Science Societies

Coming soon: An ambitious look at climate change research

By Kristen Coyne

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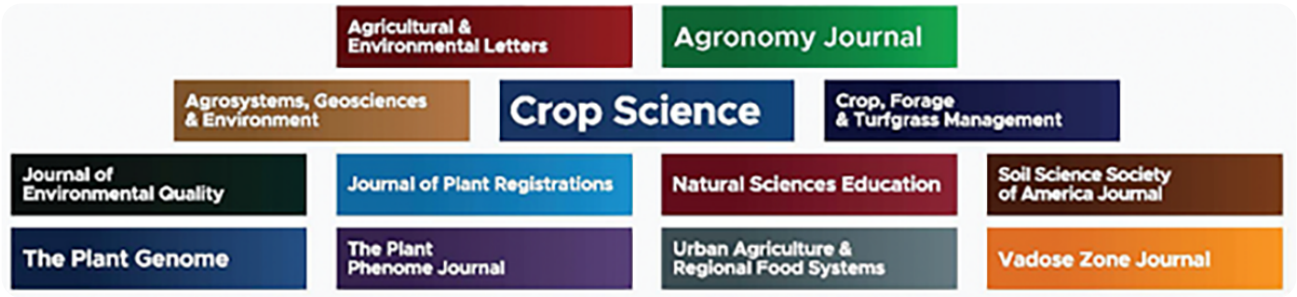

Climate change is a big, scary threat that has paralyzed some people with fear and left others feeling powerless to help.

At ASA, CSSA, and SSSA, however, scientists, practitioners, and staff have responded with ideas, resolve, and action. In addition to publishing **thousands of papers** on the subject, they are **proposing solutions**, educating the **public** and **policymakers**, and developing powerful **programs** and **tools** for making sense of the complex web of issues associated with this tremendous challenge.

Now, the Societies are leveraging the full force of their interdisciplinary expertise and relationships with an ambitious new virtual issue that will collect some of the latest scholarship on climate change's impacts on crops and soils.

Scheduled for release early next year under the title "Advancing Resilient Agricultural Systems: Adapting to and Mitigating Climate Change," the issue will bring together two dozen papers tackling key areas of climate change research, including strategies for reducing greenhouse gas emissions and sequestering carbon, crop modeling, soil sustainability, and water management.

Societies Have the Experience to Bring All the Pieces Together

Creating this issue is not just an opportunity for the Societies, says the issue's lead editor, Jerry Hatfield: It's also an obligation. Individual experts can dive deep into specific topics while the Societies as a whole can zoom out to paint the broader picture of how those topics intersect.

"You think about the umbrella that those Societies have," says Hatfield, who is a Fellow of all three and a past president of ASA. "You've got agronomic management. You've got the crops—genetics, physiology, resources, and reactions to climate. You have soils' response to climate and underpinnings of agriculture. What better society or societies to really bring this together?"

Hatfield, who retired in 2020 as director of the Laboratory for Agriculture and the Environment at the USDA-ARS, is working with a team of guest editors from across the Societies' journals to produce the virtual issue. The team is now editing a collection of commissioned and submitted papers representing authors from Iowa to Hawaii and from Nigeria to Pakistan.

The collection includes articles on the indirect effects of climate change, such as insects, diseases, weeds; specific farming practices such as relay cropping and agroforestry; genetics and breeding for resilient crops; and the fate of crop wild relatives. A subsection of papers will focus on specific crops, from corn and cotton to turfgrass and winter wheat. These papers will explore strategies to help those systems adapt to heat or water stress, such as genetic enhancement, improving soils, and other innovative agronomic practices. The overall goal is to help agriculture continue to meet humankind's needs.

Identifying Knowledge Gaps, Informing Decisions

Photo by Paramveer Singh.

Bringing this broad range of scholarship together will help identify gaps in knowledge and inform decisions not just for scientists, but for educators, policymakers, and funding agencies, as well.

"If we identify opportunities, that will drive the future funding decisions with USDA, DOD, NSF—all the funding agencies," Hatfield says. "They could use this and say, 'Here are some of the critical knowledge gaps that are out there.'"

Hatfield brings more than four decades of climate change research to this task. He served as the lead author for the agriculture section in the U.S. Climate Change Assessment Program Report (2008) and contributed to the work of the United Nations' Intergovernmental Panel on Climate Change, which received the 2007 Nobel Peace Prize. So, when he notes this virtual issue features the most comprehensive scholarship on climate change that he has ever been involved with, that's saying a lot.

With this virtual issue, the Societies are adding a balanced, realistic and authoritative voice to conversations on climate change, crops, and soils, Hatfield says: “Part of the goal of this is to put together a very credible synthesis of our understanding of climate change on agriculture and of adaptation and mitigation strategies.”

There’s also a strategic goal: To raise the visibility of the Societies’ journals. “It would bring international recognition to the Societies,” Hatfield says, “in terms of being the leader in this effort and establishing ourselves as the credible source of information for people who want to contribute their research to this effort.”

Although the collection comes out in early 2023 (all the articles will be published concurrently), Hatfield’s work will remain far from finished: This virtual issue will persist as a “living document,” he says, evolving into a kind of clearinghouse for relevant research published across Society journals. He foresees issuing reports on the state of the scholarship every few years that assess how well scientists have addressed issues and identify emerging research needs.

Apparently, Hatfield will remain retired in name only for some time to come. “It’s not just a ‘one and done,’” he said of the effort, “but it will live into the future and continue to add to our knowledge base.”

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