

THE OFFICIAL MAGAZINE OF THE OCEANOGRAPHY SOCIETY

Oceanography

CITATION

Kappel, E.S. 2016. Working toward a PhD in ocean sciences hones a variety of marketable skills: Insights from Oceanography's Career Profiles column. *Oceanography* 29(1):4–5, <http://dx.doi.org/10.5670/oceanog.2016.21>.

DOI

<http://dx.doi.org/10.5670/oceanog.2016.21>

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Working Toward a PhD in Ocean Sciences Hones a Variety of Marketable Skills

Insights from *Oceanography's* Career Profiles Column

As ocean sciences PhD recipients head out into the market for jobs in academia, government, or industry, they likely reflect upon what parts of their graduate school education will be relevant to the wide variety of available positions. In particular, graduating PhD students and postdocs applying to jobs outside of academia may wonder what exactly they have learned that will enable them to succeed at projects that fall outside of their particular research area. If subject-area expertise is not always essential, what other kinds of knowledge and skills did they gain while working on ocean sciences PhDs that translate well into careers outside of academia, or even outside of oceanography?

Perhaps some insight can be gained from responses to one of the questions posed to ocean scientists who submit career profiles to *Oceanography*: “What did your oceanographic education (or academic career) give you that is useful in your current job?” Snippets from several of the responses follow.^{1,2}

My education trained me to think critically and objectively. I learned to not rush to judgment, but rather to carefully weigh my observations before reaching a conclusion.

— Lynn Abramson, Senior Legislative Assistant,
Office of Senator Barbara Boxer

Each of my positions has required a broad knowledge of science, the scientific process, and the ability to interact with a wide range of constituencies; my training in Earth sciences and oceanography has certainly provided that.

— Robert L. Burger, Associate Dean,
Faculty of Arts and Sciences, Yale University

Completing a PhD means running a significant project, and it includes skills as diverse as fundraising, strategic planning, project management, staffing, speaking and writing, and leadership. These skills continue to be the most valuable ones I gained.

— Paul Bunje, Senior Director of Oceans, XPRIZE Foundation

The self-discipline and self-scheduling I learned as a PhD student have been invaluable to me as I've had to figure out how to meet deadlines and complete work on a variety of time scales... The logistics, planning, project management, and capacity to break a big project down into smaller pieces as well as the hefty amount of thinking and writing that my dissertation demanded have served me well.

— Ari Daniel, Digital Producer, PBS NOVA,
and Freelance Science Reporter

I use my academic training in data analysis, statistical techniques, and programming every day in my current job, but there are many other skills I have found profoundly useful. The work I did generating plots for academic publications taught me graphic design and data visualization skills, which I use for building user interfaces.

— Jordan Dawe, Data Engineer, EnerNOC

Above all else, my oceanographic education instilled in me a strong sense of integrity and inquisitiveness. Not only did I gain knowledge, but patience and adaptability as well... A particularly useful skill ingrained from years of working on board ships and in laboratory settings is the ability to be a team player and nurture a broad network.

— Tina Drexler, Geoscience Associate,
ExxonMobil Upstream Research Company

The first-hand experience I have had on Arctic icebreakers was valuable scientifically, plus it has been a great way to talk with the public and policymakers about the science. It is one thing to tell someone you are a scientist, but when you tell them about research you performed in a remote, hostile location...they are much more interested in what you have to say and much more willing to listen to the science you want to convey.

— Brenda Ekwurzel, Senior Climate Scientist,
Union of Concerned Scientists

¹ To review the complete set of profiles, including the answers to other questions we ask about their careers, job satisfaction, and job hunting, go to <http://tos.org/career-profiles>.

² The job positions listed indicate where the person was employed at the time the career profile was submitted.



My years in academia give me insight into the process of science—grant writing, peer review, experimental design, incremental progress. That experience enables me to tell science stories from a different perspective, perhaps a more human one, and that is invaluable.

— Heather Goldstone, Science Editor,
WGBH and WCAI National Public Radio Stations

Without question, the education that I received has been a platform for other, seemingly unrelated, achievements that followed. My education gave me confidence, an understanding of hard work, enduring friendships, and appreciation of strong leadership.

— Kerry Hegarty, Managing Director/CEO, Sienna Cancer Diagnostics

I would say that my skills in critical thinking, writing, and presenting, developed and improved through working on my PhD and interacting with my lab mates, are the skills that I have relied on the most. The critical thinking skills and the ability to absorb and digest new information quickly are invaluable in the policy as well as the conservation fields.

— Winnie Lau, Program Manager,
Marine Ecosystem Services Program, Forest Trends

Problem-solving skills, experience managing projects, and telling a useful story with messy data. In many things, there is often no right answer but a family of solutions.

— Norge Larson, President, Sea-Bird Electronics Inc.

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.

— Kris Ludwig, Staff Scientist, Natural Hazards Mission Area,
US Geological Survey

Going to sea during graduate school provided a great training environment for skills that can be applied for many jobs. In particular, I use skills such as logistical planning, teamwork, collaboration, problem solving, and how to work with others in challenging situations on a daily basis.

— Mitch Malone, Assistant Director of Science Services/
Manager of Science Operations, Integrated Ocean Drilling Program,
Texas A&M University

My science PhD has been an enormous asset at every step of the way. Simply having it helps open doors. More importantly, the skills I developed as a graduate student are essential ones that I still depend upon, especially the independent analysis and problem-solving skills.

— Kathryn Mengerink, Environmental Law Institute

The skills that I find most useful relate to data analysis, statistical analysis, computer programming, and writing. Less tangibly, but possibly most important, I think I picked up a commitment to integrity and quality in my work as part of my education.

— Michele Morris, Consultant

My experience as a scientist greatly facilitates my ability to work effectively with other scientists simply because I have a good sense of how scientists go about their work, how they formulate and refine their ideas, and how they communicate with each other.

— Audrey M. Rogerson, Director of Development,
The Arnold Arboretum of Harvard University

Ocean scientists learn how to think critically, solve complex problems, analyze and visualize data, communicate to peers and to the public, manage large projects, and work as a member of a team. These skills have enabled generations of ocean scientists to succeed in a wide variety of careers. At a time when the ocean sciences community is considering updating the PhD curriculum to align better with the needs of current and emerging job markets, any evaluation must recognize the importance of these less tangible but absolutely essential components of graduate training and consider teaching at least some them directly.

Ellen S. Kappel, Editor