

Date of announcement: January 20th 2025

Start date: September 2025

The CIRAIG is an interdisciplinary research center on the life cycle assessment of product, processes and services conducting leading edge research in modeling and assessing the sustainability of production and consumption systems to support strategic decision making toward a full circular and carbon neutral sustainable transition (<http://www.ciraig.org/en/>). We invite applications for a MSc or PhD scholarship at Polytechnique Montréal in the field of marine biology, oceanography or similar to develop and quantify the impact pathway mechanisms associated with the marine environment in a life cycle impact assessment framework.

Project description and responsibilities

Life cycle assessment (LCA) is a methodology to assess potential environmental impacts of emissions and resource consumption occurred along the life cycle of product and services, from raw material extraction to product use and disposal, widely used to support decision making. The translation of environmental interventions (emissions and resource consumption) into environmental impact scores is performed through a life cycle impact assessment (LCIA) phase by applying substance specific characterization factors (CF) contributing to different impact categories (impacts on climate change, ecosystem quality, human health, etc.). CFs are obtained from characterization models, which are natural science-based models assessing cause-effect relationships linking environmental interventions and category indicators.


In current models, impacts associated with the ocean are underrepresented. Activities in and around the ocean (aquaculture, marine transport, fisheries, off-shore platform, etc) generate impacts in diverse ways which are not well captured in LCIA to fully represent impacts on marine biodiversity of these activities. Moreover, the marine carbon cycle is influenced by several of these activities, both in positive and negative effects on climate. These interactions need to be captured by LCIA models to better represent the consequences of human activities on the oceans and on the climate.

Working environment and conditions

We offer a challenging and rewarding position in an internationally recognized research center for its solid scientific research and applied experience working in partnership with industry and governments. We strive for academic excellence performed in a dynamic and pleasant working environment characterized by collegial respect and academic freedom.

The MSc/PhD candidate will be working in close collaboration with leading experts in impact assessment. Moreover, there are rich opportunities to establish ties with external collaborators and organize internship with academic partners of the project.





The MSc/PhD candidate will be enrolled in the Chemical Engineering research Master or doctoral program at Polytechnique Montreal. A 3-years financial aid is granted based on research funding amount recommended at Polytechnique Montréal (<https://www.polymtl.ca/futur-etudes-superieures/en/finances>).

Requirements and application

A strong background in sciences related to the ocean is required, with a sufficient core-sciences (mathematics, physics, chemistry) background to succeed in basic chemical engineering courses. The PhD candidate should preferably have experience in environmental engineering, modelling or life cycle assessment and should be open to work in an interdisciplinary environment.

Interested candidates should send their pre-application to anne-marie.boulay@polymtl.ca **no later than February 24th, 2025**. A preliminary application in English or French must be submitted as one PDF file containing the following information: a letter motivating the application (cover letter), curriculum vitae, grade transcripts and BSc/MSc diploma. Pre-selected candidates will be asked to prepare a short presentation on a selected paper (provided with pre-selection notification) on February 26th/27th and - if selected - will need to apply by March 1st (if not-Canadian) to Polytechnique Montreal.

Please note that the scholarship is subject to academic approval following an official application through the Office of the Registrar at Polytechnique Montreal.

