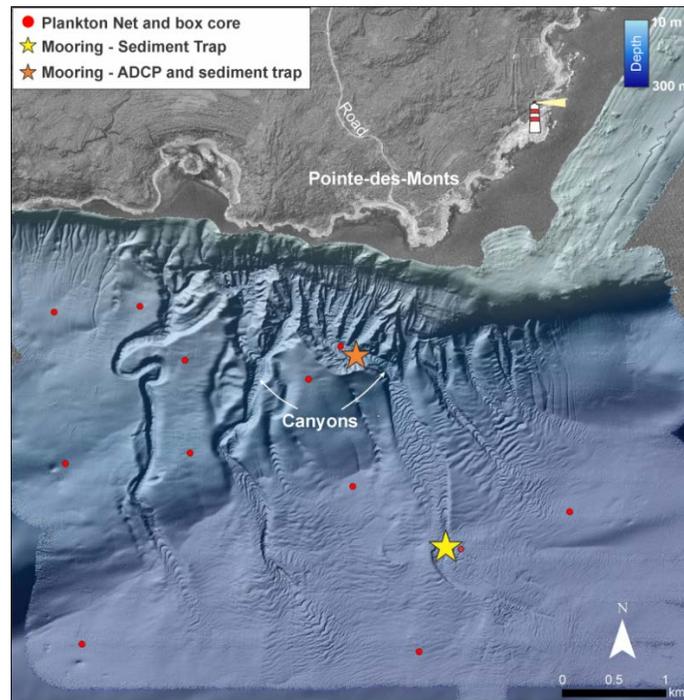


Late Holocene sediment dynamics and distribution of harmful algae in a submarine canyon system of the Lower St. Lawrence Estuary (Quebec, eastern Canada)

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Location of the Pointe-des-Monts canyons, east of the Lower St. Lawrence Estuary

Submarine canyons serve as conduits for episodic turbidity currents that move large volumes of carbon- and nutrient-rich terrigenous sediment to the seafloor. In eastern Canada, the Lower St. Lawrence Estuary (LSLE) bathymetry is bounded by steep slopes (often $\geq 5^\circ$) which allowed inner-shelf submarine canyons and channels to form during the Late Quaternary. Sediments flowing through these canyons and channels mainly originate from rivers, longshore drift, and remobilization of shelf and slope sediments. However, triggers of turbidity currents in the LSLE remain debatable in individual cases (e.g., in sediment-starved shelf environment such as off Pointe-des-Monts) due to few direct measurements and even fewer long-term (> 50 years) recurrence documentation. Likewise, blooms of toxic algae represent an important recurring threat to the LSLE marine ecosystem. One of the potentially harmful algae is the dinoflagellate *Alexandrium catenella* (formerly *Alexandrium tamarense*). As part of its lifecycle, this dinoflagellate produces resting cysts that accumulate in the shallow coastal sediments. While this capability of forming benthic seedbeds is a clear survival advantage during periods of unfavorable growth conditions, their resuspension from seafloor sediment may contribute to the initiation of blooms. In this context and based on a set of sediment traps, sediment core and phytoplankton net samples collected within a submarine canyon system located off Pointe-des-Monts in the LSLE, this PhD project will aim to (1) document the Late Holocene recurrence of turbidity current events within the Pointe-des-Monts canyons, (2) map the distribution of *A. catenella* in the seafloor sediments from the Pointe-des-Monts region, and (3) determine the role of the turbidity current events on the resuspension and dispersion of harmful algae within the Pointe-des-Monts canyons. The student recruited as part of this PhD project will have the opportunity to participate in at least one oceanographic campaign in the St. Lawrence Estuary aboard the R/V Coriolis II, as well as attending national and international scientific meetings.

EXPECTED STARTING DATE

Fall 2020 (September) or winter 2021 (January) at the latest.

STUDY PROGRAM

PhD in Oceanography from *Institut des sciences de la mer de Rimouski* (ISMER) at the *Université du Québec à Rimouski* (UQAR), Rimouski, Québec, Canada.

For more information on the PhD in oceanography at ISMER:

<https://www.uqar.ca/etudes/etudier-a-l-uqar/programmes-d-etudes/3292>

An internship at the University of New Brunswick (UNB, Fredericton campus) is planned during the development of the PhD.

For more information on ISMER (<http://www.ismer.ca/?lang=en>), UQAR (<http://www.uqar.ca/english/>) and UNB (<https://www.unb.ca/fredericton/science/depts/earth-sciences/index.html>).

SCHOLARSHIP

For this project, a scholarship of 21 000 \$CAN/year is available for 3 years.

A tuition exemption program is also available to cover the extra tuition fees of international students:

<https://www.uqar.ca/services/services-a-l-etudiant/aide-financiere/programme-d-exemption-des-droits-de-scolarité-supplémentaires-exigés-des-étudiants-étrangers-de-l-uqar>

To get an idea of the cost of studying in Rimouski, please visit this website:

<http://services.uqar.ca/SimulationFrais/>

DESIRED QUALIFICATIONS

The candidate should hold a MSc degree in Earth Sciences, Oceanography, Geology, Geochemistry, Geological engineering, or any related discipline at the time of appointment, and having experience in sedimentology, paleoclimatology, mineralogy, and palynology will be seen as an advantage. The candidate should also satisfy the basic admission requirements of UQAR-ISMER for the PhD program in Oceanography. Applicants must be proficient in both written and oral French and English.

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;
- 2) CV;
- 3) All university transcripts;
- 4) A list of practical and technical skills;
- 5) Names and contact information of two potential referees.

Review of applications will begin now and continue until the position is filled.

We welcome applications from all qualified students. We encourage women, First Nations, Métis, Inuit, members of visible or cultural minorities, LGBTQ and all who may contribute to further diversification of research approaches, ideas and group dynamics.