PhD student position in datamining and environmental chemistry

**Topic:** A student will generate and mine chemical datasets to identify the diagnostic chemical signatures associated with different landscape gradients and phosphorus sources within the Klamath Basin.

Dr. Gerrad Jones ([Gerrad.Jones@oregonstate.edu](mailto:Gerrad.Jones@oregonstate.edu)) is an assistant professor at Oregon State University in the Department of Biological & Ecological Engineering. He is looking for a creative and highly motivated student to start a funded 4-year research project. Interested students should contact Dr. Jones and include a 1) cover letter addressing required qualifications, 2) a C.V. with names and contact information of at least two references, and 3) a technical writing sample.

**Important Dates:** Graduate applications for Biological & Ecological Engineering and the Water Resources Graduate Program are due January 4th and 5th, 2021, respectively.


[https://gradschool.oregonstate.edu/programs/3100/water-resources-engineering-phd-ms-minor](https://gradschool.oregonstate.edu/programs/3100/water-resources-engineering-phd-ms-minor)

**Background:** Bodies of water are chemical data loggers for watershed processes as they contain tens of thousands of chemicals derived from upstream sources. My hypothesis is that the chemicals present in surface waters are not random but instead represent a chemical record of everything that has occurred upstream. By mining the information present within chemical datasets, I hope to identify the landscapes/sources that contribute disproportionately to the chemical loadings to receiving bodies of water. The ultimate goal is to develop management strategies that reduce phosphorus (a chemical that contributes to eutrophication and harmful algal blooms) discharge to Upper Klamath Lake, Oregon.

This project will consist of approximately equal proportions of fieldwork, lab work, and computational analysis. By the end of the project, the student will have gained considerable experience in multivariate statistics, machine learning, and water quality analysis.

**Who should apply?**

This line of research is challenging with no predefined solutions. As a result, a tremendous amount of progress can be made by creative individuals who are willing to work hard and find unorthodox solutions to problems. **All highly motivated students**, regardless of national origin, age, gender, sexual orientation, or creed are encouraged to apply.
Required Qualifications:

Chemical datamining is a new field, and few solutions have been developed. Therefore, students must:

- Have experience overcoming failure. Research is ~80% problem solving, and most ideas do not work as originally planned. Failure is a part of life, but success comes from continually rising to meet the challenge.
- Have a positive attitude. A PhD is an emotional endeavor, and a negative attitude will quickly sink a project.
- Be independent and creative problem solvers. Often, the best solutions come by taking the path less traveled.
- Take ownership of a project. A student will be successful by chasing down leads and running as far as they can with an idea. Students should come to me and say, “Look what I’ve done!”
- Be comfortable working in remote locations. The fieldwork for this project will take place around Klamath Falls, Oregon, during all seasons of the year.

If this describes you, you will be highly competitive, regardless of your past academic studies.

Preferred Qualifications include any combination of the following:

- MS in science, technology, engineering, or math (although accomplished BS students with technical skills will be competitive).
- Experience troubleshooting projects.
- Programming experience (Python, R, or other programming language).
- Comfortable with general statistics (good) or machine learning/multivariate analyses (better).
- Experience with mass spectrometry instruments.
- Fieldwork experience.
- Experience camping, hiking, traveling, backpacking, and/or driving in remote locations.

For more information, please contact Dr. Jones directly (Gerrad.Jones@oregonstate.edu) and/or visit his lab page at (http://agsci-labs.oregonstate.edu/ecochem/).

Useful links

https://bee.oregonstate.edu/ BEE Department site
https://oregonstate.edu/gradwater/ Water Res. Grad. Program site
http://gradschool.oregonstate.edu/ OSU’s graduate school
http://cgrb.oregonstate.edu/ Biocomputing at Oregon State
http://www.looscomputing.ch/eng/enviMass/overview.htm Information on analytical software
https://scikit-learn.org/stable/index.html Python tools we use in my lab