A Planet Under Pressure: 
Citizens and Scientists Taking Action on Global Warming and Other Threats

A David and Cecilia Ting Endowment
2011-2012 Film and Lecture Series

Thursday February 23, 2012, 7–9 pm
Room 7000, SFU Harbour Centre, 515 West Hastings, Vancouver, BC

Climate Change and Disease:
The Known Knowns, the Known Unknowns, and Predictions of the Unknown Unknowns of Vector-Borne Diseases in a Changing World
Carl Lowenberger, Canada Research Chair in Parasites and Vectors of Disease, Biological Sciences, Simon Fraser University

Abstract:
Insects transmit parasites and pathogens to humans and other vertebrates. Malaria, Chagas disease, sleeping sickness and Lyme disease all are transmitted by arthropod vectors. The ecosystem I study is tiny: the insides of an insect. I study what happens to the parasites once they are ingested. How do they find their way around the insect? What happens within the insect vector after it takes up a bloodmeal containing parasites or pathogens? How does the insect vector recognize the parasite; how does the insect activate its immune system to eliminate the parasite; how does this immune response kill some parasites but not others; how does the parasite circumvent or evade the insect immune response and be transmitted to another human? The interactions between these organisms is based on the nutritional and overall health status of vector and parasite. Major questions are how climate change will affect habitat and range extension of vectors and how will this affect the development of parasites within vectors? Will fitter vectors transmit more parasites? Will weaker vectors succumb to parasites? Will climate change allow for expansion north and south to new countries and new susceptible hosts? Will climate change allow expansion within an endemic country to new altitudes in the same region? These unknown unknowns are driving the predictions of what will become the reality of disease transmission in the new era.

Bio-Sketch:
Carl Lowenberger is a Canada Research Chair in Parasites and vectors of disease. He has combined his degrees in Entomology (U. of Guelph), Medical Entomology (Simon Fraser University) and Parasitology (McGill) to develop a research program around insects that transmit parasites to humans. He moved to the University of Wisconsin-Madison initially as a post doctoral Fellow and then as a Faculty member. In 2002 he was appointed to the Department of Biological Sciences as a CRC in Parasites and Vectors of Disease. He is a Scholar of the Michel Smith Foundation for Health Research and is an Associate Member of the Centre for Forensic Research (Criminology) and the Department of Molecular Biology and Biochemistry at SFU. Carl’s research is both field and lab oriented and he tries to use lab studies to predict what is happening in the field, evaluate predictions in the field, and return to the lab to modify predictions. As such Carl collaborates extensively with researchers in Colombia, Mexico, and Costa Rica on Dengue transmission, in Colombia, Mexico, and Guatemala on Chagas Disease and has worked previously in Colombia, Bolivia, and Mexico on malaria and in Egypt on lymphatic filariasis.