2026-2027 UNDERGRADUATE RESEARCH PROJECT PROPOSALS

School of Earth and Ocean Sciences, UVic

SUPERVISOR(S)	PROJECT OUTLINE	CODE	START DATE
Dr. Jay T. Cullen **Professor, SEOS** jcullen@uvic.ca	**Research cruise on icebreaker CCGS Amundsen to measure surface water chemistry in the Arctic Ocean** The student will be responsible for preparing equipment for, loading and participating in an oceanographic research expedition on a Canadian Coast Guard icebreaker to the Arctic Ocean. The research assistant will provide support in the laboratory to stage the expedition which is scheduled for summer 2026. The student will depart the ship in the Arctic and return to Victoria by air. On the ship the student will be responsible for collecting seawater samples and processing them for subsequent chemical analysis and also assist with the collection of samples for determining routine hydrographic/oceanographic parameters. Students with some background in chemistry and an interest in ocean field work are preferred. **Location:** Bob Wright Centre, UVic Main Campus & the CCGS Amundsen **Length:** 14 weeks	4600 4603	May 1, 2026 (dependent on ship scheduling)
Dr. Andrew Weaver **Professor, SEOS** weaver@uvic.ca **Dr. Daniel Garduño Ruíz** **Post-doctoral Researcher, SEOS** danielgardunoruiz@uvic.ca	**Fire behaviour evaluation in the Canadian Earth system model** The Canadian Fire Weather Index (CFWI) system is a wildfire risk evaluation tool extensively used to assess fire risk in Canada. This index estimates fire intensity based on meteorological variables. We are using the CFWI framework to investigate how global warming will impact the risk of wildfires in Canada. We have calculated the CFWI indices from equilibrium 5000-year	4150	May 1, 2026

SUPERVISOR(S)	PROJECT OUTLINE	CODE	START DATE
	integrations of the Canadian Earth system model (CanESM5) with different prescribed atmospheric CO2 levels (pre-industrial to 4x pre-industrial). The objective of this project is to evaluate model performance by comparing model results with CFWIs calculated from observations over the last several decades. The project will compare the distributions of the fire indexes in the model output with the distributions of the indices in the observations. This comparison will allow us to evaluate the model's performance in simulating fire behaviour in Canada. **Location:** Bob Wright Centre, UVic Main Campus **Length:** 16 weeks		
Dr. Carsten Abraham **Adjunct Assistant Professor, SEOS** carsten.abraham@ec.gc.ca **Dr. Adam Monahan** **Professor, SEOS** monahana@uvic.ca	**Assessing biases in the Canadian Land Surface Scheme due to missing urban representation** The Canadian Land Surface Scheme (CLASSIC), the land component of the Canadian Earth System Model (CanESM), currently does not represent urban environments. This omission can introduce biases in surface energy budgets as well as momentum and mass exchanges between the surface and the atmosphere. Historically, urban areas were not included in climate models because coarse model resolutions made their local effects relatively small compared to the model's grid scale. Modern climate models, however, are approaching resolutions where urban effects could be explicitly resolved. It is therefore important to quantify local biases in land surface atmosphere interactions resulting from the omission of urban areas. The results can then guide future climate model development to provide more accurate projections for urban regions, where the vast	4402	May 1, 2026

SUPERVISOR(S)	PROJECT OUTLINE	CODE	START DATE
	majority of the population resides. This is an excellent opportunity to gain hands-on experience in climate modeling, high performance computing (HPC) workflows, observational validation, and scientific research, while contributing to an important question in urban climate impacts. The main goal of this project is to quantify the potential biases in surface fluxes of CLASSIC introduced by omitting urban representation in the CanESM. The successful student will: • Learn to run and work with the single-column version of CLASSIC as a stand-alone model on an HPC system. • Quantify systematic biases across different levels of urbanization (from highly to moderately urbanized) by comparing CLASSIC outputs with flux tower observations from cities worldwide. • Assess how these biases impact climate model outputs at different horizontal climate model resolutions. • Conduct sensitivity analyses of model parameter values. • Contribute to a scientific manuscript. Preference will be given to students who have: • Experience running climate model components on HPC clusters. • Comfortable data analysis skills, preferably with Python for visualization. • Strong scientific writing and communication skills. **Location:** University of Victoria **Length:** 18 weeks		

SUPERVISOR(S)	PROJECT OUTLINE	CODE	START DATE
Dr. Victoria Arbour **Adjunct Assistant Professor, SEOS** varbour@ royalbcmuseum.bc.ca **Dr. Andy Fraass** **Assistant Professor, SEOS** andyfraass@uvic.ca	**Morphometrics of Late Cretaceous hadrosaur footprints from a new dinosaur tracksite in BC** A newly-discovered dinosaur tracksite in British Columbia represents a unique temporal and geographic addition to the dinosaur fossil record of BC. The locality includes a large number of footprints tentatively referred to the ichnogenus Hadrosauropodus, most likely made by hadrosaurid (duck-billed) dinosaurs. The NSERC USRA student will use measurement data collected during previous field seasons, as well as photogrammetric data, to investigate the body sizes of the trackmakers represented by the preserved tracks. The student will have an opportunity to study examples of the tracks in the museum's collection, learn how to process photogrammetric datasets and create digital footprint models, and there may be an opportunity to visit the field site. The student will also contribute to collections management and curatorial tasks at the museum, such as data digitization, or inventorying, labelling, re-housing, or packing fossils. The student may have opportunities to share their work with the public either in person or virtually through the museum's public engagement channels. **Location:** Royal BC Museum, Victoria, BC **Length:** 16 weeks	4010	May 1, 2026