MEETINGS

Progress and Future Directions in North American Carbon Cycle Science

North American Carbon Program 4th All Investigators Meeting; Albuquerque, NM, 4–7 February 2013

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The North American Carbon Program (NACP) convened its fourth biennial "All Investigators" meeting (AIM4, http://www.nacarbon.org/meeting_2013) to review progress in understanding the dynamics of the carbon cycle of North America and adjacent oceans and to chart a course for a more integrative and holistic approach to future research. The meeting was structured around the six decadal goals outlined in the new "A U.S. Carbon Cycle Science Plan" (Michalak et al., University Corporation for Atmospheric Research, 2011, available at http://www.carboncyclescience.gov) and focused on (1) diagnosis of the atmospheric carbon cycle, (2) drivers of anthropogenic emissions, (3) vulnerability of carbon stocks to change, (4) ecosystem impacts of change, (5) carbon management, and (6) decision support.

Echoing the 2011 plan, the meeting reinforced the need for advancing the core carbon cycle science of diagnosis and attribution and emphasized the need to more fully integrate vulnerability, human dimensions, and management and policy implications into the research portfolio. Twelve breakout sessions organized by community participants provided an opportunity to brainstorm on evolving topics in these crosscutting themes.

The meeting was attended by more than 340 scientists and government officials, primarily from the United States, Canada, and Mexico. A review of the approximately 200 posters presented at each of the four AIM meetings from 2007 to 2013 revealed a progression toward the adoption of a broader research agenda in the NACP community. Whereas in 2007 approximately 85% of contributions focused on the first goal, namely, diagnosis of the carbon cycle, this year more than 55% of the contributions were spread among the remaining five goals.

Research presented at AIM4 indicates that large-scale, coordinated efforts are being directed at tackling the persistent uncertainty surrounding the most fundamental questions about the diagnosis of the North American carbon cycle. The analysis of both anthropogenic and biospheric fluxes now increasingly includes multiple greenhouse gases (e.g., methane, carbon dioxide, and nitrous oxide). The scales of analysis are becoming more variable, including, for instance, urban-scale analyses. Issues related to the vulnerability of carbon stocks and ecosystem impacts are increasingly being addressed using multifaceted approaches, with emphases on carbon-water-energy linkages and the climate sensitivity of carbon flows in vulnerable systems (e.g., drought in the U.S. Southwest and permafrost thaw in the Arctic). Examples of successful interactions between carbon cycle science research and policy decisions served as blueprints of best practices for research informing carbon management and decision making.

The meeting also included special plenary sessions covering science communication, the U.S. National Climate Assessment (2013), international climate change policy and negotiations, and the U.S. Carbon Cycle Science Program's interagency science priorities and vision. These topics all represent mechanisms through which carbon cycle research informs broader scientific discussions. Candid assessments from speakers emphasized that while facts and scientific intuition are critical, they are only effective when delivered in a manner that recognizes the intended audience's needs and preconceptions. "Know their truth," noted former U.S. Congressman Bob Inglis, who spoke at the meeting.

Dan Hayes (Oak Ridge National Laboratory), Peter Griffith (NACP), and Ken Davis (The Pennsylvania State University) contributed to this article. The AIM4 Organizing Committee (http://www.nacarbon.org/cgi-bin/meeting_2013/committee.pl) and the NACP Office organized the meeting. The U.S. Global Change Research Program's Carbon Cycle Interagency Working Group (CCIWG) provided funding for it.

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