

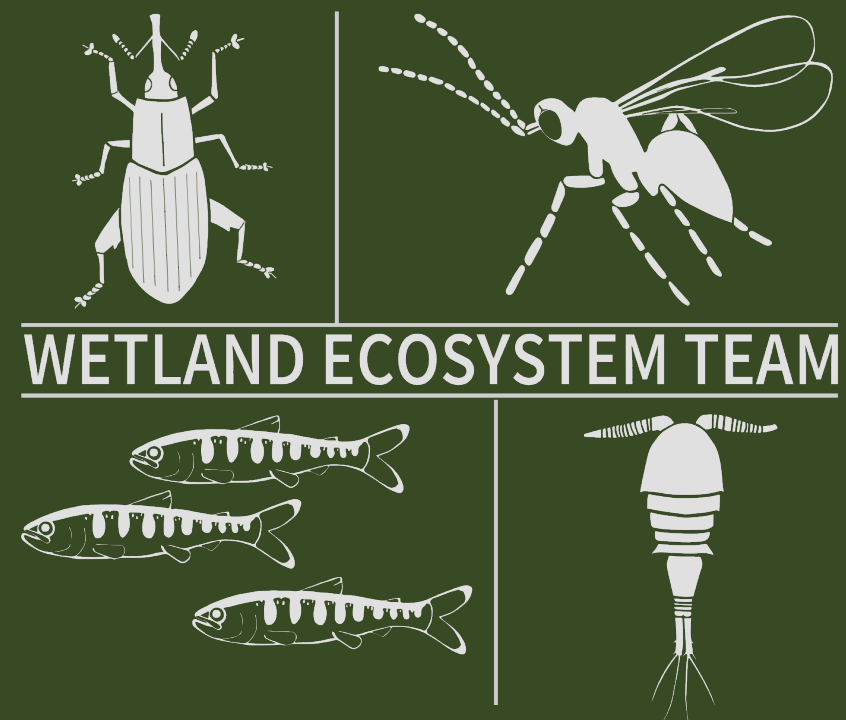
Shoreline Restoration Effectiveness in the Salish Sea



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Armor Impacts

Dethier et al. 2016. Multiscale impacts of armoring on Salish Sea shorelines: Evidence for cumulative and threshold effects. *Estuarine, Coastal and Shelf Science*.



Restoration Effectiveness?



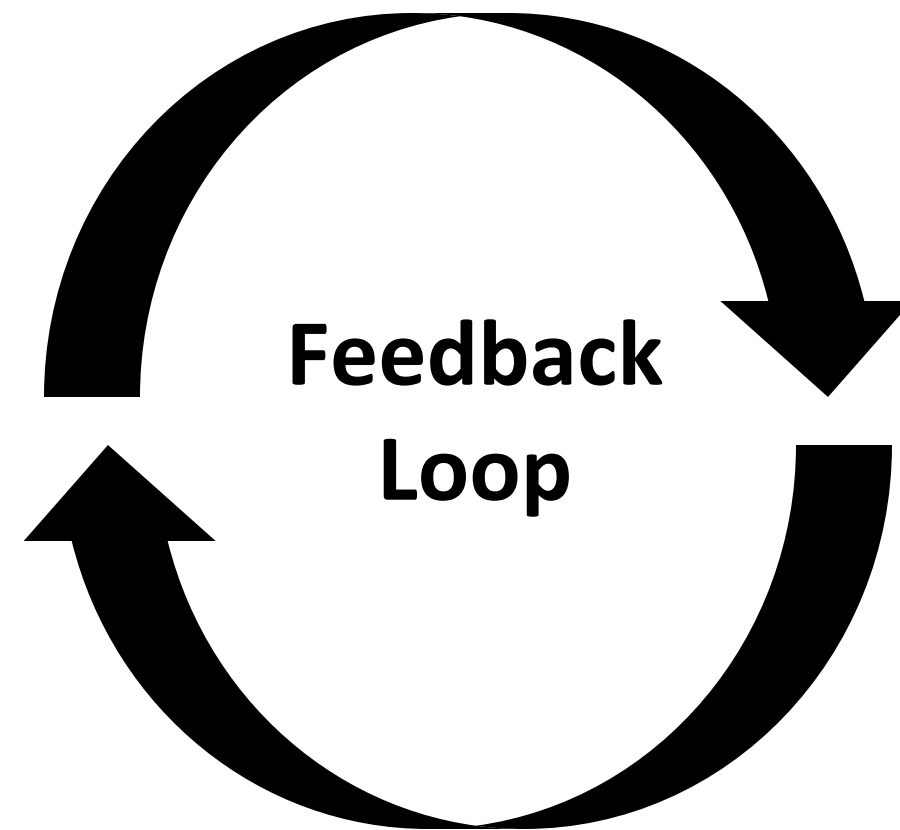
Impacts of Armor, and Restoration Effectiveness



Armor removal and restoration at Seahurst Park, a site of longer-term monitoring

The Role of Science in Restoration

- Prior to restoration – Inform goals
- During project design – Incorporation of data
- Monitoring restoration – What works, what doesn't



Online Database

www.shoremonitoring.org

- Community scientist engagement
- Protocol accessibility
- Data upload and download in a centralized format
- Data visualizations



PUGET SOUND ECOSYSTEM
MONITORING PROGRAM

Home User Guide Decision Tree Protocols Database and visualizations Map Documents References Contact Restoration Sites Sign Up Log In

Welcome to the Shoreline Monitoring Database.

A resource to upload data from standardized protocols for monitoring shorelines in Puget Sound, WA.

Sea Grant
Washington

UNIVERSITY of WASHINGTON
COLLEGE OF THE ENVIRONMENT

Protocols

- Twenty protocols available
- Eleven have data features including visualizations



Restoration Effectiveness

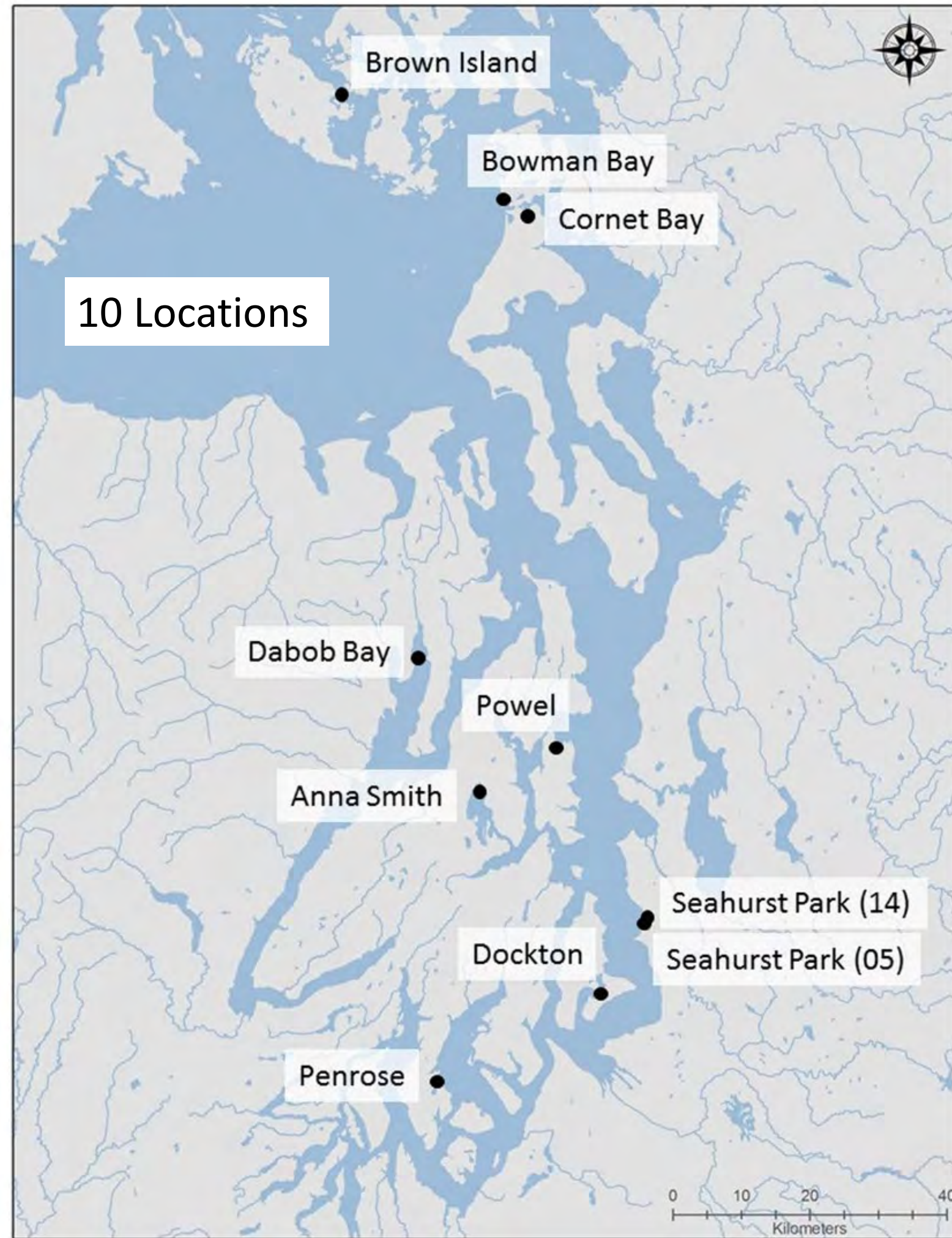
Restored



Armored



Reference





Summary of Statistical Tests: Darker Blue Colors are Greater

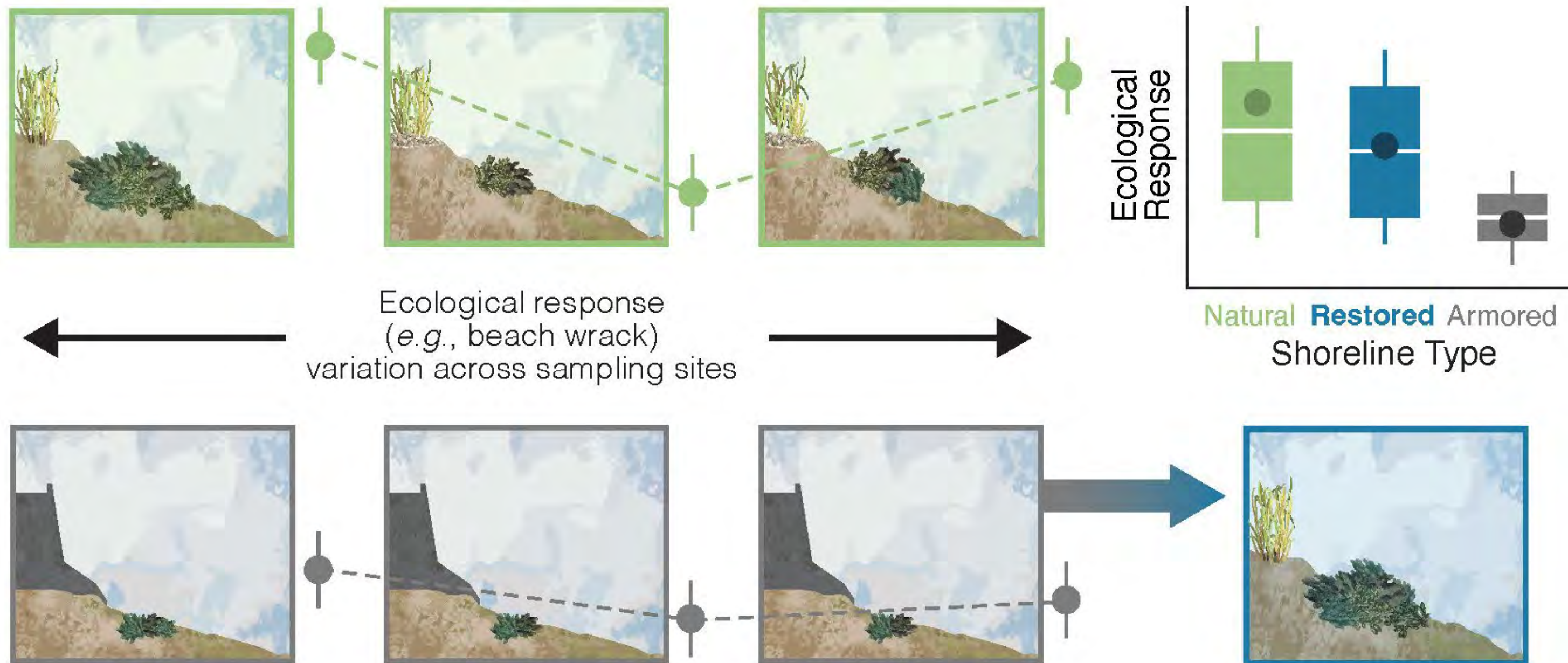


Metric	Armored	Restored	Reference
Beach Wrack	Light Blue	Dark Blue	Dark Blue
Logs and Riparian Vegetation	Light Blue	Light Blue	Dark Blue
Wrack Invertebrates	Light Blue	Medium Blue	Dark Blue
Insects	Light Blue	Medium Blue	Dark Blue



Shoreline Armor Removal Can Restore Variability

New data collected through citizen science efforts across Puget Sound, WA show that **armor reduces the variation in ecological responses** compared to natural, unarmored shorelines.



Length of Armor Removed & Additional Actions

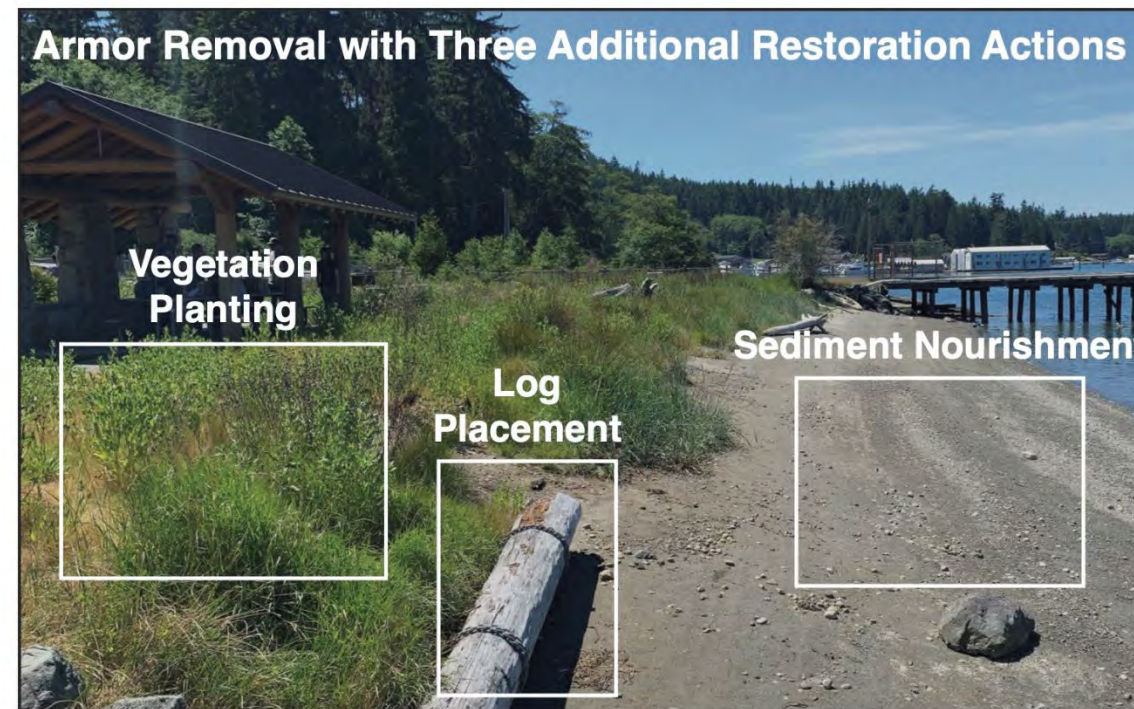
Pre-Restoration

Post-Restoration

Big Beach, Vashon Island



Cornet Bay, Deception Pass

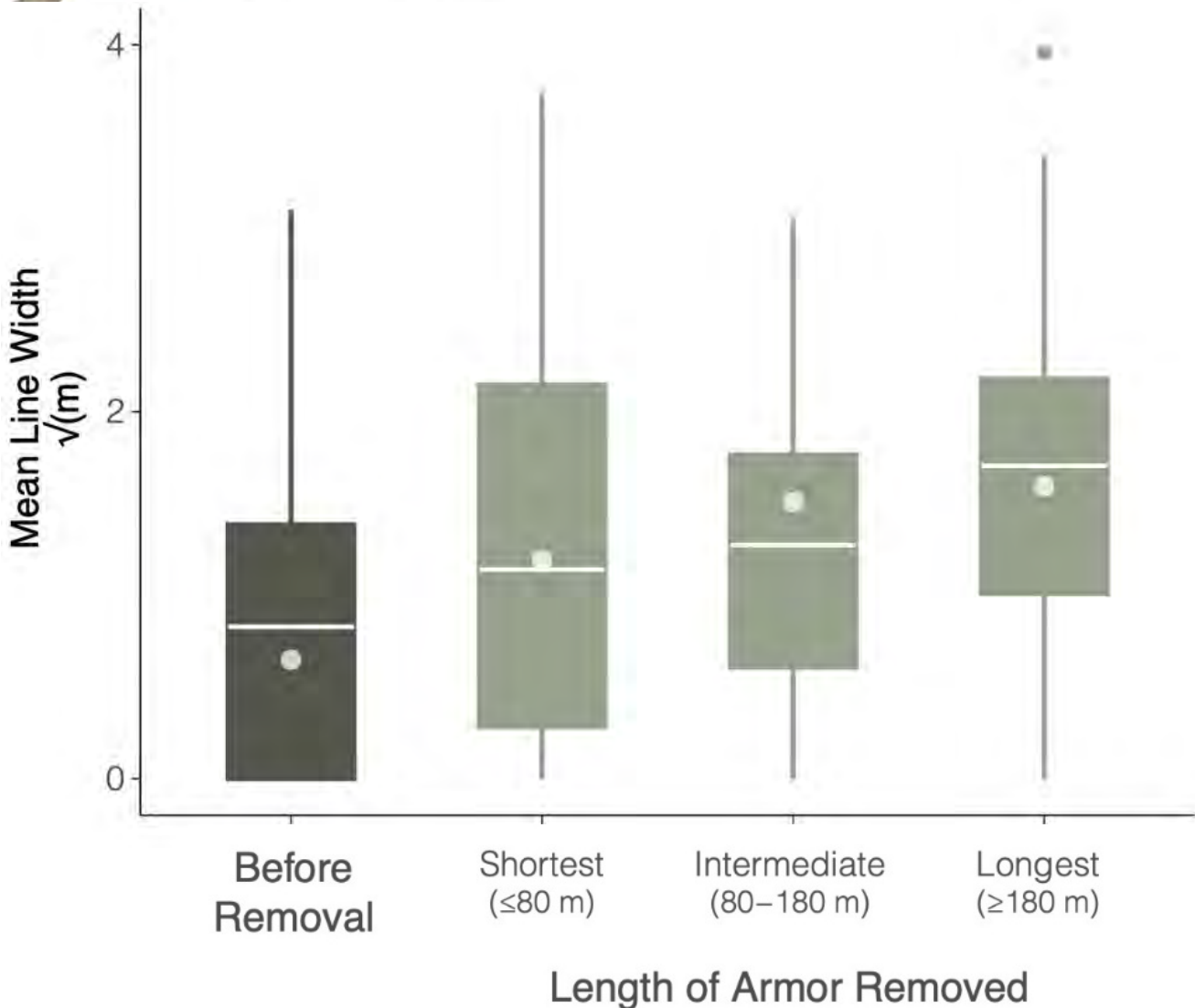


Des Roches et al. 2024. Shoreline restoration including armor removal and log placement affect ecosystem recovery through time. *Restoration Ecology*.

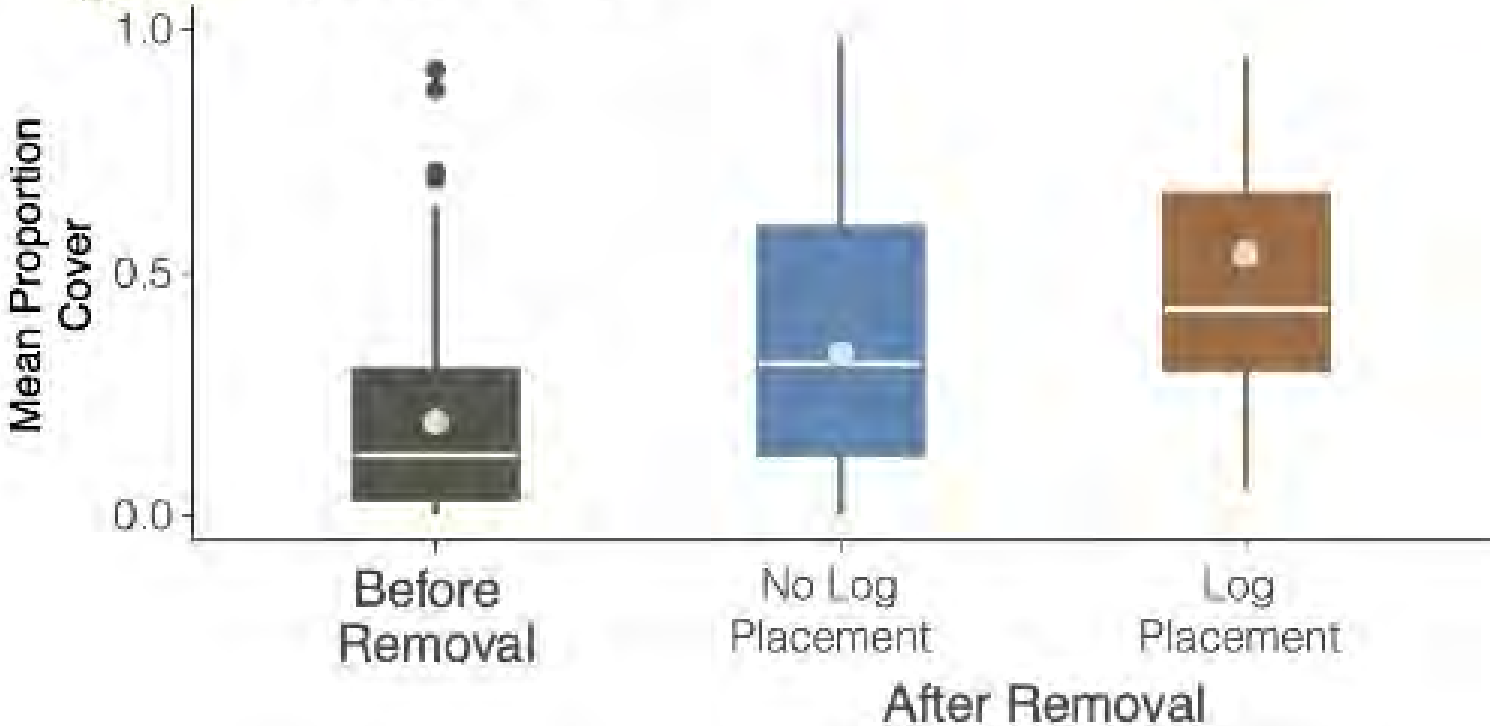
Armor Length Removed, and Log Placement



a) Beach Logs



c) Beach Wrack

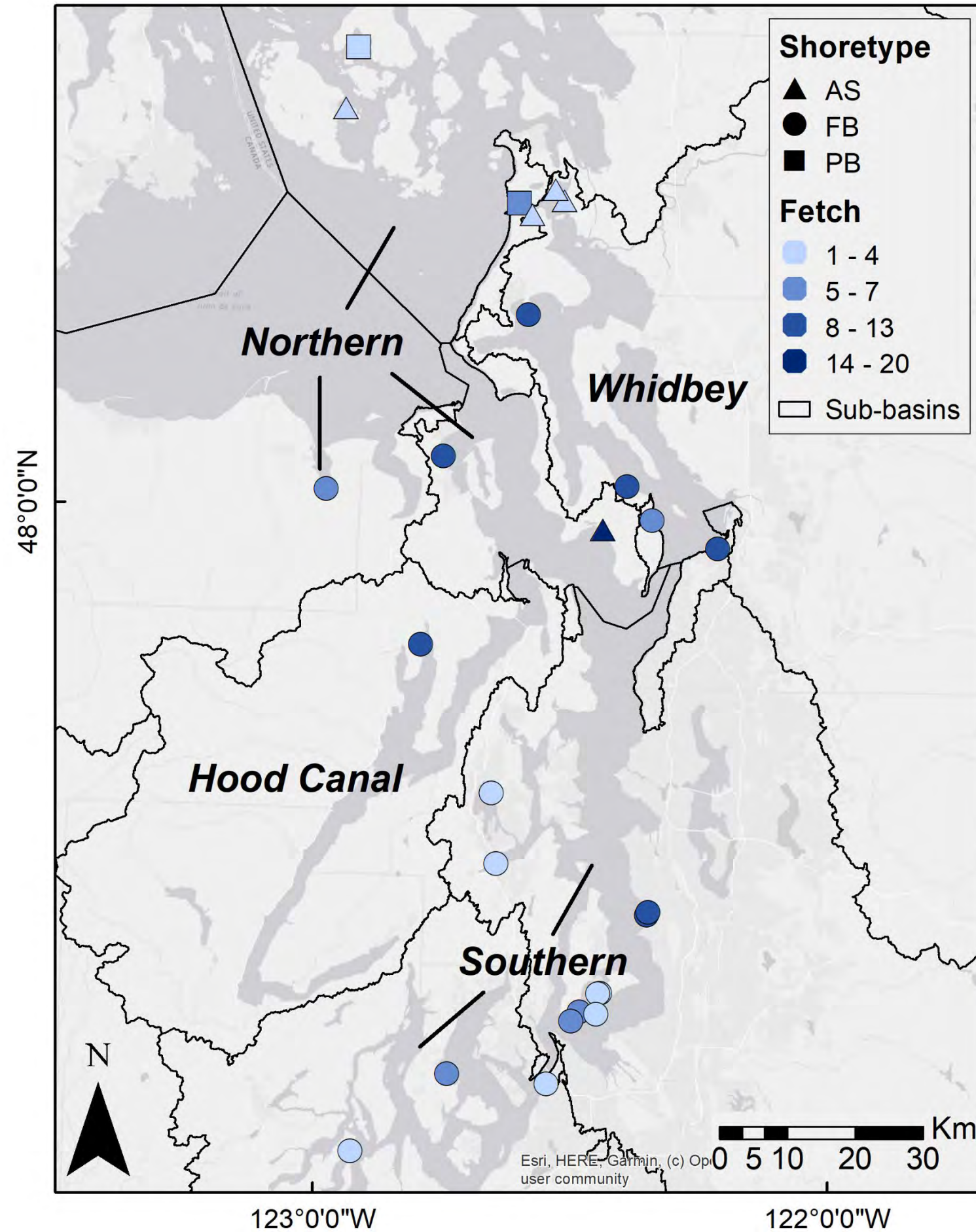




Salish Sea Beaches

Much of the shoreline is supplied by actively eroding bluffs of glacial origin that feed sediment to beaches

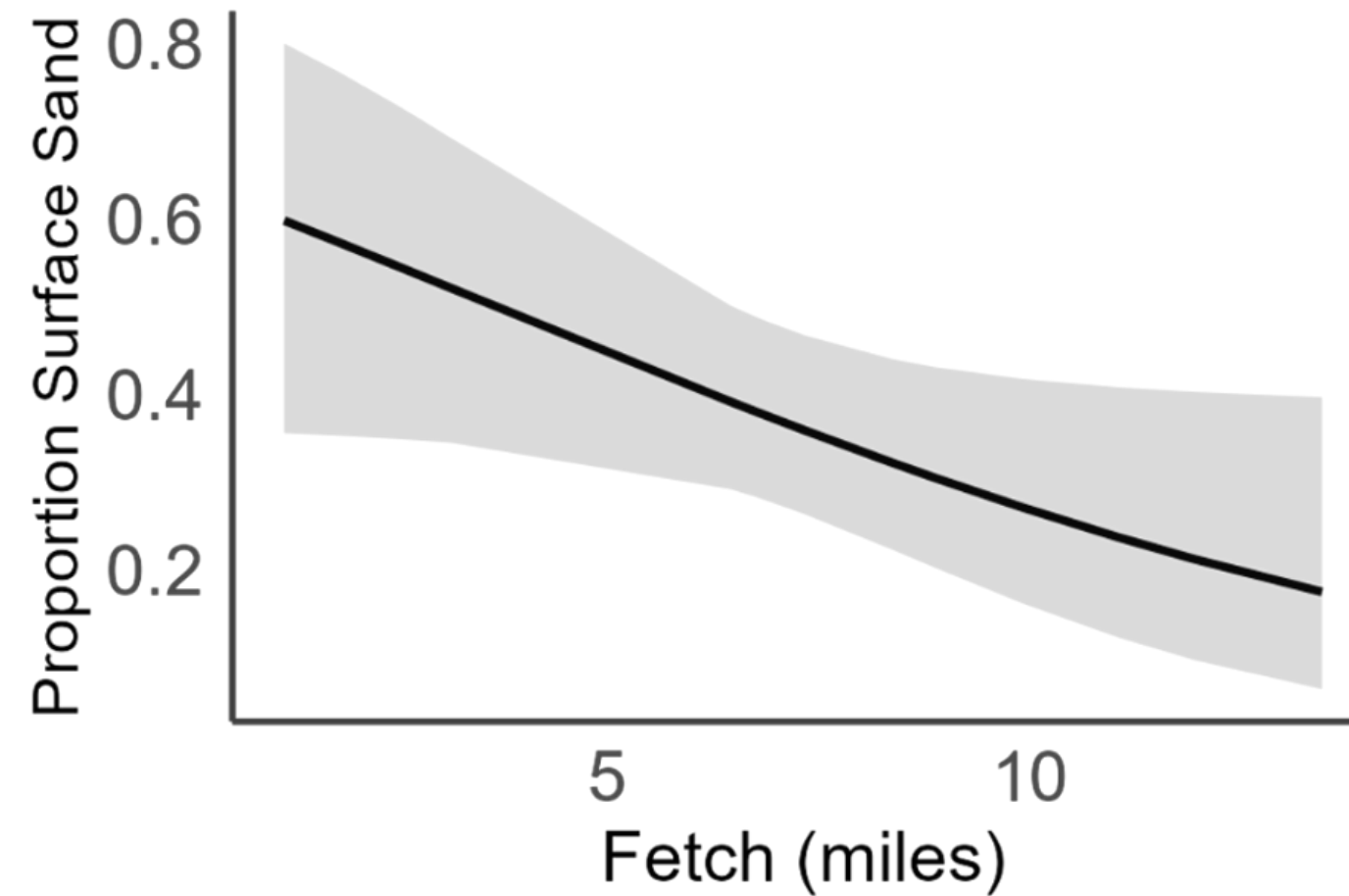
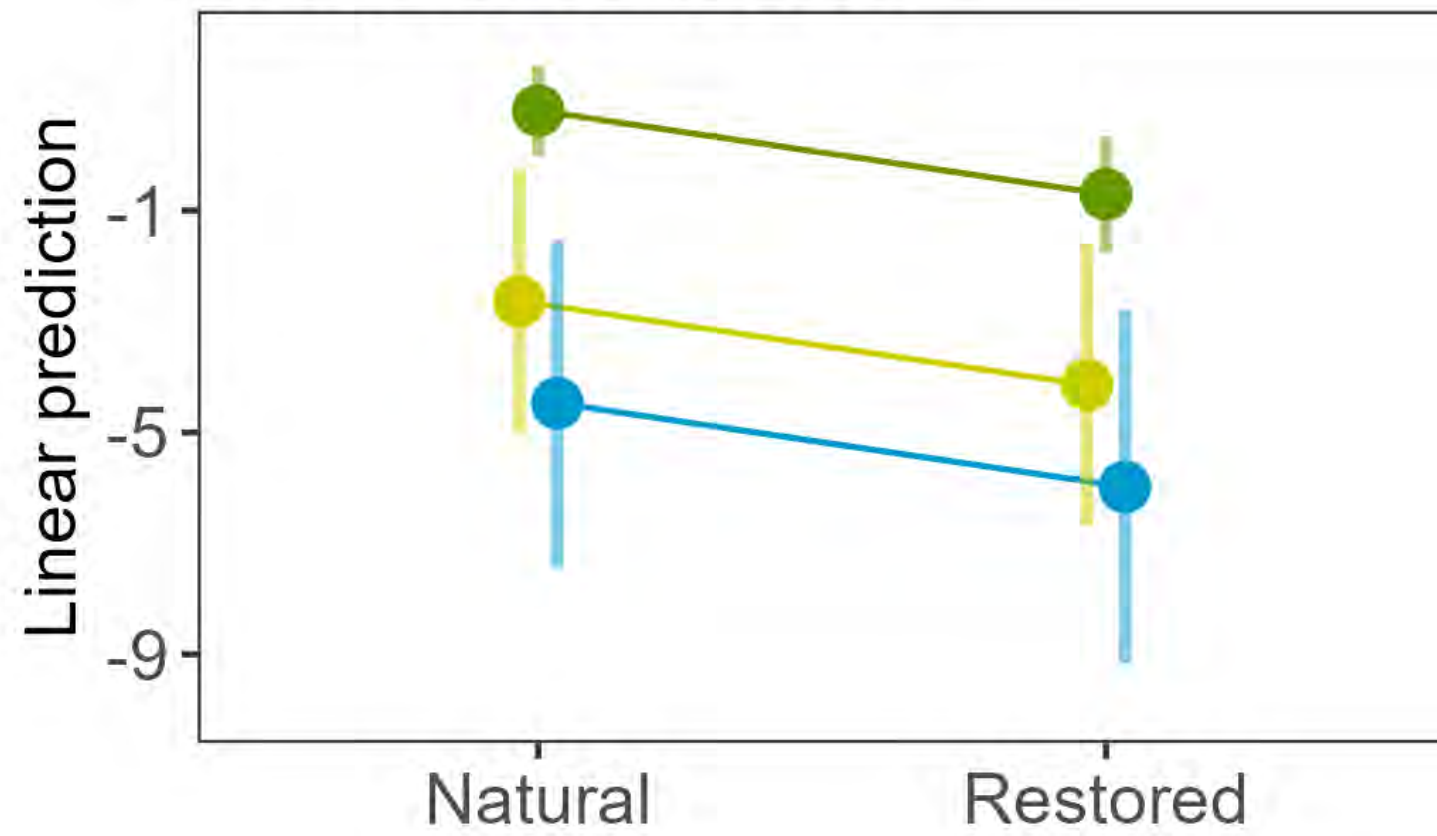
Coastal Landforms and Fetch



Shoretype at Natural and Restored Sites



Count of Fallen Trees



Bluff restoration

Restoring sediment supply processes at beaches with armored bluffs could double their ecological function.



Key Messages

- Armor removal often effective at restoring close to natural levels.
- The length of armor removed can lead to increased response in some cases.
- Placement of logs is an effective Living Shoreline treatment.
- Shoretype and fetch can govern restoration response.



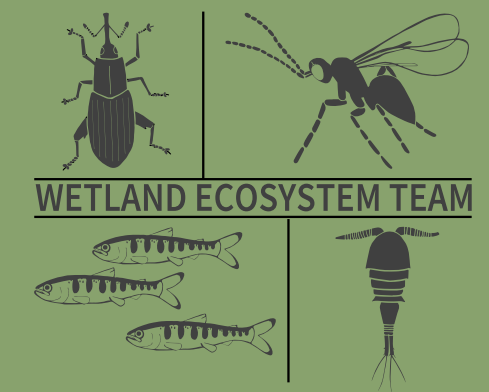
Next steps

- Current funding, grad student!
- More protocols, more fieldwork, more sites on restoration and protection.
- Sea level rise, landscape effects, timeline of monitoring?



Thanks!

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<https://depts.washington.edu/wetlab/>
Instagram – @uw_wetlandecosystemteam

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