

Position title: Postdoctoral Research Scholar – Legacy Phosphorus Data Synthesis

Essential Responsibilities:

We seek an exceptional postdoctoral associate to conduct NSF-funded independent research in the areas of geospatial modeling, nutrient biogeochemistry, and environmental/agricultural data analysis. The project will involve collection and curation of soil phosphorus data, developing models to predict soil P at high resolution across the US, and interfacing the models with other national P models to develop inventories to develop comprehensive P budgets. Opportunities exist to interact closely with a group of distinguished intramural and extramural collaborators working all aspects of phosphorus sustainability.

The position is under the direction supervision of Dr. Owen Duckworth in the Department of Crop and Soil Sciences but will collaborate closely with Drs. Natalie Nelson and Dan Obenour from the Departments of Biological and Agricultural Engineering and Civil, Construction, and Environmental Engineering. It is funded through the newly established NSF Science and Technologies for Phosphorus Sustainability (STEPS) Center (<https://steps-center.org/>), headquartered at a new intersectional working space on NC State's Centennial Campus (<https://cals.ncsu.edu/psi/psb>). Interested applicants should be available to start as soon as possible. The position is supported through the through October 2024, with the possibility of renewal with satisfactory performance.

Qualifications:

To start work, a Ph.D. in Biological and Agricultural Engineering, Environmental Engineering, Soil Science, Hydrologic Science, Data Science, or a related discipline is required. The ideal candidate will have experience working with a programming language like R or Python, experience with geographic information systems (GIS), experience in studying and nutrient fate and transport, and strong technical communication skills (written and oral). A strong publication record is highly desirable. *We especially encourage women and members of underrepresented groups to serve as undergraduate and graduate students, and postdoctoral researchers in STEPS.*

For more information and informal consideration:

The position is currently open and we are seeking to fill it *immediately*. **More details about working on the project and within STEPS are included on Page 2.** To apply, please send a CV, a list of 3 references, and cover letter to owen_duckworth@ncsu.edu. We will accept applications until a suitable candidate is found.

Working as the Legacy Phosphorus Data Synthesis Postdoctoral Scholar

Grand challenge:

Phosphorus is as fundamental to life as carbon, water, and nitrogen, yet there exist immense challenges associated with its availability, application, management, and disposal. The world food system relies heavily on phosphorus fertilizers, most of which originate from non-renewable phosphate deposits. The proposed project is part of the Science and Technology for Phosphorus Sustainability (STEPS) center, a NSF funded center that seeks to enable discovery and enact changes that reduce dependence on mined phosphate by 25% within 25 years.

The project:

The postdoctoral scholar will participate in interdisciplinary research with a team of scholars in multiple departments at NC State, as well as other universities. The goal of the overall team project is to better understand and model phosphorus export, retention, and mobilization at the national scale. The postdoc will lead efforts associated with collecting and curating soil phosphorus data, and developing models to predict soil P at high resolution across the US. In collaboration with other team members, the postdoctoral scholar will integrate their research with a comprehensive P budget model and data visualization efforts. This will involve diverse skills — not only hard research skills like GIS and coding but also soft skills, including reaching out to other collaborators and interfacing with stakeholders.

Models developed by the team will have real impacts. In addition to writing journal papers and presenting at relevant scientific conferences, the postdoc will have opportunities to interact with groups that may use the model to guide management and policy decisions. This involves working with the Sustainable Phosphorus Alliance (<https://phosphorusalliance.org/>) and technical working groups made up of stakeholders, including producers, policy makers, environmental groups, and industry partners.

The people:

Our goal is to recruit and train intersectional researchers for the type of convergent research necessary to spur innovation that impacts the real world. The postdoc will work with a diverse cadre of researchers working on all aspects of phosphorus sustainability. In addition to training provided by research mentors, formal mentoring is provided by STEPS Education and Human Resource Development team. Likewise, the postdoc will have the opportunity to mentor undergraduate students from the Research Experiences for Undergraduates (REU) Program.

The essence of the strength of STEPS is the diversity in thought, culture, experience and approach toward problem solving required to address a societal issue that no single discipline or group can solve on its own. Our goal is to have a diverse and inclusive Center that mirrors the population of the United States and values the contributions and uniqueness of all participants.