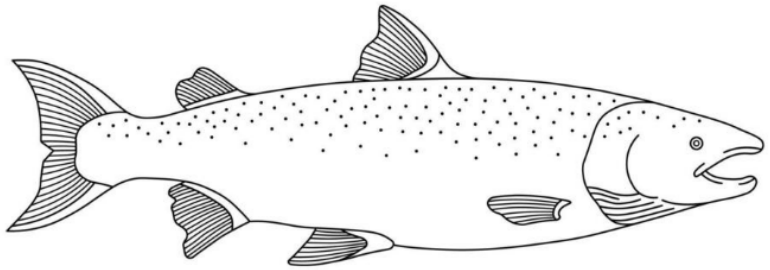
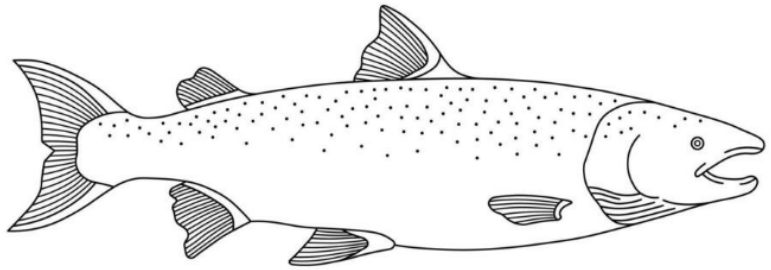
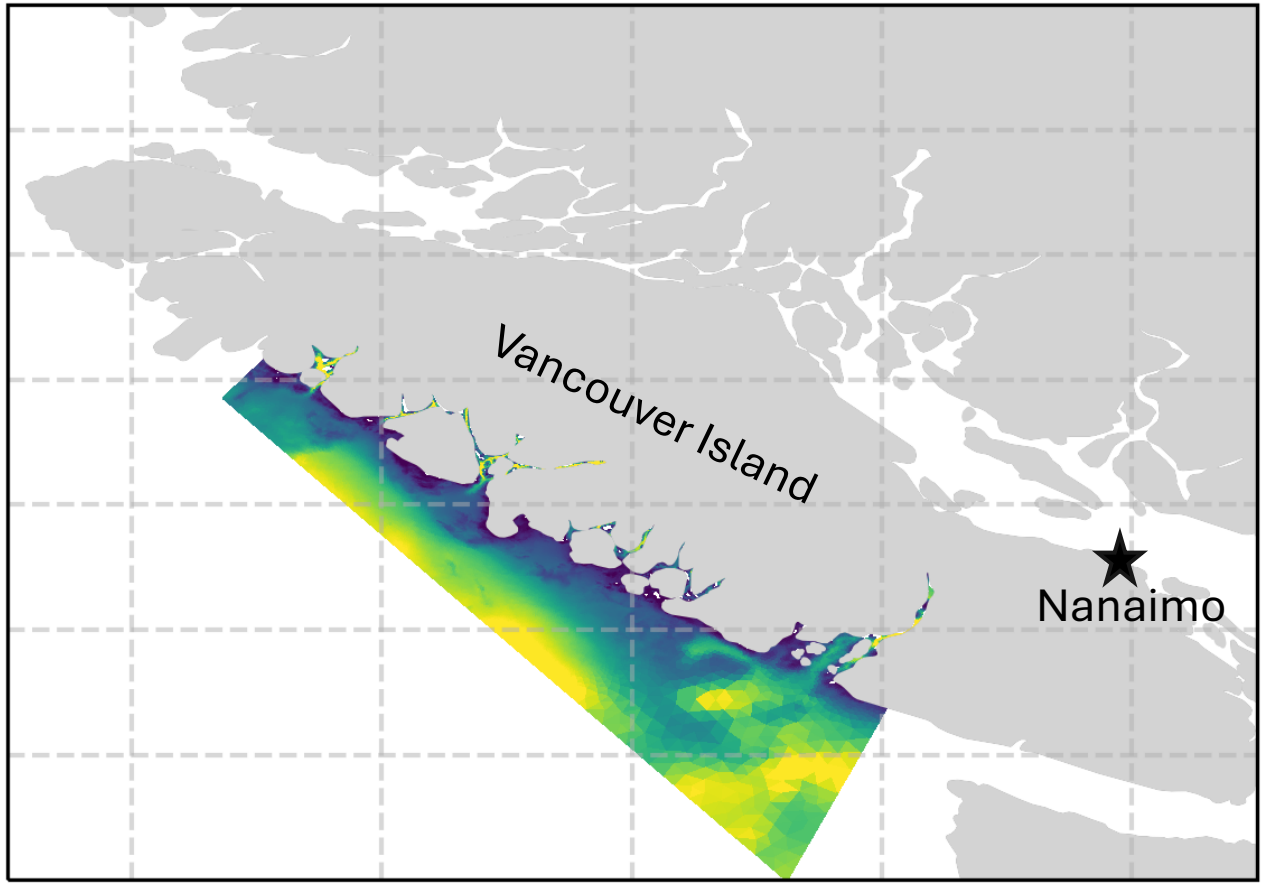
Assessing climate change and potential impacts to Pacific Salmon in Clayoquot Sound, British Columbia

Marilena Geng & Laura Bianucci





Problem: estimating future conditions for small-scale, complex coastal systems



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- Salmon play an important ecologic, economic, and cultural role in the North Pacific

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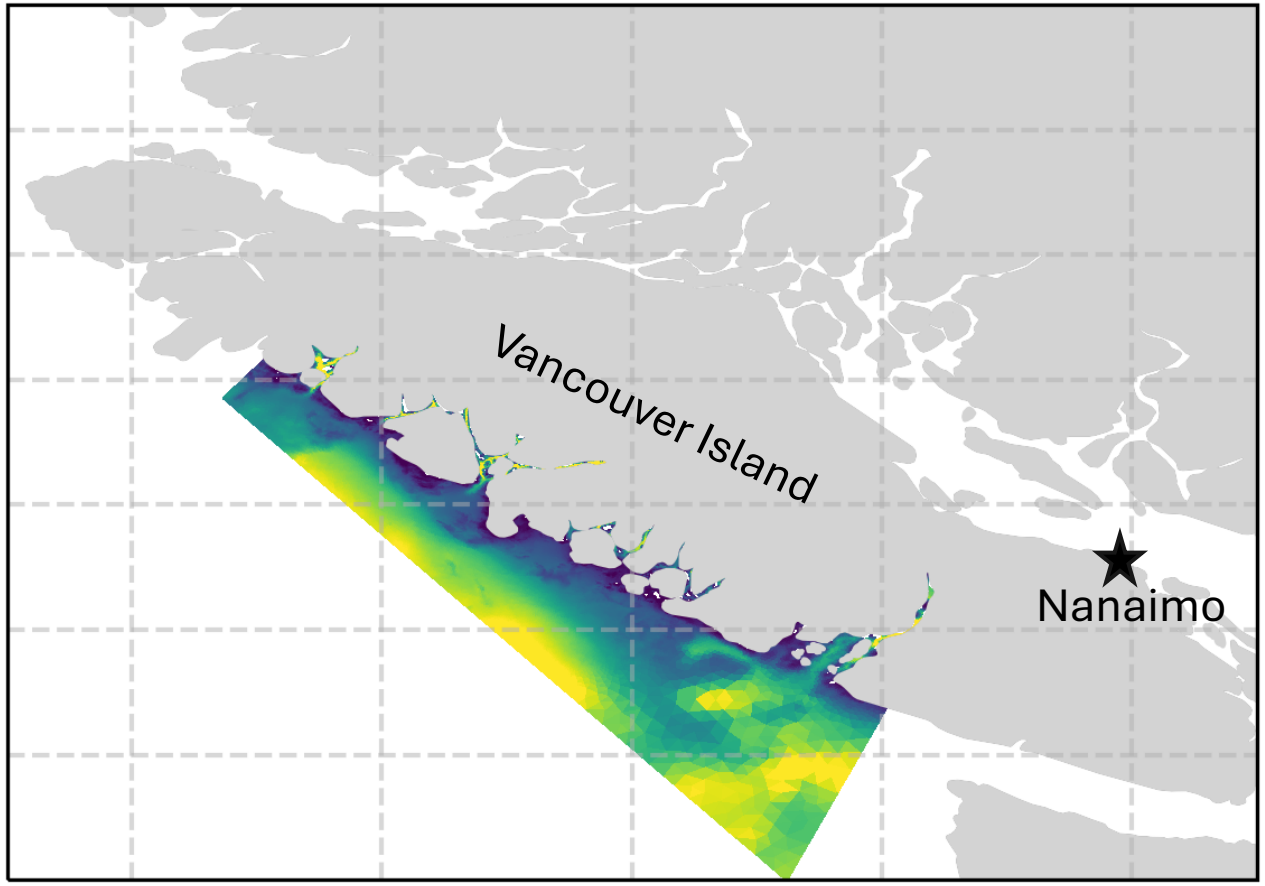

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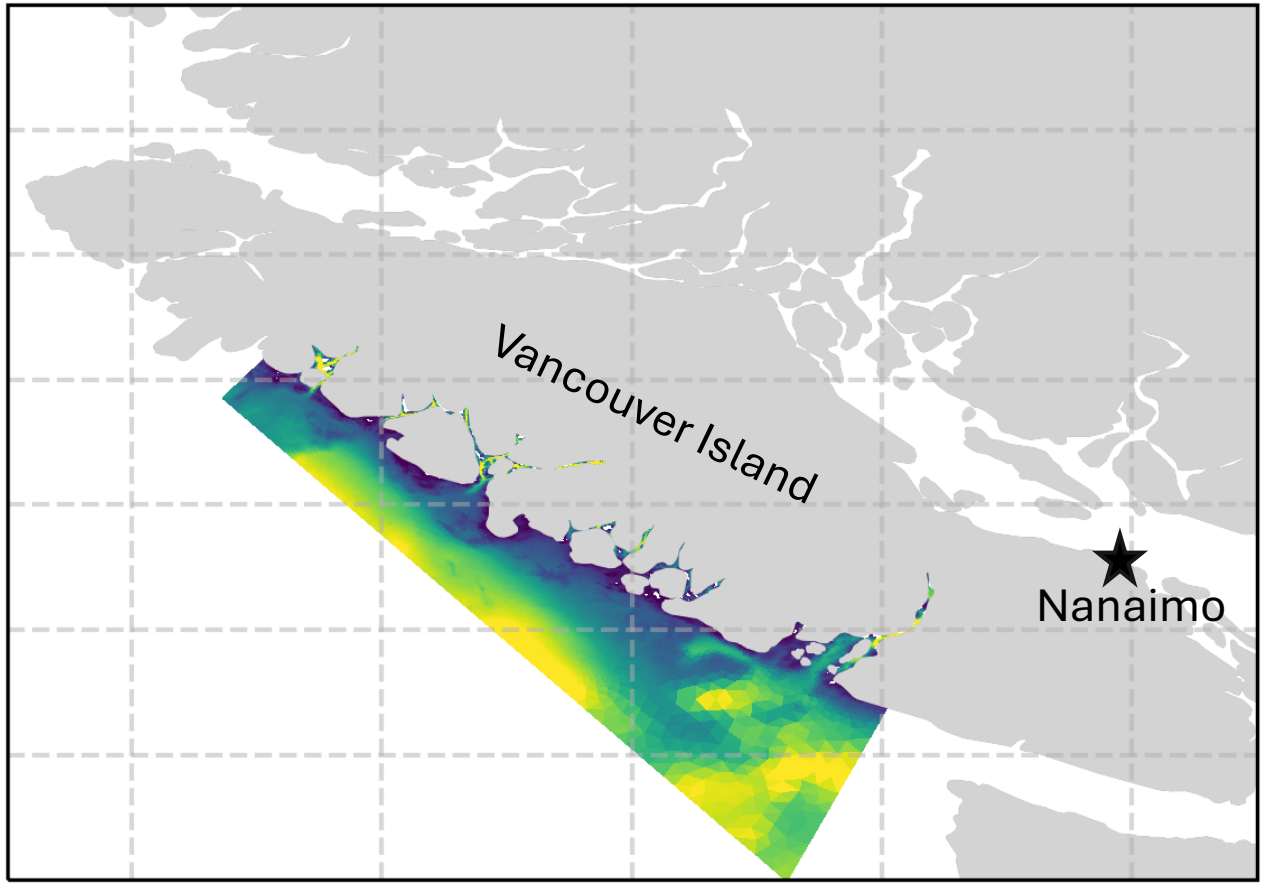

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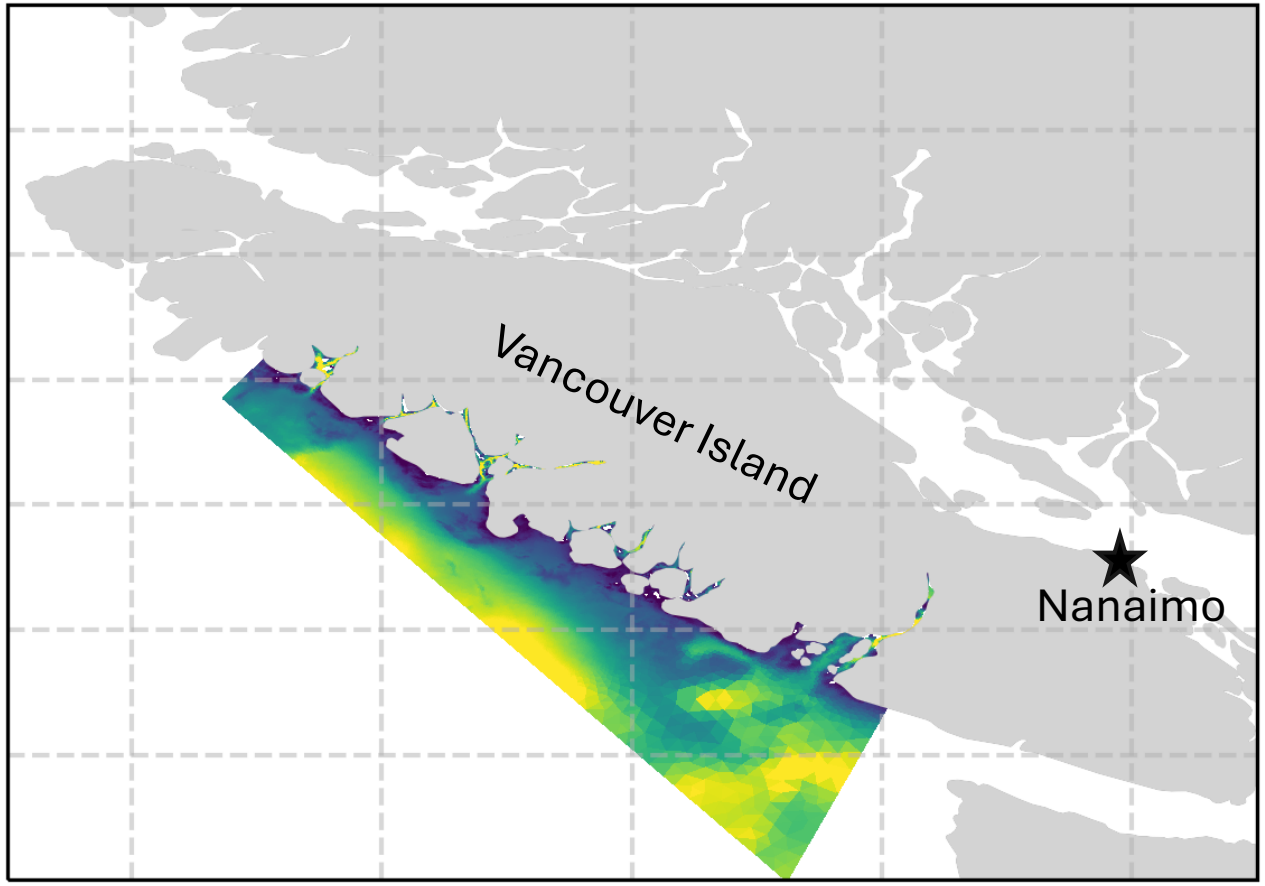

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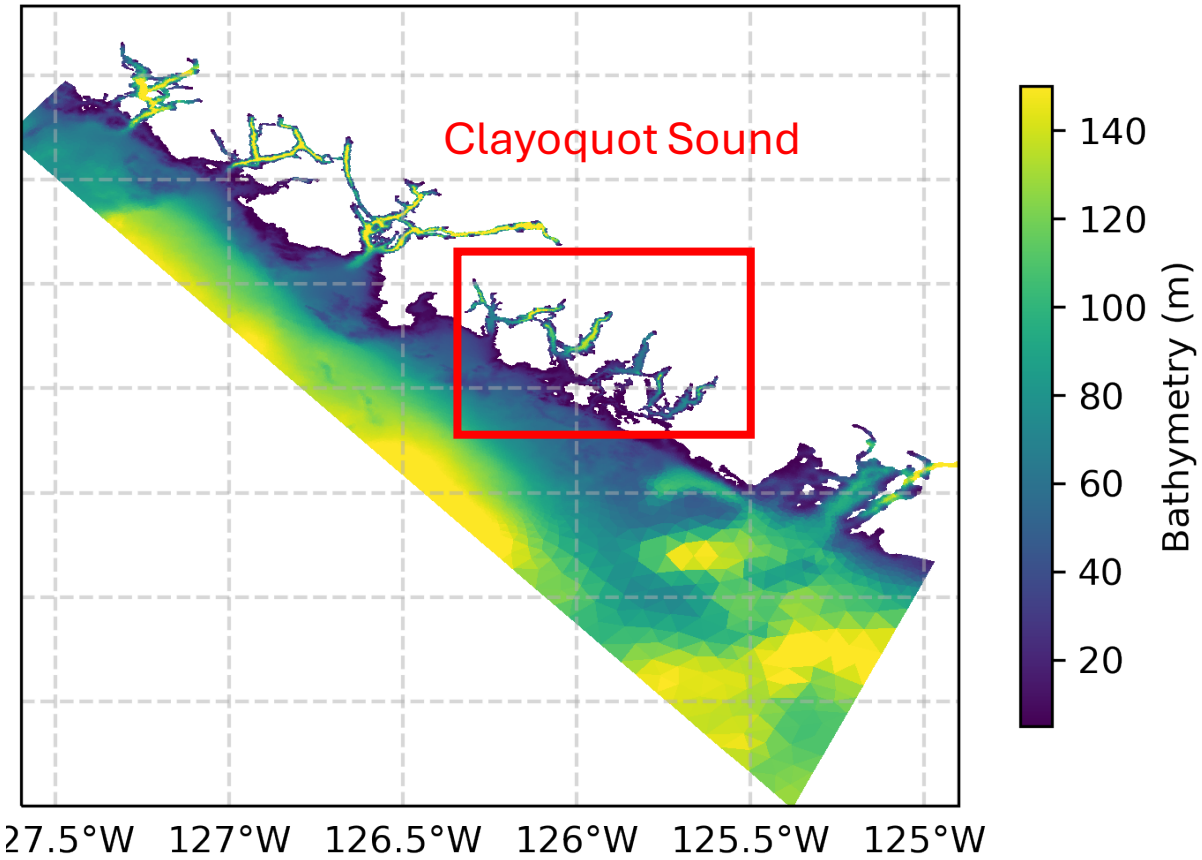
⇒ Future projections do not resolve the small-scale dynamics characteristic of fjord systems

Solution: apply delta climate change to forcings of a high-resolution simulation



High resolution simulation:

- FVCOM simulation for 2024
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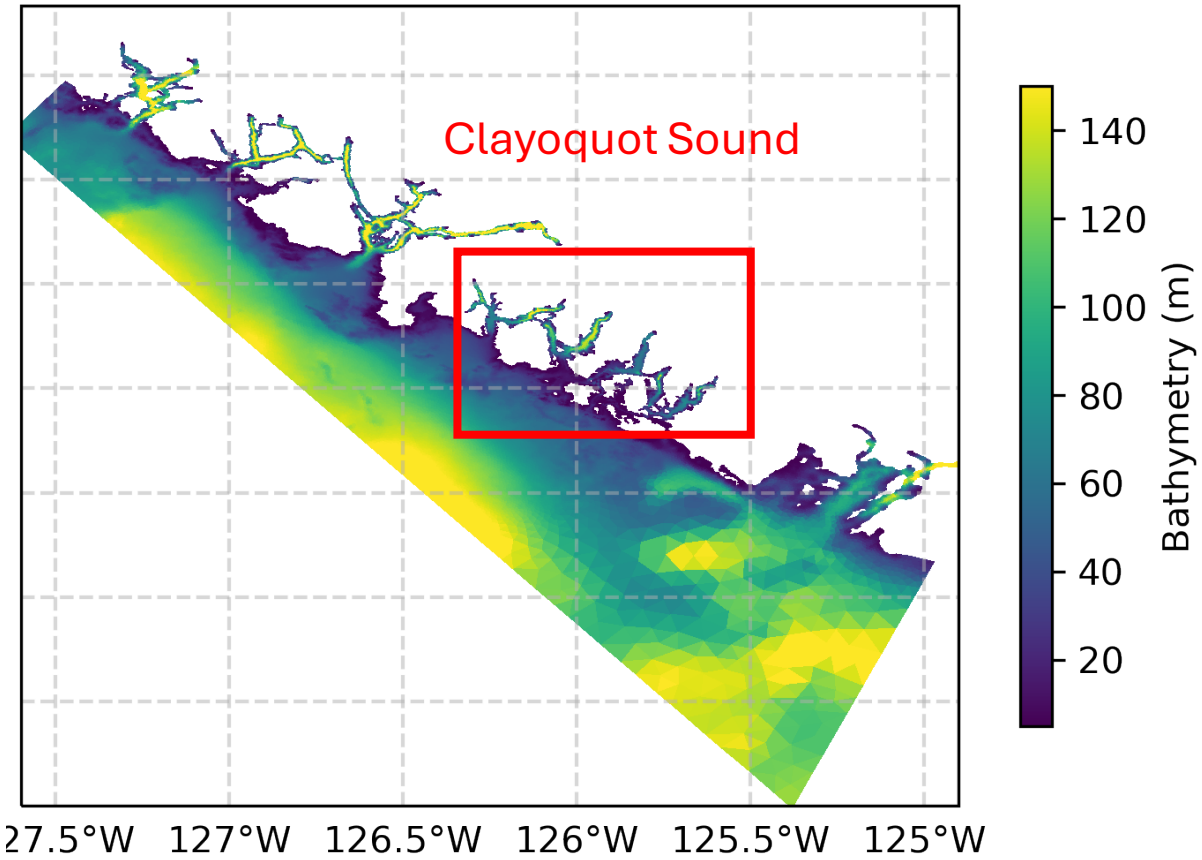

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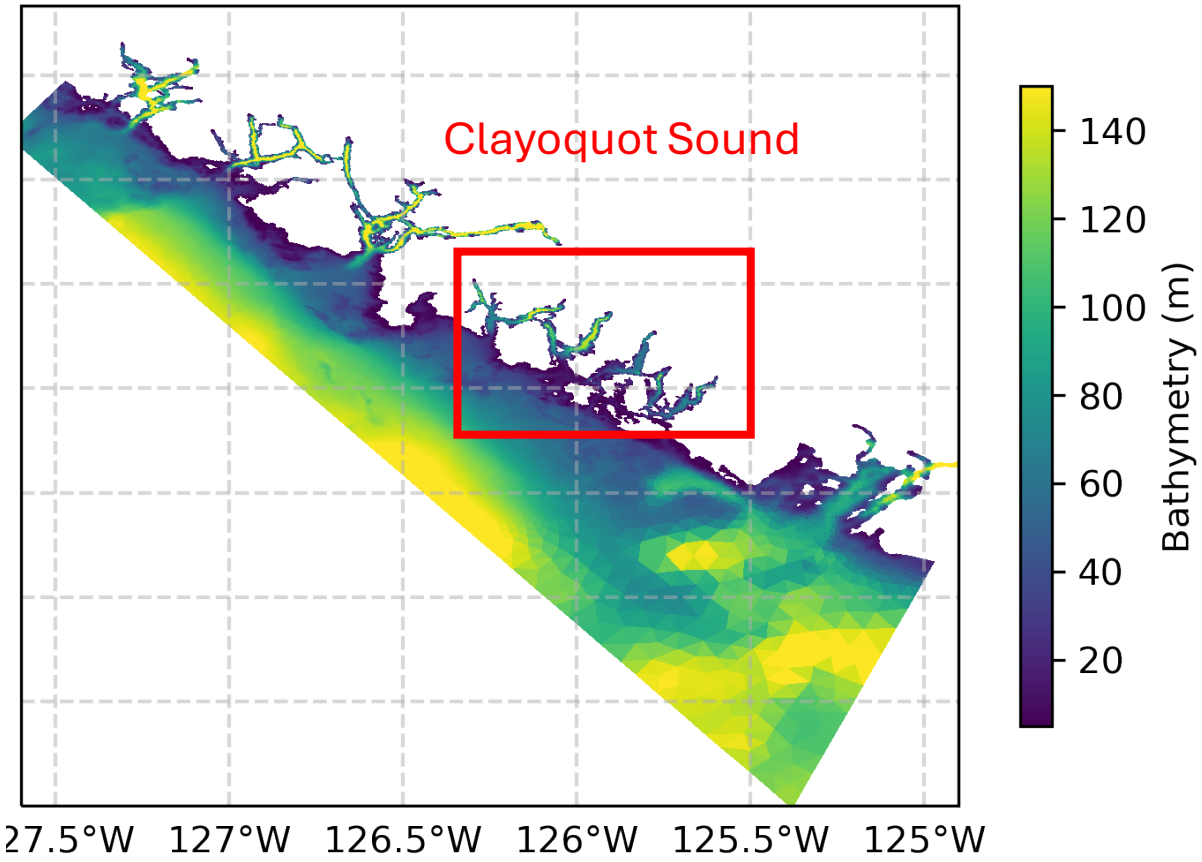

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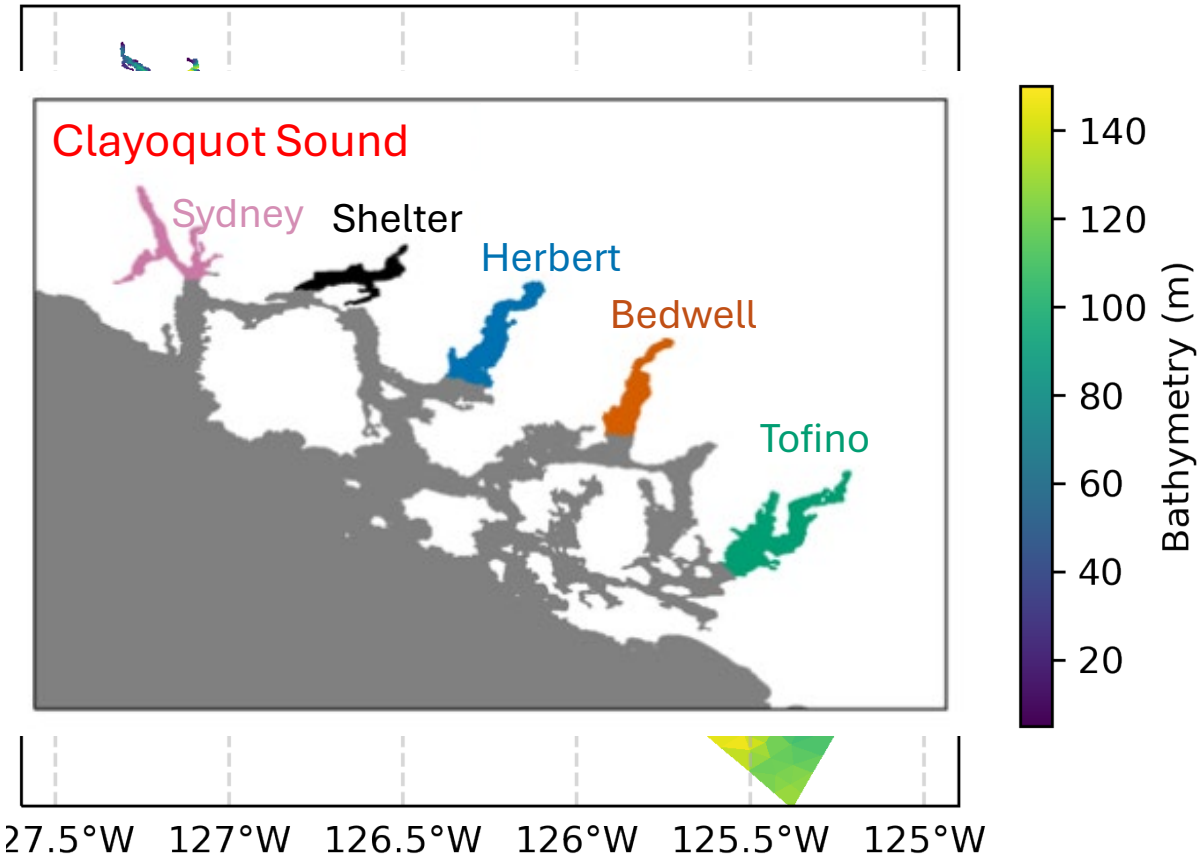

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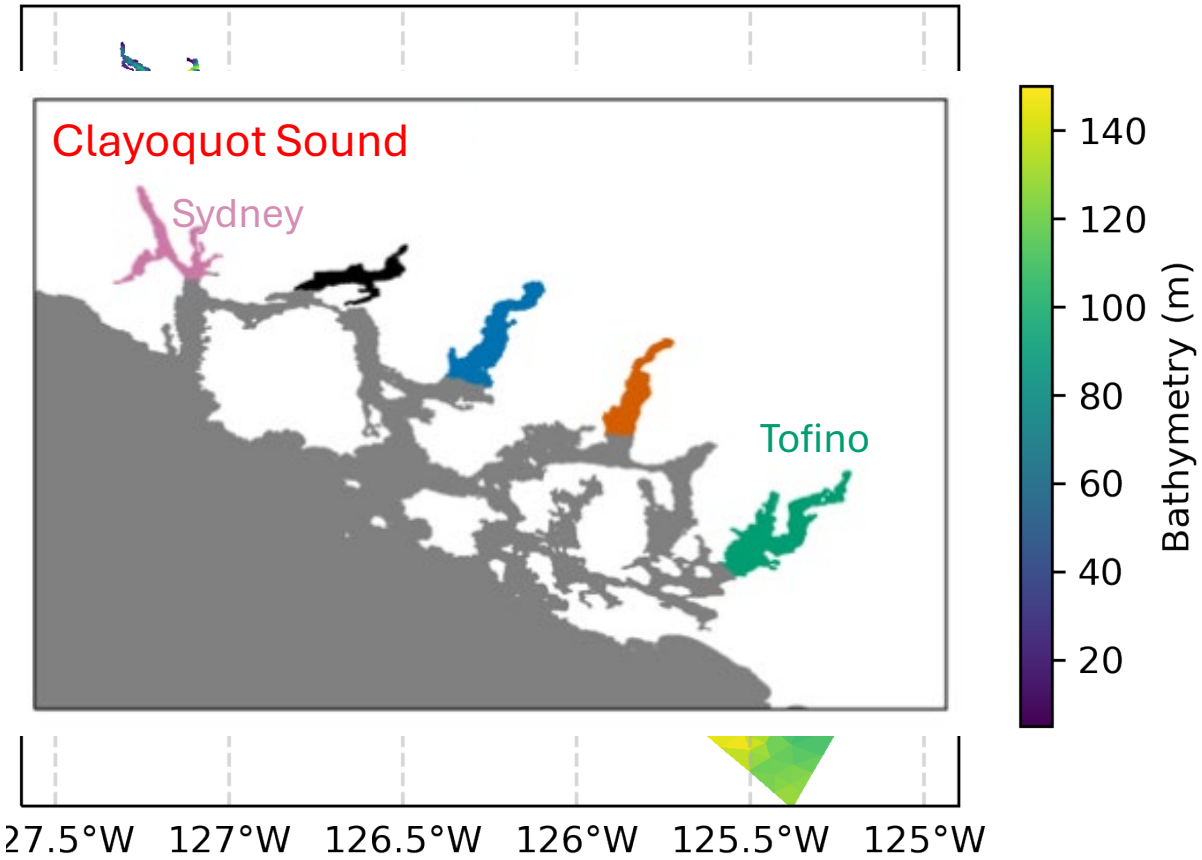

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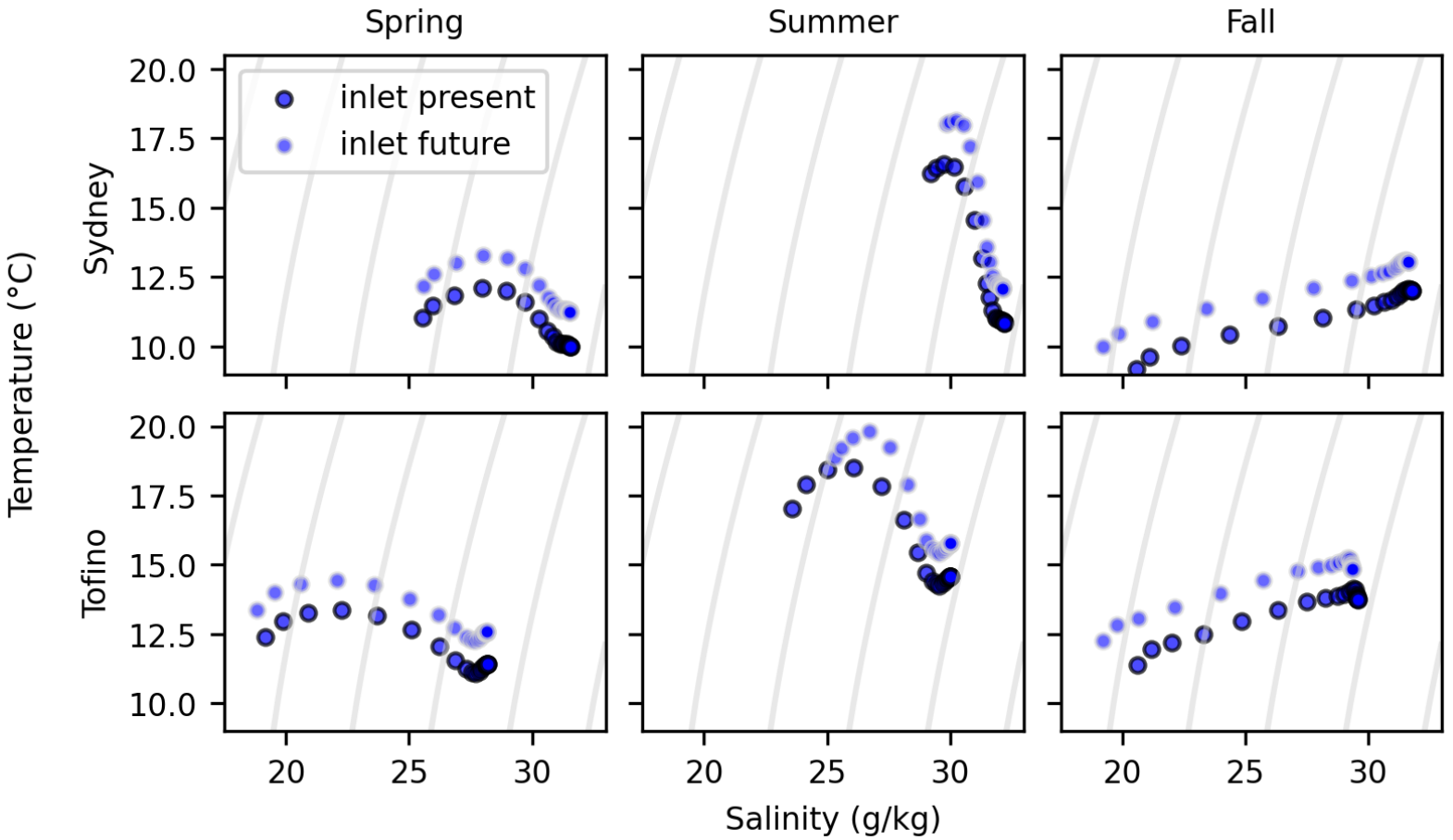
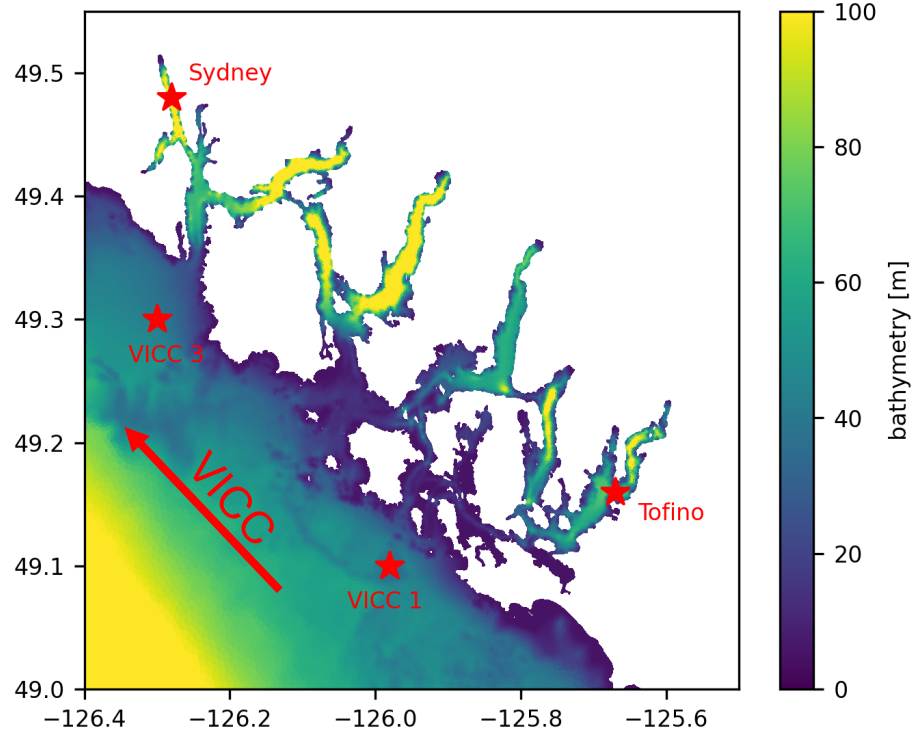
T-S diagram: temperature increase, northern inlets more connected to the shelf





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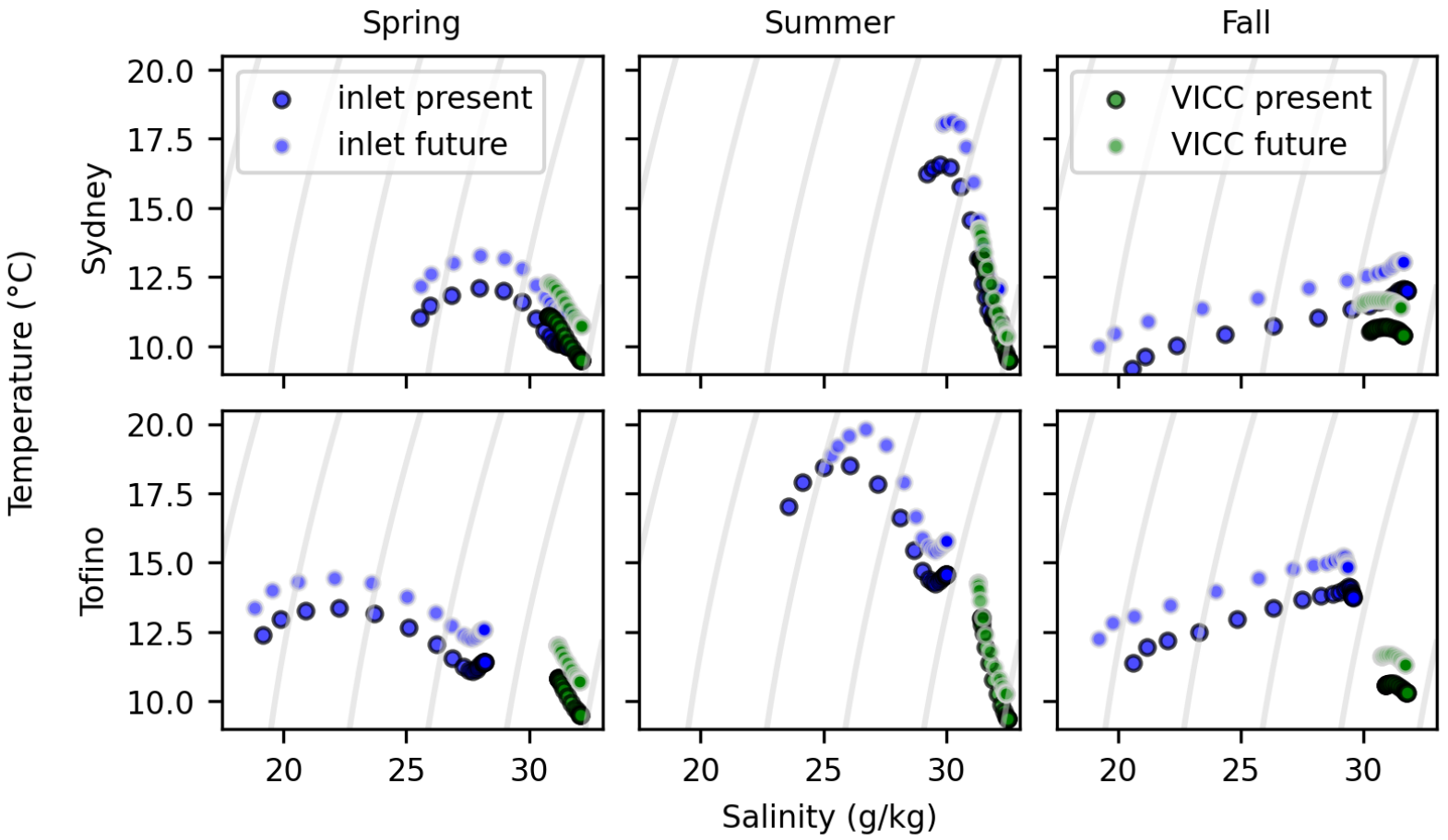
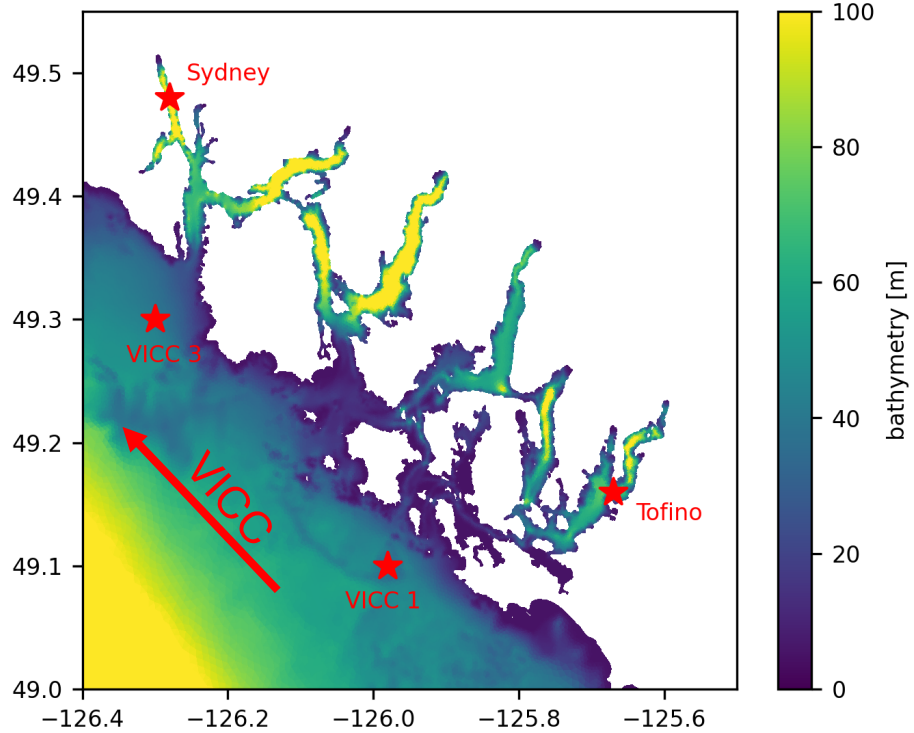
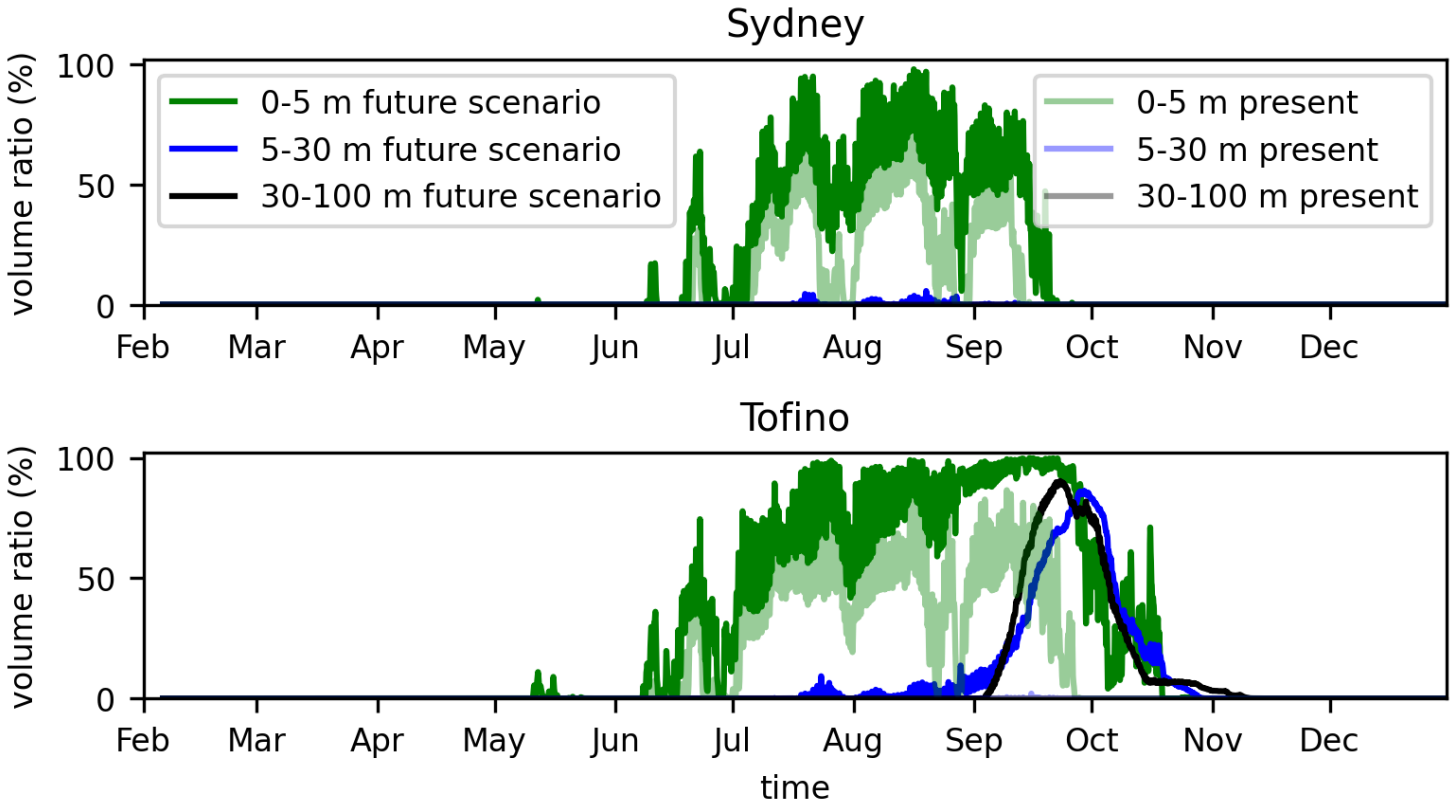
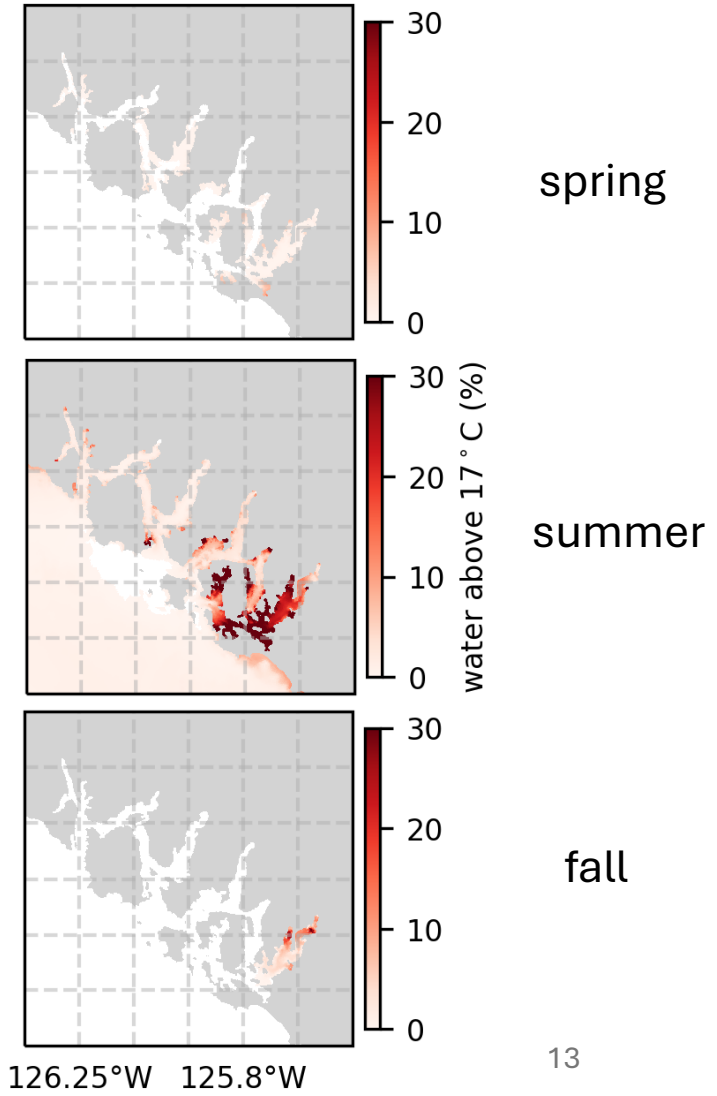




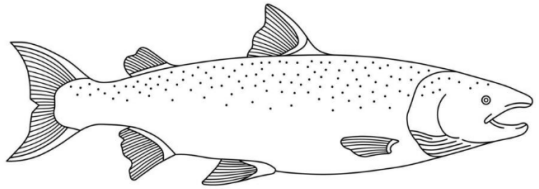
Temperature stress for salmon: increase in water volume above 17 °C especially at surface

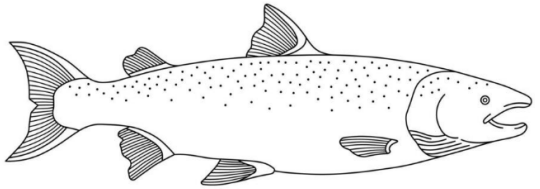




Takeaways

- Clayoquot Sound's northern inlets are more connected to shelf waters than southern inlets , therefore northern inlets are primarily influenced by regional circulation and southern inlets by local forcings
- Distinct temperature increase (~1.15 °C) from present (2024) to future (2055) scenario
- Temperature threshold (17 °C) exceeded in increasing areas in Clayoquot Sound
- Threshold mostly exceeded in surface waters but in the future scenario in Tofino Inlet in summer, nearly the whole water column is above 17 °C
- This method can readily be applied to other species and thresholds





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