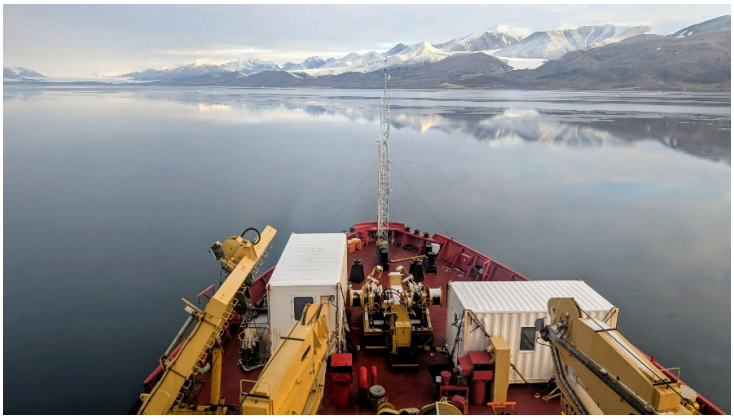
Ph.D. position in marine geology and geochemistry

The Holocene sedimentary record of Good Friday Glacier dynamics, western Axel Heiberg Island (eastern Canadian Arctic Archipelago)



The CCGS Amundsen navigating through Good Friday Fjord during the 2026 Arctic expedition (@ J-C Montero-Serrano)

The Arctic is warming at up to four times the global average rate, resulting in rapid sea-ice decline and widespread glacier retreat. The fjords of the Queen Elizabeth Islands (QEI), located in the northernmost Canadian Arctic, have historically been blocked by some of the world's oldest and thickest sea ice, rendering them largely inaccessible even to icebreaker vessels. However, the recent reduction in sea-ice cover has increased summer access to previously ice-choked channels and fjords across the QEI region, creating new opportunities to investigate glacier-ocean interactions and environmental change in this remote sector of the Arctic. During the most recent summer field season, the Canadian Coast Guard Ship Amundsen conducted the second comprehensive oceanographic research expedition through the QEI. As part of this expedition, several sediment cores were collected from Good Friday Fjord, a glacial fjord whose sedimentary environment is strongly influenced by the dynamics of the Steacie Ice Cap, one of the few glaciers in the Canadian Arctic that has been advancing over the last 70 years. These newly acquired sedimentary records provide a unique opportunity to reconstruct long-term glacier variability and sediment transfer processes during both the Holocene glacier retreat and the modern advance, as well as to evaluate the influence of atmospheric and oceanic forcing on marine-terminating glaciers in QEI. Such knowledge is essential for improving predictions of Arctic glacier responses to ongoing climate warming and their contribution to future sea-level rise.

To address these questions, this PhD project will apply a multiproxy approach combining ^{210}Pb and radiocarbon geochronology with sedimentological, physical, and geochemical analyses of sediment cores collected from Good Friday Fjord. The specific objectives are to: (1) reconstruct long- and short-term variations in detrital sediment and organic carbon transfer from Good Friday Glacier in response to Holocene climate variability; (2) determine how climatic and oceanographic changes influenced sediment dynamics within the fjord during the Holocene; and (3) assess the significance of recent glaciological changes in the southwestern sector of the Steacie Ice Cap.

The PhD project will be supervised by Professors Jean-Carlos Montero-Serrano (ISMER-UQAR; supervisor), Stephanie Kusch (ISMER-UQAR; co-supervisor), and Alexandre Normandeau (Geological Survey of Canada; co-supervisor), and will benefit from a strong multidisciplinary and interinstitutional collaboration involving Guillaume

St-Onge (ISMER-UQAR), Audrey Limoges (University of New Brunswick), Luke Copland (University of Ottawa), and Mark Furze (UNIS). Together, this team provides complementary expertise in marine geology, paleoceanography, geochemistry, glaciology, and Arctic environmental change.

DESIRED QUALIFICATIONS. The candidate should hold a M.Sc. degree in Earth Sciences, Oceanography, Geology, Geography, Geochemistry, Geological engineering, or any related discipline at the time of appointment, and having experience in sedimentology and paleoclimatology will be seen as an advantage. The candidate must have a grade point average (GPA) of at least 3.7/4.3 or the equivalent (ex. ≥ 14/20). Applicants must be proficient in written and spoken English. As ISMER-UQAR is a French-speaking university, knowledge of French will be considered an asset.

HOW TO APPLY. Please send all the documents listed below in one PDF file to Jean-Carlos Montero-Serrano (jeancarlos_monteroserrano@uqar.ca):
1) Cover letter explaining the candidate's background and how it fits with the proposed project and the PhD in oceanography at ISMER;
2) CV (including scientific communications, fellowships, awards, missions at sea, etc.);
3) All university transcripts;
4) Three letters of recommendation (one of which must be from a research supervisor).