



Breaking into science writing



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Virginia Gewin had finished a master's in soil microbiology and was 3 years into a PhD on an Earth science fellowship from NASA when her project caved in. The climate-controlled chambers she relied on for her project were abruptly shut down by a government funding cut. "It was years of work down the drain", Gewin says. She didn't have the heart to start over, so she started to explore other options.

While pursuing her PhD, Gewin had done some writing for her campus newspaper, and a contact from her university news office suggested she apply for a 10-week summer program in science journalism through the American Association for the Advancement of Science (AAAS) Mass Media Science & Engineering Fellows Program. As a Mass Media Fellow she landed an internship at the daily newspaper *The Oregonian*, where she leapt at any field reporting opportunity. She backpacked into the wilderness to write about efforts to monitor volcanic activity, and accompanied researchers on a Pacific cruise to track undercurrents using fluorescent dye. Gewin says she "wrote her butt off" during that time. Hooked, she left academia and accepted a 6-month internship at *Nature* magazine in Washington, DC, where she made as many contacts as she could. Now a freelance science journalist based in Portland, Oregon, she hasn't looked back.

For many, science writing is a chance to break away from research and explore science more broadly. "I realized I wanted to be thinking about the bigger picture, rather than the minutiae", continues Gewin, whose writing about climate change and food security has appeared in *Nature*, *Science*, *Discover*, *Slate*, *The Washington Post*, *Frontiers*, and other outlets (Figure 1).

Ecologist Aaron Sidder chose science writing for some of the same reasons. Sidder was in his first year of a master's program at Colorado State University when someone asked him to write about his research on bark beetle outbreaks for the department blog. His first post became one of several, and this experience eventually morphed into a 10-hour-a-week paid gig as editor-in-chief. Currently a writer in Denver, Colorado, Sidder still reads scientific papers and attends research talks and conferences as part of his work. But now he's a generalist. "In a given month I might write about a pipeline protest, then about remote sensing, then climate-change apps, then oil and gas in Texas. I get to interact with the wider world of science and research topics I wouldn't come across otherwise." After finishing his master's degree, Sidder interned at *National Geographic* as a AAAS Mass Media Fellow.

One of the biggest adjustments was adapting his writing style. "Most of the comments I got back from my editor were, 'Hey, let's not be so rigid with this language, [and] don't be afraid to inject a little humor or lightness or make things more conversational'".

Writing is only part of a science writer's job. Microbial ecologist Aurora MacRae-Crerar remembers one of her first assignments at public broadcaster KQED in San Francisco, California – a story about blue whales making a comeback off the state's coast. She learned how to interview scientists, record sound, and take photographs, all while scrambling around on a swaying research vessel in a tangle of microphone wires and other gear. MacRae-Crerar, who earned her PhD at the University of Pennsylvania, says that the frenzied pace of daily deadlines taught her she can only do so much background research before beginning an interview. "I had to learn to take a deep breath and pick up the phone, even if I didn't feel completely prepared." Climate scientist and fellow KQED radio trainee Michael Osborne, PhD, believes that writing for the ear forced him to pare things down and get to the point. "In a one-minute audio story, you basically have time to say one thing", he explains.

A doctorate isn't essential to make it in this field; some of the most accomplished science writers have no formal training. But if you've spent time in academic research, "you have a better understanding of how the



Figure 1. Virginia Gewin conducting an interview on expanded agricultural opportunities in Arctic nations as a result of climate change.

process of science works”, says Gewin. You know that research isn’t a straight line. Experiments fail. Data are messy. “The years I spent in the lab help me to mine for stories that others miss”, she continues. Likewise, Osborne feels that his insider knowledge makes it easier to connect with scientists during interviews. “Empathy is a big part of it. You know what it’s like to look at a squiggly line that doesn’t make any sense and bang your head against the wall.”

North Carolina-based science writer Kendall Morgan – who has leveraged her PhD-level expertise in genetics to land assignments in outlets such as *Genome Magazine* and *The Scientist*, as well as a gig editing the blog of NIH director Francis Collins – agrees. “A PhD can make a difference for certain publications.” Some PhD scientists learn how to write on the job, or through internships. Others take classes, or get another degree. Morgan was finishing a doctorate in ecology and evolution at the University of Oregon and exploring her options post-PhD when she heard about the science communication program at the University of California–Santa Cruz (UCSC). She had never taken a journalism class before she enrolled in the program, which requires prior research experience. Two-thirds of students in the UCSC Science Communication Program earned a master’s or PhD in science before leaving research for writing.

New York University, Boston University, MIT, and other universities also offer graduate programs in science writing. Typically one to two academic years, they combine coursework, internships, multimedia training, and coaching from professional editors. While partial funding is available to help offset a portion of the costs, many students find they need to borrow to cover the rest of the tab. Roughly 60% of the Santa Cruz class of 2015–16, for example, took out student loans, finishing up owing \$23,800 on average. With a job placement rate of 90%, many graduates say it was worth it. “You don’t necessarily need a special degree or certificate to be a science writer, but you do need clips and connections”, Morgan says. “Going this route can be more efficient than trying to make it on your own.” When she finished, she had a portfolio of published articles, newsroom experience, and a ready-made network of hundreds of alumni and instructors who regularly share information about jobs and other opportunities. “Compared with years of grad school, another 9 months to a new career is not a long time”, Morgan continues.

Aspiring science writers who can’t stomach the idea of spending more time or tuition on school can sign up for shorter training courses or workshops instead, such as the week-long Santa Fe Science Writing Workshop, held in May, or ComSciCon, a free 3-day science communication series organized each June by and for graduate students in Cambridge, Massachusetts, and other locations.

Some science writers work full-time staff jobs from a company or campus office; others, like Morgan, are self-employed and work from home. Staff jobs provide a regular, fixed income, not to mention benefits such as sick

days, paid vacation, parental and medical leave, and health insurance or retirement plans. For those who want to make a living as a freelancer, being self-employed can offer more geographic flexibility and freedom to set their own hours and pick and choose assignments. For freelancers in particular, rejection, isolation, unanswered emails, and late payments are common. And for all science writers, salaried or freelance, changes in today’s media market mean newspapers, magazines, and broadcast outlets aren’t as stable as they used to be.

Fewer than half of the 2600 members of the National Association of Science Writers work solely for media outlets. Science writers may also be found working for universities, museums, government agencies, and nonprofits. These institutions hire science writers to cover newsworthy research and events in order to share that information with the public and pitch it to reporters. The outlook for these kinds of jobs is expected to grow by 6% over the next decade, as compared with a 9% projected decline for journalism, according to the Bureau of Labor Statistics (<http://bit.ly/2keMYyd> and <http://bit.ly/KEbcyv>).

Such is the case for Osborne, who got his start in grad school at Stanford by offering to teach a science communication class. His students recorded audio interviews with scholars about humans’ impact on the planet, resulting in a podcast series he dubbed “Generation Anthropocene”. Within weeks of finishing his PhD, he was offered a full-time job as a podcast producer with Worldview Stanford. “In grad school I lost perspective on why I cared about science and why I was doing research in the first place”, he admits. “Getting involved in science communication rejuvenated my love of science.”

For information on internships, professional organizations, graduate programs, and other resources for aspiring science writers, see WebPanel 1.

Additional resources may be found in the online version of this article at <http://onlinelibrary.wiley.com/doi/10.1002/fee.1727/supinfo>

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Author biographies

Robin Smith was a researcher and writing teacher for more than ten years before joining the news office at Duke University. She has also written for the *Raleigh News and Observer*, the *Charlotte Observer*, and the blog column of *Scientific American*. Robin earned a PhD in biology in 2005. For more, visit robinannsmith.com.

Julie Reynolds is Associate Professor of the Practice in biology and education at Duke University. In 2002, she was one of the first scientists hired to teach in the award-winning Thompson Writing Program at Duke, where she developed courses such as “Communicating Science to the Public”.