Member Spotlight

A monthly highlight featuring an ASEG member. All past member spotlights can be found in our newsletter [archive](#).

We welcome **Lindsey Heagy** under the spotlight in this issue as she shares her enlightening story!

Lindsey is an Assistant Professor and Director of the Geophysical Inversion Facility at the University of British Columbia.

I started in my role as an Assistant Professor at UBC in 2021 where I have the pleasure of working with a talented group of graduate students and postdoctoral researchers on questions in computational geophysics. Our work at the Geophysical Inversion Facility focusses on advancing numerical methods in simulations, inversions, and machine learning for gaining insights from geophysical data. Mineral exploration is a main application of interest. We also do work in carbon capture and storage, permafrost, groundwater and unexploded ordnance. As a part of our research, we lead the development of open-source software for geophysical inversions with the SimPEG project.

Prior to my current role, I was a postdoctoral researcher in statistics at the University of California in Berkeley. I completed my BSc in Geophysics at the University of Alberta, and my PhD at UBC, working with Doug Oldenburg. I am delighted to be connecting with the ASEG community!

1. ***Tell us who you are and what you do.***

   I enjoy that my role involves a few different facets. I connect with folks from industry and other collaborators to identify research questions that we can build research projects around. I then work with postdocs and students in the group to help define the components they are interested in pursuing. There are folks in the group working on projects that range from understanding fundamental physics through to combining machine learning with inversion methods to test out new ideas for regularization, or avenues for bringing in additional geologic information into the inversion. Our research is primarily computational and as a part of our work, we develop the SimPEG project, which contains python tools for

simulating and inverting geophysical data. I still periodically get to write some code myself!

I also teach undergraduate and graduate courses in courses in applied geophysics, inversion, and data science. Many of the educational resources that we have developed for these courses are available through the open-access GeoSci.xyz site.

2. **What do you like most about being a geophysicist?**

The problems and the people! Being able to work on intellectually challenging problems that can help contribute to solutions of societal challenges is a rewarding space to be in. I also think that the global geophysics community is a great group of people. Geophysics is an interesting Venn diagram of physics, computation, practical problems, and the outdoors, with each person bringing their own balance of these interests, and often a genuine curiosity that is contagious.

3. **What made you decide to be a geophysicist?**

When I started my undergraduate degree, I wasn't sure what I wanted to do. I was lucky to be a part of an experimental first-year science program at University of Alberta called Science 100. It was an interdisciplinary program, and the instructors made a serious effort to make connections between the disciplines – they psychology professor was usually the one asking the most questions in the math lectures. Being in an environment where curiosity was encouraged helped spark my interest in research. Early on in my degree, we saw the image of the global gravity anomaly from the GRACE satellites, and I was captivated by all of the history and events that could be seen: mid ocean ridges, post-glacial rebound, and tectonic events. I also have always been fascinated by electromagnetics and just enjoy thinking about problems in EM; seeing that I could combine those interests with the outdoors and solving practical problem – I was sold!

4. **What reaction do you mostly get when you tell someone that you are a geophysicist?**

Often confused looks, but in Vancouver, I sometimes then get asked "When will the big one [earthquake on the Cascadia Subduction Zone] be? …"

5. **When asked what you do – what do you do?**

I usually draw an analogy between geophysical imaging and medical imaging. Many people are familiar with the idea of going for a scan to non-invasively image a person, so explaining that we often use the same physics, and many similar computational methods, just on a different scale to image the Earth can be a good connection point.

6. **What do you do in your spare time?**

Yoga, hiking, and I recently started stand-up paddleboarding

7. **What's your most treasured textbook?**

Ward and Hohmann "Electromagnetic Theory for Geophysical Applications"