

2024-25 NSERC USRA PROJECTS – School of Earth and Ocean Sciences

SUPERVISOR(S):	PROJECT TITLE AND OUTLINE:	CODE:	START DATE:
<p>Dr. Laurence Coogan Professor, School of Earth and Ocean Sciences lacoogan@uvic.ca</p>	<p><u>Hydrothermal fluid compositions from the Juan de Fuca mid-ocean ridge</u></p> <p>The project will use measure the composition of a series of hydrothermal fluid samples collected from two locations on the Juan de Fuca ridge at two week intervals for a year to determine their major and trace element composition and how these vary over time. The student will receive training in clean room lab techniques and general lab sample handling procedures focusing on things like safe handling of chemicals, avoiding sample contamination etc. They will also receive training on the use of ICP-MS to analyse samples and on the processing and interpretation of the data produced. The student will gain experience in these lab techniques as well as in interpreting the data in terms of the processes operating beneath the seafloor controlling the fluid composition (e.g., fluid-rock reaction, sulfide mineral precipitation, etc) and in terms of the impact of the fluids on the chemistry of the ocean. The project will be best suited to students with experience in geochemistry and mineralogy/petrology and who are detail-oriented as the lab work requires very careful and precise sample-handling.</p> <p>Location – Bob Wright Centre, University of Victoria B415/B423</p>	<p>4604</p>	<p>May 1, 2024</p>
<p>Dr. John Dower Professor, School of Earth and Ocean Sciences dower@uvic.ca</p>	<p><u>Quantifying aspects of energy flow through zooplankton in Northeast Pacific foodwebs</u></p> <p>This project will use a variety of approaches to quantify both the biomass (i.e. food quantity) and food quality (e.g., via lipid content) that zooplankton represent to their predators in the NE Pacific. Working with preserved samples, the successful applicant will employ techniques including light microscopy, computer photography, image scanning and processing/analysis software to examine zooplankton (primarily euphausiids and large copepods) to estimate their individual bio-volume and lipid content. A side project will involve microscopic analysis of stomach contents of schoolmaster squid (<i>Berryteuthis magister</i>) from the Strait of Georgia, a species about which very little is currently known.</p> <p>Location – Bob Wright Centre, University of Victoria</p>	<p>4602</p>	<p>May 1, 2024</p>
<p>Dr. Jay Cullen Professor, School of Earth and Ocean Sciences jcullen@uvic.ca</p>	<p><u>Research cruise on icebreaker CCGS Amundsen to measure surface water chemistry in the Arctic Ocean</u></p> <p>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 2024. 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.</p> <p>Location – Bob Wright Centre, University of Victoria</p>	<p>4600 4603</p>	<p>May 1, 2024, but dependent on ship scheduling</p>

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SUPERVISOR(S):	PROJECT TITLE AND OUTLINE:	CODE:	START DATE:
<p>Dr. Lucinda Leonard Assistant Professor, School of Earth and Ocean Sciences leonard@uvic.ca</p> <p>Dr. Yan Jian Adjunct Assistant Professor, School of Earth and Ocean Sciences. Geological Survey of Canada yjiang1@uvic.ca</p>	<p><u>Unlocking Earth's Secrets: Exploring Crustal Motion and Earthquake Potential with High-Precision GNSS Technology</u></p> <p>The student will receive training and practical experience in conducting geodetic fieldwork, data processing, interpretation, and visualization. The project will involve approximately one week of fieldwork on southern Vancouver Island to collect high-precision GNSS data at a number of sites. The majority of the student's time will be devoted to processing new and previously-collected geodetic data to calculate site velocity vectors and generate a regional crustal deformation map. This will be interpreted along with remote sensing and regional LiDAR data to enhance the interpretation of the GNSS velocity field. Additional analysis may be carried out to assess deformation across crustal faults and to estimate fault slip rates. The student will utilize various data processing and interpretation tools, leveraging software and resources from both the GSC and UVic.</p> <p>Location – Victoria and Sidney, BC</p>	<p>4300</p>	<p>May 1, 2024 OR September 1, 2024</p>
<p>Dr. Ed Nissen Professor, School of Earth and Ocean Sciences enissen@uvic.ca</p>	<p><u>Illuminating Vancouver Island's active faults with airborne laser scanning</u></p> <p>Vancouver Island lies in the fore-arc of the northern Cascadia subduction zone. Shallow earthquakes within the fore-arc pose an important seismic risk, additional to the well-recognized hazards from megathrust ruptures along the plate interface and deep earthquakes within the subducting slab. Three seismogenic crustal faults are now recognized in southern and central Vancouver Island: the Leech River, XEOLXELEK-Elk Lake, and Beaufort Range faults, each of which seems to have reactivate older, Eocene structures. The aim of this project is to scrutinize other known geological faults on northern and western Vancouver Island for signs of surface rupturing earthquakes, through analysis and interpretation of newly available airborne laser scanning (lidar) topographic data. The project requires a strong background in both remote sensing and glacial geomorphology.</p> <p>Location – Bob Wright Centre, University of Victoria</p>	<p>4302 4015 4005</p>	<p>May 1, 2024</p>
<p>Dr. Stan Dosso Professor, School of Earth and Ocean Sciences sdosso@uvic.ca</p> <p>Dr. William Halliday Adjunct Assistant Professor, School of Earth and Ocean Sciences whalliday@wcs.org</p>	<p><u>Assessing the performance of a deep learning detector for ringed seal vocalizations</u></p> <p>The student will work on testing the performance of a new deep learning detector being developed to detect the vocalizations of ringed seals from passive acoustic data collected in the Canadian Arctic. Specifically, the student will run the deep learning detector on a novel dataset, and will assess the accuracy of detections, as well as examining parts of the data where no detections were found to test if the detector missed any signals. This work will help to improve the detector, and ultimately this detector will be used to study the distribution of ringed seals in the Canadian Arctic. Ringed seals were recently assess as special concern in Canada due to predicted habitat loss caused by climate change, and this detector, along with a research program to collect passive acoustic data in the region, will help to monitor this species.</p> <p>Location – Victoria, BC</p>	<p>4701</p>	<p>May 1, 2024</p>