DEIRDRE A. BYRNE | Surface Oceanography Unit, National Oceanographic Data Center, National Oceanic and Atmospheric Administration (deirdre.byrne@noaa.gov)

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

I earned a Bachelor of Science degree in geology and geophysics from Yale University in 1990 and a PhD in Earth and environmental sciences from Columbia University in 2000. My doctoral research involved measuring the heat, salt, and mass transports "leaking" from the Indian Ocean to the South Atlantic via the Agulhas Current.

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

When I was about six months away from finishing my PhD, I took a position at the Island Institute, an environmental nongovernmental organization in Rockland, Maine. The Institute was organizing a multidisciplinary study (funded by the National Oceanic and Atmospheric Administration, NOAA) called the Penobscot Bay Marine Resource Collaborative. In the second year of this study, I was funded as a principal investigator and moved to the University of Maine as an Assistant Research Scientist. I finished my doctorate while working full time as a soft-money researcher there. This was an extremely difficult way to finish a dissertation and launch a career. I stayed at U. Maine for about 13 years. Ultimately, I was not happy with the work-life balance afforded by an academic soft-money position, nor with the professional opportunities available there for my husband, also a physical oceanographer.

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

I used the usajobs.gov website extensively, targeting NOAA as an organization that hires a lot of oceanographers and the Washington, DC, area as one in which both my husband and I could probably find positions. I think it is relatively anomalous to join an organization "cold" without a single inside contact. In my case, although I was not personally known to the National Oceanographic Data Center (NODC) staff, we had colleagues in common. I cannot over-emphasize the value of a professional network—even just to conduct the work I do now, I rely heavily on information from colleagues both inside and outside NOAA.

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

I've been at NODC for just under four years now, so I'm relatively new to federal service. I came to NODC to lead the Satellite Oceanography Team. Nowadays, I also supervise the Surface Oceanography Unit. At NODC, my unit's role is to provide a full suite of scientific stewardship services for surface observations—including all of NOAA's oceanographic satellite products (whether derived from NOAA or from other satellites). The term "scientific data stewardship" sounds arcane—but it is something that the individual scientist does almost reflexively. Making a measurement requires knowing the data format the instrument uses, its calibration parameters, and where and when the measurement was made. Without that information, it isn't possible to make good use of the data collected. A good scientist also takes some care to back up the precious data in a variety of locations and on a range of media. Our goal at NODC is to accomplish that task—ensure that the data our nation pays to collect, and the data sent to us by data producers and sister institutes, is going to be useful to scientists

around the world for decades to come. It's an enormous and complex task.

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

In grad school, I learned that attention to detail is critically important for the conduct of rigorous science, but to be a good scientist you simultaneously have to keep an eye on the big picture. As a research scientist, I learned how to define the scope of work for a project, and the concomitant goals and objectives, and from them, develop a comprehensive budget and staffing plan, then execute the plan on time and on budget. I learned to strategize—to always have a Plan B and maybe a Plan C in my pocket. I also learned to lead a mixed group of scientists, programmers, and techs. As a soft-money scientist, I also learned how to define the ways in which my group could contribute to a larger project and how to define the cost of that involvement and write up a succinct statement of work. As an academic scientist, I also served as the system administrator for my Linux LAN. The other critical thing I learned as an academic scientist was how to collaborate with others on a team and how to reach out to scientists at other

institutes who have relevant expertise. I draw on these skills and the professional network I developed as an academic quite heavily in my present position.

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

I love my job. NODC's mission is one that I wholeheartedly support. The quality of the people at NOAA is superb, and it is a pleasure to work with them.

One thing I've learned at NOAA is that you have to be very patient with the sometimes agonizingly slow or seemingly convoluted processes of government. It's a big ship we are steering, so it takes a long time to change course. You have to give that process a chance to succeed. For example, I've become involved in satellite mission planning, and the time horizons are very long. The payoff is that you have the opportunity to set up something of value to the scientific community and society as a whole that will endure. It's a satisfying feeling.

I love that I am working full time in my field but no longer routinely putting in 60 hours a week; I love being in a place where work-life balance is encouraged. While I still work long hours when needed to meet deadlines, I am not only expected, but required, to take time off after the deadline has been met. To me personally, the least satisfying part of my job is being subject to the severe uncertainties sometimes imposed by the federal budgeting process. The furlough last fall was very demoralizing, and NOAA's oceanographic programs and offices have endured some pretty severe budget cuts, while the scope of our work only increases.

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

Keep an online version of your professional self up to date and easily accessible. People shouldn't have to hunt around to find a list of your publications and presentations. If you are seeking a non-academic position, do not circulate a CV. Instead, write a resume with sections detailing your executive/leadership, scientific, and technical qualifications. Make sure you reach out to your professional network—not just when you are looking for a job, but on a regular basis. Don't hesitate to suggest meeting someone for lunch for an informal informational exchange. Sometimes you may be the one with a need, and sometimes it will be the other person. Don't always wait until you are the needy one. If you are looking to bring in work for yourself or your group, ask your colleagues what their or their organization's current challenges are. Think hard about whether you can offer them some help and don't be afraid to suggest it (at a reasonable rate of compensation). If you are looking for a new position—be yourself—don't misrepresent your abilities, but at the same time, be open to new experiences and a new line of work. Think about what the organization might need and how you could supply that—not about what your research or scientific priorities are. The job you are offered may not be ideal, but through it, you may make valuable contacts or gain experience that leads to the next, better position.

In government and large organizations, there is a big need for scientists with strong programming, information technology, and data management skills. Consider expanding your skills with, say, a course in Python programming or ISO metadata, or a certification in project management. Alternatively, consider obtaining a certification for teaching Earth system or marine science at the high school level. These positions pay reasonably well and you actually get the summer off! If you are not a US citizen but are in a position to obtain citizenship, consider doing so—there will be more opportunities open to you. If you think you might be interested in operational oceanography, realize that we do not do everything in Matlab. Shell scripting, command-line-based packages such as GMT, languages like Perl or Python, C or Fortran, familiarity with formats like NetCDF, HDF, and relational databases, services like OPeNDAP and revision control systems like CVS, RCS, or git—these are all valuable skills and well within the grasp of someone getting a PhD in a quantitative science. If you can, take some time while still in grad school to learn some of these skills. Community colleges or MOOCs (massive open online courses) can be a good way to brush up on these. As well as technical skills, good organizational and communication skills are essential, and a strong command of written and spoken English is a definite plus. When you present your work to a potential non-academic employer, be careful to mention not only the scientific results, but how you got there—did you have to collaborate widely, strategize a fallback plan when your original experiments fell through, manage a budget, organize a cruise? What technical skills did you use to conduct this work? In other words, try to highlight what associated skills you will bring with you to the job.