



## MITACs-POSTDOC in ecological habitat modelling

### DESCRIPTION

WSP is leading one of the five teams that is working on smartWhales, a federal initiative that explores how satellite data could be used, in conjunction with other information, to help monitor and detect the presence of North Atlantic right whales and predict their movement. The initiative is led by the Canadian Space Agency, in collaboration with Fisheries and Oceans Canada and Transport Canada. The research and development projects from this initiative will provide information that could be useful to help mitigate collisions between North Atlantic Right Whale (NARW) and vessels and identify when whales may be in danger from additional human threats.

WSP, in collaboration with experts from DHI Water and Environment, the Canadian Whale Institute, Dalhousie University, and the Institut des Sciences de la Mer de Rimouski (ISMER), will develop a spatial and temporal decision support system to ultimately provide near real-time forecasted output on NARW presences and associated risk of vessel encounters

As part of this project, WSP, DHI and ISMER are looking at hiring a postdoctoral researcher to support the development of the spatial and temporal decision system. This current postdoctoral opportunity will be under the responsibility of Dr. Gesche Winkler from the ISMER. The selected candidate will be working in close collaboration with WSP and DHI team. This position is for **8 months** and it will be funded through a **MITACs Accelerate program**.

WSP Canada Inc.: [www.wsp.com](http://www.wsp.com)

DHI Water and Environment: [www.dhigroup.com](http://www.dhigroup.com)

Institut des sciences de la mer de Rimouski: [www.ismer.ca](http://www.ismer.ca)

### YOUR ROLE

- 1 Collaborate with an international team of scientists on the smartWhales project.
- 2 Develop an agent-based model (ABMs) of the distribution of *Calanus finmarchicus* and *Calanus hyperboreus* for modeling the habitat of the North Atlantic right whale (*Eubalaena glacialis*).
- 3 Carry out exhaustive collation and review of peer-reviewed literature that characterises features of *Calanus finmarchicus* and *C. hyperboreus* that will be parameterised in the ABMs:
  - This includes collating parameterization used in previous *Calanus* ABMs (ex: Brennan et al. 2019).
- 4 Extract of empirical *Calanus* spp. spatial distribution and abundance data from different sources to:
  - Establish a database for a 5-year period from 2015-2019 for use in:
    - ABM parameterisation (e.g. through dedicated statistical analyses where literature does not provide sufficient input), and
    - The testing (calibration) and validation of *C. finmarchicus* and *C. hyperboreus* ABM results.
- 5 Set-up of the of *C. finmarchicus* and *C. hyperboreus* ABMs through:
  - the customization of an existing zooplankton ABM with data collected,
  - referencing and, where applicable, applying ABM parameterisation used by Brennan et al. 2019, and other relevant publications
  - executing ABM testing (calibration) using the database developed.
- 6 Carry out Pattern Oriented Modeling validation analyses and running the *C. finmarchicus* and *C. hyperboreus* ABMs for a 5-year hindcast period.
- 7 Preparing a report on the achieved level of model validation and an overview of applied ABM parameters using the “Overview, Design concepts, Details” protocol standard format for describing and disseminating ABMs (Grimm et al. 2020).



## WHO YOU ARE

### Required Qualifications

The candidate must:

- Hold a Ph.D. and/or undergraduate/graduate education in one or a combination of the related disciplines, e.g.:
  - Marine biology,
  - Biological oceanography,
  - Numerical ecology,
  - Computer or data science.
- Have knowledge and/or experience specifically related to marine zooplankton (e.g. *Calanus*) and/or numerical modelling - for example, he or she would have:
  - specific background expertise related to marine zooplankton behaviour and distribution, or
  - experience/knowledge with processing and/or applying various forms of coastal/biological datasets (e.g. abundance, physicochemical), or
  - experience with the execution of statistical, agent-based, or other types of modelling.
- Be willing to work with an international team of experts from the University of Quebec ISMER, WSP and DHI.
- Be self-directed, enthusiastic and able to develop new numerical modelling skills.
- Possess excellent writing and presentation skills in English; bilingualism (French and English) is an asset.
- Have a good knowledge of the usual analyses and statistical tests in aquatic biology.
- Show scientific rigor and leadership as well as an ability to work in multidisciplinary teams.

**SALARY:** based on 42.000\$/year

**STARTING DATE:** open now

## APPLICATION

Please submit a motivation letter, a complete CV, all university transcripts, coordinates of at least two referees for potential recommendation letters. Everything should be submitted as one single pdf file. The closing date for receipt of applications is until the position is filled. For all additional information and submission, please contact Gesche Winkler

[Gesche.Winkler@uqar.ca](mailto:Gesche.Winkler@uqar.ca)