Two PhD or MSc student positions in Subarctic Coastal Oceanography

Theme: Importance of freshwater on the oceanography of James Bay and Southern Hudson Bay

We are seeking two highly motivated PhD or MSc students to investigate the role of freshwater (terrestrial runoff, precipitation and sea-ice meltwater) in controlling stratification, surface nutrient stocks, locations of mixing and upwelling—which can become hotspots for biological activity, and air-sea interactions. The successful candidate will join our coastal oceanography program that has been operated in the James Bay and Southern Hudson Bay (JB&SHB) area continually since 2014. The team includes physical, chemical, and biological oceanographers and sea-ice scientists. We have two ongoing projects: (i) Sources and sinks of carbon across the land-to-ocean aquatic continuum at the coast of the Hudson Bay and James Bay Lowlands, and (ii) Polynyas of the Belcher Islands, which aims to support marine conservation efforts for the *Qikiqtait* protected area development. The PhD/MSc projects can furthermore make use of existing datasets collected as a part of the recently completed BaySys project (2016-2021) and a two-year James Bay Oceanographic Expedition and Mooring Program (2021-2022). The successful candidates will have opportunities to participate in fieldwork onboard ships, using small boats in summer, and/or from the landfast sea ice platform during winter.

The marine system in JB&SHB represents the southernmost boundary of the Arctic, with water masses originating largely in the Arctic, a seasonal sea-ice cover and an Arctic-like marine ecosystem. It remains one of the least studied water bodies in Canada despite being home to > 20,000 Cree and Inuit in 13 coastal communities, evidence of strong impacts on ecosystems by climate and environmental change, and its critical location bordering the carbon-rich peatlands of the Hudson Bay Lowlands. Freshwater cycling in JB&SHB is of key importance to the understanding of the marine system. As the largest inland sea in the world, Hudson and James Bays receive relatively more river runoff per area than the Arctic Ocean. Even more freshwater is withdrawn and then added to the water column by the seasonal sea ice formation and melt cycle. The two largest rivers are regulated for hydroelectric power generation, which has also impacted the seasonality of the runoff with more freshwater input during winter than what occurred naturally. Cumulative impacts to the ecosystems observed by Inuit and Cree are closely associated with climate change and the winter-weighted freshwater input from regulated rivers. Little is known about how the increasing loss of carbon from the peatlands will impact the JB&SHB marine ecosystems in terms of ocean acidification risks.

The successful candidates will be enrolled in the Department of Environment and Geography or Department of Earth Sciences, University of Manitoba, and join the Centre for Earth Observation Science (CEOS), housed in the Clayton H. Riddell Faculty of Environment, Earth, and Resources. CEOS is a research centre founded in 1994, with a mandate to research, preserve and communicate knowledge of Earth system processes. CEOS is multidisciplinary and collaborative, drawing on researchers from different areas and faculties at the University and elsewhere. CEOS researchers are mainly observationalists with the Arctic marine system as a unifying focus of activity because of the acute climate change effects and need for observations.

To apply, you will be required to provide your CV, University transcripts, a short statement of relevant research experience and interests, and the contact information for two referees. International students with English as a second language are also required to submit an English language test score, such as TOEFL or IELTS. Application materials should be sent by email to zouzou.kuzyk@umanitoba.ca and/or jens.ehn@umanitoba.ca. For inquiries about the positions, please contact Dr. Kuzyk and Dr. Ehn directly.

Application deadline: The positions will remain open until filled.