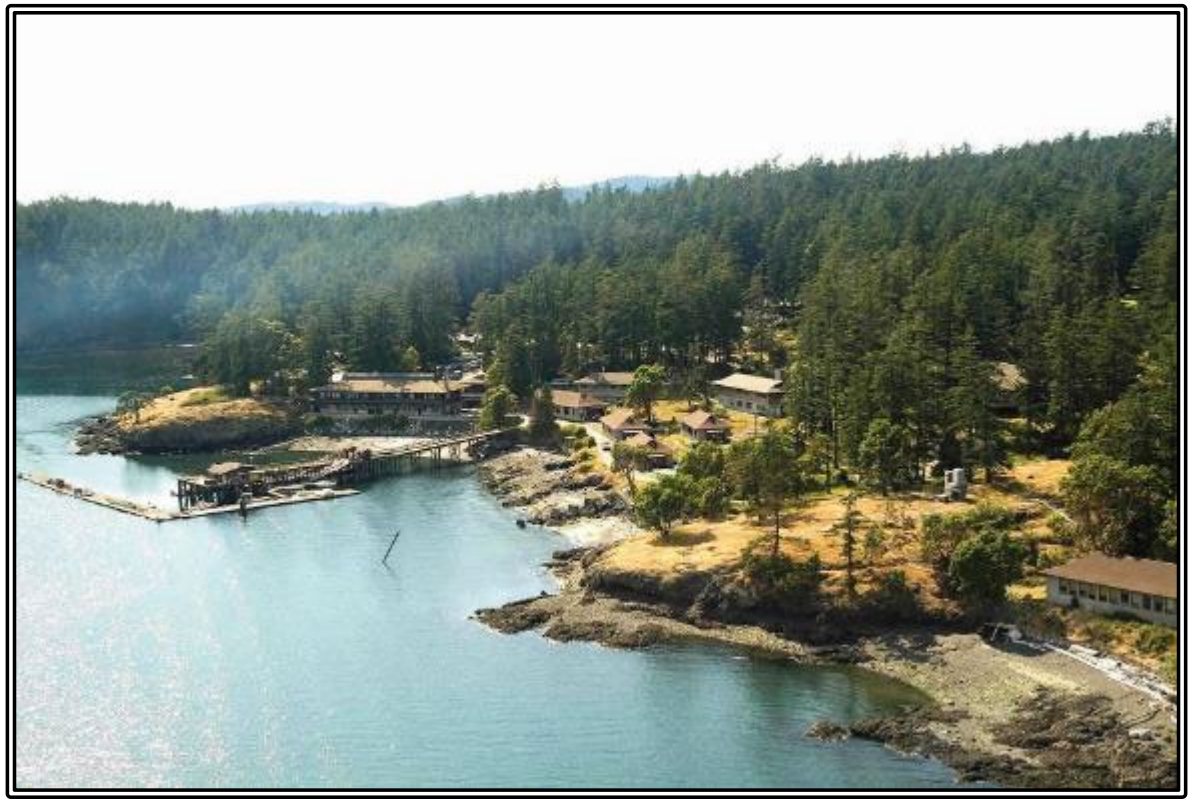
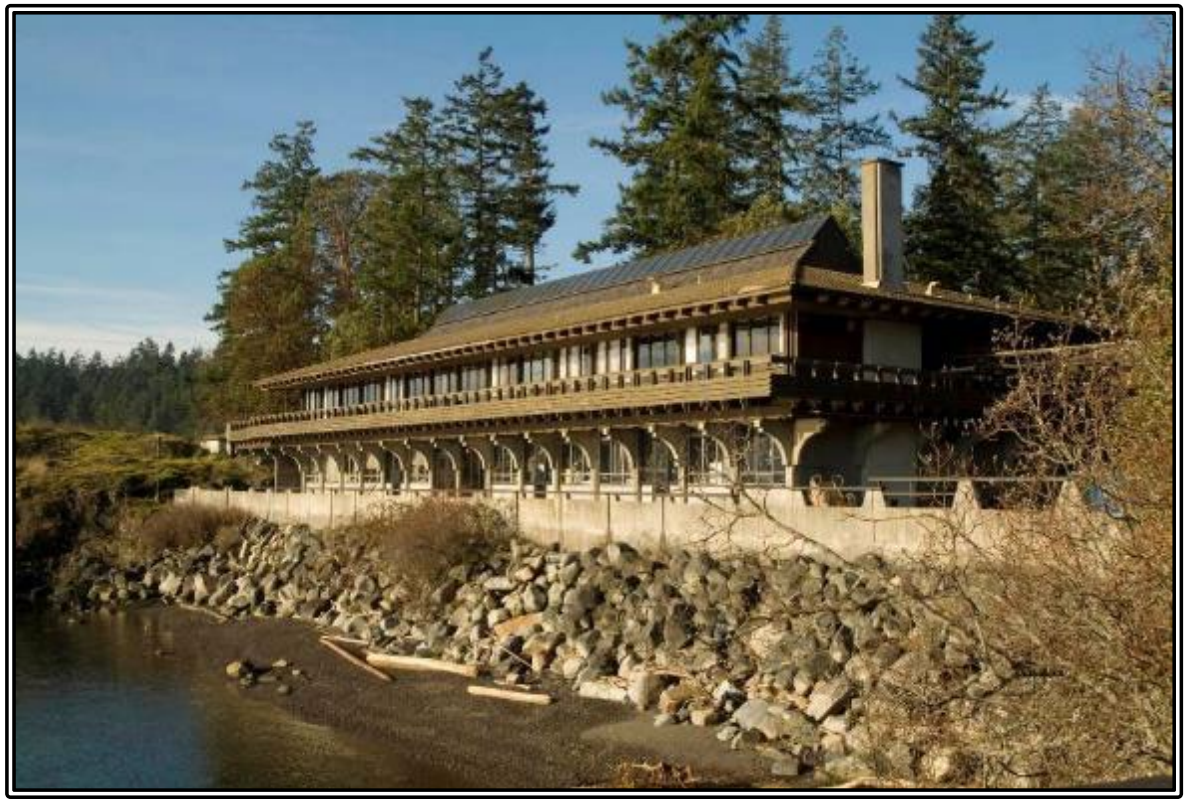
Overview of Friday Harbor Laboratories and some local projects

Megan Dethier, Ph.D
Director





Mission:

To create and maintain a world-class facility for marine research and education, with an open and egalitarian atmosphere

University of Washington
College of the Environment

Research Facilities:

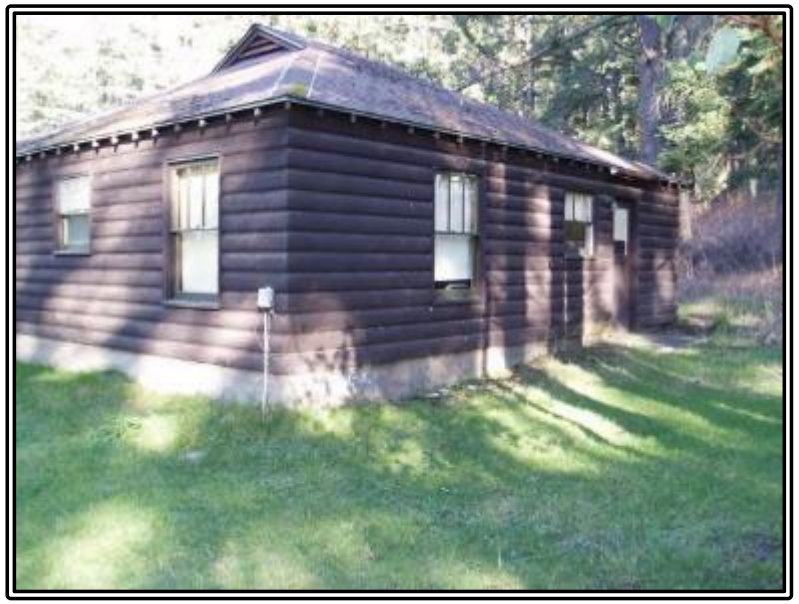
- 13 laboratory buildings, most with running seawater
- Ocean Acidification and Environmental Laboratory
- Imaging Facility
- Genetics Laboratory
- Research Vessel
- Diving facilities and program

University of Washington
College of the Environment

Housing on campus:

- Dorms
- Huts
- Graduate Student Housing
- Cottages
- Apartments
- Duplexes

Total capacity ~ 150 people



University of Washington
College of the Environment

Other Facilities:

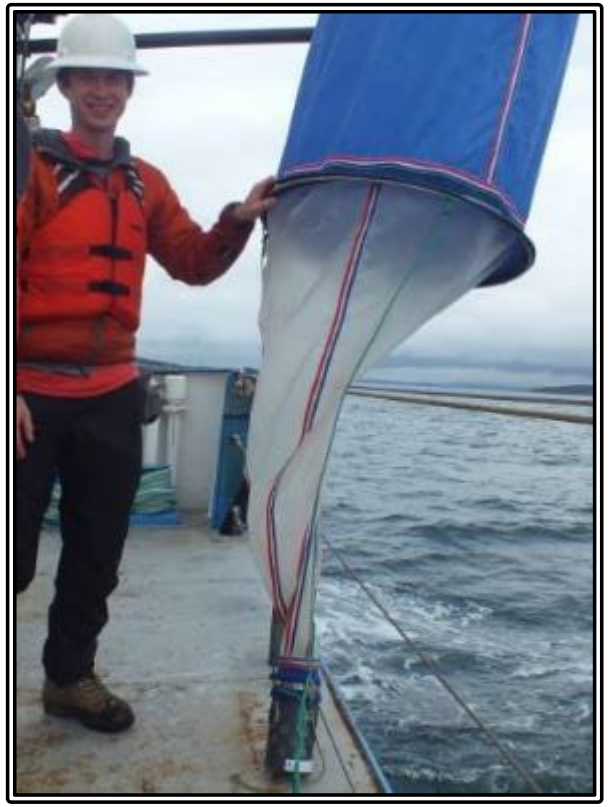
- Classrooms, large meeting spaces
- Dining hall
- Computer lab
- Stockroom
- Library

Other Facilities:

- Whiteley Center
- Artist Studio
- Boats, large and small
- Maintenance shop
- ~500 acres biological preserve

Academic Program:
Spring Quarter (10 weeks), Summer Quarter (two 5-week sessions, Fall Quarter (10 weeks)

- 20 students (or fewer) per class, 3-6 classes at a time
- Lots of time in the field
- Work is all hands-on with live organisms
- Courses very diverse, from genetics to ecology
- All for UW academic credits
- **Many students rely on scholarships** from private donors



Community Outreach:

Friday Harbor Labs Science Outreach Program

- Brings marine science lessons into every grade on San Juan Island (public and Spring Street schools)
- Field and laboratory work
- Maintain elementary school aquarium

FHL Annual Open House

(May 13, 2023?)

More Outreach…

- **Connecting with the Canoe Journey,** other tribal connections
- **Seminars:** open to all
- **Tide Bites:** monthly e-newsletter

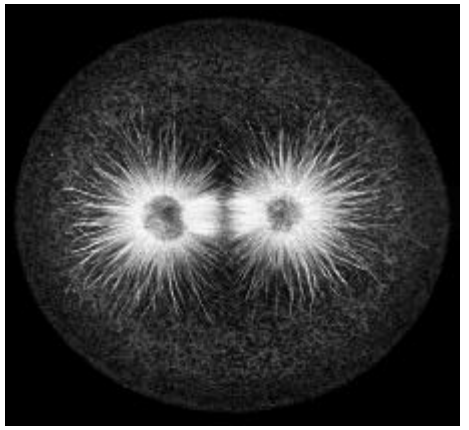
GAINING A "FRESH" PERSPECTIVE ON OCEAN ACIDIFICATION

by Aaron Ninokawa

Climate change resulting from increased emissions of carbon dioxide is a major issue facing global communities. One aspect of climate change that is particularly concerning is ocean acidification. This occurs when that extra carbon dioxide enters the ocean to form carbonic acid, which makes the seawater more acidic (causing a reduction in pH). Organisms that form shells, like mussels and oysters, are especially impacted by this process as they have a harder time growing and producing high-quality shells in an acidified ocean. Extensive research in marine systems has revealed that responses of species to acidification can differ depending on a wide range of factors like the organism's life stage, type of shell material, exposure history, etc.

Types of Research at FHL: Diverse!

- Genomics – the genetics behind evolution and development
- Cell Biology
- Biomechanics
- Shoreline ecology
- Studies of marine diseases – eelgrass, seastars
- Larval ecology, especially how to raise sunflower stars
- Seagrass ecology and restoration
- Neurobiology, Ocean Acidification, ….

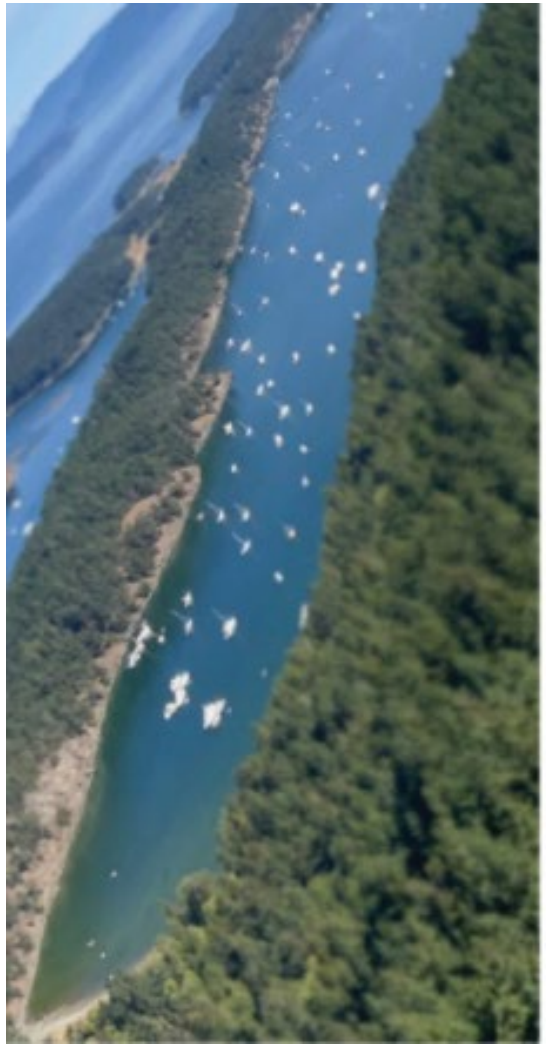


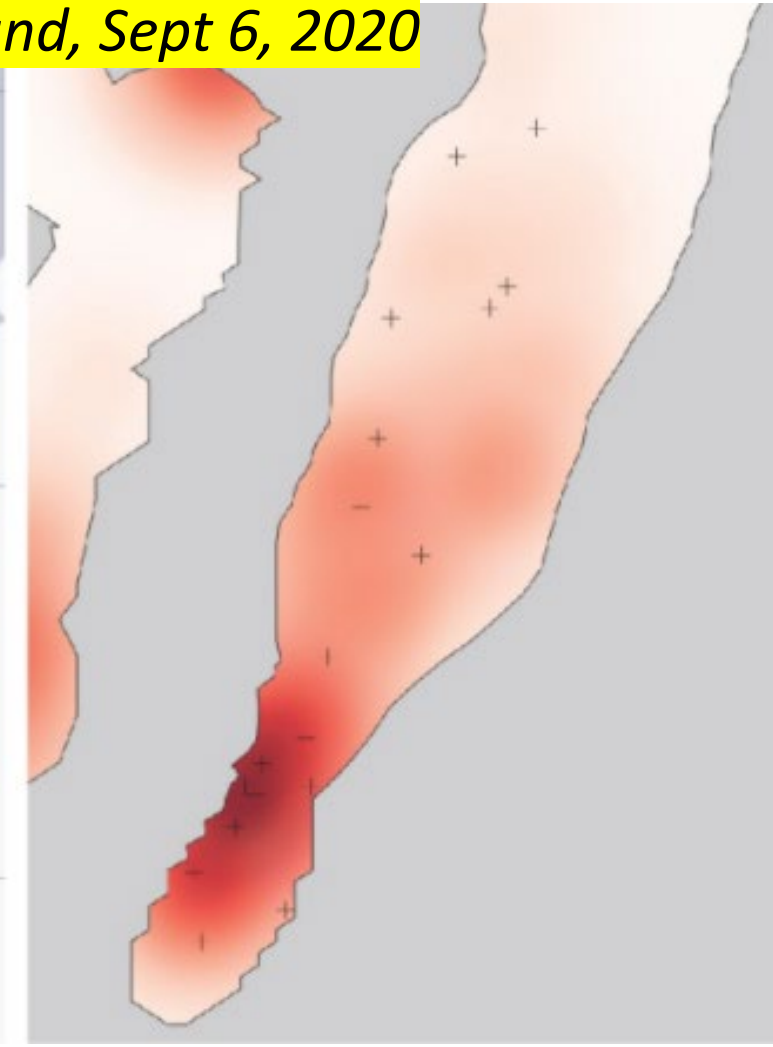
A sampler of marine field projects currently underway

- Over the last 20 years, sites with declines in eelgrass abundance exceed those with increases (DNR data)
- The FHL Seagrass Lab: seeking to **understand eelgrass declines and find effective restoration methods**
- A pilot program is testing if the large-scale, low-cost technique of restoring eelgrass area with seeds is feasible locally

Using AIS Data to Track Boat Occupancy in San Juan Archipelago Embayments: Seasonal Trends and Potential Impacts

Reid Harbor, Stuart Island, Sept 6, 2020





Aerial photo AIS Screenshot "Heat map" of boat impact on the seafloor

In collaboration with MRC, FSJ: Protect eelgrass through “Anchor-Out zones”

- These are voluntary, but have been working beautifully in Port Townsend.
- The Marine Resources Committee has been conducting vessel surveys to assess effectiveness of the zone at Odlin County Park.
- Further areas planned around the county and the MRC has been conducting pre-installation vessel surveys.

Mooring buoy assessment

- The MRC and an FHL student are undertaking an assessment, using aerial photos, to identify all mooring buoys in San Juan County.
- This effort will enable the County's Marine Program staff to determine where the highest densities of mooring buoys are in the county.
- They will also be assessing the regulatory status of mooring buoys that have appeared since 2009.

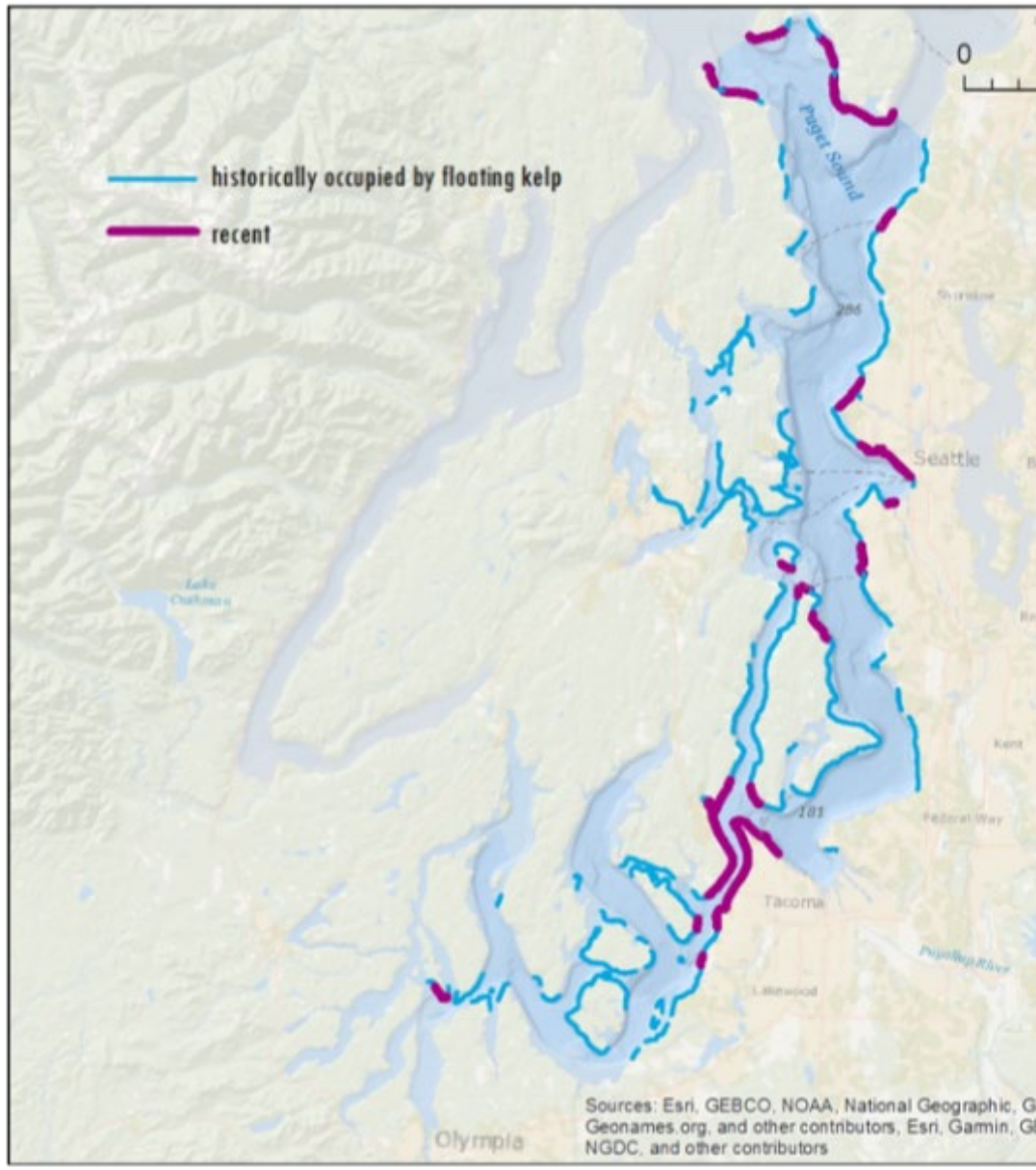
Underwater Acoustic Monitoring for noise pollution that affects marine mammals

FHL provides vessel support for Jason Wood, SMRU (Sea Mammal Research Unit)

- Measure underwater soundscapes
- Monitor the habitat use of vocalizing marine mammals (orca, humpbacks, and harbor porpoise)
- Try to identify the sources of human generated noise and then work with others (e.g., SJ County MRC, ECHO Program) to develop mitigation strategies

Understanding kelp losses in the Salish Sea

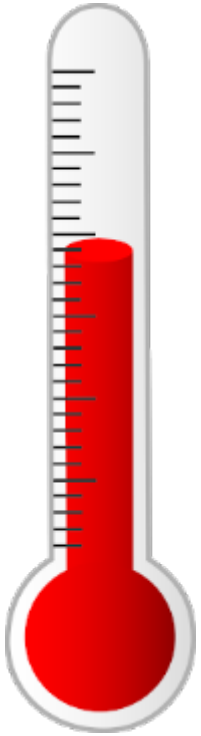
- Bull kelp losses are clearly documented for south Puget Sound; trends are less clear for San Juan County
- Lots of work on this issue! Field surveys, drone images of beds
- Lab work studying effects of temperature, salinity, and nutrients on growth of bull kelp – both microscopic and macroscopic stages



Floating kelp

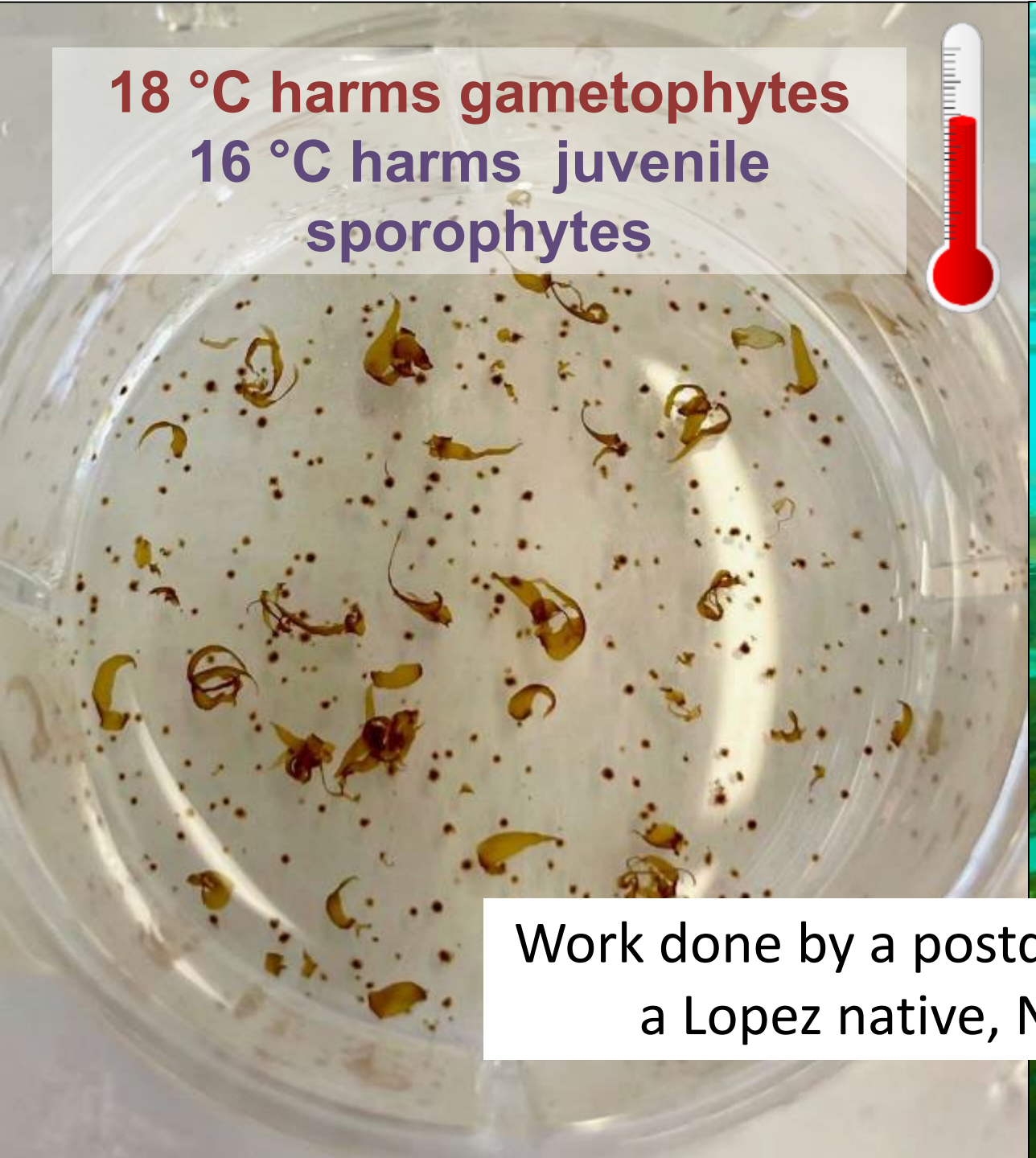
Historical studies & recent

What factors contribute to the loss of kelp forest ecosystems? Regional differences in stressors

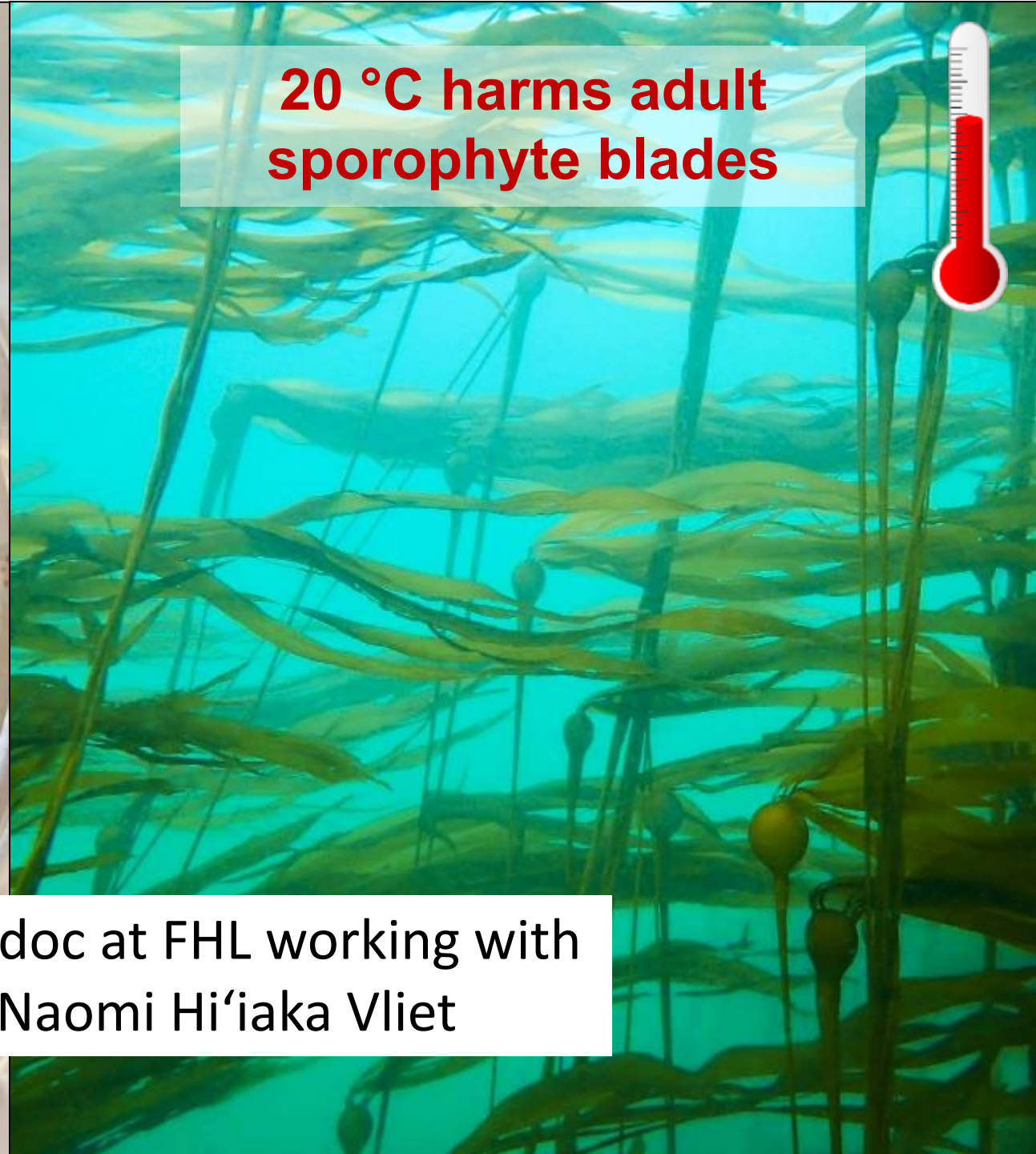


thermal stress, overgrazing, loss of important predators, pollution & sedimentation, other environmental stressors?

18 °C harms gametophytes
16 °C harms juvenile sporophytes



20 °C harms adult sporophyte blades



Work done by a postdoc at FHL working with a Lopez native, Naomi Hi‘iaka Vliet

Questions?