

Negotiating the Landscape of U.S. Science Policy Making: My Journey as a Congressional Fellow

Adria Wilson

Being a scientist, I never used to give weight to the perspective that decision-making processes don't always follow the most linear, objective stream of logic as possible—a pathway that most scientists strive for as a fundamental piece of the scientific method. Deviating from rational experimental design is all but certain death to any research project. However, there is indeed a place where problem-solving strategies heavily consider the feelings of people who have a tenuous-at-best grasp on the details of the problem, as well as the money of those who want to influence the conclusion of the logic sequence. This place is called Capitol Hill, otherwise known as the United States Congress.

That might read like cynicism, but what I'm really doing is describing my awakening to the existence of very real boundary conditions that influence the ability of scientific research to be useful and that assign value to the research we do in the eyes of non-scientists. I came to this realization through my experiences as the 2014–2015 TMS/MRS (Materials Research Society) Congressional Science and Engineering Fellow. The insights I gained were incredibly empowering. I have a better grasp of the landscape that gives STEM (science, technology, engineering, mathematics) research a societal context, and now understand that plugging in to the biggest issues of our time

and gaining an appreciation of how they affect people can provide critical, top-down inspiration for innovation.

I came to the Hill with a strong desire to understand more about the complexities that surround the clean energy sector. I am a chemist who harbors a very strong desire to be creative in addressing our greenhouse gas pollution problem. As of last September, I knew only the outline of the issues surrounding a transition to renewable energy. I was able to interview with and finally choose to work for the personal office of U.S. Sen. Bernie Sanders of Vermont, who represents a state that is leading the nation in its desire and efforts to transition to renewables. The people I worked with helped me to understand a tremendous amount about clean energy—the policies and arguments against it, the pros and cons of certain energy sources, and the motivations people need in order to want to make a transition to clean energy.

In the eyes of the senator, and for me personally, this motivation comes in the form of climate change, and I spent most of my fellowship working on this topic. I helped the senator flesh out how he speaks about the impacts of climate change and assisted with framing other issues that came up in senate business within this context. For example, one of the first issues I delved into deeply was the Keystone XL pipeline permitting process. I learned a great deal on my own about the potential environmental impacts of the project, saw how other senators would use the facts to their own ends, and then helped put the whole issue into context for Senator Sanders to discuss: If scientists are telling us we have to leave nearly all Canadian tar sands oil in the



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ground to avoid catastrophic levels of global warming, then why are we not talking more about clean energy sources?

As my fellowship progressed, the senator's audience grew exponentially larger after the flashpoint of his presidential candidacy announcement. At the same time, his desire to talk more about what we could do to address climate change grew stronger. It was extremely gratifying to be able to help evolve his strategy from only talking about the scope of the problem to educating people about the benefits of clean energy sources and making them realize science is already making a clean energy economy a reality.

In addition to working with Senator Sanders directly on issues that are important to me, the fellowship offered me some unexpected insights on the relationship of scientists with the rest of the world that I feel are valuable to share:

Motivation, Not Jargon, Connects with Nonscientists

One of the first things that became very clear to me was that no one was going to

recognize my research or even the broader discipline of chemistry as a useful tool in the halls of the U.S. Congress. Instead, my expertise had to be translated to

fit into a new basis set of expertise. Energy, environment, education, health, agriculture, and finance were the kind of words used to categorize me as I searched for offices to join. I was not very comfortable with this, at first, for obvious reasons—my degree is not in energy. But, without rebranding myself, congressional staffers wouldn't know what to do with me. What I learned from this is the important role that motivation plays as a point of recognition for nonscientists.

If you know what problem motivates you, you have a structure for framing your research to the public, and for establishing the importance of your work in a way that doesn't require use of the scientific lexicon.



Adria Wilson (back corner) helps staff a morning coffee session hosted by Sen. Bernie Sanders to discuss issues of concern with his constituents of Vermont.

Meet the 2015–2016 Congressional Science and Engineering Fellow



Jeremy W. Ward

"Science, to me, is more than the culmination of facts and equations," said Jeremy W. Ward, 2015–2016 TMS/MRS Congressional Science and Engineering Fellow. "It is the combination of those, with the ability to view a problem from a variety of perspectives and then use those perspectives to generate creative solutions. I am very excited to use my technical and interdisciplinary experience as the TMS/MRS Science and Engineering Congressional

Fellow—to help build on the effectiveness of the legislative methods in addressing science and education problems and to improve upon my understanding of the policy-making process."

Prior to starting his one-year fellowship on September 1, Ward earned his bachelor's degree in physics and mathematics from Simpson College and his Ph.D. in physics in 2015 from Wake Forest University. His doctoral research interests included investigations on the self-patterning fabrication and electrical properties of solution-processed organic field-effect transistors. During graduate school, Ward was named a 2013 Wake Forest University Richter Scholar, serving as a visiting researcher at the Institute of Materials Science of Barcelona. He also received a National Science Foundation Graduate Research Fellowship in 2012.

Beyond his academic accomplishments, Ward served as a

staff sergeant with the U.S. Air Force in the Iowa Air National Guard and is nationally licensed as a high school soccer coach. He believes these experiences and his strong ties to the secondary education community, as well as his expertise as a materials science Ph.D. scholar, will enable him to provide unique insights as a Congressional Fellow. Ward's policy interests include science, technology, engineering, and mathematics education, ranging from early childhood to post-secondary stages. He said he looks forward to learning about the interdisciplinary nature of using federal policy to address the science and education-related problems of today.

The value of these fellowships to both the participants and to TMS is abundantly clear to former Congressional Fellow Edward D. Herderick, who now serves as TMS Public & Governmental Affairs Director. "The Congressional Science and Engineering Fellow program is an important way that TMS supports informed policy making at the federal level," Herderick said. "Jeremy Ward was a great candidate throughout the interview process, and we are excited to have him as the Congressional Fellow this year. In addition to a strong academic background, his military service stood out, as did his passion for education policy and the unique perspectives he will add."

Ward will start his fellowship with an intensive science policy orientation facilitated by the American Association for the Advancement of Science. Following orientation, Ward will participate in an interview and selection process with offices of senators, representatives, or committees on Capitol Hill. Offices will extend offers, and Ward will choose the office in which he will spend his fellowship year.

An Opportunity to Learn and Serve

TMS and the Materials Research Society (MRS) are now accepting applications for the 2016–2017 TMS/MRS Congressional Science and Engineering Fellowship.

To be considered for the fellowship, applicants must have a record of success in research or scholarship in a field relevant to materials science, while also demonstrating a strong interest in applying scientific and technical knowledge to U.S. public policy issues. Additional critical qualities include the ability to work quickly and communicate effectively to both scientific and nonscientific audiences on a wide variety of topics, as well as being able to work cooperatively with individuals having diverse viewpoints. An applicant is expected to be a member of or an applicant for membership of TMS or MRS, and must have a Ph.D. by September 1, 2016. U.S. citizenship is not required, but applicants must be authorized to work in the United States.

The American Association for the Advancement of Science Congressional Science and Engineering Fellows Program is operated as a cooperative effort of approximately 30 national scientific and engineering societies that provide an opportunity for accomplished scientists and engineers with public policy interests to learn about and contribute to the policy-making processes in Congress.

For additional information on the 2016–2017 TMS/MRS Congressional Science and Engineering Fellowship, contact Mary Samsa, TMS Foundation and Public Affairs Manager, at msamsa@tms.org.

this, I have a ton of ideas that I want to pursue going forward. Seeking out people to collaborate with, especially outside of science, can be extremely useful.

Your Opinion Matters to Elected Officials

Embarrassingly, I was extremely surprised when I finally realized that two major factors play into the type of decision-making that happens on the Hill even more than policy—money and voters. Understanding this can help you predict the way any member of congress will fall on an issue. This is the reason, for example, that a senator in late February walked onto the floor of the Senate with a snowball and said something to the effect of, “If global warming is really happening, then why is it so cold outside?” as he pitched it across the room. Money, for better or for worse, makes people argue in ways that don’t make sense sometimes.

The biggest shock of all from my time on the Hill, though, is that offices spend a great deal of time keeping track of letters and calls from their constituents. At the end of the day, members of congress are elected to serve their constituents’ interests, and if they do a bad job, they won’t be back. If you think you don’t matter in the political process, you are wrong. If you think science is threatened by congressional antics, you should be writing a letter or going to visit. If you don’t, someone else is certainly framing how science, or anything else you care about, should be viewed.

Overall, this past year has been a life-changing, extremely educational ride that I would never give back. I would encourage any scientist with a desire to help politics and science understand one another better to apply for the Congressional Fellowship.

Prior to her appointment as the 2014–2015 TMS/MRS Congressional Science and Engineering Fellow, Adria Wilson earned her Ph.D. in chemistry (2014) from Duke University in Durham, North Carolina. She was funded by the National Science Foundation through the Graduate Researcher Fellowship Program (NSF-GRFP), and was selected to accompany the U.S. delegation to the 2013 Lindau Meeting of Nobel Laureates in Chemistry as a Young Researcher.



This was also a good reminder that society has some very real problems it expects science to address.

Work Does Get Done in Washington

There is a myth that no one on Capitol Hill does any work, and this is a thousand times false. I have never worked so hard in my life, in such a time-sensitive environment, with such a sustained level of acute stress as I did on the Hill—not even when I was preparing to defend my thesis. I have also never stayed at work so late without recognizing the passage of time, or been surrounded continuously by so many intelligent, purpose-driven people who are willing to share their knowledge with me. Yet, precious little actually passes through the legislative process. I think these two levels of interaction can be accurately characterized by vector addition: at both the staff and member level, the unique set of motivating factors that people have make them like so many vectors. For members of Congress, this tends to lead to a net-zero sum. I, on the other hand, grew tremendously as a vector. This fellowship forced me to surround myself with people who had different perspectives, but similar motivation, and that helped me to learn a great deal about energy. Because of

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