18-months postdoctoral research position in shoreline change modelling, Pessac (SW France)

Description

The EPOC laboratory (University of Bordeaux, French National Centre for Scientific Research) and the French Geological Survey (BRGM) are seeking for a highly-motivated postdoctoral researcher to investigate shoreline dynamics along a sandy coast in a context of chronical erosion.

The study site is a 15-km-long sandy coast located in the north of the Gironde (SW France) adjacent to the large-scale Gironde estuary mouth. This stretch of coast is exposed to energetic ocean waves and tide-driven longshore currents. This site has suffered dramatic erosion for decades in spite of some mitigation actions undertaken by local authorities. New coastal defense strategies (coupling hard and soft engineering) are currently under consideration to stabilize the shoreline near urbanized areas. However, the lack of a thorough knowledge of the hydro-sedimentary functioning in this area prevents from assessing correctly the potential of each of these strategies.

The regional research project ESTOC (2021-2024) seeks to meet this objective by:

1. Gathering past datasets on coastal change and collecting new datasets to support analysis of the hydro-sedimentary functioning and shoreline response in this area
2. Producing a conceptual model of coastal changes observed locally since the beginning of the 20th century
3. Setting up modeling tools to predict future shoreline changes at decadal scale and to assess the ability of different coastal management strategies to mitigate erosion

With support of the ESTOC project team, the postdoc will focus on the 3rd action and will be in charge of setting up the reduce-complexity shoreline evolution model LX-Shore (Robinet et al., 2018*) on the study site, performing simulations and testing different scenarios in terms of coastal management strategy. A wide range of coastal management strategies (including hybrid strategies) will be studied from reinforcement of hard coastal defenses (e.g. groins, seawalls) to soft engineering approaches such as mega-nourishment. This will involve performing ensemble simulations and bringing some new developments in LX-Shore. The postdoc may also be requested to present their simulation results to coastal managers involved in the project.

Required qualifications

The candidate must have a PhD in coastal oceanography or related area and must already have experience in the field of coastal modelling and computer programming.

Additional qualifications the candidate must satisfy:

- High level of knowledge in coastal geomorphology and hydrodynamics
- Advanced programming skills in Matlab or Python and in Fortran90
- Strong motivation in shoreline modeling and programming
- Experience in pre- and post-processing coastal data (waves, bathymetry, topography)
- Autonomy and initiative
- Excellent communication skills and experience in working on projects with multiple partners
- Synthesis, drafting skills and ability to write scientific papers
- Fluency in English and minimal knowledge of French

Other qualifications that would be appreciated

- Experience with wave models (e.g. SWAN, WW3), hydrodynamic models (e.g. MARS, TELEMAC), morphodynamic models (e.g. Deft3D, XBeach) and reduced-complexity shoreline models (e.g. ShorelineS, Genesis)
- Experience in using GIS to process vector and raster files
- Experience with git
- Fluency in French

Additional information

The postdoc is an **18-months** full-time position based at the EPOC laboratory (University of Bordeaux, French National Centre for Scientific Research) in Pessac (Nouvelle-Aquitaine, France). The position must start no later than **July 1, 2023.**

The net salary will be about **2600 €/month** with social security included (free or reduced costs for all usual medical acts and treatments as part of the French national health care system).

Application

Full consideration will be given to applications received by **March 30, 2023**. Interviews will be conducted around mid-April (in-person/videoconference). The position will remain open until filled.

Required application documents:

- Letter of application that briefly summarizes the qualifications of the candidate and its interest in the position
- Curriculum Vitae, which must include a list of the candidates' publications
- List of professional references along with their contact information (three references are required)

Application documents must be submitted as PDFs and should be sent by email to Arthur Robinet (a.robinet@brgm.fr), Vincent Marieu (vincent.marieu@u-bordeaux.fr) and Bruno Castelle (bruno.castelle@u-bordeaux.fr).

Robinet A., Idier D., Castelle B., Marieu V., 2018. A reduced-complexity shoreline change model combining longshore and cross-shore processes: The LX-Shore model. Environmental Modelling & Software, 109, pp. 1-16, https://doi.org/10.1016/j.envsoft.2018.08.010.