

CCSP 2.2 North American Carbon Budget State of the Carbon Cycle Report (SOCCR)

U.S. Climate Change Science Program Workshop
Climate Science in Support of Decision Making
November 14, 2005

Anthony King
for the SOCCR Coordinating Team

Anthony King

Lisa Dilling

David Fairman

Skee Houghton

Gregg Marland

Adam Rose

Tom Wilbanks

Greg Zimmerman



SOCCR



State of the Carbon Cycle Report

CCSP 2.2 North American Carbon Budget State of the Carbon Cycle Report (SOCCR)

- **What**
- **Who**
- **When**



SOCCR



State of the Carbon Cycle Report

What is SOCCR? State of the Carbon Cycle Report

- “... a series of reports on the state of the carbon cycle designed to provide accurate, unbiased, and policy-relevant scientific information concerning the carbon cycle to a broad range of stakeholders.”
 - SOCCR Terms of Reference, U.S. Carbon Cycle Interagency Working Group
- “... a series of increasingly comprehensive and informative reports about the status and trends of carbon emissions and sequestration.”
 - Strategic Plan for the U.S. Climate Change Science Program

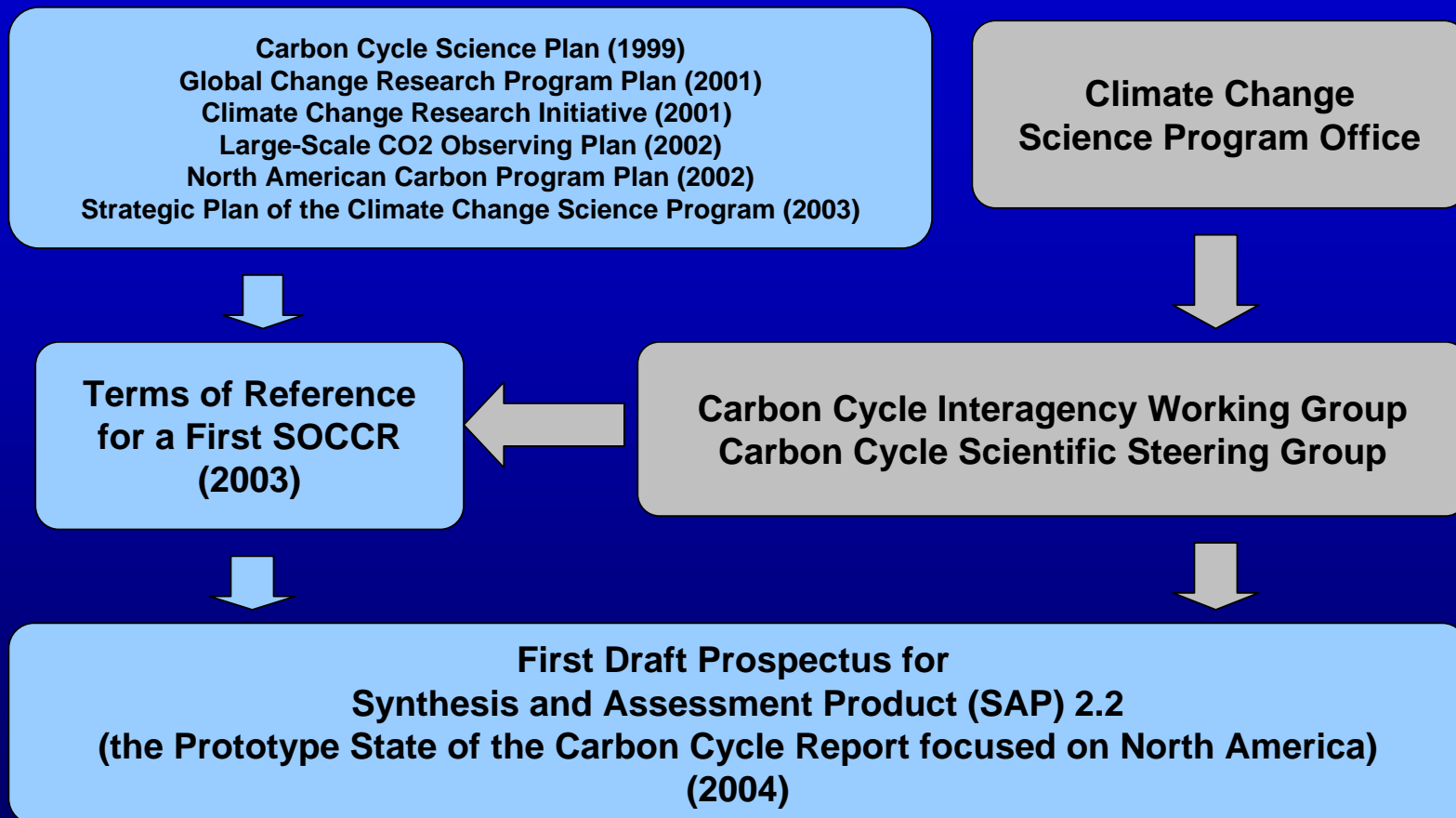


SOCCR



State of the Carbon Cycle Report

Consensus on the need for the SOCCR



SOCCR



State of the Carbon Cycle Report

Proposal-based origin of the first SOCCR

Terms of Reference
for a First SOCCR

Two Unsolicited Proposals
NCAR/USGS/CBI
ORNL
(2003)

Guidelines for Synthesis
and Assessment
Products
(2004)

Merged Proposal
ORNL/NCAR/USGS/CBI
(2004)

Prospectus
for SAP 2.2
(draft 2004
revised 2005)

The first SOCCR
CCSP Synthesis and Assessment Product 2.2
"State of the Carbon Cycle: North America"
(2006)

Future SOCCR's



SOCCR

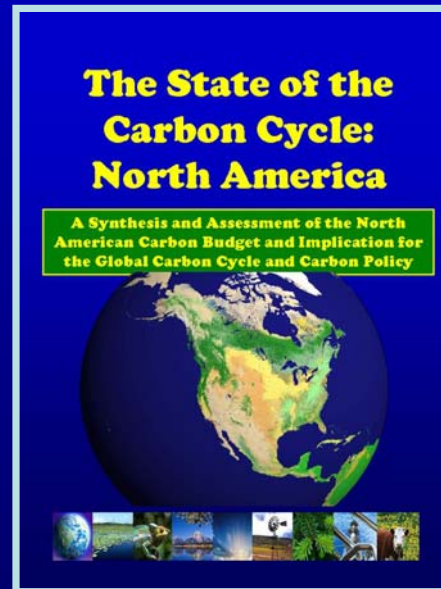


State of the Carbon Cycle Report

The first SOCCR ---

The State of the Carbon Cycle: North America

A Synthesis and Assessment of the North American Carbon Budget and Implications for the Global Carbon Cycle and Carbon Policy



SOCCR

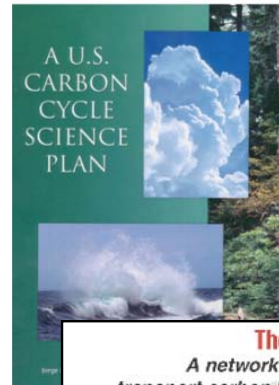


www.isse.ucar.edu/soccr/
State of the Carbon Cycle Report

What are the goals of the SOCCR?

- To summarize scientific knowledge about carbon cycle properties and changes, with a focus on North America.
- To provide scientific information for decision support and policy formulation concerning carbon.

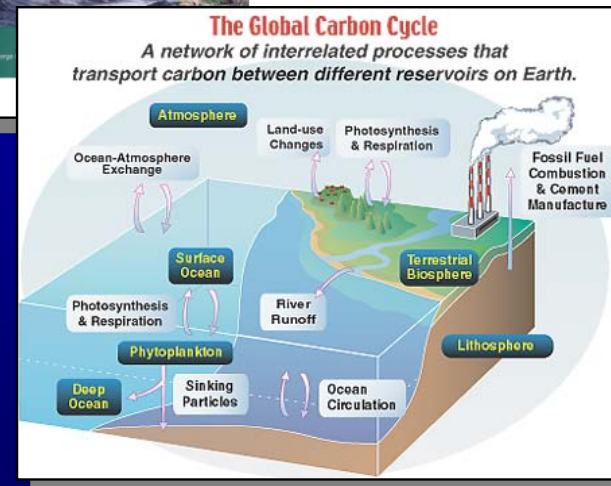
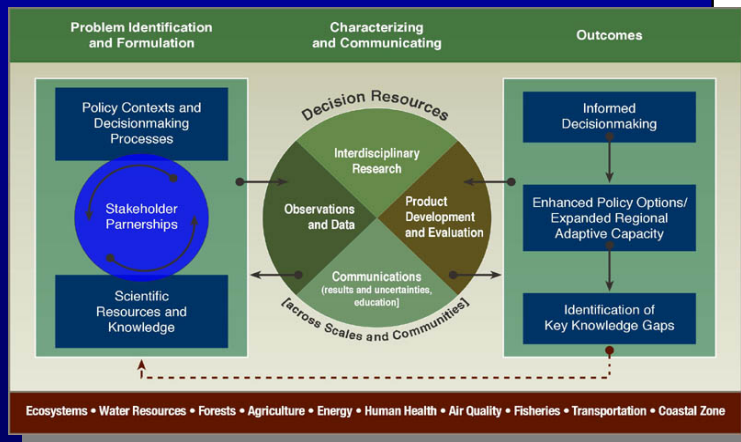
U.S. Carbon Cycle Science Plan



Plan Prepared by Scientists Active in Carbon Cycle Research for the U.S. Global Change Research Program (USGCRP)

Interagency:
NOAA, NASA, NSF, USDA, DOE, USGS

A Major Emphasis is Placed on Understanding North American Carbon Sources and Sinks



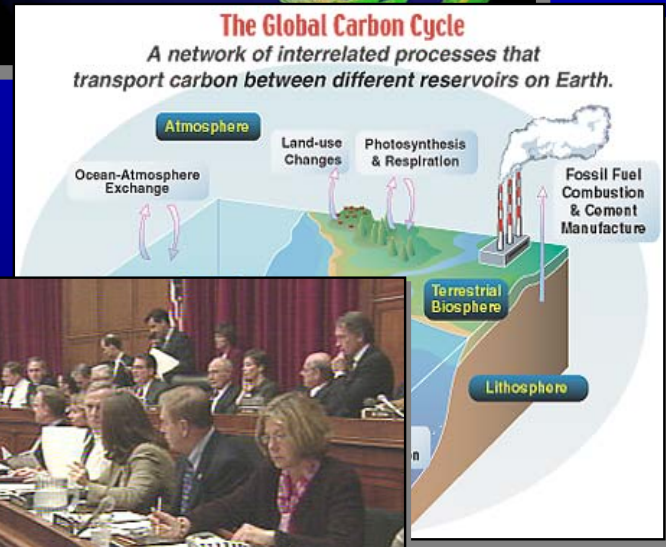
SOCCR



State of the Carbon Cycle Report

SOCCR Science Questions

- What are the primary carbon sources and sinks in North America, and how are they changing?
- How do North American carbon sources and sinks relate to the global carbon cycle?
- How are North American carbon sources and sinks affected by present and anticipated future changes in human activities and climate?
- What are the primary uncertainties in the North American carbon budget, and what factors affect carbon budget uncertainties and information quality?
- What scientific information is most needed to support carbon management and climate policy decisions?



Who is SOCCR?

- **SOCCR Coordinating Team**
- **SOCCR Lead Chapter Authors**
- **Carbon Cycle Stakeholders**
- **The SOCCR Agency Executive Committee**

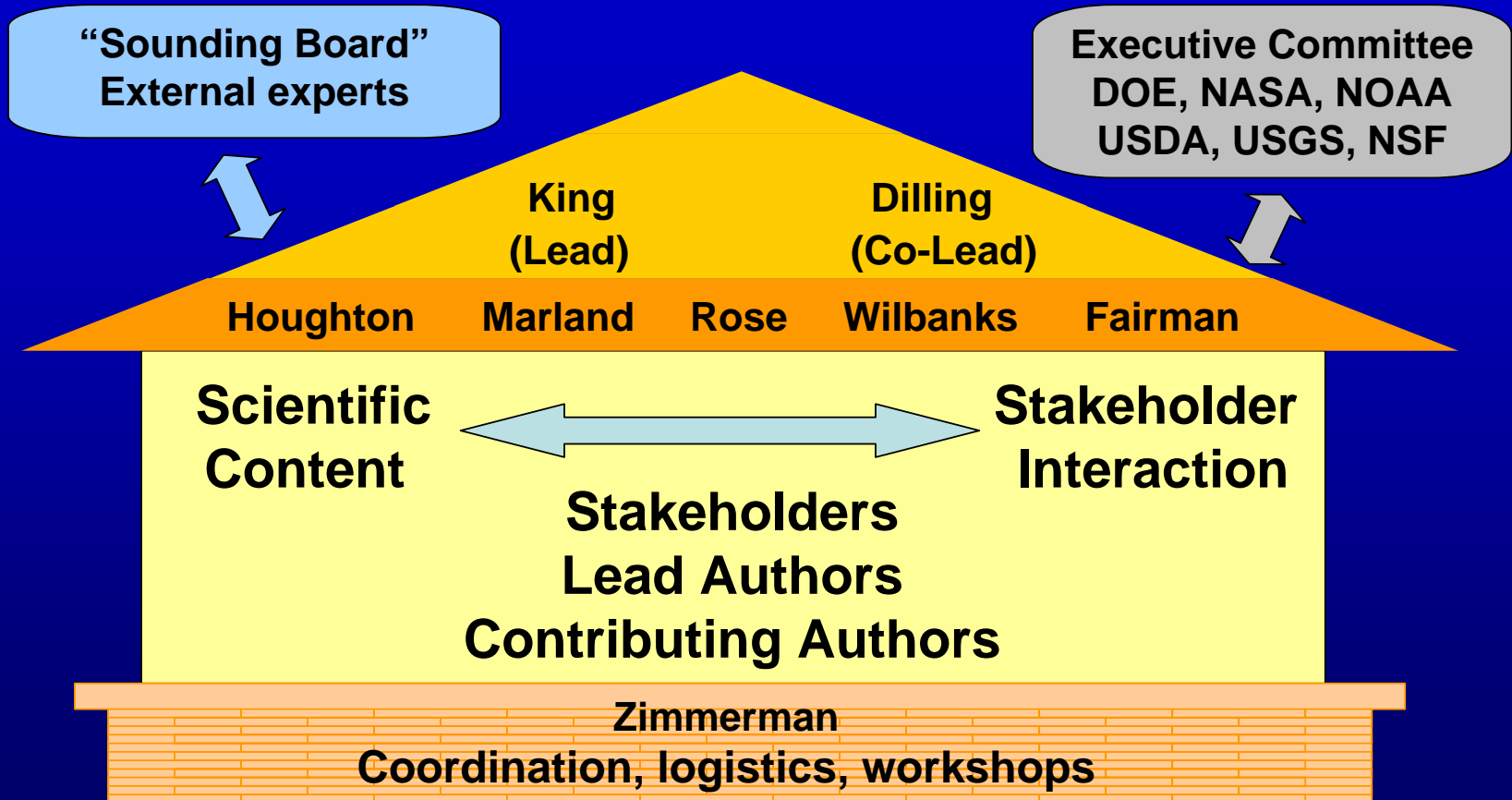


SOCCR



State of the Carbon Cycle Report

SOCCR Infrastructure



SOCCR Coordinating Team

- **Dr. Anthony King, Oak Ridge National Laboratory**
 - Overall Lead and Acting Lead for Scientific Content
- **Dr. Lisa Dilling, University of Colorado / National Center for Atmospheric Research**
 - Co-Lead and Lead for Stakeholder Interaction
- **Dr. David Fairman, Consensus Building Institute, Inc.**
 - Stakeholder Interaction
- **Dr. Richard (Skee) Houghton, Woods Hole Research Center**
 - Scientific Content (Land Use)
- **Dr. Gregg Marland, Oak Ridge National Laboratory**
 - Scientific Content (Energy Emissions)
- **Dr. Adam Rose, The Pennsylvania State University**
 - **Scientific Content (Economics)**
- **Dr. Thomas Wilbanks, Oak Ridge National Laboratory**
 - Scientific Content (Human Dimensions)
- **Mr. Gregory Zimmerman, Oak Ridge National Laboratory**
 - Project Coordinator



SOCCR Lead Chapter Authors

- Dr. Richard Birdsey, U.S. Forest Service
- Dr. Scott Bridgham, University of Oregon
- Dr. Ken Caldeira, Carnegie Institution
- Dr. Francisco Chavez, Monterey Bay Aquarium Research Institute
- Dr. Rich Conant, Colorado State University
- Dr. Kenneth Davis, The Pennsylvania State University
- Dr. Lisa Dilling, University of Colorado / National Center for Atmospheric Research
- Dr. David Fairman, Consensus Building Institute, Inc.
- Dr. Chris Field, Carnegie Institution
- Dr. David Greene, Oak Ridge National Laboratory
- Dr. Mark Jaccard, Simon Fraser University
- Dr. Burke Hales, Oregon State University
- Dr. Erik Haites, Margaree Consultants
- Dr. Richard Houghton, The Woods Hole Research Center
- Dr. Elizabeth Huber-Sannwald, Institute for Scientific and Technological Research of San Luis Potosi
- Dr. Jennifer Jenkins, University of Vermont
- Dr. Mark Johnston, Saskatchewan Research Council
- Dr. James McMahon, Lawrence Berkley National Laboratory
- Dr. Gregg Marland, Oak Ridge National Laboratory
- Dr. Ron Mitchell, University of Oregon
- Dr. Stephen Pacala, Princeton University
- Dr. Diane Pataki, University of California-Irvine
- Dr. Keith Paustian, Colorado State University
- Dr. Patricia Romero Lankao, Metropolitan Autonomous University – Xochimilco
- Dr. Adam Rose, The Pennsylvania State University
- Dr. Jorge Sarmiento, Princeton University
- Dr. Taro Takahashi, Lamont-Doherty Earth Observatory, Columbia University
- Dr. Pieter Tans, National Oceanic and Atmospheric Administration
- Dr. Charles Tarnocai, Agriculture and Agri-Food Canada
- Dr. Thomas Wilbanks, Oak Ridge National Laboratory
- Dr. Steven Wofsy, Harvard University



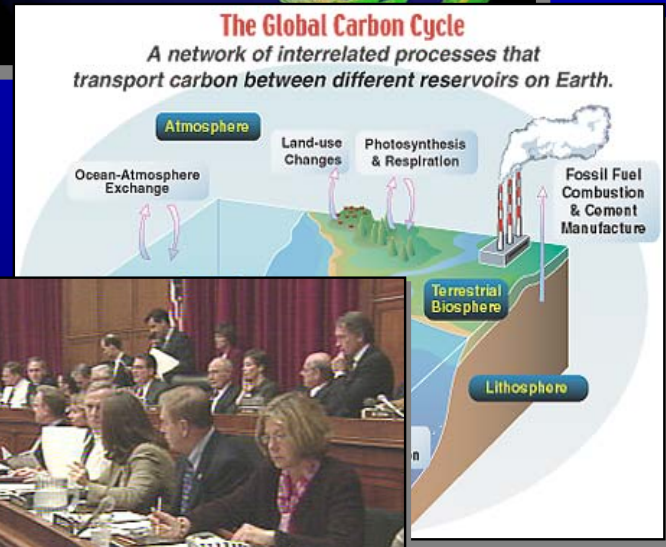
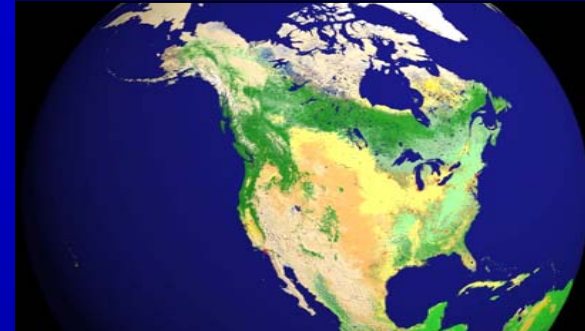
When --- the SOCCR Timeline

- October 2004: Initial stakeholder contacts, review of proposal's chapter outline
- November 15-16, 2004: First stakeholder workshop, Washington D.C.
- November-December 2004: revised outline posted on SOCCR website
- December 2004: drafting of CCSP SAP 2.2 Prospectus
- January 2005: draft Prospectus submitted to CCSP
- February 2–March 7, 2005: public comment on draft Prospectus
- April 2005: response to comments and revision of Prospectus
- May 16-17, 2005: First lead chapter authors workshop, Atlanta GA
- May-October 2005: Authors prepare initial chapter drafts
- October 24-25, 2005: Joint second stakeholder and author workshop, Arlington VA
- November-December 2005: Authors revise/complete chapter drafts
- January 2006: Prepare draft 1 of report for submission to expert review
- February 2006: Submit draft (1) to AEC for expert review
- March 2006: Complete expert review of draft SOCCR
- May 2006: Deliver revised draft (2) SOCCR to AEC for 45-day public review
- May or June 2006: Third stakeholder workshop
- June-August 2006: Response to comments and final preparation
- August 2006: Delivery of SOCCR (draft 3) to AEC



SOCCR Science Questions

- What are the primary carbon sources and sinks in North America, and how are they changing?
- How do North American carbon sources and sinks relate to the global carbon cycle?
- How are North American carbon sources and sinks affected by present and anticipated future changes in human activities and climate?
- What are the primary uncertainties in the North American carbon budget, and what factors affect carbon budget uncertainties and information quality?
- What scientific information is most needed to support carbon management and climate policy decisions?



SOCCR stakeholder interactions

- Identification of key stakeholder constituencies --scientists, resource managers, decision makers, policy makers, policy advocates, carbon-related industries
- Initial rapid assessment of views using structured interviews
- Assessment of stakeholder focus areas for in-depth interviews and discussion
- Workshops
- Regular interactions with authors

SOCCR listservs and a website
www.isse.ucar.edu/soccr/



SOCCR



State of the Carbon Cycle Report

The Design of the SOCCR

The design of the SOCCR as a document started with an outline in the original proposal but has evolved significantly based on input from the First Stakeholders Workshop in November 2004, and the First Authors workshop in May 2005.

There are three parts to the SOCCR,
prefaced by an Executive Summary and Introduction:

Part I: The Carbon Cycle in North America

**Part II: Energy, Industry and Waste Management
Activities**

Part III: Land and Water Systems



SOCCR



State of the Carbon Cycle Report

Part I: The Carbon Cycle in North America

- **Chapter 2. How do North American carbon sources and sinks relate to the global carbon cycle?**
 - Chris Field (Coordinating Lead), Burke Hales, Jorge Sarmiento, and others
- **Chapter 3. What are the primary carbon sources and sinks in North America, how are they changing and why?**
 - Steve Pacala and Steve Wofsy (Coordinating Leads), Ken Davis, Burke Hales, Skee Houghton, Pieter Tans, and others
- **Chapter 4. What are the options and measures that could significantly affect the carbon cycle?**
 - Erik Haites (Coordinating Lead), Ken Caldeira, Patricia Romero Lankao, Adam Rose, Tom Wilbanks
- **Chapter 5. How can we improve the application of scientific information to decision support for carbon management and climate decision-making?**
 - Lisa Dilling and Ron Mitchell (Coordinating Leads), David Fairman



Part II: Energy, Industry and Waste Management Activities

Overview of Part III: Energy, Industry, and Waste Management Activities: An Introduction to CO2 Emissions from Fossil Fuels

-- Gregg Marland

- Chapter 6: Energy Extraction and Conversion

-- Gregg Marland

- Chapter 7: Transportation

-- David Greene

- Chapter 8: Industry and Waste Management

-- Mark Jaccard

- Chapter 9: Buildings

-- James McMahon



PART III: LAND AND WATER SYSTEMS

- **Overview of Part III: Title To Be Determined**
 - Skee Houghton
- **Chapter 10. Agriculture, Grassland, Shrubland and Arid Lands**
 - Keith Paustian and Rich Conant
- **Chapter 11. Forests**
 - Mark Johnston, Jennifer Jenkins, Richard Birdsey, Elisabeth Huber-Sannwald
 - A. Boreal Forests
 - B. Temperate Forests
 - C. Tropical Forests
- **Chapter 12. Carbon Cycle in Permafrost Regions (i.e., Boreal, Subarctic and Arctic Areas) of North America**
 - Charles Tarnocai
- **Chapter 13. Non-Permafrost Wetlands**
 - Scott Bridgham
- **Chapter 14. Human Settlements and the North American Carbon Cycle**
 - Diane Pataki
- **Chapter 15. Aquatic Carbon, Coastal Management, and Ocean Basins**
 - Francisco Chavez and Taro Takahashi



The State of the Carbon Cycle: North America

A Synthesis and Assessment of the North
American Carbon Budget and Implication for
the Global Carbon Cycle and Carbon Policy



SOCCR



www.isse.ucar.edu/soccr/
State of the Carbon Cycle Report