

The 26-day plan

- Phase 1 5 day/4 night longboat expedition
- Phase 2 Scientific processes, field & lab research
- Phase 3 Capstone projects & presentations

A typical day

- Morning** Wake up early
Eat breakfast & pack a lunch
Low tide — head to the rocky intertidal
Meet up with UW Prof. Dennis W.
Observe & record tide pool transect data
Boots off, shoes on, gear stowed
Sack lunch
- Afternoon** Van ride to UW Friday Harbor Labs
Meet scientific illustrator Alex S.
Observe and draw microscopic plankton
Review the day's findings & illustrations
Set out gear for tomorrow's urchin survey
Wrap up with Science Director Tim
- Evening** Prepare dinner & welcome Amy B. PhD
Eat dinner & learn about Amy and her work
Amy introduces tomorrow's urchin survey
Thanks Amy, see you in the morning
Journal, blog, play games, relax
Bedtime — lights out

TIDAL CURRENT EFFECTS ON *L. ZOSTERAE* PATHOGEN

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Garfield High School, Salish Sea Sciences 2017

Background

Zostera marina, L. 1793 is the native species of *Zostera* to the Salish Sea. Belonging to the phylum of Chlorophyta, *Z. marina* and other seagrasses have vascular systems and are not of the class *Chara*. *Z. marina* lives in dense beds in shallow water. These large beds are an integral part of the life cycles of many organisms, particularly in their juvenile stages (Gulian, 2015).

Labidocera zosteris D. Porter & Munkittrick 1991 is a type of protist that lives upon the chloroplast in the cells of *Z. marina* and has been shown to be the cause of seagrass wasting disease (Munkittrick, Porter and Short, 1990, 1991).

The objective of this study is to provide more insight into the way that pathogens, *L. zosteris* are spread. Not much is known about how the pathogens move from one site to another.

Hypothesis

Seagrass wasting disease, *L. zosteris*, will be more prevalent in *Z. marina* beds that are in areas that are exposed to a more significant tidal current.

Methods

Transects are spaced parallel with the shoreline at a controlled depth. Quadrats are placed at designated locations along each transect. Within each quadrat 7 vegetative shoots are picked at random and the second oldest (to avoid collection of newly developing blades) is collected.

In the lab the blades are cut to fit and scanned for the presence of disease (Figure 1). Presence or absence of disease symptoms is recorded for finding the prevalence of disease.

In order to find the current velocity, the GPS location of the collection site (Figure 2) is used in combination of National Oceanic and Atmospheric Administration's tide prediction as well as the local Tidal Current Atlas and accompanying Wagoner Tables. These are used to create a rough but conservative estimation of the current strength.

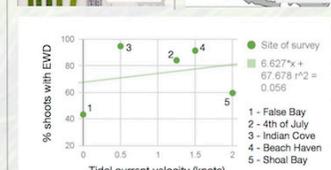


Figure 3: Estimated current speed and *Z. marina* shoots with symptoms of EWD.

Phase 3 concludes with students presenting their capstone project posters, like the one above, at the end-of-session barbecue bash, bringing together scientific mentors, friends, fellow students, alumni, and families. Many alumni have applied their capstone project toward the IB Extended Essay, a high school research requirement, or internship opportunity.



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2019 deadlines & fees

Session (26 day) tuition: \$5,900
Application processing: \$35
Airport pickup/delivery, including ferry: \$100
\$2,000 deposit due within 2 weeks of acceptance
All fees paid in full: May 15, 2019

Fees cover

Tuition (professional faculty and staff, program materials, rentals, activities, longboat expedition) and room & board (dormitory, 3 meals a day plus snacks).

Fees do not cover

Travel to or from the greater Seattle area. *Health insurance is not provided; students must have an approved health insurance plan to attend the program.*

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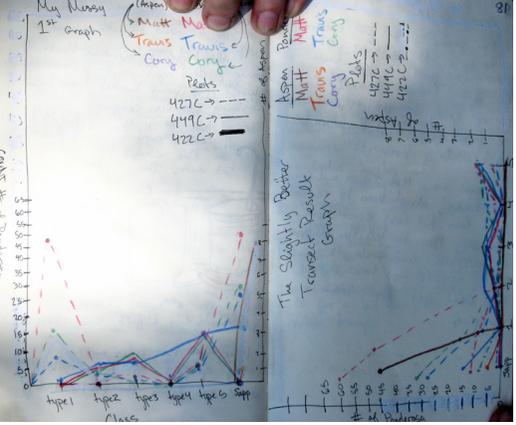
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SALISH SEA SCIENCES



For students ages 14-18
June 23-July 19, 2019

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A local scientific treasure...

For years, students from the San Juan Islands have benefited from living and studying near the University of Washington Friday Harbor Laboratories, and many have earned the chance to participate in real world research through pre-college mentorships with working scientists.

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Salish Sea Sciences opens up this incredible opportunity to students from around the world, preparing motivated pre-college students ages 14-18 with the knowledge, field and lab techniques, science communication and leadership skills needed to collaborate effectively with university researchers on scientific investigations.

*By request, students may receive a written evaluation, grade, course hours, and descriptions of the curricula in Marine Field & Lab Research and Leadership Skills. Ask your high school about obtaining course credit.

If you are an emerging scientist, this is your chance to engage with researchers on a personal level, as colleagues, sharing conversations, meals, career directions, field and lab experiments, and real research findings, culminating in your own investigation, pilot project, and presentation.*

Paradise for scientific exploration

- Transect surveys of snails in the intertidal zone

- 3D CT scans of sculpin and other bony fish

- Eelgrass ecology data visualization and analysis

- Scientific illustration of microscopic plankton

- Deep-water dredge of the Salish Sea floor

- Hydrophone array recordings of orca vocalizations

An inland ocean expedition

The Salish Sea offers a wealth of opportunities for adventure as well as science, and Friday Harbor is a magnet for fun: kayaking and paddling, movies, Shakespeare, museums, whale watching, and more.

For 5 days and 4 nights you and your mates will navigate through the San Juan Islands National Monument in wooden longboats like those used to explore the Salish Sea in the 1790s. Set a course, hoist the sails, pull the oars, man the tiller, and make camp.

Along the way, immerse yourself in maritime skills and local lore, recording your observations and experiences with new friends in one of the most biologically diverse places on Earth.

