



Overview: U.S. Climate Change Science Program(CCSP) Synthesis and Assessment Reports (SAP)

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**DOE Climate Change Science Program Product
Development Advisory Committee (CPDAC)**

BERAC

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CCSP Strategic Plan Goals & SAPs

- **Goal 1: Improve knowledge of the Earth's past and present climate and environment, including its natural variability, and improve understanding of the causes of observed variability and change.**

SAPs 1.1, 1.2, 1.3

- **Goal 2: Improve quantification of the forces bringing about changes in the Earth's climate and related systems.**

SAPs 2.1, 2.2, 2.3, 2.4

- **Goal 3: Reduce uncertainty in projections of how the Earth's climate and environmental systems may change in the future**

SAPs 3.1, 3.2, 3.3, 3.4

- **Goal 4: Understand the sensitivity and adaptability of different natural and managed ecosystems and human systems to climate and related global changes**

SAPs 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7

- **Goal 5: Explore the uses and identify the limits of evolving knowledge to manage risks and opportunities related to climate variability and change**

SAPs 5.1, 5.2, 5.3

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DOE lead agency



DOE led SAPs

- **SAP 2.1**

2.1a: *Scenarios of Greenhouse Gas Emissions and Atmospheric Concentrations*

2.1b: *Review of Integrated Scenario Development and Application*

DOE + (EPA NASA NOAA)

completed 07/07; Lead John Houghton

- **SAP 4.5**

Effects of Climate Change on Energy Production and Use in the United States

DOE

completed 10/07; Lead Jeff Amthor

- **SAP 3.1**

Climate Models: An Assessment of Strengths and Limitations

DOE + (NASA NOAA NSF)

completed 07/08; Lead Anjuli Bamzai

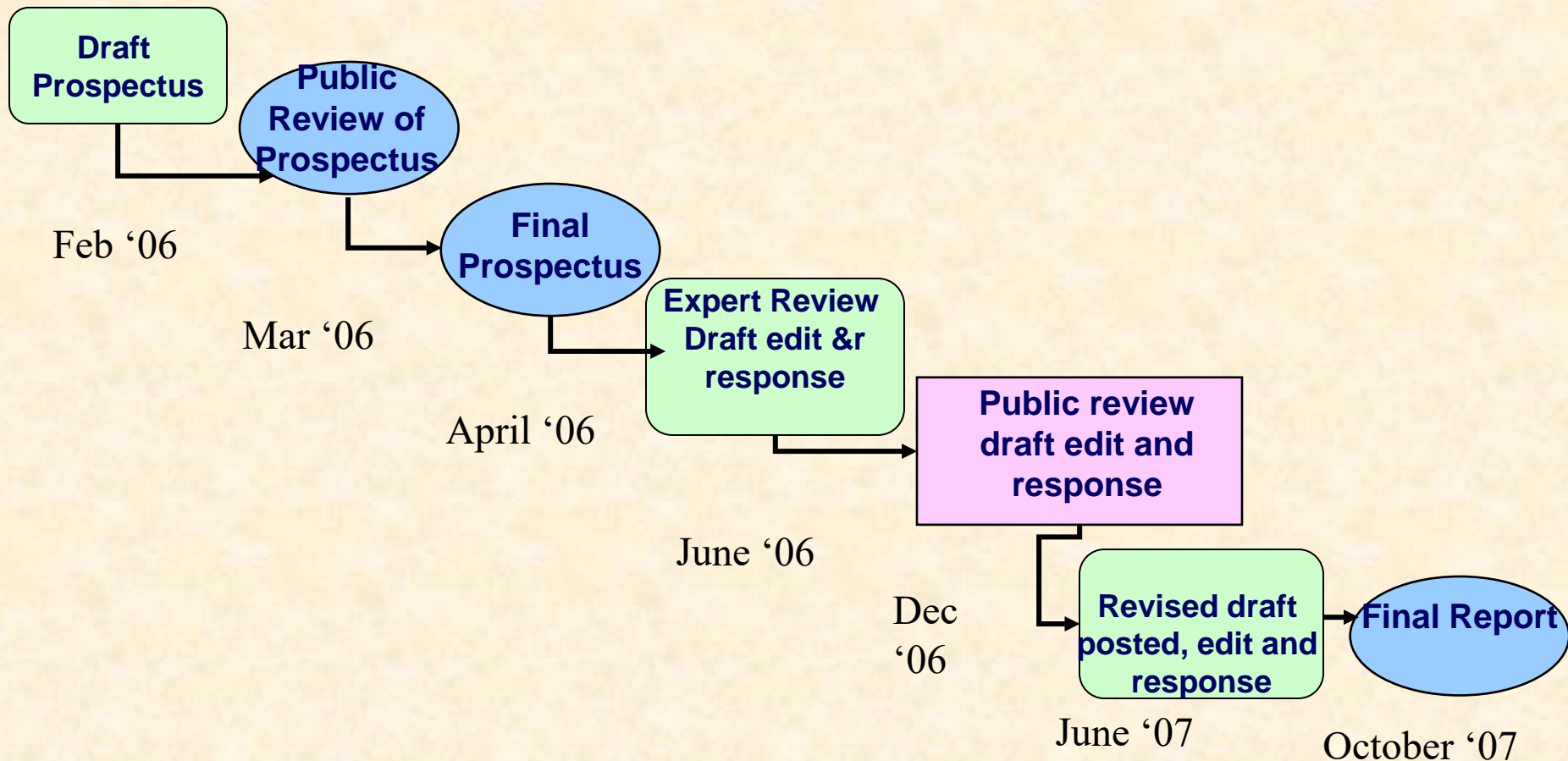


SAP 4.5

- **Thomas J. Wilbanks, ORNL, Coordinator + Authors from ANL, BNL, LBNL, NETL, NREL, ORNL, PNNL**
- **Three questions:**
 - How might climate change affect energy consumption in the United States?**
 - How might climate change affect energy production and supply in the United States?**
 - How might climate change have other effects that indirectly shape energy production and consumption in the United States?**

SAP 4.5 Development Process

Sept '05 Stakeholders WS





SAPs 2.1 and 3.1 were developed by a DOE Advisory Committee, U.S. Climate Change Product Development Advisory Committee aka CPDAC



DOE CPDAC

- <http://www.sc.doe.gov/ober/CPDAC/CPDAC.html>
- 29 members,
- Dr Soroosh Sorooshian/UC Irvine Chair
- Dr Anthony Busalacchi/UM College Park Vice-Chair
- CPDAC active from Aug '06 to Jul '08.



SAP 2.1

- Part A ***Scenarios of Greenhouse Gas Emissions and Atmospheric Concentrations***
...developed scenarios to evaluate four alternative stabilization levels of greenhouse gases in the atmosphere (450, 550, 650 and 750ppm) and the implications to energy and the economy for achieving each level.
- Part B ***Global-Change Scenarios: Their Development and Use***
... examined how scenarios have been developed and used in global climate change applications; evaluated effectiveness of current scenarios; and recommended ways to make future scenarios more useful.
- Leon Clarke/PNNL lead coordinator for SAP 2.1
- <http://www.climate-science.gov/Library/sap/sap2-1/default.php>



SAP 3.1

Climate Models: An Assessment of Strengths and Limitations



SAP 3.1 Target Audience and Scope

- Assumes a technical reader, but not necessarily a climate researcher
- Written at a level that enables intelligent use of climate model results
- Covers comprehensive global coupled atmosphere-ocean-land surface-sea ice models and downscaling approaches
- Does not include Earth System Models of Intermediate Complexity



SAP 3.1 Author Team

- Dave Bader/Lawrence Livermore National Laboratory (Coordinating Author)
- Dr Curtis Covey/Lawrence Livermore National Laboratory
- Dr William Gutowski/Iowa State Univ
- Dr Isaac Held/NOAA GFDL
- Dr Kenneth Kunkel/Illinois State Water Survey
- Dr Ron Miller/NASA GISS
- Dr Robin Tokmakian/Naval Postgraduate School
- Dr Minghua Zhang/SUNY Stonybrook

Authors were members of the larger CPDAC



SAP 3.1 Peer Reviewers

- Dr. Kerry Cook/Cornell
- Dr. Carlos Mechoso/UCLA
- Dr. Gerald Meehl/NCAR
- Dr. Philip Mote/Univ. Washington Seattle
- Dr Brad Udall/Western Water Assessment Boulder
- Dr John Walsh/International Arctic Research Center Fairbanks



SAP 3.1 focuses on the following questions

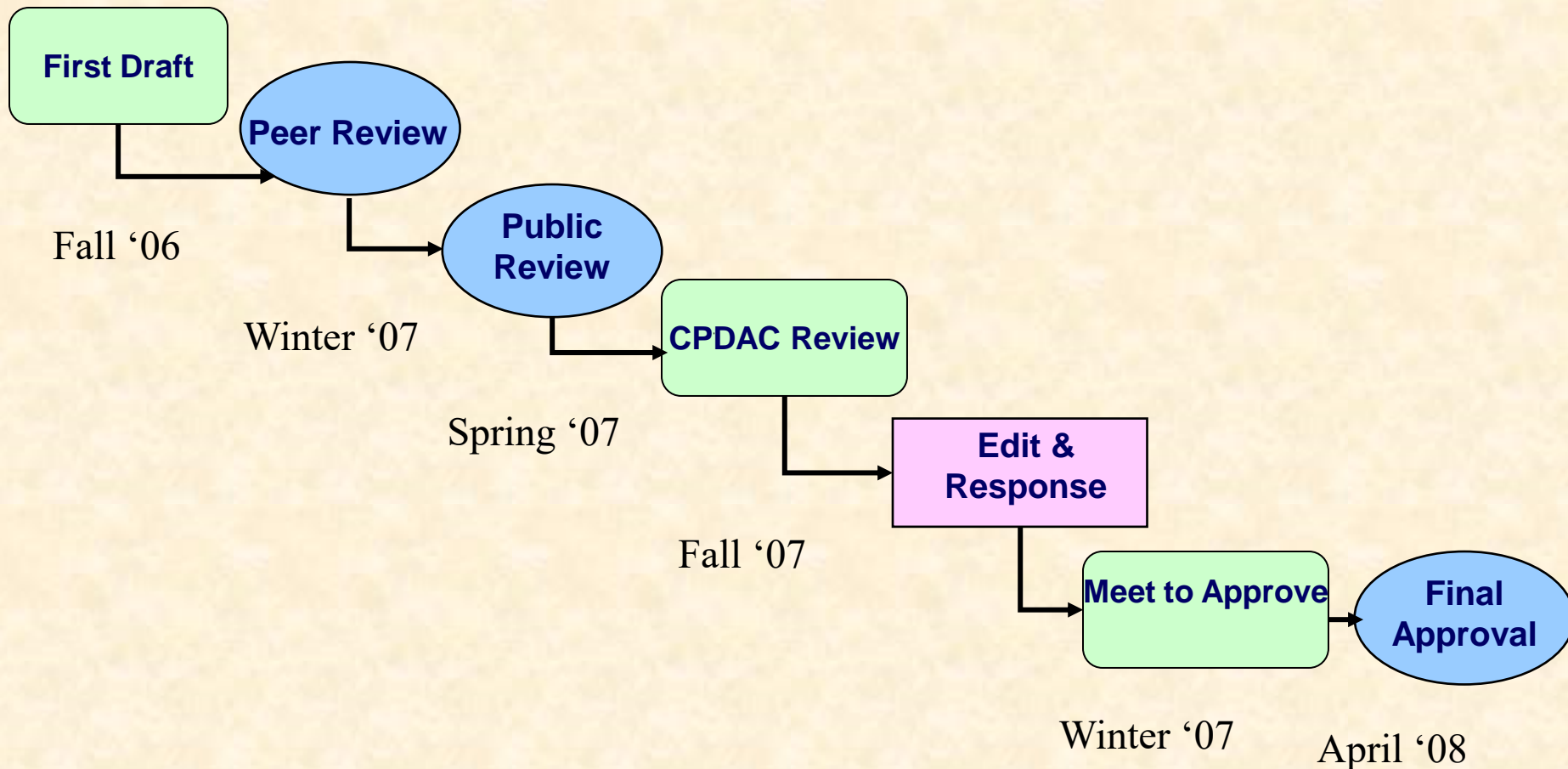
- ***What are the major components and processes of the climate system that are included in present state-of-the-science climate models, and how do climate models represent these aspects of the climate system?***
- ***How are changes in the Earth's energy balance incorporated into climate models? How sensitive is the Earth's (modeled) climate to changes in the factors that affect the energy balance?***
- ***How uncertain are climate model results? In what ways has uncertainty in model-based simulation and prediction changed with increased knowledge about the climate system?***
- ***How well do climate models simulate natural variability and how does variability change over time?***
- ***How well do climate models simulate regional climate variability and change?***
- ***What are the tradeoffs to be made in further climate model development (e.g., between increasing spatial/temporal resolution and representing additional physical/biological processes)?***

SAP 3.1: Contents

- 1. Introduction**
- 2. Description of Global Climate System Models**
- 3. Added Value of Regional Climate Model Simulations**
- 4. Model Climate Sensitivity**
- 5. Model Simulation of Major Climate Features**
- 6. Future Model Development**
- 7. Example Applications of Climate Model Results**

SAP 3.1 Development Process

CPDAC First meeting Aug '06.





Status of DOE led SAPs

- All 3 SAPs have been completed. DOE coordinated press release of each SAP with U.S. CCSP
- SAP 2.1 hard copies submitted to Congress
- SAP 4.5, SAP 3.1 hard copies being printed; these will also be submitted to Congress
- Steps being taken to terminate the CPDAC since it has successfully completed charge