

Sylx Okanagan Flood and Debris Flow Risk Assessment: Weaving *siwtk*^w (water) into Adaptation

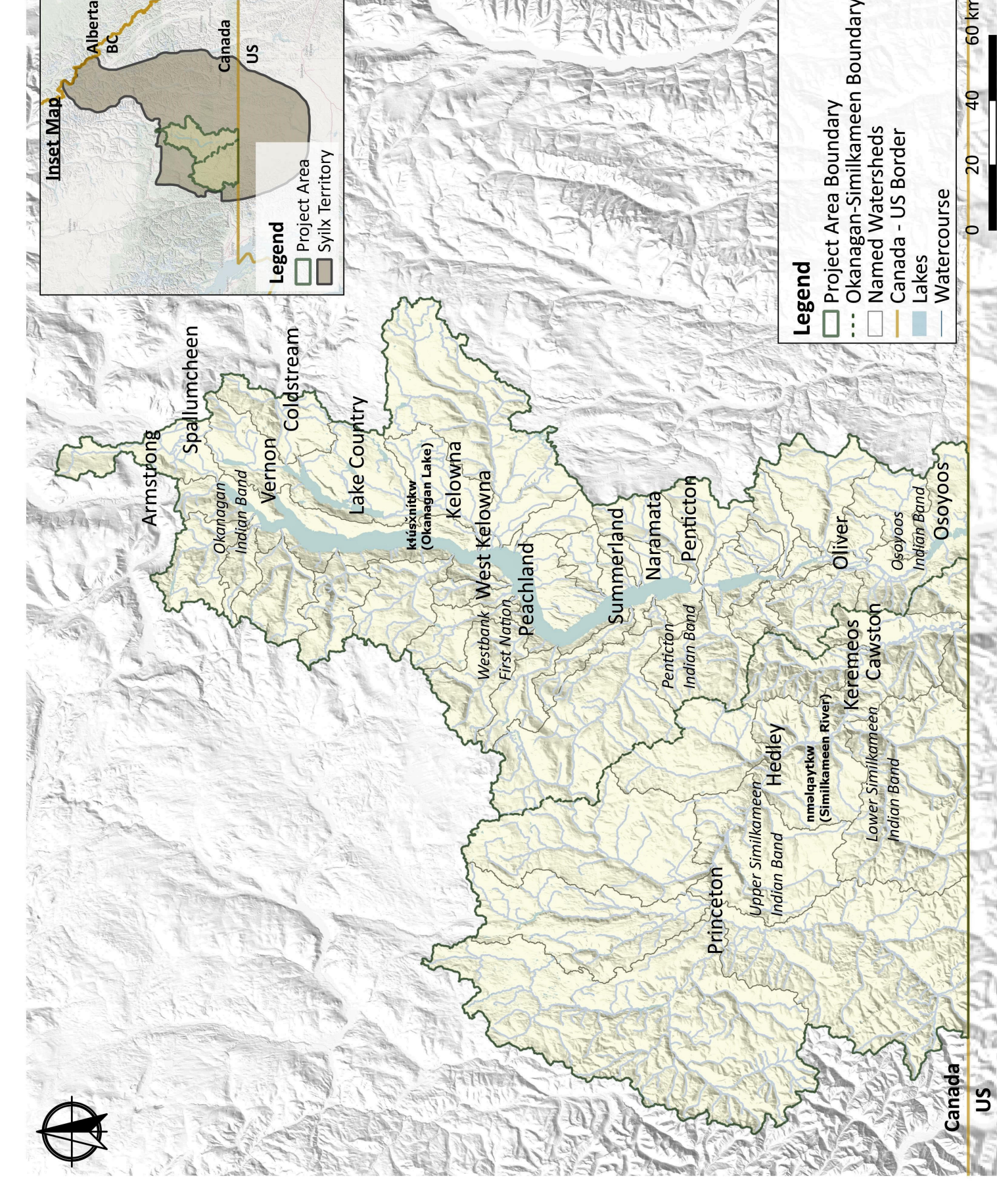
Adaptation Canada 2020
18-20 February 2020
Vancouver, BC

Background

Flood and debris flow are natural processes with positive ecosystem benefits. However, across Sylx Okanagan territory, recent events have also caused negative impacts in the form of flooded septic systems, erosion of fish-bearing creeks, and contaminant spills. Closed roads have affected access to services and land required to sustain livelihoods.

This project, led by the Okanagan Nation Alliance, had the goal to **understand risk due to flood and debris flow within the Okanagan-Similkameen region**, in order to support priority-setting of future work. It is part of ongoing adaptation efforts and is centred on building relationships and considering diverse views through complementary qualitative and quantitative analyses.

Project Area and Partners

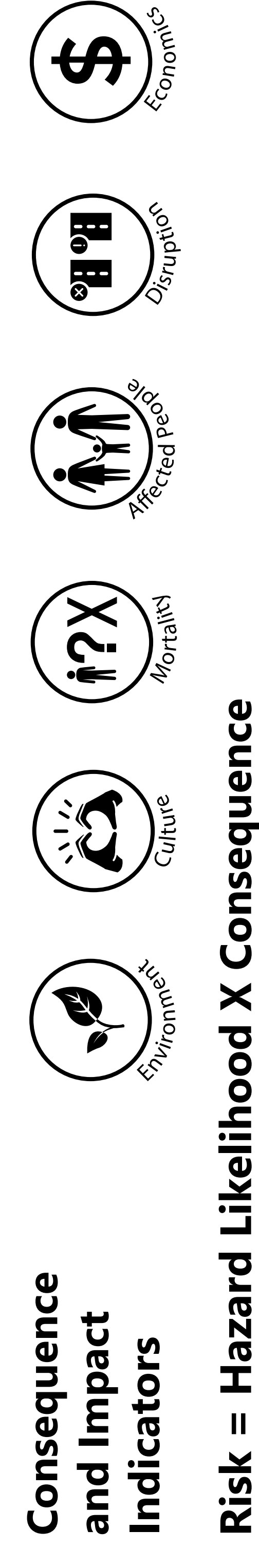


- Emergency Management BC (EMBC)
- En'owkin Centre
- Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD)
- City of Kelowna
- Village of Kelowna
- District of Lake Country
- Lower Similkameen Indian Band (LSIB)
- Okanagan Basin Water Board (OBWB)
- Okanagan Indian Band (OKIB)
- Okanagan Nation Alliance (ONA)
- Town of Osoyoos
- Osoyoos Indian Band (OIB)
- City of Penticton
- Penticton Indian Band (PIB)
- Regional Districts of Central and North Okanagan, and Okanagan-Similkameen (RDCO, RDNO, and RDOO)
- Upper Similkameen Indian Band (USIB)
- District of Summerland
- Westbank First Nation (WFN)
- City of West Kelowna

Terminology

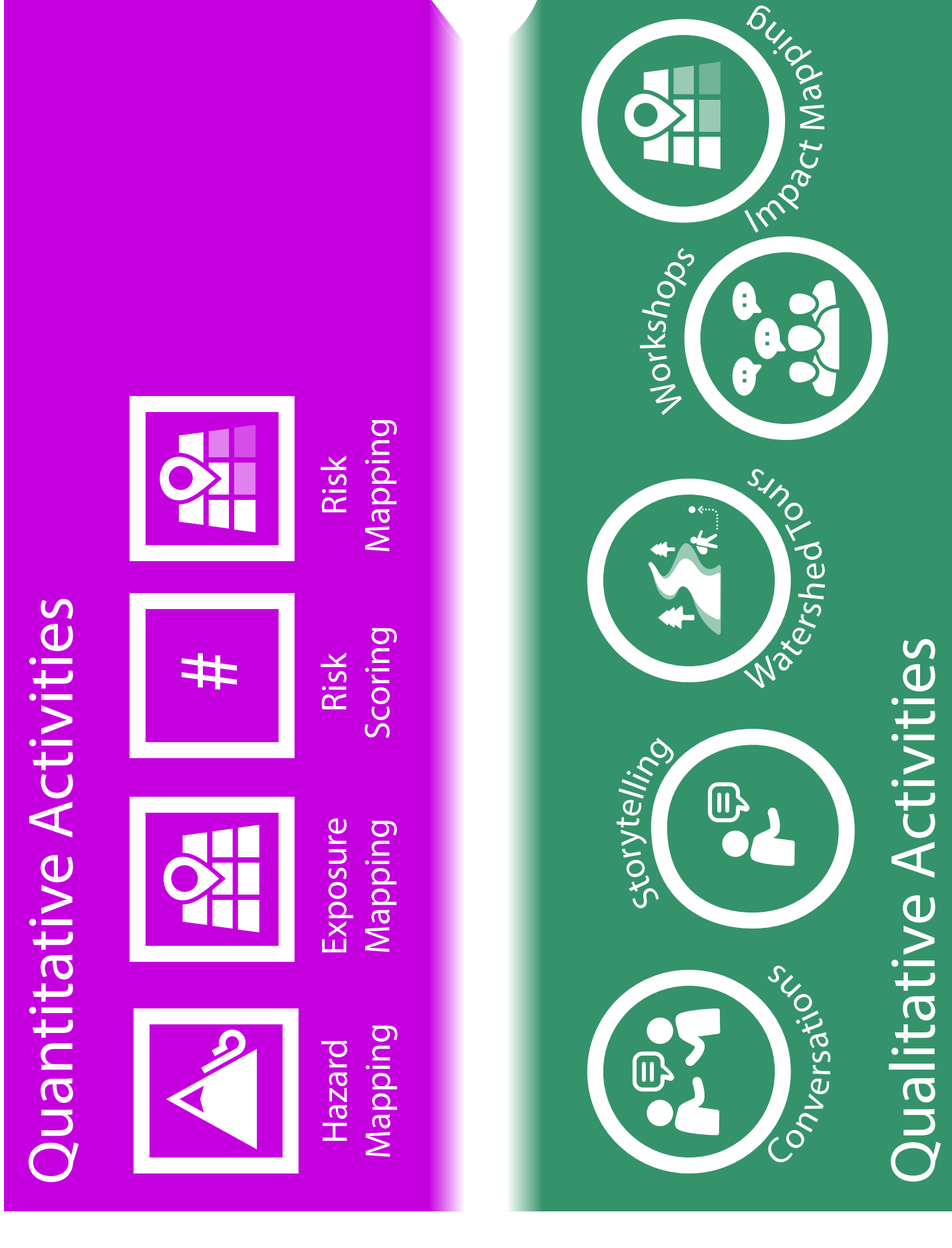
The project worked with standard terminology and indicators. These are key to understanding the overall process and results.

- Hazards**
 - A **flood** occurs when surface water reaches higher than normal water levels and inundates land that is usually dry.
 - For this project, a single scenario of debris flow susceptibility and generalized flow magnitude flood scenarios were explored.
- Consequence and Impact Indicators**
 - A **debris flow** is a rapid mass movement of saturated surface material down a slope.
 - For this project, a single scenario of debris flow susceptibility and generalized flow magnitude flood scenarios were explored.



Project Activities

A template was developed to gather and integrate a variety of qualitative and quantitative information sources.



Learning

Weaving

Synthesizing

Approach

Framing with Sylx perspective and multi-disciplinary western science for holistic understanding

Local Perspectives

tik't is the word for flood... [it's] shallower and not still like the lake

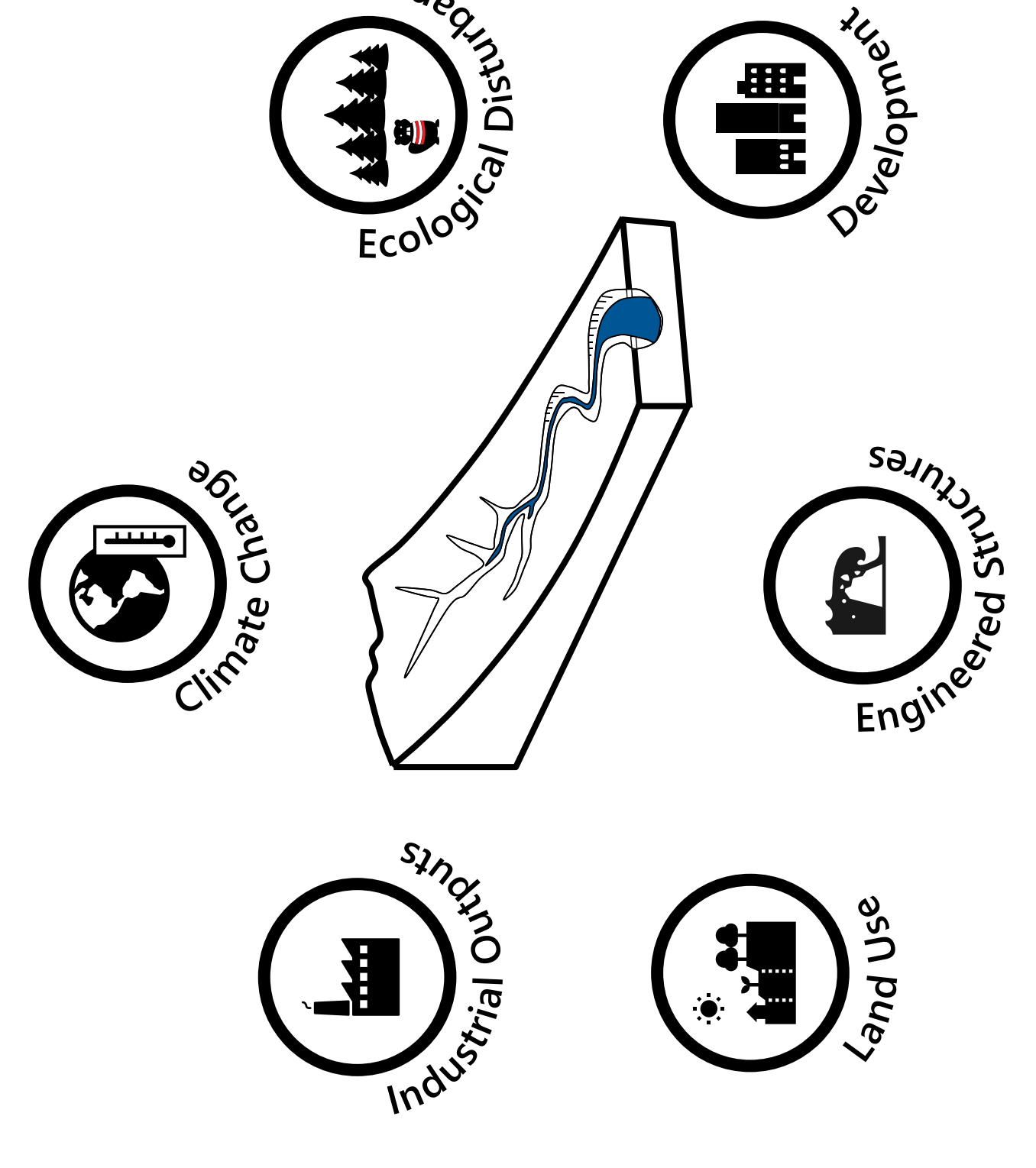
Richard Armstrong, Sylx Okanagan

"When we take care of the land and water, the land and water take care of us."

siwtk^w (Water) Declaration

enowkinwix^w

Sylx process of decision making to solve issues, ideas through dialogue and always ensuring coexistence with the *tmix*^w. It is knowledge that fills participants' heads like drops of water; decision making through consensus building.



Best Practice

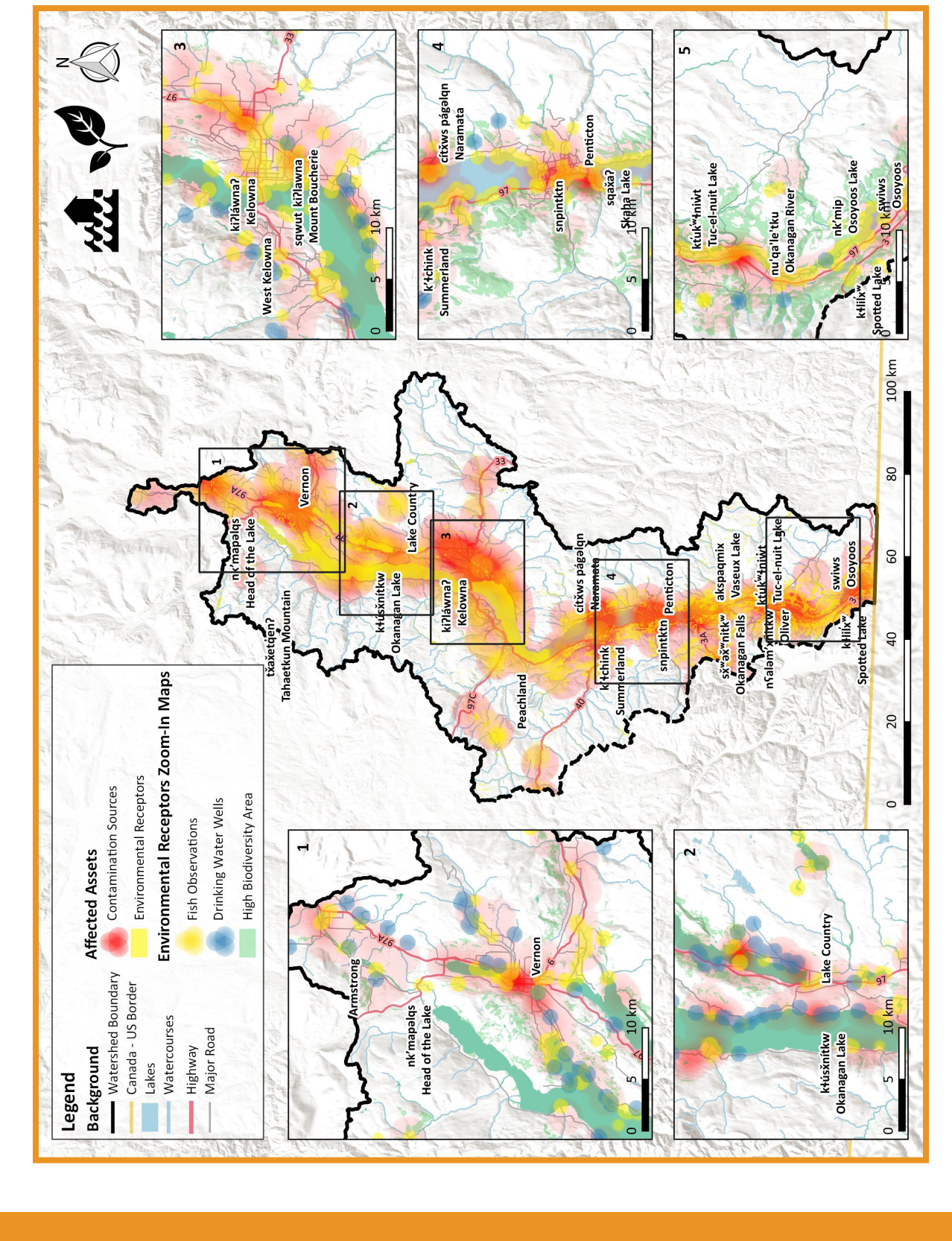
Sendai Framework for Disaster Risk Reduction

10 Golden Rules of Flood Management
(Soyers et al., 2014)

Cumulative Watershed Pressures

Scoring risk on a watershed scale for relative comparison

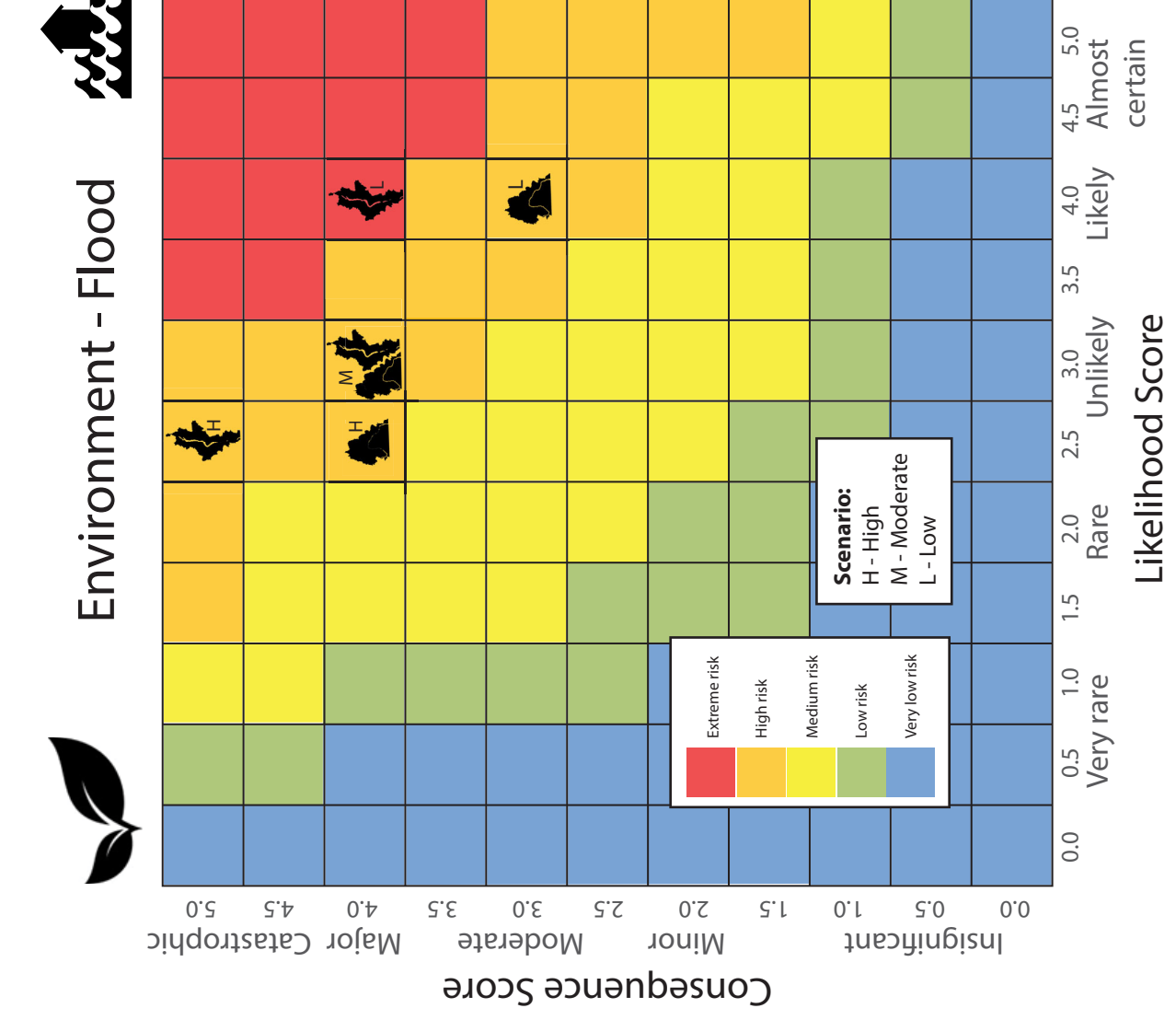
Spatial Risk Identification



Distribution of Consequences

- Higher within 10-20 km of shorelines and major population centres. More widespread for culture and disruption indicators. Higher compared to Similkameen watershed in absolute terms.
- Higher near population centres and along river and main highways. Per capita consequences are as high or higher than Okanagan.
- Affects highly populated areas near large rivers, and lakes. Compared to debris flows, floods affect more buildings.
- Consequences are typically comparable to moderate and high flood scenarios. More widely distributed, including hillside areas, and affects indicators that are more prevalent in rural areas (e.g., culture, disruption).

Risk Matrices



Summary

Results

Watershed	Scenario	Risk Level	Extreme	High	Medium	Low	Very Low
Okanagan	High	High	Extreme	High	Medium	Low	Very Low
	Moderate	Moderate	High	Medium	Low	Very Low	
	Low	Low	High	Medium	Low	Very Low	
Similkameen	High	High	Extreme	High	Medium	Low	Very Low
	Moderate	Moderate	High	Medium	Low	Very Low	
	Low	Low	High	Medium	Low	Very Low	

Respecting *siwtk*^w (water)

Water is Powerful	Water is Life	Water is Connected
Over time, water exerts its power in a range of event sizes. Water finds a way around obstacles. Flood defence structures alone are not sustainable. Events are likely to increase in magnitude and frequency.	Flood and debris flow phenomena are part of natural processes that bring ecosystem benefits. Contaminant release to land and water systems leads to widespread negative impacts.	People in the region are connected by shared recent history, values and watersheds. Water is affected by human-induced cumulative pressures. Flood is linked to a range of geohazards.
Understand and act on the risks from a range of magnitude events. Favour nature-based solutions over fighting nature. Address uncertainty by using robust solutions and building community resilience.	Land and resource management needs to be informed by ecosystem-based knowledge-holders. Regulate and monitor contaminant production and disposal. Work together to pool resources and take a whole-of-society approach to adaptation. Prioritize reversing or modifying human activities. Adopt an all-hazards approach to risk reduction.	

Priority Action Themes

- Detailed mapping.
- Research and training.
- Communication and outreach.
- Self-determination.
- Collaborative decision-making.
- Regulatory tools.
- Property-level resilience.

Next Steps

- Present findings to decision-makers in the region.
- Support local-scale risk assessment to integrate Sylx perspective using results from this project.
- Foster connections with private interests.

Lessons Learned

- The Sylx perspective and multi-disciplinary western science converge in ecosystem-based management.
- Weaving diverse perspectives offers an opportunity to gain a fulsome understanding of inherently wicked issues.

Acknowledgements

Project funded by Emergency Management British Columbia and Public Safety Canada (as part of the National Disaster Mitigation Program), Real Estate Foundation of British Columbia, and First Nations Adapt. Okanagan Nation Alliance (ONA) team included: Tessa Terbasket, Kathy Holland, and Skyeler Folks. Many community members contributed to the process including Janine Terbasket, Stephanie Paul, Wendy Hawkes, Colleen Marchand, and Trudy Peterson. Ebbwater team included: Robert Larson, Tamsin Lyle, Dickon Wells, Silja Hund, and Nikoleta Stamatatou. Palmer team included: Derek Crommiller, Cory McGregor, and Robin McKillop. Workshops were developed and facilitated by Erica Crawford (SHIFT Collaborative) and Kelly Terbasket (IndigenEYEZ).

All disaster icons from United Nations OCHA Visual collection.

Mapping qualitative impacts and quantitative consequences for comprehensive understanding