

Dear future instructor,

My name is **Kaatje Kraft**. I teach **Geology and Oceanography at Whatcom Community College**. I have been teaching geology and oceanography at community colleges for more than 20 years. I moved to Washington in 2014 and have been teaching at WCC since that time. My general teaching philosophy is one of connection-finding ways to connect the content to your own life and places in addition to making connections with each other. My goal is to create a learning space that fosters those opportunities. In my classes, we take field trips and do original research in order to apply what we're learning in the classroom in a real-world context. One of my favorite memories of a field trip here in the Salish Sea region was after students had completed collecting their data for research on Lummi Island, and we had time to kill before the ferry would pick us up, so we sat on a beach, the sun warming us, and hearing the waves crash against the gravel creating a rhythmic sound that was truly entrancing. The science explains why this is happening, but the internal peace one feels is well beyond what the content can provide. It's this combination of knowledge and internal fulfillment that drives me to find new ways to explore this incredible place we occupy. I created this learning activity for in spring of 2020 as a way to help students access the beach when everything was locked up at the height of the COVID pandemic. I have used this activity for online field trips for those students unable to attend in person and/or access a beach in introduction to physical geology (Geology 101), Oceanography 101, and in the Introduction to the Salish Sea class (SALI 201).

This activity can be used in any size class if it is a virtual experience, and up to 24 in a face to face capacity (and possibly more). The learning environment needed for this activity is flexible - if it is used virtually, just needs access to a high speed internet connection and a free adobe pdf software reading capabilities. If conducted in person, the equipment can vary from simply pencil and paper to a quadrat (a square meter or square foot depending on your preference) with identification guides, rock hammers, and dilute hydrochloric acid and access to a beach along the Salish Sea.

The discipline(s) and area(s) of study activated by this activity can include **Geology, Biology and Anthropology**.

By the end of this learning activity, students should be able to:

- Learning Domain 1: Develop skills for expressing information and sharing stories about the Salish Sea

- Learning Domain 4: Describe and define the Salish Sea region's biodiverse ecosystems, watershed geographies, and human-environment systems.

Here is how I carried out this activity:

The goal of this activity is to help students make observations and inferences while applying concepts of surface processes (weathering & erosion; stream transport mechanisms, ocean wave processes) and rock variation (properties associated with different rock types) - and they can do that through a series of highlighted stops (virtually) or focused observation at both the macro and micro scale (in person).

*Virtual Field Trip:* This activity is integrated into the geology unit within a larger interdisciplinary course. As such, students engage in readings and videos prior to engaging in this activity (see below). The virtual field trip is designed to be a lower-tech way of visiting a field trip through hyperlinked pdfs. After students have the basic background, students "go" on a field trip by visiting each hyperlinked spot and zooming in and out of specifically identified locations in order to explore the beach. The primary goal is for students to get practice in making observations (a critical skill for field-based sciences) and distinguishing them from inferences. In addition, students are asked to connect the inferences and observations to the content they have learned and ask at least one follow up question. Depending on where this content is situated within the context of a course, it can be layered to have students examine each location through multiple lenses - one with a geoscience lens, one with a ecosystems lens and one with a human-footprint lens (that is how the field trip guide is currently structured, but can be easily modified to just focus on geoscience).

*In person alternative option:* The preparation for the activity is the same as the virtual option, but students then go to a local beach where students are asked to first make a sketch of what they see through the various lenses (depending on the focus and prior background content). Students can then make their own 1 meter by 1 meter (or 1 foot by 1 foot) quadrat (this can also be constructed with pvc pipe - [an example is here](#)) and describe in a more focused way what they are seeing through a geoscience lens (and if desired an ecosystems lens and a human footprint lens).

Here is how I assessed students' learning for this activity:

Students submit their handout from the field experience as either a word document or might prefer to take a photo of their hand drawn notes and upload it. When grading the lab, I generally look mostly for completion and provide feedback on their ability to separate observations from inferences and whether they found a way to connect that to the course content. An end of the week reflection/quiz also asks students to indicate

what they observed and how that relates to previous weeks content (but is not specifically part of this activity assessment).

All of the photos, videos and sound recordings were taken by me - all are CC-BY. For the pre-preparation material - the readings include:

- Sea to Sky Geotour from British Columbia tourism ([can be downloaded from here](#)), I typically ask them to focus on pages 4-10.
- [Geology of the Seattle area video](#) from Nick Zenter (13 minutes)
- [Video on coastal processes](#) of the Salish Sea region from Northwest Straits Foundation (10 minutes)
- [Lecture Video](#) is available here (15 minutes)

I encourage you to try this with your students because it allows students to experience looking at what might be a familiar type of setting through a new lens. In addition, in the in-person version, it allows for team building and collaboration opportunities. The virtual option provides opportunities who are unable to get to a beach for a whole host of reasons to still explore a local place. Students in particular noted the appreciation of being able to apply the content they had learned about in the context of a place that they knew and looking at it through a new lens. Taking students out in the field is always an enjoyable experience as they'll have questions you didn't anticipate and the time to just be outside is a change in typical classroom experiences.

Some things I encourage you to keep in mind include the use of the virtual field trip may require some instructions - a video explaining how to use the virtual field trip is [here](#). While there are two different locations and a total of 5 "stops", I generally only assign one of two beaches to my students as I found that all 5 started to get to be too much (although you'll see that the handout has a space for observations at all 5 stops). So for my intro geology/oceanography students, I have assigned the stops 1 & 2; for my Salish Sea students, I've assigned Stops 3-5. There is a video to play for stop 2 that is [available online here](#) and is linked within that stop. I also have recorded sounds of me walking from stop 5 back to 3 if you'd like to make it a more immersive experience for the students.

The pdf file is too large for many students to download as an individual document - so I have separated them into separate pdf files, 1 for each stop.

I would like to thank Laura Lukes, geology faculty at UBC who shared the idea of creating a virtual field trip that was more accessible by ways of using hyperlinked pdfs ([original article here](#)). I would also like to thank the National Endowment for Humanities (Grant #AE-269104-20) in providing funding for our development of curriculum for the

Salish Sea class at Whatcom Community college and Anna Booker, the PI of that grant that helped to make this activity a reality.

If you have questions about this activity, please email [kkraft "at" whatcom.edu](mailto:kkraft@whatcom.edu)

Best wishes,

**Kaatje van der Hoeven Kraft (Kaatje rhymes with gotcha)**