

Evolving Flood Management to Incorporate What Matters

Tamsin Lyle | Principal
Ebbwater Consulting Inc.

tamsin@ebbwater.ca



A willingness to live with floods

- Individual and small communities adapt to nature's rhythm.

Concept from Sayers et al. 2014



A desire to use the floodplain

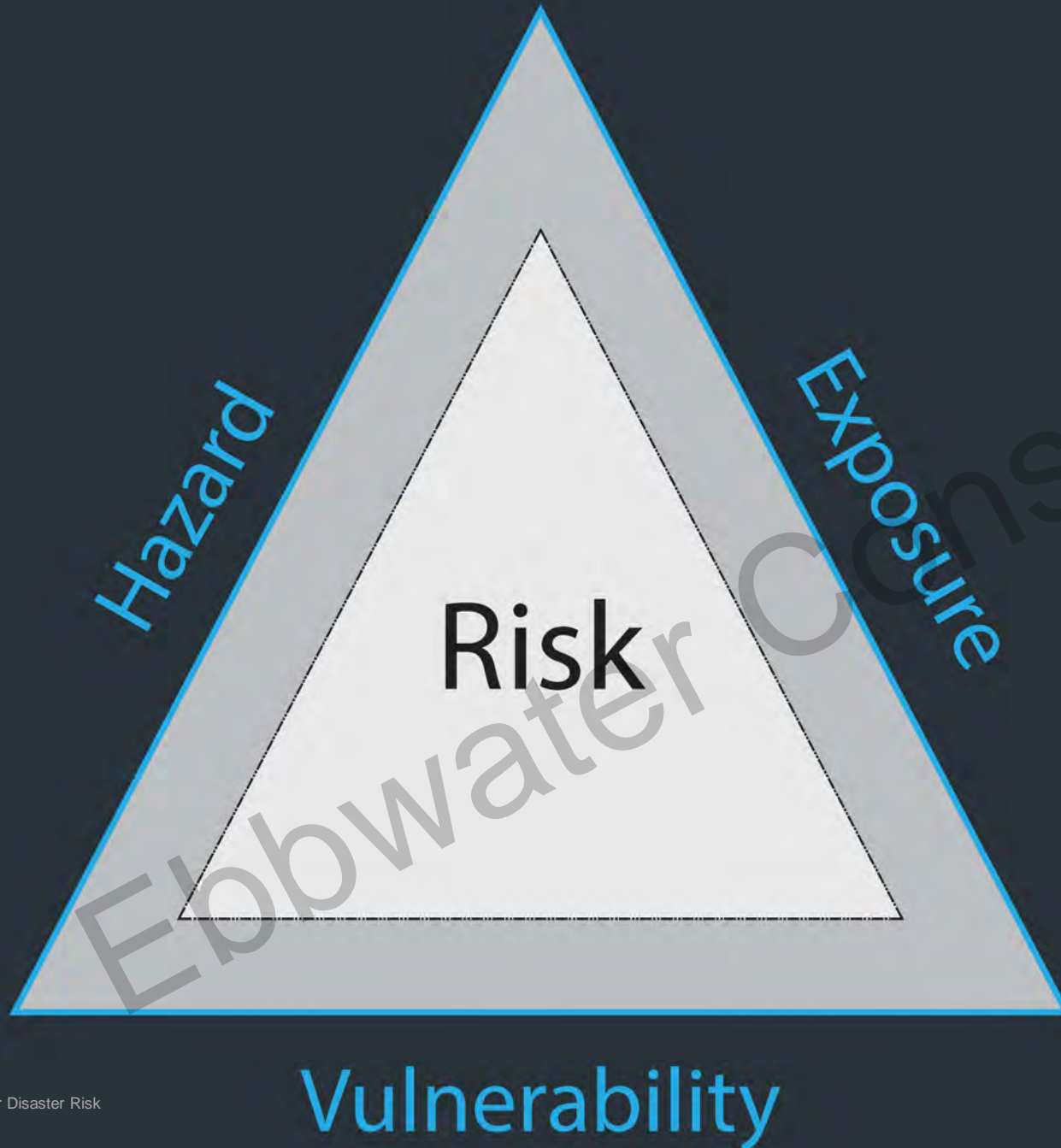
- Fertile land in the floodplain is drained.
- Permanent communities are established.
- Local uncoordinated dikes are constructed.



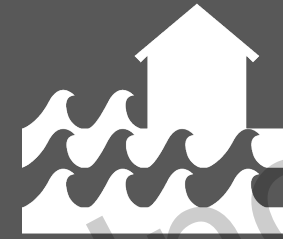
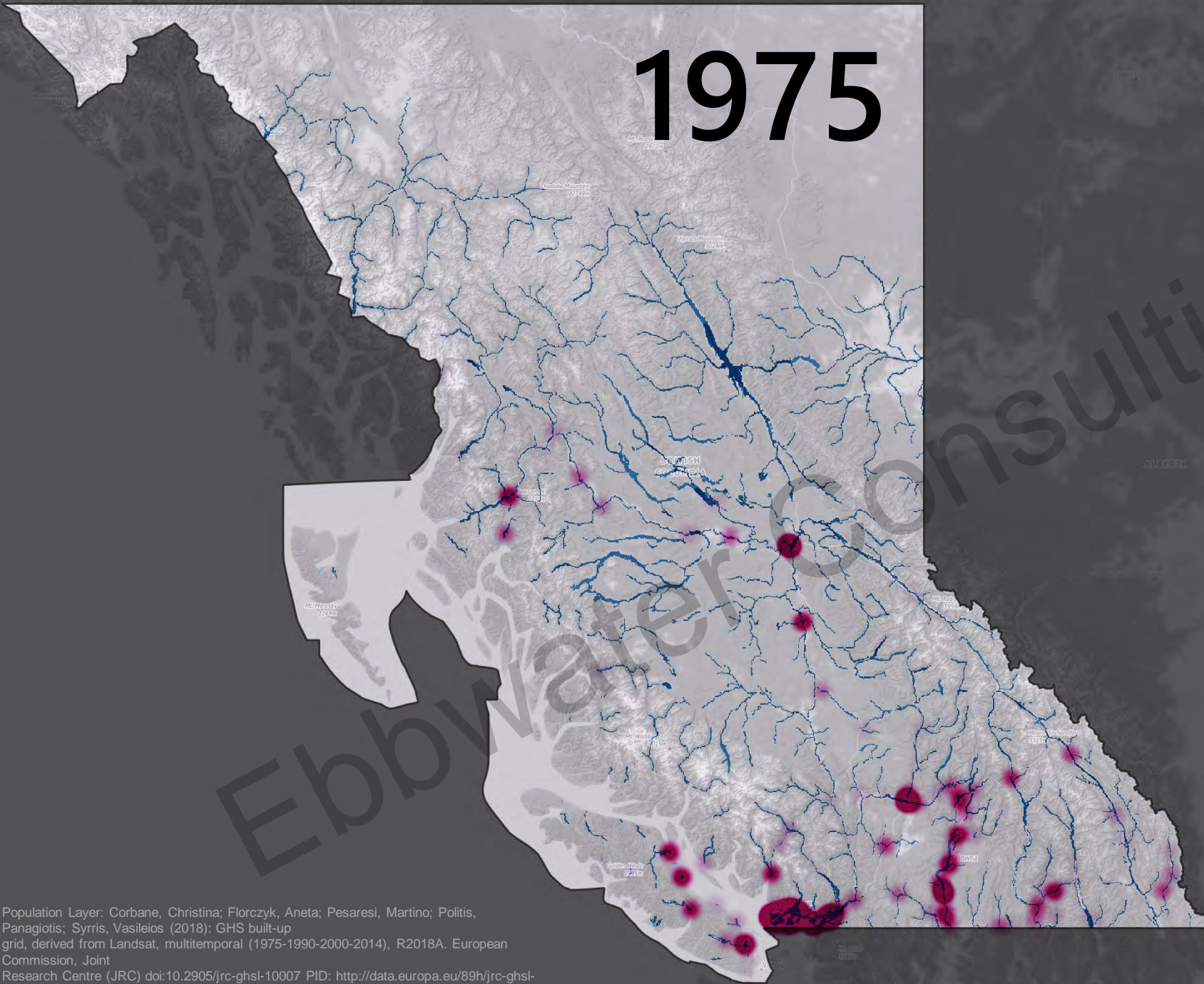
A desire to control and defend

- Large-scale structural approaches (dikes, dams and other controls) are planned and implemented.

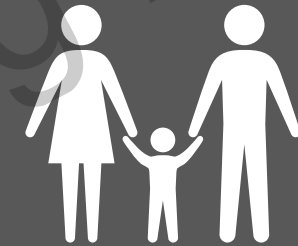
An evolution in flood risk



1975

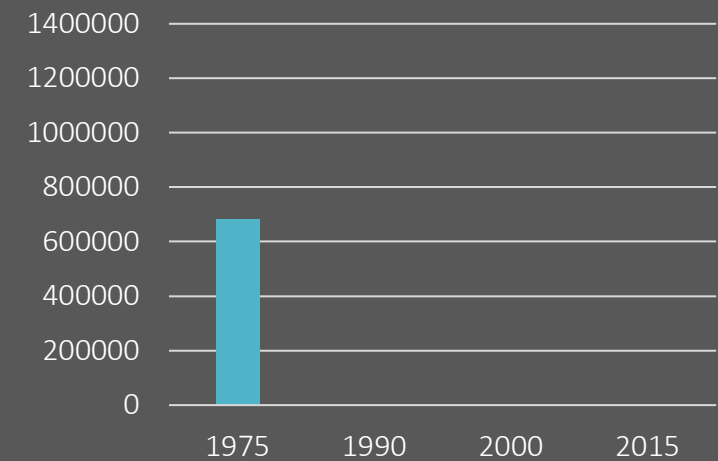


0.2 % AEP Flood



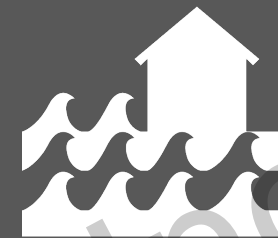
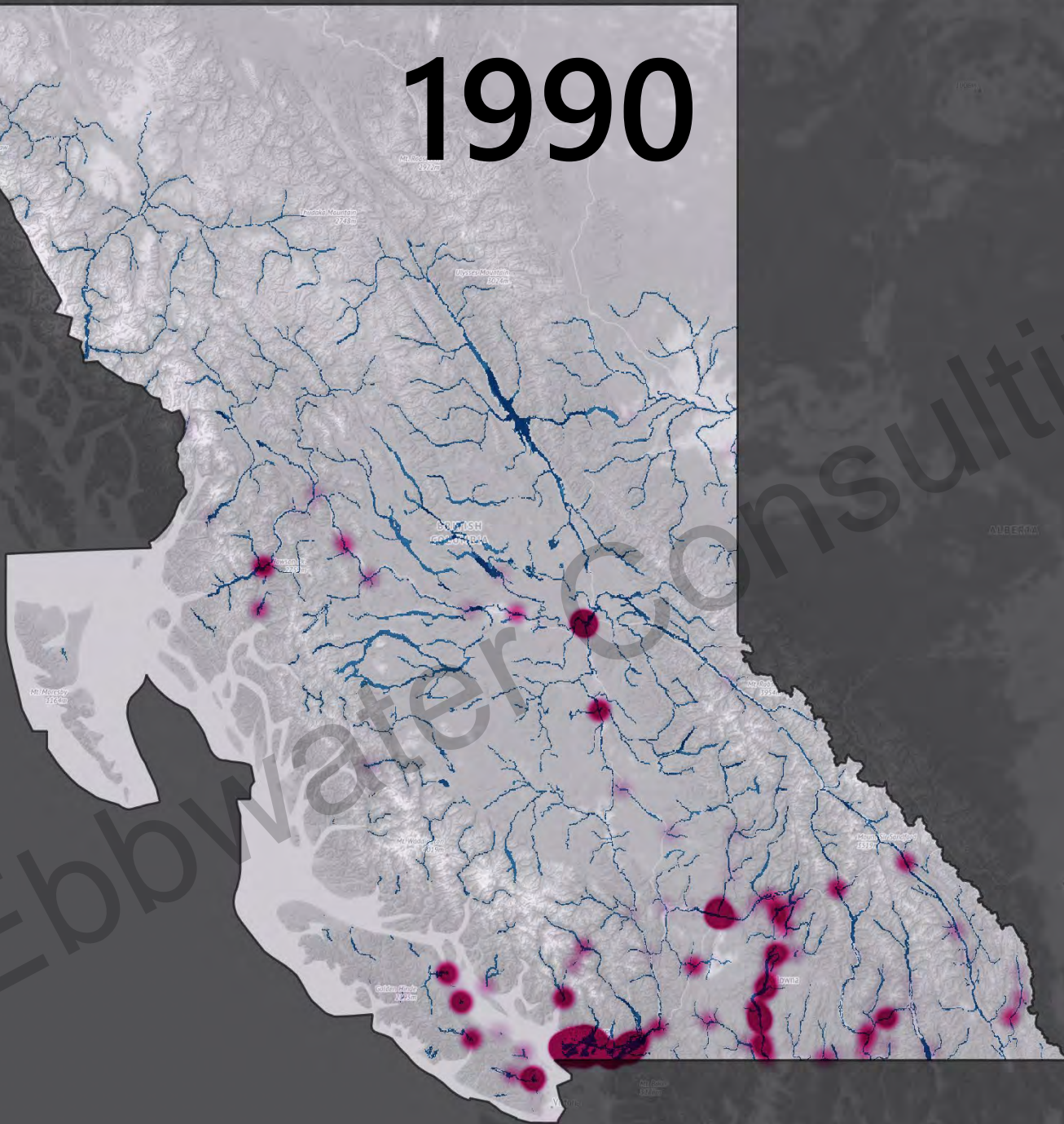
Exposed
Population

683,000

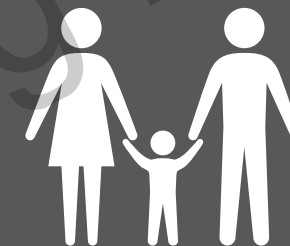


Population Layer: Corbane, Christina; Florczyk, Aneta; Pesaresi, Martino; Politis, Panagiotis; Syrris, Vasileios (2018): GHS built-up grid, derived from Landsat, multitemporal (1975-1990-2000-2014), R2018A. European Commission, Joint Research Centre (JRC) doi:10.2905/jrc-ghsl-10007 PID: <http://data.europa.eu/89h/jrc-ghsl-10007>

1990

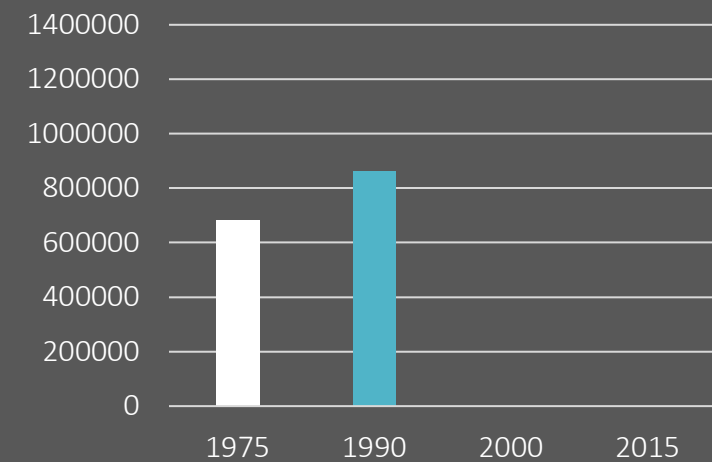


0.2 % AEP Flood

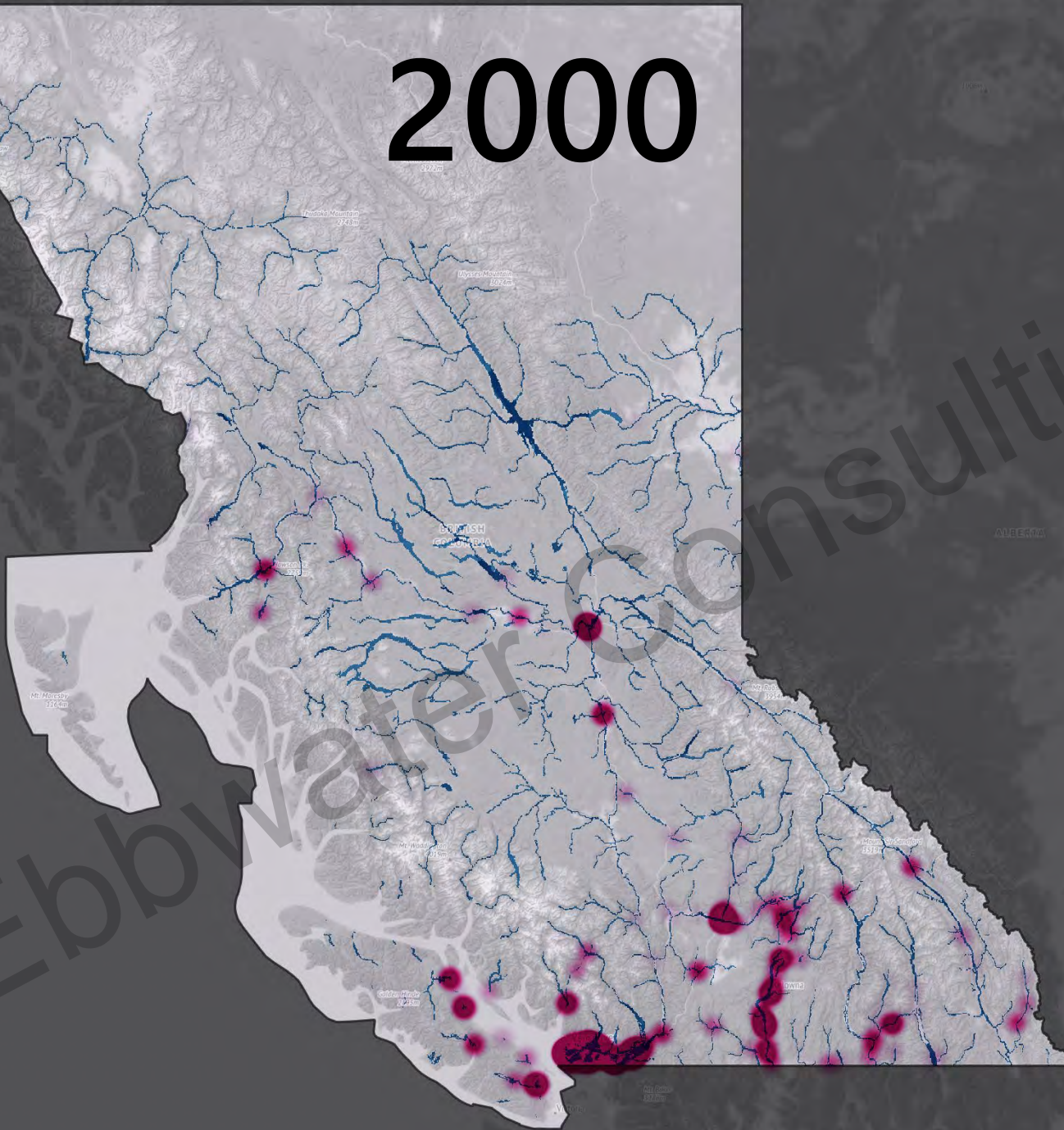


Exposed
Population

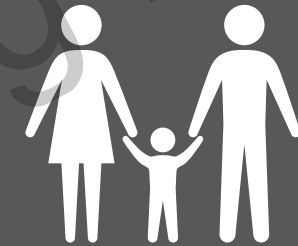
864,000



2000

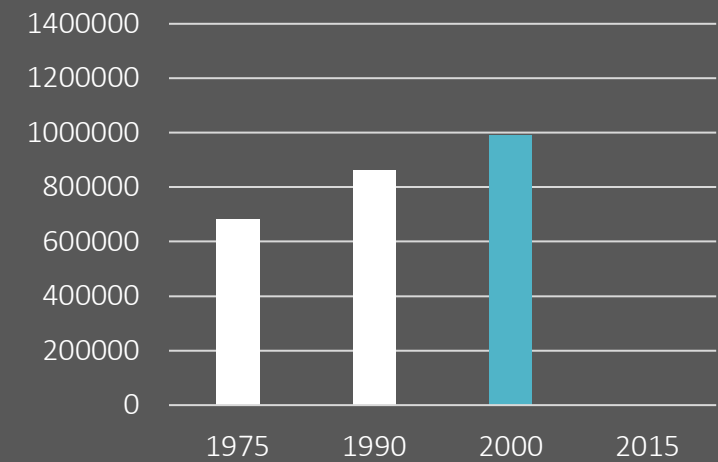


0.2 % AEP Flood

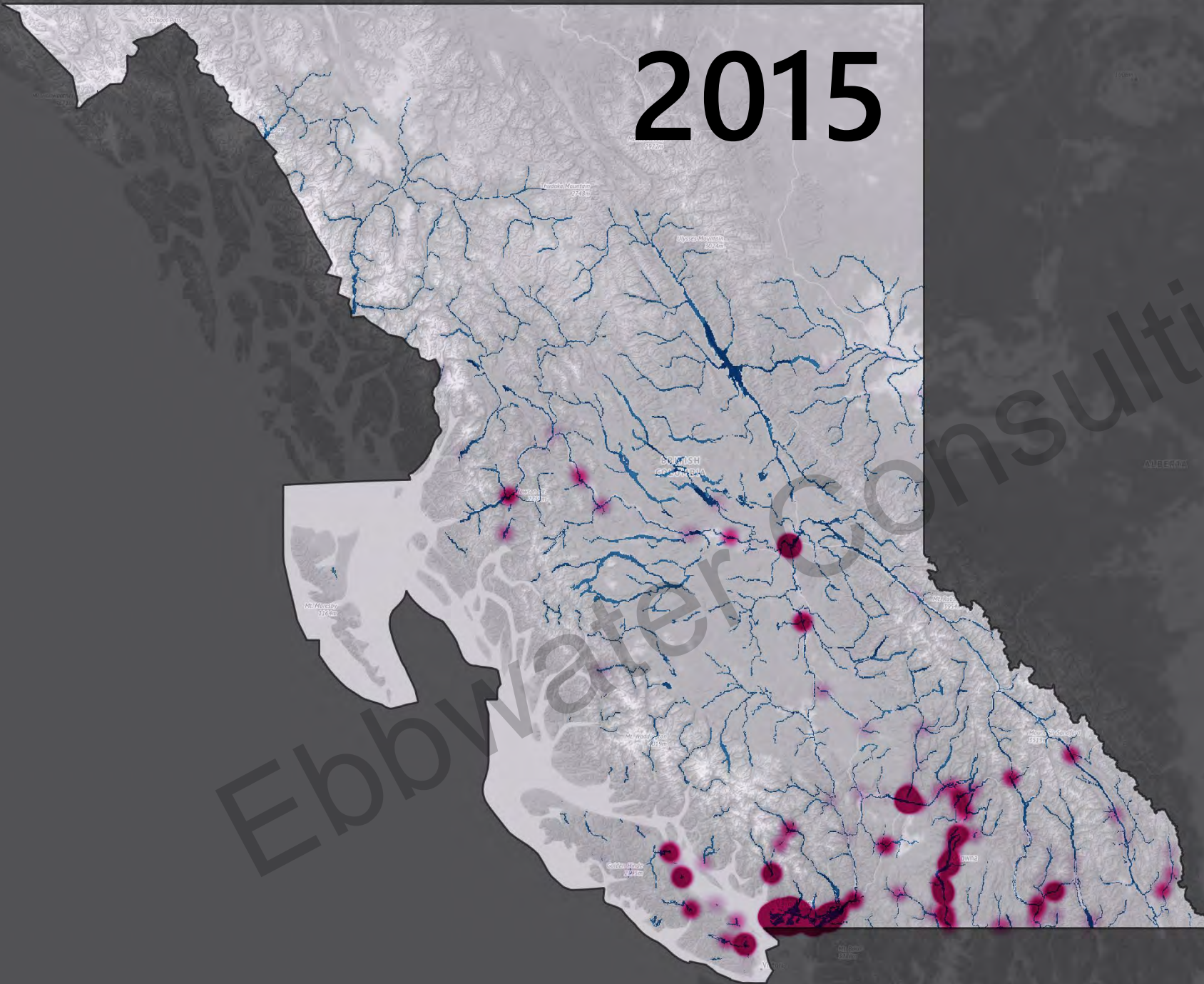


Exposed Population

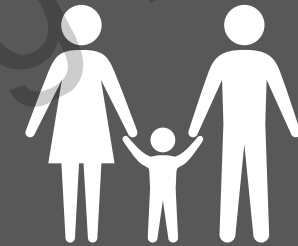
991,000



2015

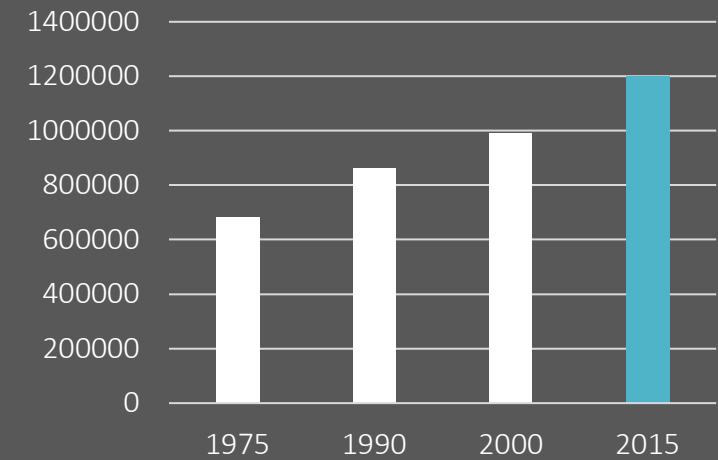


0.2 % AEP Flood

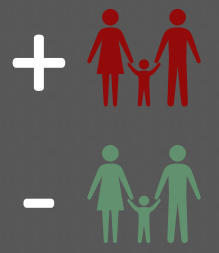
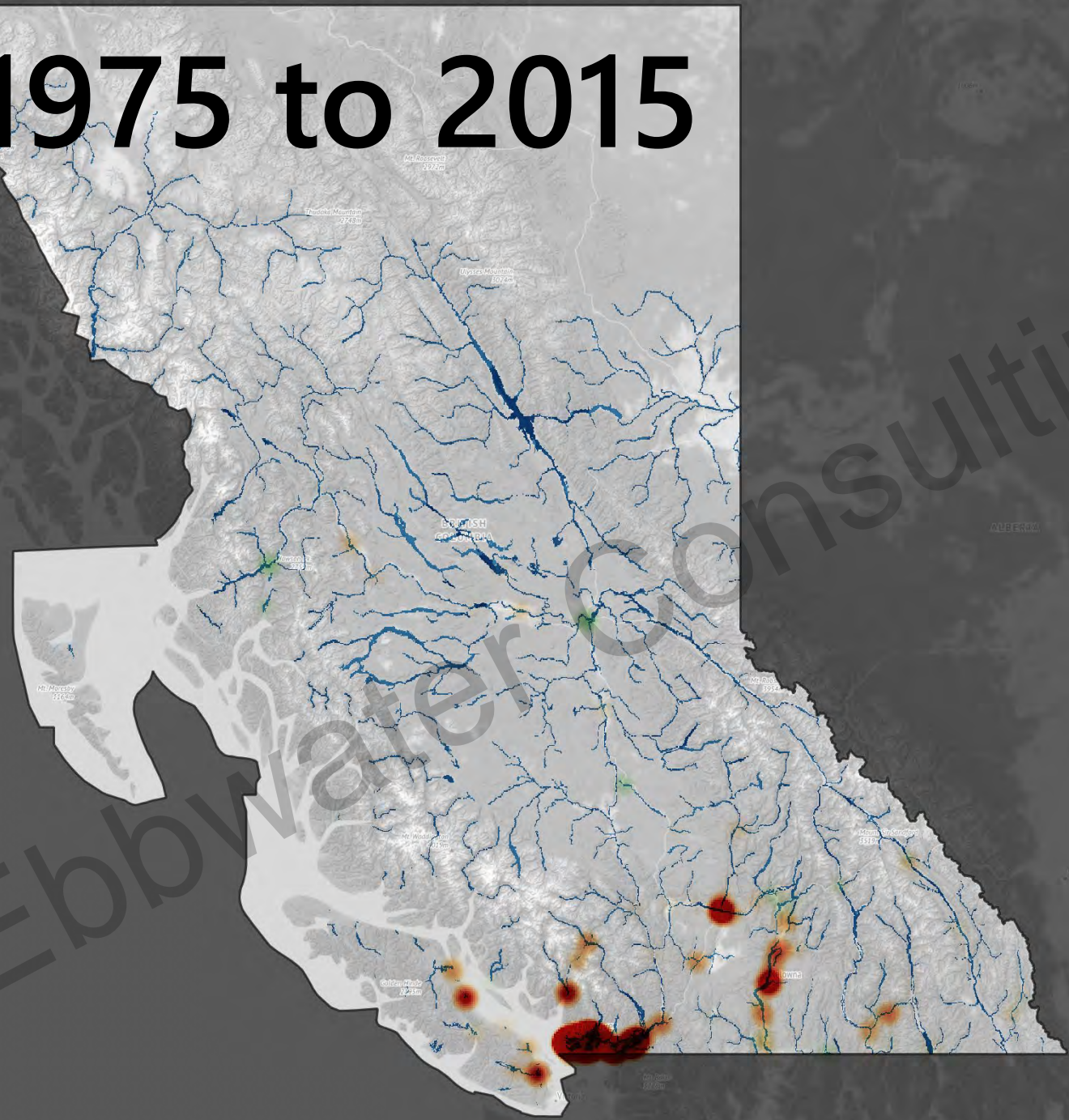


Exposed Population

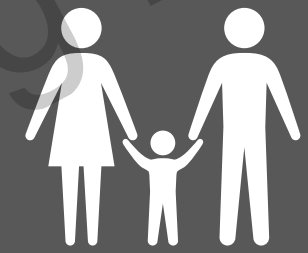
1,200,000



1975 to 2015

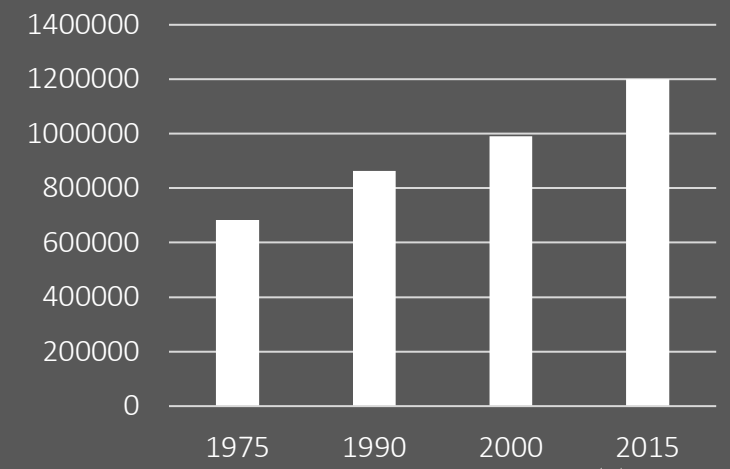


0.2 % AEP Flood



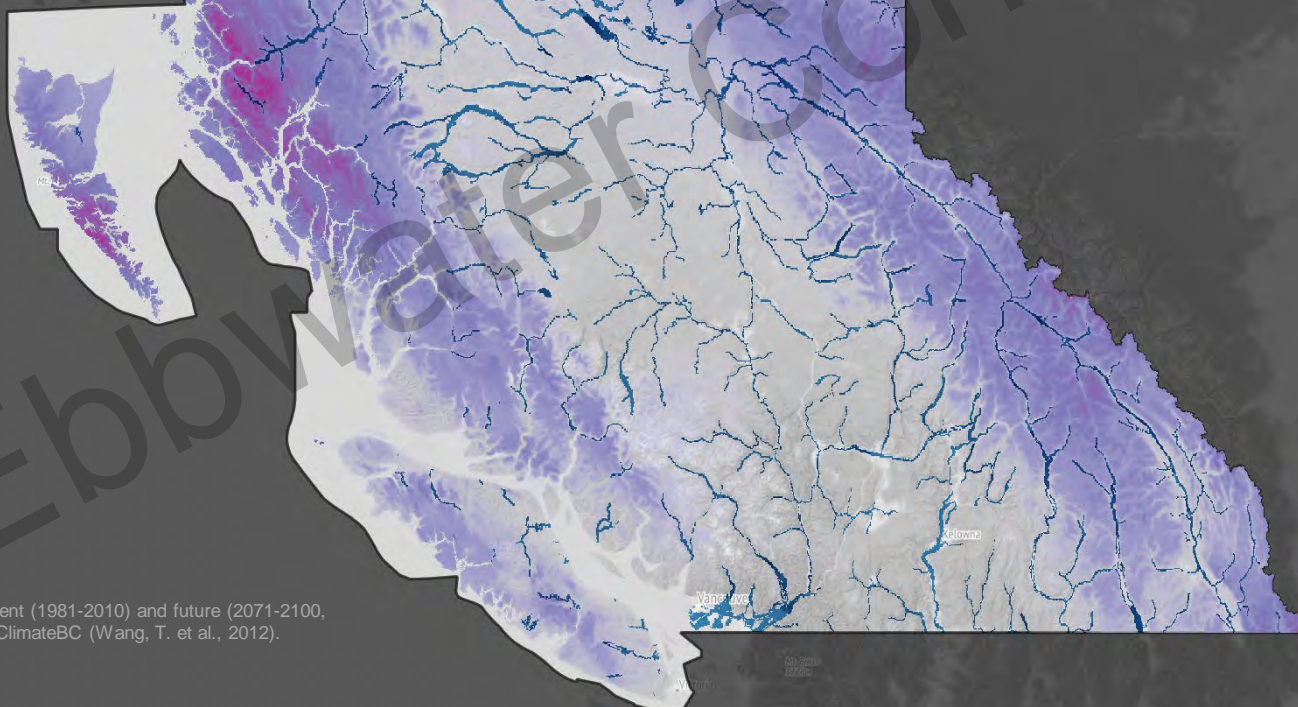
Exposed Population

+517,000

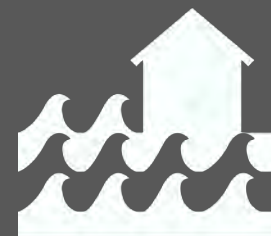


Precipitation Change

Increase in precipitation (current and future)



Climate Change

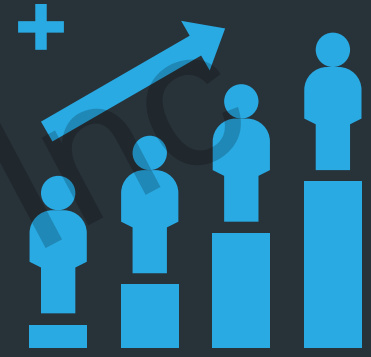


Flood Hazard will INCREASE overall

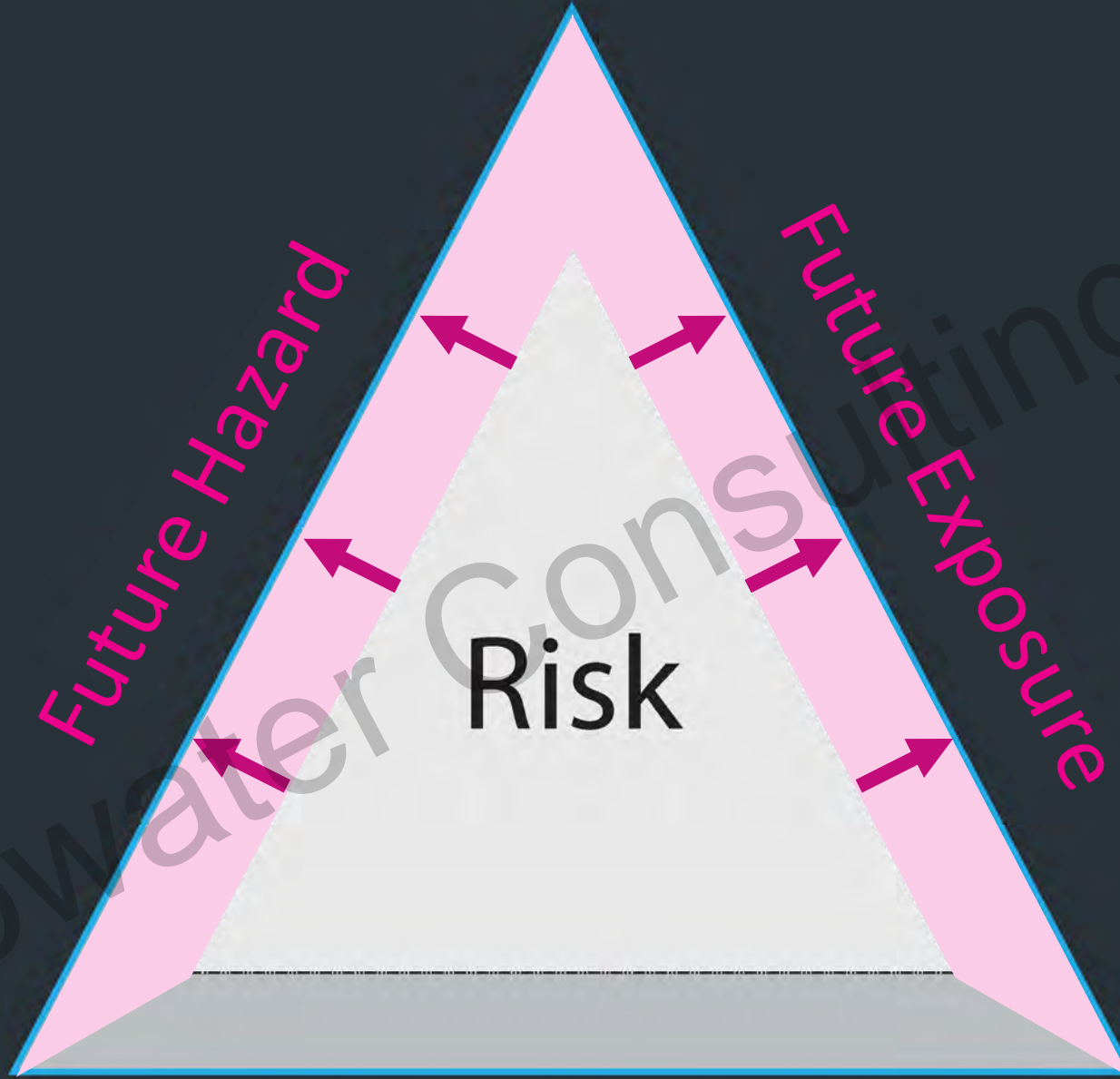
Precipitation: Absolute difference between current (1981-2010) and future (2071-2100, RCP 8.5) total annual precipitation. Data from ClimateBC (Wang, T. et al., 2012).



Climate Change



Development



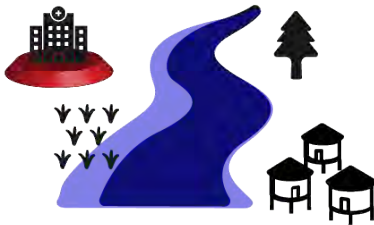
Vulnerability

We can continue to evolve



A desire to reduce flood damages

- A recognition that engineering alone has limitations.
- Effort is devoted to increasing resilience of communities.



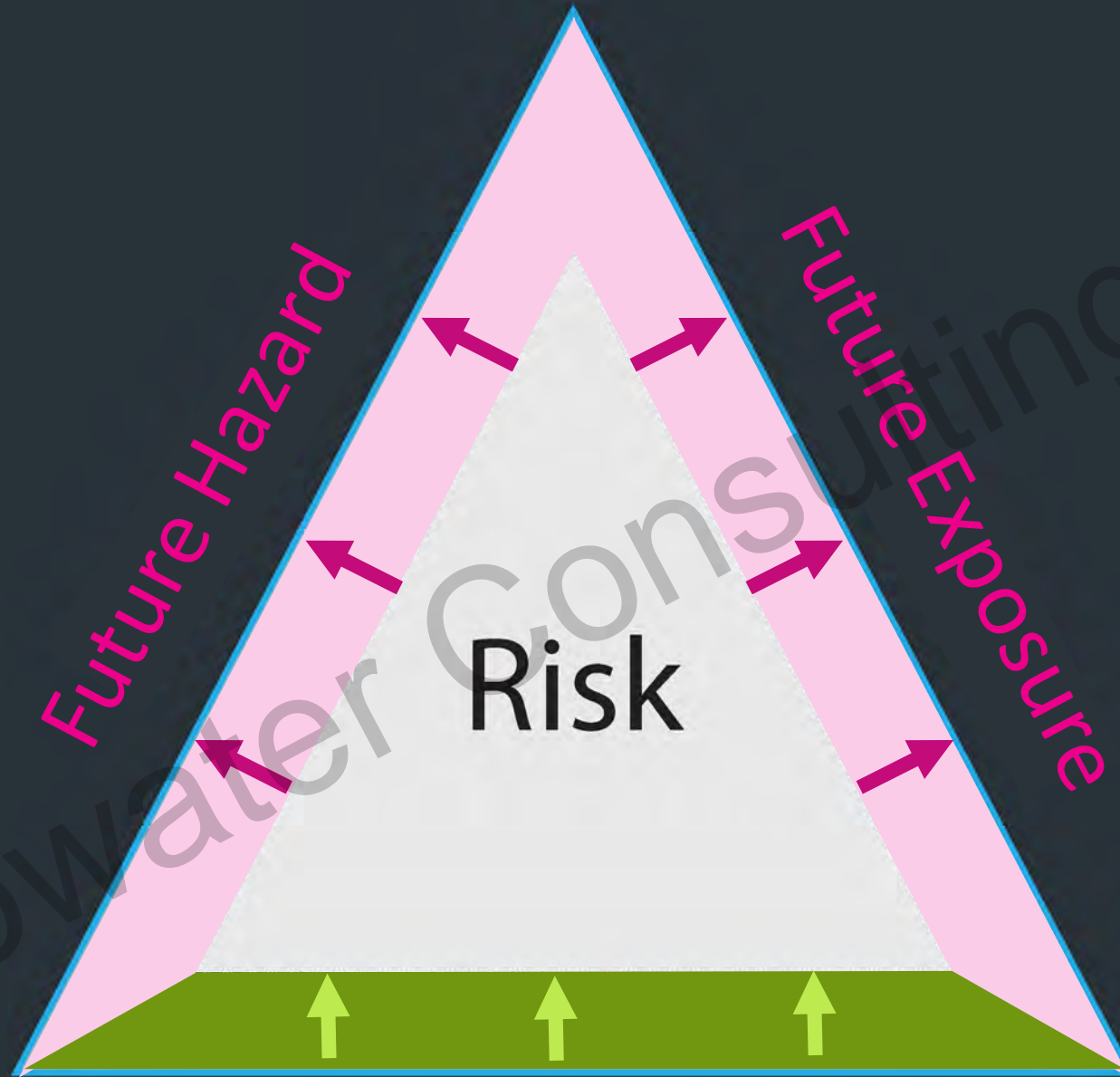
A desire to manage risks effectively

- A recognition that budgets are limited and not all problems are equal.
- Risk management is seen as a means to target limited resources.



A desire to promote opportunities and manage risks adaptively

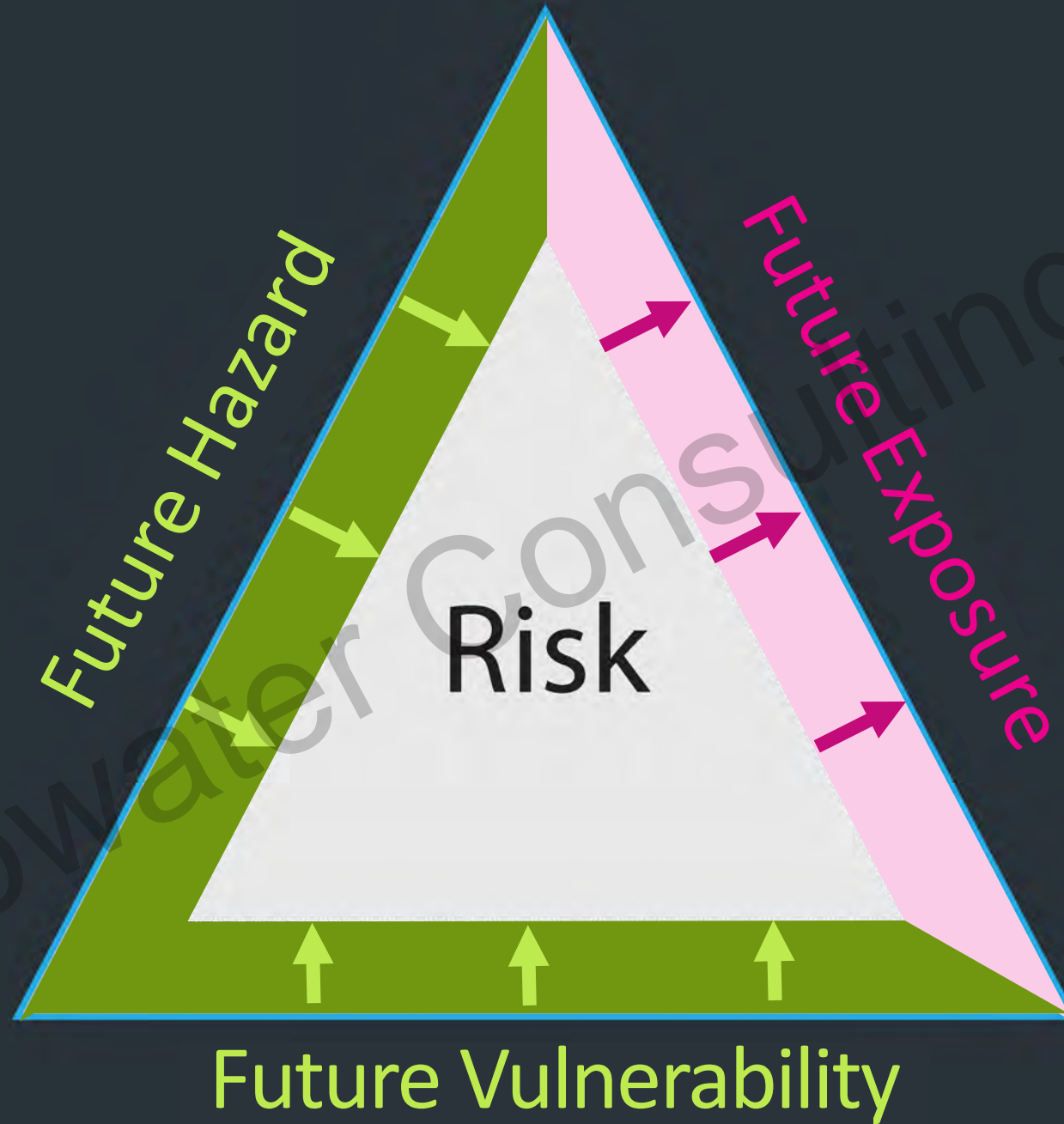
- Adaptive management used to work with uncertainties in future climate change, demographics and funding.



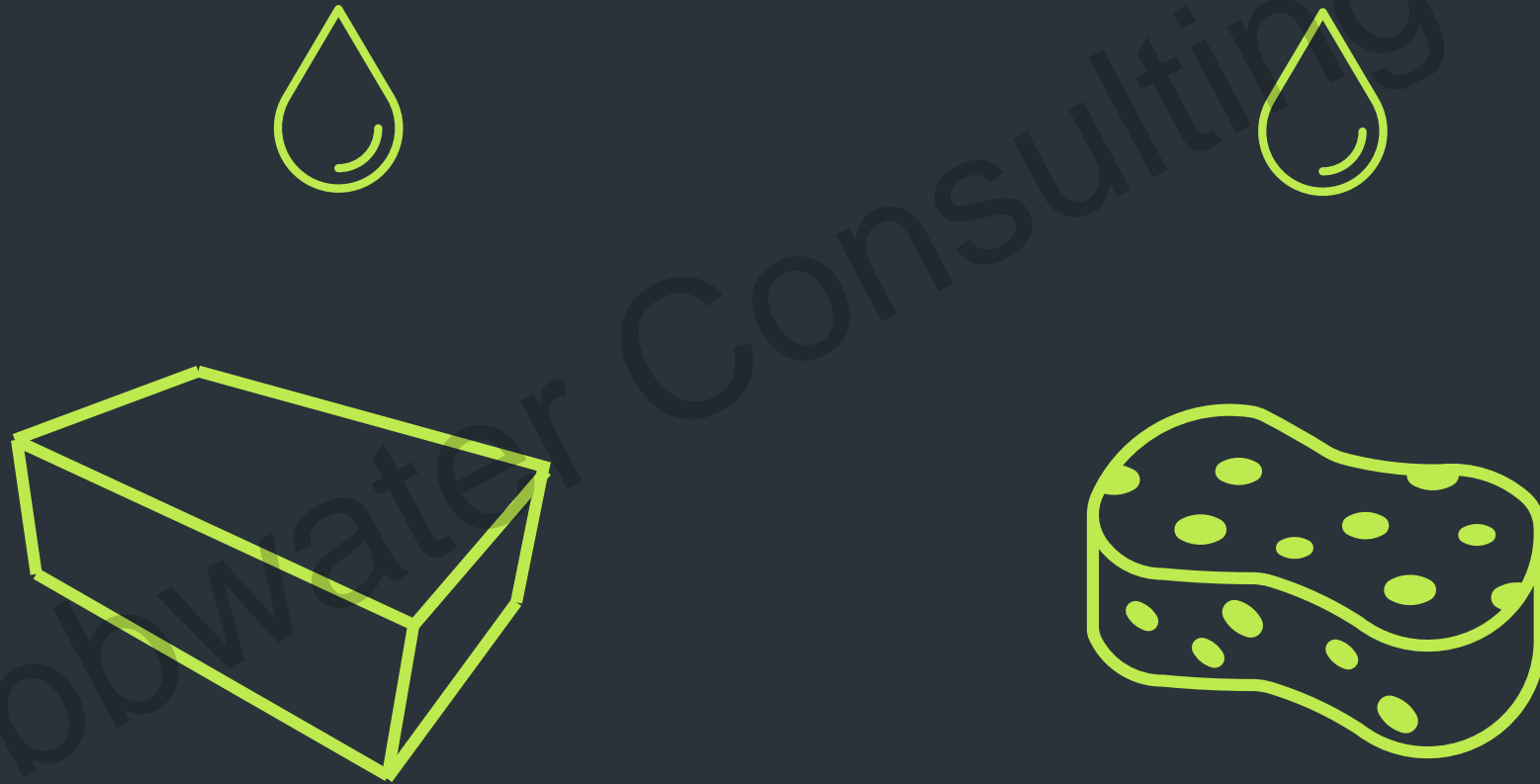
Future Vulnerability

Vulnerability = f (Sensitivity, Adaptive Capacity)





Hazard Power = f (Hazard Intensity, Landing Pad)



But...we kinda suck at change; we have deeply entrenched pathways

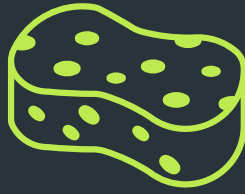
Cost-benefit processes favour past practice

- Let's modify our processes to incorporate things that matter to the health of our ecosystems and society.
- Let's ensure capital and operations are part of the equation

Procurement favours past practice

- Engineers are good at engineering...

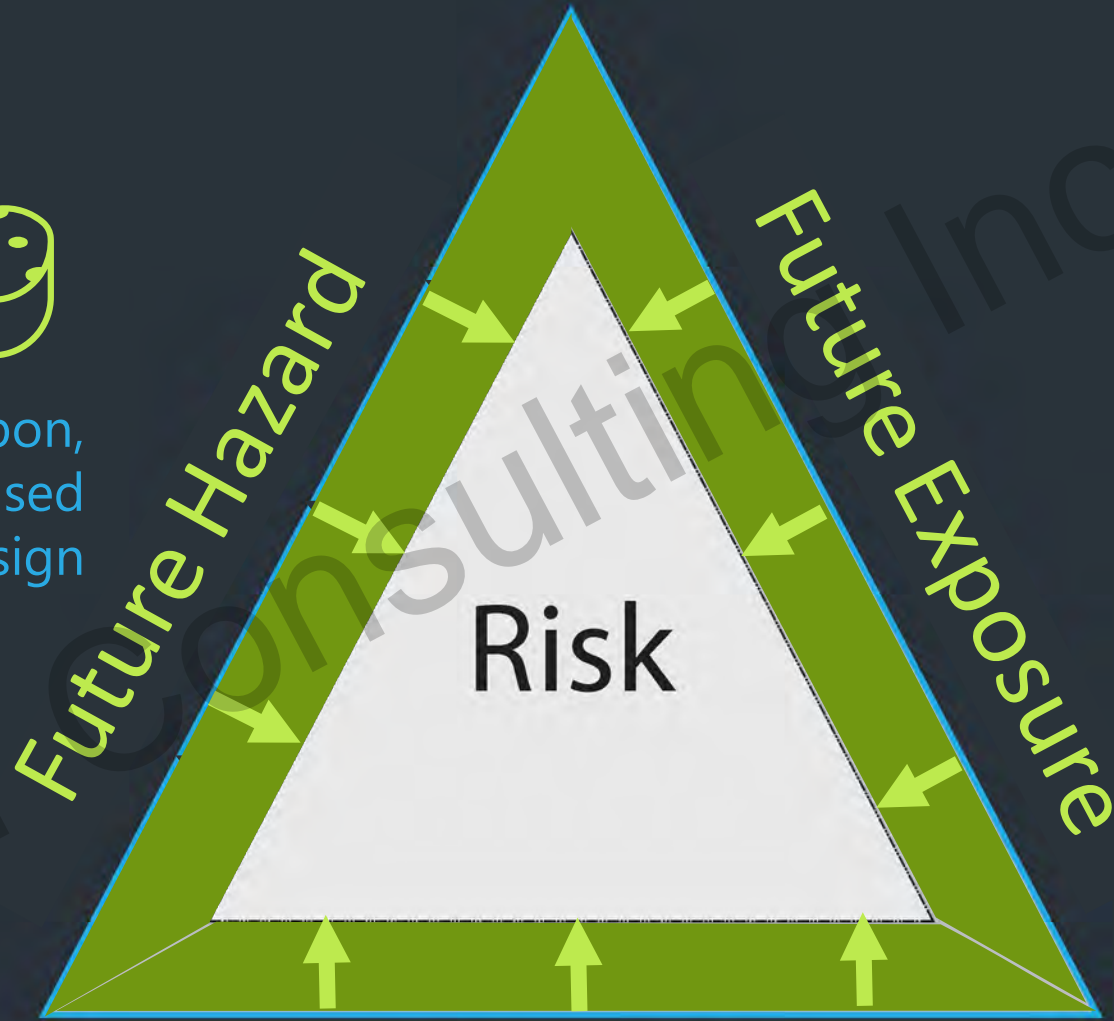
Our current risk is human-caused...and so with a bit of humility can be human-solved



Low Carbon,
Ecosystem Based
Design



Targeted
Development



Investment in
Resilience

Thank you

1 December 2020

Stewardship Centre for British Columbia

Tamsin Lyle, P.Eng | Principal | Ebbwater Consulting Inc.

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