



BRITISH  
COLUMBIA



# Enhancing Tsunami Warning Along North America's Northwest Coast: Reaching the Last Mile

Peter Anderson  
Simon Fraser University

Maiclaire Bolton  
Emergency Management BC

June 8, 2010

# Acknowledgements

- Cascadia Region Earthquake Workgroup



- Van Horne Institute



- Natural Resources Canada (Pacific Geoscience Centre)



Natural Resources  
Canada

Ressources naturelles  
Canada

# Purpose

- To generate a series of applied projects aimed at addressing deficiencies in current coastal last-of-the mile tsunami warning and emergency telecommunications systems within remote areas of the Cascadia and Northern Pacific Regions.

# Objectives

- To bring experts and key stakeholder groups together to build relationships, share knowledge and encourage long term thinking about coastal public warning and emergency communication systems
- To identify strengths and weaknesses of current and 'next-generation' emergency communication options
- To improve applications of these systems through generating a series of new pilot projects





# Session A:

# Tsunami Warning in the

# Pacific Northwest Today



# Tsunami Notification Process

# Notification: Two Types of Tsunamis

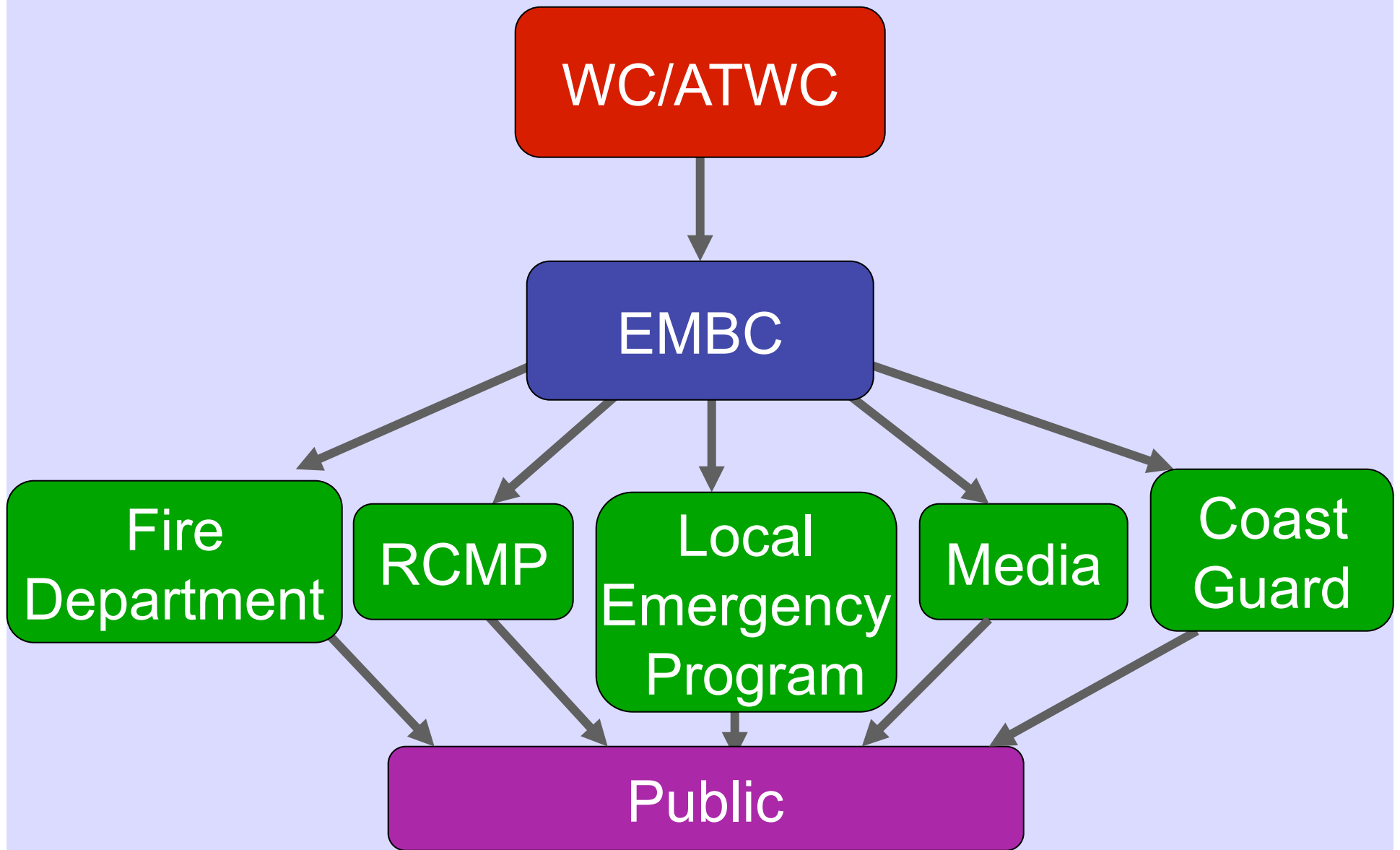
## 1. Local

- **Travel Time:** minutes
- **Notification:** the earthquake  
(severe shaking for >1min)

## 2. Distant

- **Travel Time:** hours
- **Notification:** from local officials

# Notification Process





# Types of Notification Messages

- **Tsunami Warning** – imminent threat of a tsunami
- **Tsunami Advisory** – warning of possible strong localised currents.
  - Can be upgraded to a warning.
- **Tsunami Watch** – based on early information.
  - Can be upgraded to a warning.
- **Tsunami Information Statement** – information that an earthquake has occurred with no tsunami warning, watch advisory issued.
- **Tsunami Cancellation** – cancels any previously issued bulletins when no tsunami has been generated.
- **Tsunami All-Clear** – issued when the threat of an impacting tsunami has passed.

# Tsunami Advisory

- Issued due to the threat of a potential tsunami which MAY produce strong currents or waves dangerous to those in or near the water
- Greatest risk to coastal regions historically prone to damage due to strong currents induced by tsunamis
- Threat may continue for several hours after the arrival of the initial wave
- Significant widespread inundation is NOT expected for areas under an advisory

# Tsunami Advisory

- Actions to be taken by local officials may include:
  - closing beaches
  - evacuating harbours and marinas
  - repositioning ships to deep waters when it is safe to do so
- Advisories can be updated to expand/contract affected areas, upgraded to a warning, or cancelled

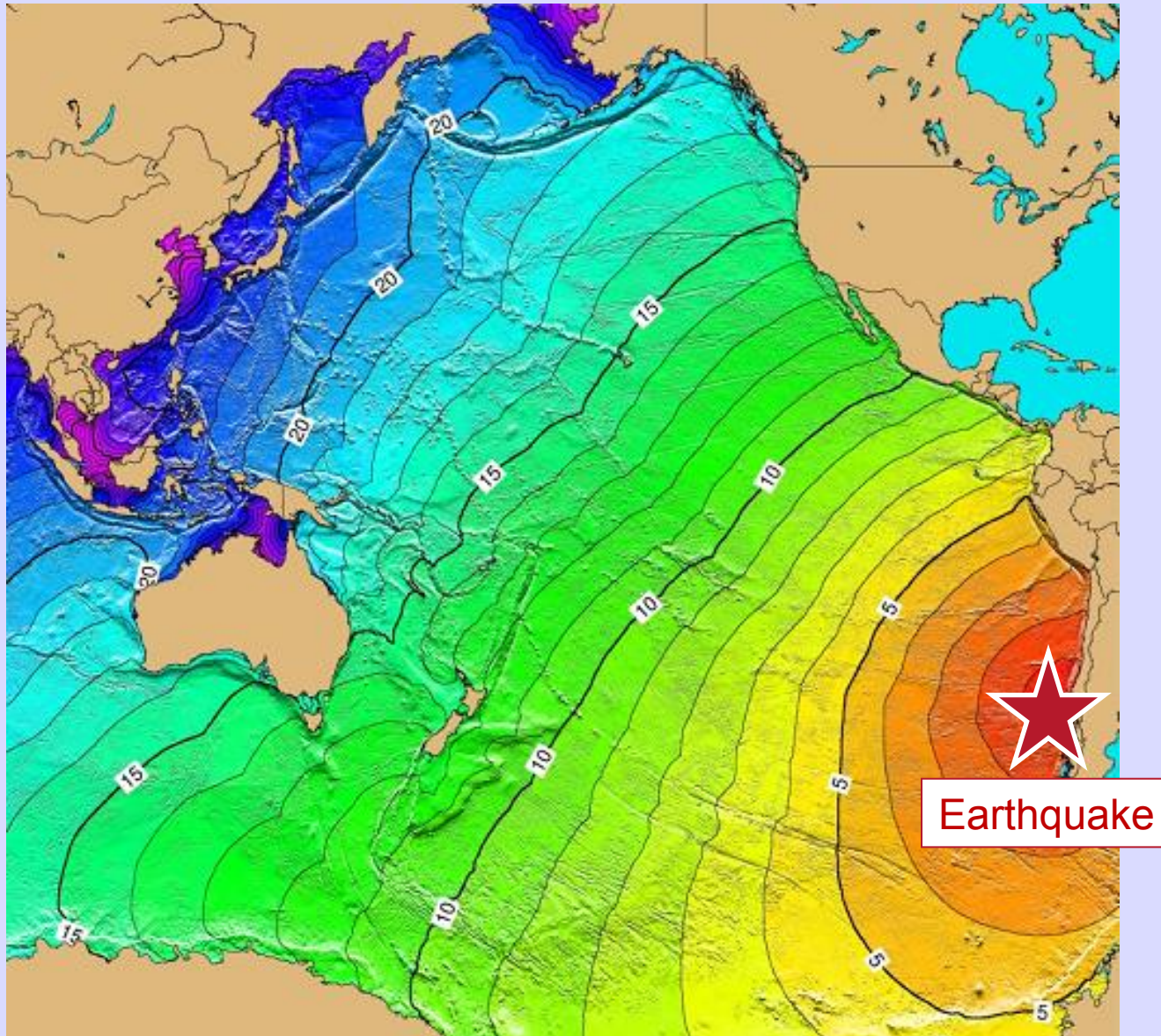


# February 27, 2010

## M8.8 Chile



# M8.8 Chile February 27, 2010





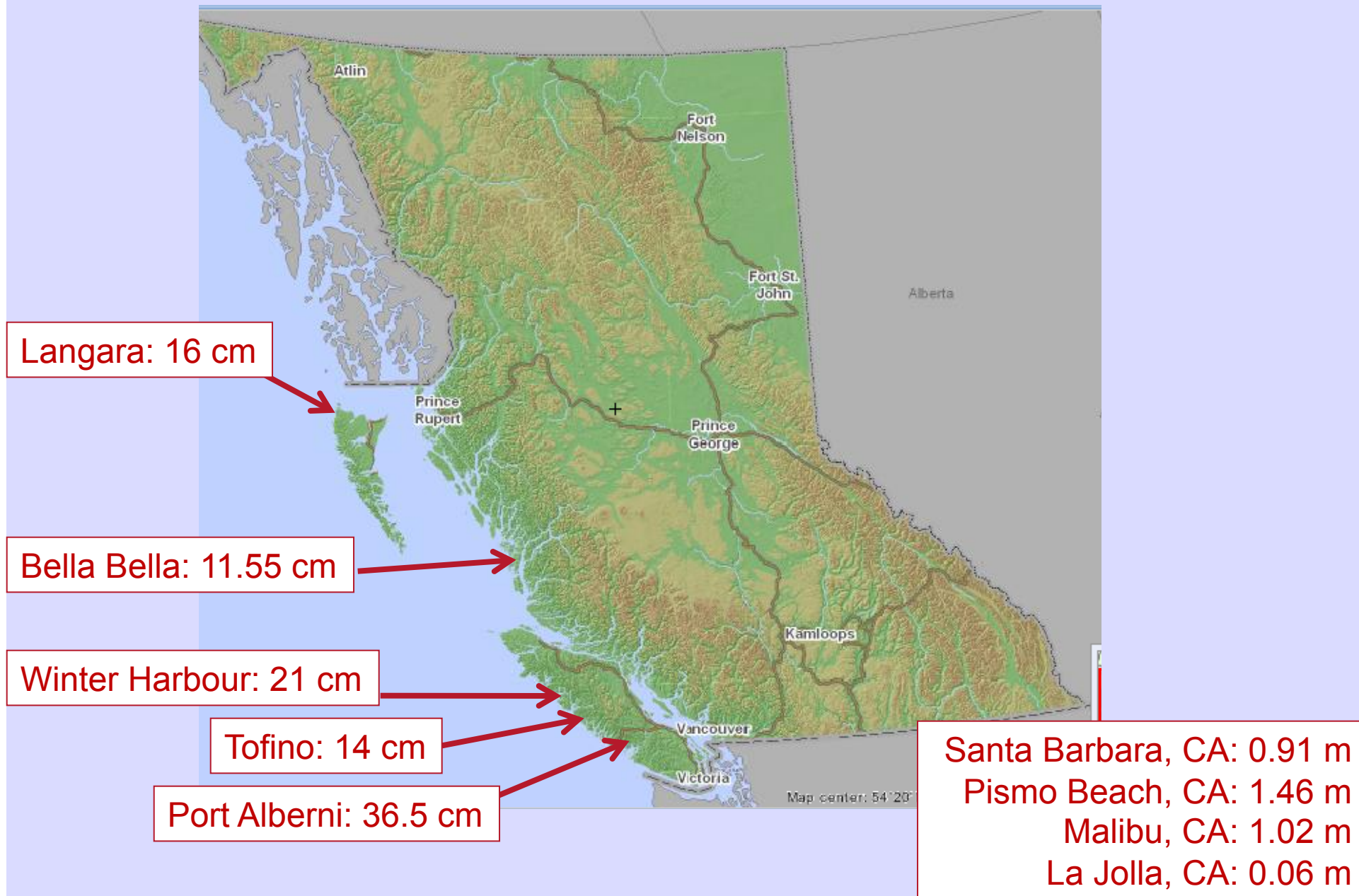
# Unique Situation

- First “Tsunami Advisory” issued for BC (under current definition)
- First tsunami response with multiple notifications
- Olympic Games time period

# Provincial Emergency Notification System (PENS)

- 6 PENS messages between 04:15 and 18:20 PST
- 3 components to PENS:
  - Interactive Voice Response (IVR) Telephone System
    - 1100 phone calls (20-60 mins)
  - Fax
    - 300 faxes
  - Email
    - 300 emails

# Observations





# Breakout Session A: Challenges in the Coming Decade



# Session B:

## Building on Existing and Emerging Systems





# Breakout Session B:

## Envisioning Next Generation Last Mile Public Warning



# Session C:

## Framing an Action Plan for a Series of Pilot Projects



# Concluding Remarks and Next Steps



# Thank you

**Peter Anderson**  
[anderson@sfu.ca](mailto:anderson@sfu.ca)

**Maiclaire Bolton**  
[Maiclaire.Bolton@gov.bc.ca](mailto:Maiclaire.Bolton@gov.bc.ca)