KRIS LUDWIG | Staff Scientist, Natural Hazards Mission Area, US Geological Survey (kaludwig@usgs.gov)

Degree: When, where, what, and what in?

I earned a bachelor's degree in Earth systems from Stanford (1999) and a PhD in oceanography from the University of Washington (2008). My dissertation focused on the formation, age, and evolution of carbonate chimneys at the Lost City Hydrothermal Field near the Mid-Atlantic Ridge.

Did you stay in academia at all, and if so, for how long?

No, but I have maintained my ties to the academic community by attending conferences, serving on review panels, mentoring students, and adjunct teaching.

How did you go about searching for a job outside of the university setting?

I cast a wide net and kept an open mind! I relied heavily on my network and online job postings. Participating in the Consortium for Ocean Leadership's Marine Geoscience Leadership Sympo-sium gave me valuable contacts that ultimately led to my first job in Washington, DC. Informational interviews were extremely valuable in understanding the breadth of possible options.

Is this the only job (post-academia) that you've had? If not, what else did you do?

No—I have had several positions that have enabled me to explore science education, communications, and policy. After completing my PhD, I worked at Seattle's Pacific Science Center where I supported the education programming for a project named "Around the Americas." The project followed the expedition of a sailboat circumnavigating North and South America, and my work included curriculum development and exhibit design. I later moved to Washington, DC, to manage communications for the Integrated Ocean Drilling Program (IODP) at the Consortium for Ocean Leadership, a nonprofit organization that promotes research, education, and sound ocean policy. As part of this work, I wrote press releases and organized public outreach and media events in international ports of call. While in DC, I developed an interest in policy and became an American Association for the Advancement of Science (AAAS) Science & Technology Policy Fellow.

What is your current job? What path did you take to get there?

I am a Staff Scientist in the US Geological Survey's (USGS) Natural Hazards Mission Area. In this position, I support a fairly new group known as the Department of the Interior (DOI) Strategic Sciences Group (SSG, http://www.doi.gov/strategicsciences), which rapidly assembles interdisciplinary teams of scientists to develop scenarios used to inform decision making during environmental crises such as oil spills and hurricanes.

It's been a circuitous path. When the Deepwater Horizon oil spill occurred in 2010, I had the chance to be part of a team from Ocean Leadership that coordinated one of the first meetings of academic scientists to discuss response to the spill. I had never seen anything like it—we were broadcasting live to CNN International as federal agency leaders provided updates on ongoing response efforts, and veterans of the response to the Exxon Valdez spill shared cautionary tales of inevitable litigation. During break-out sessions and coffee

breaks, researchers from all subdisciplines of oceanography frantically traded observations and field schedules to help each other plan sample collection. It was science on steroids.

For me, the most memorable moment was when someone exclaimed, "If we could only get samples of the oil, gas, and water together…" A friend from grad school and I looked at each other and almost started laughing. The deep-sea community had been doing this for decades at hydrothermal vents—why not use the same technology to sample the oil and gas effusing from the Macondo well? While we certainly weren't the only ones to arrive at this solution, it was the first time I realized that my expertise in marine geology could be used, in a very small part, toward solving a national crisis. I was inspired to find a way to help improve science coordination in response to disasters, which sparked my interest in policy.

I spent the first year of my AAAS Fellowship at the National Science Foundation, where I analyzed policies underpinning complex planning behind major federal science investments such as astronomical observatories, EarthScope,

and the oceanographic research fleet. However, I missed working more closely with the geoscience community, and when the opportunity arose to continue my fellowship at USGS, I switched agencies. Three months later, Hurricane Sandy struck the East Coast, affecting 17 states. I was thrown into the deep end of co-leading the SSG's response to Sandy in support of DOI's role on the Hurricane Sandy Rebuilding Task Force. Last year, I was fortuitously hired by USGS to continue this work.

What did your oceanographic education (or academic career) give you that is useful in your current job?

Resourcefulness. In the lab or in the field, when something goes awry, you have to think on your feet and find alternative solutions, sometimes with limited information or tools. This skill transfers quite well into hazards—while I may no longer be looking for yet another use for duct tape, I have had to be resourceful in problem solving, sometimes under pressure. I credit my oceanographic field experience with this ability!

Is the job satisfying? What aspects of the job do you like best/least?

Yes—one of the things I like the best is learning about different hazards—they are very "meaty" in that they affect so many dimensions of our lives, across our society, economy, and environment. In any given week, I am working with specialists in earthquakes, tsunamis, oil spills, pandemics, floods, and hurricanes. Because our group can be called on to respond to many kinds of natural- or human-caused disasters, I have to have some knowledge of all of these events—as well as of the experts working in these fields. It is a great excuse to be constantly learning and to meet many talented individuals who are working very hard on solving complex problems.

While my current work is intellectually stimulating, I do find that I miss fieldwork. My passion for Earth sciences began with hiking across the San Andreas Fault and diving in the *Alvin* submersible—most of my travel now is to attend meetings, and our hazard response deployments involve huddling in a hotel conference room for a week to develop our disaster scenarios. While this is rewarding, nothing compares to feeling sea spray in your face or sketching an outcrop! I hope to find a way to return to the field down the road.

Do you have any recommendations for new grads looking for jobs?

Be open-minded and think broadly about your options—you have more skills than you may realize, and with creativity and persistence, they can be applied to many career paths! Know that transitioning from your specialty to something different or with a broader scope than what you have been accustomed to in school can be disorienting at times, but can also lead to rewarding new opportunities.