JOB OFFER

Research assistant in coastal morphodynamic modeling

CONTEXT

Global changes lead to coastal zone modifications and increased vulnerability to flooding and erosion of coastal populations at a global scale. Accelerated sea-level rise is undoubtedly the most important consequence resulting from climate change. The risk of submersion will become the hazard that will have the greatest impact on coastal communities over the next century. These changes will result in numerous social impacts including, amongst others: deterioration of coastal residents' quality of life, chronic stress, mental and physical health deterioration, changes in traditional and commercial activities, growth in conflicts of use and loss of human lives. These findings have led governments and major global organizations to invest in the development of coastal risk assessment methods and to initiate adaptation strategies and find lasting solutions.

The Coastal Geoscience Research Chair program is aimed at developing and providing the expertise and tools necessary to innovative solutions adapted to local context in terms of coastal dynamics, as well as to social, economical, cultural and environmental aspects. Its program is designed around three axis of research: 1) coastal hazards modeling in a context of climate change; 2) quantifying the vulnerability and resilience to coastal hazards (including communities, infrastructures and ecosystems) in a context of climate change with the aim to reinforce adaptation capacities at a regional scale; 3) develop and experiment adaptation solutions/strategies to different local and regional contexts of Quebec's maritime regions with the aim to reduce present and future coastal risks.

SUMMARY OF FUNCTIONS

In the framework of the projects entitled "**Measurement and Modeling of Erosion and Coastal Flooding Morphodynamics in the Estuary and Gulf of St. Lawrence (MODESCO)**" and "**Joint Modeling of the Future Development of Coastal erosion and submersion for the development of a multi-hazards mapping of the coasts of the Lower Estuary and Gulf of St. Lawrence**" resulting from a collaboration between the Coastal Geoscience Research Chair and the Oceans Physics Laboratory (POLR), we are looking for a candidate specialized in morphodynamic modeling of the coastal zone. The candidate will be part of a team of multidisciplinary researchers including graduate students and researchers specializing in coastal geomorphology, physical oceanography, geography, marine biology and engineering. The candidate will use and develop Matlab, Python or programming languages and tools to process data from offshore Nortek AWAC ADCPs (measuring wave height, direction, water levels, currents, ice), as well as water levels and wave data from RBR pressure sensors installed in intertidal and shallow subtidal zones. The candidate will have to analyze these data to evaluate the wave regime along the coasts of the Estuary and Gulf of St. Lawrence.

Based on seasonal and annual coastal evolution databases (DGPS, LiDAR, bathymetric) and outputs of a spectral wave model (WaveWatch III), the candidate will have to calibrate the XBeach model and evaluate its ability to assess nearshore processes such as wave runup and overwash, and to reproduce flooding events and recent coastal evolution. First, XBeach will be used to reproduce the evolution of 7 instrumented sites. Other numerical models can also be evaluated (e.g. Delft 3D). The candidate will then use these numerical models to simulate scenarios characteristic of a future climate and to carry out projections of coastal erosion and submersion. He or she will have at his disposal a high performance-computing cluster as well as the support needed to run models. He or she will participate in writing scientific papers.

REQUIREMENTS

- Hold a post-graduate degree in a relevant discipline, i.e. **physical oceanography, coastal or maritime engineering, hydraulic engineering, coastal geoscience**;
- Have at least 3 years of relevant experience in a similar position;
- Experience with the use of spectral wave models (SWAN, WAVEWATCH III) and / or coastal dynamics models (Delft 3D, XBeach).
- Have teamwork skills;
- Provide leadership in collaborating on research and facilitating workshops;
- Have oral and written communication skills;
- Knowledge of the marine environment;
- Holding a post-graduate degree is an asset;
- Having scientific publications and experience in knowledge transfer are assets.

TREATMENT

- A salary range between $ 26.60 and $ 31.05 per hour (Can$) based on qualifications and experience.
- Working hours of 35 hours per week;
- Anticipated start date: September 2017.
- Position under a grant awarded for a three-year period. The first contract will be until March 2018 and renewed according to the candidate's evaluation;
- Place: Université du Québec à Rimouski, Rimouski campus (Quebec, Canada).

ALL APPLICATION WILL BE PROCESSED CONFIDENTIALLY.

Those interested in this position are asked to submit their application only by e-mail to the following address: pascal_bernatchez@uqar.ca. This email must be received no later than September 16, 2017 at 4:00 pm and must include:

- A signed letter of presentation of a maximum of 2 pages explaining the candidate's reasons for applying to this position and describing his or her strengths and abilities to perform the required tasks.
- A curriculum vitae containing all information relevant to the evaluation of the application;
- The name and full contact details of two references;
- A transcript of the undergraduate, master's and doctorate (if applicable).
- The application must be a single document in PDF format.

Incomplete applications will be declared ineligible. We will contact only those selected for an interview