

PhD and Postdoctoral Positions in Computational Fluid Dynamics of Nearshore Processes

The Department of Environmental, Earth, and Atmospheric Sciences at the University of Massachusetts Lowell invites applications for a fully funded PhD position and a Postdoctoral Research Associate to join an NSF-funded project investigating physical transport and mixing processes at the groundwater–surface water interface in the nearshore zone. The project combines coastal field observations with high-resolution computational fluid dynamics modeling to examine interactions among groundwater flow and coastal hydrodynamics. Both researchers will work in a collaborative environment spanning hydrogeology, fluid dynamics, oceanography, and coastal science.

PhD Position

The fully funded PhD position is expected to begin in Fall 2026, with the possibility of a Spring 2027 start, and is supported by a three-year grant. The successful applicant will participate in coastal field investigations and develop computational fluid dynamics models as part of their dissertation research. The position includes a competitive stipend and full tuition support. The student will also have opportunities to present research at scientific conferences, publish in peer-reviewed journals, and mentor undergraduate researchers.

Ideal applicants will have:

- A bachelor's or master's degree in hydrology, engineering, geoscience, oceanography, physics, or related discipline.
- Experience with scientific programming, such as Python or MATLAB.
- Experience or interest in computational fluid dynamics and high-performance computing.
- Experience or interest in coastal ocean, nearshore, or surf-zone field investigations.
- Strong written and oral communication skills.
- The ability to work independently and collaboratively.

Interested students are encouraged to contact Dr. James Heiss at james_heiss@uml.edu before submitting a [formal graduate application](#). Please include in the email a brief statement describing your research interests and previous research experience, a CV, and unofficial academic transcripts.

Postdoctoral Research Associate Position

The postdoctoral research associate will lead the development, testing, and application of computational fluid dynamics simulations of density-dependent transport and mixing in dynamic coastal surface waters. The position is for one year.

Primary responsibilities include:

- Leading CFD model development and application.
- Developing reproducible workflows for model setup, high-performance computing, sensitivity analysis, and visualization of large simulation datasets.
- Participating in coastal field investigations, including the installation, maintenance, and recovery of oceanographic and hydrological instrumentation.

- Leading peer-reviewed manuscripts and conference presentations.
- Collaborating with faculty, graduate and undergraduate researchers, and external project partners.
- Contributing to the development of open and transferable modeling tools.

Minimum qualifications include:

- A PhD in engineering, hydrology, oceanography, physics, geoscience, or a related field.
- Proficiency in scientific programming, cluster computing, and CFD modeling.

Preferred qualifications include:

- Experience with CFD platforms such as OpenFOAM, coastal or nearshore hydrodynamics, Python or MATLAB workflows, and surf-zone, hydrologic, or hydrogeologic field investigations.
- The initial appointment is for one year. Review of applications will begin immediately and continue until the position is filled.

Postdoctoral candidates should contact Dr. James Heiss at james_heiss@uml.edu and submit a CV and a description of relevant experience and research interests.

Location

UMass Lowell is located in Lowell, Massachusetts, approximately 40 minutes from Boston, one hour from the Atlantic coast, and 90 minutes from the White Mountains of New Hampshire.