Salish Sea Climate Change Indicators

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Climate in Focus: Coastlines and Estuaries

- What changes can we expect?
- How might we be impacted?
- How can we measure this change?
- How can we adapt?

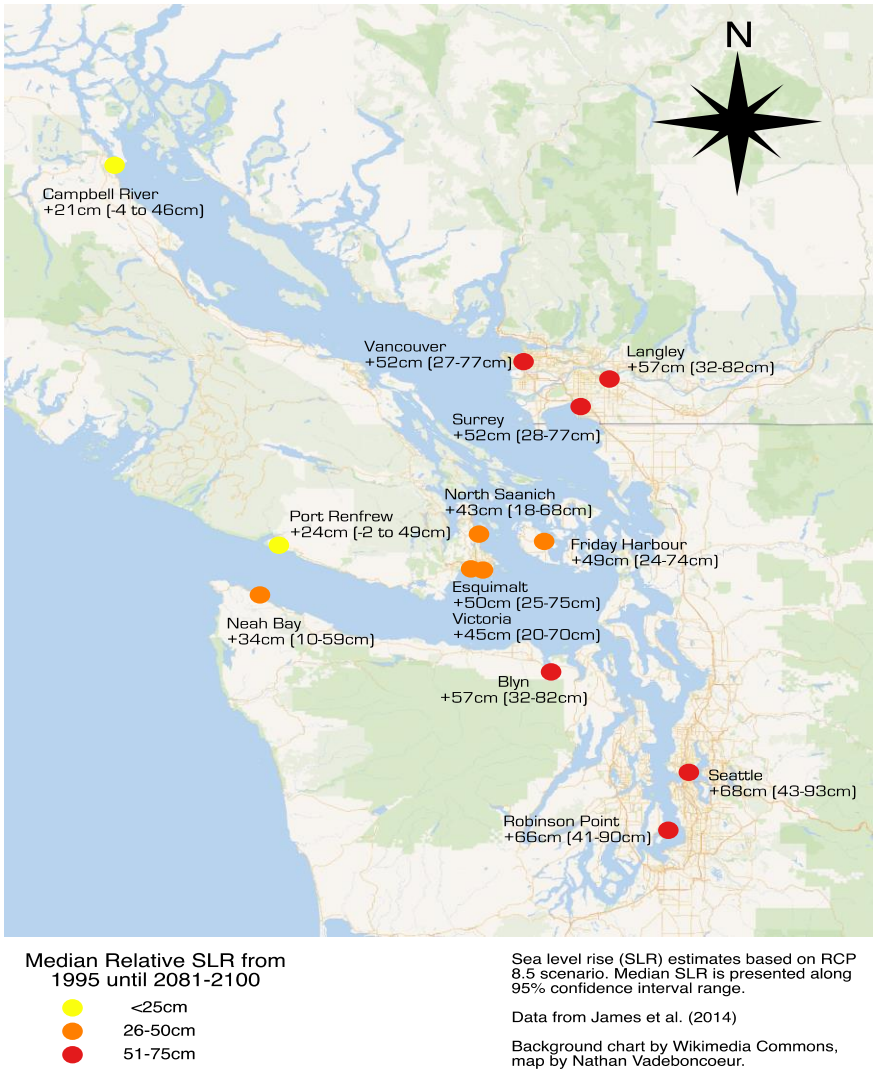
Sea Level Rise

- Sea level rise varies by region
- Wave impacts present the greatest risk
- Sediment transport is a key feature

Rising Water Temperature

- Northward distribution of species
- Increased river temperature

Relative Sea Level Rise
Projections for the Salish Sea

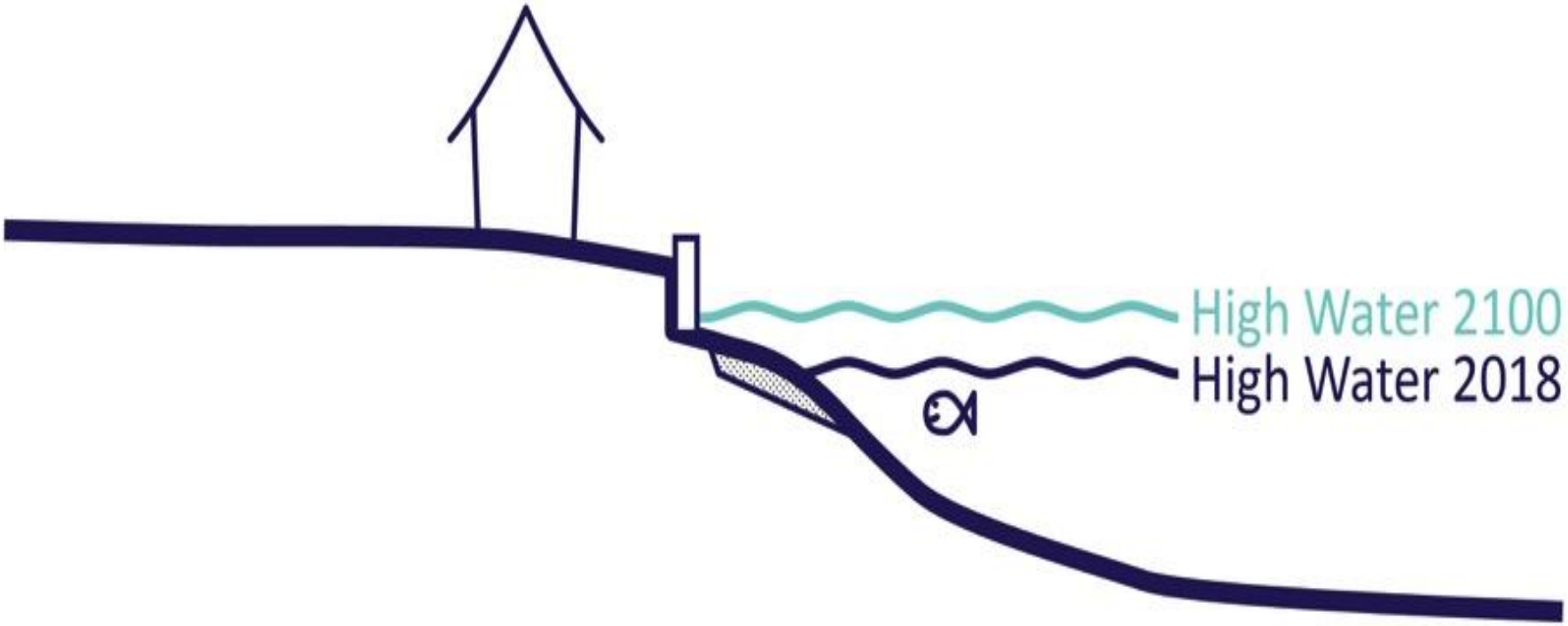


Physical Coastal Processes

- Sediment Transport
- Shoreline Armouring
- Habitat Impacts

Fisheries

- Forage fish and juvenile salmon habitat
- Water temperature
- Riparian Zones
- Predation



Food Sovereignty

- Climate change will impact:
  - Distribution of species
  - Species habitat / harvesting sites
- Measurable impact on wild foods and associated activity

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North end of Vancouver Island by 2050

- Climate change means going from 7 to 6 sockeye per-person, per-year

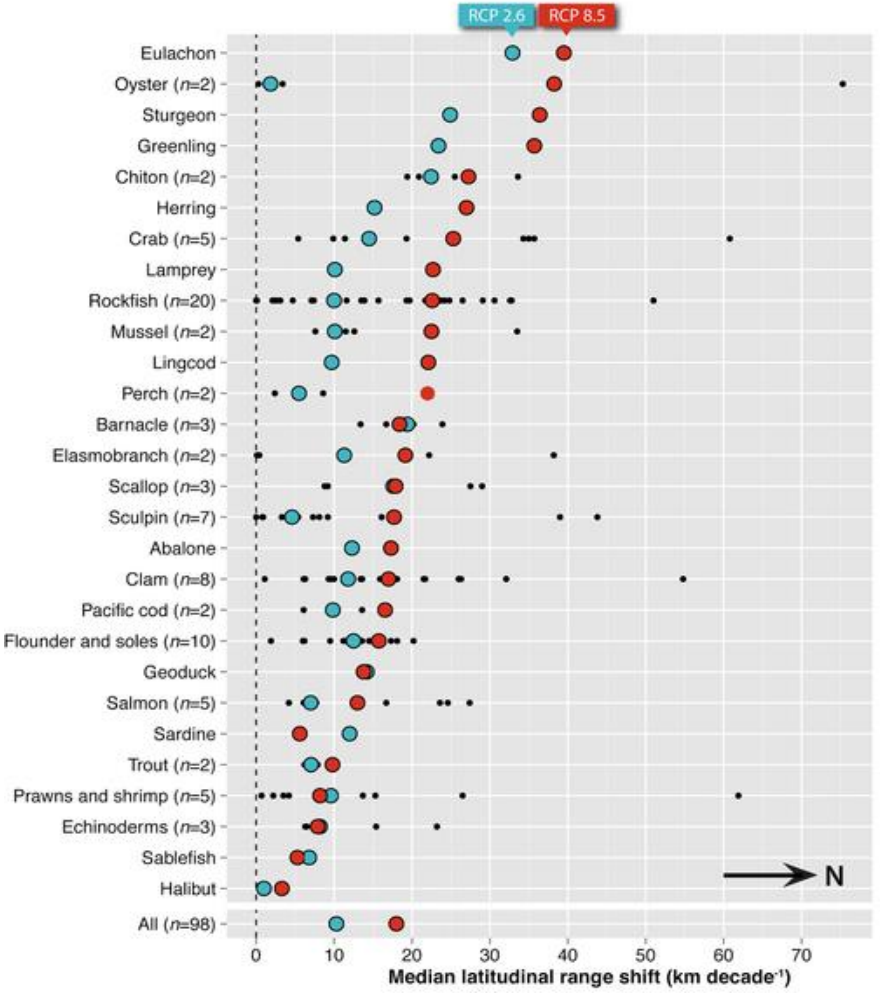
Lower Mainland by 2050

- Climate change means going from 7 to 5 sockeye per-person, per-year

	Estimated Need	Estimated Availability	% Need Under-Served	Estimated Change	Direction of Change
Sockeye	~24000 fish	~6908 (exclusive of 2010)	~70%	10.0%10–19%	Negative
Pink	~6900 fish	1740	75%	10.0%10–19%	Negative
Chum	~3600 fish	274	92%	10.0%10–19%	Negative
Halibut	~4900 fish	319	93%	10%–19%	Likely positive
Herring	~7500 kg	n/a		28.1%–49.5%	Negative
Rockfish	~1900 fish	578	70%	Estimate unknown	Neutral
Crab	~29,900 whole crabs	112	<1%	No change	Neutral
Pink shrimps	190 bags	N/A		Stable or upward, estimate unknown	Neutral–positive
Clams	~15,000 bags or 300,000 lb	28.5 bags or 570 lb OR 62 bags or 570 kg	Less than 1% in either case	Estimate unknown	Negative

For salmonids, the northern range is lower at 3.2%–8.2%; but in the 'Namgis case, a large portion of catch comes from the Fraser River run that travels over the north end of Vancouver Island and through Johnstone Strait and whose decline is estimated at 17.1%–29.2%. Thus a very rough proxy is this average of the high and low estimates. Assumption is 55 clams per kilogram.

Fig 1. Projected median latitudinal range shifts (km decade-1) by taxonomic group or species.



Weatherdon LV, Ota Y, Jones MC, Close DA, Cheung WWL (2016) Projected Scenarios for Coastal First Nations' Fisheries Catch Potential under Climate Change: Management Challenges and Opportunities. PLOS ONE 11(1): e0145285. https://doi.org/10.1371/journal.pone.0145285
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Fig 2. Projected change in relative catch potential by commercial fishery with known First Nation participation.

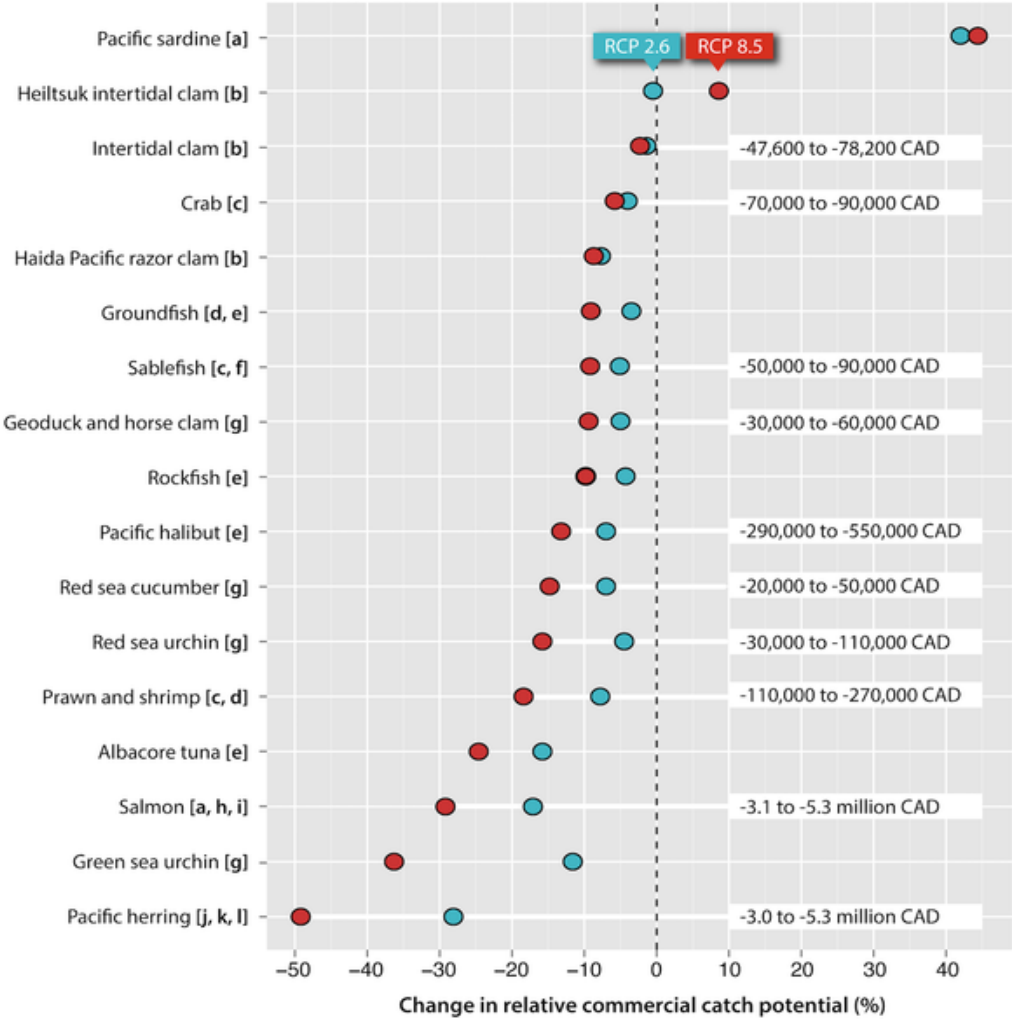

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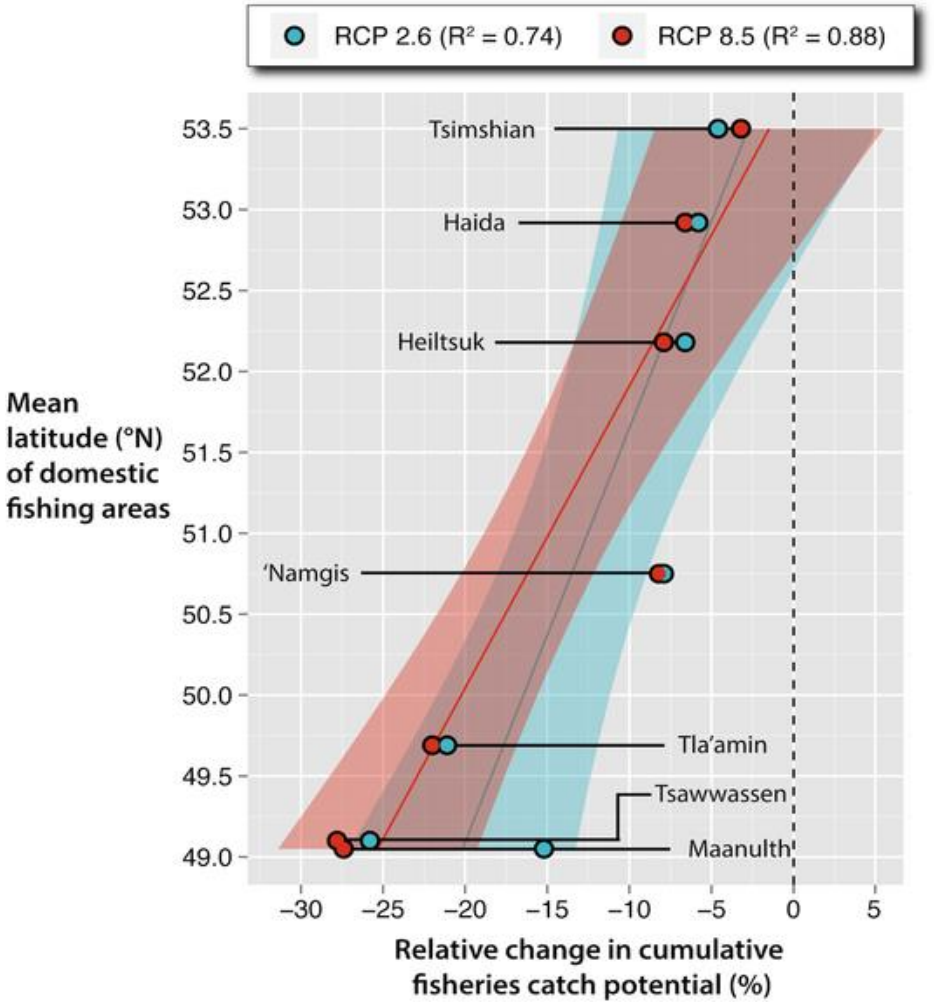
Fig 3. Relationship between latitude and cumulative change in catch potential (%) by 2050 from the baseline (0%) under the lower (RCP 2.6; blue) and upper (RCP 8.5; red) scenarios of climate change.



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Food Sovereignty

- The projections described here are based on TEMPERATURE change
  - They do not take into account habitat loss
  - They do not take into account phenological mismatch
  - They do not take into account pollution

One community can do little to affect the global climate, but can do much to affect its impact.

Key Messages

- First Nations and municipalities play a key role in determining climate impacts
- Climate impacts are the result of synergistic effects and have cascading consequenc
- Climate change will have measurable impacts on First Nations food sovereignty