

Social Science Perspectives on Climate Change March 8-10, 2017, Washington, D.C. Workshop Summary

The Social Science Coordinating Committee (SSCC) of the U.S. Global Change Research Program (USGCRP) hosted a workshop March 8-10, 2017, in Washington D.C. at the headquarters of the National Aeronautics and Space Administration (NASA). The objectives of the workshop were to:

- convene federal agency scientists and program managers with academic social scientists to consider how social science perspectives can improve our understanding of climate change challenges and solutions;
- present draft thematic white papers on integrating human and natural systems, community vulnerability, and drivers of climate change, and get comments from participants; and
- identify opportunities to enhance federal-academic collaboration on climate change research.

Wednesday, March 8

Opening presentations

Rob Winthrop (SSCC) opened the workshop and welcomed participants on behalf of the SSCC and four co-sponsors: the American Anthropological Association, the American Association of Geographers, the American Sociological Association, and the Society for American Archaeology.

Ann Bartuska, Chair of USGCRP's Subcommittee on Global Change Research, welcomed the participants and shared information about the USGCRP. It began as a presidential initiative in 1989, and was subsequently established by Congress in the Global Change Research Act of 1990 (P.L. 101 – 606) to “assist the Nation and the world to understand, assess, predict, and respond to human-induced and natural processes of global change.” The USGCRP is a consortium of the science arms of 13 federal agencies with responsibilities for global change.

Jack Kaye, Director of NASA's Earth Science Division, then gave welcoming remarks and described the very significant role of NASA in global change research.

Carrie Hritz (Co-chair, SSCC) explained that the recent effort to strengthen the social sciences in federal climate change research began with a Social Science Taskforce. Its 2013 report noted that “understanding the fundamental human dimensions of global change, linking the Program's basic and applied components, aligning research with national needs, and moving knowledge into action all require increased integration of the social sciences into USGCRP.” The report provided recommendations on *science integration and boundary activities*, including indicators, scenarios, and valuation; and *fundamental research* on vulnerability, integrated human-natural systems, improved decision-making, and evaluation of global change response processes.

On the basis of this report, the Subcommittee on Global Change Research established the SSCC in 2014. Broadly the Committee's goals are to create knowledge networks, support capacity building, and catalyze innovation in the application of the social sciences to global climate change research.

Rob Winthrop noted that climate change is inherently a social phenomenon, whether one considers drivers, impacts, mitigation, or adaptation. While there is a critical need to improve our understanding of the interplay of biophysical and social processes shaping climate change, several factors make this difficult. First, the social sciences are pre-paradigmatic (in Thomas Kuhn’s sense of paradigm), and thus lack methodological consensus in areas relevant to climate change research. Second, methodological rigor looks different in the social and natural sciences, which makes interdisciplinary cooperation more difficult. Third, in the social sciences the path from basic research to use is less institutionalized, and perhaps less rewarded, than in the natural sciences.

The SSCC and the four co-sponsoring associations jointly identified the three themes of the workshop:

- Identifying innovative tools, methods, and analyses to clarify the **interactions** of human and natural systems under climate change,
- Characterizing differences between and within communities affecting **vulnerability** to climate change; and
- Providing social science perspectives on **drivers** of global climate change.

Paul Stern, Senior Scholar, National Academy of Sciences, gave the keynote address, “Usable Social Science for Understanding and Addressing Climate Change.” Dr. Stern pointed out that integrating the social sciences into the work of the USGCRP has been a long-term challenge, noted by the National Academies since at least 1992. We need a better fundamental understanding of “social processes that produce the causes, affect the consequences, and enable, inhibit, or transform responses” to climate change.

Social science perspectives on climate change are relevant at multiple social and temporal scales: from individual to global, from moments and days to centuries. Applicable contexts range from very short-term decisions about household energy use to the rise and fall of civilizations. Dr. Stern called for an emphasis on “problem-focused social science,” where “for use by whom?” and “in relation to which actions?” should be critical considerations. In the climate change context, a strong disciplinary focus is often counter-productive. In particular,

- A problem-oriented approach can yield insights that integrate disciplinary and other insights.
- The most influential disciplines (engineering, economics) don’t have all the answers, but their answers have to be taken into account to offer better, transdisciplinary solutions.
- Start with problems before disciplines: seek targets for research that are important in terms of global change.

Panel on disciplinary perspectives

- Heather Lazrus, American Anthropological Association
- Dean Hardy, American Association of Geographers
- Lawrence Hamilton, American Sociological Association
- Tom McGovern, Society for American Archaeology

Heather Lazrus gave an overview on the use of anthropology to understand climate change. Anthropology’s toolkit can be applied to examine relationships between humans and their environments across space and time using an ethnographic perspective involving participant observation, attention to context, and cross-scale analysis. The American Anthropological Association’s (AAA) Task Force on

Global Climate Change noted in its 2014 report that climate change is a human, not a natural problem. The global problem of climate change is rooted in social institutions and cultural habits.

The AAA statement on Humanity and Climate Change notes that climate change is a present reality which intensifies underlying problems. It will lead to widespread but uneven impacts on communities. The culture of consumerism is a driver. The archaeological record is relevant to the contemporary human experience of climate change. Local and regional solutions are required.

Dean Hardy explained that space, place, scale, and human-environment interactions are fundamental to the discipline of geography. Over the past decade there has been a 400% increase in geographic publications that have mentioned climate change. Among other insights from geography: ‘natural disasters’ are not natural, there are social limits to adaptation, and social processes are important factors shaping differential vulnerability to climate change.

Lawrence Hamilton introduced sociological perspectives of climate change by first addressing the limitations of the natural sciences, which have dominated climate change research. While it was recognized early on that human activities such as burning fossil fuels were contributing to global warming, the social forces behind these activities, and the social consequences of climate change, were largely treated as a “black box.”

While economics and psychology are helpful in providing insights into individual behavior, sociologists emphasize the roles of organizations, institutions, nation-states, and culture. They analyze topics such as: the impact of economic and population growth on greenhouse gas (GHG) emissions; the role of corporations in both producing GHG emissions and in inhibiting efforts to reduce those emissions; the roles of culture and advertising in promoting consumption; and the social barriers to effective mitigation and adaptation. To review and organize sociological perspectives on climate change, the American Sociological Association established a Task Force on Sociology and Global Climate Change, which produced a report in 2015: *Climate Change and Society: Sociological Perspectives* (Riley Dunlap and Donald Brulle, eds., Oxford University Press).

Tom McGovern explained that archaeology is relevant to climate change research for several reasons. By offering a deep time perspective on environmental and cultural change, it can correct the shallow ‘shifting baseline’ that limits the options shaping potential management outcomes. It helps us use “completed long term experiments in human adaptation” for the strategic management of future ecosystems. Archaeology also helps us communicate with the public about the past while engaging their participation in planning for better alternative futures.

Planning for future human-environment dynamics requires a better understanding of past interactions of people, landscape, climate, and time. Archaeology gives us time dimensions for our scenarios. Archaeology helps with tough questions: “Sustainability of what, for whom, at what cost, and for how long?” Archaeologists and allies globally are now working to integrate more fully the long-term perspectives of the past into resource management and scenario building for future resilience. The data, methods, and analytical tools of historical ecology, environmental humanities, social sciences, complex systems theory, and advanced computational approaches make archaeologists useful partners for achieving a transdisciplinary perspective on climate change.

Panel on conference themes

Ariela Zycherman (SSCC) introduced the conference themes. The four disciplinary associations proposed potential topics for the workshop. The SSCC Planning Committee, with federal and academic members, drew on those topics to identify three major themes, with guiding questions. Workgroups were formed with representatives from all four disciplines and government agency representatives to develop the themes into draft white papers.

Nicole Peterson, American Anthropological Association, introduced Theme 1: *Identifying Innovative Tools, Methods and Analyses to Clarify the Interactions of Human and Natural Systems*. Among the topics considered are:

- computational and visualization methods (agent-based modeling, network analyses, machine learning)
- remote sensing
- ethnographic methods (community-focused studies, consumption analyses)
- multivariate analysis
- comparative and historical methods
- cultural models
- local and traditional ecological knowledge
- long-term records of human ecodynamics, and
- archaeological techniques (ancient DNA analyses, zooarchaeology, paleoethnobotany, pollen analysis, isotopic dating).

The paper considers a diversity of methods through differences in scale, differences in types of detail, and the use of both quantitative and qualitative approaches. The paper supports innovations in method that cut across disciplines and scales to address complex, non-deterministic systems.

Ben Orlove, American Anthropological Association, introduced Theme 2: *Community Vulnerability under Climate Change*. The four topics considered in the white paper are:

- Access to resources – How climate change interacts with existing social and economic structures to determine differential vulnerabilities in and among communities;
- Culture, memory, and perception – The role of culture, social memory, and perception in the context of vulnerability;
- Governance and civil society – Connecting the power dynamics of ‘policy’ (organizations across scales: public, private, community) with ‘politics’ (civil society engagement and mobilizing factors); and
- Information and forecasts – Factors that govern how people access, perceive, and use both technical information and local knowledge about climate and weather.

Andrew Jorgenson, American Sociological Association, and **Torben Rick**, Society for American Archaeology, introduced Theme 3: *Social Science Perspectives on the Drivers of Climate Change*. The white paper considers long-term drivers, short-term drivers, and their interactions. Some of the considerations include:

- economic growth and business cycles
- consumption and income
- the relation of power, stratification, and inequality, at multiple scales, and

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- land use change.

The social sciences are well positioned to clarify the role of governance structures, technology, consumption, and production in both mitigation and adaptation processes.

Thursday, March 9

The thematic workgroups met separately to discuss draft white papers and hear input from federal participants who were not involved in drafting the papers. The main questions discussed were:

- How is this work relevant to your federal agency program?
- What important sources or perspectives are missing?
- What changes would improve the document flow and communicate more effectively?
- How can the white papers be more useful from a federal agency viewpoint?

The thematic workgroups spent most of the day planning revisions to the white papers. In the afternoon, the groups came back together in plenary for a panel discussion on research gaps.

Panel discussion: identifying research gaps

- Moderator: Paul Stern, National Academy of Sciences
- Andy Miller, Environmental Protection Agency
- Leah Nichols, National Science Foundation, SSCC
- Gyami Shrestha, USGCRP Carbon Cycle Interagency Working Group
- Jennifer Saleem-Arrigo, National Oceanographic and Atmospheric Administration, USGCRP Indicators Interagency Working Group
- Anne Grambsch, Environmental Protection Agency, USGCRP Scenarios Interagency Working Group

Some of the remarks from the panel and the audience:

- There are many barriers to integrating social science in federal agency work.
- Some managers don't want to fund research involving data produced outside the laboratory.
- We need a more concerted, top-down effort to integrate social sciences.
- SSCC discussions about vulnerability, security, and/or pathways to sustainability offer useful frameworks for integrating social and natural sciences.
- The Carbon Cycle Interagency Working Group and the US Carbon Science program have worked to incorporate social sciences into its membership. These groups are currently developing the Second State of the Carbon Cycle Report (SOCCR-2), which includes chapters on decision support, urban environments, agriculture, and society and carbon.
- The Fourth National Climate Assessment (NCA4) is a strategic opportunity for social scientists.
- NCA4 includes risk-based framing.
- Methodical workshops for NCA4 have taken an intentionally broad view of valuation.
- Currently the indicators that we are using are strictly physical. How can this system meet the broader vision to include social science indicators?
- Can the social sciences develop 'plug and play' modules for various climate change-related models?
- Social indicators need to be used consistently. What are key time scales – perhaps 50 to 100 years? This implies a long-term commitment to support such indicators.

- Do we have research or case studies of the use of indicators for decision making? Who are the potential users?
- EPA indicators report is a good example of usability. The team works with stakeholders to produce the indicators.
- Long-term data sets on people living in communities being displaced by sea-level rise would be very useful.
- Another interesting area for indicators could be those associated with tribal and indigenous communities, such as shifts in diets.
- Scale should be considered in planning for additional indicators. A national / federal effort may be appropriate for defining and validating indicators, while state and local governments collect the data and use the indicators.

Friday March 10

Panel discussion on ideas and pathways for improving academic/federal collaboration

- Moderator: Katie Reeves, USGCRP
- Bryan Hubbell, US Environmental Protection Agency
- Chelsea Combest-Friedman, National Oceanic and Atmospheric Administration
- John Wertman, American Association of Geographers
- Shirley Fiske, American Anthropological Association
- Torben Rick, Society for American Archaeology
- Marcy Rockman, National Park Service and Society for American Archaeology
- Margaret Vitullo, American Sociological Association

Some of the remarks about challenges to collaboration from the panel and audience:

- Collaboration challenges include requirements of the Federal Advisory Committee Act, budget ceilings, the time consuming process of Requests for Proposals, and lack of social science expertise on many review panels.
- We train students to speak about academics and not how to apply theories and knowledge in a practical setting.
- We don't have a way of measuring the impact of social sciences so we don't often recognize people for bridging the divide.

Some of the remarks about overcoming the challenges to collaboration from the panel and audience:

- Members of associations could take more advocacy action in communities and with Congress.
- Federal agencies could work more through social science associations to reach a wide range of academic expertise.
- NOAA has a learning series that brings together climate scientists with social scientists on projects.
- Push more for joint programs and interdisciplinary work to encourage innovation.
- Could use cooperative agreements and not just grants and RFPs.
- Create "cultural exchange" experiences for natural scientists.
- Use the national academies and professional networks more.

- Foster formal and informal collaboration by establishing a forum for exchanging ideas and knowledge between social and natural scientists interested in interdisciplinary social-environmental research, encouraging both federal and non-federal participation. This could be a combination of in-person and virtual collaboration.
- Social science associations can work to improve understanding of and training in social science concepts and methods for non-social scientists, using “boot camps” or other intensive training methods. Collaboration with existing interdisciplinary organizations, such as the National Socio-Environmental Synthesis Center at the University of Maryland is also a good example of an approach to break down barriers and encourage interdisciplinary collaboration through training, facilitation, and human interactions.
- One potential approach for professional social science associations is to co-sponsor (with federal agencies) “interdisciplinary weekends” where researchers from social and natural science disciplines are brought together, the environmental problems are “pitched” to them, and interdisciplinary groups are then organically formed to develop preliminary proposals for interdisciplinary research to address the problems. The best proposals developed during the weekend would then receive seed money to use in developing a more complete proposal.
- Create “boundary objects” to focus interdisciplinary cooperation, for example:
 - use software tools such as GitHub to share statistical methods and interpretation;
 - develop a forum for discussing and evaluating agent-based, scenario, and simulation models (similar to the Energy Modeling Forum at Stanford which is sponsored by several federal agencies, companies, and industry organizations);
 - sponsor an initiative to “mine” social science case studies for transferable insights;
 - promote a Social Science Data Initiative, potentially in conjunction with one of the federally funded NSF Big Data Regional innovation Hubs, to facilitate data standardization and integration of social science data.

Discussion of next steps

After the panel discussion, the workgroups met on their own to decide how to incorporate feedback from participants and discuss next steps for completing the white papers. Then the groups came back together to discuss possible next steps for the overall efforts. This is a brainstormed list; no decisions were made.

- Write editorial/opinion pieces in newspapers.
- Disseminate findings widely.
- Talk with other committees and interagency working groups of USGCRP.
- Make connections with publications/journals.
- Share with regional planning organizations and groups.
- Hold follow-up workshops with agencies.
- Release white papers in a systematic order (drivers, vulnerability, methods/tools).
- Share additional information with AAAS (connections to other associations).
- Engage with cultural resource management organizations.
- Treat the white papers as living documents, later reconvene and add on.
- Organize a panel or workshop to share findings.
- Share executive summaries with community groups.
- Hold webinars with target audiences.

- Participate in the Earth Optimism Summit April 21 & 22 at the Ronald Reagan Building.
- Share work at April 22 March for Science (AAG and AAA nominating speakers).
- Share with climate news venues/blogs (Think Progress/Climate Progress, Skeptical Science, Climate Central, Real Climate, Inside Climate News).
- Continue to bring disciplines together using the “Energy Modeling Forum” concept.

On behalf of the SSCC **Carrie Hritz** and **Rob Winthrop** thanked the workshop’s facilitators – Susan Goodwin, Skye Sieber, and Karlee Yurek – for their outstanding assistance in planning and conducting the workshop. They also expressed the committee’s great appreciation to all the presenters and participants for their thoughtful and enthusiastic involvement in the workshop.

The workshop adjourned at 1:00 pm.

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