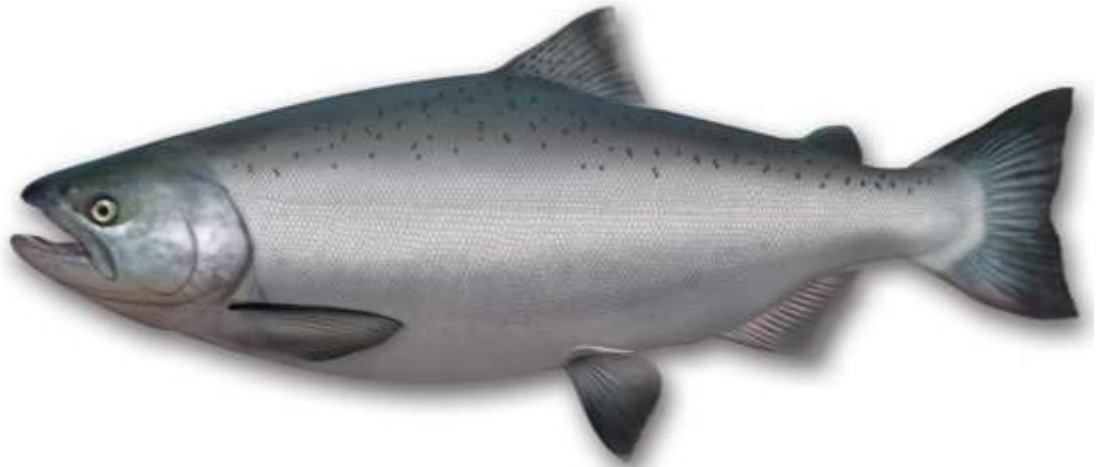


ENVIRONMENTAL ISSUES & KNOWLEDGE GAPS

– tools for turning the tide ...

| RASMUS GABRIELSSON



FISH & GAME SALMON SYMPOSIUM, ASHBURTON, 11TH- 12TH NOV 2017

KNOWLEDGE GAPS (some of many)

HABITAT & RECRUITMENT:

- Which areas produce returning salmon?
- Where could habitat enhancement and rehabilitation help?

FRESHWATER REARING & OUTMIGRATION:

- Which habitat do juvenile salmon use?
- Where are major FW mortality bottlenecks occurring?

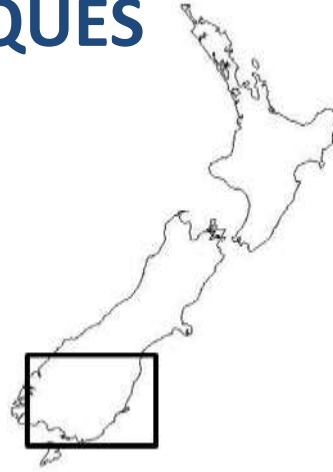
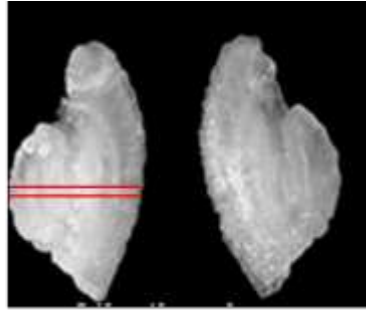
OCEAN PHASE:

1. At what size, age & time do wild salmon enter the ocean?
2. Where do salmon travel & seek food during their ocean life stage?
3. What influences ocean survival - predators, lack of particular food, or changeable & unsuitable ocean conditions?

POPULATION RESILIENCE:

- How connected are the different salmon populations?
- What role does (or could) landlocked salmon populations play?

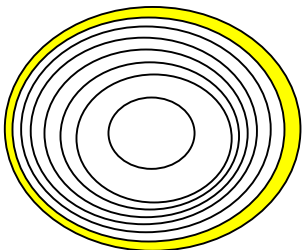
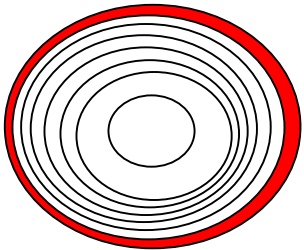
RECRUITMENT - TOOLS & TECHNIQUES



How identify natal stream habitat?

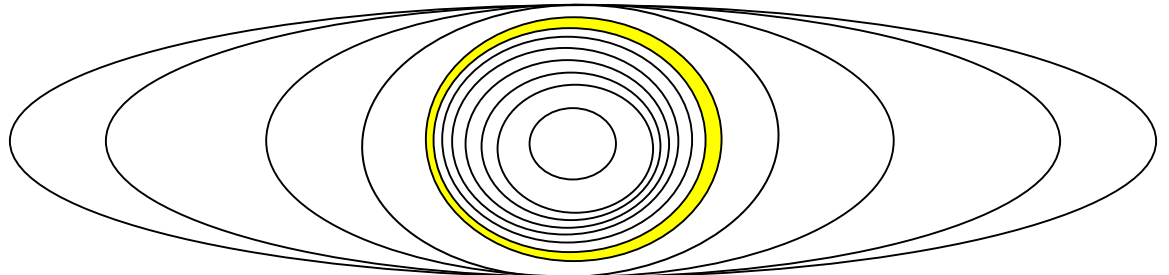
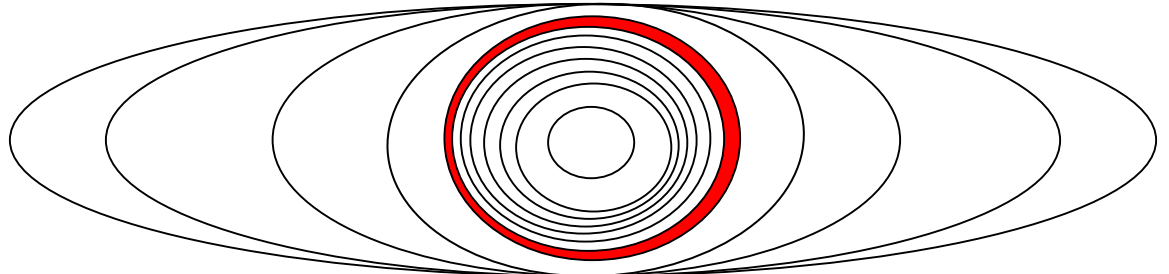
In juvenile fish (3-4 month old)

Habitat specific geochemical signature is incorporated into otolith

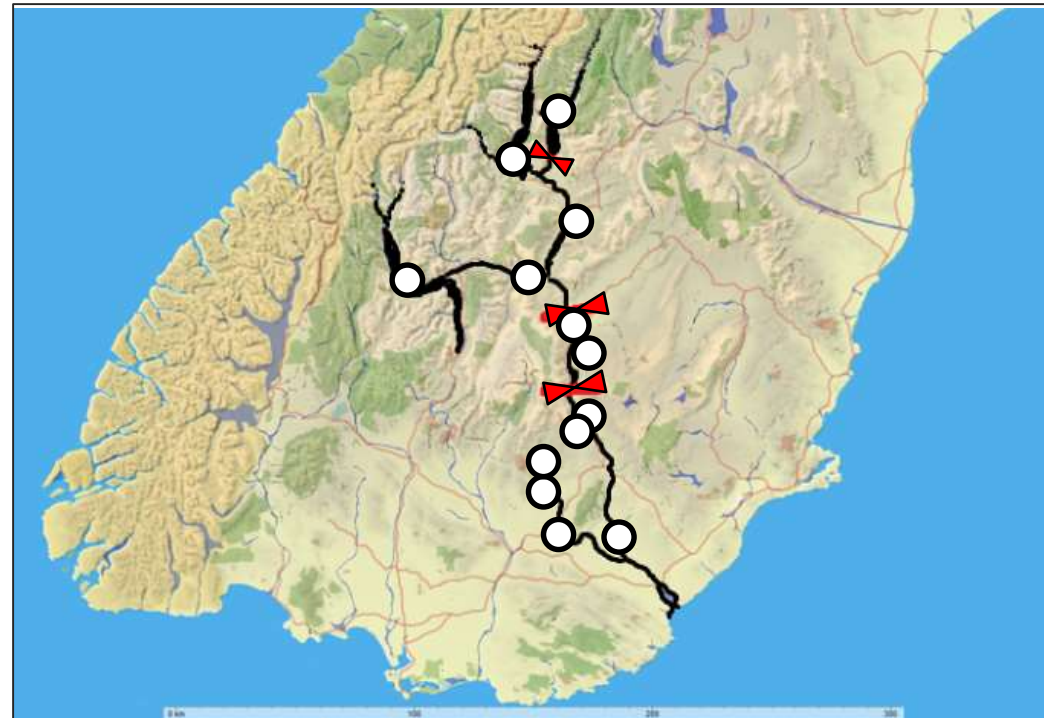


In adult fish

Specific juvenile habitat signature is retained at <1yr age ring

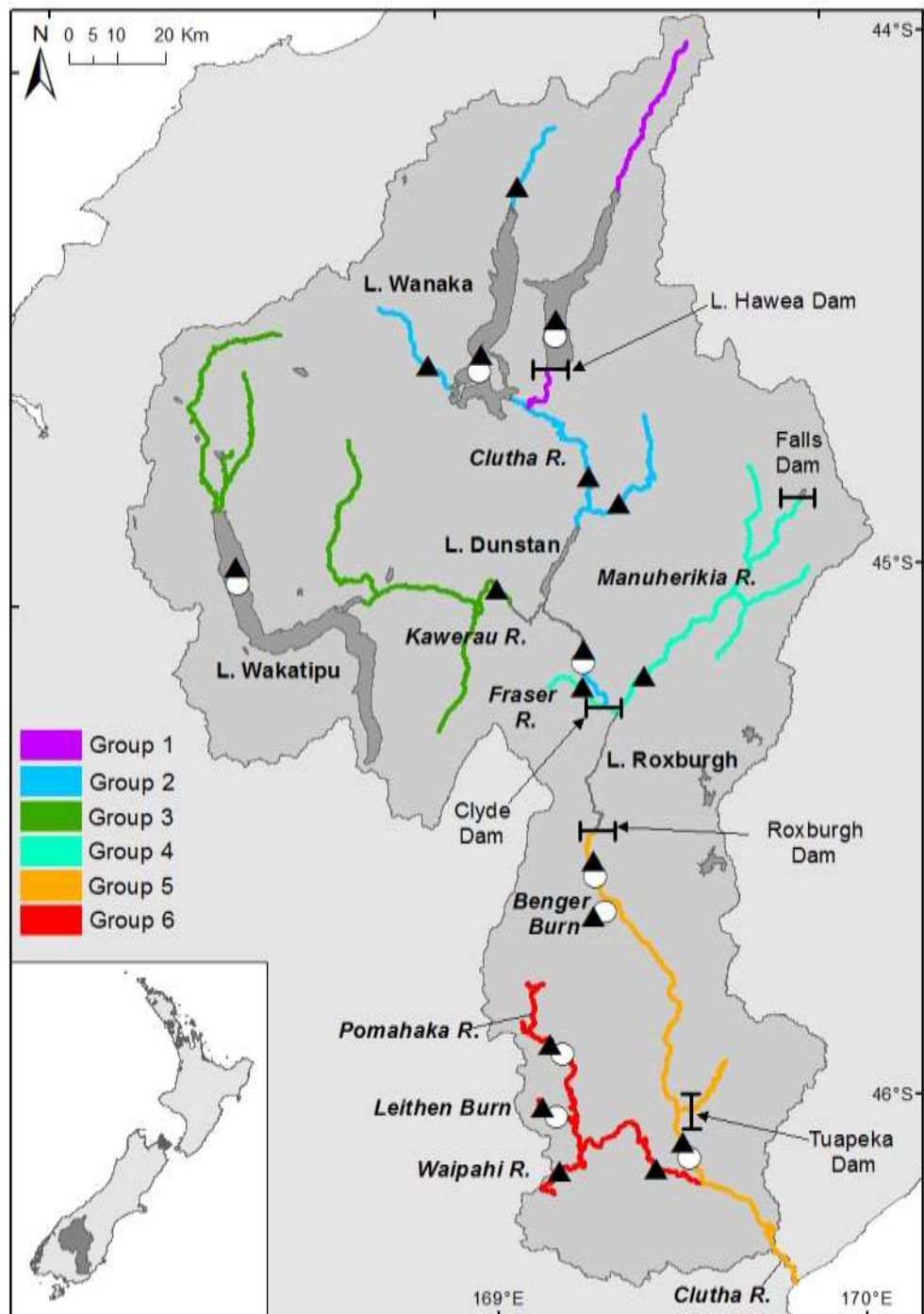


METHODS: CHARACTERISING NATAL SOURCES

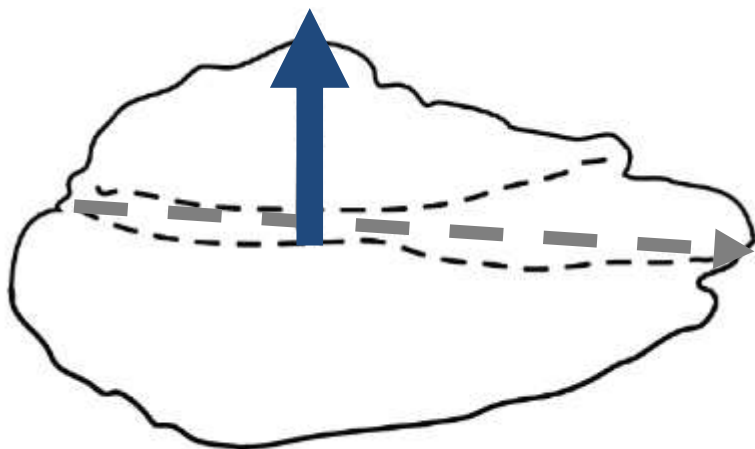
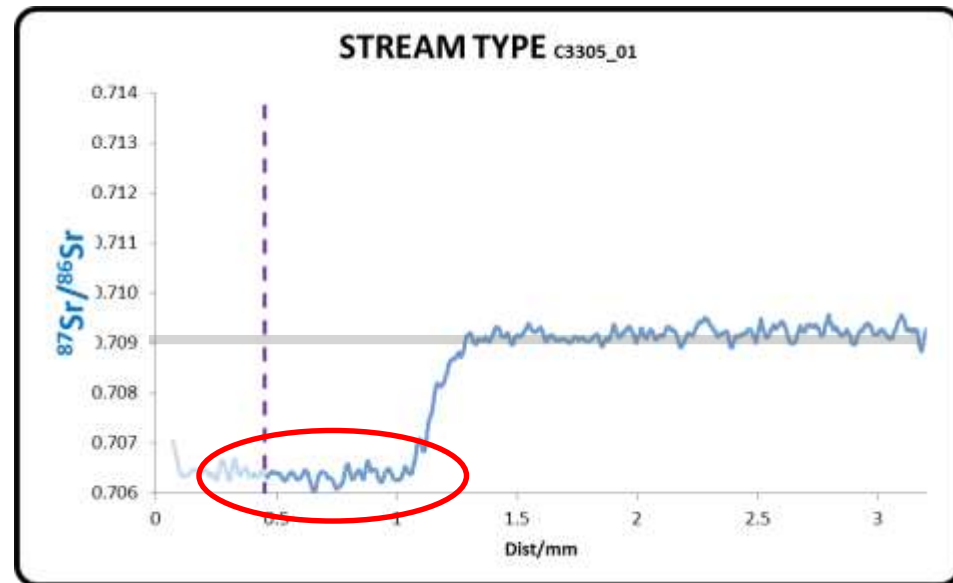
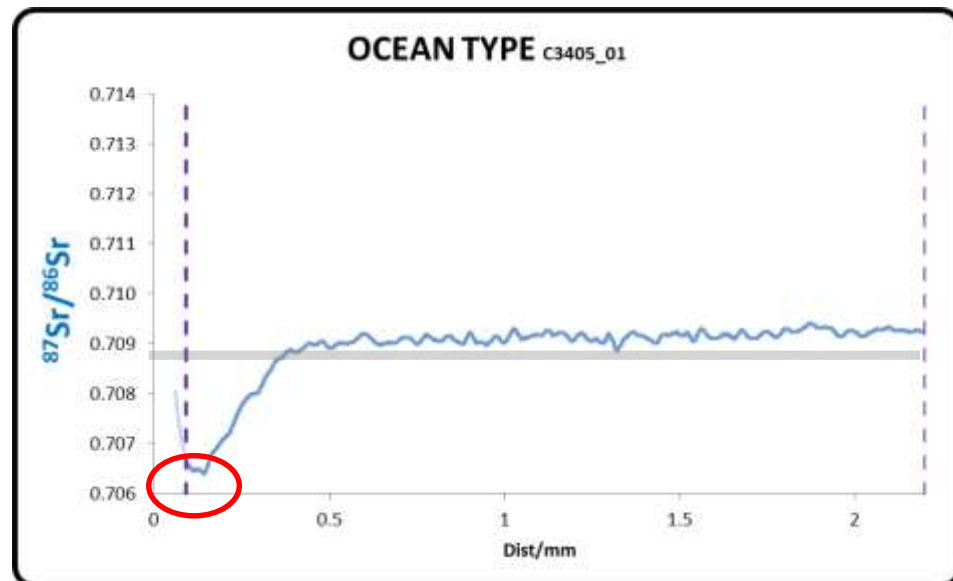
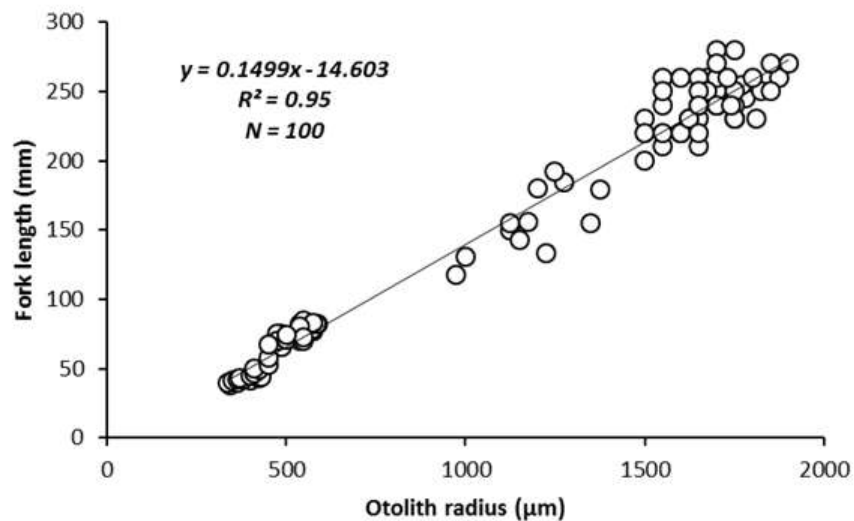


○ Natal sources

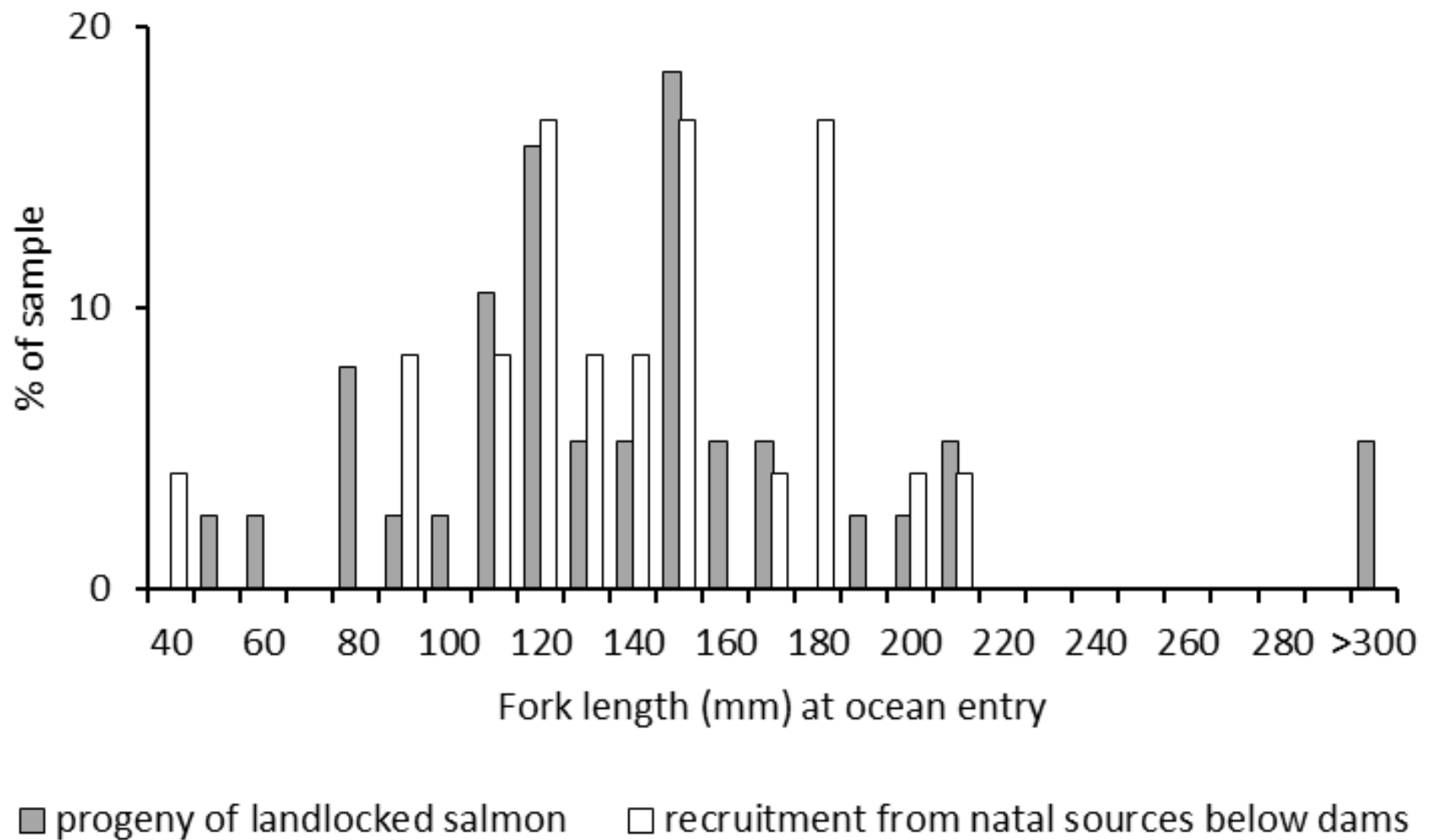
RECONSTRUCTING NATAL ORIGIN OF ADULT SALMON



RESULTS: LIFE HISTORY PATTERN & SIZE AT OCEN ENTRY



RESULTS: SIZE AT OCEAN ENTRY





HOW ARE SALMON HATCHERY RELEASES PREFORMING?

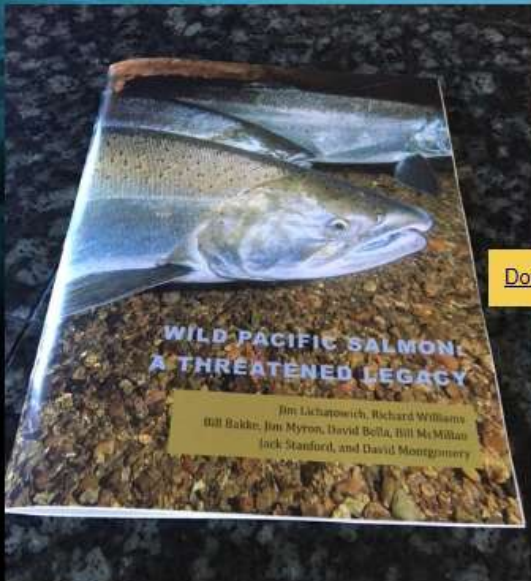


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Salmon History

A source of Pacific salmon history and their environs

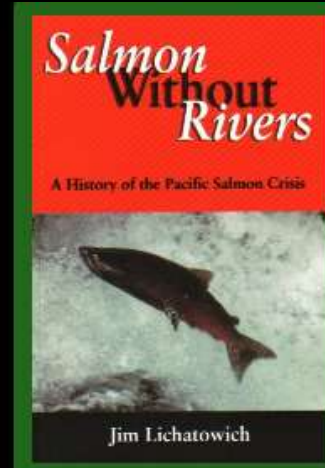
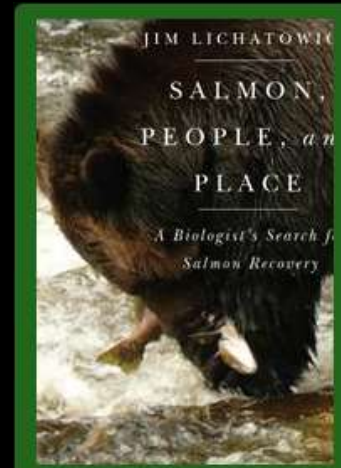
This website maintained by Jim & Paulette Lichatowich



✓ Like

Faith in Nature:
The Missing Element in Salmon Recovery Programs

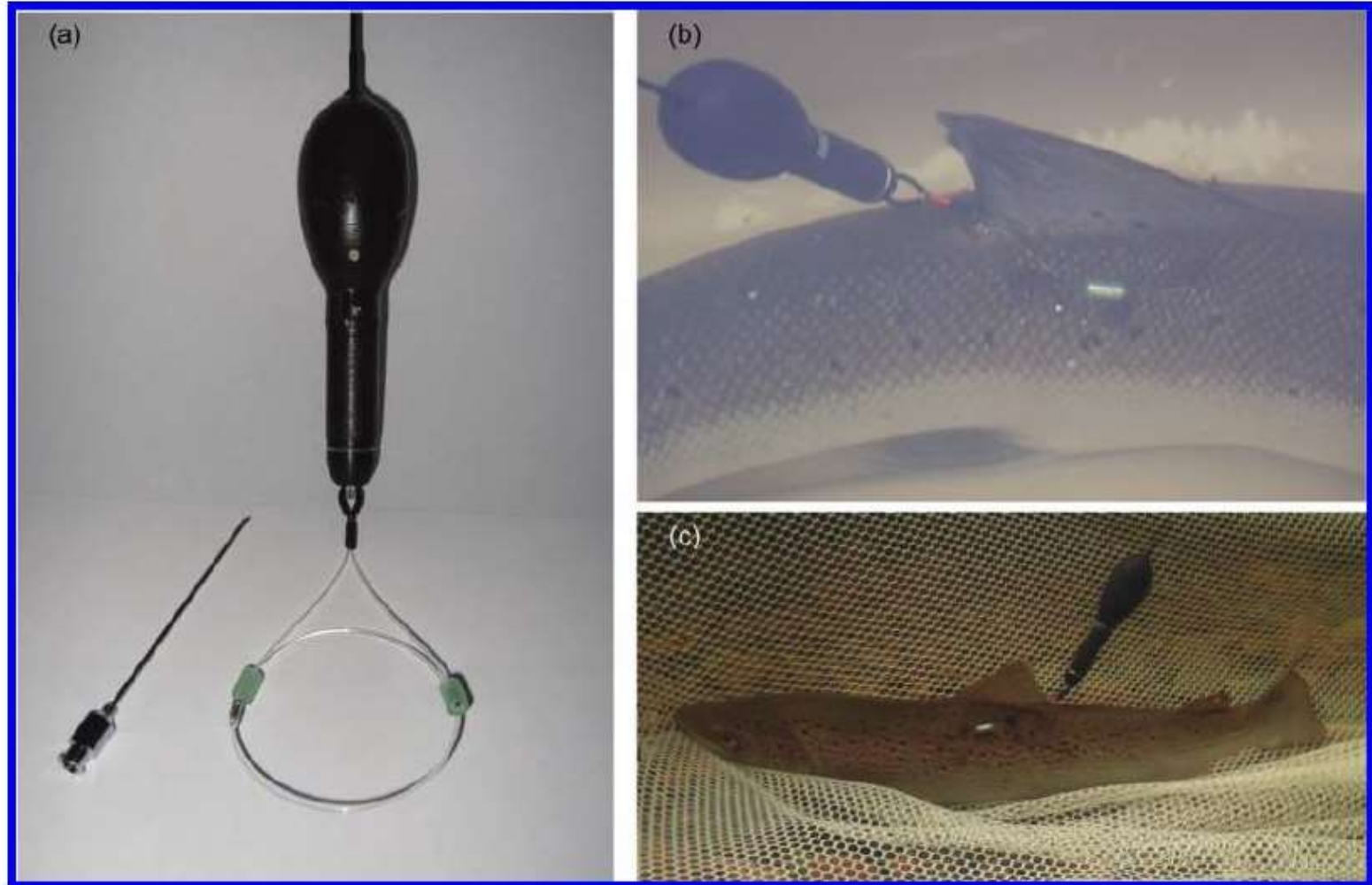
Jim Lichatowich





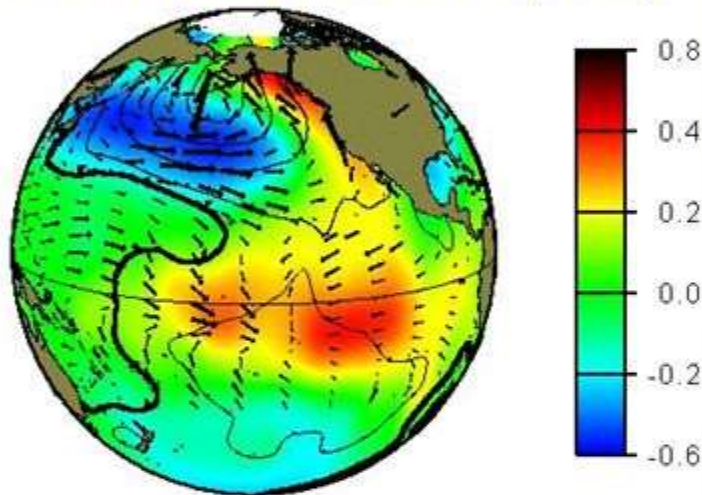


KNOWLEDGE GAPS: OCEAN MOVEMENTS ?

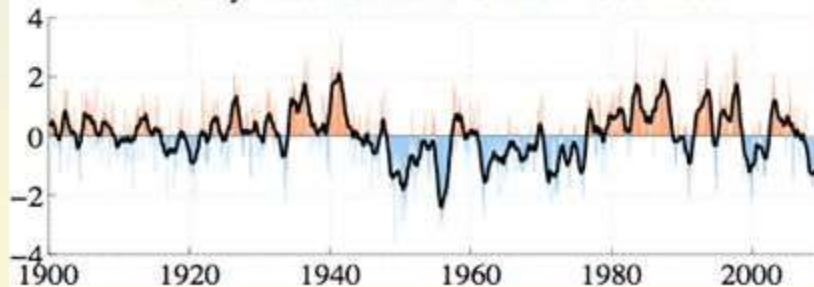


Climate variability has a powerful influence on salmon production -- just a 1 to 2°C swing in ocean temperatures is associated with a doubling of salmon biomass between “warm” and “cool” eras of the Pacific Decadal Oscillation

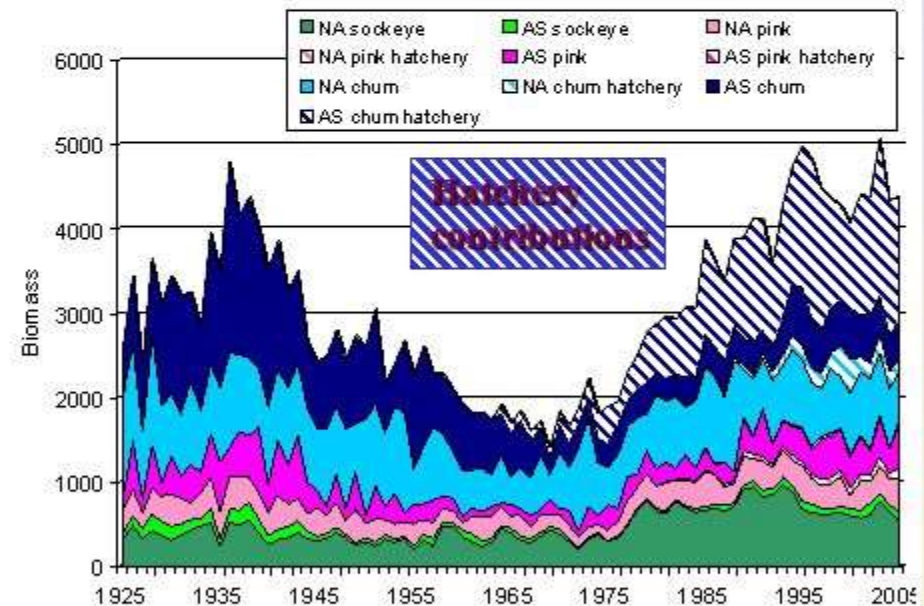
Pacific Decadal Oscillation (PDO)



monthly values for the PDO index: 1900–2008



Total Pacific salmon biomass



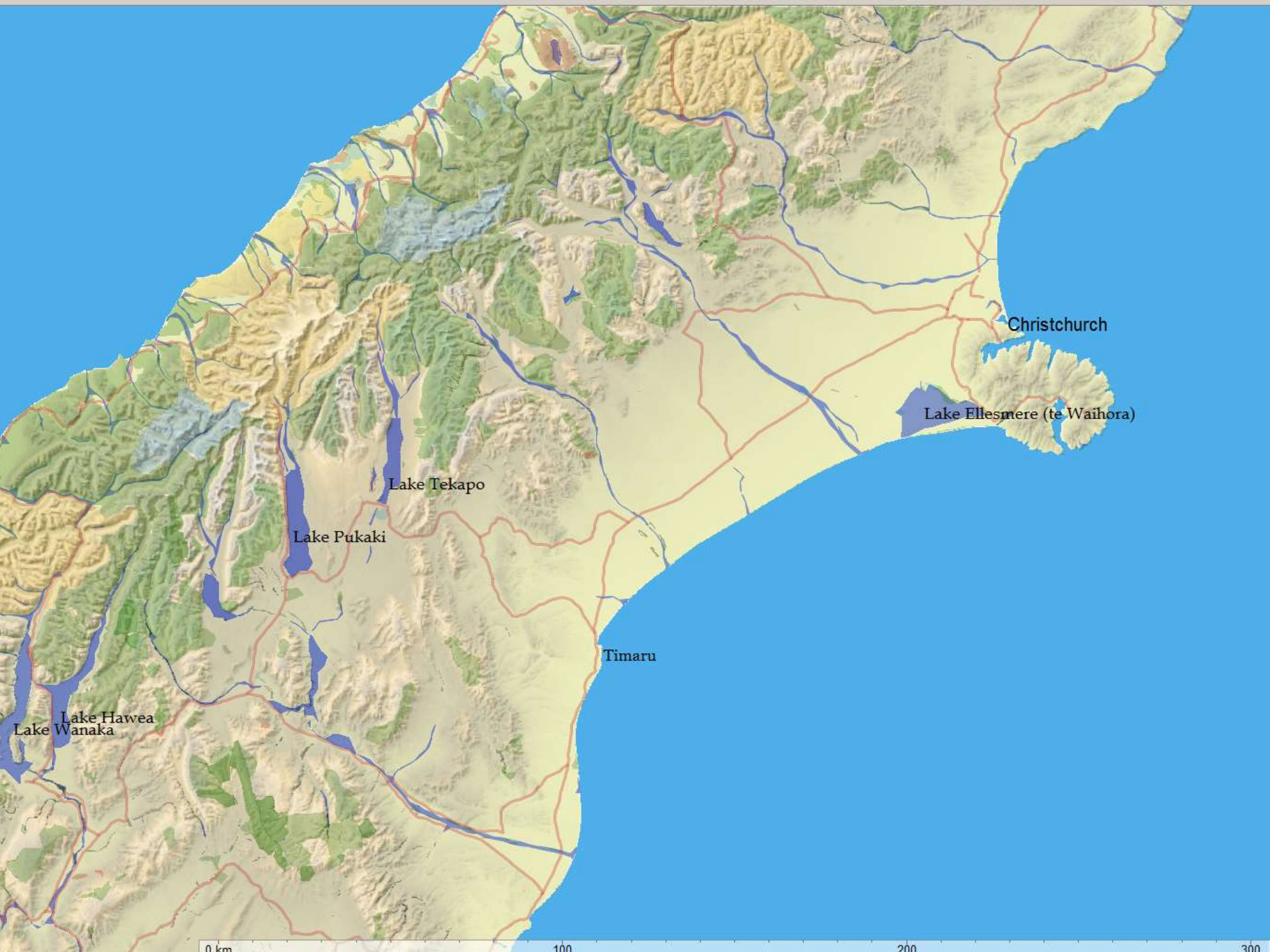
Data from Eggers; Figure from Schindler et al (2008): Fisheries



GATHERING FW DATA FOR EVIDENCE-BASED DECISION MAKING







Christchurch

Lake Ellesmere (te Waihora)

Lake Tekapo

Lake Pukaki

Timaru

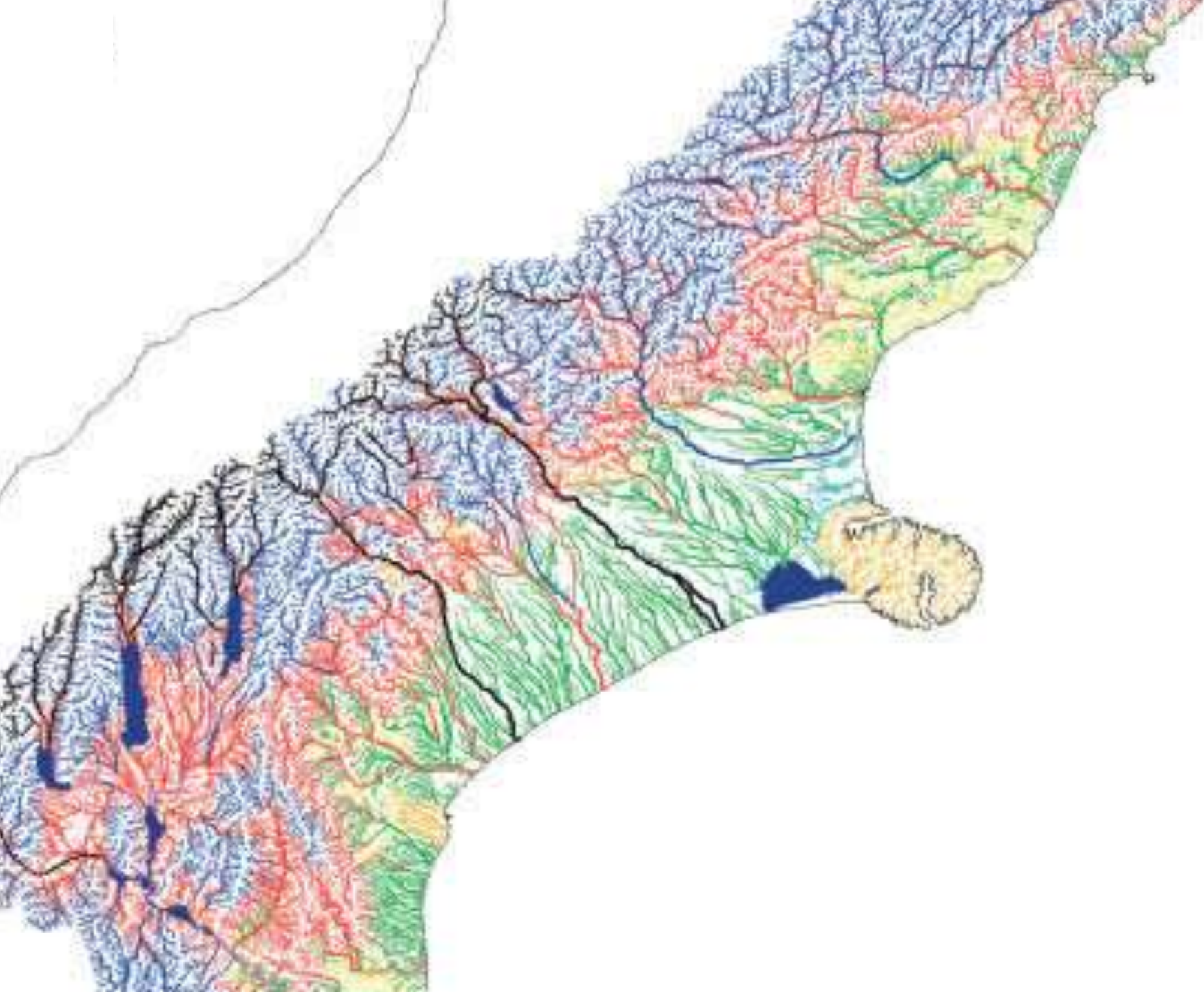
Lake Hawea
Lake Wanaka

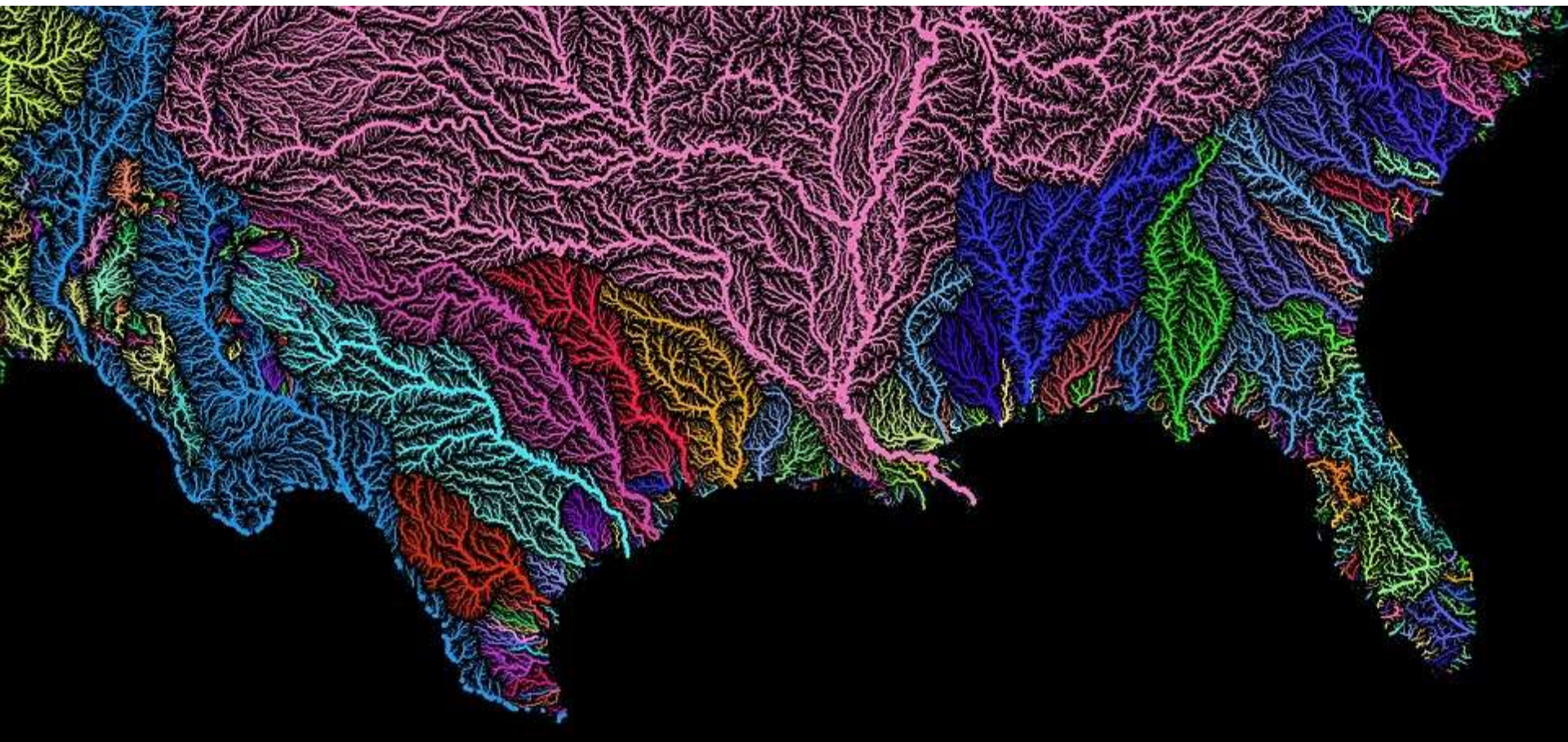
0 km

100

200

300





WILD SALMON POPULATIONS ARE SHAPED BY THEIR ENVIRONMENTS ...



Thank you!