worked with the Ministry of Health to develop a simulation model for emergency hospital admissions. She presented her work at the Operational Research Applied to Health Services Conference (2021) and received the Steve Gallivan Award for best presentation by a PhD student.

3. J. Dhahan (PhD student supervised by A. Rutherford & T. Stephen) analyzed data on emergency hospital admissions in BC. Dhahan is currently working with the BC PBCO to develop a simulation model to improve inventory management of O-negative blood.

4. S. Zimmerman (MSc student supervised by A. Rutherford & T. Stephen) developed a queuing theory model to inform management of the provincial mechanical ventilator supply during the first 3 months of the pandemic and a simulation model of the BC Critical Care System to support pandemic planning. Zimmerman is currently working at VCH Decision Support.

5) Additional projects pairing HQP with external partners include:

1. B. He. (MSc student supervised by S. Mitrovic-Minic and T. Stephen) with the Surrey Fire Department (2015-17).

2. M. Faizrahnemoon (MITACS industrial postdoc supervised by T. Stephen) at Wesgar, Inc., Coquitlam (2017).

3. A. Rask, University of Michigan PhD student (MITACS Accelerate intern supervised by T. Stephen) at 1QBit, Inc., Vancouver (2019).

Notable media successes:

During the pandemic, CORDS members (A. Rutherford and a team of graduate students from Rutherford, Stephen, and Colijn) collaborated extensively with the BC Ministry of Health to inform planning for mechanical ventilators and critical care capacity. Much of this work informed COVID updates provided by the Ministry of Health, especially during the first three months of the pandemic. However, by agreement with the Ministry of Health all reporting to the media went through either the Ministry of Health or the BC Centre for Disease Control.

Events, workshops, public outreach events:

In 2019, CORDS applied for funding from PIMS to bring Prof. Margaret Brandeau (Stanford) to SFU as Distinguished Visitor on Healthcare Operations Research. Her visit would have included a public lecture. This funding application was successful; however, her visit has been postponed due to the pandemic. Subject to Prof. Brandeau's availability, we intend to renew this application.

The Centre/Institute's multi-year goals for the next renewal term:

1) Expand CORDS membership to include representation from more faculties.

A review and revitalization of CORDS membership was planned for two years ago; however, this has been delayed due to the pandemic. It has been impossible to plan in-person events, which are important for engaging with new faculty members. Furthermore, some of the current members in CORDS have been extensively involved in pandemic modelling and been unable to devote time to outreach within SFU.

Over the next two years will will focus on expanding our membership in the following faculties, schools, and departments: Faculty of Health Sciences, Computing Science, Beedie School of Business, School of Interactive Arts and Technology, and Department of Statistics and Actuarial Sciences.

Particular focus will be placed on engaging with new faculty members.

KPI 1:

This goal will be measured according to the number of new members and their breadth across different faculties.

2) Graduate students play an important role in research projects at CORDS. In our recent meetings, we discussed formalizing a process for graduate student membership in CORDS to foster more collaboration and interaction between graduate students of faculty members. Part of this vision was inviting Prof. Brandeau as a PIMS Distinguished Visitor in Healthcare Operations Research. Development of a process for greater graduate student involvement in CORDS has been delayed due to the pandemic; however, we plan to begin discussions on this with the membership in fall 2022.

KPI 2:

Existence of an active graduate student membership in CORDS.

3) Developing a mini-course on Operations Research and Modelling for promotion to the government and private sector.

We plan to use the mini-course that was developed for the Ministry of Health as the basis for a course that can be offered more broadly to decision support, data analytics, and operations research teams at health authorities in BC and other provinces. We hope to work with the Partnerships Hub at the SFU VPR's office to establish a model for offering this course for paid tuition to provide financial support for CORDS.

KPI 3:

Revenue generated by offering training course(s) to outside agencies.

4) Establish long-term collaborations with external agencies to provide ongoing consulting support.

Currently discussion are underway with Vancouver Coastal Health and the Ministry of Health to formalize relationships to provide ongoing expertise in Operations Research. Our relationship with the Community Health Division at VCH was formalized in an MOU between VCH and SFU that was signed in 2020. We feel that formalizing relationships in this way will allow us to coordinate the research contracts, mini-course training, and internships for graduate students.

KPI 4:

Existence of collaboration agreements or MOUs with outside agencies.

5) Host an edition of the West Coast Optimization Meeting (WCOM) at SFU in 2023 or 2024. WCOM was meeting regularly once or twice a year through 2019. In 2020 it was unable to meet. This was followed by an on-line meeting in 2021 and meeting within a conference in 2022. We would like to resume traditional meetings of this series. It will probably not make sense to do this in Spring 2023 with the SIAM Optimization Meeting running in Seattle, but Fall 2023 or Spring or Fall of 2024 may work well. We will co-ordinate with other potential hosts (UW, UBC Vancouver, UBC Okanagan and UVic).

KPI 5:

Whether the series resumes.

Supporting documents:

Membership_signoff_form_2022_2vr9va7.xlsx (See attachment below)

Financial Summary

Does your Centre/Institute receive direct financial support from the university?

No

Was the Centre/Institute leveraged to attract external funding (donations, grants, contracts) which were only made possible by its existence?

Yes

External funding details:

1. Research contract from the BC Ministry of Health Partnership for Healthcare Innovation.

Project: Develop and support simulation models for hospital ward beds and the critical care system

PI: A. Rutherford

Amount: \$315,000

Funding term: April 1, 2020 to March 31, 2021 (granted a co-cost extension)

2. CANMOD Grant (NSERC)

Project: A Decision Support Tool for Advanced Acute Care Resource Allocation during COVID-19

Project PI: A. Rutherford

CANMOD PI: C. Colijn

Amount: \$44,000

Funding term: March 15, 2021 to March 31, 2023

Confirm policy review:

Yes

Submitted by:

Tamon Stephen, Director

Director's comments:

It's certainly been an unusual 5 year period. CORDS was founded along with the O.R. program in Mathematics in Surrey, and had made some connections there. Not long after the previous renewal, Math decided to rebase the O.R. program in Burnaby. The O.R. Seminar has followed. In fact, many of O.R.'s natural partners, such as Computing Science, Economics and Business are Burnaby-based.

Soon after arriving in Burnaby, Covid hit, causing a variety of disruptions. While our core activities didn't stop except for a brief period in Spring 2020, we haven't managed to reach out as we would have liked to. For this reason, we propose a two year renewal which will give us some time to do this.

Reviewer's Section

Reviewed by:

Michael Richards, Associate Vice-President, Research

Reviewer's decision:

Approved for 2 years

Reviewer's comments:

This centre is undertaking active mathematical-based research on a number of important public issues, especially pandemic-related modelling. It is encouraging too see the desire to expand the membership of this centre upon renewal. I recommend renewal of this centre.

Report Type: Renewal Application

Reporting Year: 2022

General Information

Name of the Centre/Institute: Centre for Studies in Print and Media Cultures

Website: <http://www.sfu.ca/cspmc.html>

Faculty: VP Research

Director: Rebecca Dowson

Director's term end: 2022-12-31

Renewal date: 2025-11-01

Details

Description of the Centre/Institute:

The Centre for Studies in Print and Media Cultures is a multidisciplinary research group at Simon Fraser University. Its mission is:

(a) to encourage interdisciplinary exchange among researchers in the multi-disciplinary areas of Print and Media Studies;

(b) to promote innovative theoretically and historically grounded research in these areas;

(c) and to support advanced education in the overlapping investigative fields of print culture, media cultures in general, communications technologies, the arts, and the public sphere.

This interdisciplinary community builds on the foundation established since 1998 by the Print Culture Studies group based in the Department of English. The CSPMC, formed in 2007, brings together scholars in a wide range of humanities, social sciences, and applied sciences departments, schools, and non-departmentalized programs, including Communication, Contemporary Arts, English, History, Humanities, Interactive Arts and Technology, Linguistics, Publishing Studies, and Scottish Studies. Through the involvement of senior and upcoming scholars in the Faculties of Arts and Social Sciences (FASS) and of Communication, Arts and Technology (FCAT), the Centre is well positioned to profile new research clusters and initiatives in some of the university's largest departments, and to build bridges between the humanities, the social sciences, and the applied sciences. The CSPMC has also established a strong relationship with the SFU Library; with its holdings in Special Collections and its ongoing technological innovations, the Library is a central player to the Centre's collaborations.

The Centre/Institute's membership and organization structure:

The Centre welcomes members of the SFU community whose interests are in keeping with the mission of the Centre. The Centre's cross-faculty membership has included representatives from Communication, Contemporary Arts, English, Gender, Sexuality and Women's Studies, History, Interactive Arts and Technology, Linguistics, Publishing, and the Library. Graduate students are particularly encouraged to participate in the Centre's activities. The Centre is governed by a Director and a Steering Committee.

Rationale for the renewal of the Centre/Institute:

The opportunities and challenges identified in SFU's Strategic Research Plan resonate strongly with the work of the Centre and its membership. In particular, the Centre is well positioned to respond to the identified research clusters of "Community-Based Research" and "Big Data" and research challenges 2, 4, 5, 6 (Understanding our origins; Strengthening civil society by advancing justice equity and social responsibility; Enhancing our world through technology, and Transforming the landscape of teaching and learning).

A founding principle of the Centre is to build bridges between disciplinary specialists in the areas of Print and Media Studies. The research collaborations facilitated by Centre activities since 2007 have established strong links between scholars from the Faculty of Arts and Social Sciences, the Faculty of Contemporary Studies, and the SFU Library. Connections among these groups promote the exchange of theoretical and methodological approaches across disciplines and positions SFU scholars for strategic networking and collaboration with academics from other universities, creative and technological industries, and memory institutions holding cultural data collections.

The SFU Library, home of Special Collections and Rare Books and the Digital Humanities Innovation Lab, has recently opened the Media Maker Commons (MMC). MMC users have access to tools and expertise for experimentation and prototyping, as well as support for acquiring digital literacies. Available technologies support several key areas of activity and inquiry, including video and audio production; letterpress printing; 3D printing and scanning; and electronics. Of particular interest to the Centre's membership is the inclusion of letterpress printing technology and the planned development of the Dick Kouwenhoven Book Arts Studio and Printer-in-Residence program. Access to this technology will open partnership opportunities with local experts in the publishing industry and academic specialists in the areas of bibliography and book history to lead expert seminars on the material culture of print.

The international turn towards examining cultural memory through a data-driven lens invites scholars to develop computationally driven approaches to gather, analyze, and disseminate research in the areas of Print and Media Cultures. The Digital Humanities Innovation Lab is a natural point of continued collaboration with the Centre, however, there

is potential for further collaboration with other research partners located at SFU's Big Data Hub. In particular, access to training resources in computational approaches to scholarship and partnerships in data visualization align well with the goals of the Centre. In addition to leveraging the potential to develop methodological interventions using Big Data, the Centre is also well positioned to examine the limits and ethical questions of Big Data through humanistic inquiry.

In addition to the current expertise and research initiatives at SFU supporting the mandate of the Centre, there are potential future funding supports that will increase the capacity to engage in collaborative study of print and media cultures. Centre member Michelle Levy is co-lead on a recently submitted Canadian Foundation for Innovation (CFI) Innovation grant proposal titled "Digital Cultures: Co-Designing Technology for Cultural Heritage and Community Engagement". The project details the development of a Digital Cultures Centre and Main Digital Studio, staffed with experts in digital storytelling, digital media, software development, and user interface design. This infrastructure will support collaboration between researchers and community groups to develop platforms that enable research-driven digital stories about the cultural past and present and "will engage academic and non-academic communities in new understandings of our cultural past and present, combat disinformation, and promote more inclusive and diverse digital culture." Several centre members form part of the core research team and wider user group identified in the application. The results of the competition will be announced in Summer 2023.

How has the Centre/Institute enhanced research over and above what would have been accomplished by an individual faculty member?

The Centre draws on the expertise and resources of affiliated units to enhance educational and research opportunities in the areas of Print and Media Studies through research collaborations, public events, discussion groups, and workshops. These activities bring together researchers to discuss theoretical and methodological approaches, build digital research skills, and co-develop new modes of critical analysis in the areas of print and media theory and culture.

The use of computationally-intensive methods to collect, analyze, and disseminate innovative digital scholarship in the social sciences, arts, and humanities requires a combination of expertise in these academic disciplines, digital curation and preservation, software and web development, and publishing and dissemination. This research movement demands new models of collaboration between scholars, librarians, technologists, and communities engaged in the production of cultural memory. The Centre serves as a platform to connect researchers and practitioners across these interrelated sectors and as such, facilitates new modes of scholarly production.

How has the Centre/Institute accomplished its goals?

The Centre facilitates research exchange and collaboration through colloquia, conferences featuring internationally and nationally prominent speakers, and reading groups. The

interdisciplinary research culture fostered by the Centre has produced several major research or colloquium proposals. Past conference and colloquium topics have included “Digital Humanities: Theory, Practice, Pedagogy,” “Media in Time and Space,” “Media and Cultural Memory, and “The Afterlife of Media.” Reading groups have focused on the themes of “Remediation,” “Residual Media,” “Participatory Media,” and “Actor Network Theory.”

During this renewal period, Centre members, affiliated programs and partners have continued this work via the Print Culture Program Speaker series; Digital Humanities Innovation Lab events and @Us Discussion Series; co-creation of digital and public humanities research projects; and presentations at major disciplinary conferences.

Additionally, Centre members as well as affiliated programs and partners have supported advanced education in print and media cultures through specialized workshops in research software, digital and archival research methods, and access to advanced technologies that support the production of media and research creation. These resources have supported independent and course-integrated research.

Changes planned upon renewal (e.g. membership, organization structure, etc.):

During the first year of the requested renewal period, the Centre will undertake a strategic planning process to reassess its mission, vision, and goals. As part of this process the Centre will also make changes required to adhere to the requirements of policy R 40.01, including a revamped web presence and change of name request to reflect its position as an institute.

This renewal period will also provide the Centre with an opportunity to grow the membership through outreach to SFU researchers who have established aligned research programs since the Centre was last active. There will also be an effort to connect with other Centres and Institutes with shared research interests, as well as potential partner units such as SFU Galleries, the Knowledge Mobilization Hub, and the Community-Engaged Research Initiative (CERi), and the Centre for Digital Media. The Centre will accomplish this outreach, in part, through programming efforts in the second and third years of the renewal period. Additional outreach mechanisms may also be developed through the strategic planning process.

Significant accomplishments:

1) The Digital Humanities Innovation Lab is a collaboration based in the Library and developed in partnership with faculty members engaging in Digital Humanities research. This initiative aligns emerging research and teaching agendas in the Digital Humanities with the Library’s expertise in digital initiatives, unique special collections, skill development and research dissemination programming. The DHIL works to establish best practices in developing digital projects, supports the development of highly qualified personnel via a digital humanities student intern program, and facilitates a robust digital humanities community at SFU. The lab has supported 11 Digital Fellows, SFU graduate students from FASS, FCAT, and FAS) between 2017-2022.

Co-founders Drs. Colette Colligan and Michelle Levy directed the DHIL until 2020. Several Centre members work together through DHIL sponsored research projects and participation in DHIL hosted workshops and events from 2016 to present. Centre member projects supported by DHIL include: Books in English Parishes (J. Craig), Reconstructing Early Circus: Entertainments at Astley's Amphitheatre, 1768-1833 (L. Davis), Photoshop Inscriptions (F. Lesage), Women's Print History Project, 1750-1836 (M. Levy), and Aldus@SFU (J. Maxwell), Amplify Podcast Network (H. McGregor), Manuscript Verse Miscellanies (B. Schellenberg). A full list of projects and events can be found on the DHIL website (dhil.lib.sfu.ca).

2) The SSHRC funded SFU-UVic Digital Pedagogy Network (Co-PIs Drs. Colette Colligan & Michelle Levy) was established to build on the existing interdisciplinary and interinstitutional connections between Simon Fraser University and University of Victoria. The multi-lab, cross-institutional regional network emphasized the exchange and mobilization of knowledge and training between faculty, students, librarians, educational partners, and the general public in the field of digital research and learning. Funding provided by a SSHRC Connections grant supported a series of events in 2016-2018 that will enable us to share new methods, training opportunities, and research on digital pedagogy.

Events included an Indigenous Film and Media Wikipedia Edit-a-thon (2016), two Student Project Showcases (2017 & 2018), a Symposium (2017), the development and delivery of a short course for the Digital Humanities Summer Institute on Digital Fieldwork Methods (2018), and the publication of a special issue of Digital Studies (V. 10, issue 1) titled "Student Perspectives from within the Digital Pedagogy Network (DPN)", guest edited by SFU graduate student Kandice Sharren.

3) The SSHRC-funded SpokenWeb partnership (2018-present) aims to develop coordinated and collaborative approaches to literary historical study, digital development, and critical and pedagogical engagement with diverse collections of literary sound recordings from across Canada and beyond. Centre members M. Levy, H. McGregor and R. Dowson are co-applicants on the project, while additional SFU representation includes Melissa Salrin, Tony Power, and Mark Jordan (Library), Clint Burnham and Carole Gerson (English), and 11 current or former SFU graduate students.

Outcomes of the project thus far include digitization of key literary audio recordings held in SFU Special Collections and Rare Books, the SpokenWeb Podcast (Hosted by H. McGregor); and a series of annual Symposiums and Sound Studies Institutes. The inaugural Institute and Symposium was held at SFU in May 2019. A full list of research outputs and partnership activities can be found at spokenweb.ca.

4) The Implementing New Knowledge Environments (INKE) Partnership is a North American-based research network with the goal of fostering open social scholarship:

academic practice that enables the creation, dissemination, and engagement of open research by specialists and non-specialists in accessible and significant ways. Centre members R. Dowson, M. Levy, J. Maxwell, alongside Colette Colligan and University Librarian Gwen Bird are active participants in the INKE membership activities, including the annual INKE gatherings. A full list of research outputs and partnership activities can be found at inke.ca.

5) The SSHRC funded Women in Book History, 1660-1836 Symposium was held in Vancouver in August 2018 and continued at the Folger Shakespeare Library in Washington, D.C., in March 2019. This international meeting of experts working to unearth and communicate the stories of women's involvement in creating manuscript and print literature in the long eighteenth century brought together scholars, librarians, and archivists from Europe and North America. Participants "thought collectively about how the often-separate practices associated with literary studies, textual and editorial scholarship, bibliography and book history, social and feminist history, and archival, digital, computational, and quantitative methods" could be combined. Some of these reflections were captured in a Special Issue of Huntington Library Quarterly (Volume 84, Number 1, Spring 2021), edited by Drs. Levy and Schellenberg. Centre members participating in the symposium included: L. Davis, R. Dowson, M. Levy, B. Schellenberg. Additional SFU participation included Colette Colligan, Carole Gerson and Diana Solomon (English) and Melissa Salrin (Library).

6) Davis, Leith, Joey Takeda, Jasmyn Bojakli, Taylor Breckles, Alyssa Bridgman, and Kaitlyn MacInnis. "NextGen Meets OldGen: Encoding an Eighteenth-Century Metadata Project." Text Encoding Initiative (TEI) 2021 Conference. October 26, 2021.

7) Maxwell, John and Rebecca Dowson. "An Embarrassment of Riches: The Challenge to Balance Focus and Sustainability in an Open, Collaborative Project". Open Digital Collaborative Project Preservation in the Humanities. June 15, 2021.

8) Levy, Michelle. "The Women's Print History Project." University of Toronto's Lightning Lunch – Digital Literary Archives, 5 January 2021, online.

9) Joyce, Michael, Joey Takeda, Frédéric Lesage, Michelle Levy, and Rémi Castonguay. "Collaboration in the Middle." Collaboration Roundtable. Collaboration: Digital Humanities Conference. University of British Columbia. October 29, 2020.

10) Lesage, Frédéric. "Photoshop Inscriptions: Tracing communicative genres of 'know how' for digital culture." DHIL Research Spotlight Series. April 2019.

11) Bordini, Alessandra and John Maxwell. "Breaking SFU Aldines Out of the Vaults: Aldus Manutius and the Origin of Open Social Scholarship" Understanding and Enacting Open Scholarship, An INKE-hosted gathering. 16 January 2019.

12) Davis, Leith. "The Sound of Spectacle and the Spectacle of Sound: Phillip Astley and Circus Songs," Song and the City Symposium, University College, London. October 2017.

13) Dowson, Rebecca. "Collaborative Approaches to Digital Scholarship and Open Access Foreign-Language Press Archives". 5th International TransfoPress Encounter. Paris, France. October 2017.

14) McGregor, Hannah and Ray Siemens. "Open Beyond the Academy: Building Community Through Open Social Scholarship" SFU Open Access Week. October 27 2017.

15) Levy, Michelle, and Kandice Sharren. "Aggregating and Remediating Women's Book History in 'The Women's Print History Project, 1750-1836.'" NASSR Annual Meeting: "Romantic Life," Ottawa, ON. 9-13 August 2017.

Notable media successes:

-

Events, workshops, public outreach events:

1) Over the past five years, members of the Centre have organized colloquia, speaker series, conferences, and workshops relevant to the mission of the Centre. In particular, the Print Culture Speaker Series organized by the Department of English and the workshop and events series organized by the Digital Humanities Innovation Lab continues to provide opportunities to promote innovative research in the areas of Print and Media Studies.

2) Print Culture Program Speakers Series (PCP Coordinators: Matthew Hussey, Diana Solomon, Leith Davis)

Canadian Magazines & the Emergence of Contemporary Cultures of Celebrity in English Canada. Dr. Katja Lee, University of Western Australia. January 26, 2018.

Was There a Scottish Novel After Scott? Professor Juliet Shields, University of Washington. March 9, 2018.

Chaucer and his Books. Professor Alexandra Gillespie, University of Toronto. April 6, 2018.

Affect in the Margins: Marking Readers in Elegiac Sonnets. Professor Michael Gamer, University of Pennsylvania. October 19, 2018.

Local Heroes: Mapping Memoirs in Early Modern England. Professor Elizabeth Hodgson, University of British Columbia. November 30, 2018.

Obscenity & Censorship in Modernist Literature. Professor Robert Spoo, University of Tulsa.
February 1, 2019

Novel Mediations: Negotiating Print and Manuscript in the Long Eighteenth Century.
Professor Marta Kvand, Texas Tech University. September 20, 2019.

Indigenizing Book History. Presenters: Dr. Carole Gerson, Dr. Sophie McCall, Dr. Deanna Reder, & Dr. Alix Shield, SFU. October 7, 2021.

3) Archival Research: A Best-Practices Workshop (Feb 18 2022)

Co-organized by Betty Schellenberg and Linda Morra (Visiting Farley Professor). Featuring talks by Centre members Betty Schellenberg, Michelle Levy and John Craig.

This workshop was designed to facilitate the process for students embarking on archival research for the first time. The workshop featured scholars who have used archival materials in crucial ways in their own research, theorized about them and what they mean, and developed material or digital forms of archives, with which other scholars and researchers have come to work.

4) Digital Humanities Innovation Lab Workshops & Events

Each semester the DHIL offers hands-on workshops on methods and tools relevant to digital research in the humanities that are free and open to all. A number of these topics are relevant to the research interests of Centre members and frequently DHIL supported projects by Centre members are used as examples in the workshops. A sample of topics offered between 2017-2022 include:

Intro to Digital Humanities Tools

Using Palladio for Social Network Visualization

Introduction to the Text Encoding Initiative (TEI): What is it and why should I care?

Minimal Computing, or When Wordpress No Longer Sparks Joy

Introduction to APIs and Web Scraping: Ethical Considerations

Introduction to Content Management Systems: Creating Exhibits with Omeka

Introduction to Twitter Bots with Tracery

Using NVivo for Humanities Research

Introduction to Spatial Data in the Humanities: The Spatial Elements of Textual Analysis

Introduction to Spatial Data in the Humanities: Creating Story Maps

Beyond the Cloud: Using Voyant Tools to Analyze Texts

Tools for Humanities Data Analysis

You Mean I Produce Data, Too? Managing Research Objects in the Arts, Humanities, and Social Sciences

5) @Us Critical Digital Humanities Discussion Series

From 2018-2019 the DHIL hosted a reading group focused on critical digital humanities. Topics covered included: Social Media, Research, and Teaching; Feminism and the Digital Humanities; Intersectionality and Digital Projects; and Disorienting Democracy.

6) Building Better Galleries, Libraries, Archives and Museum Labs

On February 25, 2019, the DHIL hosted a keynote and workshop by Mahendra Mahey, British Library Labs (BL Labs) Manager. The British Library is one of the largest reference libraries in the world, created in 1753 as a part of the British Museum and made a separate institution in 1973. BL Labs is a part of the British Library's Digital Scholarship team, and it works to connect researchers, artists, and educators with the BL's digital collections in innovative ways.

7) Speculative Interventions: Employing the imaginary in Value-Sensitive Design

On February 27, 2020, the DHIL hosted a keynote and workshop by designer, curator, and researcher Gillian Russell. The event focused on the potential for the imaginary as a design tool for social change. Working at the intersection of design, anthropological futures, and narrative environments, Russell's work uses a combination of speculative intervention and value-sensitive design to engage publics to question the authority of a specific reality in order to foreground its assumptions and ideologies – raising awareness that if reality is made, then it can be unmade and made anew.

The Centre/Institute's multi-year goals for the next renewal term:

1) Make any necessary changes to adhere to the requirements of policy R 40.01.

KPI 1:

KPI 1: Complete a name change request to reflect the appropriate status as an Institute.
KPI 2: Launch a renewed website under the new name. Consider launching other social media accounts as appropriate.

2) Develop a strategic plan for 2022-2025 that includes a refreshed mission.

KPI 2:

KPI 1: A strategic plan for the centre is published on the website.

KPI 2: Planned activities will reference identified priorities in the strategic plan.

3) Conduct outreach to new members that reflect the current research strengths in print and media culture at SFU. Consider outreach to external experts in these areas (scholars, creative and tech professionals, cultural memory organizations, community members).

KPI 3:

KPI 1: The centre's membership will be expanded.

4) Promote interdisciplinary exchange and increase cross-institutional collaboration in the overlapping areas of fields of print culture, media cultures in general communications technologies, the arts, and the public sphere.

KPI 4:

KPI 1: Host an event, such as a colloquium, to explore the place of print and media culture research at SFU and beyond.

KPI 2: Explore grant funding opportunities to support the CSPMC research activities.

Supporting documents:

CSPMC_Membership_signoff_form_IJgDyTj.xlsx (See attachment below)

Financial Summary

Does your Centre/Institute receive direct financial support from the university?

Yes

SFU account number:

N890521

Opening balance:

\$492.26

Revenues:

-

Expenditures:

-

Closing balance:

\$492.26

Financial report:

CSPMC_FAST22_DLtSYj9.pdf (See attachment below)

Financial contributions from the university:

No ongoing contributions. The funds reflected in the account are those remaining from previous CSPMC activities.

List of major equipment provided by the university:

-

University personnel:

-

Space provided by the university:

-

Was the Centre/Institute leveraged to attract external funding (donations, grants, contracts) which were only made possible by its existence?

No

Confirm policy review:

Yes

Submitted by:

Rebecca Dowson, Director

Director's comments:

SFU's research excellence in the overlapping fields of print and media cultures continues to produce innovative theoretical and practical interventions in a wide range of fields. Recent expansion of research infrastructure to support these areas of investigation provides fertile ground for continued growth. However, due to capacity challenges (pandemic and personal), the Centre's activities during the period of this report have been largely facilitated through the connections between members and partner units rather than Centre organized activities. The members listed on this renewal application are enthusiastic to revive the activity of the Centre, reaching out to colleagues within their departments and beyond who have joined SFU recently for guidance during the proposed strategic planning process. We

feel a renewal period of three years will be adequate to conduct such a process, learn the results of the proposed CFI Innovation Fund application, and make progress on Centre organized research exchange and collaboration initiatives.

Reviewer's Section

Reviewed by:

Michael Richards, Associate Vice-President, Research

Reviewer's decision:

Approved for 3 years

Reviewer's comments:

This centre is very interdisciplinary with members from across SFU departments and Faculties. The research is innovative, especially in Digital Humanities. Upon renewal there is a plan to review the centre's strategic plan and membership, with the hope of expanding membership even further. I recommend renewal of this Centre.

SFU FAST System

Printed: 8/31/2022
Report Filter: User: rda26 Project: N890521 Int Of Print Media Cult-DowPeriod: Fiscal 2022

Fund	Description	Budget Original	Budget Adjustments	Total Budget	Mar-2022 Cur.Month	Mar-2022 YTD.Actuals	O/S Encumb.	Balance Available
13	Internal Research (OR)	0.00	492.26	492.26	0.00	0.00	0.00	492.26
	Total	0.00	492.26	492.26	0.00	0.00	0.00	492.26

Report Type: Renewal Application

Reporting Year: 2022

General Information

Name of the Centre/Institute: International Cybercrime Research Centre (ICRC)
Website: <https://www.sfu.ca/icrc.html>
Faculty: VP Research
Director: Richard Frank
Director's term end: 2021-04-01
Renewal date: 2027-04-01

Details

Description of the Centre/Institute:

The International Cyber Crime Research Centre (ICCRC) was borne out of a joint venture consisting of Simon Fraser University, the Province of BC, and the International Society for the Policing of Cyberspace (POLCYB), a BC-based non-profit organization established to prevent and combat crimes on the Internet. It opened at the Surrey Campus of Simon Fraser University in the summer of 2008. Significant core funding was provided by the Government of British Columbia. The ICCRC is a focal point for collaboration among cybercrime researchers from universities, government agencies, NGOs and private sector organizations. The Centre brings together SFU faculty researchers, researchers from other Canadian and international universities, relevant government agencies, and private sector organizations to address issues related to countering criminal activity within cyberspace. Projects are concerned with child exploitation, terrorism, the dark web or Internet crimes such as hate narratives on social media platforms. Some of the projects are more technical in nature, two current projects, for example, deal with ways to detect money laundering using machine learning, capture and analyze data from online cryptomarkets. Other projects are more qualitative in nature, such as our project on surveying people's attitudes about online cryptomarket purchases, or their experiences with online abuse during COVID. Finally, the Centre also conducts studies on online social movements, like the #metoo Twitter movement bringing support for the victims of sexual assault and harassment. Throughout these projects, the Centre develops web-crawling and analysis tools for studying a wide variety of activities and content on the Internet although a lot of the recent research projects have involved the application of machine learning models to solve these problems. Many of our research projects are in collaboration with various organizations or government entities, relationships built through years of work and collaboration, recently leading to larger research projects and student complement.

The Centre/Institute's membership and organization structure:

Richard Frank became director in late Fall 2017. There are two Associate Directors:

- Dr. Barry Cartwright, who retired from the School of Criminology in August of 2020 but still remains very active, or is co-PI, in a number of our research projects at the Center, and is expected to continue to participate in our research projects and publications.
- Dr. Ryan Scrives, who did his PhD at the School of Criminology (SFU) while at the ICCRC, and is currently an Assistant Professor the School of Criminal Justice at Michigan State University. We have a number of ongoing research projects, and he is the webmaster for the ICCRC website. He is also a prolific publisher in journals.

Our members include scholars from:

- The USA
 - o Thomas Holt at MSU
 - o Bryce Westlake and San Jose State U
- Australia
 - o Lennon Chang at Monash U
 - o Russel Brewer at the University of Adelaide, with whom we are trying to establish a reciprocal Field School
- the UK
 - o George Weir, U of Strathclyde, who hosted, and is expected to host in 2023, our Field School to Scotland
- Malaysia
 - o Manmeet Kaur Mahinderjit Singh at University Sains Malaysia with whom we currently have a joint project
- Canadians
 - o Laura Huey at Western University
- The ICCRC would not be complete without students. We currently have the following students:

- o Noelle Warkentin, who is currently a first-year PhD student interested in studying dark-web firearm sales
- o Ashleigh Gonzales, who is a third-year MA student, and also full time RCMP analyst, who is studying money laundering in BC
- o Yuxuan Zhang, a third-year MA student, studying online threats against critical infrastructure, and will be a PhD student in Fall 2023
- o Ruby Ling, who is a third-year MA student studying the female contributions to the gender-based extremist incel community who will defend in a month
- o Shu Liu, a second-year MA student studying online cryptomarkets who will defend in a month
- o Kelley Massingale, a first-year MA student studying cults
- We currently have 5 co-op students from Computing Science helping with technical work at the ICCRC
- We are currently sponsoring 3 half-time Undergrad Student Research Award recipients doing research for one of our projects
- We are expecting at least 1 MA student and 2 PhD students in Fall 2022

The full list of members can be viewed here: <https://www.sfu.ca/iccrc/members.html>

Rationale for the renewal of the Centre/Institute:

Hopefully the activities of the Centre will speak to the success of the research and work being done at the Centre. However, the Centre should continue for all of these reasons:

- The productivity of our members is increased through the collaborative nature of the Centre, where professors/researchers/students can draw upon each other's strengths knowing exactly who is doing what work and what special skills each person has. Without the Centre, this would be lost.
- Infrastructure: The Centre now has 4 servers within the lab, and 10 workstations that belong to the Centre used for day-to-day research by the members. We are also in the process of setting up 3 "secure" workstations where sensitive (for example, from the RCMP) data can be safely analyzed. In addition to this, the Centre has (virtual) infrastructure (one database server, one application server + 6 data-scraping virtual machines) that SFU IT

Services has provided for the data collection and analysis needs of the Centre. Without the umbrella of the Centre, this infrastructure would not have been possible, and our research would not have been possible.

- The importance and number of research projects we have ongoing. The Centre allows us to apply for external grants and other funding as an established institution, with the backing of multiple members and all the infrastructure provided by the Centre. We can use the ICCRC to provide continuity of projects in the event the members leave or join. Increasingly the name is being recognized during discussions with law enforcement.
- The role the Centre has played at the national and international level with the organizing of multiple conferences over the past few years, and by attracting professors and students from other national and international institutions for research and collaboration. Several professors have spent their sabbaticals with us in the past 5 years.
- The uniqueness of the Centre in Canada despite the growing importance of cybercrime, especially with it located within the School of Criminology, which gives the Centre a unique angle to address cybercrime issues. There are numerous very technical research centers and businesses that are trying to address cybercrime, but the ICCRC is unique in that we are also addressing the human element in this space.

None of our most recent projects would have been successfully received had we not had continuity in our reputation, the history of previous grants under the umbrella of the ICCRC, and the resources established over the years.

How has the Centre/Institute enhanced research over and above what would have been accomplished by an individual faculty member?

The ICCRC provides an important infrastructure for government and law enforcement agencies who want to collaborate with us. The name is becoming increasingly recognized. Without the Centre, we would not have the continuity in reputation, or infrastructure and computational capacity to organize the ambitious data collections we do on a daily basis. We need a separate server, multiple computers at a time to perform these tasks efficiently. It took years to develop.

The Centre also now has a secure environment, a lab with physical security approved by the RCMP to house sensitive data. This could not be achieved otherwise.

Having the ICCRC also allows us to attract international collaborations, and institutional collaborations like the partnership with (the just-ended) SERENE-RISC, which contributes to graduate student mentoring, and knowledge transfer to partners in the policy world. The ICCRC is currently a member and supporter of, for example, VOXPol, a Network of Excellence (NoE) funded by the European Union Framework Programme 7 (FP7) focused on researching the prevalence, contours, functions, and impacts of Violent Online Political

Extremism and responses to it. This scale of collaboration is possible due to our members, and not due to a specific individual.

How has the Centre/Institute accomplished its goals?

Our initial goal was to study online child exploitation here in BC. We started with that task in 2011 and worked on the problem for approximately 5 years through which we have expanded upon the research topics to include hackers and extremists, threats against critical infrastructure, the dark web, and online illicit drug sales. We've accomplished these by applying to provincial, federal, and sometimes private-entity, grants and contracts. If we're able to security the funding, then, working with ICCRC graduate students, or graduate or undergraduate students from the School of Criminology (and often from the School of Computing Science), we collect data, build tools, carry out analysis, and meet the deliverables laid out in the project proposal. Once the project is complete, we write up our findings and publish them in respected journals.

Through this process we meet our objectives of i) securing funding, ii) training undergraduate and graduate students in research, iii) conducting cutting-edge research, and iv) increasing the reputation of the ICCRC, the School of Criminology, and SFU in general.

Changes planned upon renewal (e.g. membership, organization structure, etc.):

There are no changes planned that are a direct result of the renewal of the ICCRC. Our membership changes periodically due to interest by researchers and students.

Significant accomplishments:

1) ****Graduate Students****

The following students have received their degrees directly as a result of their work within the ICCRC:

--PHD--

Logan Macnair – From Empty to Angry: Extremism, Modernity, and the Search for Identity – Currently teaching at Douglas College

Ryan Scrivens – Understanding the Collective Identity of the Radical Right Online: A Mixed-Methods Approach – Currently an Assistant Professor at the Michigan State University

--MASTERS--

Noelle Warkentin – Cyber-attacks again Critical Infrastructure

Sarah-May Strange – Fake news and LGBTQ

Rachelle Loudon – Influence of robo-calls on the Canadian Election

Karmvir Padda – Foreign Interference in U.S. Politics: An Examination of “Fake News”
Content on Social Media

Naomi Zakimi – Exploring anti-immigration discourse in Canada: A look at Reddit as part of
the right-wing extremist movement

Amanda Champion – Examining the Impacts Associated with Technology-Facilitated Sexual
Violence: A Mixed Methods Approach

Myf Thomson – When survivors speak, what does Twitter say?: A multiple case study of
#metoo

Tiana Gaudette – Upvoting Extremism: Exploring a far-right ‘virtual community’ on Reddit

Bryan Monk – Tor, what is it good for? How crime predicts domain stability on the darkweb

2) The following students have done their Honours work within the ICCRC:

--HONOURS--

Bomin Keum – Morphed, Entangled, and United: Introducing the Hybridity of Radicalization
in the COVID-19 era

Gabriel Pratico – Written in Blood & Glass: Terrorist Narratives, e-Communities, and Mass
Media Discursive Strategies and Themes

Mei Yuan – Incels or In (jail) Cells? An Exploration on Incel Killers Compared to Forum
Users.

Emily Choma – Cyber-Attacks against Critical Infrastructure

Naomi Zakimi – Narratives of hate in the mainstream: A comparison of Stormfront Canada
and Facebook

3) The following students have spent at least one semester at the ICCRC, paid, full time.
During this time they were trained, and performed data analysis or built tools for the ICCRC:

Dingshuo Yang – 4th Year Computing Science Student, SFU. Programmer

Tianming Liu – 4th Year Computing Science Student, SFU. Programmer

Caleb Tong – 4th Year Computing Science Student, SFU. Programmer

Katelyn Kim – 4th Year Computing Science Student, SFU. Programmer

Arpit Kaur – 4th Year Computing Science Student, SFU. Programmer

Jyotiraditya Mayor – 3rd Year Computing Science Student, SFU. Programmer

Ryan Ficocelli – 3rd Year Computing Science Student, TRU. Programmer

Ritika Goyal – 3rd Year Computing Science Student, SFU. Programmer

Suki Cai – 4th Year Computing Science Student, UBC. Programmer

Hod Kimhi – 4th Year Computing Science Student, UBC. Programmer

Andy Liu – 4th Year Computing Science Student, UBC. Programmer

Akio Suzuki – 5th Year Computing Science student. Programmer

Nick Yang – 3rd Year Computing Science student. Programmer

Manav Sharma – 3rd Year Computing Science student. Programmer

Soobin Rim – 3rd Year Computing Science student. Programmer.

Michael Xie – 3rd Year Computing Science student. Programmer.

Jason Wong – 4rd Year Computing Science student. Programmer.

4) Over the last 5 years, the ICCRC has conducted \$1.28m worth of projects:

****ICCRC-led Research projects****

Public Safety Canada's Cyber Security Cooperation Program: "Securely Linked Anti-Trafficking and Exploitation Database" \$494,500 CAD 8 students trained

Environment and Climate Change Canada: "Pilot project on using a webcrawler to study online wildlife trafficking networks" \$18,362.50 CAD 2 students trained

Office of Crime Reduction & Gang Outreach (OCR-GO) - Policing and Security Branch. "The role of trust between buyer and vendor trust on dark web firearms and drug markets in

British Columbia" \$78,046 CAD 3 students trained

Government of Canada's Digital Citizen Contribution Program "Deploying artificial intelligence to combat COVID-19 disinformation on social media" \$96,600
CAD 5 students trained

Office of Crime Reduction & Gang Outreach (OCR-GO) - Policing and Security Branch.
"Deploying artificial intelligence to detect and respond to the use of digital technology by perpetrators of human trafficking" \$84,688 CAD 4 students trained

Office of Crime Reduction & Gang Outreach (OCR-GO) - Policing and Security Branch.
"Understanding the Drug and Firearms on Dark Web Markets in British Columbia" \$79,688 CAD 3 students trained

Office of Crime Reduction & Gang Outreach (OCR-GO) - Policing and Security Branch.
"Impact of the COVID-19 Pandemic on Gender-based Violence and Related Essential Services" \$95,188 CAD 3 students trained

5) **ICCRC-led Research projects (cont'd)**

Office of Crime Reduction & Gang Outreach (OCR-GO) - Policing and Security Branch.
"Detecting Money Laundering An intelligent system for automatic detection of money laundering typologies from FINTRAC disclosures" \$100,000 CAD 2 students trained

Cyber Security and Critical Energy Infrastructure Program. "Risk and Resiliency: Evaluating Cyber Threats and Vulnerabilities to Canada's Critical Energy Infrastructure" \$48,152 CAD 3 students trained

Government of Canada's Innovation for Defence Excellence and Security (IDEaS) Program:
"The Dark Crawler: Detecting and responding to hostile information activities via textual analysis, sentiment analysis, and machine learning" \$164,956 CAD 7 students trained

SSHRC Partnership Engage Grants: "The Dark Figure of Reporting and the Dark Figure of Recording: Measuring Ransomware Attacks on Businesses in British Columbia" partnering with the RCMP \$18,750 CAD 2 students trained

Small SSHRC. "Beyond extremism: Examining the The_Donald and MetaCanada users" \$6,954 CAD 1 student trained

Public Safety Canada's Cyber Security Cooperation Program. "Fighting Disinformation Warfare with Artificial Intelligence - Using machine learning to identify and combat

disinformation attacks” \$28,750 CAD 3 students trained

Public Works and Government Services Canada “A taxonomy-based data collection and notification system for online investigations” \$158,102 CAD 6 students trained

6) **ICCRC-led Research projects (cont'd)**

Public Safety Canada. “Hackers hedging bets: a cross-community analysis of online hacking forums” \$43,700 CAD 3 students trained

7) --INTERNATIONAL RESEARCH FUNDING--

2020-2023 Researcher Ministry of Higher Education, Malaysia – “Advanced Persistent Threat Attacks Defender and Remediation model using behavioural based tactics, techniques and procedures (TTP) for Smartphone Environment” \$35,000 CAD

8) --Publications--

*Helm, B., Scrivens, R., Holt, T. J., Chermak, S. M., and Frank, R. (2022). Examining Incel Subculture on Reddit. Journal of Crime and Justice. Ahead of print, 1-19.

Scrivens, R., Wojciechowski, T. W., Freilich, J. D., Chermak, S. M., and Frank, R. (2022). Differentiating Online Posting Behaviors of Violent and Non-Violent Right-Wing Extremists. Criminal Justice Policy Review. Ahead of print, 1-23.

Scrivens, R., *Osuna, A. I., Chermak, S. M., *Whitney, M. A., and Frank, R. (2021). Examining Online Indicators of Extremism in Violent Right-Wing Extremist Forums. Studies in Conflict and Terrorism. Ahead of print, 1-25.

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Activity”, Deviant Behavior, Aug 2020

Cartwright, B., Weir, G.R.S., Frank, R., Padda, K.: “Deploying Artificial Intelligence to Combat Disinformation Warfare”, International Journal On Advances in Security, v 12 n 3&4 2019. Submitted Aug 2019

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Macnair, L., and Frank, R. “Changes and stabilities in the language of Islamic state magazines: a sentiment analysis”, Dynamics of Asymmetric Conflict, 11:2, 109-120. 2018

Macnair, L., and Frank, R.: “The mediums and the messages: exploring the language of Islamic State media through sentiment analysis” Studies in Conflict and Terrorism, March 2018

Notable media successes:

1) --This is a sample of media engagements --

CBC Radio Kamloops. Commenting on the rise of online fraud in Merritt, BC Radio

CTV News. Commenting on the fake encrypted phones created by FBI. TV

VOXPol: “Comparing the Online Posting Behaviors of Violent and Non-Violent Right-Wing Extremists” <https://www.voxpol.eu/comparing-the-online-posting-behaviors-of-violent-and-non-violent-right-wing-extremists/>

Global Network on Extremism & Technology “Comparing the Online Posting Behaviours of Violent and Non-Violent Right-Wing Extremists” <https://gnet-research.org/2021/03/10/comparing-the-online-posting-behaviours-of-violent-and-non-violent-right-wing-extremists/> Online

Global Network on Extremism & Technology “Upvoting Extremism: Collective Identity Formation and the Extreme Right on Reddit” <https://gnet-research.org/2020/11/25/upvoting-extremism-collective-identity-formation-and-the-extreme-right-on-reddit/> Online

VOXPol: “Triggered by Defeat or Victory? Assessing the Impact of Presidential Election

Results on Extreme Right-Wing Mobilisation Online” <https://www.voxpol.eu/triggered-by-defeat-or-victory/> Online

The Conversation “LifeLabs data breach: Hackers could still hold health records of 15M Canadians”

<https://theconversation.com/lifelabs-data-breach-hackers-could-still-hold-health-records-of-15m-canadians-129071>

Online

CFAX. Commenting on the LifeLabs hack of 15m Canadian data Radio

CKNW Morning Show. Commenting on the LifeLabs hack of 15m Canadian data Radio

2) Ming Pao Daily News. Commenting on the LifeLabs hack of 15m Canadian data Print

ATV. Commenting on hacks against BKK (In Hungarian) Live TV

<http://www.atv.hu/videok/video-20170811-frank-richard>

https://www.youtube.com/watch?v=LRGeKD_8bzc&feature=youtu.be

CBC. Commenting on the move to encrypted digital scanners Radio

C-FAX 1070, Commenting on the WannaCry Ransomware Radio

RoundHouse Radio 983, Commenting on the WannaCry Ransomware Radio

The Source, SFU students counter extremism through competition Print

<http://thelasource.com/en/2017/01/09/sfu-students-counter-extremism-through-competition/>

Country 103, Commenting on arrest of man for Child Exploitation Radio

Events, workshops, public outreach events:

Members continue to showcase ICCRC research and activities at various conferences and events. ICCRC members routinely meet with members of the law enforcement community to collaboratively work on policy issues, and other challenges facing either municipal, provincial or federal law enforcement agencies. We do not participate in active investigations, but attempt to help whenever possible. This allows us to be visible, while at

the same time influencing our research directions to be as relevant as possible. We have established relationships with various sections of the RCMP (with whom we have worked on, or are actively working on, three projects), as well as the Vancouver Police Department with whom we have discussed collaboration, and joint grants.

--Conferences organized--

FOSINT-SI (Forensic Open Source INtelligence – Security Informatics) 2017

--Public Outreach--

Panelist on the “CyberCrime and Security session of the Canadian Mortgage Brokers Association Conference” – ONLINE

Discussant after the documentary “Truth Detectives”, discussing the role of open source intelligence and big data in police investigations

Discussant after “The Events” theater production, discussing with audience how and why violent extremist individuals think, act, and how extremist communities work (online/offline)

“Lighting Up the Dark Web: Mapping the Lifecycle of Dark Websites in Search of Violent Extremist Content” presented to the Vancouver Security Special Interest Group

The Centre/Institute's multi-year goals for the next renewal term:

Our goals are to continue what we are doing right now: i) apply for funds to do research projects, ii) train students through those projects, iii) publish, and iv) engage with media/community.

Over the last 5 years, the ICCRC has conducted \$1.28m worth of projects, with \$963,710 within the last two years. We hope to continue along this path of applying for increasingly complex and larger projects, with a specific goal of applying for, and securing, funding for a large multi-year project that can keep the ICCRC occupied for 4-5 years.

KPI:

N/A

Supporting documents:

-

Financial Summary

Does your Centre/Institute receive direct financial support from the university?

No

Was the Centre/Institute leveraged to attract external funding (donations, grants, contracts) which were only made possible by its existence?

Yes

External funding details:

Over the last 5 years, the ICCRC has conducted \$1.28m worth of projects:

****ICCRC-led Research projects****

Public Safety Canada's Cyber Security Cooperation Program: "Securely Linked Anti-Trafficking and Exploitation Database" \$494,500 CAD 8 students trained

Environment and Climate Change Canada: "Pilot project on using a webcrawler to study online wildlife trafficking networks" \$18,362.50 CAD 2 students trained

Office of Crime Reduction & Gang Outreach (OCR-GO) - Policing and Security Branch. "The role of trust between buyer and vendor trust on dark web firearms and drug markets in British Columbia" \$78,046 CAD 3 students trained

Government of Canada's Digital Citizen Contribution Program "Deploying artificial intelligence to combat COVID-19 disinformation on social media" \$96,600
CAD 5 students trained

Office of Crime Reduction & Gang Outreach (OCR-GO) - Policing and Security Branch. "Deploying artificial intelligence to detect and respond to the use of digital technology by perpetrators of human trafficking" \$84,688 CAD 4 students trained

Office of Crime Reduction & Gang Outreach (OCR-GO) - Policing and Security Branch. "Understanding the Drug and Firearms on Dark Web Markets in British Columbia" \$79,688 CAD 3 students trained

Office of Crime Reduction & Gang Outreach (OCR-GO) - Policing and Security Branch. "Impact of the COVID-19 Pandemic on Gender-based Violence and Related Essential Services" \$95,188 CAD 3 students trained

****ICCRC-led Research projects (cont'd)****

Office of Crime Reduction & Gang Outreach (OCR-GO) - Policing and Security Branch. "Detecting Money Laundering An intelligent system for automatic detection of money

laundering typologies from FINTRAC disclosures" \$100,000 CAD 2 students trained

Cyber Security and Critical Energy Infrastructure Program. "Risk and Resiliency: Evaluating Cyber Threats and Vulnerabilities to Canada's Critical Energy Infrastructure"

\$48,152 CAD 3 students trained

Government of Canada's Innovation for Defence Excellence and Security (IDEaS) Program: "The Dark Crawler: Detecting and responding to hostile information activities via textual analysis, sentiment analysis, and machine learning" \$164,956 CAD 7 students trained

SSHRC Partnership Engage Grants: "The Dark Figure of Reporting and the Dark Figure of Recording: Measuring Ransomware Attacks on Businesses in British Columbia" partnering with the RCMP \$18,750 CAD 2 students trained

Small SSHRC. "Beyond extremism: Examining the The_Donald and MetaCanada users" \$6,954 CAD 1 student trained

Public Safety Canada's Cyber Security Cooperation Program. "Fighting Disinformation Warfare with Artificial Intelligence - Using machine learning to identify and combat disinformation attacks" \$28,750 CAD 3 students trained

Public Works and Government Services Canada "A taxonomy-based data collection and notification system for online investigations" \$158,102 CAD 6 students trained

****ICCRC-led Research projects (cont'd)****

Public Safety Canada. "Hackers hedging bets: a cross-community analysis of online hacking forums" \$43,700 CAD 3 students trained

Confirm policy review:

Yes

Submitted by:

Richard Frank, Director

Director's comments:

I feel very privileged to be able to lead the ICCRC, and conduct research within it, with a fantastic group of members and graduate students without whom none of this would be possible. We have established relationships with RCMP, VPD, and other agencies who are active in our area. These networks have taken years to develop and would not be possible

without the ICCRC, but are critical for the formulation of research grants, which often involve these organizations as interested parties.

Reviewer's Section

Reviewed by:

Michael Richards, Associate Vice-President, Research

Reviewer's decision:

Approved for 5 years

Reviewer's comments:

This is a very active Centre with a wide range of members from both SFU and International organizations, and with clear public outreach (especially with local and national police). I recommend renewal of this Centre.

Report Type: Renewal Application

Reporting Year: 2022

General Information

Name of the Centre/Institute: Science and Technology for Aging Research Institute (STAR)

Website: <http://www.sfu.ca/starinstitute.html>

Faculty: VP Research

Director: Andrew Sixsmith

Director's term end: 2022-04-01

Renewal date: 2027-04-01

Details

Description of the Centre/Institute:

AgeTech - using existing and emerging advanced technologies to support health and well-being in later life - is increasingly being recognized as a key component of the services and supports needed to help everyone age healthily and live independently. AgeTech can help older Canadians to keep healthy and active, increase their safety and security, support independent living, and enhance social participation, whatever the person's needs, abilities and circumstances.

This sector has enormous potential to not only improve the quality of all of our lives as we age, but to create good jobs and spark economic growth. Rapid advances in technology are occurring at the same time as population aging. AgeTech innovation is a key strategy for creating a society that is responsive to seniors' needs while reducing healthcare costs.

SFU's Science and Technology for Aging Research (STAR) Institute was founded in 2016 to support and nurture this process. The mission of the STAR Institute is to make SFU a world leader in research and innovation in the AgeTech sector, becoming an essential resource for students, researchers, industry and services in BC.

STAR and SFU has been a major partner of AGE-WELL Network of Centres of Excellence, Canada's Technology and Aging network (www.agewell-nce.ca). STAR Director Dr. Sixsmith was a founding co-Scientific Director of AGE-WELL and STAR has been at the forefront of research and innovation in AgeTech both in Canada and internationally. STAR is currently engaged in six transformational joint projects with AGE-WELL:

- AGE-WELL Healthy Lifestyles and Wellness Challenge Area program of research

- Leading and facilitating AGE-WELL/Springer AgeTech book series (<https://agewell-nce.ca/challenge-areas>)

- Health Care Management Forum (HMF) Journal - AGE-WELL AgeTech Special Edition on “Aging, Technology and Health in a Post-COVID World”

(<http://www.sfu.ca/starinstitute/about/institute-activities/archive/age-well---healthcare-management-forum-agetech-special-edition-o.html>)

- Rehabilitation and Assistive Technologies Engineering (RATE) Journal strategic publications - Including the AGE-WELL Special Collection on “Robots to Support Caregiving and Promote Independent Living of Older Adults” (<https://agewell-nce.ca/journal-of-rehabilitation-and-assistive-technologies-engineering-rate-collaboration>)

- AGE-WELL publications relating to survey of seniors’ use of technology (<https://www.frontiersin.org/articles/10.3389/fpubh.2021.749515/full>;

<https://journals.sagepub.com/doi/full/10.1177/02704676221094731>)

- AGE-WELL Amplify Program (development phase) - Designed to support knowledge mobilization activities aligned with the AGE-WELL mandate

The Institute is committed to supporting community-engaged research in the rapidly growing area of technology and aging. The Institute supports the development and implementation of technologies to address many of the health challenges encountered in old age, as well as address the social, commercial and policy aspects of using and accessing technologies including barriers around equitable access.

The STAR Institute is affiliated with SFU and conducts its activities in such a way as to enhance the reputation and the programs of the University. STAR’s research activities align with SFU’s Strategic Research Plan, particularly:

- Supporting health across the human lifespan
- Enhancing our world through technology

Our research is based on community engagement and we also recognize SFU’s commitment to the United Nations Sustainable Development Goals, notably:

- SDG3 - Ensure Healthy Lives and Promote Well-being for All at All Ages
- SDG9 - Industry, Innovation and Infrastructure

- SDG10 - Reduced Inequalities
- SDG17 - Partnerships for the Goals

Please see the “How has the Institute accomplished its goals” section and the accompanying supporting document on significant accomplishments, media successes and public outreach for more specific details.

The Centre/Institute's membership and organization structure:

STAR Research Institute Governance

Management Team

- Andrew Sixsmith, Director
- Pam Borghardt, Managing Director
- Juliet Neun-Hornick, Special Projects Manager

The Management Team is responsible for the operations of the facility, including day-to-day decision making, budget allocation, resource assignment, policy recommendations, and strategic planning. The Management Team presents the operating plans for the Institute annually to the Steering Committee for ratification.

Steering Committee 2016-22

Academic:

- Pam Borghardt, SFU
- Theodore Cosco, SFU
- Sarah Lubik, SFU
- Carlo Menon, SFU
- Andrew Sixsmith, SFU

Community:

- Mike Harcourt (Current Chair), United Way’s Public Policy Institution; Past BC Premier; Past Vancouver Mayor

- Jim Mann, Advisory Board on Dementia, Federal Minister of Health; Alzheimer Society of Canada; AGE-WELL Research Management; BC SUPPORT Unit Patient Council

Industry:

- Lynda Brown Ganzert, CEO, Curatio
- Aly Devji, Director, Stakeholder Relations and Business Development, BC Care Providers Association
- Kahir Lalji, Provincial Director, Population Health, United Way of the Lower Mainland

Research Project Team

Mei Lan Fang, Education and Engagement Director

J Lynn Fraser, Technical Editor

Becky Horst, Research Assistant, SFU

Hannah Shin, Community-Engaged Researcher, SFU-411

Becky White, Research Assistant, SFU

Karen Lok Yi Wong, Research Assistant, SFU

Research Scholars

Mei Lan Fang, University of Dundee, United Kingdom

Vicki Komisar, University of Northern British Columbia, Canada

Norm O'Rourke, Ben-Gurion University of the Negev, Be'er Sheva, Israel

Jason Powell, Staffordshire University, United Kingdom

Karen Yi Lok Wong, Registered Social Worker, Canada

SFU Affiliates

Laurie Anderson, Faculty of Education

Siamak Arzanpour, Engineering Science

Lupin Battersby, Knowledge Mobilization Hub

Mirza Faisal Beg, Engineering Science

Habib Chaudury, Gerontology

Teresa Cheung, Engineering Science

Greg Christie, Digital Health Hub

Theodore Cosco, Gerontology

Ryan D'Arcy, Engineering/Computing Science

Martin Ester, Computing Science

Faranak Farzan, Mechatronic Systems Engineering

Uwe Glasser, Computing Science

Farid Golnaraghi, Mechatronic Systems Engineering

Diane Gromala, Interactive Arts and Technology

Gloria Gutman, Gerontology

Angelica Lim, Computing Science

Sarah Lubik, Beedie School of Business

Elicia Maine, Beedie School of Business

Randy McIntosh, Biomedical Physiology and Kinesiology

Laurence Meadows, Partnerships Hub

Carlo Menon, Engineering Science

Barbara A. Mitchell, Gerontology

Sylvain Moreno, Interactive Arts and Technology

Edward Park, Mechatronic Systems Engineering

Jane Pulkingham, Anthropology

Indira Riadi, Interactive Arts and Technology

Stephen Robinovitch, BPK

Emma Rodriguez, Interactive Arts and Technology

Thecla Schiphorst, Interactive Arts and Technology

Carolyn Sparrey, Mechatronic Systems Engineering

Andrew Wister, Gerontology

Community Partners and Collaborators

411 Seniors Centre Society

AGE-WELL Network of Centres of Excellence

AGE-WELL New Brunswick National Innovation Hub - Advancing Policies and Practices in Technology and Aging (APPTA)

BC Care Providers Association

Brenda Strafford Foundation

Canadian Consortium on Neurodegeneration in Aging

Canadian Institutes of Health Research - Institute of Aging

AGE-WELL Prince George Innovation Hub - Centre for Technology Adoption for Aging in the North (CTAAN)

Curatio

Digital Health Circle

University of Dundee

Universitat Heidelberg

Universitat Jaume I

Northern Health Science Alliance (NHSA)

SFU Point of Care Health Technologies Team

SFU Institute for Neuroscience and Neurotechnology (INN)

United Way Lower Mainland

Rationale for the renewal of the Centre/Institute:

While STAR has been highly successful the last 5 years in its various AgeTech activities, the next five years will build on the foundations put in place and develop and explore new opportunities.

Build on foundations already put in place

STAR will continue to work in key areas, notably:

Community engaged research: Continue to work with community partners such as 411 Seniors Centre Society and the United Way of the Lower Mainland to co-design equitable technology-based solutions and services to support healthy aging.

Publications: STAR, funded through AGE-WELL, leads on its publication strategy in AgeTech.

- Springer Nature series on AgeTech: A special series of publications on AgeTech which publishes the introductory texts on AGE-WELL's eight Challenge Areas (<https://agewell-nce.ca/challenge-areas>).
- Special issues on AgeTech in journals: Leading on special issues in: Healthcare Management Forum; Aging and Mental Health; Journal of Rehabilitation and Assistive Technology Engineering.

New opportunities

Through consultation with our Steering Committee and with our academic and community partners, we have identified a number of key directions for future work:

Pushing conceptual boundaries of AgeTech: Here, the aim is to develop a research network

focused on theoretical and ethical aspects of AgeTech.

Healthy Lifestyles and Aging: STAR, awarded funding to lead AGE-WELL's challenge area on healthy lifestyles and wellness, will carry out an environmental scan of AgeTech in this sector, with a book in the Springer AgeTech series in the pipeline.

NeuroTech and Healthy Aging: Our work on healthy lifestyles will have a particular focus on brain health. STAR collaborated with SFU's Institute for Neuroscience and Neurotechnology (INN) (<https://www.sfu.ca/neuro-institute.html>) on an awarded New Frontiers in Research Transformation pilot grant and is collaborating on a larger NFRFT grant in 2022.

Modelling Cognitive Health: Precision medicine in the context of healthy aging will help a better understanding, prevention, and treating of age-related cognitive impairment (ARCI). STAR, recently awarded a Mitacs Accelerate, PDF joining in April 22, will carry out the project.

Ethics and AgeTech: While technology offers many possibilities to support healthy aging, it also brings the potential to increase inequalities in access to health services and outcomes. A workshop on Ethical Issues in AgeTech will convene at the PETRA conference in Greece June 2022 (<http://www.petrae.org/workshops/EAT.html>).

Education and Training: STAR has been at the forefront of innovation in training in the AgeTech sector in Canada and internationally. Education and training activities will involve STAR in various collaborations with other centres at SFU and organizations in Canada and worldwide. Planned training initiatives include:

- SFU Gero 830 Course on Aging in a Technological World - Seniors Centre of the Future student project - STAR Director Dr. Sixsmith will teach a course on innovation and aging in Fall 2022 that will include a student project with 411 Seniors Centre Society on what a 'Seniors Centre of the Future' looks like.
- CREATE - STAR will continue to collaborate with SFU colleagues in education and training initiatives, specifically in an application to the CREATE program.
- AGE-WELL EPIC-AT training program - STAR will partner in the recently re-funded AGE-WELL Early Professionals, Inspired Careers in AgeTech (EPIC-AT) Health Research Training Program <https://agewell-epic.ca/Df>
- Joint training activities with NHSA in the UK - STAR continues collaborations with NHSA and in June 2022 STAR researchers will work with UCLAN in UK in planning a sandpit workshop to encourage engineers working in health tech and AgeTech to adopt user-centered design principles.

- International Society of Gerontechnology (ISG) - STAR Education and Engagement Director Dr. Mei Lan Fang will be the ISG General Secretary commencing September 2022. STAR will support activities in training, communications, conferences, and coordination. <https://www.gerontechnology.org/>

Long term sustainability

We will continue to work towards long-term sustainability through submission of research proposals focused on the above themes, with a particular emphasis on collaborations with community partners and with the SFU INN on major funding opportunities such as New Frontiers Research Fund - Transformation and International.

How has the Centre/Institute enhanced research over and above what would have been accomplished by an individual faculty member?

Real-world impact in the AgeTech sector can only be achieved through meaningful collaboration across disciplines and with stakeholders in industry, communities, and government. The many partnerships that STAR has developed within SFU and at the local, national, and international levels have allowed it to leverage scientific and real-world impact beyond what could be achieved as an individual research program. STAR has developed key partnerships at the community level and its continued close connection with AGE-WELL NCE ensures that the Institute is closely linked to the Canadian AgeTech community. STAR will continue to nurture its existing partnerships, while exploring opportunities for new ventures, particularly:

- 411 Seniors Centre Society and community organizations on local technology initiatives
- SFU's new Institute of Neuroscience and Neurotechnology on brain health initiatives
- AGE-WELL on publications and Highly Qualified Personnel (HQP) training
- International groups (e.g., UK Northern Health Services Alliance) on various initiatives

STAR has had or currently has active collaborations with the following Universities and Institutes:

Canadian: University of British Columbia; University of Northern British Columbia; Emily Carr University of Art and Design; University of Victoria; University of Toronto; University of Ottawa; University of Alberta; University of Waterloo; McMaster University; Carleton University; CIHR Institutes of Aging

International: University of Dundee, Scotland; Heriot-Watt University, Scotland; Universitat

Heidelberg, Germany; Universitat Jaume, Spain; Landsteiner University, Austria; Ben-Gurion University of the Negev, Israel; Staffordshire University, UK; Lancaster University, UK; University of Central Lancashire, UK; Kings College London, UK; Florida State University, US; University of Florida; University of California

How has the Centre/Institute accomplished its goals?

Please see the accompanying supporting document attachment in the Supporting Document section that lists STAR's achievements over the last five years. STAR's research activities align closely with SFU's Strategic Research Plan, particularly:

- Supporting health across the human lifespan - STAR and partner AGE-WELL focus on supporting the health, independence and participation of older people. Our work emphasizes healthy lifestyles and wellness across the lifespan.
- Enhancing our world through technology - We live in an increasingly digital world. STAR focuses on AgeTech and the potential of technology to support health aging.

Our research is based on community engagement, with stakeholders (older adults and caregivers, service providers, government, industry, community organizations) involved in all aspects of our work. We also recognize SFU's commitment to the United Nations Sustainable Development Goals, notably:

SDG3 - Ensure Healthy Lives and Promote Well-being for All at All Ages: STAR Institute Director Dr. Sixsmith is the co-founding Scientific Director of AGE-WELL (www.agewell-nce.ca) with the aim to drive the AgeTech sector in Canada in order to harness the potential of technology to support the healthy aging for everyone. STAR has played a major role in AGE-WELL's success over the last 7 years (see below). For example, STAR leads the development of AGE-WELL eight Challenge Areas that frame the strategic vision for technology and aging in Canada in AGE-WELL's second cycle 2020-24 and beyond.

SDG9 - Industry, Innovation, and Infrastructure: A weakness of the AgeTech sector has been the failure to turn research into real-world products and services that will benefit older people. STAR in conjunction with AGE-WELL has addressed this issue through training and support of researchers, and developing partnerships with industry, service providers and stakeholder organisations to foster innovation. STAR played a key role in facilitating the set-up of the Digital Health CIRCLE now based at SFU Venture Labs that focuses on helping companies develop tech-based products for the seniors' market. STAR will continue to address real-world innovation through training and KMB activities, such as involvement in CREATE proposals / initiatives (Sparrey, Mechatronics), and ongoing activities with AGE-WELL's HQP "EPIC-AT" training program (<https://agewell-epic.ca/>). A key output in 2021 was the book "Knowledge, Innovation, and Impact: A Guide for the Engaged Health Researcher" (Sixsmith et al, 2021, <https://link.springer.com/book/10.1007/978-3-030-34390-3>), published by Springer Nature, which captured many of the key learnings that

made AGE-WELL one of the most successful innovation networks in Canada.

SDG10 - Reduced Inequalities: STAR's community-engaged approach has focused on supporting grass roots community organizations to address the digital divide and address the digital determinants of health and well-being. Our engaged research approach helped Seniors 411 Seniors Centre Society to successfully lobby TELUS to extend their low-cost "Internet for All" programs to low-income seniors (see Significant Accomplishments section).

SDG17 - Partnerships for the Goals: Real-world impact in the AgeTech sector can only be achieved through meaningful collaboration across disciplines and with stakeholders in industry, communities, and government. The many partnerships that STAR has developed at the local, national and international levels has allowed it to leverage scientific and real-world impact beyond what could be achieved as an individual research Institute. STAR has developed key partnerships at the community level (see above). STAR continued close connection with AGE-WELL NCE ensures that the Institute is closely linked to the Canadian AgeTech community. We will continue to nurture existing partnerships, while exploring opportunities for new ventures.

Changes planned upon renewal (e.g. membership, organization structure, etc.):

We are not planning or anticipating any significant change in organizational structure of the STAR Institute over the coming five years (see organizational structure in "The Centre/Institute's membership and organization structure" section). However, we are planning some changes to membership:

Management: No change is envisaged for management of the Institute at this time.

Steering Group: STAR has had a Steering Committee comprising SFU scholars and community stakeholders since its inception. The Steering Committee provides ideas, feedback, support and mentorship for STAR and its members. An updated Steering Committee will convene commencing in mid 2022 to represent our mission and program of activities going forward. New Steering Committee members will include Randy McIntosh, Director of SFU's Neuroscience and Neurotechnology Institute and Leslie Remund, Executive Director of 411 Seniors Centre Society.

Research Team: Our team of researchers actively engaged on STAR projects has expanded over the last five years and will continue to do so.

Research Scholars: STAR actively collaborates with a number of researchers from other Institutes in Canada and worldwide. New research scholars in 2022 include Charlene Chu (Faculty of Nursing at University of Toronto) and Giovanni Rubeis (Landsteiner University, Austria) who collaborate on issues relating to ethical aspects of AgeTech.

SFU Affiliates: STAR connects with numerous faculties from across SFU with an active interest in AgeTech as well as numerous universities and organizations outside of SFU (see Appendix A: SFU STAR Institute's Membership Sign-Off Form in the accompanying supporting document attachment in the Supporting Document section).

Significant accomplishments:

1) Please see the accompanying supporting document in the Supporting Documents section where we highlight just a few of our many activities in the last five years. A few of our significant accomplishments over the last five years are also listed in this section.

2) SFU interdisciplinary institute community impact

STAR's community-engaged approach has fostered collaborations with local seniors' organisations, such as 411 Seniors Centre Society that operates in Vancouver. The "In Community" report (<https://tinyurl.com/yc5k34hd>) was a major output arguing that addressing the digital divide through low-cost access to internet and mobile data is essential for social participation. This helped 411 successfully lobby TELUS to extend their low-cost "Internet for All" program to low-income seniors. The following is a testimony from 411:

The 411 Seniors Centre Society is a volunteer-driven, senior-led agency in Vancouver that assists over 5000 seniors each year. The 411 membership and clientele are older adults who are disproportionately underserved and impacted by poverty. Weekly meetings with Dr. Sixsmith and STAR team helped translate out of reach academic research and knowledge. This enabled 411 to make more informed decisions, including on where to target limited resources. Understanding the full complexity of the challenge's seniors face enhanced 411 lobbying efforts for a fairer and just world by naming digital discrimination as a human rights issue and joining with others across Canada on a Day of Action for Affordable internet. The partnership with STAR and work to date has given 411, a small grassroots organization, the confidence to move forward and to continue to tackle the digital divide (Leslie Remund, Director of 411 Seniors).

3) Training the next generation of AgeTech researchers

STAR is committed to supporting training of researchers in the AgeTech sector. A key output in 2021 was the book "Knowledge, Innovation, and Impact: A Guide for Engaged Health Researcher" (Sixsmith et al, 2021), published by Springer, which captured many of the key learnings from AGE-WELL and SFU STAR. This is the only book currently available dealing with practical aspects of transdisciplinary, community-based research and will place AGE-WELL and SFU at the forefront of scientific leadership in this approach to research. The book is directly relevant to SFU's commitment to community-engaged research by providing a practical guide to this approach (<https://tinyurl.com/b5vtb6r6>). STAR received \$85,000 in funding from CIHR Institute of Aging between 2017-18 to co-organize and co-host an innovative five-day Summer Program in Aging training program that focused on Technology

and Innovation Supporting the Health of Older Adults. STAR organized and facilitated the week and developed and designed all event materials (<https://tinyurl.com/4bfmskbd>). STAR supports the newly funded AGE-WELL Early Professionals, Inspired Careers in AgeTech (EPIC-AT) Health Research Training Program - a national training platform that will prepare graduate students, postdoctoral fellows and early career researchers to be future leaders in digital health solutions for older adults with complex health needs (<https://agewell-epic.ca/>).

4) AGE-WELL AgeTech Book Series

STAR and AGE-WELL are publishing a series of books on AgeTech, including a sub-series on AGE-WELL's eight Challenge Areas (<https://agewell-nce.ca/challenge-areas>), in partnership with Springer and as part of a "Synthesis Lectures on Technology and Health". Two books have been published so far and thirteen more are in the book development pipeline or are being commissioned. The series publishes state-of-the-art short books on transformative technologies for health, wellness, and independent living. The books are written in accessible language appropriate to a multidisciplinary and worldwide readership. <https://www.morganclaypool.com/toc/arh/1/1>.

5) Rehabilitation and Assistive Technologies Engineering (RATE) Journal Publications Strategy

RATE Journal and AGE-WELL have partnered on a special issue on "Robots to Support Caregiving and Promote Independent Living of Older Adults" to be published in late 2022 and on a broader publication strategy to support manuscript submissions by AGE-WELL Network Investigators whose research will form part of a special section in RATE. STAR supports the partnership by supporting the editorial process. STAR Director and STAR Engagement and Education Director are RATE Associate Editors.

<https://agewell-nce.ca/journal-of-rehabilitation-and-assistive-technologies-engineering-rate-collaboration>

6) Renewal of AGE-WELL NCE and continued collaboration with STAR

STAR Institute Director Dr. Sixsmith is the co-founding Scientific Director of AGE-WELL (www.agewell-nce.ca) funded (\$36.6 million) under the federal Networks of Centres of Excellence program 2015-2020. The mission of AGE-WELL and STAR is to encourage and support research and innovation in technology that will enhance the health, independence and social participation of older people and caregivers. In 2019, Dr Sixsmith with support from STAR co-led a successful renewal application to NCE (\$21.9 million) 2020-24. By any metric, AGE-WELL has been one of the most successful NCEs and SFU has benefited hugely from its association with AGE-WELL as the second highest recipient of research funding in the country.

Notable media successes:

STAR researchers and affiliates have been very active in engaging with the media and STAR has a significant social media presence. Our website is continuously updated. Please see the accompanying supporting document in the Supporting Documents section where we highlight just a few of our many activities in the last five years.

Events, workshops, public outreach events:

A major goal of STAR is community and public engagement. Please see the accompanying supporting document in the Supporting Documents section where we highlight just a few of our many activities in the last five years.

The Centre/Institute's multi-year goals for the next renewal term:

1) We have an ambitious plan to place STAR and SFU at the forefront of AgeTech research and innovation over the next five years. We will build on the foundations already put in place, develop new opportunities for research and innovation and put in place plans for long-term sustainability. Please see STAR Institute's multi-year goals below for specific details on objectives, actions and KPIs.

Continued sustainability of SFU interdisciplinary institute

We aim to be a viable and effective interdisciplinary research institute at SFU. Many of our activities are supportive of projects and collaborations (such as AGE-WELL, Point of Care Healthcare Technologies (PCHT), International Society of Gerontechnology) with the aim to drive research and innovation in the AgeTech sector. We will continue to work towards sustainability through submission of research proposals around the below themes, with a particular emphasis on collaborations with community partners and with the SFU INN on major funding opportunities such as New Frontiers Transformation and International. STAR will also continue its close relationship with AGE-WELL driving AgeTech research and innovation within Canada. This will focus on promoting strategic publications; research on AgeTech for Healthy Lifestyles and Wellness; supporting outreach and community engagement; education and training.

KPI 1:

- Annual number of projects
- Annual amount of funding per year
- Annual total direct costs
- Annual reimbursed indirect costs
- Annual number of collaborative grant submissions
- Annual total dollar value of proposals submitted
- Annual number of successful proposals
- Dollar value of successful proposals

- Centre-supported publications per year
- Affiliated faculty from SFU and elsewhere that collaborate on STAR activities and proposals each year

2) Partnerships and community engaged research

STAR will continue to nurture its existing partnerships, while exploring opportunities for new ventures, including: SFU's INN; SFU's DHC; AGE-WELL; community organisations; International Society of Gerontechnology; International research groups and institutes. We will continue to work with community partners such as 411 Seniors and United Way of the Lower Mainland to co-design technology-based solutions and services to support healthy aging. We have a particular emphasis on making technology more affordable and usable for low-income and marginalized individuals and groups in Vancouver. STAR will continue to work with local community organisations in Vancouver and BC, with the aim of creating a vision for the "Seniors Centre of the Future".

KPI 2:

- MoUs in place
- Jointly planned activities (e.g., training events, symposia, exchanges, advisory meetings)
- Number of academic articles
- Number of communications for general public
- Impact case study

3) Publications - Springer series on AgeTech and special issues on AgeTech in journals

STAR has been funded through AGE-WELL to lead on its publication strategy in AgeTech. Since 2020, STAR has been leading on a special series of publications on AgeTech (<https://www.morganclaypool.com/toc/arh/1/1>). This series initially aimed to publish introductory texts on AGE-WELL's eight Challenge Areas (<https://agewell-nce.ca/challenge-areas>). Seven of these are in the pipeline and we are now looking to expand the series with an additional six being commissioned. In 2022-23, STAR and AGE-WELL will lead on special issues in: Healthcare Management Forum; Aging and Mental Health; Journal of Rehabilitation and Assistive Technology Engineering. We will continue to look for opportunities for future initiatives. Two special issues will be published in 2022/23: Health Care Management Forum (HMF) Journal - AGE-WELL AgeTech Special Edition on "Aging, Technology and Health in a Post-COVID World" (<https://tinyurl.com/2bc72s88>); Rehabilitation and Assistive Technologies Engineering (RATE) Journal strategic publications - Including the AGE-WELL Special Collection on "Robots to Support Caregiving and Promote Independent Living of Older Adults" (<https://tinyurl.com/4edfx6n>).

KPI 3:

- Number of books published in new series each year
- Number of new books commissioned each year
- Sales metrics

- Number of journal special issues each year
- Number of new special issues in pipeline

4) New opportunity - Healthy Lifestyles and Aging

Through consultation with our Steering Committee and with our academic and community partners we have identified a number of key directions for future work including research on healthy lifestyles and aging. STAR received funding in 2022 to lead AGE-WELL's challenge area on healthy lifestyles and wellness. During 2022-24 we will be carrying out an environmental scan of AgeTech in this sector with a book in the Springer AgeTech series in the pipeline co-authored by Dr Sixsmith and other SFU researchers and HQP. There will be a major focus on KT through publications, communications and social media.

KPI 4:

- Annual total dollar value of proposals submitted
- Annual number of proposals submitted
- Number of successful proposals
- Dollar value of successful proposals
- Number of STAR supported workshops and symposia
- Number of presentations and publications

5) New opportunity - NeuroTech and Healthy Aging

STAR has also identified research on neurotechnology and healthy aging as a key direction for future work. Our work on healthy lifestyles will have a particular focus on brain health. STAR is already a collaborator with SFU's Institute for Neuroscience and Neurotechnology on a recently funded New Frontiers Exploration grant and we will continue to develop this collaboration with the STAR playing a lead role in knowledge mobilization. The research involves an interdisciplinary approach that brings together theoretical, empirical and applied perspectives to establish a cycle of building knowledge and solutions for brain resilience. Additionally, STAR was awarded Mitacs Accelerate funding to look at precision medicine in the context of healthy aging to help better understand, prevent, and treat age-related cognitive impairment (ARCI). To date, despite the known risk factors related to cognitive impairment, it is not yet clear how these factors interact to influence cognitive health, especially in older adults at the individual level. The research involves transdisciplinary collaboration with researchers at SFU, notably the SFU Institute of Neuroscience and SFU Digital Health Circle, to develop new models that can explicate inter- and intra-variability within the older adult population which can lead to the development of better prevention and treatment of ARCI.

KPI 5:

- Annual total dollar value of proposals submitted
- Annual number of proposals submitted
- Number of successful proposals
- Dollar value of successful proposals

- Number of STAR supported workshops and symposia
- Number of presentations and publications

6) New opportunity - Ethics and AgeTech

STAR has also identified research on ethics and AgeTech as a key direction for future work. While technology offers many possibilities to support healthy aging, it may also bring with it the potential to increase inequalities in access to health services and health outcomes. Research has indicated a crucial need to fully understand who and in what ways AgeTech can have both positive benefits for older people or further exacerbate experiences of marginalization. We have founded a group of researchers in Canada and Europe with a strong track record in ethics that we intend to grow in the coming years. A workshop on Ethical Issues in AgeTech will be convened at the PETRA conference in Greece 29th June – 1st July 2022 (<http://www.petrae.org/workshops/EAT.html>) and there are plans to expand the group, convene conference symposia and publish findings.

KPI 6:

- Number of STAR affiliated scholars/researchers
- Number of STAR supported workshops and symposia
- Number of presentations and publications

7) New opportunity - Pushing conceptual boundaries of AgeTech

The aim is to develop a research network focused on theoretical and ethical aspects of AgeTech. Research in the sector has been overwhelmingly practice-oriented and is limited by a weak understanding of technology development, implementation and innovation in psycho-social terms. A better theoretical foundation for AgeTech will afford more useful, usable and appropriate solutions for healthy aging. Discussions around publications and symposia at key conferences in 2023 and after have already taken place with collaborators at UCL in the UK.

KPI 7:

- Number of STAR affiliated scholars/researchers
- Number of STAR supported workshops and symposia
- Number of presentations and publications

8) Communications and outreach

STAR will continue its knowledge mobilization activities that focus on outreach and involvement of community partners, older adults and caregivers, service providers and industry, aligning with our mission of making SFU a world leader in research and innovation in the AgeTech sector, becoming an essential resource for students, researchers, industry and services in BC. A STAR monthly webinar series will launch in Fall 2022 and bring together local, national and international researchers and thought leaders in the broad AgeTech sector.

KPI 8:

- Number of reports and articles for general audience
- Number of interviews and features in media
- Social media analytics
- Webinar series metrics including attendance, post event hits, etc.

Supporting documents:

SFU_STAR_Institute_Renewal_Application_June_2022_Supporting_Document_-_Significant_Accomplishments_Media_Successes_and_Public_Outreach_aGg1ER0.pdf (See attachment below)

Financial Summary**Does your Centre/Institute receive direct financial support from the university?**

No

Was the Centre/Institute leveraged to attract external funding (donations, grants, contracts) which were only made possible by its existence?

Yes

External funding details:

We have provided a summary of STAR Institute External funding in the 2021-22 year directly below. Please see accompanying supporting document attachment in the Supporting Document section for details on our funding initiatives between 2016-2024.

STAR Institute External funding in the 2021/2022 year (donations, grants, contracts):

1. Mitacs Accelerate Award - Cognitive Effects of Individualized Lifestyle Interventions in Typical Ageing (Project partners - SFU Institute of Neuroscience and Neurotechnology and SFU Digital Health Circle) 2022-24

\$80,000

Recent award information: Award start date - August 1, 2022

2. AGE-WELL NCE Funding: AGE-WELL Challenge Area Development Grant 2021-23

\$57,000

3. SFU STAR Institute/411 Seniors Research Grant - Navigation and Peer Support 2021-23

\$50,000

4. Partial Operating from the Point of Care Health Technologies - STAR (Science and Technology for Aging Research) Institute Node 2021-22

\$18,000

5. AGE-WELL NCE Funding: AGE-WELL Scientific Director (SD) Stipend 2020-24

\$75,000 per year

Confirm policy review:

Yes

Submitted by:

Juliet Neun-Hornick, Special Program Manager

Director's comments:

The STAR Institute has had a highly active program of research and training on aging and technology over the last five years. The research team has carried out some outstanding work with the key goal of mobilizing and communicating results that will lead to practical solutions in the aging and technology sector. The STAR Institute is affiliated with SFU and conducts its activities in such a way as to enhance the reputation and the programs of the University. The mission of the STAR Institute is to make SFU a world leader in research and innovation in the AgeTech sector, becoming an essential resource for students, researchers, industry and services in BC. The STAR Institute, in addition to being an SFU Research Institute, also plays an important role in facilitating the activities and research of the AGE-WELL Network of Centres of Excellence (www.agewell-nce.ca). STAR Director and SFU Professor Dr. Andrew Sixsmith was the founding co-Scientific Director of the AGE-WELL Network from 2015-2020 and is the Associate Director from 2020 onward. A major priority between 2020-24 is to establish sustainable legacies for both the STAR Institute and the AGE-WELL Network. This work is a key focus over the next few years, specifically through activities related to AGE-WELL's Challenge Areas (<https://agewell-nce.ca/challenge-areas>) which form the basis of AGE-WELL's 2020-24 newly refunded core research program.

The team's efforts have also extended internationally, with missions and events with academic partners and universities in Europe and Asia. This resulted in an MoU with the Northern Health Sciences Alliance (NHSA) in the UK (<https://www.thenhsa.co.uk>) with a number of research and training activities in aging already underway.

Understandably, the last two years have been dominated by the COVID-19 pandemic. The pandemic has had a huge impact on everyone but has had a particular impact on the health and well-being of older people. The aging of world populations is one of the biggest challenges of our time, but the impact of the COVID-19 pandemic has had a particular

impact on older people and their caregivers. The pandemic has rightly sparked a serious and long overdue national conversation about long-term care, while there is increasing attention on the needs of isolated seniors living in the community.

In an effort to share what is happening in the field both nationally and internationally, STAR also will launch a monthly webinar series in Fall 2022, has an active communications program and is dedicated to providing a wide-range of resources and news (from publications and community-engaged research templates to alerts on community-engaged events, opportunities and initiatives/services), via our website and social media platforms.

STAR has been highly active over the last 5 years, working closely with local community organizations during the COVID-19 pandemic. Our work with 411 Seniors Centre Society in Vancouver and other community groups speaks directly to SFU's mission of being an "engaged university". It also fulfills STAR's ambition to combine both excellent academic research with real-world impact. From very modest beginnings, our "In-Community" project and report has generated a lot of interest provincially and nationally and has led to academic articles and numerous presentations. The project has provided 411 Seniors with a platform for taking a province-wide role in developing information and referral services, where STAR will continue to partner with 411 Seniors in a 2-year action research and outreach project.

We have also been active in supporting national research communities and strengthening our international collaborations. We continue to work with AGE-WELL in pushing research and innovation boundaries within the aging and technology sector further forward. STAR has the responsibility of supporting transdisciplinary working within the AGE-WELL Network and carrying out environmental scans to inform its strategic priorities. The last year saw the fruition of some key joint initiatives. These included the publication of two major books aimed at the AgeTech sector: "Knowledge, Innovation, and Impact: A Guide for the Engaged Health Researcher" (Springer, <https://link.springer.com/book/10.1007/978-3-030-34390-3>) and "AgeTech, Cognitive Health, and Dementia" (Morgan & Claypool).

STAR looks forward to continuing its work, and keeping SFU at the forefront of AgeTech research in Canada and worldwide, in particular:

- Leading on a program of research on AgeTech for Healthy Lifestyles and Wellness
- Collaborating with partners at SFU on initiatives in neuroscience and healthy cognitive aging
- Supporting outreach and community engaged research
- Providing innovative education and training activities

- Promoting strategic publications to push the boundaries of theory and research in AgeTech
- Continuing its collaboration with AGE-WELL

Reviewer's Section

Reviewed by:

Michael Richards, Associate Vice-President, Research

Reviewer's decision:

Approved for 5 years

Reviewer's comments:

This is clearly a very active Institute with significant research outputs and public outreach, and is well integrated into local and national health agencies. I recommend renewal of this Institute.

SFU STAR Institute Renewal Application 2022
Significant Accomplishments, Media Successes, and Public Outreach

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STAR Institute Significant Accomplishments 2016/2022

The STAR Institute has had a highly active program of research and training on aging and technology over the last five years. The research team has carried out some outstanding work with the key goal of mobilizing and communicating results that will lead to practical and equitable and diverse solutions in the aging and technology sector. The STAR Institute is affiliated with SFU and conducts its activities in such a way as to enhance the reputation and the programs of the University. The mission of the STAR Institute is to make SFU a world leader in research and innovation in the AgeTech sector, becoming an essential resource for students, researchers, industry and services in BC. STAR activities are determined with SFU priorities towards equity, diversity and inclusion in mind. STAR works closely with 411 Seniors Centre Society, a seniors' service agency in Vancouver that assists over 5000 predominantly low-income and immigrant older adults per year. The ongoing partnership is called *LEADS: Learning, Equity, Aging, Digital for Seniors*. The STAR Institute, in addition to being an SFU research institute, also plays an important role in facilitating the activities and research of the AGE-WELL Network of Centres of Excellence (www.agewell-nce.ca). STAR Director and SFU Professor Dr. Andrew Sixsmith was the founding co-Scientific Director of the AGE-WELL Network from 2015-2020 and is the Associate Director from 2020 onward. A major priority between 2020-24 is to establish sustainable legacies for both the STAR Institute and the AGE-WELL Network. This work is a key focus over the next few years, specifically through activities related to AGE-WELL's Challenge Areas which form the basis of AGE-WELL's 2020-24 newly refunded core research program. STAR is currently engaged in six transformational joint projects with AGE-WELL:

- AGE-WELL Healthy Lifestyles and Wellness Challenge Area program of research
- Leading and facilitating AGE-WELL/Springer AgeTech book series
<https://agewell-nce.ca/challenge-areas>
- Health Care Management Forum (HMF) Journal - AGE-WELL AgeTech Special Edition on "Aging, Technology and Health in a Post-COVID World"
<http://www.sfu.ca/starinstitute/about/institute-activities/archive/age-well---healthcare-management-forum-agetech-special-edition-o.html>
- Rehabilitation and Assistive Technologies Engineering (RATE) Journal strategic publications - Including the AGE-WELL Special Collection on "Robots to Support Caregiving and Promote Independent Living of Older Adults"
<https://agewell-nce.ca/journal-of-rehabilitation-and-assistive-technologies-engineering-rate-collaboration>
- AGE-WELL publications relating to survey of seniors' use of technology
<https://www.frontiersin.org/articles/10.3389/fpubh.2021.749515/full>
<https://journals.sagepub.com/doi/full/10.1177/02704676221094731>
- AGE-WELL Amplify Program (development phase) - Designed to support knowledge mobilization activities aligned with the AGE-WELL mandate

The team's efforts have also extended internationally, with missions and events with academic partners and universities in Europe and Asia. This resulted in an MoU with the Northern Health Alliance in the UK, with the prospect of joint future research and training activities in aging.

In an effort to share what is happening in the field both nationally and internationally, STAR also has an active communications program and is dedicated to providing a wide-range of resources and news (from publications and community-engaged research templates to alerts on community-engaged events, opportunities and initiatives/services), via our website and social media platforms.

Below we highlight the following significant accomplishments between 2016/22:

1. Key Outputs and Publications
2. STAR Institute COVID-19 Response
3. SFU Collaborations
4. Provincial & National Collaborations and Partnerships
5. International Collaborations and Partnerships
6. Funding Initiatives

1) Key Outputs and Publications

STAR has been highly active over the last five years producing a number of reports and publications in the AgeTech sector. The summary below is not a list of individual publications by STAR researchers, but presents the key strategic publications that have contributed to the STAR vision and mission. These outputs will help position and provide SFU and Canada with opportunities in relation to global research and innovation in the field of aging and technology.

2021/2022

Citadel Love Stories: An Intergenerational Creative Storytelling Project and Zine

Out of a series of creative writing online workshops in Summer 2021, the Citadel Love Stories: An Intergenerational Creative Storytelling Project created a zine that includes countless stories and poems from people of different ages including older adults, many of whom identified as belonging on the LGBT2QI+ rainbow. The international project, with partners at SFU STAR Institute, University of Dundee, Scotland, and Citadel Youth Centre, Scotland, aligns with SFU's priorities toward Equity, Diversity and Inclusion (EDI) and was a hugely collaborative project exploring a diverse range of relationships, identities and experiences. SFU STAR supported the project and STAR's project manager created the zine's design layout. The project wouldn't

have been possible without the success of the Age-Friendly Living Ecosystems project 2020-onward, which STAR has supported through project management and graphic design of project materials. <https://citadelyouthcentre.files.wordpress.com/2021/12/citadel-love-stories-zine-final.pdf>

STAR Institute - Karl Landsteiner University of Health Sciences Special Collection

STAR Institute and colleagues at Karl Landsteiner University of Health Sciences are collaborating on a special collection to be published in early 2023 by Springer Nature Publishers on “Ethical and Societal Implications of AgeTech”. Ethical issues in AgeTech are multifaceted, arise in different contexts, and are in part determined by the cross sectoral organization of health services for the older people. Thus, an interdisciplinary and cross-sectoral approach is needed that facilitates a dialogue between the different actors and disciplines involved, giving each the opportunity to provide their expertise and perspective. This special issue will bring together perspectives from medical informatics, engineering science, nursing science, social sciences, and ethics to provide a more holistic and coherent picture of the ethical issues in AgeTech. <https://link.springer.com/collections/chbhbeafjj>

STAR Institute - Journal of Mental Health and Aging Special Collection

STAR Institute and Dr. Teddy Cosco in the SFU Gerontology Department are collaborating on a special collection to be published in early 2023 on “Technology, Aging, and Mental Health: Opportunities and Challenges” in the Journal of Mental health and Aging. The collection will include original research exploring, developing and evaluating innovative solutions to support the mental health and well-being of older adults. The goal is to provide a benchmark issue of wide interest to an interdisciplinary community of researchers across fields and disciplines. https://think.taylorandfrancis.com/special_issues/technology-aging-mental-health/?utm_source=TFO&utm_medium=cms&utm_campaign=JPG15743

SFU AgeTech and Innovation Asset Map

STAR collaborated with Laurence Meadows (SFU Strategic Partnerships Manager) and Fred Popowich (Scientific Director of KEY, SFU’s Big Data Initiative and Professor at SFU’s School of Computing Science) as part of the NRC-SFU initiative. STAR developed an SFU AgeTech and Innovation Asset Map that included information about researchers at SFU within the AgeTech and innovation field, including individual expertise and community connections. The NRC program was approved in 2020 and we look forward to continued collaborations as part of the NRC-SFU initiative (see Appendix B for SFU AgeTech and Innovation Asset Map).

AGE-WELL Healthy Lifestyles & Wellness Challenge Area Program of Research Lead

STAR received AGE-WELL Healthy Lifestyles and Wellness Challenge Area development funding for a two-year project, with STAR Director Dr. Andrew Sixsmith as the Healthy Lifestyles and Wellness Challenge Area research lead. The broad aim is to stimulate and support research and innovation within the AgeTech sector, with a particular focus on the Healthy Lifestyles and Wellness Challenge Area. The objectives of the project are the development of a Community of Practice around this Challenge Area and to look at how this can be sustained in the years to come. A key activity of the project is laying a basic foundation for the Challenge Area, including the development of an environmental scan of the Challenge Area, development of personas and scenarios to illustrate problems and opportunities for AgeTech, and briefing documents, summary reports, and data.

Having a healthy lifestyle contributes to the prevention and delay of chronic disease and enhances life expectancy. Being healthy encompasses more than physical wellbeing, but also relates to our emotional and social wellbeing. However, many individuals do not have healthy lifestyles and find it challenging to maintain healthy habits over time. Technology can play an important role in supporting individuals to adopt and maintain healthy lifestyle behaviors, and live an engaged and purpose-filled life. Despite the proliferation of commercially-available health and wellness technologies in recent years, there remains a significant gap in the provision of digital solutions focused on promoting healthy lifestyles for older people. The STAR Institute brings together researchers from diverse perspectives and academic disciplines, who will expand and develop this knowledge base, building on existing collaborative relationships across SFU departments and other institutions both in Canada and internationally. Furthermore, understanding how innovative health and wellness technologies can be successfully embedded within individuals' lives, whether living independently in the community or in long-term care facilities, is integral for optimizing health and wellbeing outcomes. To support the effective translation of digital health and wellbeing solutions to real-world settings, the STAR Institute will work with community partners to develop and create a suite of tools and resources to assist organizations with implementing and evaluating the impact of new technologies which promote healthy aging.

AGE-WELL AgeTech Book Series

As a joint STAR / AGE-WELL initiative, in partnership with Morgan & Claypool Publishers and as part of a "Synthesis Lectures on Technology and Health" Lecture Series edited by STAR Director Dr. Andrew Sixsmith and colleagues from Universities of Toronto, Florida and California, AGE-WELL is publishing a series of books on AgeTech, including a sub-series on AGE-WELL's eight Challenge Areas (<https://agewell-nce.ca/challenge-areas>). In 2022, Springer bought Morgan & Claypool and took over the series publication, significantly expanding the potential readership. The series publishes state-of-the-art short books on transformative technologies for health, wellness, and independent living. The books are written in accessible

language appropriate to a multidisciplinary and worldwide readership. Authors include material on their own work while surveying the broader landscape of related research, development, and impact.

Two books have been published so far. The first book entitled “AgeTech, Cognitive Health, and Dementia” was published in 2020 lead by STAR Director Dr. Andrew Sixsmith. The second book entitled “Autonomy and Independence: Aging in an Era of Technology” was published in 2021. A remaining seven books in the sub series will be published between 2022-24, including a second book lead by STAR Director Dr. Andrew Sixsmith on “Healthy Lifestyles and AgeTech”. An additional four books are in the pipeline to be published in the next five years as part of the larger AGE-WELL AgeTech book series (Ethical Issues in AgeTech; AgeTech and Virtual Reality; Technology in Palliative Care; and, Art, Technology, and Healthy Aging).

<https://www.morganclaypool.com/toc/arh/1/1>

Health Care Management Forum AGE-WELL AgeTech Special Edition

The Canadian College of Health Leaders and AGE-WELL are collaborating on a special edition of Healthcare Management Forum to be published in Fall 2022 on the theme of “Aging, Technology and Health in a Post-COVID World”. STAR Director Dr. Andrew Sixsmith is a guest editor on the collection and STAR is providing project management support. The special edition will focus on *Leveraging Technology to Improve the Health and Quality of Life of Older Adults* and papers within the collection will address the policy and practice issues relating to innovation, adoption and implementation of technology-based services and products to improve the health of older Canadians. <http://www.sfu.ca/starinstitute/about/institute-activities/archive/age-well---healthcare-management-forum-agetech-special-edition-o.html>

Rehabilitation and Assistive Technologies Engineering (RATE) Journal - AGE-WELL Special Collection and Broader Publications Strategy

RATE Journal and AGE-WELL have partnered to support manuscript submissions by AGE-WELL Network Investigators whose research will form part of a special section in RATE. RATE is an interdisciplinary journal focusing on the engineering aspects and their practical applications of rehabilitation and assistive technologies. It covers engineering design, electrical engineering, mechanical engineering, engineering devices and their applications, robotics and biomedical engineering. STAR Director Dr. Andrew Sixsmith was a RATE Associate Editor from 2019-21 and STAR Engagement and Education Director Dr. Mei Lan Fang become a RATE Associate Editor from 2021 onward. STAR supports the partnership by overseeing the submissions process, selecting reviewers for submitted manuscripts where appropriate and making recommendations based on reviews and the editor’s own review.

RATE Journal and AGE-WELL are collaborating on a special collection on “Robots to Support Caregiving and Promote Independent Living of Older Adults” to be published in Summer 2022. STAR Director Dr. Andrew Sixsmith is a co-editor on the collection and STAR is providing project management support. The special collection has an international focus as RATE has a strong international readership and the invited guest editors are from the UK and Japan.

<https://agewell-nce.ca/journal-of-rehabilitation-and-assistive-technologies-engineering-rate-collaboration>

AGE-WELL publications on seniors’ attitudes and use of technology

AGE-WELL commissioned surveys in 2019 and 2020 by Environics Research, to examine older people’s use of, and attitudes towards, technology in their everyday lives. The 2020 survey was commissioned to particularly explore the impact of the COVID-19 pandemic. AGE-WELL and STAR published two articles entitled “Demographic and Psychographic Factors of Social Isolation During the COVID-19 Pandemic: The Importance of Technology Confidence” published in *Frontiers in Public Health* in 2021 and “Older People’s Use of Digital Technology During the COVID-19 pandemic” published in *Bulletin of Science, Technology & Society* in 2022. A third paper is currently being developed on the accessibility of telehealth during COVID-19. The two surveys collected data on a combined 1923 older adults aged 65 years and older in Canada. These looked at how older adults think about and use technology, with the 2020 survey additionally questioning how COVID-19 has impacted their use and attitudes towards technology.

Sixsmith, A., Horst, B.R., Simeonov, D., Mihailidis, A. (2022) Older People’s Use of Digital Technology During the COVID-19 Pandemic. *Bulletin of Science, Technology & Society*. 42 (1-2): 19-24. doi: 10.1177/02704676221094731

<https://journals.sagepub.com/doi/full/10.1177/02704676221094731>

Horst, B.R., Sixsmith, A., Simeonov, D. and Mihailidis, A. (2021) Demographic and Psychographic Factors of Social Isolation During the COVID-19 Pandemic: The Importance of Technology Confidence. *Frontiers in Public Health*. 9:749515. doi: 10.3389/fpubh.2021.749515

<https://www.frontiersin.org/articles/10.3389/fpubh.2021.749515/full>

AGE-WELL Amplify Program

This new program is designed to support various knowledge mobilization (KM) activities aligned with the AGE-WELL mandate. The program will also support international KM opportunities beyond simple event sponsorship to help teams make a splash with their international conference plans and create follow-up opportunities for their work to have impact with network support. STAR is providing coordination support to the program’s pilot project -

organizing a joint STAR / AGE-WELL workshop on “Ethical Issues in AgeTech to Support Healthy Ageing (EAT) at the Pervasive Technologies Related to Assistive Environments (PETRA) 2022 Conference in Summer 2022 (see *International Collaborations and Partnerships* section). STAR is also providing design support for the program (branding development, presentation slide template development, etc.)

2020-2021

Information and Referral Services to Seniors in British Columbia - Past Learnings and Learnings since COVID-19 Report

A joint STAR / 411 Seniors Centre Society report entitled “Referral Services for Seniors in British Columbia | Past Learnings and Learnings since COVID-19” was published online in February 2021. STAR Director Dr. Andrew Sixsmith co-supervised a UBC Masters student’s practicum at 411 and the report was a direct result of the practicum. STAR designed the report. The report was in response to the growing need for a comprehensive review of existing information and referral services for seniors in B.C. in an attempt to capture the state of senior-focused service provision in B.C. The report explores the existing barriers that community-based service-providers face in the provision of Information and Referral (I&R) services as well as the existing challenges that older adults and caregivers face in accessing these services. The report aims to fill a knowledge gap as a means of assessing and evaluating current best practices and the future potential for providing equitable and inclusive I&R support to seniors. The report was widely disseminated through the STAR Institute and 411 Seniors networks and communications channels, including the BC Seniors Advocate, BC Ministry of Poverty Reduction, Parliamentary Secretary for Seniors, City of Vancouver Social Policy, United Way, MOSAIC Seniors Hub, various BC MLA’s and BC MP’s, BC-based community groups and seniors’ organizations, and Fair Child TV and other media outlets. The report was also received by Open Media for their campaign Affordable Internet Day of Action (<https://affordable-internet.ca>). <https://tinyurl.com/3upzs7ye>

Knowledge, Innovation, and Impact: A Guide for the Engaged Health Researcher Book

A joint STAR / AGE-WELL book entitled “Knowledge, Innovation, and Impact: A Guide for the Engaged Health Researcher” was published by Springer in January 2021. The book has 68 author contributors and was a tremendous and rewarding effort to coordinate. The aim of the book is to provide researchers with a straightforward and accessible guide on how to carry out research that will help them to combine both good science with real-world impact. The book is divided into 4 sections: *Thinking about impact; Working Collaboratively; Designing Together; and Reaching Out*. It consists of 47 chapters (25 short chapters on key topics each addressing a key pillar in the translational research process, 15 case study chapters and 7 learning activity chapters). The book is written in plain language (maybe a first in a book aimed at the research

community) that will guide researchers through the process of research-driven innovation.

Sixsmith, A., Sixsmith, J., Mihailidis, A., Fang, M. (Eds). (2021). *Knowledge, Innovation, and Impact - A Guide for the Engaged Health Researcher*. Springer.

<https://www.springer.com/gp/book/9783030343897>

COVID-19 and AgeTech Manuscript

A STAR manuscript entitled "COVID-19 and AgeTech" was published in *Quality in Ageing and Older Adults Journal* in November 2020. This paper aims to provide an overview of the emerging AgeTech sector and highlight key areas for research and development that have emerged under COVID-19, as well as some of the challenges to real-world implementation.

Sixsmith, A. (2020), "COVID-19 and AgeTech", *Quality in Ageing in Older Adults*. Vol. 21 No. 4, pp. 247-252. <https://doi.org/10.1108/QAOA-07-2020-0029>

<https://www.emerald.com/insight/content/doi/10.1108/QAOA-07-2020-0029/full/html>

AgeTech, Cognitive Health, and Dementia Book

A joint STAR / AGE-WELL book entitled "AgeTech, Cognitive Health, and Dementia" was published by Morgan & Claypool in September 2020. The book was the first in AGE-WELL's AgeTech book sub series on AGE-WELL's Challenge Areas. The manuscript explores the ways in which AgeTech can contribute to healthy cognitive aging and support the independence of people with dementia. It consists of 16 chapters and is part of a series titled *Assistive, Rehabilitative and Health Preserving Technologies*. AgeTech refers to the use of technologies, such as information and communication technologies (ICTs), robotics, mobile technologies, artificial intelligence, ambient systems, and pervasive computing to drive technology-based innovation to benefit older people.

Sixsmith, A., Sixsmith, J., Fang, M., Horst, B. (2020). *AgeTech, Cognitive Health, and Dementia*. Morgan & Claypool Publishers. doi: <https://doi.org/10.2200/S01025ED1V01Y202006ARH014>
<https://www.morganclaypool.com/doi/10.2200/S01025ED1V01Y202006ARH014>

2019/2020

Environmental Scans of AGE-WELL Challenge Areas

Beginning in March 2020, AGE-WELL and STAR commenced a comprehensive environmental scan of AGE-WELL's 8 challenge areas (<https://agewell-nce.ca/challenge-areas>) which are

driving AGE-WELL's research and innovation agenda between 2020-24. The environmental scans were an important early step in advancing the challenge areas, looking at current actors within each CA landscape and what they are doing in the sector (i.e., a scan of products, projects, policies, organizations, articles, patents, media, information website and specialized websites, best practice/impact case studies and more). The information was compiled in a more agile way compared to conventional academic research.

An Exploration of Experiences of Transdisciplinary Research in Aging and Technology Manuscript

A joint STAR / AGE-WELL manuscript entitled "An Exploration of Experiences of Transdisciplinary Research in Aging and Technology" was published in *Forum: Qualitative Social Research (FQS) Journal* in January 2020. STAR Director Dr. Andrew Sixsmith lead AGE-WELL's Crosscutting Activity 3 (CC3) Transdisciplinary Working team which produced the manuscript.

Wada, M., Grigorovich, A., Fang, M. L., Sixsmith, J., & Kontos, P. (2020). An Exploration of Experiences of Transdisciplinary Research in Aging and Technology. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, 21(1). <https://doi.org/10.17169/fqs-21.1.3332>. <https://www.qualitative-research.net/index.php/fqs/article/view/3332>

Point of Care Health Technology (PCHT) Real-World Output Guidelines and Templates Tool-kit

One of the roles of STAR is to communicate research outcomes to the "real-world". Each research project within the SFU technology and aging world should have parallel academic and real-world outputs. As well as academic papers, projects coming out of STAR and PCHT aim to provide outputs targeted at knowledge users. In order to facilitate this, STAR developed a set of guidelines and templates for researchers which are available on STAR's website.

<http://www.sfu.ca/starinstitute/about/institute-activities/star-institute-real-world-output-guidelines-and-templates-tool-k.html>

Key Issues in Aging in the 21st Century Digital Booklet

A STAR digital booklet entitled "Key Issues in Aging the 21st Century" was published online in September 2019. The booklet outlines 18 key issues for research, innovation and technology that will have real-world benefits for older adults, the economy and policy-makers. Our aim is to help people working in the field of aging to identify where we need innovation - new ideas, technologies, policies and practice - in order to make an impact in each of these areas. STAR partnered with United Way of the Lower Mainland (<https://www.uwlm.ca/>), launching the

booklet at their 2019 Summit on Aging with a view to explore future avenues for collaboration within the 18 key areas identified.

The booklet provided the groundwork for the joint STAR / AGE-WELL book on “AgeTech, Cognitive Health, and Dementia” within AGE-WELL’s AgeTech book sub-series (see *AgeTech, Cognitive Health, and Dementia* section in **2020-21 Year** section above) and a joint STAR / AGE-WELL Older Adult and Caregivers Advisory Committee COVID-19 report (see *STAR Institute COVID-19 Response* section for more details). <https://tinyurl.com/4jbftvyv>

2018/2019

Aging Workforce Manuscript

The ageing of populations worldwide has implications for workforces in developed countries, and labour shortages have increasingly become a political concern. Governments in developed countries have responded by increasing the retirement age as a strategy for overcoming the fall in labour supply. Using bibliometric techniques, STAR produced a manuscript entitled “Defining organizational contributions to sustaining an ageing workforce: a bibliometric review” which reviewed 122 articles published between 1990 and 2018. The aim was to examine the effectiveness of the strategy in addressing the labour shortages and, in particular, to identify the factors that contribute positively to maintaining worker participation within an ageing workforce at an organizational level. The manuscript was published in March 2019 in *European Journal of Ageing*.

Nagarajan, R N, Wada, M., Fang, M., Sixsmith, A. (2019). Defining organizational contributions to sustaining an ageing workforce: a bibliometric review. *European Journal of Ageing*. 6: 1-25. <https://link.springer.com/article/10.1007/s10433-019-00499-w>

Canadian Consortium on Neurodegeneration in Aging (CCNA) Project Environmental Scan and Report

Following the development of the preliminary e-health scoping review (see **2017-18 Year** section below), STAR carried out an environmental scan focusing on the developments over the past decade in technology for the support and care of persons with dementia, and a final report which was used to identify the current global landscape of products, services, and policies to make evaluations of the gaps and opportunities for future research and development. A final report was developed in parallel with a Knowledge Café workshop at SFU in October 2018. <https://tinyurl.com/yc7kyz5a>

CIHR Summer Program in Aging (SPA) 2018

STAR partnered with the CIHR Institute of Aging (IA), as the local organizing institution, to host an innovative five-day training program that focused on *Technology and Innovation Supporting the Health of Older Adults*. STAR co-organized and facilitated the entire week, including securing an impressive group of mentors within the aging and technology sector. STAR developed and designed all event materials.

During SPA 2018, trainees (Postdoc, PhD and MSc students from all over Canada) had the opportunity to engage in learning sessions, experiences, and activities. SPA 2018 explored fundamental topics such as research and professional skill building, grant writing, communications and knowledge translation. To further the interdisciplinary experience, trainees had access to networking and mentoring opportunities that were offered throughout the week including core mentors that were available throughout the program.

<http://www.sfu.ca/starinstitute/about/institute-activities/archive/spa.html>

Provincial and International Ageing Policies Environmental Survey/Scan

In parallel with an environmental scan carried out by AGE-WELL's New Brunswick Innovation Hub (<https://agewell-nih-appta.ca/>) focusing on national Canadian ageing policies, STAR conducted an environmental scan that looked at policy documents released by extra-governmental, research and international ageing organizations, as well as those released by other nations and by organizations invested in the "silver economy." Sources were gathered on expert recommendation. While the organization summary, policy challenges and provenance categories have been summarized by STAR, the policies were copied verbatim from their sources. These formed the basis for STAR Institute's 18 Key Issues in Aging in the 21st Century digital booklet (see **2019-20 Year** section above) and AGE-WELL's 8 Challenge Areas booklet entitled "The Future of Technology and Aging Research in Canada."

<https://tinyurl.com/yckuu548>

2017/2018

Canadian Consortium on Neurodegeneration in Aging (CCNA) Project E-Health Scoping Review

As part of a large international project between Canada and France, STAR lead a sub-project on "Technologies for Cognitive Health" which looked at market opportunities in relation to technologies for people with dementia. The project aimed at investigating integrated models of dementia care, study concrete solutions to sustain or improve health in aging population (i.e., training, activities), and the determinants of dementia over the lifespan. STAR carried out a preliminary e-health scoping review that looked at cost effectiveness of technology supports

for people with dementia and explored the extent to which current research on dementia technology-aids demonstrate the cost-effectiveness of these initiatives.

2) STAR Institute's COVID-19 Response

Throughout 2020 and 2021 in response to COVID-19, STAR developed a set of resources to support the needs of Vancouver-based 411 Seniors Centre Society's members and Canadian older adults more widely, in a time where self-isolation was and, in some ways, continues to be imperative. Eventually STAR developed similar resources for Researchers and shared this initiative with SFU Communicators across the 3 campuses. See STAR's COVID-19 related resources which span from March 2020 to present.

As Canadian citizens increasingly become vaccinated, the compiled lists will be adjusted accordingly. Many of the resources on the lists (such as Technology Basics which provide basic tech guides to stay connected with family as well as resources and services that are increasingly found online) will remain helpful.

STAR COVID-19 Resources and Solutions

COVID-19 Resources for Seniors and Caregivers

As part of STAR's community engagement strategy, STAR curated a comprehensive set of resources and solutions for older adults and caregivers. These range from simple guides for using technology to services that can help with daily living.

<http://www.sfu.ca/starinstitute/covid-19.html>

COVID-19 Resources for Researchers

STAR also compiled a comprehensive list of practical information and resources for the academic community. These range from funding opportunities for research projects to available resources and networks, all with the aim of developing technology-based solutions for problems related to COVID-19.

<http://www.sfu.ca/starinstitute/covid-19-info-for-researchers.html>

This initiative was launched in March 2020 and was widely circulated across the STAR, SFU and AGE-WELL networks. STAR received a lot of positive feedback from older adults, community organizations and researchers through an online feedback survey. Over the last two years, STAR has continued to update and revise its resource lists based on feedback and new information as it is received.

STAR's response to the COVID-19 outbreak has generated discussion about and shone a light on the digital divide faced by older adults. How willing are older adults to adopt and use

technology and how much support can they access to help them learn to actually use that technology? Based on these questions, STAR's next challenge was to understand how we might help older adults who are unable to access online resources, to benefit from the resources compiled and to remain healthy, connected, and getting the most out of life during COVID and post-COVID. This research question has and is being discussed widely across the sector.

As a next step and as described in publication section above, STAR Director Dr. Andrew Sixsmith co-supervised a 411 Seniors Centre Society UBC student's practicum in Summer 2020. This resulted in the opportunity to co-author a STAR-411 report that looks at the current information and referral service provision landscape for seniors in B.C. and the need for an adaptive technology-based approach to I&R services in the face of the COVID-19 pandemic. STAR designed the report. From there, a longer-term partnership between STAR and 411 was formed named "LEADS: Learning, Equity, Aging, Digital for Seniors" (see *National Collaborations and Partnerships* section below) with the overarching goal of supporting key priorities and projects identified by 411 and its member base.

SFU COVID-19 Engagement Events

SFU Centre for Dialogue Presentation: STAR COVID-19 Resource Initiative

STAR Director Dr. Andrew Sixsmith is part of the SFU Vancouver Engagement Committee organized by the SFU Centre for Dialogue which meets regularly. During an April 2020 meeting, members presented on their COVID-19 related efforts and STAR presented on its COVID-19 Resource initiative specifically. STAR received a lot of positive feedback as well as suggestions which were implemented.

SFU Vancouver Lunch 'N' Learn: Connecting Isolated Seniors at a Time of Disconnection

The SFU Centre for Dialogue asked STAR Director Dr. Andrew Sixsmith to be the featured speaker for SFU Vancouver's first virtual Lunch 'N' Learn in April 2020 and present on STAR's COVID-19 Resource initiative. The presentation was entitled "Connecting Isolated Seniors during a Time of Disconnection." There were approximately 230 attendees (most of which were older adults and caregivers) and the presentation received a huge response with very engaged commentary throughout (via chat box) which was both extremely positive and also constructive. The conversations were recorded and reviewed by STAR's team following the presentation which further informed STAR's COVID-19 project. We also asked participants to visit our website and provide further feedback via the online feedback survey.

<https://events.sfu.ca/event/10686>

BCCPA Webinar: Navigating the uncertain waters of the pandemic wave together

Following the SFU Lunch 'N' Learn, STAR was contacted to present on its COVID-19 Resource initiative in a June 2020 webinar hosted by Medical Pharmacies and supported by BC Care Providers Association (BCCPA) which featured three astute panelists (Dr. Andrew Sixsmith included) providing their unique perspectives on managing COVID-19 and faring a potential future wave together.

SFU Gerontology Research Centre (GRC) News COVID-19 Special Issue: Risk, Response, and Resilience in an Aging COVID-19 World

STAR met with SFU GRC staff and researchers to produce a COVID-19 special summer 2020 issue. STAR wrote an article within the issue titled "SFU STAR Institute COVID-19 Response, Resources and Solutions" <http://www.sfu.ca/content/dam/sfu/grc/stories/grc-news/GRC-News-Summer-2020.pdf>

3) SFU Collaborations

As a university-wide research institute, the STAR Institute collaborates across SFU, with affiliate researchers in every faculty. Within this report, we highlight just a few of the many collaborations over the last five years - notably with SFU Gerontology Research Centre (GRC), SFU Centre for Dialogue, SFU Vancouver, SFU Digital Health Circle, various SFU schools and departments including SIAT and Mechatronics, and the SFU VPRI office.

STAR has collaborated with the Point of Care Health Technologies (PCHT) team at SFU (<http://www.sfu.ca/pcht.html>) over the last five years with the intention of securing more funding past the final PCHT funding cycle 2022-23. PCHT is a multidisciplinary collaboration of 16 SFU faculty members from 4 faculties working to research and develop new point of care health technologies to improve health outcomes and keep people out of hospitals. The team is focused on ground breaking research from fundamental mechanistic ideas to clinical trials of point of care technologies. Throughout the research process PCHT aims to develop a community of health technology innovators, build research and training capacity across SFU campuses, and prepare the next generation of innovators to take on the unique challenges of effective, cost-conscious healthcare. STAR is the Independent Living Technologies node of PCHT, providing PCHT project management support to the larger team. Duties include and have included the launch and coordination of a biweekly and now bi-annual PCHT training forum, including securing guest presenters, the coordination of PCHT research presentations and meetings, the coordination of outreach sessions with local senior centres, development and dissemination of PCHT newsletter on PCHT and other aging and technology related events and activities, and identification of ongoing funding opportunities.

STAR collaborated with Laurence Meadows (SFU Strategic Partnerships Manager) and Fred Popowich (Scientific Director of KEY, SFU's Big Data Initiative and Professor at SFU's School of

Computing Science) as part of the NRC-SFU initiative. STAR developed an SFU AgeTech and Innovation Asset Map that included information about researchers at SFU within the AgeTech and innovation field, including individual expertise and community connections. The NRC program was approved in 2020 and we look forward to continued collaborations as part of the NRC-SFU initiative (see Appendix B for SFU AgeTech and Innovation Asset Map).

The STAR Institute and AGE-WELL have played a role in developing the SFU FASS Innovation Curriculum, a programme shaped around innovation-focused teaching & learning. The core idea of the curriculum is to improve the possibilities for graduates to land work in new knowledge and tech-intensive positions. Dr. Sixsmith was on the SFU FASS Innovation Curriculum advisory board and he built his Spring 2020 (undergrad), Spring 2021 (grad) and Spring 2022 (undergrad) Innovation and Aging GERO 412, 480 and 101 courses around the principles developed within the new curriculum. The courses were based off of AGE-WELL's 8 Challenge Areas and acted as a pilot/model to be used by other AGE-WELL members across other academic institutions.

STAR collaborated with the SFU Neuroscience and Neurotechnology Institute (<https://www.sfu.ca/neuro-institute.html>) (INN) on a large New Frontiers in Research Fund - Transformation (NFRFT) grant in 2021-22 on cognitive health and aging. While the larger NFRFT grant was not funded in this round, a smaller NFRF grant was funded which will allow the team to develop ideas and address the weaknesses in the larger NFRFT proposal for resubmission in early 2024. STAR will make a significant contribution through the development of a conceptual framework for brain health that could then be operationalized in the mathematical modelling. STAR's role would be the connector between the science and the end-user (integrated knowledge mobilization).

4) Provincial & National Collaborations and Partnerships

LEADS: Learning, Equity, Aging, Digital for Seniors

Since 2019, STAR Institute and 411 Seniors Centre Society (www.411seniors.bc.ca) in Vancouver, have partnered on numerous community-based projects with the overarching goal of supporting key priorities identified by 411 and its member base.

The partnership is called *LEADS: Learning, Equity, Aging, Digital for Seniors* and brings together staff and researchers from SFU STAR, staff and members from 411, and staff from the province-wide Navigation & Peer Support (NPS) initiative (<https://tinyurl.com/49z2jyd9>) monthly, to identify projects and protocols that enhance local information and referral services to better connect seniors and caregivers to the resources in their community.

The 411 is the Provincial lead on the NPS initiative sponsored through the United Way Lower Mainland Healthy Aging Strategy (<https://www.uwlm.ca/your-impact/healthyaging/>). The goal

of the NPS project is to establish navigation and peer support best practices through collaboration to develop strategies for enhancing information and referral services across BC. Community-based services provide on-the-ground localized expertise to support older adults' quality of life, sense of social connectedness, and empowerment.

SFU STAR and 411 co-hired a Community-Embedded Researcher in 2021/22 to promote the service development and academic objectives of the LEADS project and NPS initiative.

See full list of past, present and ongoing LEADS projects, events, outputs and publications here: <http://www.sfu.ca/starinstitute/about/institute-activities/star---411-seniors-centre-society-community-based-partnership-up.html>.

United Way of the Lower Mainland

STAR launched its "Key Issues in Aging in the 21st Century" digital booklet (http://www.sfu.ca/content/dam/sfu/starinstitute/Key%20Issues%20in%20Aging%20-%2021st%20Century_Print%20Version.pdf) at Healthy Aging by United Way's 2019 Provincial Summit on Aging. The 2019 Provincial Summit on Aging brought together community-based seniors services (CBSS) organizations, older adults, family and friend caregivers, academia and government representatives to discuss and collaborate on current issues and innovations in healthy aging. The Institute had a booth at the summit to share copies of the booklet and project findings and the booklet was launched in the last session of the summit by STAR Director Dr. Sixsmith and the United Way team. STAR and United Way will continue to co-design technology-based solutions and services to support healthy aging, building off of the work identified within STAR's digital booklet.

AGE-WELL Network

As highlighted in *Significant Accomplishments* section above, the STAR Institute, in addition to being an SFU research institute, plays an important role in facilitating the activities and research of the AGE-WELL Network of Centres of Excellence (www.agewell-nce.ca). AGE-WELL is focused on building a lasting legacy over the next five years and STAR will continue to support key AGE-WELL projects, initiatives and events, as well as strategic publications and knowledge mobilization activities. STAR provides part time management and coordination support, and more recently, design support to the AGE-WELL Network.

Publications: AGE-WELL AgeTech book series project management (nine books on AGE-WELL's Challenge Areas and 4 books on other areas of AgeTech research); Special Collections project management (RATE Journal collection on Robotics and Healthcare Management Forum collection on Aging, Tech and Health in a Post-COVID World); AGE-WELL publications relating to Environics survey of seniors' use of technology.

AGE-WELL Conferences and other events: Event and webinar project management including AGE-WELL's annual conference (event identity and branding materials, prospectus and program materials, PowerPoint slides, virtual backgrounds, etc.).

Amplify Program: Program project coordination and design support (identity and branding materials and Amplify program pilot project management - PETRA Conference 2022 Workshop). The program is designed to support various knowledge mobilization (KM) activities aligned with the AGE-WELL mandate (includes support of international KM opportunities beyond simple event sponsorship to help teams make a splash with their international conference plans & creating follow-up opportunities for their work to have impact with network support).

Canadian Institute of Healthy Aging (CIHR) Institutes of Aging

The STAR Institute is an official Institute of Aging and a member of the CIHR Research Centres and Institutes on Aging. As such, STAR participates in the bi-annual CIHR Research Centres and Institutes on Aging Directors meetings which provide a unique opportunity to engage with directors and associates of aging institutes across Canada, share resources, collaborate, work on joint projects and more. STAR provides detailed activity updates and an overview of current and future research efforts, including the strategic work of the AGE-WELL Network.

5) International Collaborations and Partnerships

STAR Institute - AGE-WELL Symposium at the British Society of Gerontology (BSG 2022)

STAR and AGE-WELL are collaborating on a symposium on "Lost in translation - Realising the potential of new and emerging technologies for healthy ageing" at BSG Conference from July 6 – 8, 2022. The symposium will bring together researchers from the UK and Canada to explore the opportunities and barriers for AgeTech to support healthy aging in an increasingly digital 21st Century. STAR Director Dr. Andrew Sixsmith is one of the symposium authors and STAR managed the project, disseminating the call for papers, managing the paper submission process and coordinating the symposium. The conference theme is *Better Futures for Older People - Towards Resilient and Inclusive Communities*.

<https://www.britishgerontology.org/events-and-courses/bsg-annual-conference>

STAR Institute - AGE-WELL Workshop at Pervasive Technologies Related to Assistive Environments (PETRA 2022)

STAR and AGE-WELL are collaborating on a workshop on "Ethical Issues in AgeTech to

Support Healthy Ageing (EAT)” at PETRA Conference from June 29 - July 1, 2022. The workshop will bring together researchers from the UK and Canada and aims to provide a multidisciplinary and critical overview of ethical issues related to the use of AI-based solutions for health care and social support of older people. STAR Director Dr. Andrew Sixsmith is one of the workshop authors and STAR managed the project, disseminating the call for papers, managing the paper submission and external review process, and coordinating the workshop. The outcomes of this conference have a broad impact in application areas that include, manufacturing, transportation, healthcare, energy systems, security and safety, robotics, biomedicine, environment and conservation, and many others.

<http://www.petrae.org/workshops/EAT.html>

Northern Health Science Alliance (NHSA)

STAR partners with the Northern Health Science Alliance (NHSA) and is involved in a Canadian and Northern England Multi-Organizational Collaboration on Healthy Ageing MoU. Current objectives include: 1) Creating a two-way knowledge exchange in research and development of health tech acceleration and technology adoption; 2) Building relationships and research partnership opportunities set to address mutual, international challenges; and 3) Creating potential channels for future commercial collaboration). The NHSA collaboration was disrupted due to the pandemic 2020/21, but is now ramping up during 2022, including a joint symposium. Dr Sixsmith is on the NHSA advisory panel and on a major UK-based project on brain health that connects various NHSA groups.

Age-Friendly Living Ecosystem (AFLE)

STAR provided coordination and design support for the Age-Friendly Living Ecosystem (AFLE) project piloted in Dundee, Scotland. Over the course of six virtual co-creation camps between June to December 2020, the project created translational opportunities for intergenerational placemaking towards developing an age-friendly and intergenerational community ecosystem. Participants from all over the world joined the workshops. STAR designed all identity documents for the AFLE project, summary posters and key thematic findings reports for each workshop (<https://tinyurl.com/yn2jn7d7>). STAR designed the project’s final report (<https://tinyurl.com/he8462zz>) and is currently developing a website for the next phase of the project.

6) Funding Initiatives

The STAR Institute team has been involved in numerous grant applications and funded projects over the past five years, including a number of collaborative grants with SFU affiliates. Where proposals were not successful the collaborations as a result of the proposal development

continue and more initiatives are underway. We have included details on some of our funded projects below. Key performance indicators include:

- STAR researchers were involved in 26 proposals between 2016-22, as lead or as partners
- Of these 18 were successful
- STAR has been involved in successful proposals for research funding amounting to \$1,731,452.98
- ** indicates funding directly awarded to the STAR Institute

New Frontiers in Research Fund - Transformation 2022 pilot grant 2022-24

In collaboration with SFU academic partners at the SFU Institute for Neuroscience and Neurotechnology, an application to the New Frontiers in Research Fund Transformation 2022 titled “What makes our brain resilient” was submitted and approved in 2021. STAR is collaborating on a larger NFRFT grant in 2022 with SFU INN.

Mitacs Accelerate Award: Cognitive effects of individualized lifestyle interventions in typical ageing 2022-24**

STAR received \$160,000 in funding for a two-year project on Cognitive effects of individualized lifestyle interventions in typical ageing, in partnership with SFU Institute for Neuroscience and Neurotechnology and SFU Digital Health Circle. Precision medicine in the context of healthy aging will help a better understanding, prevention, and treating of age-related cognitive impairment (ARCI). A new STAR PDF joined in April 2022 to officially begin in August 2022 to carry out the project.

AGE-WELL Challenge Area Development Funding: Healthy Lifestyles and Wellness 2021-23**

STAR received \$57,000 in funding for a two-year project on AGE-WELL’s Healthy Lifestyles and Wellness Challenge Area with Dr. Sixsmith being the Healthy Lifestyles and Wellness Challenge Area lead. The broad aim is to stimulate and support research and innovation within the AgeTech sector, with a particular focus on HL&WCA. The key objectives of the project are the development of a Community of Practice around this Challenge Area and to look how this can be sustained beyond AGE-WELL’s Network of Centres of Excellence time frame.

SFU STAR Institute - 411 Seniors Research Grant: Navigation & Peer Support 2021-23**

STAR received \$50,000 in funding between 2021-23 to co-fund a community-based researcher to support joint STAR - 411 projects with the aim of enhancing local information and referral

services to better connect seniors and caregivers to the resources in their community.

Community Partnership Fund David and Celia Ting Endowment for Education and Public Responsibility Award: Town Hall on Digital Health Informatics 2021-22**

STAR received \$3,000 in funding between 2021-22 to co-create and co-host a Town Hall for older adults and community-based seniors' agencies with 411 Seniors Centre Society as part of STAR and 411's LEADS: Learning, Equity, Aging, Digital for Seniors partnership. The Town Hall, on the theme of *Digital Health Information & Older Adults: COVID-19 and Beyond*, will take place in Fall 2022 and will feature panelists from various sectors to address the digital divide and digital health informatics for older adults.

AGE-WELL Scientific Director Stipend 2020-24**

As Associate Scientific Director of AGE-WELL between 2020-24, Dr. Sixsmith will receive an annual Scientific Director stipend (a total of \$225,000 between 2020-24) to support AGE-WELL activities and research, particularly in the western provinces, and to carry out activities and research at the STAR Institute that align with AGE-WELL's mandate. STAR continues to support numerous AGE-WELL activities and events as outlined in above and below sections.

SSHRC Partnership Engage Grant: COVID-19 and Mental Health 2020-22

In collaboration with SFU academic partners in Gerontology, SIAT and Mechatronics, an application to the SSHRC Partnership Engage Grant titled "COVID-19: Mental health needs and technological interventions for social connectedness amongst older adults" was submitted in June 2020 and approved in August 2020.

AGE-WELL 2020-24 - \$21.9 million in federal funding

Under the leadership of Scientific Directors Andrew Sixsmith (SFU) and Alex Mihailidis (UoT), AGE-WELL was successful in being renewed for three additional years (2020-23) under the Network of Centres of Excellence (NCE) program, with federal funding of \$21.9 million. AGE-WELL received a no-cost extension to 2024. The next phase of AGE-WELL represents a singular opportunity to continue the growth of Canada's leadership in AgeTech. This phase builds on the foundation that it has created and positions AGE-WELL to deliver a strong and sustainable technology and aging sector in Canada. With input from over 1000 partners, older adults and caregivers, AGE-WELL identified its 8 Challenge Areas. Meeting these challenges will be the key to continuing to drive the sector forward. AGE-WELL will ensure that everyone is pulling in the same direction so that technologies are actually having an impact on people's

lives. A major focus will be to ensure that the Network creates sustainable legacies that will generate social and economic benefits for Canada in years to come. As mentioned earlier in this report, the STAR Institute will continue to work closely with the AGE-WELL Network.

AGE-WELL Initiatives at SFU 2015-24 (in addition to direct STAR funding)

Digital Health Circle (DHC) - AGE-WELL Innovation Hub on SFU Campus

Digital Health Circle (DHC) is the non-profit connector of scientific expertise to Canadian-made digital healthcare innovators. The unique hub approach brings together inventors, researchers, businesses and end-users to create digital solutions that make a meaningful difference in people's lives. This work serves multiple objectives by leading to the creation of relevant and effective new digital technologies, creating high-quality jobs in British Columbia, improving the lives of its citizens and helping create industry clusters. SFU has benefited from DHC's involvement with its students, acting as a training centre to prepare high technology innovators of tomorrow. DHC also assists with technology transfer and leveraging academic excellence at SFU to create new opportunities to enhance innovation positioning of the university.

STAR provided extensive time, resources and coordination support during the development phase of the AGE-WELL Innovation Hub in Surrey and played a huge role in getting the hub off the ground. STAR scheduled and tracked meetings and outreach efforts with local partners, stakeholders, government and community over the course of six months prior to launch and helped coordinate the hub's launch event on SFU Surrey campus in 2018. STAR Director Dr. Andrew Sixsmith provided strategic support to hub director Dr. Sylvain Moreno, Associate Professor, SFU School of Interactive Arts and Technology. <https://www.digitalhealthcircle.ca/>

AGE-WELL Core Project: Stephen Robinovitch, Professor, SFU Biomedical Physiology and Kinesiology (BPK) - \$550,000

STAR affiliate and SFU researcher, Dr. Stephen Robinovitch was successfully funded through AGE-WELL's core research project funding for a project on "Wearable technology implementation and innovation to prevent fall-related hip fractures and traumatic brain injuries in older adults". Summary of project: Falls cause 95% of hip fractures and 80% of traumatic brain injuries (TBI) in older adults. These injuries are twice as common among older adults in long-term care (LTC) and acute care, than seniors living independently. Falls management in these settings requires complementary strategies to prevent falls, and prevent injury when falls occur. This research program focuses on facilitating the use of proven technologies, and developing new technologies for preventing injuries from falls in older adults. In Project 1, we will work with care providers to co-develop and evaluate strategies to increase uptake with wearable hip protectors. We will build on our success in implementing hip protectors in LTC in BC's Fraser Health Authority (FHA), where hip protectors are worn in 60% of falls, and reduce

fracture risk 3-fold. We will adapt and evaluate the FHA hip protector implementation model to LTC sites in Schlegel Villages (SV) in Ontario. In Project 2, we will also co-design and evaluate the usability of wearable technologies to prevent fall-related TBI. Our deliverables include evidence-based strategies for implementing hip protectors in LTC, and wearable devices designed to prevent fall-related TBI. Ultimately, this project will advance the health, safety, and mobility of seniors. <https://agewell-nce.ca/wp-content/uploads/2021/05/PDF-CRP-1.pdf>

AGE-WELL Core Project: Theodore Cosco, Assistant Professor, SFU Gerontology and Martin Ester, Professor, Computing Science - \$474,000

STAR affiliates and SFU researchers, Drs. Theodore Cosco and Martin Ester were successfully funded through AGE-WELL's core research project funding for a project on "Precision mental health: A stakeholder-informed, Big Data approach to psychological and wellbeing". Summary of project: One in five seniors suffers from some form of mental illness. Lack of attention and support for mental illness not only harms the person, but also costs the healthcare system and economy billions. Our challenge is to identify: What seniors believe is good mental health and Factors that make and keep a person mentally healthy. Our objectives are to 1) Understand seniors' definitions of good mental health, 2) Identify who is more likely to be at risk and/or showing early signs of poor mental health 3) Link people with help and support specific to their needs. Our project will use detailed information about the lives of thousands of people, collected in large study of aging, and advanced computer programming, such as machine learning. Rather than using traditional statistics that are only able to determine how a few variables are related to another, we will use machine learning to determine how many variables interact and relate to mental health. This will lead to the development of an "early-warning system" identifying seniors at risk and connecting them to personalized pathways for better mental health. <https://agewell-nce.ca/wp-content/uploads/2021/05/PDF-CRP-1.pdf>

AGE-WELL Crosscutting Activity: CC3 T-Work Transdisciplinary Working Research 2017-20**

STAR received \$179,443 in funding over the course of 2017-21 to support AGE-WELL's Crosscutting Activity: CC3 T-Work Transdisciplinary Working research. Transdisciplinary working is an approach to research that involves scientists from diverse academic disciplines and experiential stakeholders (e.g., older adults and caregivers, industry and financiers, policymakers) as researchers or partners. The aim of this type of approach is to solve complex social problems by developing innovations and knowledge that have real-world impact. It is not research that involves only one discipline or sector, or research that includes experiential stakeholders only as research participants or subjects. <https://agewell-nce.ca/research/crosscutting-activities>

AGE-WELL OA Involve: Older Adults' needs, experiences and preferences for Assistive Technology (AT) 2017-19**

STAR received \$40,800 in funding over the course of 2017-19 to support AGE-WELL's OA Involve project. The aim of OA-INVOLVE is to develop best practices to support the active involvement of older adults in AGE-WELL projects. It will focus on understanding how to best incorporate the experience and insight of older adults in aging and technology research.

<http://www.oa-involve-agewell.ca/>

Canadian Consortium on Neurodegeneration in Aging (CCNA) Team 15: Gerontechnology and Technologies for Cognitive Health 2017-19**

STAR received \$39,375 in funding between 2017-19 as part of a large international project between Canada and France. STAR lead a sub-project on "Technologies for Cognitive Health" which looked at market opportunities in relation to technologies for people with dementia. The project aimed at investigating integrated models of dementia care, study concrete solutions to sustain or improve health in aging population (i.e., training, activities), and the determinants of dementia over the lifespan. Outputs included a preliminary e-health scoping review, environmental scan and final report (see *Significant Accomplishments* section above for more details).

CIHR Summer Program on Aging (SPA) 2017-18**

STAR received \$85,000 in funding from CIHR between 2017-18 to co-organize and co-host an innovative five-day training program that focused on *Technology and Innovation Supporting the Health of Older Adults*. STAR organized and facilitated the entire week and developed and designed all event materials. During SPA 2018, trainees (Postdoc, PhD and MSc students from all over Canada) had the opportunity to engage in learning sessions, experiences, and activities (see *Significant Accomplishments* section above for more details).

Community Engagement Fund Point of Care Health Technologies (PCHT) team - Independent Living Technologies Node 2016-22**

STAR received \$84,000 in funding over the course of 2017-22 for work within SFU's Point of Care Health Technologies team funded through Community Engagement Fund. PCHT is a multidisciplinary collaboration of 16 SFU faculty members from 4 faculties working to research and develop new point of care health technologies to improve health outcomes and keep

people out of hospitals. The team is focused on ground breaking research from fundamental mechanistic ideas to clinical trials of point of care technologies. Throughout the research process PCHT aims to develop a community of health technology innovators, build research and training capacity across SFU campuses, and prepare the next generation of innovators to take on the unique challenges of effective, cost-conscious healthcare.

AGE-WELL Scientific Director Stipend 2015-20**

As Scientific Director of AGE-WELL between 2015-20, Dr. Andrew Sixsmith received an annual Scientific Director stipend (a total of \$500,000 between 2015-20) to support AGE-WELL activities and research, particularly in the western provinces, and to carry out activities and research at the STAR Institute that align with AGE-WELL's mandate. STAR supported numerous AGE-WELL activities and events between 2015-20 (e.g., AGE-WELL annual conferences, roadshows, impact challenge competitions and more), lead core research projects (outlined in below section) and supported AGE-WELL strategic planning (e.g., AGE-WELL renewal 2020-24; Challenge Area development informing AGE-WELL's core research program 2020-24; sitting on various AGE-WELL committees and participating in Network Management Office strategic meetings).

AGE-WELL 2015-20 - \$36.6 million in federal funding

Under the leadership of Scientific Directors Andrew Sixsmith (SFU) and Alex Mihailidis (UoT), AGE-WELL received funding for five years (2015-20) under the Network of Centres of Excellence (NCE) program, with federal funding of \$36.6 million.

As noted above, the STAR Institute plays a major role in AGE-WELL, Canada's AgeTech network. This relationship is reflected in funding flowing for AGE-WELL to support a range of STAR activities and funding flowing to SFU researchers affiliated with STAR. Below we highlight a few funded projects through AGE-WELL that support STAR activities. We also highlight funded projects through AGE-WELL that support SFU researchers affiliated with STAR.

STAR Institute Media Successes 2016/2022

The STAR Institute has been successful in engaging with public media. We highlight a few below:

Shin, H., Moreheart, S., **Sixsmith, A.**, Remund, L. (2021, November 9). *B.C.'s vaccine card rollout left many seniors confused and frustrated, researchers say*. CTV News.

<https://bc.ctvnews.ca/b-c-s-vaccine-card-rollout-left-many-seniors-confused-and-frustrated->

[researchers-say-1.5658920](#)

Shin, H., Moreheart, S., **Sixsmith, A.**, Remund, L. (2021, November 8). *Seniors struggled bridging digital divide in B.C.'s vaccine card rollout*. SFU News media release. <https://www.sfu.ca/sfunews/media/issues-experts/2021/11/seniors-struggled-bridging-digital-divide-in-b-c-s-vaccine-card.html>

Sixsmith, A. (2020, November 6). *Aging with Attitude*. Shaw Community Link episode. https://www.youtube.com/watch?v=4lPvCB_gjJw&feature=emb_title

Sixsmith, A. (2020, August 4). *Canada, we need to talk about COVID-19, Pandemics, Technology and the way forward*. YOUAREUNLTD. <https://tinyurl.com/m89kau56>

Sixsmith, A. (2020, July 13). *Seniors and technology: staying connected to prevent isolation*. LUMINO Health. https://luminohhealth.sunlife.ca/s/article/Seniors-and-technology-staying-connected-to-prevent-isolation?language=en_US&WT.mc_id=en-ca%3Aweb%3Athird_party%3Aagewell%3Abacklink_outreach

Sixsmith, A. (2020, May 20). *SFU Change Makers - Andrew Sixsmith*. SFU Changemaker series. https://www.youtube.com/watch?v=TCRH7qTxUYI&utm_source=twitter&utm_medium=social&utm_content=bd64865f-9e3e-443b-b400-a432721d2184

Sixsmith, A. (2020, May 19). *COVID-19 cuts across workplace generational boundaries*. PIQUE News Magazine. <https://www.piquenewsmagazine.com/whistler/covid-19-cuts-across-workplace-generational-boundaries/Content?oid=15402803>

Sixsmith, A. (2020, May 12). *AGE-WELL's \$21.9 million funding extension supports technology-driven aging research*. SFU News. <http://www.sfu.ca/sfunews/stories/2020/05/age-well-s--21-9-funding-extension-supports-technology-driven-ag.html>

Sixsmith, A. (2020, April 18). *Using tech to stay connected*. More than Money radio show. <https://morethanmoneyradio.com/show/helping-loved-ones-that-need-care/>

Sixsmith, A. (2020, April 16). *Senior podcasters take on tech to stay connected with each other and the world*. Canadian Press. <https://www.nationalnewswatch.com/2020/04/16/senior-podcasters-take-on-tech-to-stay-connected-with-each-other-and-the-world-2/>

Sixsmith, A. (2019, Oct 22). *AGE-WELL Conference 2019*. Times & Transcript (Regional paper for Telegraph Journal)

Sixsmith, A. (2019, September 27). *How urban design can help people with dementia navigate neighbourhoods and public spaces*. CBC Radio Spark. <https://www.cbc.ca/radio/spark/how->

[urban-design-can-help-people-with-dementia-navigate-neighbourhoods-and-public-spaces-1.5298810](#)

Sixsmith, A. (2019, August 16). *Technology and Aging*. Joytv BC Fraser Focus. https://www.youtube.com/watch?time_continue=5&v=EgApn3HVGMY

Sixsmith, A. (2019, June 25). *AGE-WELL: Solutions for Healthy Aging*. AGE-WELL Network. <https://www.youtube.com/watch?v=PesRZAcM8uo>

Sixsmith, A. (2018, November 14). *AGE-WELL: Aging & Technology*. YouAreUNLTD Magazine. <https://agewell-nce.ca/youareunltd>.

Sixsmith, A. (2018, October 15). *Silver economy offers business opportunities, SFU aging expert says*. Vancouver Sun. <https://vancouversun.com/business/local-business/silver-economy-offers-business-opportunities-sfu-aging-expert-says>

Sixsmith, A. (2017, June 21). *Being older not main reason some Canadians struggle with technology*. Technology.org. <https://www.technology.org/2017/06/21/being-older-not-main-reason-some-canadians-struggle-with-technology/>

Sixsmith, A. (2017, July 18). *Eliminating the Digital Divide*. Darpan Magazine. <https://www.darpanmagazine.com/lifestyle/tech/eliminating-the-digital-divide/>

Sixsmith, A. (2017, July 28). *Why robots are the way of the future, especially for the elderly*. Ottawa Sun. <https://ottawasun.com/2017/07/28/why-robots-are-the-way-of-the-future-especially-for-the-elderly/wcm/285681c1-7113-4e29-8cc8-e9339f46e090>

Sixsmith, A. (2017, August 5). *Robots are paving the way for our aging future*. Highbrow Magazine. <https://www.nationalnewswatch.com/2020/04/16/senior-podcasters-take-on-tech-to-stay-connected-with-each-other-and-the-world-2/>

Sixsmith, A. (2017, August 5). *Why robots are the way of our aging future*. Salon. https://www.salon.com/2017/08/06/why-robots-are-the-way-of-our-aging-future_partner/

Sixsmith, A. (2017, January): *SFU creates institute for tech research on healthy aging* <https://tinyurl.com/2p8s2r39>

STAR Institute Public Outreach 2016/2022

STAR is committed to supporting community-based research in the area of technology and aging and has been highly active over the last five years working with community partners as well as supporting AGE-WELL's community engagement efforts. Below we highlight a few of

the many activities STAR has been involved in between 2016-21.

2021/2022 Year

Town Hall on Digital Health Informatics - Fall 2022

STAR and 411 Seniors Centre Society received funding in 2021 to co-create and co-host a Town Hall for older adults and community-based seniors' agencies. The Town Hall will take place in Fall 2022 on the theme of *Digital Health Information & Older Adults: COVID-19 and Beyond* and will feature panelists from various sectors to address the digital divide and digital health informatics for older adults.

AGE-WELL AgeTech Innovation Week - Fall 2021

STAR provided management, coordination and design support to the AGE-WELL Network Management Office leading up to and during AGE-WELL's virtual AgeTech Innovation Week. STAR also presented a poster at the conference. AgeTech Innovation Week was a unique virtual event for anyone with an interest in technology-based solutions that support older adults and caregivers and featured curated public panels, workshops, networking opportunities and catalytic conversations that connect people and create change. The week-long event was a huge success. STAR played a large role in supporting program development, securing panelists and scheduling planning sessions, supporting logistics work and virtual event app use, and designed the event branding materials, marketing materials (including a full page spread in Canada's Globe and Mail newspaper), slide deck materials, etc.

<https://agetechinnovationweek.com/>

411 Seniors Centre Society - 2021/22

STAR and 411 officially named their partnership of a few years *LEADS: Learning, Equity, Aging, Digital for Seniors*. The project brings together staff and researchers from SFU STAR, staff and members from 411, and staff from the province-wide Navigation & Peer Support (NPS) initiative (<https://tinyurl.com/49z2jyd9>) monthly, to identify projects and protocols that enhance local information and referral services to better connect seniors and caregivers to the resources in their community. In 2021-22, STAR and 411 co-supervised a community-based researcher to support the project and ramped up the number of sub-projects within the partnership significantly. See full list of past, present and ongoing LEADS projects, events, outputs and publications here: <https://tinyurl.com/uj4wdy9w>. The Institute is also engaged in supporting the development of a new communications infrastructure for 411 and is currently putting new and efficient communications protocols in place, developing a new website to act as the central communications platform for the centre, creating new branding materials and a new monthly e-and-print newsletter, all in close conversation and audit interviews with 411 members, volunteers, staff and board.

2020/2021 Year

New Technologies International Conference Presentation - Late Winter 2021

STAR presented on "COVID-19 and AgeTech: Experiences and Implications" at the *New Technologies: Opportunity or Challenge for the Aging Population?* Conference held virtually. The international conference was the fifth in the series within the *eng(aging)!* project (see **2018/19 section** below for more details).

Maple Ridge Probus Club Visit - Spring 2020

STAR was invited to present to the Maple Ridge Probus Club whose members comprise of a community of retired professionals ranging between 60-90 years of age. STAR Director Dr. Andrew Sixsmith spoke on the topic of "COVID-19 and AgeTech".

411 Seniors Centre Society - 2020/21

STAR and 411 worked closely over 2020/21, identifying areas for collaboration as part of the MoU in place. STAR supported 411's transition to online member support in Spring 2020 by way of consultation and soon after compiled STAR's COVID-19 online resource lists (see *STAR Institute's COVID-19 Response* section above). STAR co-supervised a UBC Masters student's practicum at 411 and co-authored and designed a report on Information and Referral Services to Seniors in British Columbia (see *Significant Accomplishments* section above). 411 also became the Provincial lead in a new Navigation & Peer Support Project. STAR partnered with 411 on the two-year project which includes the co-supervision of a community-based researcher with the aim to enhance local information and referral services to better connect seniors and caregivers to the resources in their community. A key component of the project will include hosting a workshop involving SFU collaborators and community members.

<https://www.411seniors.bc.ca/>

2019/2020 Year

AGE-WELL Annual Conference - Fall 2019

STAR provided management and coordination support to the AGE-WELL Network Management Office leading up to and during the AGE-WELL Conference on *Exploring the Future of Technology and Aging* in Moncton, New Brunswick, Canada. STAR also presented one poster at the conference. The conference showcased a multi-disciplinary program of research and innovation from across the AGE-WELL network and engaging demonstrations and presentations spotlighted real-world solutions to support healthy aging. Sessions were designed to maximize networking, knowledge exchange and collaboration among AGE-WELL stakeholders. <https://agewell-nce.ca/conference>

AGE-WELL National Impact Challenge Competition - Summer 2019

The AGE-WELL Impact Challenge Competition was co-hosted by STAR in Vancouver. The top five finalists from the region were selected to compete for \$15,000 cash plus in-kind prizes. Attendees had the opportunity to learn from industry experts, gain key insights on

commercialization and meet tech entrepreneurs in this space; and discover funding and other opportunities within the AGE-WELL Network. <https://agewell-nce.ca/age-well-national-impact-challenge-startup-edition>

411 Seniors Centre Society - Spring 2019/20

The Executive Director of 411 Seniors Centre Society in Vancouver contacted STAR in 2019 with an interest in understanding the kind of work STAR was involved in and how it supports community-based research. STAR and 411 met to discuss further and develop avenues for collaboration (with an MoU in place). STAR provided guidance on the layout of 411 new facilities pre construction (Fall 2022 move in date) with regards to accessibility, space for future collaborative opportunities and engagement with outside organizations and universities (e.g., meeting spaces, a 'tech room' where older adults can test assistive technologies that help with healthy aging, as well as discussions around the funding of putting computers and training supports in place at the new centre for those who need access to online resources, filling in governmental forms and so forth). In late Spring 2022, STAR took part in a 411 Powered by Age podcast series (<https://www.poweredbyage.com/>) meeting, a podcast for seniors by seniors tackling issues pertinent to older adults in modern life. Episode topics range from finding ways to tackle the digital divide, to housing and health challenges for an aging population, to debunking myths on aging, leadership in the community, sharing poetry, storytelling, and much more. STAR Director Dr. Andrew Sixsmith was interviewed in one of their episodes. <https://www.411seniors.bc.ca/>

Brock House Seniors Society Visit - Spring 2019

STAR researchers in collaboration with PCHT colleagues visited Brock House Seniors Society for a second time (see **2017-18 Year** section below) to share current STAR research with older adult members, specifically STAR's recently published Key Issues in Aging in the 21st Century digital booklet.

2018/2019 Year

New Technologies International Conference Presentation - Early Spring 2019

STAR presented at the *New Technologies: Opportunity or Challenge for the Aging Population?* Conference in Prague. The international conference was the third in a series within the *eng(aging)!* project, organized by KEYNOTE (<https://www.keynote.cz/>), a well-established consultancy firm. The project reflects the crucial importance of a society-wide debate regarding the topic of demographic change and an aging population, and aims to highlight these issues, stimulate constructive discussion, and help to create conditions that will make use of demographic change for the benefit of societies. The project consists of a series of panel discussions, public seminars, roundtables and annual international conferences focusing on topics related to demographic change and population aging.

AGE-WELL Annual Conference - Fall 2018

STAR provided management and coordination support to the AGE-WELL Network Management Office leading up to and during the AGE-WELL Conference on *Innovation in Action* in Vancouver, British Columbia, Canada. STAR also presented two papers at the conference. The conference showcased a multi-disciplinary program of research and innovation from across the AGE-WELL network and engaging demonstrations and presentations spotlighted real-world solutions to support healthy aging. Sessions were designed to maximize networking, knowledge exchange and collaboration among AGE-WELL stakeholders.

<https://agewell-nce.ca/conference>

STAR Institute Knowledge Café - Fall 2018

STAR hosted a Knowledge Café workshop at SFU Harbour Centre in Vancouver. As mentioned in the *Significant Accomplishments* section of this report, STAR received funding from the Canadian Consortium on Neurodegeneration in Aging (CCNA) for sub-project 15.8 which specifically looked at market opportunities in relation to technologies for people with dementia. The findings from the environmental scan that was carried out were used to develop the Knowledge Café on the topic of cognitive health and technology. AGE-WELL NCE and the CIHR Institute of Aging also provided funds for event development and organization expenses. The Knowledge Café was a great opportunity for researchers, students, industry and government partners and stakeholders in the aging and technology sector to: prioritize areas of development for future care technologies; identify key ethical considerations of current and future technologies; discuss strategies to best distribute knowledge concerning technologies for dementia to those who may need it. <http://www.sfu.ca/starinstitute/about/institute-activities/archive/star-institute-knowledge-cafe-2019.html>

AGE-WELL National Roadshow - Spring 2018

The 2018 AGE-WELL Roadshow on “Creating the Future: AGE-WELL 2020-2025” was co-hosted by STAR at SFU Harbour Centre in Vancouver. The roadshow was a part of a national dialogue about the next phase of Canada’s technology and aging network. In early 2018, AGE-WELL began a strategic planning process that enabled it to define its priorities for 2020-2025. AGE-WELL organized six roadshows across Canada to engage in a dialogue with stakeholders by sharing highlights of plans for the future, describing how to get involved in the network and inviting participants to share their comments.

Point of Care Health Technology (PCHT) Research Forum Community Engagement Event - Spring 2018

Notably, STAR organized a Research Forum event on behalf of the PCHT team at the Brock House Seniors Society in Vancouver. Trainees from PCHT and STAR connected with members of Brock House to provide information on emerging care health technologies and research findings through a series of short presentations. Each presentation was followed by a Q&A period with a chance to see prototypes of upcoming technology. <http://www.sfu.ca/pcht.html>

AGE-WELL HQP and OACAC, STAR Institute and AGING 2.0 Social - Spring 2018

STAR co-sponsored, organized and hosted a social event at Rogue Restaurant in Vancouver for local researchers, local AGE-WELL Highly Qualified Personnel (HQP) and local members of AGE-WELL's Older Adult and Caregiver Advisory Committee (OACAC). Members from Vancouver's Aging 2.0 Chapter also attended. The social provided the opportunity to meet and chat informally with others in BC interested in technology and aging and develop community and industry partnerships.

2017/2018 Year

AGE-WELL Annual Conference - Fall 2017

STAR provided management and coordination support to the AGE-WELL Network Management Office leading up to and during the AGE-WELL Conference on *Benefiting Canada: Technologies, Services and Policies for Healthy Aging* in Winnipeg, Manitoba, Canada. STAR also presented two papers at the conference. The conference showcased a multi-disciplinary program of research and innovation from across the AGE-WELL network and engaging demonstrations and presentations spotlighted real-world solutions to support healthy aging. Sessions were designed to maximize networking, knowledge exchange and collaboration among AGE-WELL stakeholders.

<https://agewell-nce.ca/conference>

Kitsilano House Seniors' Centre Visit - Fall 2017

A STAR Research Associate (Mei Lan Fang) shared current STAR research with older adults at the Kits House Seniors' Centre on National Seniors Day

AGE-WELL Summer School on Aging - Summer 2017

A STAR Research Associate (Mei Lan Fang) attended the AGE-WELL Summer School on Aging in Santiago, Chile. She presented scoping reviews conducted in collaboration with other graduate students on the etiological, ethical and political implications of mild cognitive impairment and technology. This international collaboration emphasized the importance of having different disciplines collaborating to deliver a superior result.

<https://agewell-nce.ca/archives/3819>

CIHR Summer Program in Aging (SPA) - Summer 2018

STAR partnered with the CIHR Institute of Aging (IA), as the local organizing institution, to host an innovative five-day training program that focused on *Technology and Innovation Supporting the Health of Older Adults* (see *Significant Accomplishments 2018-19 Year* section for more details). STAR co-organized and facilitated the entire week, including securing an impressive group of mentors within the aging and technology sector. STAR developed and designed all event materials including the week program booklet and program at a glance. During SPA 2018, trainees (Postdoc, PhD and MSc students from all over Canada) had the opportunity to

engage in learning sessions, experiences, and activities.

<http://www.sfu.ca/starinstitute/about/institute-activities/archive/spa.html>

AGE-WELL National Roadshow - Spring 2017

The 2017 AGE-WELL Roadshow was co-hosted by STAR at SFU Segal Graduate School of Business in Vancouver. The roadshow included presentations on AGE-WELL's comprehensive suite of research, funding, and HQP training programs and announced new opportunities for researchers, trainees, community and partners to become involved.

AGE-WELL HACKING HEALTH National Ideathon - Spring 2017

The 2017 AGE-WELL Ideathon was co-hosted by STAR at SFU Joseph and Rosalie Centre in Vancouver. The large workshop generated ideas, teams and proposals to submit proposals to the National AGE-WELL/HACKING HEALTH Ideathon Competition. The goal of the national competition was to identify and invest in great new technologies and services to support healthy aging. Prizes awarded at the AGE-WELL-HACKING HEALTH National Ideathon totaled \$75,000 in cash and in-kind services. <https://tinyurl.com/ys43t3na>

SFU Point of Care Health Technologies team - 2017/18

STAR provided administration and coordination support to the PCHT team. Duties included launch and coordination of a bi-weekly PCHT Training Forum and securing guest presenters, coordination of PCHT research presentations and meetings, coordination of outreach sessions with local senior centres, development and dissemination of a weekly PCHT newsletter on PCHT and other aging and technology related events, and identification of funding opportunities. <http://www.sfu.ca/pcht.html>

SFU PCHT Research Forum - 2017/18

PCHT facilitated PCHT Research Forum meetings as a primary venue for research translation, capacity building, communication, and community development. The Research Forum meetings provided the opportunity for PCHT trainees and PIs to share their work and expertise, ensuring that PCHT researchers developed the crucial knowledge to be successful and generate transformative impact at SFU and beyond. The meetings helped build strong connections across the community, including outreach to local stakeholders.

<http://www.sfu.ca/pcht.html>

AGE-WELL National Innovation Hub - 2017/18

STAR provided resources and coordination support during the development phase of the AGE-WELL National Innovation Hub based at SFU - Digital Health Circle. Duties included scheduling and tracking meetings and outreach efforts with local partners, stakeholders, government, community over the course of six months prior to launch. <https://www.digitalhealthcircle.ca/>

Appendix A: SFU STAR Institute - Membership Sign Off Form June 2022

Last Name	First Name	Institution	Faculty (If SFU)	Department (If SFU)	Active Member	Peripheral Member
Adeci	Isaac	Simon Fraser University	Arts and Social Sciences	Gerontology	X	
Anderson	Laurie	Simon Fraser University	Education	Education		X
Arzanpour	Siamak	Simon Fraser University	Applied Sciences	Mechatronic Systems Engineering	X	
Astell	Arlene	University of Toronto			X	
Battersby	Lupin	Simon Fraser University	Knowledge Mobilization	Knowledge Mobilization		X
Belmonte Fernández	Oscar	Universitat Jaume, Spain				X
Boger	Jennifer	University of Waterloo			X	
Boot	Walter	University of Florida				X
Borghardt	Pam	Simon Fraser University	Arts and Social Sciences	Gerontology	X	
Brown	Lynda	Curatio			X	
Faisal Beg	Mirza	Simon Fraser University	Applied Sciences	Engineering Science	X	
Chaudhury	Habib	Simon Fraser University	Arts and Social Sciences	Gerontology		X
Chrostowski	Michael	AGE-WELL, University Health Network			X	
Chu	Charlene	University of Toronto			X	
Chung	Teresa	Simon Fraser University	Applied Sciences	Engineering Science	X	
Christie	Greg	Simon Fraser University	Communications, Art and Technology	Interactive Arts and Technology	X	
Cosco	Theodore	Simon Fraser University	Arts and Social Sciences	Gerontology	X	
D'Arcy	Ryan	Simon Fraser University	Applied Sciences	Engineering Science	X	
Devji	Aly	BC Care Providers			X	
Dixon	Mandy	Northern Health Science Alliance (NHSA)			X	
Ester	Martin	Simon Fraser University	Applied Sciences	Computing Science	X	
Fang	Mei Lan	Simon Fraser University, University of Dundee	Arts and Social Sciences	Gerontology	X	
Farzan	Faranak	Simon Fraser University	Applied Sciences	Mechatronic Systems Engineering		X
Flynn	Aisling	SFU, National University of Ireland, Scotland	Arts and Social Sciences	Gerontology	X	
Froggett	Lynn	University of Central Lancashire, UK			X	
Glasser	Uwe	Simon Fraser University	Applied Sciences	Computing Science	X	
Golnaraghi	Farid	Simon Fraser University	Applied Sciences	Mechatronic Systems Engineering	X	
Goubran	Rafik	Carlton University			X	
Gromala	Diane	Simon Fraser University	Communications, Art and Technology	Interactive Arts and Technology	X	
Gutierrez	Habana	Simon Fraser University	Arts and Social Sciences	Gerontology	X	
Gutman	Gloria	Simon Fraser University	Arts and Social Sciences	Gerontology	X	
Harcourt	Mike	Former Premier of British Columbia, Former Mayor of Vancouver			X	
Horst	Becky	University of Western Ontario			X	
Jackson	Piper	Thompson Rivers University				X
Juzwishin	Don	University of Victoria			X	
Khan	Shehroz	University Health Network			X	
Knoefel	Frank	University of Ottawa			X	
Komisar	Vicki	SFU 2016-20, UNBC 2020-22	Science	Biomedical Physiology and Kinesiology	X	
Lalji	Kahir	United Way of the Lower Mainland			X	
Lim	Angelica	Simon Fraser University	Applied Sciences	Computing Science		X
Liu	Lili	University of Waterloo				X
Lubik	Sarah	Simon Fraser University	Beedie School of Business	Beedie School of Business	X	
MAHAMADOU	Abdoul Jalil DJIBEROU	Simon Fraser University	Arts and Social Sciences	Gerontology	X	
Mahmood	Atiya	Simon Fraser University	Arts and Social Sciences	Gerontology		X
Maine	Elcia	Simon Fraser University	Beedie School of Business	Beedie School of Business		X
Mann	Jim	AGE-WELL			X	
McAloney	Richard	AGE-WELL			X	
McIntosh	Randy	Simon Fraser University	Science	Biomedical Physiology and Kinesiology	X	
Meadows	Laurence	Simon Fraser University	Partnerships Hub	Partnerships Hub		X
Menon	Carlo	Simon Fraser University	Applied Sciences	Engineering Science	X	
Miguel-Cruz	Antontio	University of Alberta				X
Mihalidis	Alex	AGE-WELL, University Health Network, University of Toronto			X	
Mitchell	Barbara A.	Simon Fraser University	Arts and Social Sciences	Gerontology		X
Moreheart	Sarah	411 Seniors Centre Society - NPS Program			X	
Moreno	Sylvain	Simon Fraser University	Communications, Art and Technology	Interactive Arts and Technology	X	
Murphy	Bridgette	AGE-WELL, University Health Network			X	
Neubauer	Noelannah	University of Calgary				X
Neun-Hornick	Juliet	Simon Fraser University	Simon Fraser University	Simon Fraser University	X	
Nwosu	Amarachukwu Callistus	Lancaster University, UK			X	
O'Rourke	Norm	Ben-Gurion University of the Negev, Israel			X	
Park	Edward	Simon Fraser University	Applied Sciences	Mechatronic Systems Engineering	X	
Polanyi	Margaret	AGE-WELL, University Health Network			X	

By uploading this list, the Director certifies that all the members listed in this document have agreed to be affiliated with the Centre/Institute and approve of this renewal application

Powell	Jason	Staffordshire University, UK			X	
Pulkingham	Jane	Simon Fraser University	Arts and Social Sciences	Anthropology		X
Raber	Caylee	Emily Carr University				X
Remund	Leslie	411 Seniors Centre Society			X	
Riadi	Indira	Simon Fraser University	Arts and Social Sciences	Interactive Arts and Technology	X	
Rincon	Adriana Rios	University of Alberta				X
Robinovitch	Stephen N.	Simon Fraser University	Science	Biomedical Physiology and Kinesiology	X	
Rodriguez	Emma	Simon Fraser University	Arts and Social Sciences	Gerontology	X	
Rubeis	Giovanni	Karl Leindster University, Austria			X	
Sandassi	Samantha	AGE-WELL, University Health Network			X	
Schiphorst	Thecla	Simon Fraser University	Communications, Art and Technology	Interactive Arts and Technology	X	
Schneider	Alison	AGE-WELL, University Health Network			X	
Shin	Hannah	Simon Fraser University	Arts and Social Sciences	Gerontology	X	
Sixsmith	Andrew	Simon Fraser University	Arts and Social Sciences	Gerontology	X	
Sixsmith	Judith	University of Dundee			X	
Sparrey	Carolyn	Simon Fraser University	Applied Sciences	Mechatronic Systems Engineering	X	
Tinker	Anthea	Kings College University				X
White	Becky	Simon Fraser University	Arts and Social Sciences	Gerontology	X	
Wilson	Nicola	Northern Health Science Alliance (NHSA)			X	
Wister	Andrew	Simon Fraser University	Arts and Social Sciences	Gerontology		X
Wong	Karen Lok Yi	University of British Columbia			X	
Woolrych	Ryan	Heriot-Watt University, UK				X

Appendix B: SFU STAR Institute - SFU AgeTech and Innovation Asset Map June 2022

Institution	Faculty	Department	First	Last	SFU Title	Email	Expertise	Community Connections	City	Province
SFU	Beedie School of Business	Business	Jan	Kietzmann	Assistant Professor	jan_kietzmann@sfu.ca	human-computer interaction, information technology and social change, information systems, communication technology, technological innovation	Associate editor, Business Horizons (https://www.journals.elsevier.com/business-horizons); Fellow, Consumer and Organisational Data Analytics (CODA) Research Centre, King University, UK (https://www.kcl.ac.uk/business/research/centres/coda)	Surrey	BC
SFU	Faculty of Applied Sciences	Computing Science	Uwe	Glasser	Professor	glaesser@cs.sfu.ca	situational awareness and decision support, formal engineering methods	Principle investigator and founder, Software Technology Lab and the Public Safety and Security HPC Lab, SFU (https://www.sfu.ca/computing/research/labs/stl.html)	Burnaby	BC
SFU	Faculty of Applied Sciences	Computing Science	Lovedeep	Gondara	PhD student	lgondara@sfu.ca	privacy preserving machine learning, machine learning in healthcare	Biostatistician, BC Cancer Agency (http://www.bccancer.bc.ca/)	Burnaby	BC
SFU	Faculty of Applied Sciences	Computing Science	Ke	Li	Assistant Professor	keli@sfu.ca	machine learning (incl. deep learning, generative models, meta-learning and reinforcement learning), computer vision, algorithms	Information not readily available	Burnaby	BC
SFU	Faculty of Applied Sciences	Computing Science	Angelica	Lim	Rajan Family Assistant Professor of Professional Practice	angelica@sfu.ca	human robot interaction, affective computing, multimodal perception and learning, development robotics	Director, Rosie Lab (https://www.rosielab.ca/home)	Burnaby	BC
SFU	Faculty of Applied Sciences	Computing Science	Xiaowei	Song	Adjunct Professor	Xiaowei.Song@fraserhealth.ca	patient care through health sciences and technology innovations, high-performance structural and functional MRI, computational health informatics, data mining technologies	Senior Clinical Scientist, Fraser Health Authority (https://www.fraserhealth.ca/); MRI Program Lead, SFU ImageTech Lab in Surrey Memorial Hospital (https://www.sfu.ca/research/facilities/imagetech-lab)	Vancouver	BC
SFU	Faculty of Applied Sciences	Computing Science	Ke	Wang	Professor	wangk@cs.sfu.ca	graph and network data, data privacy, data security, mining massive datasets, mining biological datasets	Associate editor, ACM TKDD journal; Associate editor, IEEE TKDE journal; Editorial board member, Journal of Data Mining and Knowledge Discovery	Burnaby	BC
SFU	Faculty of Applied Sciences	Computing Science, SFU Big Data Initiative	Fred	Popowich	Professor	bdi_dir@sfu.ca	technology commercialization, cognitive science, machine learning, smart houses, technology enhanced learning	Associate Director, SFU Research and Industrial Relations; Scientific Director, SFU's Big Data Initiative (https://www.sfu.ca/big-data/); President, Canadian Network for Visual Analytics (CANVAC) (http://www.canvac.org/CANVAC_public/); Founding Director, Vancouver Institute for Visual Analytics (https://viva.sfu.ca/)	Burnaby	BC
SFU	Faculty of Applied Sciences	Engineering Science	Michael	Adachi	Assistant Professor	mmadachi@sfu.ca	nanodevice fabrication, 2D materials and devices, solar cells	Nano device fab group (http://nanodevice.fas.sfu.ca/)	Burnaby	BC
SFU	Faculty of Applied Sciences	Engineering Science	Teresa	Cheung	Assistant Professor of Professional Practice	tpc5@sfu.ca	MEG imaging and analysis methods development, modelling cognitive processes in time, frequency and phase, analysis and integration of MEG, MRI, fMRI and DTI data	Physicist and medical imaging scientist, Fraser Health (https://www.fraserhealth.ca/)	Burnaby	BC
SFU	Faculty of Applied Sciences	Engineering Science	Ryan	D'Arcy	Professor	rdarcy@sfu.ca	neuroscience and non-invasive biomedical imaging interfacing, complex neural systems, treatment of brain diseases and disorders	Neuroscientist and entrepreneur; Co-founder, president and chief scientist officer, HealthTech Connex Inc. (https://healthtechconnex.com/)	Surrey	BC
SFU	Faculty of Applied Sciences	Engineering Science	Mirza	Faisal Beg	Professor	mfbeg@sfu.ca	computational anatomy, non-rigid registration of medical images, shape analysis, medical image computing	Co-Director, Medical Image Analysis Laboratory; Scholar, Michael Smith Foundation for Health Research Scholar	Burnaby	BC
SFU	Faculty of Applied Sciences	Engineering Science	Carlo	Menon	Professor	cmenon@sfu.ca	robotics, mechatronics, and dynamics, MEMS, smart materials and structures, artificial muscles and design of mechanisms	President and co-founder, CEA Innovations Corp (https://www.ceai.ca/)	Burnaby	BC
SFU	Faculty of Applied Sciences	Engineering Science	Shahram	Pavandeh	Professor	shahram_pavandeh@sfu.ca	robotics, movement tracking, activity recognition, multi-modal user interface, visual reconstruction, healthcare robotics	Networked Robotics and Sensing Laboratory (NR&S-L) (https://erl.ensc.sfu.ca/)	Burnaby	BC
SFU	Faculty of Applied Sciences	Mechatronic Systems Engineering	Siamak	Arzanpour	Associate Professor	arzanpour@sfu.ca	vibration control, smart materials and structures, energy harvesting, haptic devices and interfaces	Co-founder, MobiSafe Systems (SFU spinoff focused on commercialization of a reusable airbag system for wheelchair application); Co-founder, Human in Motion Robotics (SFU spinoff)	Surrey	BC
SFU	Faculty of Applied Sciences	Mechatronic Systems Engineering	Faranak	Farzan	Associate Professor	faranak.farzan@sfu.ca	neuromodulation technologies, brain stimulation technologies, bio-signal processing, electrophysiology	Chair in Technology Innovations, eBrain Lab/Youth Addiction Recovery and Mental Health (http://ebrainlab.ca/)	Surrey	BC
SFU	Faculty of Applied Sciences	Mechatronic Systems Engineering	Farid	Golnaraghi	Professor	farid_golnaraghi@sfu.ca	application of intelligent sensor systems to: biomedical, automotive and condition monitoring and diagnostic systems	Co-founder and CEO, Optican Systems Inc.; Co-founder, Shield-X Technology Inc.; Fellow, Canadian Academy of Engineering	Surrey	BC
SFU	Faculty of Applied Sciences	Mechatronic Systems Engineering	Woo Soo	Kim	Associate Professor	woosook@sfu.ca	sensor robots, advanced 3D printing, 3D printed electronics	Senior member, IEEE; Associate Editor, IEEE Transactions on Electron Devices (https://www.ieee.org/)	Surrey	BC
SFU	Faculty of Applied Sciences	Mechatronic Systems Engineering	Edward	Park	Director and Professor	ed_park@sfu.ca	mechatronics, biomechatronics, biomedical technologies, wearable technologies, biorobotics	Director, Biomechatronic Systems Laboratory	Surrey	BC
SFU	Faculty of Applied Sciences	Mechatronic Systems Engineering	Carolyn	Sparrey	Assistant Professor	csparrey@sfu.ca	injury biomechanics, computational models of injury, tissue mechanics and materials	Director, NeuroSpine Lab (http://www.sfu.ca/neurospine.html)	Surrey	BC

SFU	Faculty of Arts and Social Sciences	Anthropology	Parin	Dossa	Professor	pdossa@sfu.ca	social gerontology, gender and health, transnational aging, politics of disablement, mobility	Information not readily available	Burnaby	BC
SFU	Faculty of Arts and Social Sciences	Anthropology	Kathleen	Inglis	Professor	klinglis@sfu.ca	anthropology	Information not readily available	Burnaby	BC
SFU	Faculty of Arts and Social Sciences	Gerontology	Robert	Beringer	Masters student	RobertBeringer@outlook.com	gerontechnology, aging-in-place	Post-Doctoral Fellow, Health Systems Impact at Victoria Hospice (https://victoriahospice.org/)	Vancouver	BC
SFU	Faculty of Arts and Social Sciences	Gerontology	Habib	Chaudery	Chair and Professor	chaudhury@sfu.ca	aging and the built environment, long-term care, seniors' housing, neighbourhoods for active aging, age-friendly communities, dementia-friendly communities	Affiliated w/ Centre for Research on Personhood in Dementia, UBC and Alzheimer Catalonia; Editor-in-Chief, Journal of Aging and Environment	Vancouver	BC
SFU	Faculty of Arts and Social Sciences	Gerontology	Ryan	Churchill	Graduate student	ryan_churchill@sfu.ca	physical activity, resilience, motivation, gerontechnology, coping strategies, and sociocultural determinants among older adults	Information not readily available	Vancouver	BC
SFU	Faculty of Arts and Social Sciences	Gerontology	Theodore	Cosco	Postdoctoral Fellow	theodore_cosco@sfu.ca	healthy ageing, mental health, life course epidemiology, e-health	Research Fellow, Oxford Institute of Population Ageing, University of Oxford; Chartered Psychologist, British Psychological Society (https://www.bps.org.uk/)	Vancouver	BC
SFU	Faculty of Arts and Social Sciences	Gerontology	Gloria	Gutman	Professor	gutman@sfu.ca	senior's housing, long-term care, health promotion, elder abuse, gerontechnology, LGBT aging, age-friendly hospitals and communities, seniors and emergency preparedness	President, North American chapter of International Society for Gerontechnology (https://www.gerontechnology.org/); Vice-President, International Longevity Centre-Canada (https://www.ilccanada.org/); Member, Research Management Committee of the Canadian Frailty Network (CFN-NCE) (https://www.cfn-nce.ca/about-us/board-and-committees/network-advisory-committees/)	Vancouver	BC
SFU	Faculty of Arts and Social Sciences	Gerontology	Sharon	Koehn	Senior Lecturer / Clinical Assistant Professor	schoehn@sfu.ca	ethnocultural minority and immigrant older adults focus, health and healthcare, health promotion, elder abuse, quality of life	Research Associate, Women's Health Research Institute, BC Women's (https://whri.org/staff/sharon-koehn/)	Vancouver	BC
SFU	Faculty of Arts and Social Sciences	Gerontology	Dan	Levitt	Adjunct Professor	dlevitt@taborvillage.org	retirement and long term care administration, assisted living, leadership, ageism	Executive Director, Tabor Village (https://website.taborvillage.org/who-we-are/people/)	Vancouver	BC
SFU	Faculty of Arts and Social Sciences	Gerontology	Aliya	Mahmood	Associate Professor	amahmood@sfu.ca	environmental gerontology focus, interconnections of aging, built environment and health	Editorial board member, Journal of Aging and Environment	Vancouver	BC
SFU	Faculty of Arts and Social Sciences	Gerontology	Barbara	Mitchell	Professor	mitcheb@sfu.ca	families and aging, life-course research, intergenerational relations, social policy issues, health promotion	Information not readily available	Vancouver	BC
SFU	Faculty of Arts and Social Sciences	Gerontology	Andrew	Wister	Director and Professor	wister@sfu.ca	collection and analyses of health and social data, environmental adaptation among older adults, patterns of family and social support, health promotion and population health	Director, SFU Gerontology Research Centre (GRC) (https://www.sfu.ca/grc.html)	Vancouver	BC
SFU	Faculty of Arts and Social Sciences	Political Science	Anil	Hira	Professor	ahira@sfu.ca	technology and innovation policy, industrial policy	Latin American specialist; Founder and Lead researcher, Clean Energy Research Group (http://www.sfu.ca/politics/CERG.html)	Burnaby	BC
SFU	Faculty of Arts and Social Sciences	Sociology and Anthropology	Jane	Pukingham	Dean and Professor	fassdean@sfu.ca	institutional context of gendered inequality and public policy in work and employment, social welfare policy	Research associate, Canadian Centre for Policy Alternatives (https://www.policyalternatives.ca/); Editorial board member, International Journal of Social Research Methodology; Advisory board member, Studies in Political Economy	Burnaby	BC
SFU	Faculty of Communication, Art and Technology	Communication	Richard	Smith	Professor	smith@sfu.ca	technology and social inclusion, public surveillance, games/online communities, wireless information society, seniors and the internet	Director, Centre for Policy Research on Science and Technology (CPROST), SFU (http://www.sfu.ca/communication/research/centres/cprost.html)	Vancouver	BC
SFU	Faculty of Communication, Art and Technology	Digital Health Circle / School of Interactive Arts and Technology	Greg	Christie	Chief Technology Officer	greg_christie@sfu.ca	brain processes controlling cognition, digital health solutions to support brain health	Chief Technology Officer, Digital Health Circle (https://www.digitalhealthcircle.ca/); Associate Director, Digital Health Hub	Surrey	BC
SFU	Faculty of Communication, Art and Technology	Digital Health Circle / School of Interactive Arts and Technology	Sylvain	Moreno	Associate Professor	sylvain_moreno@sfu.ca	interactive digital media, machine learning, health, neuroscience	Director, Digital Health Circle (https://www.digitalhealthcircle.ca/)	Surrey	BC
SFU	Faculty of Communication, Art and Technology	School of Communication	Linda	Harasim	Professor	harasim@sfu.ca	computer mediated communication, educational technology (media), online education, telelearning, telework, virtual learning	Information not readily available	Vancouver	BC
SFU	Faculty of Communication, Art and Technology	School of Communication	Adam	Holbrook	Adjunct Professor	jholbroo@sfu.ca	innovation policy, science and technology policy, systems of innovation	Associate Director, Centre for Policy Research on Science and Technology (http://www.sfu.ca/communication/research/centres/cprost.html)	Vancouver	BC
SFU	Faculty of Communication, Art and Technology	School of Communication	Sun-ha	Hong	Assistant Professor	sun_ha@sfu.ca	big data/AI, digital culture, social impact of technology, surveillance and privacy, online disinformation	Information not readily available	Vancouver	BC
SFU	Faculty of Communication, Art and Technology	School of Interactive Arts and Technology	Diane	Gromala	Professor and Canada Research Chair	gromala@sfu.ca	human-computer interaction (HCI), interaction design, embodiment, immersive VR, pain modulation	Founding Director, Pain Studies Lab (https://painstudieslab.com/)	Surrey	BC
SFU	Faculty of Communication, Art and Technology	School of Interactive Arts and Technology	Carman	Neustaedt	Dean and Professor	carman@sfu.ca	human-computer interaction, video communication systems, telepresence, telepresence robots, computer-supported collaboration and social computing	Director, Connections Lab (cLab) research group (https://icarmster.com/industry/)	Surrey	BC
SFU	Faculty of Communication, Art and Technology	School of Interactive Arts and Technology	Bernhard	Riecke	Professor	dseciat@sfu.ca	human multi-modal spatial cognition, enabling robust and effortless spatial orientation in virtual environments, self-motion perception, illusions ("vection"), and simulation	Director, iSpace Lab (http://ispace.iaf.sfu.ca/); Associate member, SFU Cognitive Science Program; Dialogue Associate, SFU Morris J. Wosk Centre for Dialogue; License holder, co-organizer and speaker coach, TEDxSFU	Vancouver	BC

SFU	Faculty of Communication, Art and Technology	School of Interactive Arts and Technology	Thecla	Schiphorst	Director and Professor	thecla@sfu.ca	embodied cognition and interaction, movement knowledge representation, wearable, tangible and natural user interfaces, experience design	Board member, Digital Health Circle (https://www.digitalhealthcircle.ca/)	Surrey	BC
SFU	Faculty of Communication, Art and Technology	School of Interactive Arts and Technology	Chris	Shaw	Acting SIAT Director and Professor	shaw@sfu.ca	virtual environments, visual technologies for pain research, 3D free-form surface design, two handed 3D user interfaces	iSpace Research Lab (Virtual Reality Game Design for the Reduction of Chronic Pain Intensity in Clinical Settings) (http://ispace.iat.sfu.ca/person/chris-shaw/)	Surrey	BC
SFU	Faculty of Education	Education	Gillian	Judson	Assistant Professor in Educational Leadership	gcj@sfu.ca	educational leadership, curriculum and instruction programs	Information not readily available	Surrey	BC
SFU	Faculty of Education	Education	David	Kaufman	Professor	dkaufman@sfu.ca	educational technology, digital games for learning, digital games for older adults, digital storytelling for older adults, medical education	Information not readily available	Surrey	BC
SFU	Faculty of Education	Education	Ingrid	Leman Stefan	Professor, Resource and Environmental Management and Former Dean of the Faculty of Environment	fenvdean@sfu.ca	interdisciplinarity, exploring how different ethical assumptions, value systems and paradigms affect public policy, planning and environmental decision making	Information not readily available	Burnaby	BC
SFU	Faculty of Education	Education	Kris	Magnusson	Professor and Former Dean	eddean@sfu.ca	adult learning, organizational development, strategic planning strategies	Information not readily available	Burnaby	BC
SFU	Faculty of Health Sciences	Health Sciences	Joy	Johnson	SFU President and Vice-Chancellor and Professor	vpres@sfu.ca	health promotion and behavior change, exploring the social, structural and individual factors that influence the health of individuals	Current SFU president; past Scientific Director, Canadian Institutes of Health Research Institute of Gender and Health; Elected Fellow, Canadian Academy of Health Sciences; Fellow, Royal Society of Canada	Burnaby	BC
SFU	Faculty of Health Sciences	Health Sciences	John	O'Neil	Professor	joneil@sfu.ca	critical public health, global Indigenous health development, participatory approaches to health research	Advisory Board member, National Collaborating Centre on Aboriginal Health at Public Health Agency of Canada; Former founding Chairm Advisory Board for Institute for Aboriginal People's Health at Canadian Institutes for Health Research	Burnaby	BC
SFU	Faculty of Health Sciences	Health Sciences	Surita	Parashar	Research Scientist	sparashar@bccfe.ca	community based participatory research, qualitative health research methods	Research Scientist, BC Centre for Excellence in HIV/AIDS (http://bccfe.ca/about-us/team/parashar-s)	Burnaby	BC
SFU	Faculty of Health Sciences	Health Sciences	Kate	Tairyan	Senior Lecturer	ktairyan@sfu.ca	preventive medicine, global health, computer-assisted technology, knowledge translation	Public health professional; Former Director of Public Health, NextGenU.org (https://nextgenu.org/)	Burnaby	BC
SFU	Faculty of Health Sciences	Health Sciences	David	Whitehurst	Associate Professor	david_whitehurst@sfu.ca	preference-based measures of quality of life and wellbeing suitable for use in health economic evaluation	Economist (economics of health and health care), further information not readily available	Surrey	BC
SFU	Faculty of Health Sciences	Health Sciences	Meghan	Winters	Associate Professor	mwinters@sfu.ca	built environment and health, physical activity and mobility, age-friendly city design, spatial analyses of health and transportation-related outcomes, healthy cities	Epidemiologist, former affiliation with Centre for Hip Health and Mobility at Vancouver Coastal Health Research Institute	Surrey	BC
SFU	Faculty of Science	Biomedical Physiology and Kinesiology (BPK)	Diane	Finegood	Professor, Centre for Dialogue	finegood@sfu.ca	public-private partnerships and systems thinking to address complex problems	Currently developing innovative new Semester in Dialogue on health and wellness; former President and CEO of the Michael Smith Foundation for Health Research; Former inaugural Scientific Director of the Canadian Institutes of Health Research, Institute of Nutrition, Metabolism and Diabetes; Former Executive Director of The CAPTURE Project and Principal Investigator on the b-Cell Apoptosis Network	Burnaby	BC
SFU	Faculty of Science	Biomedical Physiology and Kinesiology (BPK)	Andy	Hoffer	Professor	hoffer@sfu.ca	clinical testing and anticipated uses of implanted neuroprosthetic devices	Director, Neurokinesiology Laboratory (https://neurokin.sfu.ca/)	Burnaby	BC
SFU	Faculty of Science	Biomedical Physiology and Kinesiology (BPK)	Vicki	Komisar	Assistant Professor	vicki.komisar@ubc.ca	assistive technology, aging, fall and injury prevention, motor control, accessible design	AGE-WELL affiliate	Burnaby	BC
SFU	Faculty of Science	Biomedical Physiology and Kinesiology (BPK)	Dan	Marigold	Associate Professor	daniel_marigold@sfu.ca	behavioural and cognitive neuroscience, sensorimotor control and learning, neural control of movement	Director, Sensorimotor Neuroscience Lab (https://www.sfu.ca/smnl.html); Member, SFU Neuromechanics Group; Research Associate, SFU Behavioural & Cognitive Neuroscience Institute (https://www.bcnf-sfu.net/); Centre Investigator, UBC Centre for Brain Health (https://www.centreforbrainhealth.ca/); Affiliated Researcher, Fraser Health Authority; Chair, Translational and Integrative Neuroscience Graduate Specialization (http://www.sfu.ca/neuroscience/TRAIN.html), Co-chair, Behavioural Neuroscience Undergraduate Program (http://www.sfu.ca/neuroscience/Behavioural-neuroscience-undergraduate-program.html)	Burnaby	BC
SFU	Faculty of Science	Biomedical Physiology and Kinesiology (BPK)	Stephen	Robinovitch	Professor	steve@sfu.ca	biomechanics, injury and mobility impairment, human movement dynamics, computer based modeling, fall prevention, wearable sensors	Principle Investigator, Injury Prevention and Mobility Laboratory (http://www.sfu.ca/tips.html);	Burnaby	BC
SFU	Faculty of Science	Biomedical Physiology and Kinesiology (BPK)	Peter	Ruben	Associate Dean	pruben@sfu.ca	assess the biophysical sequelae of identifiable sodium channel mutations and substitutions that lead to changes in cellular excitability and toxin resistance	Member, Molecular Cardiac Physiology Group (http://www.sfu.ca/mcpg.html); Associate Member, SFU Department of Molecular Biology and Biochemistry; Associate Member, SFU Department of Biological Sciences; Associate Member, UBC Department of Cell and Physiological Science	Burnaby	BC
SFU	Faculty of Science	Mathematics	Sandy	Rutherford	Director	arrutherford@sfu.ca	design and evaluation of protocols for electronic health records and applications of queuing theory to surgical waitlists and the acute care system, application of dynamical systems methods to health care modelling	Director, Complex Systems Modelling Group (CSMG) (https://www.sfu.ca/csmg.html)	Burnaby	BC

SFU	N/A	Beedie School of Business	Sarah	Lubik	Director of Entrepreneurship, SFU Co-Champion, Technology Entrepreneurship@SFU Lecturer, Innovation & Entrepreneurship	slubik@sfu.ca	business models, commercialization of advanced technologies, partnerships, innovation ecosystems, incubation	Certified expert business coach and mentor, SFU's Venture Connection incubator (https://www.sfu.ca/vc.html)	Vancouver	BC
SFU	N/A	Beedie School of Business	Elicia	Maine	W.J. VanDusen Professor of Innovation & Entrepreneurship	emaine@sfu.ca	technology innovation, science and technology entrepreneurship, technology-market matching, science-based business, innovation policy	graduate certificate "mini MBA" in Science & Technology Commercialization; Board member, Directors of the Foresight Clean Tech Accelerator and Innovate BC New Ventures BC	Vancouver	BC
SFU	N/A	Coast Capital Savings Venture ConnectionSFU	Doug	Fast	Lead Mentor	doug@darkwatertek.com	entrepreneurship, building successful companies	Mentor-in-Residence, Coast Capital Savings Venture Connection at SFU; Founder and CEO, Dark Water Tek (https://www.darkwatertek.com/); Product commercialization consultant	Burnaby	BC
SFU	N/A	RADIUS Ventures	Rebecca	Konsolos	Ventures Program Strategist	rkonsolos@radiusfu.com	consulting for entrepreneurship and social impact organizations, strategy, innovation, partnerships, due diligence, program development, impact measurement	Consultant and strategist; Ventures Program Strategist, Radius SFU (https://radiusfu.com/)	Vancouver	BC
SFU	N/A	RADIUS Ventures	Shawn	Smith	Director	ssmith@radiusfu.ca	sustainable business models	Director, Radius SFU	Vancouver	BC
SFU	N/A	RADIUS Ventures	Donovan	Woollard	Co-Director	dwoollard@radiusfu.ca	sustainable business models	Co-Director, Radius SFU	Vancouver	BC
SFU	N/A	The City Program	Andy	Yan	Director	ayan@sfu.ca	urban planning and regeneration, neighbourhood development, applied demographics, transportation	(https://www.sfu.ca/continuing-studies/about/program-units/city-program.html); extensive work in non-profit and private urban planning sectors with projects in metropolitan regions of Vancouver, San Fran, NYC, Los Angeles and New Orleans	Vancouver	BC
SFU	N/A	Venture Connections	William	Brenner	Incubator Programs Manager, SFU's Coast Capital Savings Venture Connection	vc_inc@sfu.ca	entrepreneurship, management information systems	Incubator Programs Manager, SFU's Coast Capital Savings Venture Connection (https://www.sfu.ca/vc.html)	Vancouver	BC
SFU	N/A	Big Data Initiative	Laurence	Meadows	Strategic Partnerships Manager	lmeadows@sfu.ca	creating and growing partnerships and helping to support key university initiatives	Director, Business Development, Centre for Digital Media (https://thecdm.ca/)	Burnaby	BC
SFU	N/A	Surrey Campus	Steve	Dooley	Executive Director	sdooley@sfu.ca		Information not readily available	Burnaby	BC
SFU	SFU, Faculty of Education, SFU Public Square	Education	Laurie	Anderson	Executive Director, Adjunct Professor, Lead Facilitator	laurie_anderson@sfu.ca	education, curriculum development, mediation consultant, leader development facilitator	Former consultant on education reform, Ministry of Education; Former curriculum developer and instructor, Vancouver Community College; Former mediation consultant for schools throughout BC; Former facilitator, VSB's Leadership Development Program; Former developer and instructor, Instructor Training Program	Vancouver	BC
SFU	Faculty of Arts and Social Sciences	Psychology	Wendy	Thornton	Professor	wthornto@sfu.ca	aging, cognitive changes in later life, elder fraud, decision making in later life, social cognition in later life, age differences in cognitive performance	Director, Cognitive Aging Research Lab (http://www.sfu.ca/psychology/research/cal.html)	Burnaby	BC
SFU	Faculty of Communication, Art and Technology	School of Interactive Arts and Technology	Steve	DiPaola	Professor	sdipaola@sfu.ca	artificial intelligence, computer graphics and interaction, computational systems for expression, movement, gesture and creativity	Director, iVizLab research lab (https://vizlab.org/)	Surrey	BC
SFU	Faculty of Environment	Resource and Environmental Management	Mark	Roseland	Professor, Director of Centre for Sustainable Community Development	roseland@sfu.ca	sustainable communities/development, community economic development, social economy, community capital framework	Director, Centre for Sustainable Community Development (http://www.sfu.ca/sustainabledevelopment.html); Leading development, Pando Sustainable Communities (pando.sc) (https://www.pando.sc/); involved in projects such as City of Vancouver's model sustainable community being developed at Southeast False Creek and the SFU UniverCity project (https://university.ca/); Former editor and current advisory board member, Local Environment: The International Journal of Justice and Sustainability (https://www.landonline.com/)	Burnaby	BC
SFU	SFU	Research Commons	Lupin	Battersby	Knowledge Mobilization Officer	lupin_battersby@sfu.ca	knowledge sharing within and across disciplines and sectors as a means of improving health, social, and environmental policy and practice	Information not readily available	Burnaby	BC

Report Type: Renewal Application

Reporting Year: 2022

General Information

Name of the Centre/Institute: The Institute on Violence, Terrorism, and Security

Website: <https://www.ivts.ca/>

Faculty: VP Research

Director: Raymond Corrado (Director)
Garth Davies (Associate Director)

Director's term end: -

Renewal date: 2027-11-01

Details

Description of the Centre/Institute:

The Terrorism, Violence & Security Institute Research Centre (TVSIRC) was established in 2019 according to Simon Fraser University's (SFU) Policy R 40.01. The TVSIRC aims to promote interdisciplinary and cross-national research focused on intra/interstate terrorism, major violent crimes and related security and safety policies. The institute's Director is Dr. Raymond Corrado, and Associate Director is Dr. Garth Davies. Membership in the TVSIRC is drawn from the School of Criminology, Department of Political Science, Department of Psychology, Faculty of Education, and Continuing Studies, as well as scholars from other major universities globally and government and community agencies in Canada and internationally. Since its inception, the TVSIRC has grown its membership within SFU and internationally and initiated two international workshops on anti-state terrorism threat profiling instruments. Currently, the TVSIRC is actively engaged in five major projects: first, a study of gang involvement intervention programs in Surrey B.C.; second, a cross-national study of immigrant crime profiles in France and Germany; third, a collaboration with Combined Forces Special Enforcement Unit to review the production and use of 3D-printed "ghost guns" and offer recommendations for how to address the threat of these weapons moving forward; fourth, members of the TVSIRC are part of a joint partnership between Defense Research and Development Canada (DRDC) and the Swedish Civil Contingencies Agency (MSB) studying comparative targeted violence; and finally, a research project in collaboration with the Portland Police Bureau (Oregon) on the prediction of violence in hostage and barricade incidents. The goal of this project is to conduct an in-depth analysis of these incidents to identify and propose a tool that can be used by the police before intervening in hostage and barricade incidents (see also Beauregard & Michaud, 2015). These projects involve either internal grants, including the Ting Foundation and the Dean of Arts and Social Science, and/or external funding from several sources, including the B.C. provincial government (e.g., Civil Forfeiture Proceeds: Crime Prevention Grant), the

Royal Canadian Mounted Police RCMP), Social Science and Humanities Research Council (Ph.D. fellowships), the Max Planck Institute for the Study of Crime, Security & Law in Freiburg, Germany, and Defense Research and Development Canada. A primary objective of the TVSIRC is to facilitate policy-focused research on various major violent crimes among SFU researchers in several disciplines and faculties, as well as scholars/policymakers national and cross-nationally. The joint research and scholar exchange (including Ph.D. students) protocol with the Max Planck Institute in Germany and the Interdisciplinary Centre Herzliya (ICD) at Reichman University in Israel are significant steps toward meeting this objective. Recently, we have completed a similar joint research protocol with the Netherlands's National Police.

Terrorism has always had an international component, requiring cross-national intelligence and security policies. However, in the last several decades, this crime has become increasingly complex, particularly regarding the role the internet plays in messaging, recruitment, planning and financing across national borders. Accordingly, while criminology is typically interdisciplinary, the study of major violent crimes such as terrorism and organized gang violence has substantially required theories and researchers from other faculties, such as computing science, economics, and business. The first TVSIRC book publication, *Terrorism Risk Assessment Instruments: Contemporary Policy and Law Enforcement Challenges* (Corrado, Wössner and Merari; 2021; IOS Press), brought together perspectives from scholars and policy analysts from several disciplines in nine countries. Currently, the TVSIRC director, Dr. Corrado, has completed a protocol approved by SFU's Office of Research Services concerning a research/scholarly exchange protocol for inter-institute research collaboration and training with Professor Assaf Moghadam, Director of the Interdisciplinary Center Herzliya (IDC) in Tel Aviv. IDC is a leading global research institute in the study of terrorism. Further, Dr. Corrado is discussing a similar arrangement with Professor Marco Lombardi, Director of the Italian Team for Security Terroristic Issues & Management Emergencies (ITSTIME). Through TVSIRC, Dr. Davies and Dr. Corrado are currently conducting a joint research project on ghost guns with RCMP E Division policy and research section. In addition, Dr. Davies is involved in leadership roles on several national and cross-national research projects. Most notably, he is centrally involved in a collaboration between Defense Research and Development Canada (DRDC) and the Swedish Civil Contingencies Agency (MSB). At present, this national-level collaboration is being extended to also include the Nether

The Centre/Institute's membership and organization structure:

There are currently 16 SFU Faculty Members (representing the School of Criminology, Departments of Psychology & Political Science, Continuing Studies, and the Faculty of Education) and 40 Associate Members representing 8 countries (Australia, Belgium, Canada, Germany, Italy, Norway, Scotland, the Netherlands, and the United States). In addition, there are 6 SFU Graduate Student Members. A Steering Committee has been established and is responsible for setting the strategic direction of the Institute; ensuring the effective

management of the Institute and its activities; providing advice to the Director about future directions; approving appointments of new members, the Director, and the Associate Director; and monitoring the activities of the Institute to ensure it is in keeping with its principles and goals. The following are current members of the Steering Committee.

Members of the Steering Committee

Name	Institution	Department

Raymond Corrado (Director)	Simon Fraser University	School of Criminology

Garth Davies (Associate Director)	Simon Fraser University	School of Criminology

Martin Andresen	Simon Fraser University	School of Criminology

Richard Frank	Simon Fraser University	School of Criminology

Aaron Hoffman	Simon Fraser University	Department of Political Science

Ron Roesch	Simon Fraser University	Department of Psychology

Kris Magnusson	Simon Fraser University	Faculty of Education

Andy Yan	Simon Fraser University	Continuing Studies

Rationale for the renewal of the Centre/Institute:

-

How has the Centre/Institute enhanced research over and above what would have been accomplished by an individual faculty member?

-

How has the Centre/Institute accomplished its goals?

-

Changes planned upon renewal (e.g. membership, organization structure, etc.):

-

Significant accomplishments:

The initial major accomplishment for the TVSIRC was the formal research and faculty/graduate student exchange protocol with the Max Planck Institute for the Study of Crime, Security & Law (MPISCSL) in Freiburg, Germany. The Max Planck Institute is world-

renowned through its substantial involvement in conducting innovative policy research on a broad range of issues related to sex offenders, terrorism, and criminal law in the European Union countries. Its location and facilities in Freiburg in the southwestern German state of Baden-Wurttemberg, its array of researchers, visiting scholars' offices, and specialized criminology library offer excellent opportunities to conduct cross-national policy research for our institute members. The former Director of the MPISCSL, Dr. Hans-Jorg Albrecht, and senior researcher, Dr. Gunda Wössner, each played a significant role in establishing the formal protocol arrangement with SFU. These roles include participating in the 2018 Vancouver conference/workshop on terrorism risk/threat instruments in the Canadian context; the submission of the successful the 2019 North Atlantic Treaty Organization (NATO) Advanced Research Workshop grant application and subsequent NATO book publication in 2021; and, coordinating the workshop held in the Max Planck Society's conference site, the Harnack House, in Berlin. Also, the current Director, Dr. Jean-Louis van Gelder, was supportive in facilitating Dr. Wössner's key role in editing the book as mentioned above

Notable media successes:

1. As mentioned previously, a one-day conference open to the public was co-sponsored by the TVSIRC and RCMP, with support funding from the Ting Foundation, which took place in Vancouver in the spring of May 2018. SFU media assisted in publicizing this event. Also, scholars from SFU and other B.C. universities as well as senior policy individuals in the federal Ministry of Public Safety and Solicitor General, Canadian Intelligence Service, and the RCMP were invited and attended. On the first day of the conference, researchers from the TVSIRC, Germany, and Israel presented original research papers. The following day a closed workshop of researchers and government officials directed by Dr. Garth Davies explored key policy issues that emerged in the papers presented.
2. The NATO Advanced Research workshop held in Berlin in December 2019 was publicized primarily in Europe by Dr. Gunda Wössner and the media team associated with MPISCSL.
3. Faculty and graduate student members of the TVSIRC presented papers at theme panels on either youth violence and psychopathy and terrorism at the American Society of Criminology annual conferences in 2018 and 2019.
4. In 2019, TVSIRC members participated a one-day conference hosted by Dr. Ronald Roesch, Director of the MHLPI, for a larger delegation of 11 members of the Norway Prison system, again led by Dr. Waage. We held a one-day conference in which MHLPI and TVSIRC (i.e., Dr. Corrado, Dr. Evan McCuish, and Ph.D. student Jeff Mathesius) pres

Events, workshops, public outreach events:

see media section

The Centre/Institute's multi-year goals for the next renewal term:

-

Supporting documents:

-

Financial Summary

Does your Centre/Institute receive direct financial support from the university?

No

Was the Centre/Institute leveraged to attract external funding (donations, grants, contracts) which were only made possible by its existence?

Yes

External funding details:

The TVSIRC received funds from:

- The British Columbia Crime Reduction Research Program is providing \$100,000 to study the threat posed by 3D-printed firearms and other “ghost guns”.
- Federal Ministry of Public Safety provided \$40,000 to undertake both literature research of the theory/policy bases of the to be initiated SAFE project and conduct interviews with its key service providers as well as conduct network analysis of incarcerated young offenders from Surrey.
- B.C. Ministry of Public Safety provided \$ 67,000 to conduct a process evaluation of the SAFE project and undertake a wave 6 set of interviews with mothers and their adolescent children who have participated in (Greater) Vancouver Longitudinal Cohort Study.
- The Ting Foundation and the RCMP provided \$20,000 to conduct a 1-day conference and 1 day closed workshop.
- NATO provided \$65,000 to conduct the 2-day advanced research workshop in Berlin and publish a book based on papers and policy discussions.
- Four SSHRC doctoral fellowships for TVSIRC student members Amanda Champion, Sara Doering, Olivia Ha, and Jenny Yang, one post-doctoral fellowship for Oliva Ha.

Confirm policy review:

Yes

Submitted by:

Raymond Corrado, Director

Director's comments:

-

Reviewer's Section

Reviewed by:

Michael Richards, Associate Vice-President, Research

Reviewer's decision:

Approved for 5 years

Reviewer's comments:

-

MEMO

Office of the Dean

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ATTENTION Michael Richards, Associate Vice-
President, Research (AVPR)

TEL 2-4247

FROM Kris Magnusson, Dean pro tem

RE Termination of the David Wheeler Institute for Research in Mathematics
Education

DATE September 20 2022

TIME 2:15PM

Dear Colleagues,

On behalf of the Faculty of Education, I am proposing the following for consideration by the office of the VPR and SCUP:

Recommendation:

That the David Wheeler Institute for Research in Mathematics Education be terminated, effective immediately upon approval from the Senate Committee on University Priorities and subsequent notice to Senate.

Rationale:

The David Wheeler Institute was largely under the leadership of Dr. Stephen Campbell. Dr. Campbell retired June 30 2022, and the Institute has largely been dormant for the past 2 years. The research interests of the remaining Mathematics Education faculty members have shifted to other priorities, and there is no interest or perceived value in maintaining the work of the Institute.

Should you have any questions or concerns, please do not hesitate to contact me.

Sincerely,



Kris Magnusson, Dean pro tem

cc: Nathalie Sinclair, Associate Dean Research and International



Memo

Attention Dr. Michael Richards, Associate Vice-President, Research
From Lara Campbell, Dean *pro tem*, Faculty of Arts and Social Sciences
cc Steeve Mongrain, Associate Dean, Research & International, FASS
Anil Hira, Chair, Department of Political Science
Subject Recommendation to Dissolve the Centre for Global Political Economy
Date November 2, 2022

Dear Dr. Richards,

After being contacted by the AVPRI office about the renewal of the Centre for Global Political Economy, Dr. Steeve Mongrain, Associate Dean, Research & International, Faculty of Arts and Social Sciences contacted the current director, Dr. Geoff Mann. Dr. Mongrain and Dr. Mann discussed the future of the Centre, and Dr. Mann has decided to not request renewal. The Centre has been inactive over the last few years.

I support this conclusion and therefore recommend that the Centre for Global Political Economy be dissolved.

Sincerely,

Lara Campbell

Dr. Lara Campbell
Dean *pro tem*, Faculty of Arts and Social Sciences

/sf

Report Type: Renewal Application

Reporting Year: 2022

General Information

Name of the Centre/Institute: Centre for Global Political Economy
Website: <http://www.sfu.ca/cgpe.html>
Faculty: Arts and Social Sciences
Director: Geoff Mann
Director's term end: 2019-06-30
Renewal date: 2022-04-01

Details

Description of the Centre/Institute:

The Centre for Global Political Economy is housed in the Dept. of Political Science, but involves faculty from other academic units at SFU to provide a focus for existing strengths in the field of global political economy and to win a position as an international centre for such research. The Centre aims to support related research and community collaboration, in addition to providing a venue for visiting scholars and a means of cross-disciplinary engagement for faculty and graduate students.

The Centre/Institute's membership and organization structure:

The Centre is led by the Director, who works with a Board of Advisors drawn from SFU Faculty. The membership is made up of social scientists from across SFU, and includes both faculty, postdoctoral fellows and graduate students.

Rationale for the renewal of the Centre/Institute:

The Centre's main accomplishment this year has been the continued organization of a graduate student reading group, which involves students from across the social science disciplines at SFU and, increasingly, UBC as well. Faculty from both SFU and UBC also participate regularly in the group, and it has helped to build a cohort of graduates students interested in political economy. This is particularly helpful for those students, who tend often to be quite isolated in their own departments, since political economic research is spread across Sociology, Geography, Political Science, Economics (and even English).

How has the Centre/Institute enhanced research over and above what would have been accomplished by an individual faculty member?

-

How has the Centre/Institute accomplished its goals?

-

Changes planned upon renewal (e.g. membership, organization structure, etc.):

-

Significant accomplishments:

-

Notable media successes:

-

Events, workshops, public outreach events:

-

The Centre/Institute's multi-year goals for the next renewal term:

-

Supporting documents:

-

Financial Summary

Does your Centre/Institute receive direct financial support from the university?

No

Was the Centre/Institute leveraged to attract external funding (donations, grants, contracts) which were only made possible by its existence?

No

Confirm policy review:

Yes

Submitted by:

Geoff Mann, Director

Director's comments:

Trying to just submit it blank.

Reviewer's Section

Reviewed by:

Steeve Mongrain, Associate Dean, Research & International

Reviewer's decision:

Declined

Reviewer's comments:

After discussions with Professor Mann, the director of the Center for Global Political Economy, we concluded that it was better not to ask for a renewal of the centre.

Memorandum

From: Michael Richards, Associate Vice-President, Research Date: November 1, 2022

Re: Dissolution of the Behavioural and Cognitive Neuroscience Institute (BCNI)

To: Wade Parkhouse, Chair, *Ex-officio*, Senate Committee on University Planning (SCUP)

The Behavioural and Cognitive Neuroscience Institute (BCNI) is being dissolved as there is a new neuroscience Institute that has been created (the Institute for Neuroscience and Neurotechnology (INN). This was mutually agreed by the Director of the BCNI (Urs Ribary) and the Vice-President, Research and International (Dugan O'Neil).

Motion: That SCUP approve the dissolution of the Behavioural and Cognitive Neuroscience Institute.

I recommend the immediate dissolution of the Institute.

A handwritten signature in black ink, appearing to be 'M. Richards', written in a cursive style.

Report Type: Renewal Application

Reporting Year: 2022

General Information

Name of the Centre/Institute: Behavioural and Cognitive Neuroscience Institute
Website: <https://www.bcni-sfu.net/>
Faculty: VP Research
Director: Urs Ribary
Director's term end: 2027-07-01
Renewal date: 2022-04-01

Details

Description of the Centre/Institute:

Mission and Goals: The BCNI institute fosters interdisciplinary and collaborative engagement across disciplines and institutions in brain imaging infrastructure, technology-development, research, translational applications, interventions and training in brain imaging concerning the relationship between mind and brain. Building on the strengths of world-renowned researchers who investigate a variety of behavioral, sensory-motor, cognitive, and neurophysiological phenomena, the BCNI focuses on a broad range of topics related to the neurobiological mechanisms underlying attention, perception, sensory integration, language, memory and action in health and disease. The major emphases is on using structural and functional brain imaging and behavioral/clinical assessments, for better understanding the underlying “Human Cognitive Brain Network in Health and Disease”, the brain’s network connectivity and dynamics among local and large-scale networks relating to cognitive human brain functions, and its alterations in cognitive disabilities, neurological and psychiatric symptoms. The continuing goal is to further develop objective “quantitative diagnostic markers and strategies” translating into better pedagogical applications and more specific cognitive, pharmacological and neurosurgical interventional therapies.

The institute engages to further provide a matrix to facilitate scientists working synergistically across centers and institutes toward these and related goals across disciplines and institutions.

The Centre/Institute's membership and organization structure:

The BCNI Director, Co-Director, and the two Associate Director's, in consultation with selective Advisors, are representing the interests and needs related to BCNI's mission and goals across disciplines and institutions. These advisors include members from SFU

departments, including Psychology, Biomedical Physiology and Kinesiology, Physics, Engineering, Computing Science etc, and members from departments of other institutions, including BCCH (BC Children's Hospital) and UBC. In addition, the BCNI has a long list of BCNI Associates, who contributed and continuously contribute to the BCNI's overall mission, efforts and goals, especially related to networking, grant writing, facilitating /initiating specified research and training in multimodal imaging, and correlating to behavioral/clinical correlates, translational diagnostics, applications and interventional therapies.

> Recent BCNI Faculty (20):

- Director: Urs Ribary, Professor and former BC LEEF Chair (SFU, BCCH, UBC),
- Co-Director: Sam Doesburg, Associate Professor, Biomedical Physiology and Kinesiology (SFU),
- Associate Director: Teresa Cheung, Assistant Professor, Engineering Science (SFU), Clinical NeuroImaging Scientist, Fraser Health BC,
- Associate Director: Tony Herdman, Associate Professor, Audiology (UBC, SFU),
- Carolyn Sparrey, Associate Professor, School of Mechatronic Systems Engineering (SFU), Head ImageTech,
- Todd Woodward, Associate Professor Psychiatry (UBC),
- Christine Tipper, Associate Professor Psychiatry (UBC) - passed away 2022,
- Linda Siegel, Professor Emeritus Education (UBC),
- Anthony Bailey, Professor and Chair Child & Adolescent Psychiatry (UBC),
- Grace Iarocci, Professor Psychology (SFU),
- Sylvain Moreno, Associate Professor School of Interactive Art and Technology (SFU),
- Faisal Beg, Professor and Assoc. Dean Engineering Science (SFU),
- Ruth Grunau, Professor Pediatrics (UBC, BCCH),
- Lawrence Ward, Professor Psychology (UBC, Brain Research Center),
- Judy Illes, Professor Neurology and CRC (UBC), Director National Neuroethics Core (UBC),

- Dan Marigold, Associate Professor Biomedical Physiology and Kinesiology (SFU),
- Victoria Claydon, Professor Biomedical Physiology and Kinesiology (SFU),
- Ryan D'Arcy, Professor and BC LEEF Chair, Engineering Science (SFU),
- Xiaowei Song (Fraser Health), Adjunct Professor Computing Science (SFU), former Head of MRI Operation (ImageTech),
- Garrett Bernie, Associate Professor School of Nursing (UBC),

> BCNI Staff and Students (20-30):

- Alexander Moiseev: Senior Scientist, expert in MEG/EEG imaging software development & data analysis,
- Vasily Vakorin: Senior Scientist, NeuroInformatics and NeuroAnalytics Lead BCNI, ImageTech Lab, SFU,
- Harry Janke: IT Staff – Psychology, Managing BCNI IT Services,
- James Peltier: Manager SFU Research Computing Group, Managing BCNI on colony cluster,
- Approx. at least 20-30 current Students directly related to BCNI using BCNI resources.

> BCNI Associates (see BCNI website):

www.bcni-sfu.net

> BCNI Users: Overall, the BCNI has currently yet about 55+ registered users on the Research Training and Data Analysis Platform and publishes on average 50+ Abstracts/Papers each year.

Rationale for the renewal of the Centre/Institute:

- This renewal relates to an invitation from the VPR office asking to submit a renewal by Jun/30/2022 -

The BCNI is currently the only resource-platform for all the brain imaging data analysis at SFU, has yet about 55+ registered users, published on average 50+ abstract/paper publications each year and co-raised about \$55M together with its collaborators since inception - a most important and needed resource to SFU's brain imaging and beyond. In

addition, we have several ongoing grants and were just awarded with one NRC grant and one CIHR grant...

Moreover, the BCNI is currently exploring how it can be best and optimally integrated with SFU's Initiative on Neuroscience and how it can be best connected with the new Institute for Neuroscience and Neurotechnology (INN).

The BCNI Institute was originally established in regards to the Endowed BC LEEF Chair (Dr. Ribary 2007-2019, and after retirement to his successors) using the BCNI as an instrumental tool in order to better perform all comprehensive and multidisciplinary duties across disciplines and institutions (together with all the growing staff and all collaborative colleagues), as laid out in the original reviewed and very much supported 15 year LEEF plan proposal.

In addition, the BCNI was/is successfully growing and continuing to focus on collaborative multidisciplinary cognitive neuroscience brain imaging signal processing expertise and research in health and disease with the achieving goal to provide a centralized and user-friendly imaging data analysis platform and to better understand the typical/atypical brain development with further translating such findings into underlying neural diagnostic and prognostic procedures to modify and improve individual targeted interventional therapeutic programs. (See accomplishments above and below for more detailed description).

How has the Centre/Institute enhanced research over and above what would have been accomplished by an individual faculty member?

Again, all the comprehensive BCNI efforts across disciplines and institutions mentioned above and below, (I) Engagement in expanding Brain Imaging Infrastructure and Technology, (II) BCNI Services and Training, (III) BCNI's Basic and Clinical Collaborative Research Efforts, (IV) Engaging in the Public Community, and (V) especially BCNI's Infrastructure facilitating many other Research Projects across Disciplines and Institutions, speak for themselves that they would not have been accomplished by an individual (isolated) faculty member.

In addition, the BCNI Director performed his duties on behalf of his former BC LEEF Chair with the BCNI as an instrument and in alignment with the overall mission and goals.

How has the Centre/Institute accomplished its goals?

All the comprehensive accomplishments of the collaborative BCNI Institute across disciplines and institutions described above and below are speaking for itself, and indicate the enormous success.

Again, the BCNI is currently the only resource-platform for all the brain imaging data analysis at SFU, has yet about 55+ registered users, published on average 50+ abstract/paper publications each year and co-raised about \$55M together with its

collaborators since inception - a most important and needed resource to SFU's brain imaging and beyond...

In addition, the BCNI's vision, mission, goals, plans and comprehensive accomplishments are all well in line with the BCNI's approved renewal-proposal in 2017, and are also in line with the original laid out 15yr strategy by the BCNI Director and the original BC LEEF Chair's proposal in 2006, having being reviewed and strongly supported by the Canadian Provincial and Federal Government including the senior-expert national and international scientific community.

Changes planned upon renewal (e.g. membership, organization structure, etc.):

- No Changes -

The BCNI will continue with its current structure, but is exploring how it can be best and optimally integrated with SFU's Initiative on Neuroscience and how it can be best connected with the new Institute for Neuroscience and Neurotechnology (INN).

Significant accomplishments:

1) (1) BCNI during the Covid-Pandemic

Currently towards the end of the pandemic, most brain imaging operations are yet not fully operationally but all BCNI members are working full speed from campus or home and login to all the BCNI resources, platforms and online available data cohorts. We have further submitted several grants including CIHR, NSERC, NSERC-CREATE, NSERC-Discovery, NIH operating grants, DARPA, MSFHR and one successful NRC grant. In addition, the traffic on our BCNI website has increased with new visitors and an increase in page views.

Overall, the BCNI Institute continues to connect the brain imaging across SFU, BCCH and UBC, harbours collaborative meeting/working spaces, portable scanners and has a most comprehensive and user-friendly training/analysis platform on computer clusters with all the required pipelines analyzing state-of-the-art MRI, fMRI, dynamic EEG and MEG imaging data including newer AI resources and expertise.

The BCNI has yet about 55 registered users, about 20-30 active members (faculty, staff, students) who have full /part-time presence, and the BCNI published about 50+ abstract/paper publications each year before the pandemic and 40 /43 publications during the pandemic in 2020 /2021 !

2) (2) BCNI's Continuous Engagement across Disciplines and Institutions:

The BCNI continues to facilitate collaborative engagement across disciplines and institutions (including SFU, BC Children's Hospital Research Institute BCCHRI, UBC and others). The overarching goal is to team-up to better understand and quantify the 5-Dimensional

“Cognitive Human Brain Network in Health and Disease”: In particular, the BCNI's mission is to provide more coherent and complementary facilities and services, equipment, innovative hard and software, towards comprehensive multimodal brain imaging and absolutely necessary centralized and user-friendly state-of-the-art data analysis.

The collaborative BCNI strategy is therefore continuously facilitating and expanding:

- Multimodal Brain Imaging Infrastructure (structural, functional and dynamic brain imaging);
- Behavioral Research Infrastructure (behavioral and clinical assessments);
- Technology Development (centralized, user-friendly data analysis/ visualization tools and strategies);
- Applied and Translational Research (basic cognitive and clinical research);
- Training Platform (HQP: scientists, staff, postdocs, students);
- Knowledge Development and Translation (human brain: education, health and disease);
- Development: Neuro-diagnostic and Prognostic Markers (cognitive disabilities, neurology, psychiatry);
- Interventional Strategies (cognitive, pharmacological, neurosurgical);
- Monitoring Strategies and Industrial Commercialization;

3) (3) BCNI's Basic and Clinical Collaborative Research Efforts:

Despite the recent pandemic over the past two years, the BCNI has successfully progressed along its mission and goals, to continue collaborative efforts on the analysis of multimodal brain imaging research data and behavioral/clinical assessments. The BCNI continues to stress and facilitate a more comprehensive strategy/approach beyond traditional analysis of dynamic brain imaging data, namely focusing on the state-of-the-art detailed underlying human brain network's oscillations and functional connectivity/causality dynamics across 5 dimensions, and relating with sensory-motor, cognitive or behavioral /clinical correlates in the typical and atypical human brain. The continuous mission is to better understand the basic biological and unified mechanisms of the underlying network function and task-specific functional and effective connectivity dynamics among local and large-scale networks, relevant for cognitive functions, and for its alterations in cognitive disabilities and patients with neurological /psychiatric symptoms. The continuing goal is to expand integration of functional brain dynamics into multimodal structural /functional imaging,

towards the quantification and development of neural markers for cognition, and neuro-diagnostic markers for disabilities and pathologies. Although focusing mostly on data analysis, publications and grant writing during the pandemic, the continuing projects are:

4) 3a)

- Brain network oscillations, synchronization and connectivity in health and disease with Lawrence Ward (UBC);
- Alterations in brain network connectivity dynamics in child dyslexia pre/post interventional therapies with Lawrence Ward (UBC), Linda Siegel (UBC) and BC School;
- Alterations in brain network connectivity dynamics in children born very preterm with Ruth Grunau (Pediatrics, UBC) and colleagues;
- Alterations in brain network connectivity dynamics in ASD with Grace Iarocci (Psychology, SFU) and colleagues;
- Advancing the analysis /localization of MEG/EEG brain imaging data with BCNI's senior scientist Alex Moiseev (SFU) and Tony Herdman (Audiology, UBC);
- Alterations in mobile EEG recordings under hypoxic/hypobaric conditions with Victoria Claydon (SFU-BPK) and Sherri Ferguson (SFU);
- Alterations in mobile EEG recordings of children with ASD with Grace Iarocci (SFU-Psychology) earlier obtained during ASD spring/summer camps;
- Fostering collaborations between SFU Surrey brain imaging operation and SFU researchers based in Burnaby;
- Integrating computational modeling and neuroimaging methods to develop models of neural systems; extending current dipole equations to quadrupolar forms to better model magnetic fields from white matter and spinal cord conduction (with MEG Operation at Fraser Health/SFU Surrey);
- Developing techniques to apply "drizzle" (providing higher resolution) to MEG data (with MEG Operation at Fraser Health/SFU Surrey);

5) 3b)

- Exploring OPM magnetometers towards building a multichannel system for magnetic spinal cord imaging (with MEG Operation at Fraser Health/SFU Surrey);

- Using median nerve stimulation data to examine the feasibility of spinal cord SEP detection using a commercial QuSpin OPM sensor (with MEG Operation at Fraser Health/SFU Surrey);
- Developing well-validated and automated data analysis pipelines using AI to improve the clinical efficacy of MEG in surgical planning for epilepsy patients and further translating more advanced analysis methods into clinical practice (with BCNI's senior scientist Vasily Vakorin (SFU), Fraser Health and with MEG Operation at Fraser Health/SFU Surrey);
- Analysis of imaging data using continuous naturalistic stimuli to better probe complex cognitive and perceptual processes (with MEG/fMRI at Fraser Health/SFU Surrey);
- Evaluating the integration of hemodynamic (fNIRS) and electrophysiological (MEG) imaging towards a greater understanding of brain activity (with MEG Operation at Fraser Health/SFU Surrey).
- Mapping the development in the typical brain networks and their alteration in autism using MEG and MRI, as well as how developmental trajectories differ between males and females (with Fraser Health/SFU Surrey);
- Investigating functional trajectories in ageing;

6) (4) BCNI's Training of HQP:

The BCNI facilitated/s collaborative cognitive neuroscience brain imaging research across disciplines and institutions, providing additional expertise, tools, training of HQP and guidance to individual researchers (PhD students, postdocs, and scientists) and at the same time initiated/s new innovative cognitive neuroscience brain imaging research projects.

- - See attached list of selected paper publications (2017-2022) - -

Notable media successes:

Regarding BCNI's Knowledge Transfer, see List of some selected BCNI Paper Publications (2017-2022) uploaded.

Events, workshops, public outreach events:

1) (1) Outreach and Engagement in the Research Community:

Despite the recent pandemic, the BCNI was/is continuously engaging in many collaborating team-efforts across disciplines and institutions, to further stabilize and expand the brain imaging infrastructure and applications, to further facilitate and stream-line required data analysis procedures, towards a coherent multimodal imaging environment across SFU, BC

Children Hospital, and UBC as follows:

(a) BCNI Institute Equipment and Services (all free-of-charge):

Although physical space and brain imaging scanners were not operational during the pandemic, the BCNI was/is continuously providing (a) networking area with smartboard and video-conferencing capabilities, (b) assessment area for behavioral/clinical measurements (c) portable EEG brain scanner and portable eye-tracker, (d) larger imaging data analysis area, (e) merger with SFU/FAS cluster-computers to boost computing power and storage, (f) centralized data analysis platforms and innovative in-house developed pipelines, (g) continuous innovative software development to further boost data analysis and visualization, and (h) various upgrades for the MEG brain imaging operation (see research output and publications).

2) (b) MEG Brain Imaging at Fraser Health /SFU Surrey:

The BCNI was/is continuously providing all available HQP training and data analysis platforms to all scientists, students and staff at the brain imaging operation at Fraser Health/SFU Surrey, and all free of charge (see research output and selected publications). Coming slowly out of the pandemic, the BCNI will again further provide all its infrastructure (networking areas, portable imaging devices, etc).

(c) 3T MRI Imaging Research Facility at BC Children's Hospital Research Institute (BCHRI):

The BCNI was/is continuously contributing to the new state-of-the-art 3T MRI imaging facility (with the BCNI director and former BC LEEF Chair as the Co-PI of the original CFI grants). The facility allows structural and functional brain imaging and analysis on newborn babies, as well as children suffering from various neurological or psychiatric conditions.

3) (d) Multimodal Imaging Facility at University of British Columbia (UBC):

The BCNI was/is continuously contributing to the current setup and further fundraising of the Multimodality Neuroimaging Facility at the new Center for Brain Health at UBC Hospital (with the BCNI director and former BC LEEF Chair as the Co-PI of the original CFI grant), which houses 3T-MRI /fMRI, MR-PET, EEG, TMS, and will house a future MEG (BCNI Associate Director is the Co-PI of submitted CFI grant) etc, and serving the research community across disciplines and institutions in BC, including UBC, BCH and SFU, to study healthy human subjects and patients suffering from neurological or psychiatric conditions.

(e) Brain Imaging Signal Processing Development:

The BCNI was/is continuously facilitating and expanding state-of-the-art brain imaging signal-processing development and tools across disciplines and institutions towards more

user-friendly and semi-automatic centralized analysis procedures, which are extremely crucial for training of HQP and for successful brain imaging research (see research output and selected publications).

4) (f) BCNI's Collaborative Meeting Space:

Coming slowly out of the pandemic, the BCNI will again further provide its meeting space to advance networking among researchers, students and staff towards multimodal brain imaging infrastructure, software development and imaging analysis across disciplines and institutions, which was widely used over the past years by: SFU-FASS, SFU-FAS, MIAL Imaging Laboratory, SFU-Psychology, SFU-Psych-IT, SFU-Engineering Science, SFU-Computing Science, Fraser Health/SFU Surrey, UBC-Pediatrics, UBC-Psychiatry, UBC-Psychology, UBC-Neurology, UBC-Audiology, UBC-Education, BC School Representatives, etc. The BCNI will further continue to host the head-quarter for the SFU Undergraduate BCNS society and the head-quarter for the Student Journal Club for their regular weekly or bi-weekly meetings held at the BCNI.

5) (2) Outreach and Engagement in the Public Community (Public Schools):

Facilitating the integration of brain-based interventional cognitive training programs for Learning Disabilities (Child-Dyslexia) in BC schools: The BCNI director is the co-founder of the "BC Fast ForWord Intervention Consortium"; a BC school interdistrict strategy to facilitate the knowledge and integration of such programs in BC schools. Although these programs were slowed down during the pandemic, the interventional FFW training platform was/is continuously growing since 2008; More than 12,000 students have been trained in more than 130 schools across 22 districts in BC over the past years, with an overall gain of about 0.7-2.0 years in reading level, including elementary and secondary schools. This is yet by far the largest successful effort across Canada with close to 50% training in BC alone, despite funding cuts and resistance in many BC schools over the past years and despite waiting lines due to yet limited access to these training programs.

The Centre/Institute's multi-year goals for the next renewal term:

1) - Main Goals -

Again and first of all, the BCNI is currently exploring how it can be best and optimally integrated with SFU's Initiative on Neuroscience and how it can be best connected with the new Institute for Neuroscience and Neurotechnology (INN). The BCNI is currently the only resource-platform for all the brain imaging data analysis at SFU, has yet about 55+ registered users, published on average 50+ abstract/paper publications each year and co-raised about \$55M together with its collaborators since inception - a most important and needed resource to SFU's brain imaging and beyond...

The BCNI will continue its mission and goals and further expand the brain imaging and research environment (as mentioned above).

- Further engagement in expanding brain imaging infrastructure and technology,
- Expanding BCNI services and training,
- Expanding BCNI's basic and clinical collaborative research efforts,
- Further engaging in the public community,
- Further facilitation of BCNI's infrastructure into other research projects across disciplines and institutions,
- Further facilitation of BCNI's infrastructure into other training programs and research projects for SFU-Psychology

KPI 1:

None - The performance will be indicated /monitored by the success of the collaborative research and HPQ, as well as its publications and outreach activities...

2) - Additional Goals -

- The BCNI will further focus on advanced improvements of comprehensive state-of-the-art analysis of human brain networks and connectivity,
- The BCNI will further enhance awareness in brain imaging and providing leadership and assistance in brain imaging research across disciplines and institutions,
- The BCNI will further facilitate the engaging in the multidisciplinary scientific community and translation into the public community,
- The BCNI will continue its efforts to facilitate interventional programs across BC school districts and engage in public private foundations to improve human health.
- The BCNI will continue its engagement in advanced brain imaging research and production of conceptual research publications, to initiate and facilitate discoveries, translation into future research projects and technology developments.

KPI 2:

None - The performance will be indicated /monitored by the success of the collaborative research and HPQ, as well as its publications and outreach activities...

Supporting documents:

selected_Publications_2017-2022_iU8NeYt.docx (See attachment below)

Financial Summary

Does your Centre/Institute receive direct financial support from the university?

No

Was the Centre/Institute leveraged to attract external funding (donations, grants, contracts) which were only made possible by its existence?

No

Confirm policy review:

Yes

Submitted by:

Urs Ribary, Director

Director's comments:

- Financial Support and Leverage -

> Unfortunately SFU did not financially support the BCNI over the past 15 years.

> Unfortunately, SFU did not leverage any direct resources in funding, personnel, equipment, maintenance etc to the BCNI Institute to attract more funding.

- Director's Comments -

Despite all the challenges especially during the past pandemic, the BCNI was/is continuing to focus on innovative collaborative multidisciplinary cognitive neuroscience brain imaging, signal processing expertise and research in health and disease with the ultimate goal to provide a yet more centralized and user-friendly imaging data analysis platform and to better understand the typical/atypical brain development with further translating such findings into underlying neural diagnostic and prognostic procedures to modify and improve individual targeted interventional therapeutic programs.

The Director, Co-Director and Associate Directors with all the BCNI faculty, staff and collaborative BCNI associates are looking forward towards coming out of the pandemic and the re-opening of all facilities across disciplines and institutions to further implement BCNI's mission and goals together with BCNI's available equipment and services to benefit the research community at large, providing and expanding opportunities within a growing multimodal brain imaging environment across disciplines and institutions including SFU, BCCH and UBC.

SFU is progressing on its new initiative on neuroscience and brain imaging and has established a new Institute (INN); the focus is now how to best integrate the BCNI Institute into the Neuroscience initiative and best connect with the new INN Institute.

Thank you for renewing our BCNI Institute to benefit the brain imaging community.

Reviewer's Section**Reviewed by:**

Michael Richards, Associate Vice-President, Research

Reviewer's decision:

Declined

Reviewer's comments:

This Institute was agreed to be dissolved this year, as there is a new INN Institute that will incorporate the BCNI (as mentioned in the report). The dissolution of this Institute was agreed with the Director and the VPRI.

Selected BCNI Publications: 2017 - 2022 (selected Papers only)

(about 35 selected papers during pandemic)

Ribary U, Mackay AL, Rauscher A, Tipper CM, Giaschi D, Woodward TS, Sossi V, Doesburg SM, Ward LM, Herdman A, Hamarneh G, Booth BG, and Moiseev A. Emerging neuroimaging technologies: Towards future personalized diagnostics, prognosis, targeted intervention and ethical challenges. In: Neuroethics: Anticipating the Future, J. Illes and S. Hossain, eds., Oxford University Press, pp.15-53, 2017.

Ribary U, Doesburg SM and Ward LM. Unified principles of thalamo-cortical processing: The neuronal switch. Biomed. Eng. Lett., 7, 229-235, 2017.

DOI: 10.1007/s13534-017-0033-4. Online: <http://link.springer.com/article/10.1007/s13534-017-0033-4>

Anterpal Sandhu; Yasong Li; Nicholas Peatfield, Xin Yi Yong; Ryan D'Arcy; Carlo Menon; Teresa P L Cheung. Non-magnetic compliant finger sensor for continuous fine motor movement detection. Biomedical Engineering Letters, 2017.

Anterpal Sandhu; Yasong Li; Nicholas Peatfield, Xin Yi Yong; Ryan D'Arcy; Carlo Menon; Teresa P L Cheung. Non-magnetic compliant finger sensor for continuous fine motor movement detection. Biomedical Engineering Letters, 2017.

Samu D, Campbell KL, Tsvetanov KA, Shafto MA, Cam-CAN, Cheung T, ... Tyler LK. Preserved cognitive functions with age are determined by domain-dependent shifts in network responsivity. Nature Comm, 2017.

Price D, Tyler LK, Neto Henriques R, Campbell KR, Williams N, Treder M, Taylor J, Cam-CAN, Cheung T, ..., Henson R. Age-Related Delay in Visual and Auditory Evoked Responses is Mediated by White- and Gray-matter Differences. Nature Communications 8, 15671, 2017.

Shafto MA, James LE, Abrams L, Cam-CAN, Cheung T, ... Tyler L. Age-Related Increases in Verbal Knowledge Are Not Associated With Word Finding Problems in the Cam-CAN Cohort: What You Know Won't Hurt You. J Gerontol B Psychol Sci Soc Sci, 2017.

Geerligs L, Tsvetanov KA, Cam-Can, Cheung T, ... Henson RN. Challenges in measuring individual differences in functional connectivity using fMRI: The case of healthy aging. Hum Brain Mapp, 2017.

Gadie, A., Shafto, M., Leng, Y., Cam-CAN, Cheung, T., ... Kievit, R. A. Age-related differences in self-reported sleep quality predict healthy ageing across multiple domains: a multi-modal cohort of 2406 adults. BMJ Open. 7(7), 2017.

Mitchell, D. CamCAN, Cheung, T., ... Cusack, R. Visual short-term memory through the lifespan: preserved benefits of context and metacognition. Psyarxiv, 2017.

Morcom, A. CamCAN, Cheung, T., ... Henson, R. N. Increased prefrontal activity with aging reflects nonspecific neural responses rather than compensation. bioRxiv, 2017.

Taylor JR, Williams N, Cusack R, Auer T, Shafto MA, Dixon M, Tyler LK, Cam-Can, T P L Cheung, Henson RN. The Cambridge Centre for Ageing and Neuroscience (Cam-CAN) data repository: Structural and functional MRI, MEG, and cognitive data from a cross-sectional adult lifespan sample. Neuroimage, 2017.

Lehmann BCL, White SR, Henson RN, Cam-Can, TPL Cheung, Geerligs L.(2017). Assessing dynamic functional connectivity in heterogeneous samples. Neuroimage, 2017.

Herdman AT, Moiseev A, Ribary U. Localizing Event-Related Potentials using Multi-source Minimum Variance Beamformers: A validation study. Brain Topography, 2018. OpenAccess: <http://rdcu.be/G34a>

Nunes AS, Peatfield NA, Vakorin VA, Doesburg SM. Idiosyncratic organization of cortical networks in autism spectrum disorder. NeuroImage, 2018.
doi: 10.1016/j.neuroimage.2018.01.022. JIF: 5.8. Rank 1/14 (Neuroimaging).

Herdman AT, Moiseev A, Ribary U. Localizing Event-Related Potentials using Multi-source Minimum Variance Beamformers: A validation study. *Brain Topography*, 2018. OpenAccess: <http://rdcu.be/G34a>

Livingston-Hirst E, Siegel LS, and Ribary U. Developmental Dyslexia: Emotional Impact and Consequences. *Australian Journal of Learning Difficulties (AJLD)*, 2018. DOI: 10.1080/19404158.2018.1479975

Benasich AA and Ribary U. *Emergent Brain Dynamics: Prebirth to Adolescence*. MIT Press: Cambridge, MA, 2018 (book).

Benasich AA and Ribary U. Exploring Emergent Brain Dynamics. In: *Emergent Brain Dynamics: Prebirth to Adolescence*, Benasich AA and Ribary U, eds., Strüngmann Forum Reports, vol. 25 (Lupp J, series editor), Cambridge, MA: MIT Press, pp. 1-13., 2018.

Gelinas J, Baillet S, Bertrand O, Galván A, Kolling T, Lachaux JP, Lindenberger U, Ribary U, Sawa A, and Uhlhaas PJ. Discussion Forum: Late Adolescence. In: *Emergent Brain Dynamics: Prebirth to Adolescence*, Benasich AA and Ribary U, eds., Strüngmann Forum Reports, vol. 25 (Lupp J, series editor), Cambridge, MA: MIT Press, pp. 243-264, 2018.

Iman Mohammad-Rezazadeh, Sheraz Khan, Robert Coben and Urs Ribary, Guest-Editors, Special Issue "Computational Methodologies in Brain Imaging and Connectivity: EEG and MEG Applications", *Frontiers in Computational Neural Circuits*, 2018.

> 9 Articles resulted in 16,143 views and 1,205 downloads 5-6 months later in Mar/2019.

Powlowski GM, Ghosh-Hajra S, Fickling SD, Liu CC, Robinovitch S, Doesburg SM, D'Arcy RCN. Brain vital signs: Expanding from the auditory to the visual modality. *Frontiers in Neuroscience, Brain Imaging Methods*. 12:968, 2018.

Nakajima M, Wong SM, Widjaja E, Baba S, Iimura Y, Okanishi T, Sato Y, Tabei M, Morooka H, Fujita M, Ibe S, Robyn W, Ueda Y, Yagy K, Solowka SA, Ochi A, Snead OC, Rutka JT, Drake JM, Doesburg SM, Takeuchi F, Shiraishi H, Otsubo. Advanced dynamic statistical parametric mapping (AdSPM) for localizing focal cortical dysplasia at bottom of sulcus. *Clinical Neurophysiology*. 129(6): 1182-1191, 2018.

Ghosh Hajra S, Liu CC, Song X, Fickling S, Cheung T, D'Arcy RCN. Multimodal characterization of the semantic N400 response within a rapid evaluation brain vital sign framework. *J. Translational Medicine*, 16: 151, 2018.

Gu T, Lin L, Jiang Y, Chen J, D'Arcy RC, Chen M, Song X. Acupuncture therapy in treating migraine: results of a magnetic resonance spectroscopy imaging study. *J Pain Res*, 11:889-900, 2018. doi: 10.2147/JPR.S162696. eCollection 2018

Courtemanche MJ, Sparrey CJ, Song X, MacKay A, D'Arcy RCN. Detecting white matter activity using conventional 3 Tesla fMRI: An evaluation of standard field strength and hemodynamic response function. *Neuroimage*, 169:145-150, 2018. doi: 10.1016/j.neuroimage.2017.12.008

Liu C, Ghosh Hajra S, Song X, Doesburg SM, Cheung T, D'Arcy R. Cognitive loading via mental arithmetic modulates effects of blink-related oscillations on precuneus and ventral attention network regions. *Human Brain Mapping*, 2019.

Kozhemiako N, Vakorin V, Nunes AS, Iarocci G, Ribary U and Doesburg SM. Extreme male developmental trajectories of homotropic brain connectivity in autism. *Hum. Brain Mapp.*, 40, 987-1000, 2019. DOI: 10.1002/hbm.24427

Vakorin VA, Ross B, Doesburg SM, Ribary U and McIntosh AR. Dominant Patterns of Information Flow in the Propagation of the Neuromagnetic Somatosensory Steady-State Response. *Front. Neural Circuits*, 2019.

DOI:10.3389/fncir.2018.00118

Kozhemiako N, Nunes A, Vakorin V, Chau C, Moiseev A, Ribary U, Grunau RE, Doesburg SM. Atypical resting state neuromagnetic connectivity and spectral power in very preterm children. *J Child Psychology and Psychiatry*, 2019. DOI: 10.1111/jcpp.13026

Magnuson JR, Peatfield NA, Fickling S, Nunes AS, Christie G, Vakorin V, D'Arcy RCN, Ribary U, Iarocci G, Moreno S, Doesburg SM. Electrophysiology of Inhibitory Control in the Context of Emotion Processing in Children With Autism Spectrum Disorder. *Frontiers in Human Neuroscience*, 2019. DOI: 10.3389/fnhum.2019.00078

Vakorin VA, Bezgin G, Doesburg SM, Ribary U, Yangawa T, Takenaka K, McIntosh AR. Spatiotemporal interplay of visually-induced long-range synchronization and local desynchronization in large-scale functional networks of a monkey brain. *Frontiers in Neural Circuits*, 2019.

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Vakorin VA, Ross B, Doesburg SM, Ribary U and McIntosh AR. Dominant Patterns of Information Flow in the Propagation of the Neuromagnetic Somatosensory Steady-State Response. *Front. Neural Circuits*, 2019. DOI:10.3389/fncir.2018.00118

Kozhemiako N, Nunes AS, Vakorin VA, Chau CMY, Moiseev A, Ribary U, Grunau RE, Doesburg SM. Sex differences in brain connectivity and vulnerability in very preterm children. *Hum. Brain Mapp.*, 2019. DOI: 10.1002/hbm.24809

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Kozhemiako N, Nunes AS, Vakorin VA, Iarocci G, Ribary U, Doesburg SM. Alterations in local connectivity and their developmental trajectories in ASD: does being female matter? *Cerebral Cortex*, 2020.
doi.org/10.1093/cercor/bhaa109

During the Pandemic:

Nunes AS, Kozhemiako N, Hutcheon E, Chau C, Ribary U, Grunau RE, Doesburg SM. Atypical neuromagnetic resting activity associated with thalamic volume and cognitive outcome in very preterm children. *Neuroimage Clinical*, 2020. <https://doi.org/10.1016/j.nicl.2020.102275>

Magnuson JR, Iarocci G, Doesburg SM, Moreno S. Increased intra-subject variability of reaction times and single-trial event-related potential components in children with autism spectrum disorder. *Autism Research*, 2020. doi: 10.1002/aur2210

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Nunes AS, Kozhemiako N, Moiseev A, Seymour RA, Cheung TPL, Ribary U, Doesburg SM. Neuromagnetic activation dynamics of stimulus-locked processing during naturalistic viewing. *Neuroimage*, 2020. doi: 10.1016/j.neuroimage.2019.116414

Borgeest GS, Henson RN, Shafto M, Samu D, Cam-CAN, Kievit RA. Greater lifestyle engagement is associated with better age-adjusted cognitive abilities. *Plos one* 15 (5), e0230077, 2020.

Liu KY, Kievit RA, Tsvetanov KA, Betts MJ, Düzel E, Rowe JB, Howard R, Cheung T et al. Noradrenergic-dependent functions are associated with age-related locus coeruleus signal intensity differences. *Nature communications* 11 (1), 1-9, 2020.

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November 9, 2022

To: The Office of the Associate Vice-president, Research and International, SFU
From: Dr. June Francis, Director, Institute for Black and African Diaspora Research and Engagement;
Adjua Akinwumi, Administrator, Institute for Black and African Diaspora Research and Engagement

Subject: Extension request for the renewal of the Institute for Black and African Diaspora Research and Engagement

We are writing to request an extension for the renewal of the *Institute for Black and African Diaspora Research and Engagement* (IBADRE), formerly known as the *Institute for Diaspora Research and Engagement* (IDRE).

IDRE was constituted as a research institute at Simon Fraser University under the terms of SFU Policy R 40.01 (Research Centers and Institutes) in fall 2013. In July 2022, IDRE began a reconstitution process, which includes a change of Institute name and focus, as well as an affiliation with and formalization of the SFU Black Caucus. These motions are still being deliberated by SFU Senate.

We would like to coordinate the renewal application with our submission to SCUP regarding the issues raised at SCUP. For these reasons, we request an extension till February 2023.

Best Regards



June N. P. Francis LLB; PhD

Co-Director -The Co-Laboratorio Project

Director The Institute for Black and African Diaspora Research and Engagement

Associate Professor, Beedie School of Business

Simon Fraser University