

Overview of the Second State of the Carbon Cycle Report (SOCCR-2): Process and Status



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<https://CarbonCycleScience.us>

USGCRP Meeting with Natural Resources Canada and Environment Canada

USGCRP NCO, Washington, D.C.

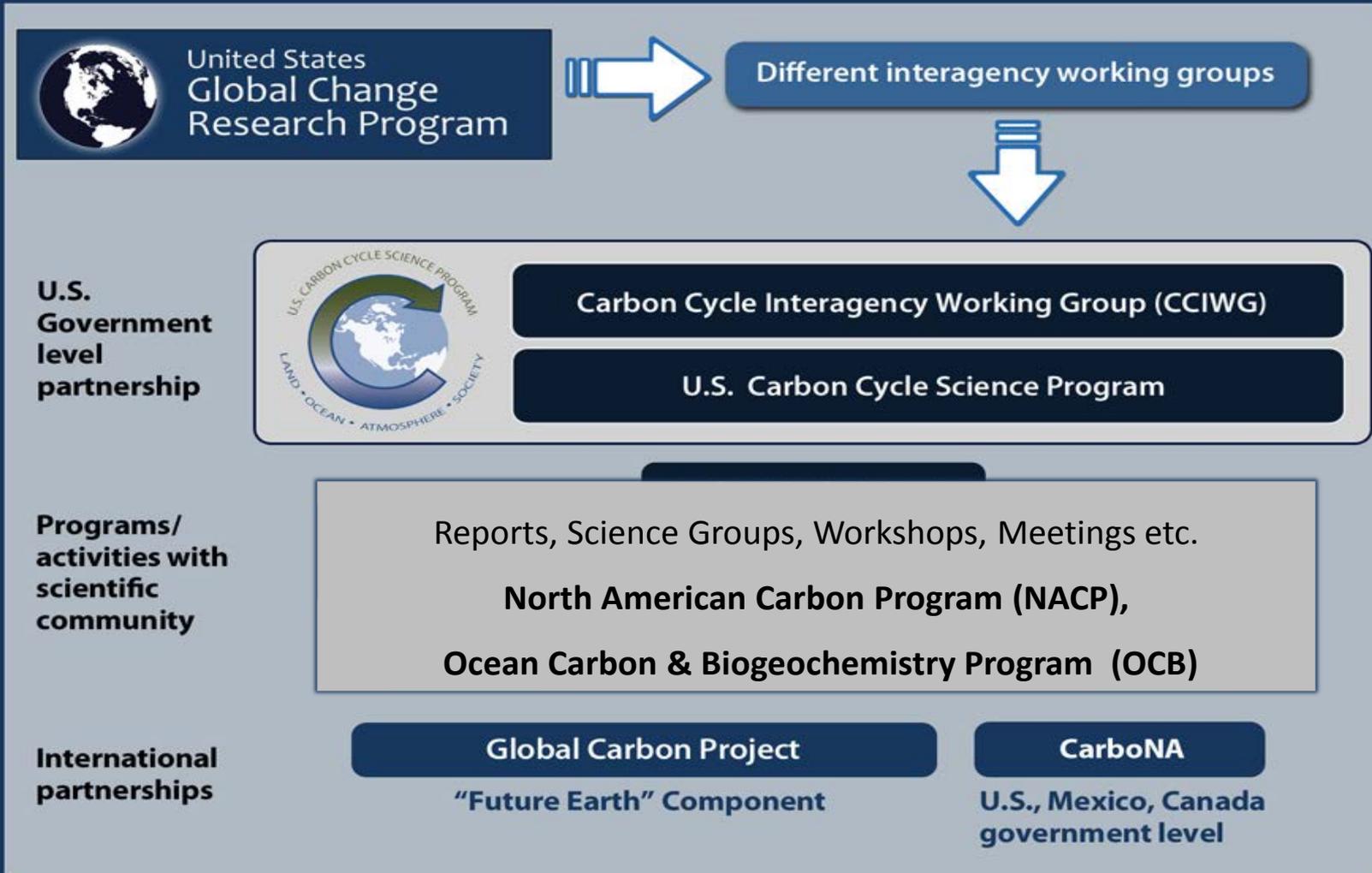
June 14, 2017





U.S. Carbon Cycle Science Program/CCIWG Mission

To coordinate and facilitate federally funded carbon cycle research, & provide leadership to the USGCRP on carbon cycle science priorities



e.g.
SOCRR-2



Since 1998: CCIWG instrumental in process of prioritization of U.S. govt. carbon cycle science research themes

What we do:

- **Promote** interagency cooperation and coordination;
- **Help** secure funding, prepare individual & joint agency initiatives & solicitations; and
- **Involve** the scientific community in providing the needed science to understand the carbon cycle

A U.S. CARBON CYCLE SCIENCE PLAN



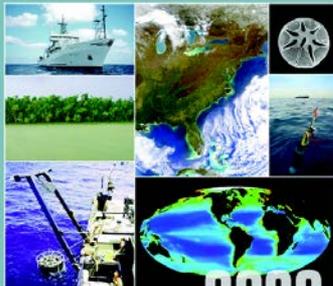
A Report of the Carbon and Climate Working Group
Jorge L. Sarmiento and Steven C. Wofsy, Co-Chairs

Strategic Plan for the U.S. Climate Change Science Program



A Report by the Climate Change Science Program and the Subcommittee on Global Change Research

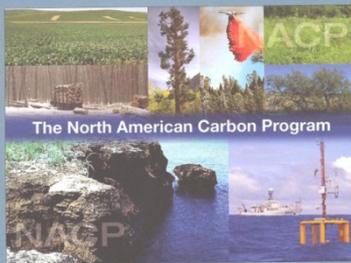
Ocean Carbon and Climate Change An Implementation Strategy for U.S. Ocean Carbon Research



OCCC

Prepared for the U.S. Carbon Cycle Science Scientific Steering Group and Inter-agency Working Group by the Carbon Cycle Science Ocean Interim Implementation Group

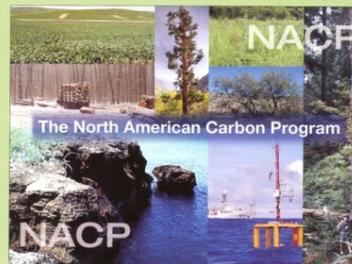
Scott C. Doney, chair and editor



The NACP Committee of the U.S. Carbon Cycle Science Steering Group

Steven C. Wofsy and Robert C. Harris
Co-Chairs

Science Implementation Strategy for the North American Carbon Program



Prepared for the U.S. Carbon Cycle Scientific Steering Group and Interagency Working Group by the North American Carbon Program Implementation Strategy Group

A. Scott Denning
Chair and editor

OUR CHANGING PLANET



The U.S. Global Change Research Program for Fiscal Year 2015
A Supplement to the President's Budget for Fiscal Year 2015



A Report by the U.S. Global Change Research Program and the Subcommittee on Global Change Research

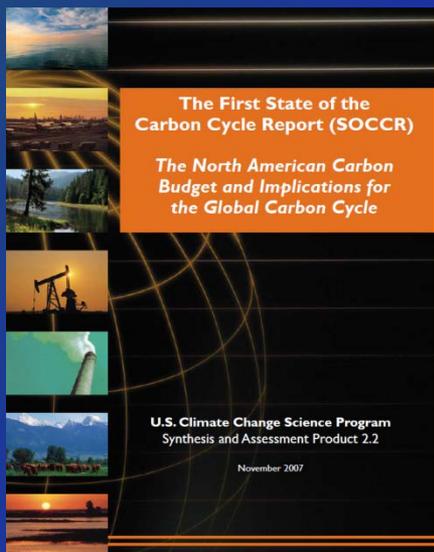
THE NATIONAL GLOBAL CHANGE RESEARCH PLAN 2012-2021

A STRATEGIC PLAN FOR THE U.S. GLOBAL CHANGE RESEARCH PROGRAM



A U.S. Carbon Cycle Science Plan

Anna M. Michalak, Robert B. Jackson, Gregg Marland, Christopher L. Sabine, and the Carbon Cycle Science Working Group

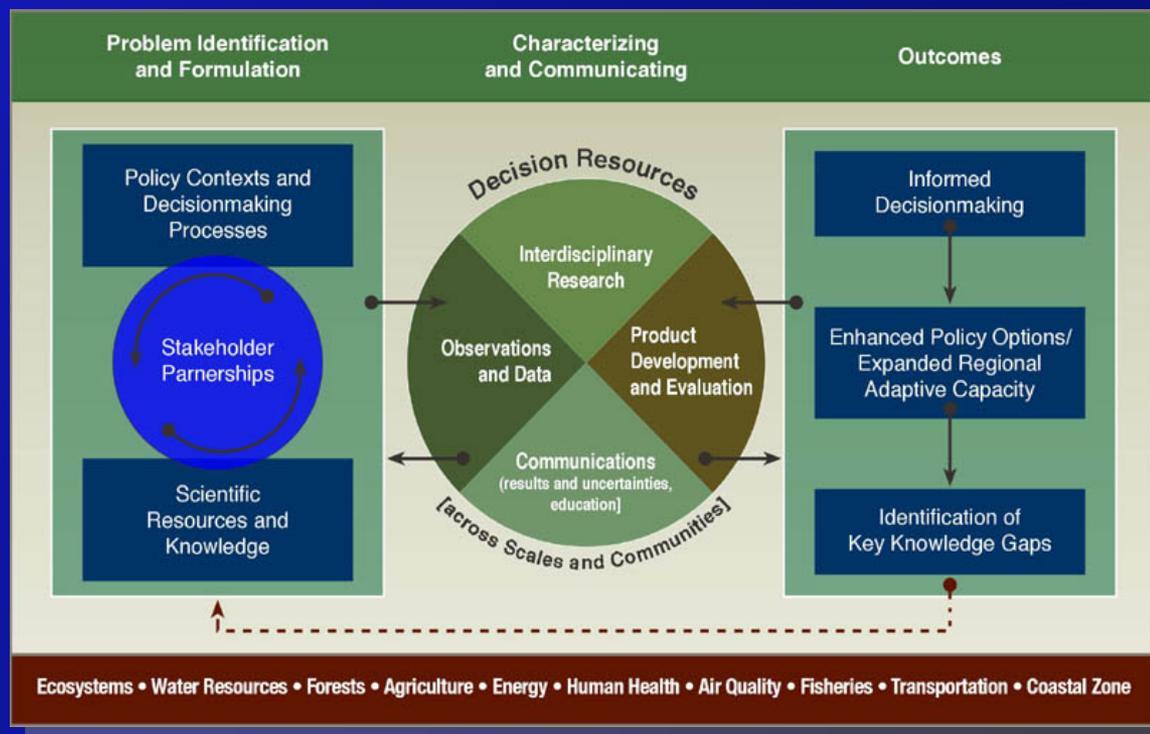


1st State of the Carbon Cycle Report: SOCCR-1 (2007)

- The North American Carbon Budget and Implications for the Global Carbon Cycle
- Synthesis and Assessment Product

2 major goals of SOCCR-1 (2007)

1. To summarize scientific knowledge about carbon cycle properties and changes for North America.
2. To provide scientific information for decision support and policy formulation concerning carbon.



U.S. Climate Science Program (now U.S. Global Change Research Program) Decision Support Strategy

10 years later: SOCCR-2

- Follow-up to the 1st SOCCR (2007)
- Led by CCIWG
- Lead Administrative agency is USDA.
- U.S. and North American carbon stocks and fluxes in managed and unmanaged systems
- Including relevant carbon management science perspectives and tools for supporting and informing decisions addressed in/related to US Carbon Cycle Science Plan (2011) and National Climate Assessment, USGCRP 2012-2021 Strategic Plan (2012-2021)

SOCCR-2 broad assessment framework

1. Carbon Cycle at Scales (*Global Perspective, North American Perspective, U.S. Perspective, Regional Perspective*)
2. Interactions/Disturbance/Impacts from/on the carbon cycle
3. Role of carbon in systems (*Soils, Water, Oceans, Vegetation, Terrestrial-aquatic Interfaces*)
4. Carbon Management Science Perspective and Decision Support (*measurements, observations and monitoring for research and policy relevant decision-support etc.*)

SOCCR-2	#	State of the Science – Chapters - Draft	<u>Required sections</u> for each chapter
	I	Preface/motivation for the report/ advances since SOCCR-1	i. Key Message/ Findings/Highlights (incl. traceable accounts - see examples from Health and NCA supporting evidence)
	II	Governmental, intergovernmental and interagency context	
	III	Executive Summary	
Part I Synthesis	1	What is the C cycle and why care/the C cycle in a global context	ii. Introduction
	2	North American C budget past, present, and future	
Part II Human Dimensions of the C Cycle	3	Energy Systems (incl. Transportation)	iii. Historical context (incl. socioeconomic drivers of carbon emissions)
	4	Urban	
	5	Agriculture	iv. Current State of Carbon Cycle Understanding of Fluxes and Stocks
	6	Societal Perspective on Carbon	
	7	Tribal Lands	
Part III: State of Air, Land and Water	8	Atmosphere	v. Indicators, Trends, Feedbacks
	9	Forests	
	10	Grasslands	vi. North American and Global Context, Regional Perspective <ul style="list-style-type: none"> • NCA regions • U.S., Mexico, Canada • Arctic, Tropics, RECCAP
	11	Arctic/Boreal/Permafrost regions	
	12	Soils	
	13	Terrestrial Wetlands	vii. Societal drivers and impacts, carbon management and decisions
	14	Inland waters	
	15	Tidal wetlands and estuaries (incl. blue carbon)	
	16	Oceans and continental Shelves (oceans, methane hydrates etc.)	
Part IV: Consequences and ways forward	17	Consequences of rising atmospheric CO2 (e.g. ocean acidification)	viii. Synthesis, conclusions, gaps in knowledge, and (near) future outlook <ul style="list-style-type: none"> • overarching synthesis of the current state of the carbon cycle • key knowledge gaps/ opportunities and near-term outlook on the North American carbon cycle
	18	Decision-support (social, behavioral, economic)	
	19	Future projections and associated climate change in North America	

SOCCR-2 TEAM

USGCRP includes SGCR
Principals, USGCRP NCO
staff (NCA, GCIS, others)



Lead agency:
USDA (legal)

Carbon Cycle Science Interagency Working Group (CCIWG)
+ SOCCR-2 Federal Steering Committee

U.S. Carbon Cycle Science Program Office
(i.e. Gyami Shrestha
+ logistical support from UCAR CPAESS
Boulder, Colorado)

Federal Liaisons
for each chapter

5 SOCCR-2 Science Leads
(Fed + non-Fed scientists)

Oak Ridge Editorial Team
(reports to DOE)

Chapter Leads,
Chapter Contributors
(Fed + non-Fed scientists)



SOCCR-2 DECISION PROCESS



 **United States
Global Change
Research Program**

FSC ensures delivery of high-quality report for approval and release as a USGCRP document

FSC keeps SGCR informed; seeks SGCR approval on strategic items as needed

**Lead agency
USDA (legal)**

**Carbon Cycle Science Interagency Working Group (CCIWG)
+ SOCCR-2 Federal Steering Committee (FSC)**

FSC
Makes/approves
decisions

Reports to FSC, provides input to and feedback on FSC decisions

**Federal Liaisons
for each chapter**

**U.S. Carbon
Cycle Science
Program Office
(Gyami Shrestha)**

Facilitates CCIWG + FSC decisions + communications+ conveys/ implements FSC decisions, contributes to report conceptualization, drafting etc.

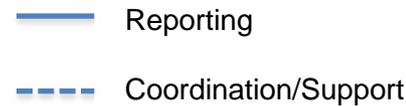
**5 SOCCR-2 Science Leads
(Fed + non-Fed scientists)**

Report to SL+ fed liaison, provide input to and feedback on FSC decisions

SL
implement
FSC
decisions

**Oak Ridge Editorial Team
(reports to DOE)**

**Chapter Leads,
Chapter Coordinators, Contributors
(Fed + non-Fed scientists)**



Who's Who (SOCCR-2 Team so far)

CCIWG SOCCR-2 Fed Steering Committee and USGCRP	Organization
Nancy Cavallaro (Administrative Lead Agency POC + CCIWG co-chair)	USDA-NIFA*
Zhiliang Zhu (CCIWG co-chair)	USGS
Dan Stover	DOE Office of Science
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Tom Wirth	EPA
Kathy Hibbard	NASA
Marlen Eve	USDA ARS
Carolyn Olson	USDA OCE
Noel Gurwick	USAID
Ben DeAngelo (Deputy Executive Director) (prior to Dec 2016)	USGCRP
Glynis Lough (NCA Chief of Staff) (prior to Sept 2016)	USGCRP/UCAR
Gyami Shrestha (U.S. Carbon Program Office Director)	CCIWG/ UCAR @USGCRP USGCRP & CCIWG POC for SOCCR-2

Federal Liaisons (in addition to the Fed Steering Committee members)

Karina Schafer (NSF), Anne Marsh (USDA FS), Laura Lorenzoni (NASA), Jim Butler (NOAA), Eric Kasischke (NASA), Kathy Tedesco (NOAA), Libby Larson (NASA/SSAI)

Science Leads

Rich Birdsey	USDA FS (retired)
Melanie Mayes	ORNL
Ray Najjar	PSU
Sasha Reed	USGS
Paty Romero-Lankao	UCAR/NCAR

SOCCR-2 Writing Team (200+)

Chapter Leads + Contributors + ORNL Editing Team

*USDA is the Administrative Lead Agency for SOCCR-2.

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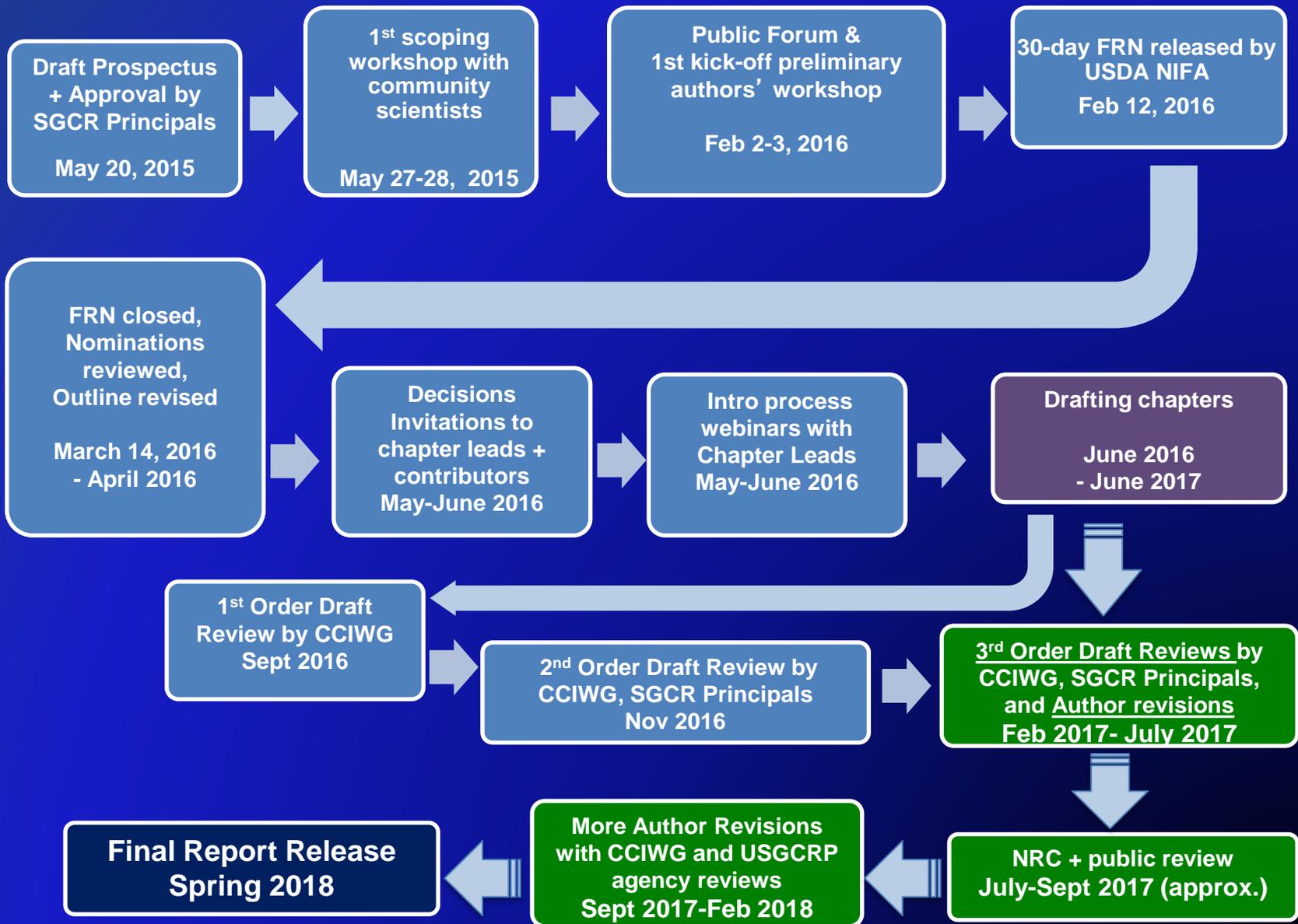
And more.....

200+

SOCCR-2 Authors

Collaborative partnership
with US, MX and CA
scientists

Major SOCCR-2 PROCESS & MILESTONES (As of June 14, 2017)



NAS Committee to Review SOCCR-2: Released for comments May 11, 2017

The review will provide an overall critique of the draft SOCCR-2 and will address the following questions: (In <http://dels.nas.edu/basc/Studies-In-Progress>)

- Are the goals, objectives and intended audience of the product clearly described in the document? Does the report meet its stated goals?
Does the report accurately reflect the scientific literature? Are there any critical content areas missing from the report?
- Are the findings documented in a consistent, transparent and credible way?
- Are the report's key messages and graphics clear and appropriate? Specifically, do they reflect supporting evidence, include an assessment of likelihood, and communicate effectively?
- Are the research needs identified in the report appropriate?
Are the data and analyses handled in a competent manner? Are statistical methods applied appropriately?
- Are the document's presentation, level of technicality, and organization effective?
What other significant improvements, if any, might be made in the document?

Ongoing:

Internal SOCCR-2 Writing and Reviews, other prep

- Planned June 23, 2017 start of 4-week 3rd order draft review prior to NAS + Public Review
- Iterative Federal feedback
- Iterations with chapter leads
- Revisions
- Deliberations with USGCRP regarding SGCR and OSTP Clearance needs for public and NRC review



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<https://CarbonCycleScience.us>

