

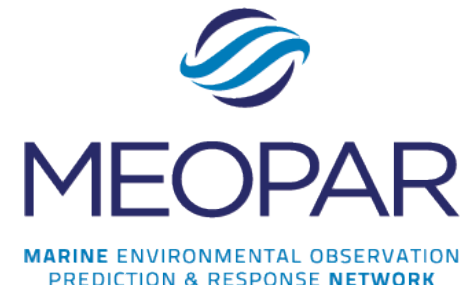
Sharing resilience knowledge among coastal communities: A similarity approach to using hazard vulnerability indicators

Coastal Zone Canada
Toronto 2016

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Outline

- Vulnerability to hazards
- Similarity-based vulnerability index
- Study of coastal communities in British Columbia
- Resilient Coasts Canada Platform

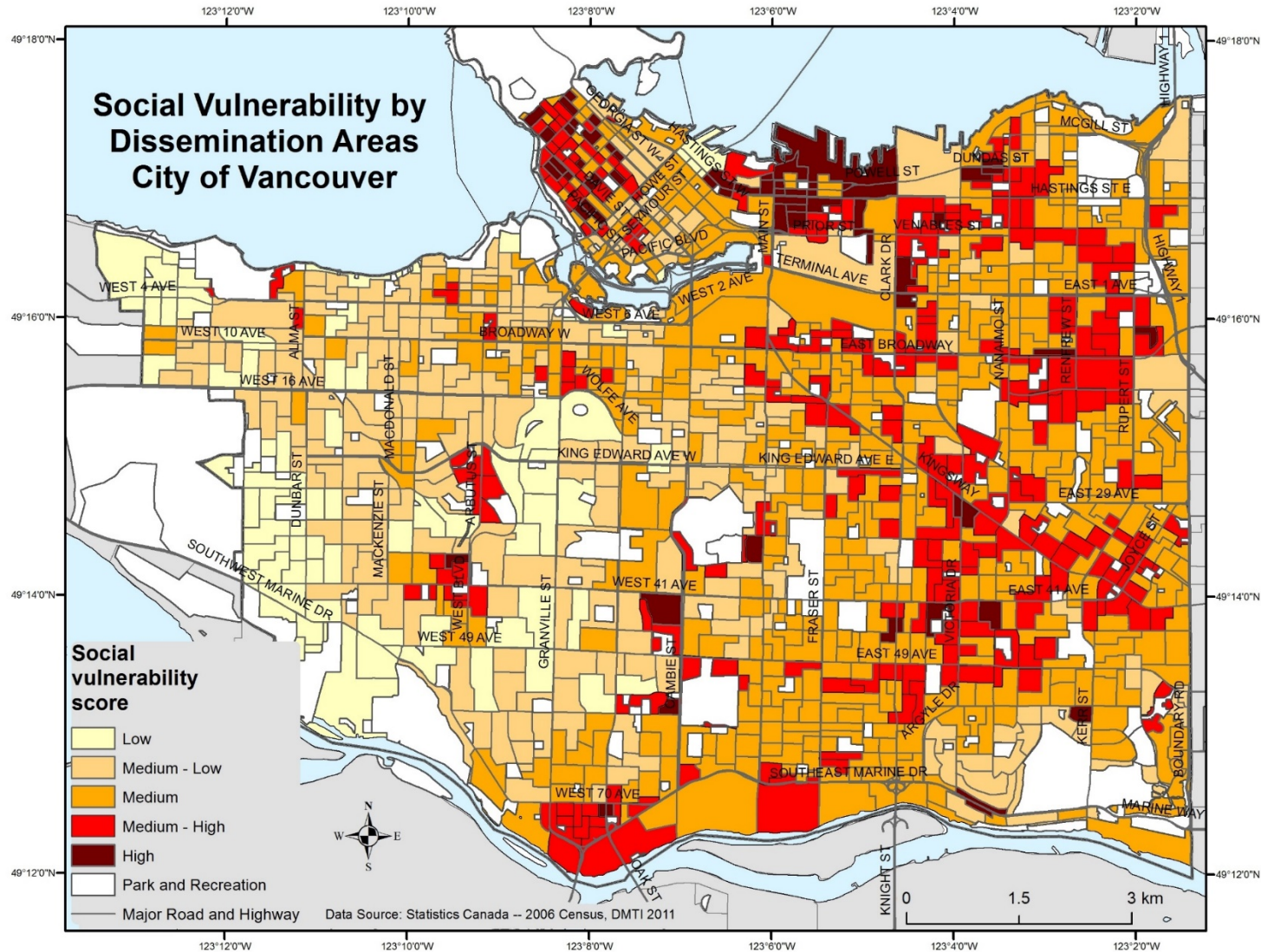


Vulnerability to hazards

- Vulnerability is a central concept in hazards research
 - The characteristics of a person or group and their situation that influence their capacity to interact with hazards (Wisner et al. 2004)
- Two important models of vulnerability:
 - Critical realist, political ecology of hazards approach
 - Contextual richness; determinants of vulnerability
 - “Hazards-of-place” (Cutter et al.)
 - Quantitative information for policy makers; indicators

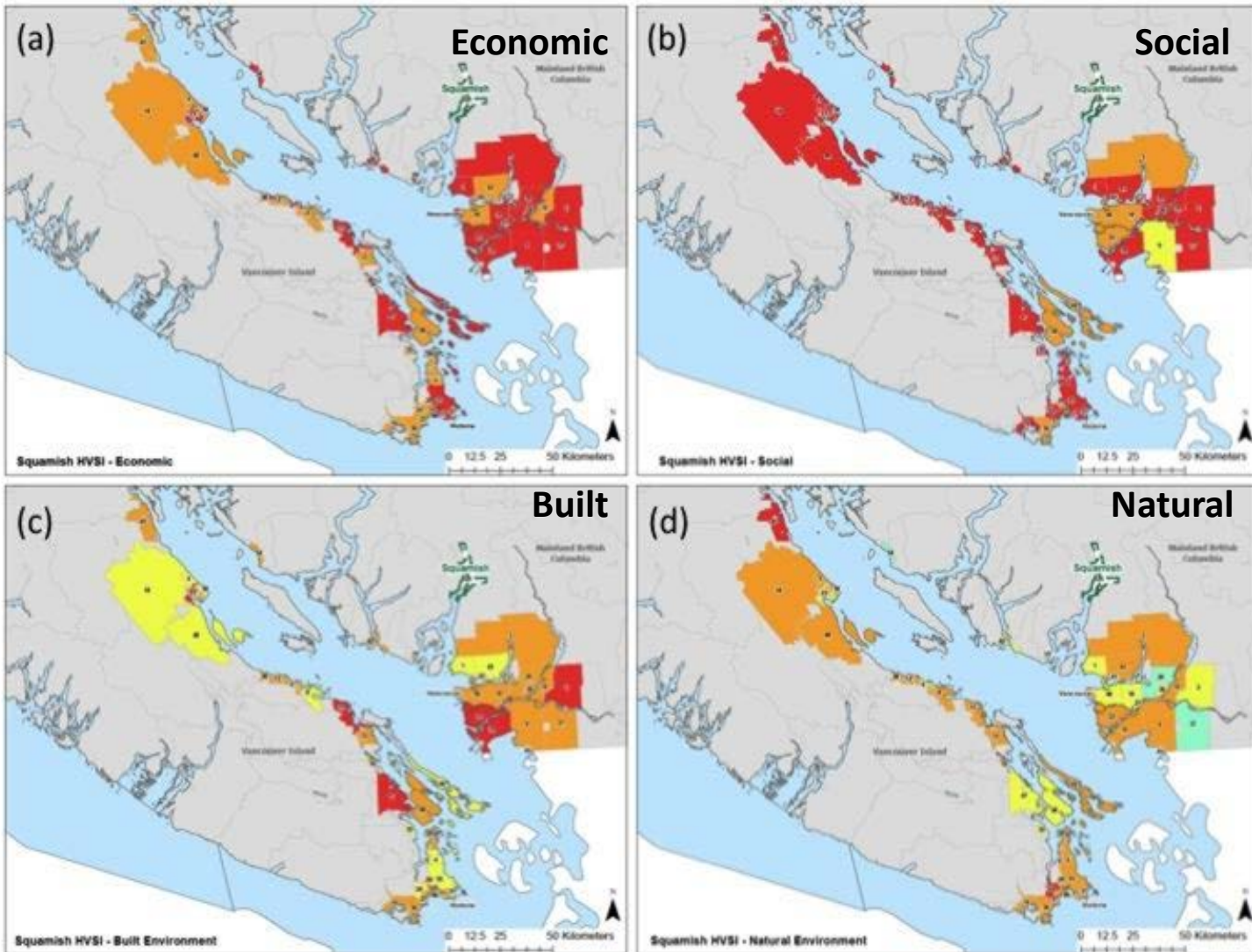
Traditional social vulnerability index

(Which places are *most* vulnerable?)



Similarity-based vulnerability index

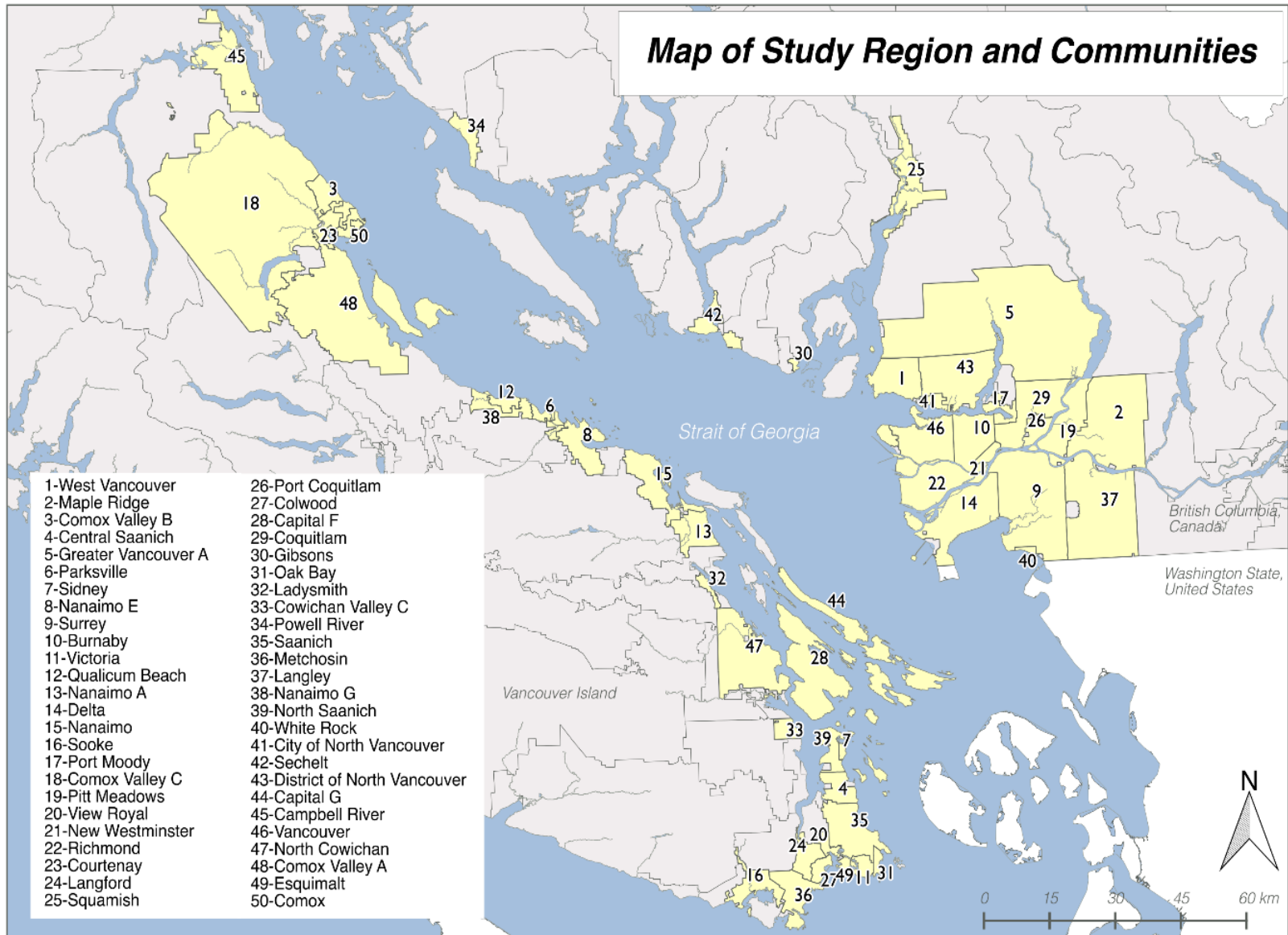
(Which places are *similarly* vulnerable?)



HVSI indicators

<i>Dimension</i>	Type of Capital				
	Economic	Social	Institutional	Built	Natural
<i>Size</i>	Businesses (no.) ⁽¹⁾	Population (no.)	Designated funding for DRR/CCA ⁽²⁾ (Yes or No)	Value of built environment (\$)	Coastline length (km)
<i>Spatial structure</i>	Population commuting outside (%)	Population living on coast (%)	Municipality's governance position (3 nominal categories)	Coastal land use (5 nominal categories)	Coastal geo- morphology (5 nominal categories)
<i>Composition</i>	Employment in extractive sector (%)	Population 65+ years old and living alone (%)	Department responsible for risk reduction (6 nom. cat.)	Structural flood protection (Yes or No)	Coastal vegetation (5 nominal categories)
<i>Integration</i>	Unemploy- ment (%)	Population not speaking official language (%)	Degree of public engagement (0~15 score)	Transport connectivity (5 ordinal categories)	Estuary ecological importance (5 ordinal cat.)
<i>Change</i>	Change in no. businesses, 2009-2013 (%)	Population moved in within last 5 years (%)	New policies: risk reduction, last 5 yrs (5 ordinal cat.)	Residential buildings built pre-1960 (%)	Sea-level change, past 100 years (5 ordinal cat.)

Case study of coastal communities in BC



Mobilizing Research

SoG Marine Hazards Workshop



May 27, 2015

Mobilizing Research

SoG Marine Hazards Workshop

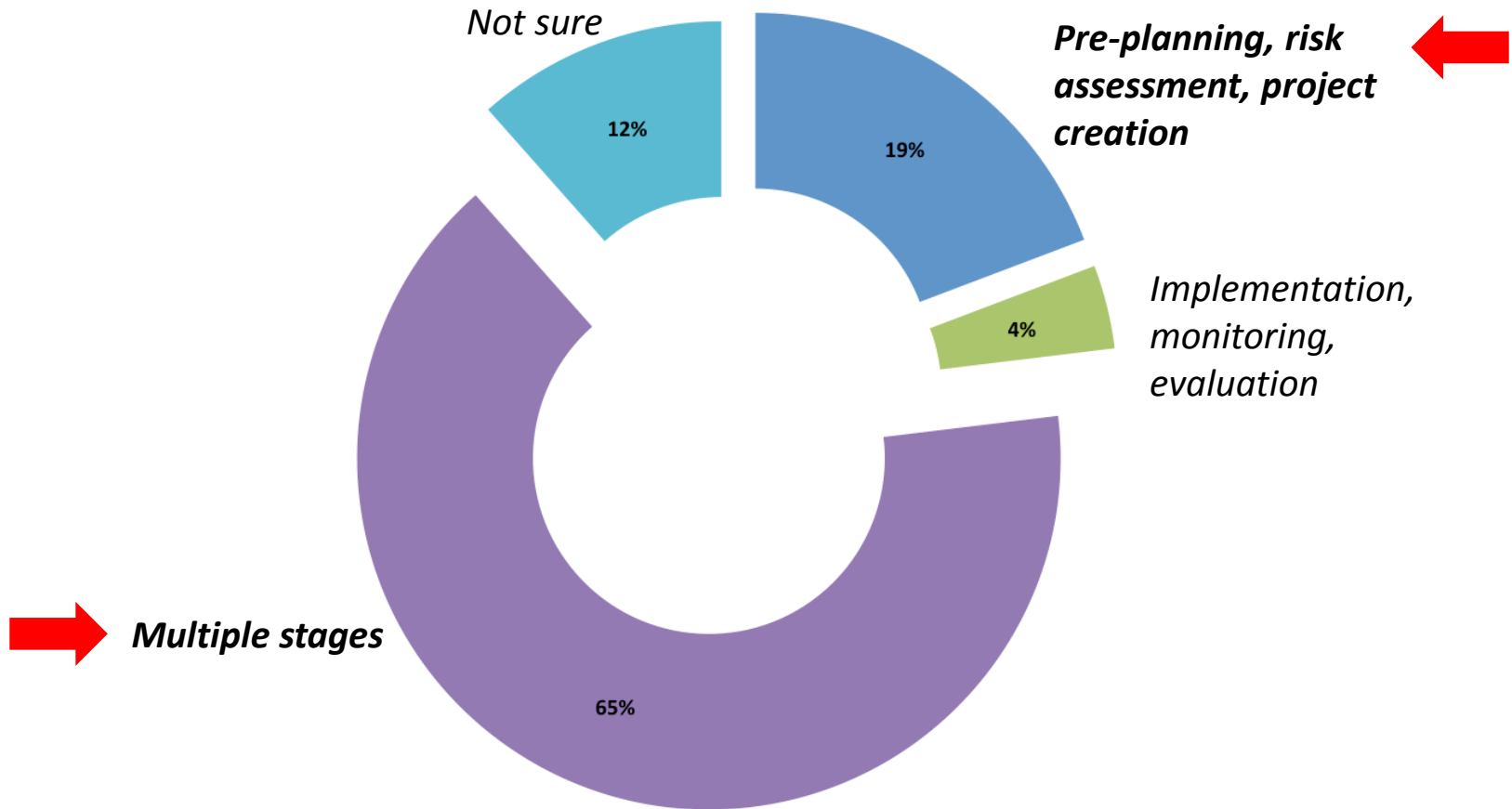
Objectives

- . Solicit stakeholder feedback on research projects
- ➔ Stakeholder input on online platform design
- . Facilitate network and connections



Platform Feedback - I

Which stage of planning would you use this platform?



Platform Feedback - II

Scope

- Land use indicators can be used for filtering
- Expand across border and other communities

Platform design

- Also focus on planning activities
- Use more user-friendly terminology
- Customize options for weighting



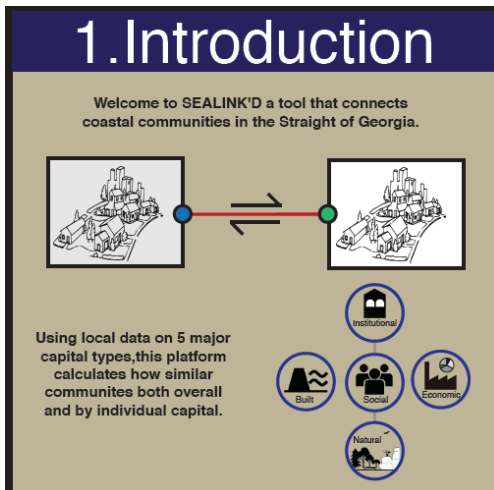
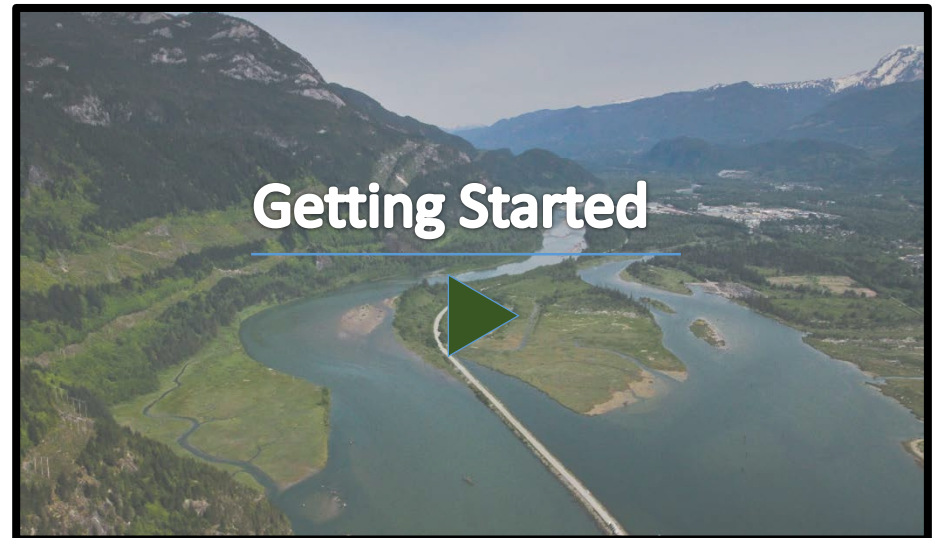
Beta Testing and Launch

Beta Testing:

- Nanaimo, Squamish, Surrey

2 films, infographics, webinars

Launch in July 2016



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<https://resilient-c.ubc.ca>

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[Analysis](#)

Institutional



Economic



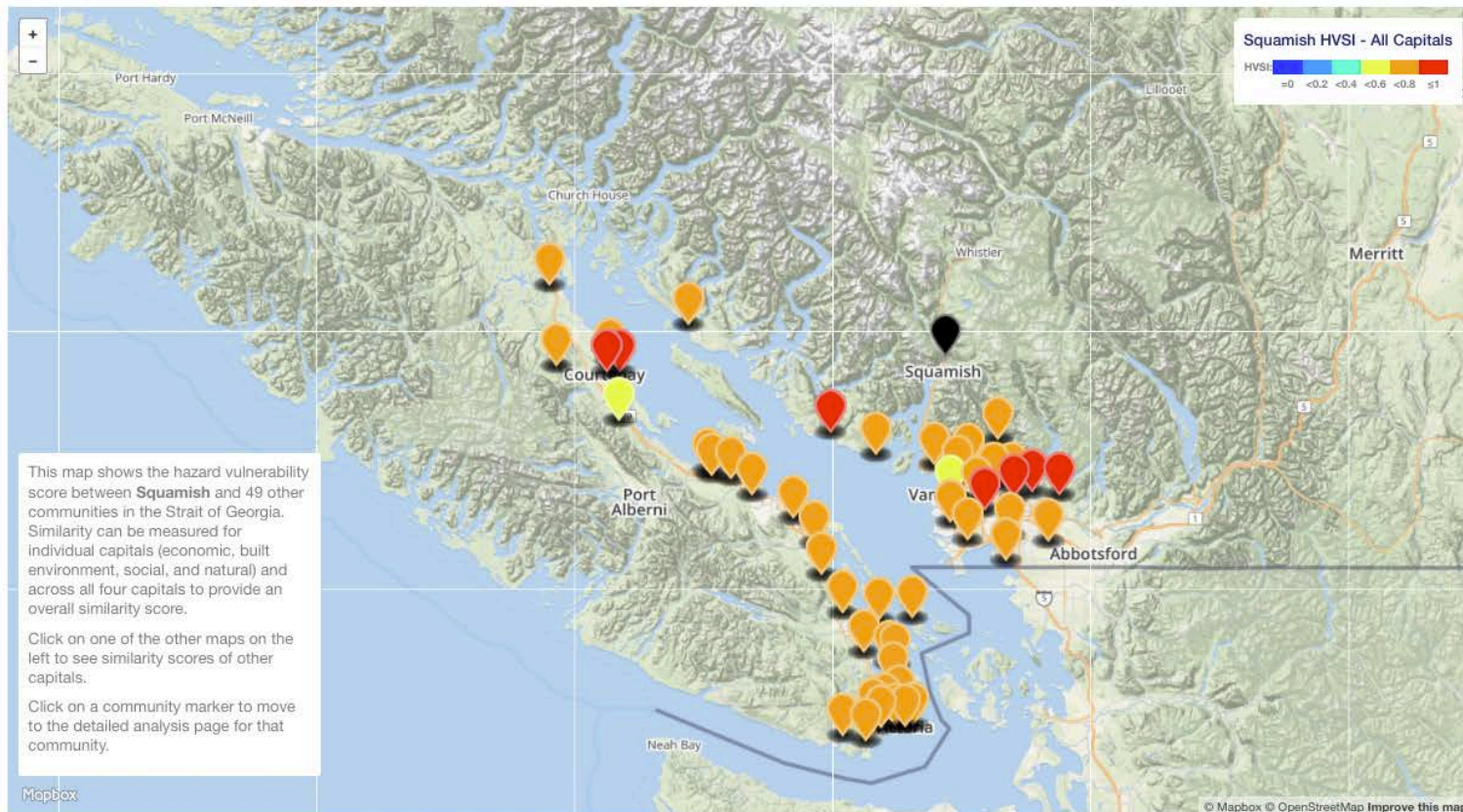
Built Environment



Natural Environment

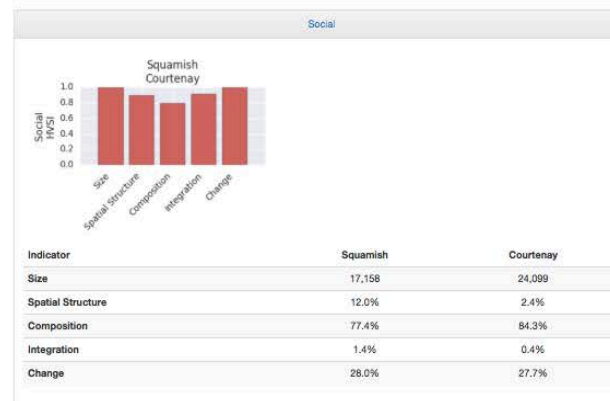
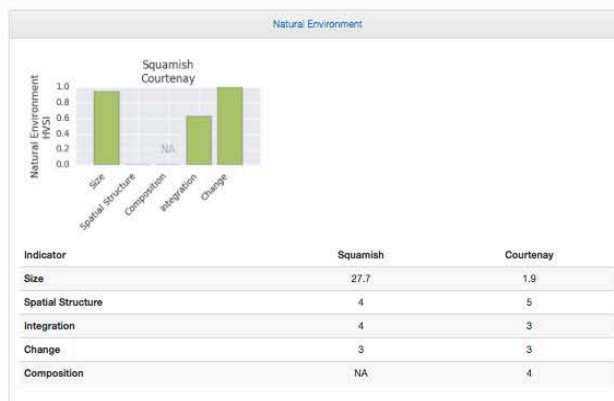
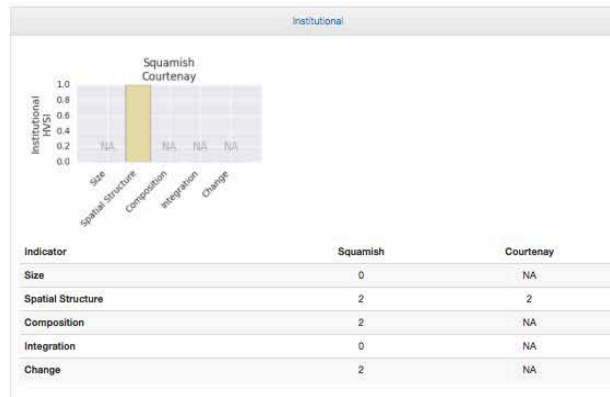
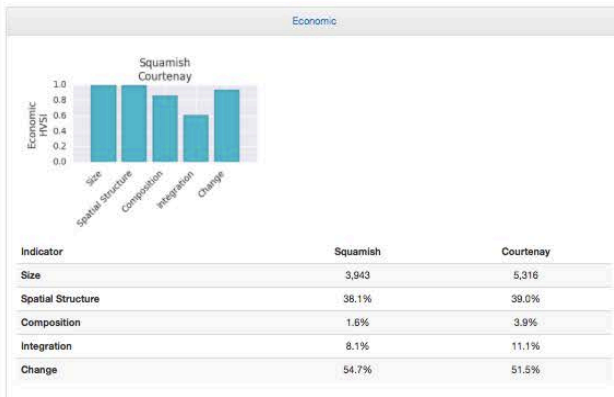
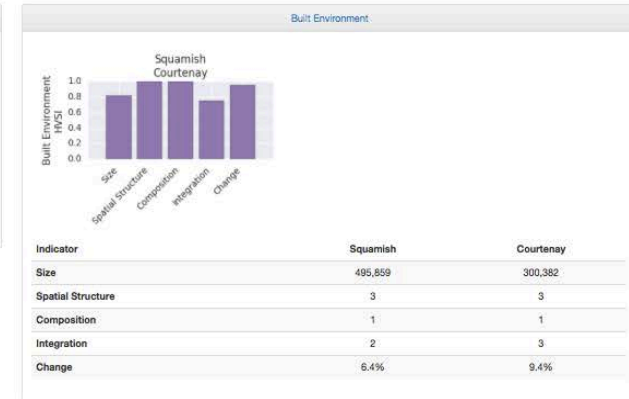
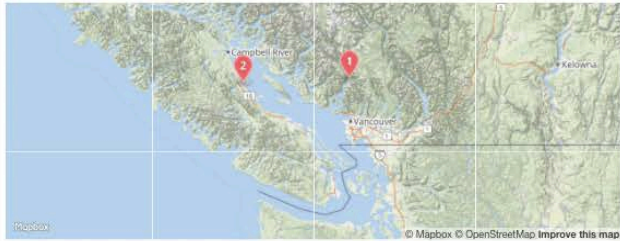


Social



Analysis

Profiles ▸

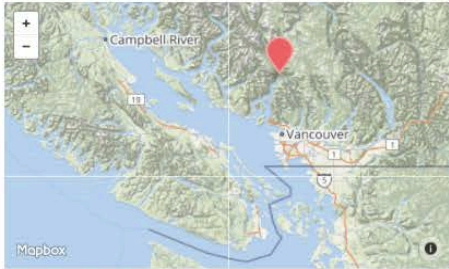




Compare

Squamish

[Hazard-at-a-glance](#) | [Hazard risks](#) | [Activities](#) | [Planning Data](#) | [HVSI Indicators](#)



Contact:

Person Responsible:

Email:

Phone:

Squamish is a district municipality home to 17,158 people (2011 census) located on the Sea to Sky Highway, at the north end of Howe Sound.

Hazard-at-a-glance:

This table gives a quick summary of which hazard the community is exposed to, whether they have implemented any action to manage the hazard(s), and whether data useful for flood management is available to them.

	FLOODING		TSUNAMI	CONTAMINANT SPILLS	EARTHQUAKE
	COASTAL	RIVERINE			
Concerned	✓	✓	✓	✓	✓
Action Taken	✓	✓	✓	✗	✓
Data Available	✓	✓			

Hazard Exposure:

Table showing the level at which the community is exposed to different major hazards based on a simple indicator. NOTE: The indicators used here to measure the relative exposure/risk of each hazard are selected based on ease of comprehension and data availability rather than accuracy.

HAZARD	INDICATOR	METRIC	VALUE
Flooding	Type of flooding	1 - Coastal 2 - Riverine 3 - Both	3
Earthquake	Risk scale from ICLR study	1 - Very low risk 2 - Low risk 3 - Moderate risk 4 - High risk 5 - Very high risk 6 - Extreme risk	2
Tsunami	Tsunami run-up potential	1 - Local tsunami potential in mainland inlets 2 - Low tsunami run-up potential (<2m) 3 - Intermediate tsunami run-up potential (1-5m) 4 - High tsunami run-up potential (1-15+m)	1
Contaminant Spill	Marine traffic density (Spill risk based on maximum marine traffic density (in hours) within 13km offshore.)	1 - Very low risk (0-150hrs) 2 - Low risk (151-620hrs) 3 - Medium risk (621-1350hrs) 4 - High (1351-3860hrs) 5 - Very high (3861-8001hrs)	5

Activities:

Table showing whether a community has implemented a list of common risk reduction related efforts and the link to any documents are provided where available. NOTE: The actions listed in this table are identified through a review of the community's documents that are publicly available. This includes Official Community Plans, Hazard Risk and Vulnerability Assessment (HRVA) (if available), and any major studies mentioned in the former documents. Therefore it is not an exhaustive review of actions taken and we encourage users to provide more information should any related actions be missing in the table.

ACTION CATEGORY	HAZARD TARGETED	ACTION	RESOURCE
Land Use Regulations	NA	NA	NA
Construction Specifications	Coastal Flooding	Follow provincial guidelines for sea level rise	District of Squamish Integrated Flood Hazard Management Plan Final DRAFT Background Report Executive summary, p.2
	Coastal Flooding	Policies 25-3, 25-5: Avoid permitting development in areas with unacceptable flood risk	District of Squamish Integrated Flood Hazard Management Plan Final DRAFT Background Report Section3, p.1
Damage Mitigation	Coastal Flooding	Sea dikes in downtown Squamish	District of Squamish Integrated Flood Hazard Management Plan Final DRAFT Background Report Section 3, p.1
	Coastal Flooding	Open ditches, storm sewers, dykes, flood gates, and pump stations for flood control	District of Squamish Official Community Plan p.107

Some insights

- Comparing similarities and differences across municipalities, investigating associations between indicators, can reveal insights to how various factors influence vulnerability
- e.g., Mapping institutional capital and overall HVSI scores illustrates similarities and differences in policy factors across communities
 - Gibsons, Colwood, Qualicum Beach high overall similarity to Squamish but low similarity for institutional capital
 - Municipal officials might have preconceived idea that communities are comparable but index reveals important differences
- Similarity approach can add contextual understanding and meaning to indicators-based assessments by using local practitioner knowledge

Thank you!

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Project funding: MEOPAR Network

Project platform: <https://resilient-c.ubc.ca>



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Resilient-C
Resilient Coasts Canada
Connecting communities to improve
resilience to coastal hazards

