

The National Academies of
SCIENCES • ENGINEERING • MEDICINE

Developing a Research Agenda for Terrestrial Carbon Dioxide Removal and Reliable Sequestration

Workshop on Terrestrial Carbon
Cherokee Park Room, 3rd Floor, North End
Lory Student Center, Colorado State University

AGENDA

September 19, 2017

8:00 **Breakfast**

8:30 **Welcome Remarks from CSU administration**

Dr. Tony Frank, CSU President and Chancellor of CSU system

Dr. Gene Kelly, Assoc. Dean for Extension and Deputy Director Agricultural Experiment Station

8:45 **Introductions and Goals of the Workshop**

Dr. Steve Pacala, Committee Chair

Remarks from Workshop Organizers (Terrestrial Carbon Group)

Dr. Mahdi Al-Kaisi, Committee Member

Dr. Richard Birdsey, Committee Member

Dr. Keith Paustian, Committee Member

SESSION 1: Current state of knowledge on the capacity (i.e., carbon benefits) of terrestrial carbon as a CDR approach and the scientific and technical research requirements to achieve this capacity.

- What is known about the carbon storage potential of different land use and management practices?
- What do we need to know about the field-level and landscape-level processes that impact terrestrial C sequestration and loss (e.g., soil erosion, cropping systems, deforestation, carbon cycling, etc.)?
- What is the impact of changing land use and management practices on carbon sequestration, GHG emissions? Other factors that are terrestrial-system specific?
- What are the significant gaps that limit our ability to assess how changing land management alters the terrestrial (including aquatic) and atmospheric carbon budget?

9:00 **Panelist Presentations**

Cropland: Jean-Francois Soussana, INRA (via WebEx)

Forestry: Tara Hudiburg, University of Idaho (via WebEx)

Grassland: Alan Franzluebbers, USDA-ARS (via WebEx)

Biochar Applications: Johannes Lehmann, Cornell University

10:20 **Discussion**

10:45 **Coffee Break**

11:05 **Continuation of Discussion**

12:00 **Lunch**

SESSION 2: Research needs for predicting across multiple scales the impacts of land use change and management practices to the future of terrestrial C storage and CDR potential

- What is the state of the science for robustly measuring, mapping, and scaling carbon dioxide removal (CDR) and sequestration from the field-level to the regional and national scale?
- What is the state of the science on GHG measurement methodologies (gas fluxes, soil C change)?
- What is the state of the science on modeling impacts of land use and management on soil C stock changes?
- How will CDR strategies change in the short-term (10-25 yrs) and long-term (50- to 100-yrs), as a function of climate change and land use change (e.g., urbanization, forest and grassland ecosystem conversion to food & fuel production use)?

1:00 **Panelist Presentations**

Stephen Ogle, Colorado State University

Steve Hamburg, Environmental Defense Fund (EDF)

Rob Jackson, Stanford University (via WebEx)

Grant Domke, US Forest Service (via WebEx)

2:00 **Discussion**

2:45 **Coffee Break**

SESSION 3: State of the knowledge on policies and incentives and socio-economic constraints on terrestrial C sequestration activities

- What policy options are suited for land use and management for C sequestration and GHG emission mitigation? What are the likely costs?
- Do existing land use and agriculture programs policies enhance or deter adoption of CDR implementation? What are barriers? How do we overcome them?
- What information is needed to assess the commercial viability of practices or land use change for C sequestration?
- What do we know about the co-benefits and negative impacts of the C sequestration terrestrial management practices and their economic value? (i.e., ecosystem services, soil health, water quality, etc.)? How important are induced or secondary macro-economic effects?

- 3:00 **Panelist Presentations**
Debbie Reed, Coalition on Agricultural Greenhouse Gases (C-AGG)
Adam Chambers, USDA NRCS
John Antle, Oregon State University (via WebEx)
Joe Cornelius, ARPA-E
Toby Janson-Smith, Verified Carbon Standard (VCS) (via WebEx)
- 4:15 **Discussion**
- 5:00 **Closing Remarks/Adjourn Workshop**

NOTE FOR PUBLIC MEETINGS: This meeting is being held to gather information to help the committee conduct its study. This committee will examine the information and material obtained during this, and other public meetings, in an effort to inform its work. Although opinions may be stated and lively discussion may ensue, no conclusions are being drawn at this time; no recommendations will be made. In fact, the committee will deliberate thoroughly before writing its draft report. Moreover, once the draft report is written, it must go through a rigorous review by experts who are anonymous to the committee, and the committee then must respond to this review with appropriate revisions that adequately satisfy the Academies' Report Review Committee and the NAS president before it is considered an official Academies report. Therefore, observers who draw conclusions about the committee's work based on today's discussions will be doing so prematurely.

Furthermore, individual committee members often engage in discussion and questioning for the specific purpose of probing an issue and sharpening an argument. The comments of any given committee member may not necessarily reflect the position he or she may actually hold on the subject under discussion, to say nothing of that person's future position as it may evolve in the course of the project. Any inference about an individual's position regarding findings or recommendations in the final report is therefore also premature.