Postdoctoral Researcher & Graduate Student Positions
Remote Sensing of Lake Drawdowns and Cyanobacteria Blooms
University of Massachusetts Amherst

Application deadline: 30 Nov 2020
Start date: Summer/Fall 2021

Overview
We are seeking applications for a postdoctoral researcher and a PhD-level graduate student to work on a new project investigating sensitivity of lake ecosystems to winter water level drawdowns and implications for lake management under future climate. The project uses remote sensing data, validated with on-the-ground water level and cyanobacteria data collected by partner organizations and citizen scientists, to identify winter drawdown lakes and prevalence of cyanobacteria blooms throughout the Northeast and Upper Midwest US. In addition, we will use continuous hydrologic data from a subset of drawdown lakes to build a hydrologic model to examine sensitivity of lake drawdowns and vulnerability of cyanobacteria blooms to future climate and precipitation. A brief summary of the project, which is funded by the Northeast Climate Adaptation Science Center, is available here.

Project Leaders:
Dr. Allison Roy (aroy@eco.umass.edu), U.S. Geological Survey, Massachusetts Cooperative Fish and Wildlife Research Unit, Department of Environmental Conservation, University of Massachusetts Amherst; UMass website; Coop Unit website.
Dr. Konstantinos Andreadis (kandread@umass.edu), Department of Civil and Environmental Engineering, University of Massachusetts Amherst; website.
Dr. Caitlyn Butler (csbutler@engin@umass.edu), Department of Civil and Environmental Engineering, University of Massachusetts Amherst; website.
Dr. Colin Gleason (cjgleason@umass.edu), Department of Civil and Environmental Engineering, University of Massachusetts Amherst; website.

Postdoctoral Position
Key Responsibilities: The postdoctoral researcher will work directly with state and federal partners to compile existing hydrology and cyanobacteria data and facilitate collection of new data by citizen scientists, and work with the PhD student on analysis of these data. They will lead a synthesis paper on winter drawdown guidelines and practices across the regions and ecological impacts of not meeting winter drawdown targets and develop website content on impacts of winter drawdowns and cyanobacteria blooms on fish and wildlife. The postdoc will also be responsible for managing data, drafting annual reports, leading quarterly meetings with partners, and conducting cross-region webinars and regional workshops with partners to share models and solicit feedback.

Qualifications: Competitive candidates will have a background and interest in freshwater science, experience working on collaborative research projects, strong coordination and communication skills, and an interest in working with stakeholders. Experience managing large datasets, knowledge of Python or R (or equivalent), and experience in cloud computing is preferred. Applicants are expected to have earned a PhD in a relevant discipline prior to the start date.

<u>Affiliation and Timing</u>: The postdoctoral researcher will be part of the Massachusetts Cooperative Fish and Wildlife Research Unit in the Department of Environmental Conservation. The position will begin on or around July 1, 2021 and is for up to 2 years, pending productivity and success in the first year.

<u>Salary/Benefits</u>: Salary is $56,000 in the first year and $58,000 in the second year and includes health insurance and other benefits through UMass as described [here](). Funding is also available for travel to meet with partners and attend professional conferences.

Graduate Student Position

<u>Key Responsibilities</u>: The PhD student will use remote sensing in conjunction with field data compiled by the postdoctoral scientist to characterize winter drawdowns and cyanobacteria blooms in lakes. The student will use the integrated hydrology model SWAT-MODFLOW to simulate hydrology of watersheds and validate the model with continuous water level data available at a subset of lakes. They will develop an empirical model of bloom vulnerability based on remotely-sensed data and hydrology models. Finally, the student will conduct a sensitivity analysis to assess the effects of warming temperature and increased precipitation on winter drawdowns and cyanobacteria blooms. The results will be shared at scientific conferences, workshops with partner organizations, and in peer-reviewed journal publications.

<u>Qualifications</u>: Competitive candidates will have an interest in remote sensing and freshwater science. Experience running a large physically-based model and data analysis skills are required. Applicants should have a strong mathematical background, but do not need an engineering degree. Undergraduate (and graduate, if applicable) GPA and coursework, writing and speaking ability, and ability to work independently and in teams will all be considered.

<u>Affiliation and Timing</u>: The PhD student would begin the graduate program in the Department of Civil and Environmental Engineering in Fall 2021 (with potential to start in summer 2021). A description of the graduate program, course requirements, and dissertation requirements, are available [here](). The successful candidate will have the apply to the UMass Graduate School by February 2021.

<u>Salary/Benefits</u>: The student will be supported on a research assistantship (20 hours/week) for 2.5 years and is expected to work with the Project Leaders to identify additional funding sources as needed, which may include a teaching assistantship. The research assistantship has a stipend of ~$32,000 per year, a tuition waiver, and benefits through the [UMass Graduate Employee Organization](). Funding for travel to professional conferences is also provided.

Application

To apply for any of the positions, send 1) a cover letter describing your background and experiences as they relate to the position you are applying for, 2) a CV, 3) names and contact information for 3 references, and 4) unofficial transcripts (graduate position only) to Allison Roy (aroy@eco.umass.edu). Review of applications will begin on 1 December 2020.

We especially encourage applications from groups that have been historically excluded from STEM fields. Our team is deeply committed to the principles of equity, diversity, and inclusiveness and seeks to create a pluralistic community. Black Indigenous People of Color, women, and individuals with disabilities are encouraged to apply. If you are interested in the project, but have additional questions about the proposed work or desired qualifications, please reach out to any of the Project Leaders.