

# Case Studies in Science Policy from Geological Survey of Canada (Pacific)

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PIPSC Science Policy Symposium  
Gatineau, Québec  
13 May 2010



Natural Resources  
Canada

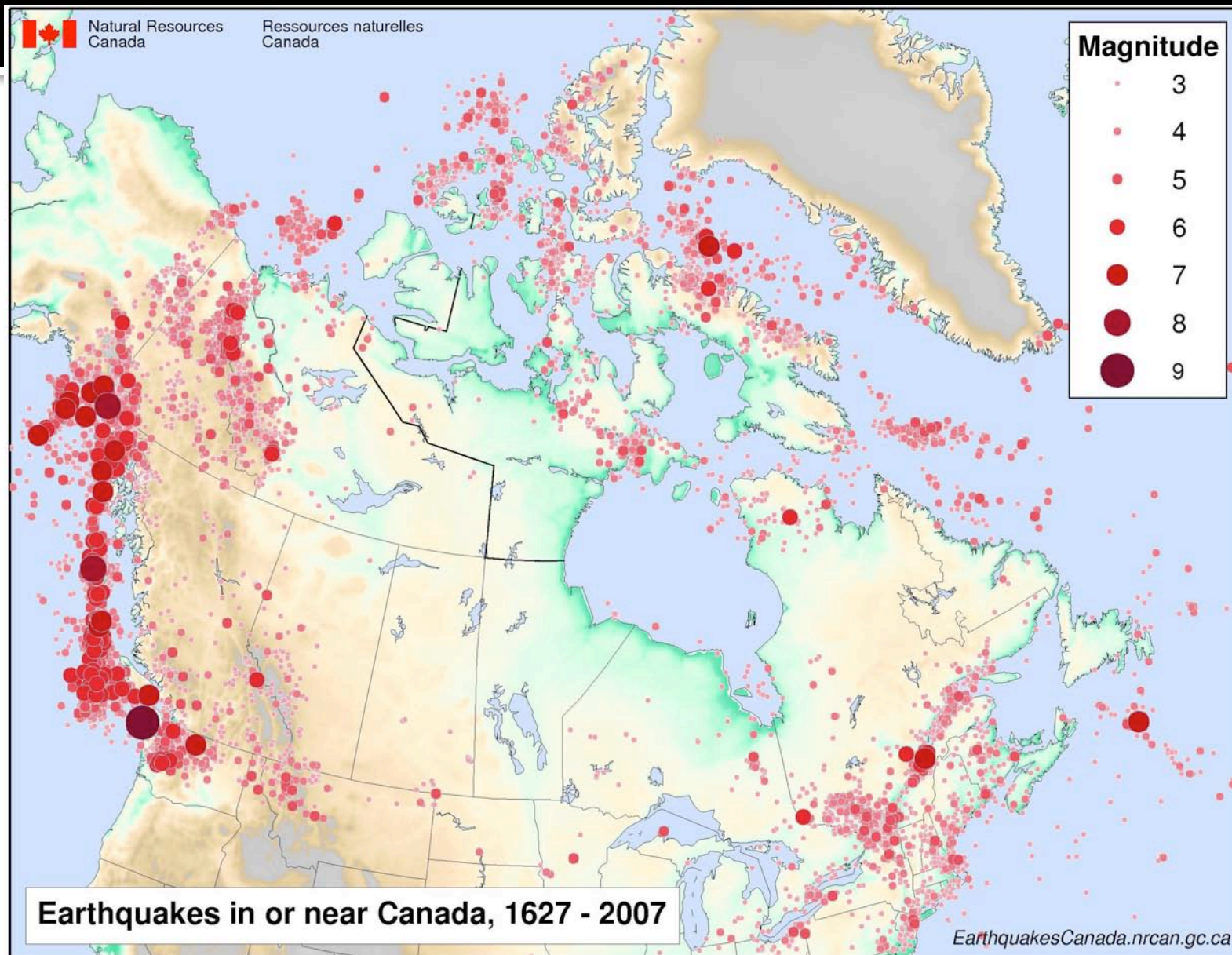
Ressources naturelles  
Canada

# Outline

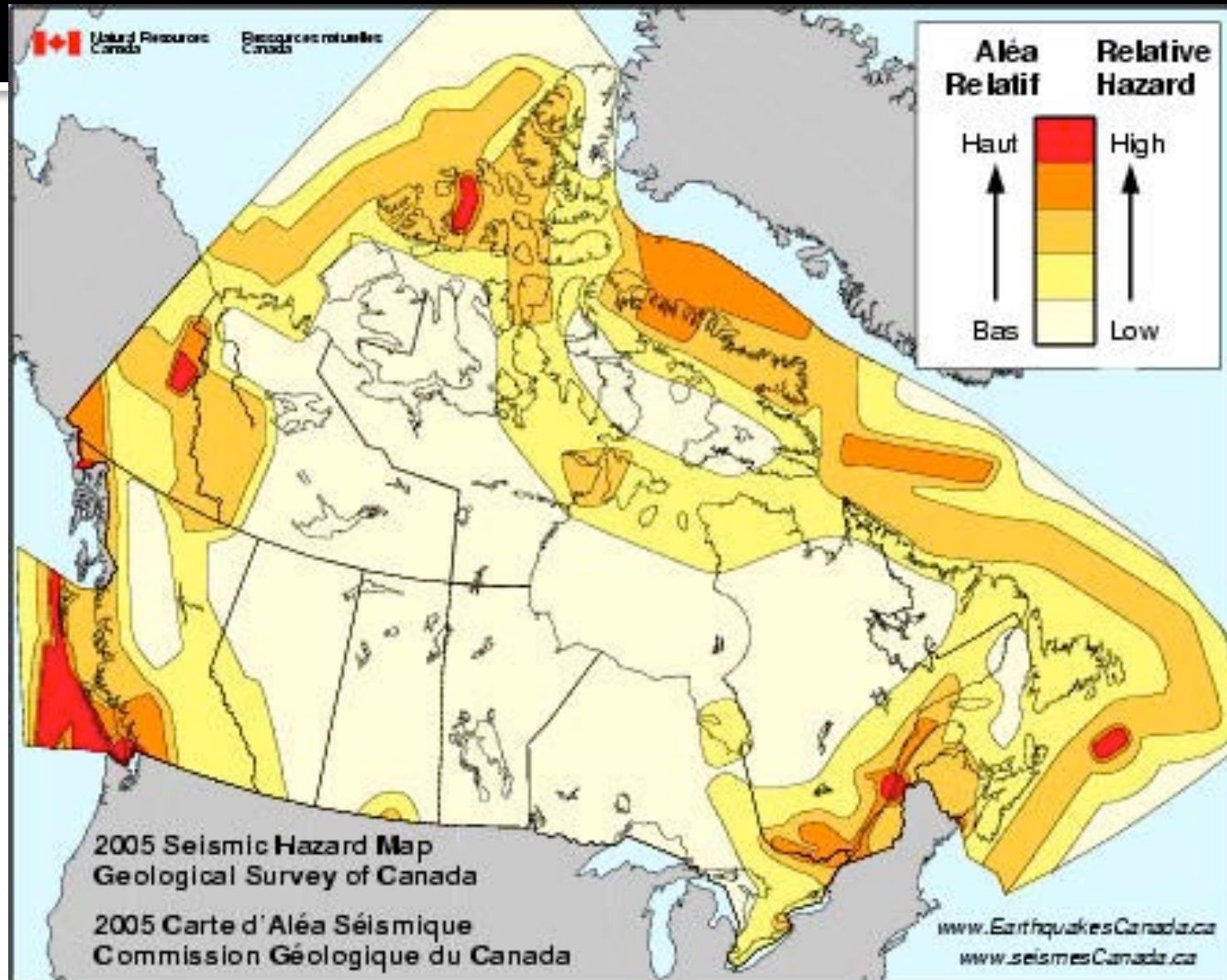
- Geological Survey of Canada
- Case studies
  - National – Natural Hazards
  - Provincial - Climate Change
  - Regional - Groundwater Vulnerability & Natural Hazards
- Thoughts for discussion



# Earthquakes in Canada



# NBCC 2005 simplified hazard map



Canada

Canada

# unreinforced masonry collapse



2010 Haiti: Port-au-Prince

5  
Ariana Cubillos, A.P.

# masonry damage



2010 Chile: Valparaíso

<sup>6</sup>  
Filipe Gamboa, AFP

# Haiti - Chile comparison

- M7.0
- ~25 km of Port-au-Prince
- M8.8
- fault ~25 km from Concepción

enforced building code and educated public

- 222,570 fatalities;  
~300,000 injured
  - 507 fatalities
- why?

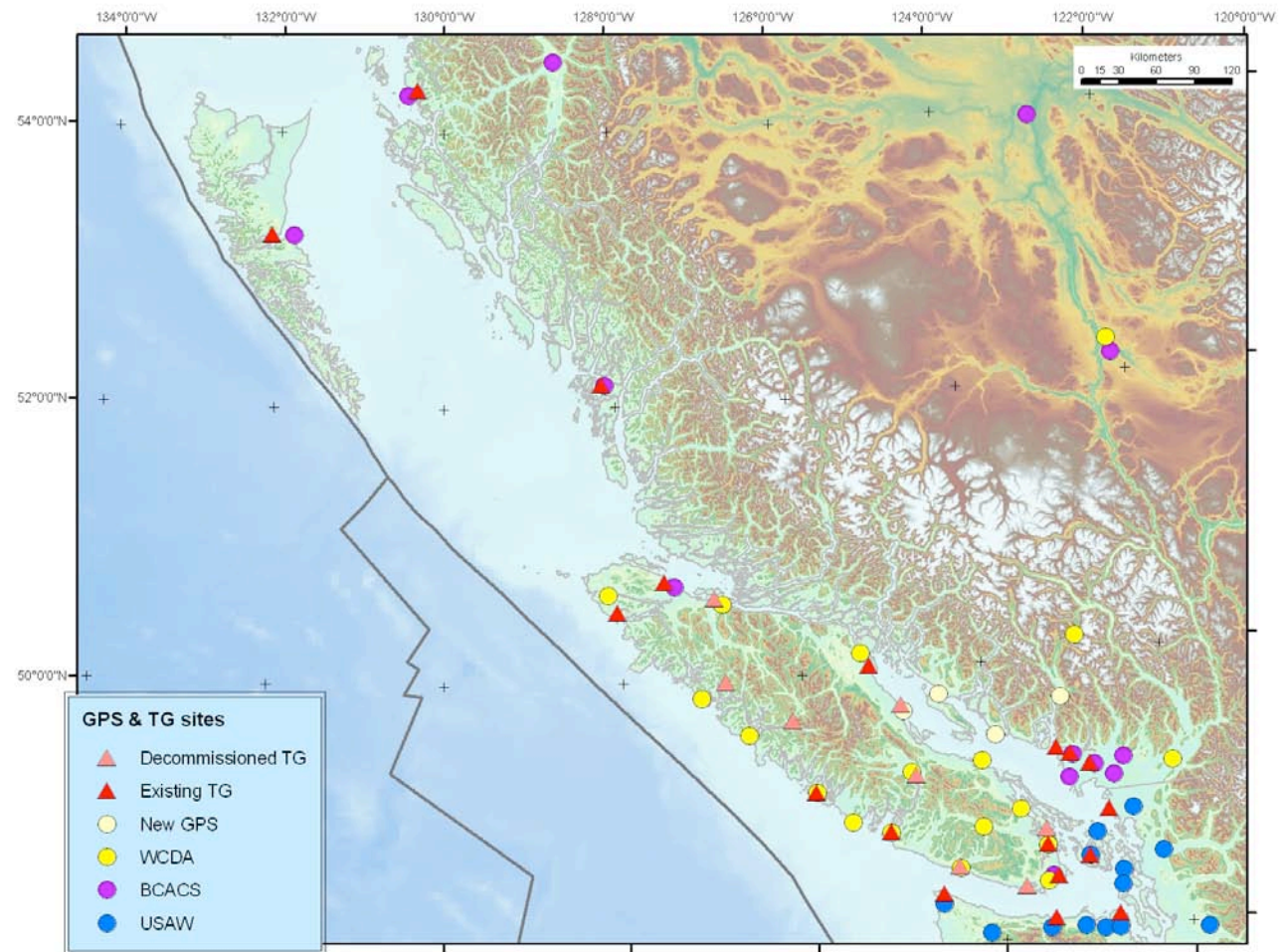


# Sea-level study – coastal BC

Integration of tide gauge and continuous Global Positioning System (GPS) data at 15 co-located sites

Tide gauge data provide measured relative sea-level change over the last 30-100 years

GPS data provide measured vertical land motion over the last 5-10 years

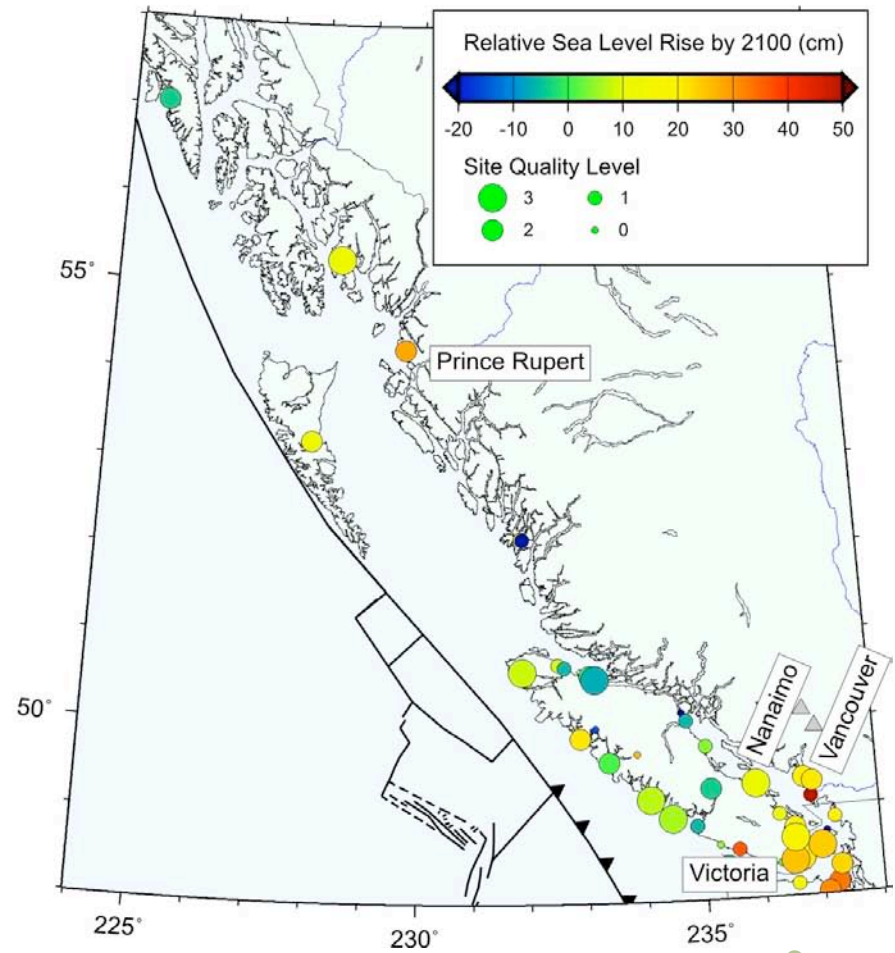


# Sea-level study – coastal BC

Integrated tide gauge-GPS study provides:

- Estimates of regional sea-level rise during 20<sup>th</sup> century
- Estimates of local vertical land motion
- Projections for local relative sea-level rise at specific locations and municipalities under a given climate-change scenario

Ex.: Projected relative sea-level rise for year 2100 based on IPCC AR4 (from 0-10 cm on west coast to 50+ cm in Fraser Delta)



# Sea-level study – coastal BC

Relative sea-level rise scenarios and projections are used by:

- Provincial and municipal planners, for example:
  - \* Regulations (e.g., protective dykes in Fraser Delta / Greater Vancouver)
  - \* Municipal development planning
- Governmental agencies and NGOs, for example:
  - \* Environmental Assessments of proposed development
  - \* Policy development of environmental projects

## Projected Sea Level Changes for British Columbia in the 21st Century

December 2008



BRITISH COLUMBIA  
Canada's Pacific Gateway

Government of Canada  
Gouvernement du Canada  
Canada



Natural Resources  
Canada

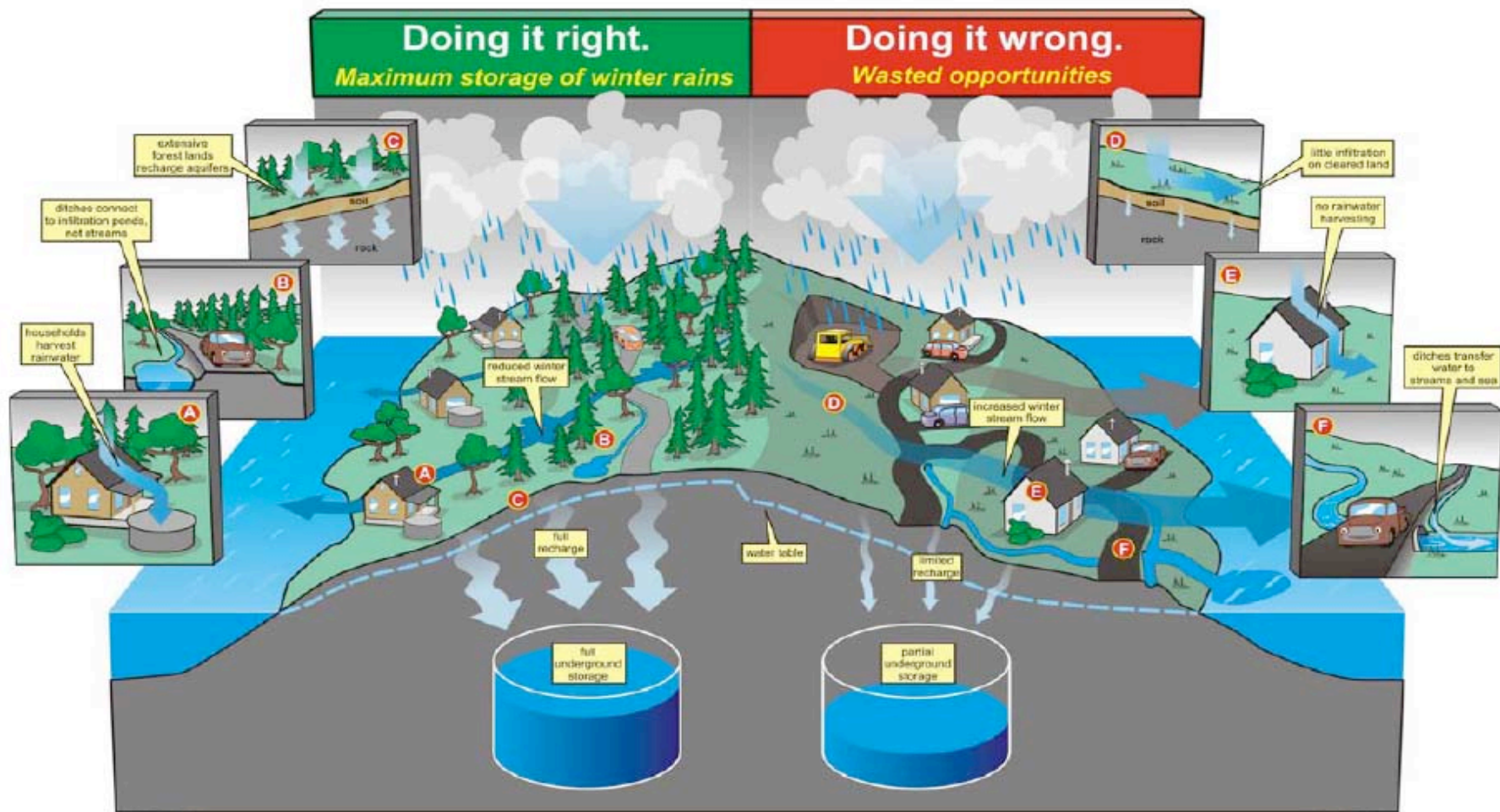
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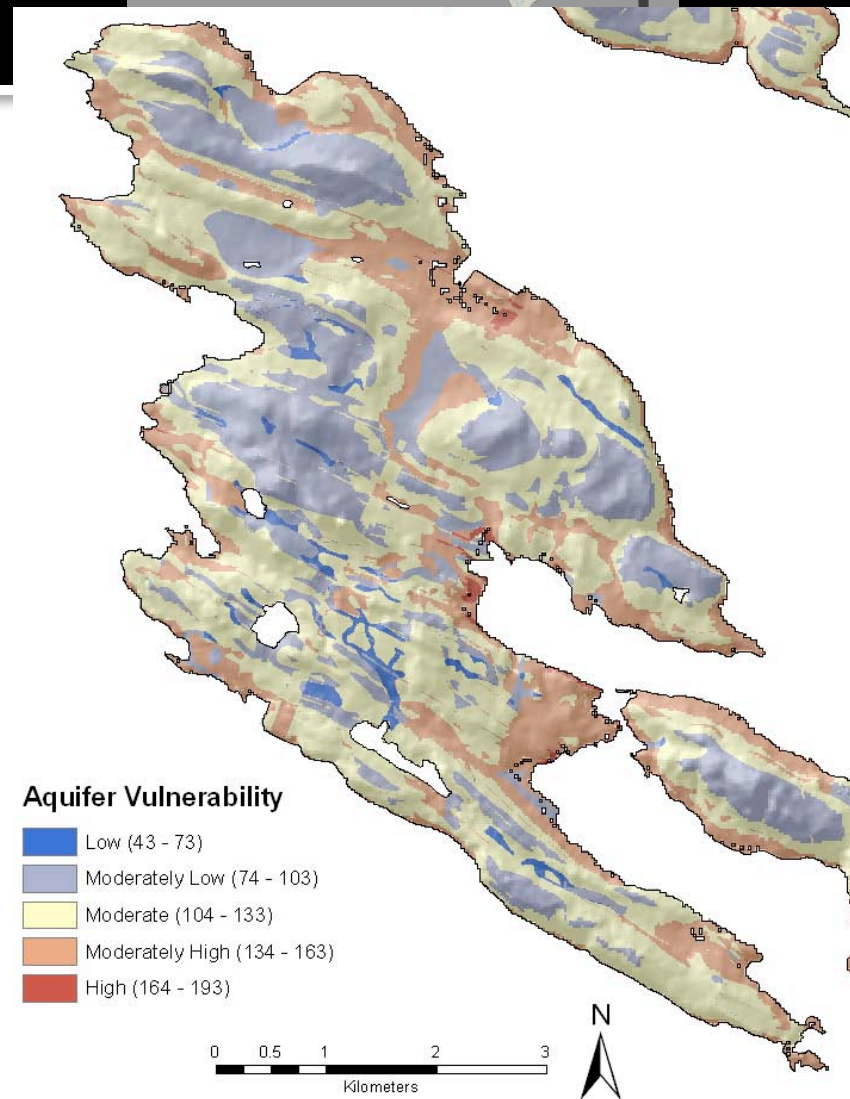
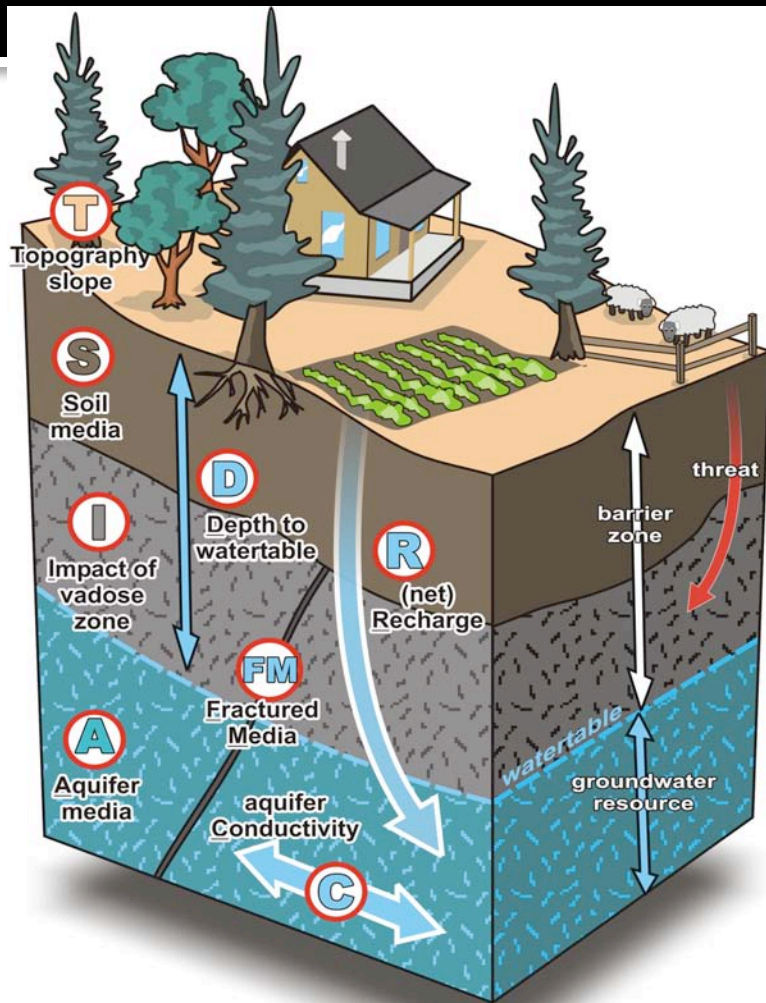
- Raise understanding of science behind water issues
- Support science-based decision-making
- Collaboration



# Groundwater Vulnerability



# Groundwater Vulnerability



# Groundwater Vulnerability

NORTH PENDER ISLAND LOCAL TRUST COMMITTEE  
OFFICIAL COMMUNITY PLAN

ADOPTED

2007



Islands Trust

Preserving **island** communities, culture and environment.

## Policies

- 4.1.1 The Local Trust Committee shall work with other agencies and the community in the implementation of a **Groundwater Management Strategy**. The Strategy should involve the following elements:
- a) development of **groundwater aquifer vulnerability mapping** that identifies intrinsic aquifer susceptibility and land use hazards;
  - b) identification of groundwater recharge areas and development of a sustainable groundwater yield model;
  - c) recommended amendments to policy and regulations that would enhance the protection of groundwater from potential contamination and promote the sustainable use of the groundwater resource;
  - d) assess the potential magnitude of groundwater demand under existing zoning and create a zoning framework to implement necessary changes to secure sustainable water resources; and
  - e) develop a database of all wells on the island (existing, abandoned, etc.) that includes the location, age, depth, depth to water and other relevant parameters.



# Food for Thought

- “Shift the dominant policy metaphor to one that mobilizes and mutates rather than being transferred, transmitted or transacted.”
- “The resulting dynamic in the policymaking process is not one of simple emulation and linear *replication* across policymaking sites, but a more complex process of nonlinear *reproduction*. Policies will mutate and morph during their journeys.”

-Peck & Theodore (2010)



# Acknowledgements

- Alison Bird, Boyan Brodaric, Murray Journey, Nicky Hastings, Calvin Klatt, Carmel Lowe, Stéphane Mazzotti, Alfonso Rivera, Bert Struik, Bob Turner, NRCan
- Islands Trust, Environment Canada
- BC Ministry of Environment
- Simon Fraser University
- University of British Columbia

