Science Societies

Classroom to career: Dianna Bagnall

By Alison Jennings

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Dianna Bagnall (right) examines soil during a field visit with a colleague from the Soil Health Institute (SHI). Photo courtesy of Dianna Bagnall.

Our "Classroom to Career" series spotlights members who began as students and grew into thriving professionals.

This installment features Dianna Bagnall, who shares how she got into her line of work, the challenges she's faced, and how her network has been an integral part of her support system every step of the way.

"An economist, a sociologist, and a soil physicist walked into a bar. And that's how I got my doctorate."

Dianna Bagnall is a Research Soil Scientist and Program Director at the Soil Health Institute (SHI), a nonprofit she's worked at for the past seven years. Her interdisciplinary work connects soil health to farmers' bottom lines and the well-being of rural communities.

It's a unique intersection of studies. How did she start out in this career?



In this UK farm, a whole landscape can be found below the agricultural landscape above ground. Photo courtesy of Daniel Evans, Cranfield University.

"I was broke. I needed a job," says Bagnall, reminiscing on her time searching for work close to her community college. Her friend, who just started working at a Texas A&M AgriLife research station, encouraged her to look into the station's animal research. "I had livestock growing up, and I thought I could get a job in livestock. [But while the research station] didn't have anything open in the livestock adjacent work, there was a job in the soil fertility/soil chemistry lab, and I thought, 'Well, if I have to, I have to!'"

She thought it would be a temporary position—being stuck in a lab, doing titrations all day was not what the outdoorsy, down-to-earth student had in mind for herself. But as her work in the soil fertility lab progressed, she got a bigger and better picture of the part soil played in ecosystems: Soil itself is a landscape found beneath other landscapes, and the health of what's underground is integral to the health of whatever is growing up above. Visually seeing how the nutrients, microbes, water content, soil texture, and other aspects of soil impacted the forage crops her team was growing really made a difference in her perspective about the work she was doing.

With the encouragement of her then-professor, she continued her education, applying to get a bachelor's and then a master's, at Texas A&M. Her research transitioned from soil fertility to soil physics, and she graduated with a thesis in modeling how water flows through shrink-swell soils (Vertisols) in East-Central Texas. She then worked for a few years as a project manager at Texas A&M AgriLife Research before returning to school again to get her Ph.D.—a decade after saying "if I have to," she still stuck with soil!

The research-to-application pipeline

The main objective of Bagnall's research has always been to help farmers. Take when she was a master's student: Fellow researchers or family members would ask her what the next steps of her work was, and she'd say, hopefully, that her models could be used by farmers to learn about their fields' soil water content. It was only after working for a few years as a project manager that she realized how difficult the transition from research to application would be. For example, the models she developed were made using an old computer programming language that had no graphical interface, and so there was no way this particular research was going to break out of the academic bubble—it was far too technical and cumbersome to replicate. As a project manager, she saw examples of this happening time after time.

"And that was really interesting to me, to realize that the flow of knowledge really has this kind of 'kink in the hose' at that phase," she says. "And so, I got very interested in more interdisciplinary work and in trying to get science out into the world."

So, she wrote a proposal with her old adviser to fund two graduate students in *soil security*, a newer academic field that combines soil science with policy, sociology, economics, and the connections people have with their soil. They were awarded the funding, and Bagnall wanted to be one of the new students.

The idea behind this interdisciplinary program was to connect different fields of study together to better understand "the system" behind a farm—not just the soil that's there, but how it influences a farmer's profits and the community's well-being—to simultaneously provide growers with knowledge to run a successful business while also restoring and investing in the land.

Many people who do "interdisciplinary work" learn just enough to be able to work with more seasoned experts outside of their field, but Bagnall says she "learned to

understand enough about another person's discipline to not just let them do their job, but to have a section of that [work] embodied in my work." And it was that aspect of her Ph.D. that really compelled her to start up school again—which wasn't an easy decision, considering the number of people trying to tell her *not* to do it.

Finding your own path

"Really, I had some sit downs with quite a few people who were like, 'Do not make this decision. This is a very bad decision,'" she says.

They warned her that it was going to be impossible to transition back to school, that the work was going to be too hard, and that it wasn't going to make her competitive for the field she was working in—and Bagnall wasn't mad at the advice, because it was all in good faith, she says. But she knew, despite what others said, that she was going to have to make her own decision. "They were giving the best advice they could with the knowledge they had," she says. It was a challenge for her to reflect on this advice and still do "what I believed was right—not right morally, but what was right for me."

The ultimate deciding factor was that she was truly passionate, not about the Ph.D. title, but about the specific line of study: this interdisciplinary nexus between soil health and farmer well-being. "I became really passionate about the work I wanted to do—the content of the work. And that [passion] was so strong that I could say, 'if I got to do that [Ph.D.] for three years, and then I'm a project manager again, I'm going to be happier, I'm going to be more fulfilled, and I'm going to carry that with me.'"



Working at the Soil Health Institute

"I feel so fortunate that immediately I got to start doing things with real world application," says Bagnall about her position with the Soil Health Institute (SHI). Photo courtesy of Dianna Bagnall.

After her doctorate, she landed a job at the Soil Health Institute (SHI), where she uses her unique training to research and educate farmers about regenerative soil health practices that not only boost crop efficiency, but also environmental health—promoting healthy soils in a way that still improves growers' yields.

Bagnall's job is to think about the work her team is doing and link that to the organization's big-picture goals: Is the work being done meaningful, and who is it meaningful to? What grants have they recently applied for, and what are the big deliverables and objectives from those grants? Are the papers people are writing achieving these yearly goals?

She likens her work at the SHI to reading a map. Not the simple GPS map on your phone, but a physical map where you have to figure out the navigation yourself. First, understanding what the big-picture goal people are trying to achieve is, then looking at the roadblocks—financial limitations, the team's time, and so on—and finally, navigating where you need to go. The interdisciplinary aspect of her work comes in because these deliverables need to represent good soil science, but also fit end-user needs. Some ongoing projects at the SHI include developing interpretable benchmarks to measure soil health in different U.S. States, calculating drought resistance on farmer land, and even developing a smart phone app to quickly measure soil health.

The challenges—and the help that comes along the way

For many, graduate school and your early career are often full of challenges. Some are physical: Too many long days in the field will eventually wear you out. Some are mental,

such as needing to quickly problem-solve after an experiment goes wrong. And some are emotional—because life still happens when you're in school.

Identity and sense of self are a common struggle among young scientists. Bagnall's identity was often under scrutiny in school. Being a woman in science meant that, sometimes, men with the same level of education as her would sit down in group meetings and turn to her, expecting her to be the one to go run for some coffee instead of intellectually contributing to the conversation. And sometimes her own opinion of herself was what held her back: "I knew, before I went back for my Ph.D., that I would never be the most intelligent or the most creative scientist in the room. And in fact, I was so sure of that, that *that* was why I wasn't going to go do my Ph.D.," she says. Worried that it would take her twice as long to come up with novel ideas as other scientists, she thought that she might just not be cut out for a Ph.D.. After a while, she realized this self-doubt was a disservice to herself and that she has other, unique skills that put her in a great position as a Ph.D. student. "I at one point was like, 'Well, I'm going to be so good at getting stuff done. I'll have no time to think about that because I can achieve. I can set those goals for myself, and I can make that happen.' That's not everybody's skill set. That was my skill set."

Having this kind of confidence in yourself is an active mindset that you have to practice. "It's so easy to look for outside forces in order to answer the question, *Am I good enough?* But we need to own that ourselves—even if that's hard, and even if you have to keep relearning that lesson," says Bagnall. "I joke sometimes [that] I'm the worst economist, soil scientist, and sociologist you ever met. *And* the best, depending on if you know any. So, is [being interdisciplinary] a weakness or is it a strength? If you think it is, you're right."

But even still, this doesn't have to be a journey you need to face completely alone. Bagnall has relied on her mentors, her grad school peers, and her broader network for support and instilled confidence. Her Ph.D. adviser, Cristine Morgan, was always there when troubleshooting needed to happen. Her graduate student cohort was a huge source of comfort when her brother passed away during the second semester of her doctorate. Having people to go to, to ask for help or to admit you're struggling really helps, says Bagnall. "If you're a student, your university has resources to help with that. That's really serious. You're not alone," she adds.

But most of all, as someone in the sciences, one of your greatest strengths is being able to learn. Usually, that skill is used to keep yourself busy—learning new methods, crunching data, and designing experiments. But Bagnall argues that this talent should also be used for your own benefit when you're going through a hard time to find support: "Turn on that science superpower for yourself, to help yourself. Don't just use it to work hard. Use it to help yourself in your life and go find the resources that you need. You'll know best what you need when you find it."

Your professional home

Your network can come from many places. It's common that it'll start with the professors and fellow students at your university, but as you progress in your career, you'll meet more people who are just as passionate about your scientific field as you are, all across the globe. Professional and scientific societies, like ASA, CSSA, and SSSA, offer many ways to network with your fellow scientists.

Bagnall started attending Society meetings in 2011. Her first conference was the ASA, CSSA, and SSSA International Annual Meeting (now called CANVAS) held in San Antonio, TX. "I came as an undergraduate, and I was terrified," she says. But she kept

going, year after year, presenting her work and getting to know other folks who were interested in soil and environmental science. As a student in soil physics, she was also able to go to SSSA's Kirkham Conference, which is a small, topical meeting on soil physics held every four years.

Since Society membership stretches out over huge distances, "it can sneak up on you that it *is* a community of people," she says. The moment that it clicked for her was during an Annual Meeting that occurred a few years after the Kirkham Conference, which she attended while was working as a project manager. At one of the mixers, she ran into someone who remembered her presentation from years prior: "Someone I really respected, who I had no idea that they knew who I was, came up to me, having a beer at the mixer and said, 'I remember you, you had done that work on Vertisols modeling, and that was really good work,'" she says. "I left that [mixer] thinking, 'I'm still a soil scientist. I'm not a project manager who used to have a master's in soil science. I'm still part of this community.'"

"[I'm] approaching the 20-year mark—which is ridiculous—of being in this discipline. And some of my most meaningful relationships are some of those long-distance relationships that I have with colleagues. And we have this shared profession, and this shared respect for each other," she says.



Society programs, like CANVAS, wouldn't be possible without the effort of volunteers.

Bagnall is heavily involved with the Societies. To name just a few of her volunteer positions, she has served as the Early Career Board Representative for SSSA, was the 2025 Chair of the Land Management and Conservation Section of ASA, and is an Associate Editor for *Vadose Zone Journal*. It's people like Bagnall who keep the Societies operating because without volunteers, the organization wouldn't be able to do half of the things it does now: There would be no planned programs at CANVAS, no mentor-mentee matching programs, and no journal peer review. There's some trial and error when it comes to finding the best place to serve, Bagnall says. But, she adds, that the time it took to find the right positions was worth it in order to help her community and her network: "Take a leap of faith, believe that that effort and that volunteering will be the way that you meet like-minded people," she says.

Bagnall ends with a reminder that generations of potential new scientists are all facing similar issues to her own challenges surrounding identity and resilience, which have been further exacerbated by volatile jobs markets and insecurities about science funding. But it should be known that they still belong within this community, she argues.

"Your identity as a member of these Societies, as a scientist, as a part of this cohort of people who care about the Earth, and care about plants, and care about how they support society, and the environment, and a better life, isn't dependent on what your boss calls you or what it takes to get the car payment paid," she says. "It's just something we all need to be honest about. There's no secret club of better people. I look at the breaks that I've gotten in my life and I go, 'Wow, have I gotten lucky.' More qualified people with different timing have gotten worse outcomes."

Through her involvement with the Societies, Bagnall is trying to make sure that people know that they have a place within this community of crop, soil, and environmental scientists. Her goal is to give back to young professionals the same way she was helped as a student. Sort of like how her day job invests in the regenerative agriculture that uplifts soil health and crop performance, she hopes that we, as an organization, can continue to uplift young scientists and make sure they grow into thriving individuals.

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