Sensitivity of Puget Sound's water quality to climate and physical drivers

Washington State Department of Ecology

Long-term marine monitoring program

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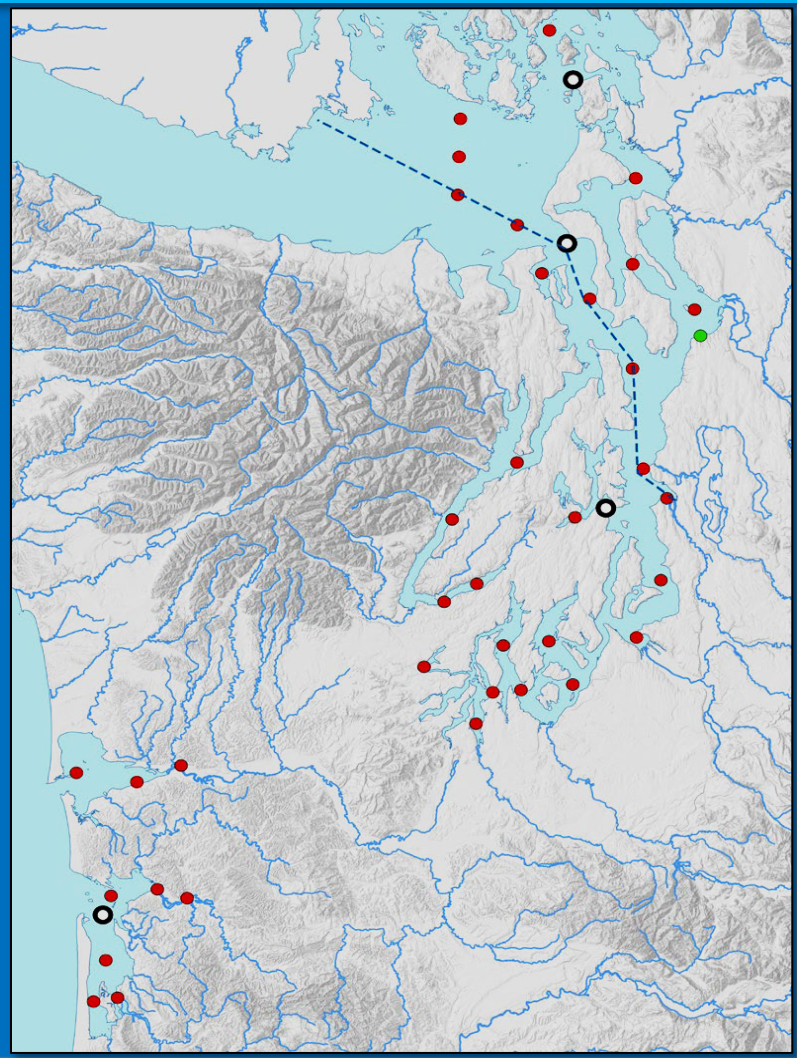
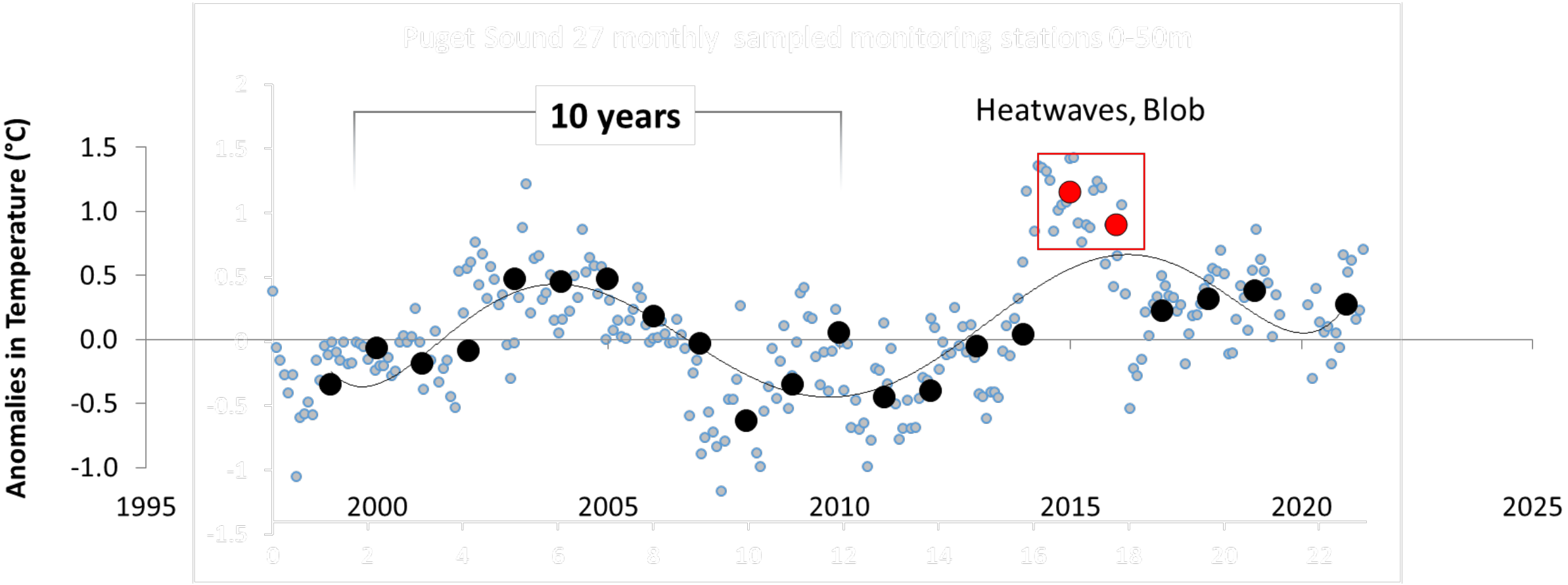
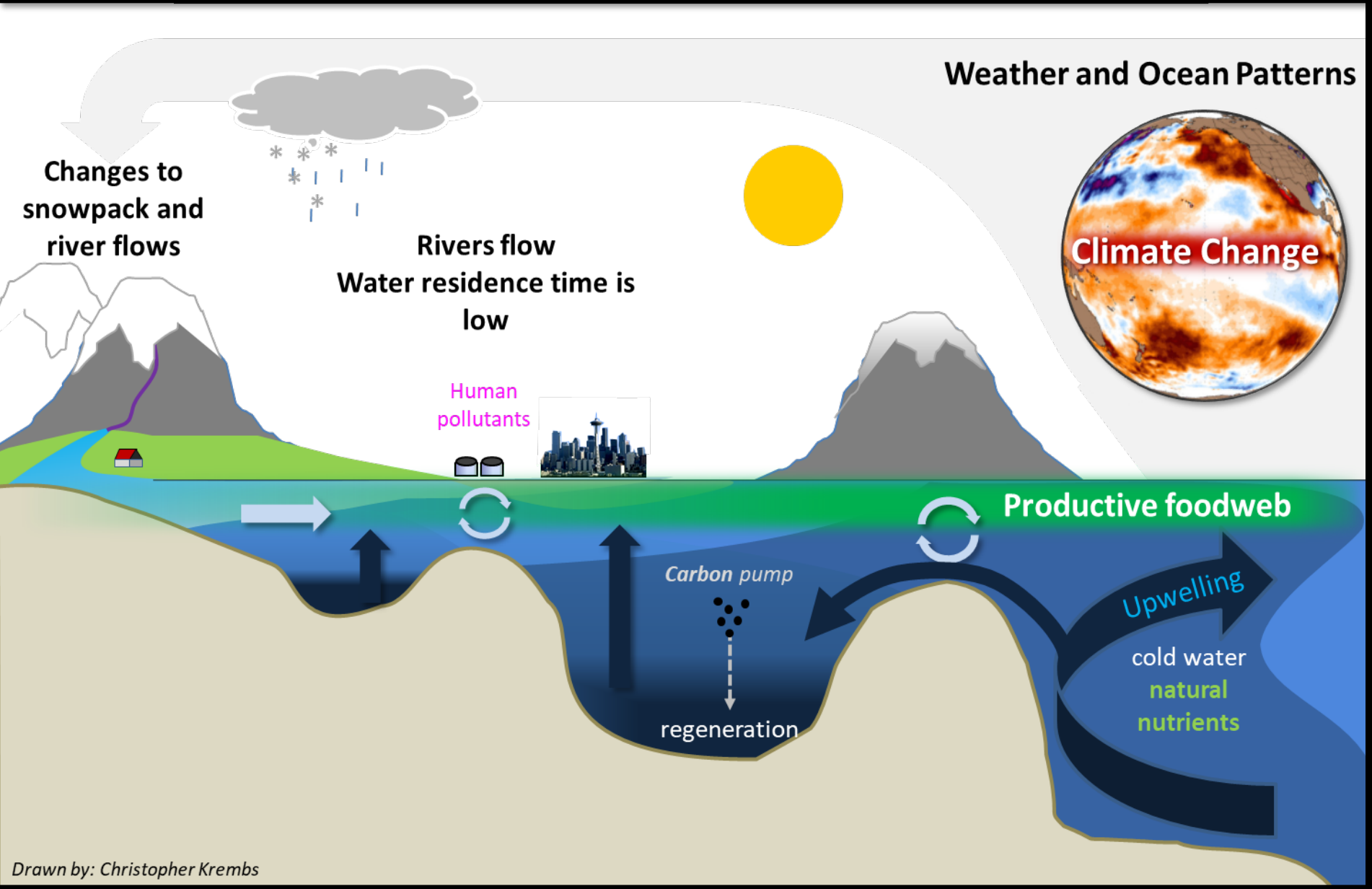
- Monitoring status and trend of 16 water quality indicators monthly at 37 station since 1973



Pacific Decadal Oscillation and upwelling are important drivers of Puget Sound water quality



Droughts increase human burden on water quality



Land Ocean Interactions

1. Consistent upwelling (northerly winds)
2. High Fraser River flows
3. Lower tidal mixing over sills

DEPARTMENT OF ECOLOGY State of Washington

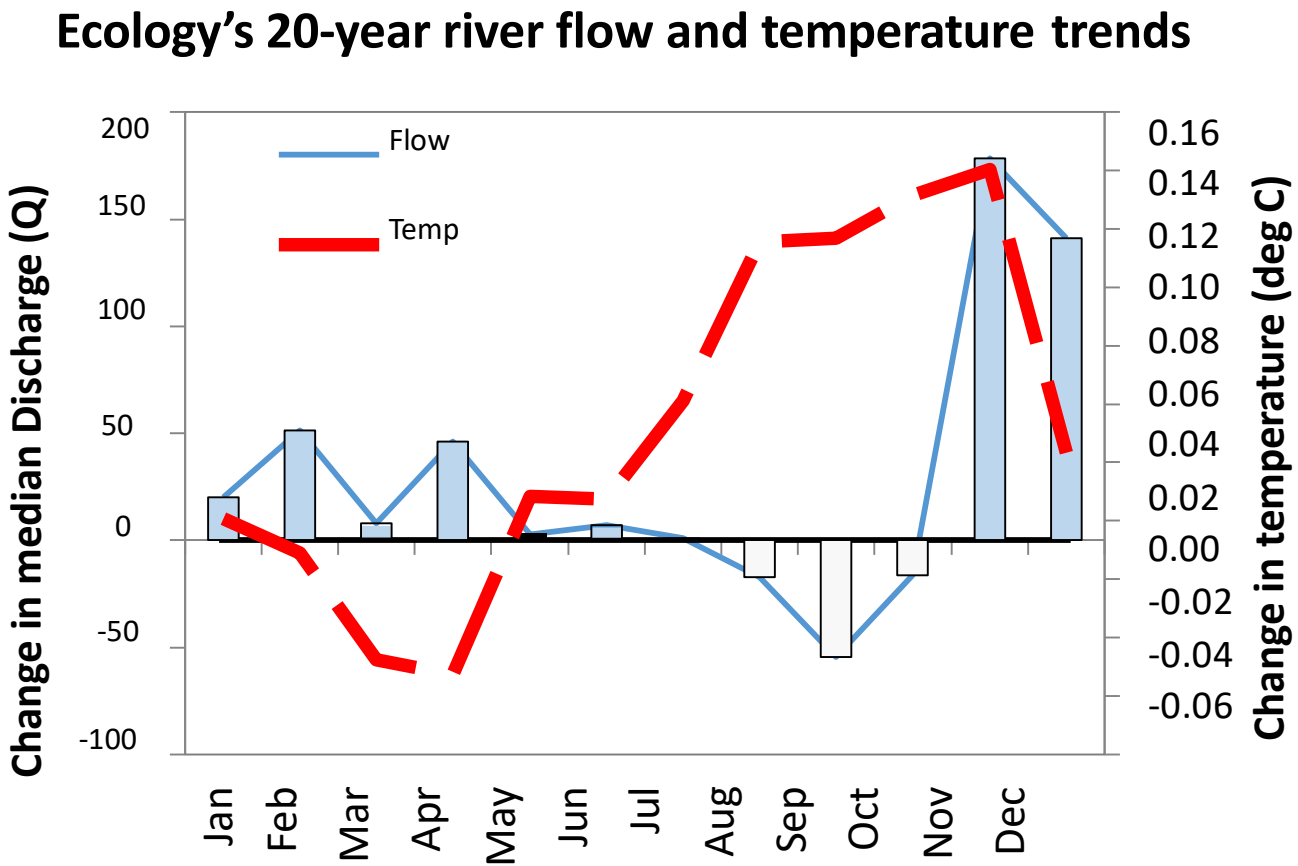
Aerial photography 6-14-2022

High number of schooling fish. On the image, we count more than 85 schools (marked with white vertical lines).
Location: Case Inlet (South Sound), 12:05 PM

Upwelled water keeps Puget Sound cool.

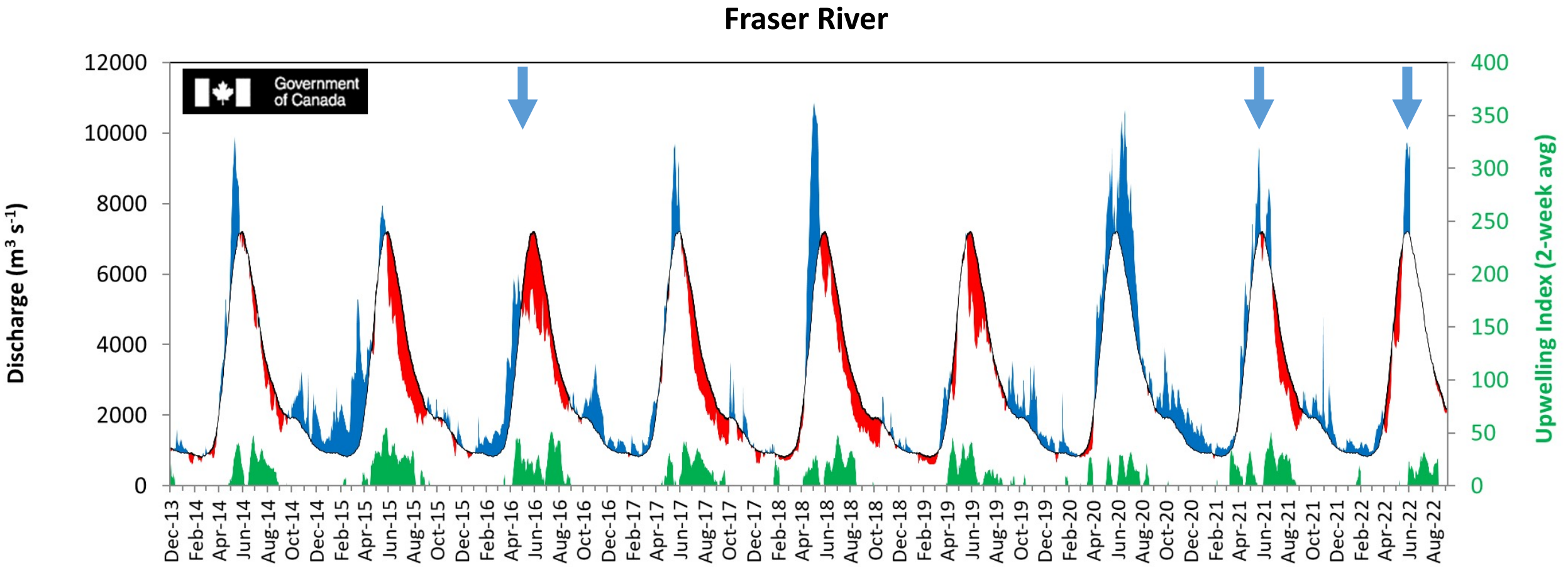
Years with cool, nutrient rich water are good for fish.

Freshwater response to climate



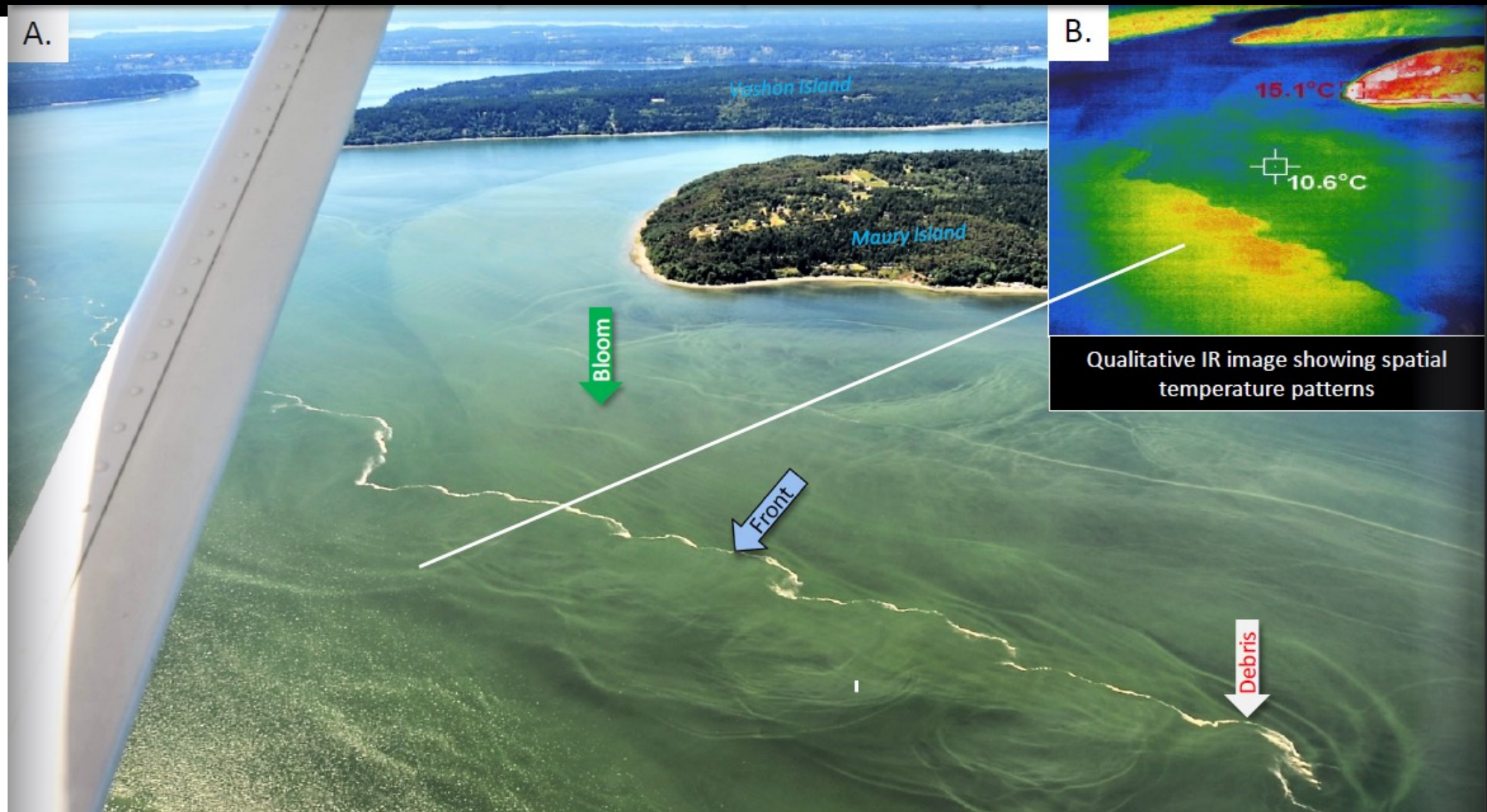
- **20 years of monitoring confirms changes in timing of FW delivery**

Upwelling and peak freshwater input align in summer

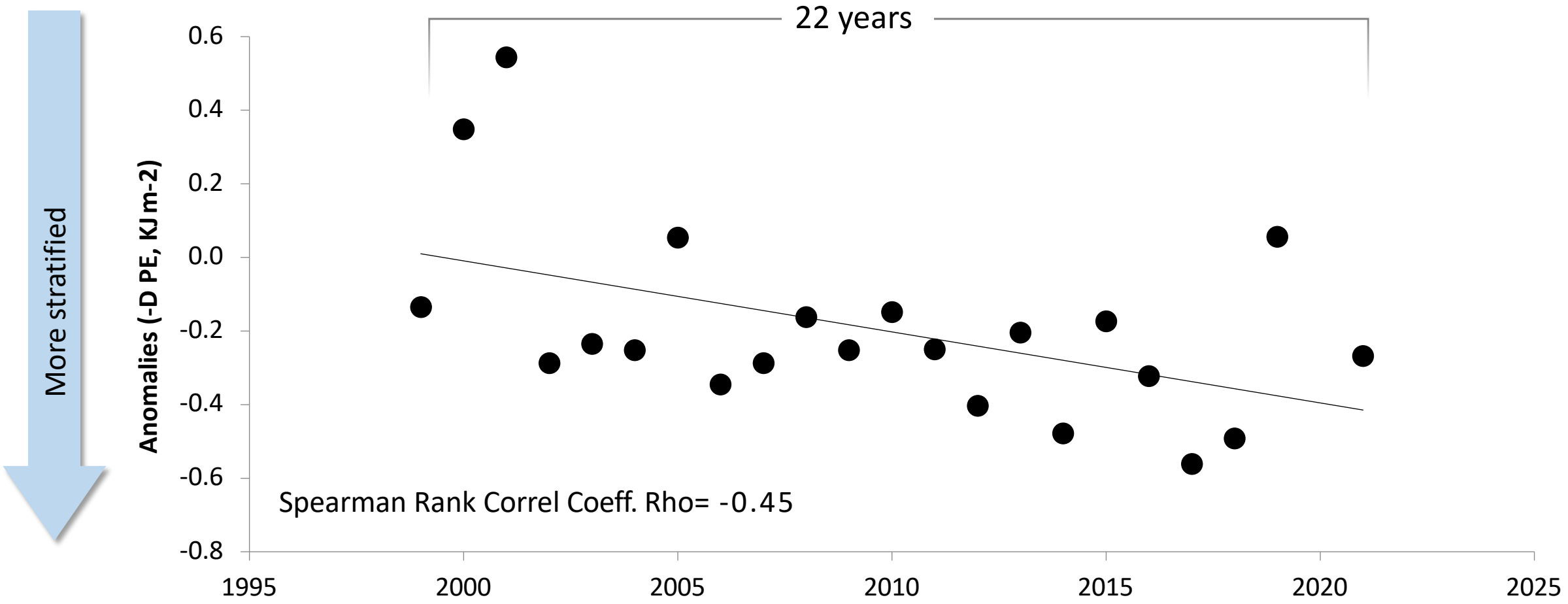


Climate → River Hydrology → Stratification

6-17-2021
Puyallup River plume

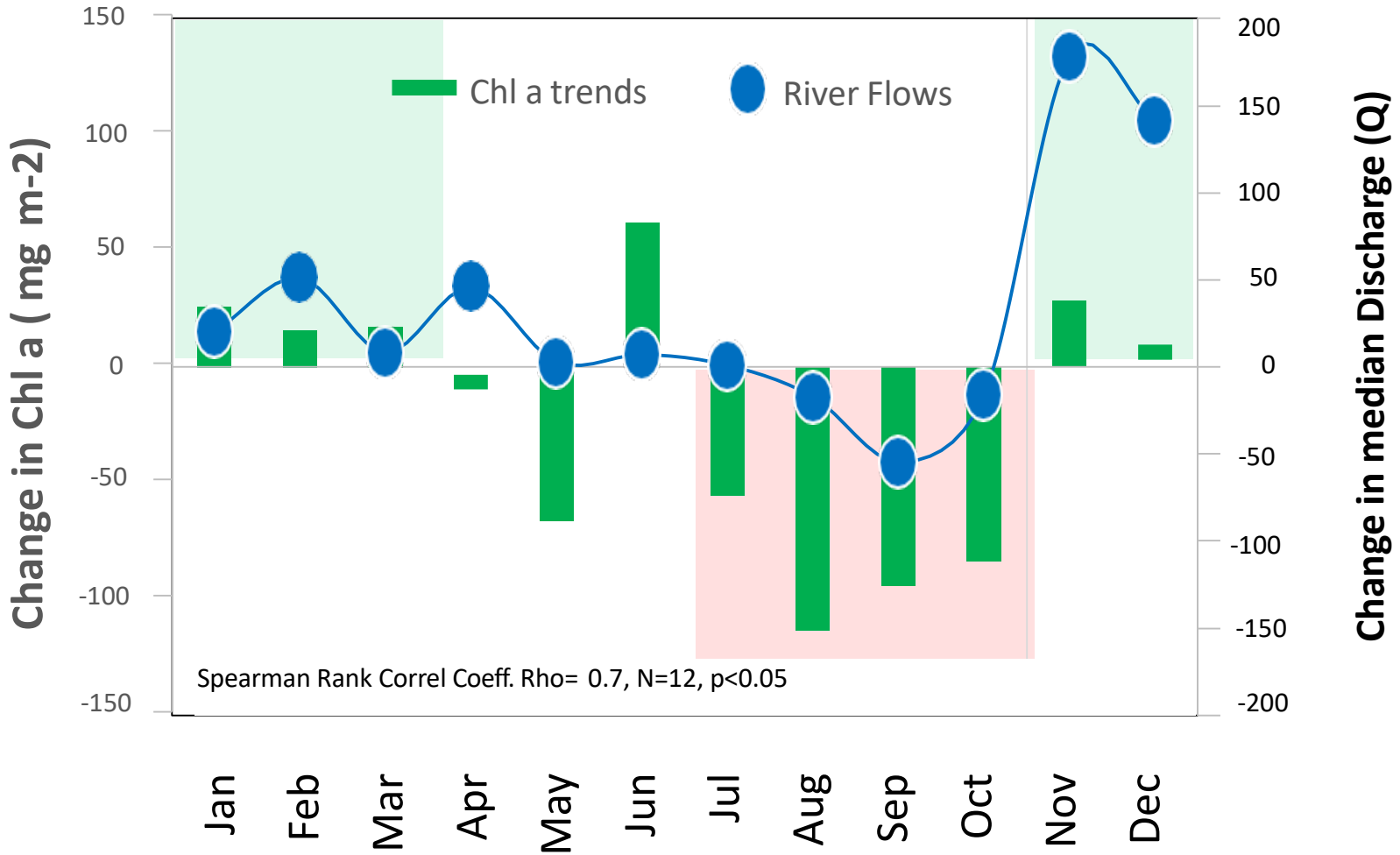


Climate change drives higher stratification



Impacts of low river flow on phytoplankton

Ecology's 20-year river flow and 2019 Puget Sound phytoplankton



Long-term Monitoring Matters

- Climate change impacts on Freshwater systems are cascading through the Puget Sound, which we only know thanks to extensive long-term monitoring efforts