Subject: PhD position in Watershed Biogeochemistry at Cornell University

The Watershed Biogeochemistry in the Anthropocene Lab (http://gersonlab.weebly.com) at Cornell University is recruiting a motivated, collaborative, and curious PhD student. The student will examine hotspots for methylmercury production within waterbodies of the Peruvian Amazon, as part of a project funded by the Gordon and Betty Moore Foundation.

Mercury is transformed by microbial activity into methylmercury – the form of mercury that is toxic and can bioaccumulate. The largest source of mercury contamination is artisanal and small-scale gold mining (ASGM), which uses mercury to isolate gold. Yet nearly all current understanding of mercury cycling originates from studies conducted in the Global North, which emits primarily ionic mercury from coal combustion, rather than elemental mercury from artisanal gold mining in the Global South and has different ecosystem structure and climate from the Global South. These differences in mercury speciation and environmental conditions alter how mercury is transported across the landscape and bioaccumulated in organisms and has implications for wildlife and indigenous communities living in the Global South. This project focuses on determining mercury transport and methylation pathways in the Peruvian Amazon to create a more nuanced, globally representative understanding of mercury cycling processes and to update existing models.

This research will involve a combination of fieldwork, laboratory analyses, lab experiments, and modeling. The student will be expected to work both independently and collaboratively, to communicate results in peer-reviewed scientific articles and conferences presentations, and to share their work with relevant community members and leaders.

The Watershed Biogeochemistry in the Anthropocene Lab studies how anthropogenic activities have altered the coupled cycling of nutrients and contaminants through watersheds. We examine the fate, transport, and transformation of these elements within and between terrestrial and aquatic ecosystems, including their consequences for people and animals.

The Gerson Lab is part of the Department of Biological and Environmental Engineering (BEE) at Cornell University. I can also bring in students through the Department of Ecology and Evolutionary Biology (EEB) and the Department of Natural Resources (DNRE). Collectively, these communities provide great opportunities for students to work and interact with other watershed and ecosystem scientists in a supportive and collaborative environment. You will have opportunities at Cornell to collaborate with others across these departments and others, including through weekly across-lab aquatic meetings and bi-weekly biogeochemistry chalk talks and seminars. There are many additional opportunities for research, interaction, seminars, etc.

I encourage all students applying to graduate school to check out this article I co-authored about demystifying the graduate school application process.

Minimum qualifications: Previous experience with labwork, fieldwork, and data analysis. Students from a range of academic majors are encouraged to apply. Preference will be given to students with a M.S. degree by the start date, although I will consider all students with a B.A. or B.S.

Desired qualifications: Previous experience conducting research or traveling independently in remote areas/difficult conditions, ability to communicate in Spanish (or willingness to learn), self-motivation, willingness to learn, positive attitude, interest in a cross-disciplinary approach, ability to work collaboratively in teams, and a commitment to creating an inclusive culture in the research group and more broadly in research science and education.

Note that GRE scores are not required or considered as part of the grad school application.

Funding: The PhD student will be funded on a combination of teaching and research assistantships, which include a competitive stipend for five years (including summers), tuition waiver, and health insurance benefits.

I also highly encourage you to apply for competitive fellowships, and I would be happy to work with you to develop your applications. Applications for the NSF Graduate Research Fellowship Program (GRFP) are due in October. You can find examples of funded application materials here to use as a guide. There are also other fellowships you can apply for, including the Simons Foundation, DOE, NOAA, NASA, and USDA.

If interested, please review our lab website for more information and then contact Dr. Jacqueline Gerson at jacqueline.gerson@cornell.edu to arrange a zoom call. **In your email, please briefly address the following questions:** 1) your previous research experience and/or relevant skills, 2) what has been your most rewarding research experience and why, 3) why are you interested in pursuing a PhD, 4) what topics are you interested in pursuing for your PhD and why are those questions important to explore, 4) why are you interested in joining this lab, and 5) what do you want to do after you earn a PhD. your previous. Please also attach **your CV, an unofficial transcript, and contact information for 3 references.**