

Opportunity Title: ORNL Energy Water Resource Systems Post-Master's

Research Associate

Opportunity Reference Code: ORNL18-87-ESD

Organization Oak Ridge National Laboratory (ORNL)

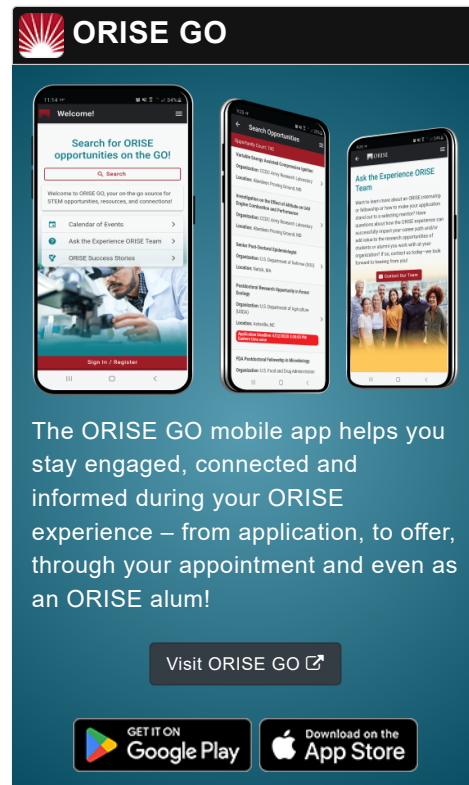
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Description Oak Ridge National Laboratory is leading a multi-year research and development project to support the siting, design, modeling and evaluation of next generation hydropower technologies. This project, Standard Modular Hydropower (SMH) Technology Acceleration, is currently focused on building a framework to develop hydropower facilities that produce energy and environmental benefits. Instead of building a dam and impounding a river, SMH facilities will use standardized, interchangeable modules designed to pass fish, sediment, water, and small recreation craft like canoes and kayaks. These modules will be adjacent to generation modules that produce hydroelectric power.

In this role, the Post-Master's Research Associate will be responsible for conducting applied research in the areas of small hydropower siting, design, operation, and environmental effects. The Research Associate will research the interactions of sediment, water, and fish with small hydropower plants. Computational models will be used to simulate these interactions and their effect on hydropower generation. These codes will be integrated with facility design models that determine the technical, economic, and environmental feasibility of the project on a reach scale and into optimization models that assess tradeoffs in siting and design at the basin scale. The participant will also be responsible for reading journal articles and technical reports, conducting detailed literature reviews, acquiring and organizing data from online sources and documents, participating in interdisciplinary roundtables with engineers, ecologists, and economists, and participating in conference calls with small hydropower technology developers.

Qualifications The candidate should have a master's degree in civil engineering or water resources engineering with advanced coursework in hydrology/hydraulics, hydrologic design, numerical methods, and mathematics. Experience conducting optimization analyses of water resource systems is preferred.

The ideal candidate will have research experience in the field of hydropower and/or energy-water resource systems, computer programming and modeling experience related to hydraulic structure design and analysis and/or water resource systems optimization and analysis at the basin scale, experience contributing to water infrastructure feasibility studies, and a track record of contributing to technical reports and/or peer-reviewed journal publications. Preferred skills include programming experience in Python or MATLAB, proficiency with hydraulic modeling software, the ability to write technical summaries

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clearly and concisely, organization, exceptional time management, a keen and relentless attention to detail, excellent communication skills, the ability to work independently with little direction and as part of a collaborative team, and a passion for applied research in sustainable water resource systems. Though not required, prior experience in engineering consulting is a plus.

The ORNL Postgraduate Research Associates Program is administered by Oak Ridge Associated Universities through its contract with the U.S. Department of Energy to manage the Oak Ridge Institute for Science and Education (ORISE).

**Eligibility
Requirements**

- **Degree:** Master's Degree.
- **Discipline(s):**
 - **Engineering** (3 )
 - **Environmental and Marine Sciences** (1 )

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