



Co-Development of Science and Decision Support

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“Decision Support” is a unique component of a much larger CCSP *RESEARCH* program



Overview

- Introduction and status of development of decision support resources
- Lessons learned from current experiences
- Questions for future directions



Overview of Decision Support Approaches

1. Conducting syntheses and assessments
2. Supporting adaptive management and planning
3. Developing methods to support climate change policymaking



1: Assessments

- Evaluate the state of scientific knowledge (and the associated degree of scientific certainty)
- Develop information applicable to specific issues or decisions in interaction with users
- Recent and ongoing assessments will be discussed in Session 2 and the poster session



Evolution of US Climate Assessment Activities

SEC. 106. SCIENTIFIC ASSESSMENT.

Not less frequently than every 4 years, prepare an assessment which--

- **integrates, evaluates, and interprets findings and discusses scientific uncertainties;**
- **analyzes the effects of global change on:**
 - **the natural environment**
 - **agriculture**
 - **energy production and use**
 - **land and water resources**
 - **transportation**
 - **human health and welfare**
 - **human social systems, and**
 - **biological diversity; and**
- **analyzes current human-induced and natural trends, and makes projections for the subsequent 25 to 100 years.**

Current Assessment Activities

- CCSP agencies and scientists participate in a wide range of international assessments
 - IPCC
 - ~120 U.S. scientists are IPCC authors; 15 are Review Editors
 - US Co-Chairs and Hosts IPCC WG I
 - WMO/UNEP Ozone assessments
 - Arctic Climate Impacts Assessment
 - Millennium Ecosystem Assessment
 - ...
- 21 CCSP Synthesis and Assessment Products related to the CCSP goals
 - 6 respond to sectoral requirements of GCRA
- CCSP sponsors research to improve the conduct and utility of assessments
 - NRC report comparing and evaluating assessments

2: Support for Adaptive Management/Planning

Adaptive Management: A systematic approach to adjust to variability and change in climate and other conditions that utilizes “learning by doing” (integrating knowledge with practice)

- Of 260 abstracts submitted for the workshop, most describe adaptive management projects. These addressed in Session 4 and the Poster Session.
- Many adaptive management projects in the United States are extensions of the first U.S. National Assessment’s stakeholder-driven and interdisciplinary collaborations



Example: Wildfire Management

- **National Seasonal Assessment Workshop**

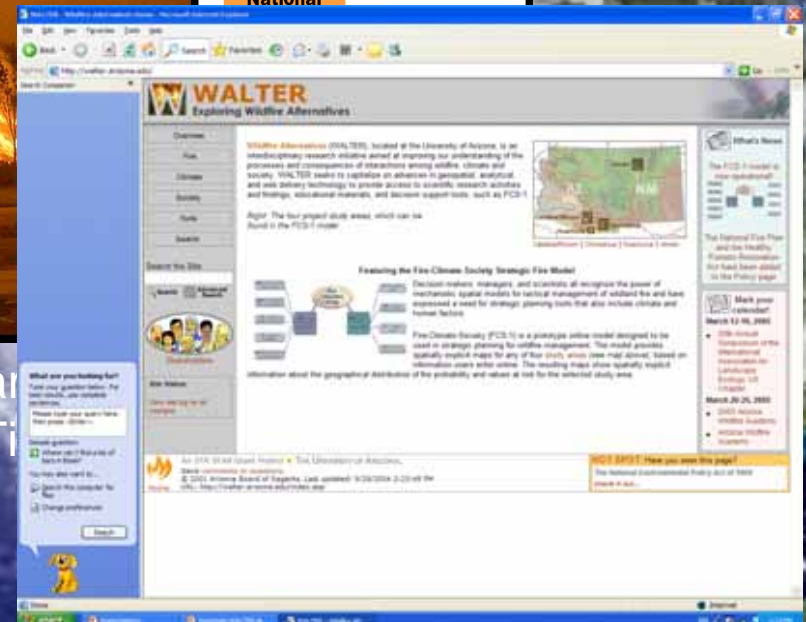
A multi-agency collaboration that produces forecasts and maps of fire potential and enables participants to plan for the coming fire seasons.

- **Interdisciplinary initiative on the interactions among wildfire, climate and society**

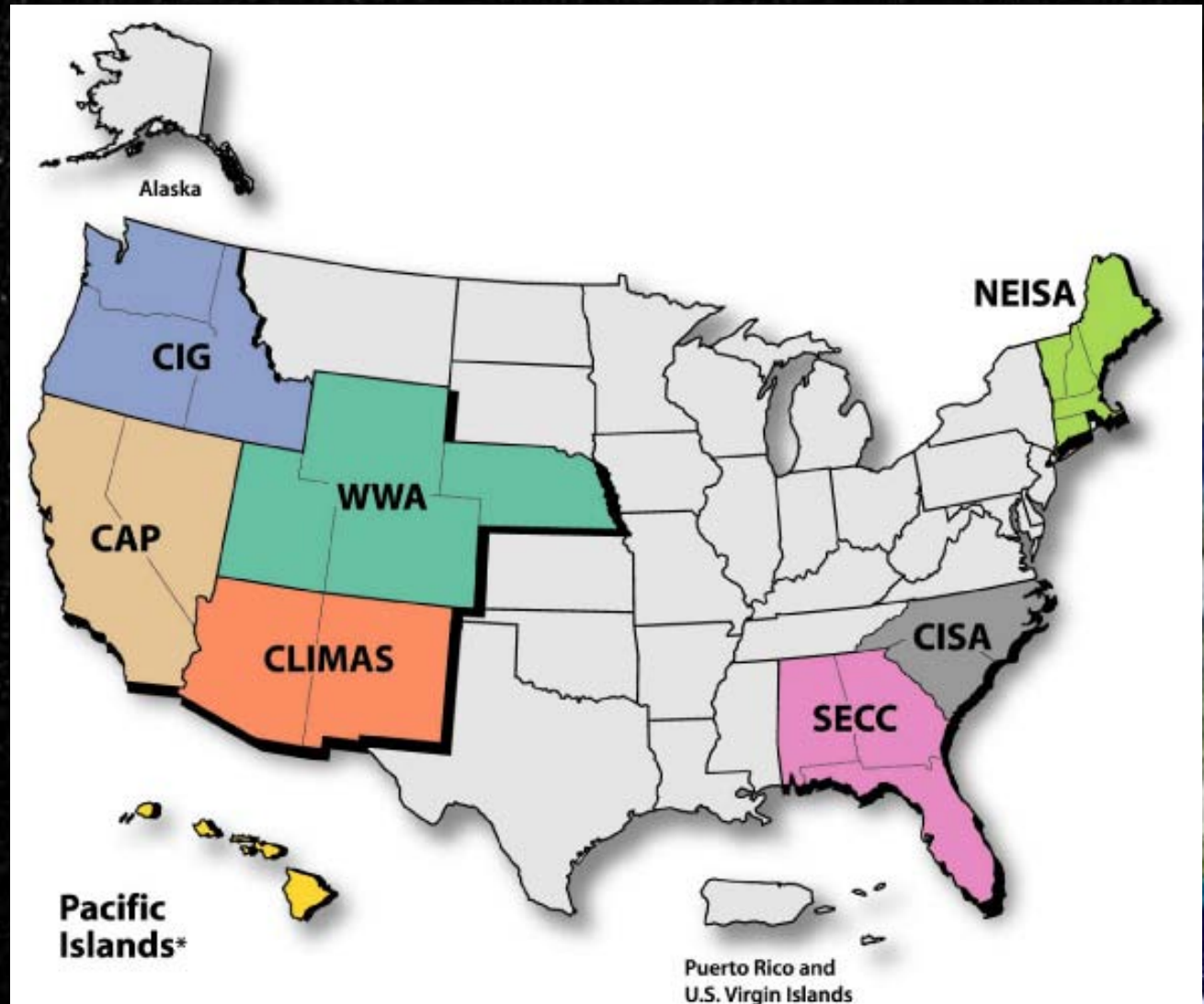
- Develops models and other support tools
- Scenario generation
- Fire risk assessment



Source: Gregg Gar
Photo: New York Ti

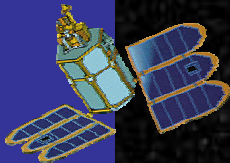


The NOAA Regional Integrated Sciences and Assessments (RISA) Program





TOI



Tasking

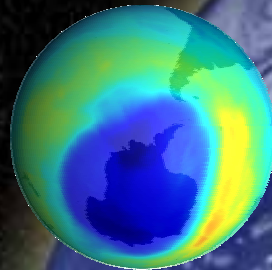


Mission Control

Downlink



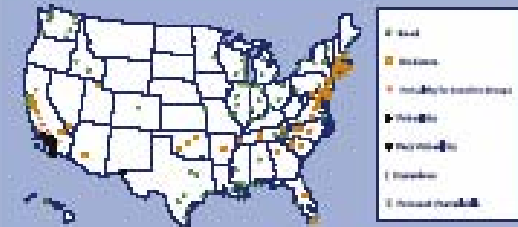
Exploitation



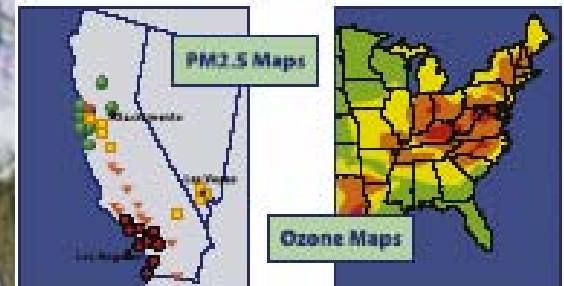
Societal Benefits




Ozone and PM2.5 Forecasts



Current Air Quality Conditions



EOSDIS & DAACs

National Application	 Partner Organizations	Decision-Support Systems
Agricultural Efficiency	USDA,NOAA	CADRE—Crop Assessment Data Retrieval and Evaluation (USDA)
Air Quality	EPA,NOAA,USDA	CMAQ—Community Multiscale Air Quality Modeling System AIRNow AQI—Air Quality Index
Aviation	DOT/FAA,NOAA	NAS-AWRP—National Air Space-Aviation Weather Research Program
Carbon Management	USDA,DOE,NOAA	CQUEST—Support to the Energy Act of 1992,Section 1605b
Coastal Management	NOAA,EPA,NRL	HAB—Harmful Algal Bloom Bulletin/Mapping System CREWS—Coral Reef Early Warning System
Disaster Management	DHS/FEMA,NOAA,USGS,USFS	AWIPS—Advanced Weather Interactive Processing System HAZUS-MH—Hazards U.S.—Multi-Hazards
Ecological Forecasting	USAID,NOAA,NPS,CCAD,USGS	SERVIR—Regional Visualization and Monitoring System
Energy Management	DOE,UNEP,NOAA,NRC	RETScreen—Energy Diversification Research Laboratory (CEDRL) NEMS—National Energy Modeling System
Homeland Security	DHS,USGS,NOAA,NGA,DOD	IOF—Integrated Operations Facility IMAAC—Interagency Modeling and Atmospheric Assessment Center
Invasive Species	USGS,USDA,NOAA	ISFS—Invasive Species Forecasting System
Public Health	NIH,CDC,DOD,EPA	PSS—Plague Surveillance System EPHTN—Environmental Public Health Tracking Network MMS—Malaria Monitoring and Surveillance RSVP—Rapid Syndrome Validation Project
Water Management	EPA,USDA,USGS,BoR	RiverWARE—Bureau of Reclamation decision-support Tool AWARDS—Agricultural Water Resources and decision-support Tool BASINS—Better Assessment Science Integrating Point and Nonpoint Source

3: Methods to Support Climate Change Policymaking

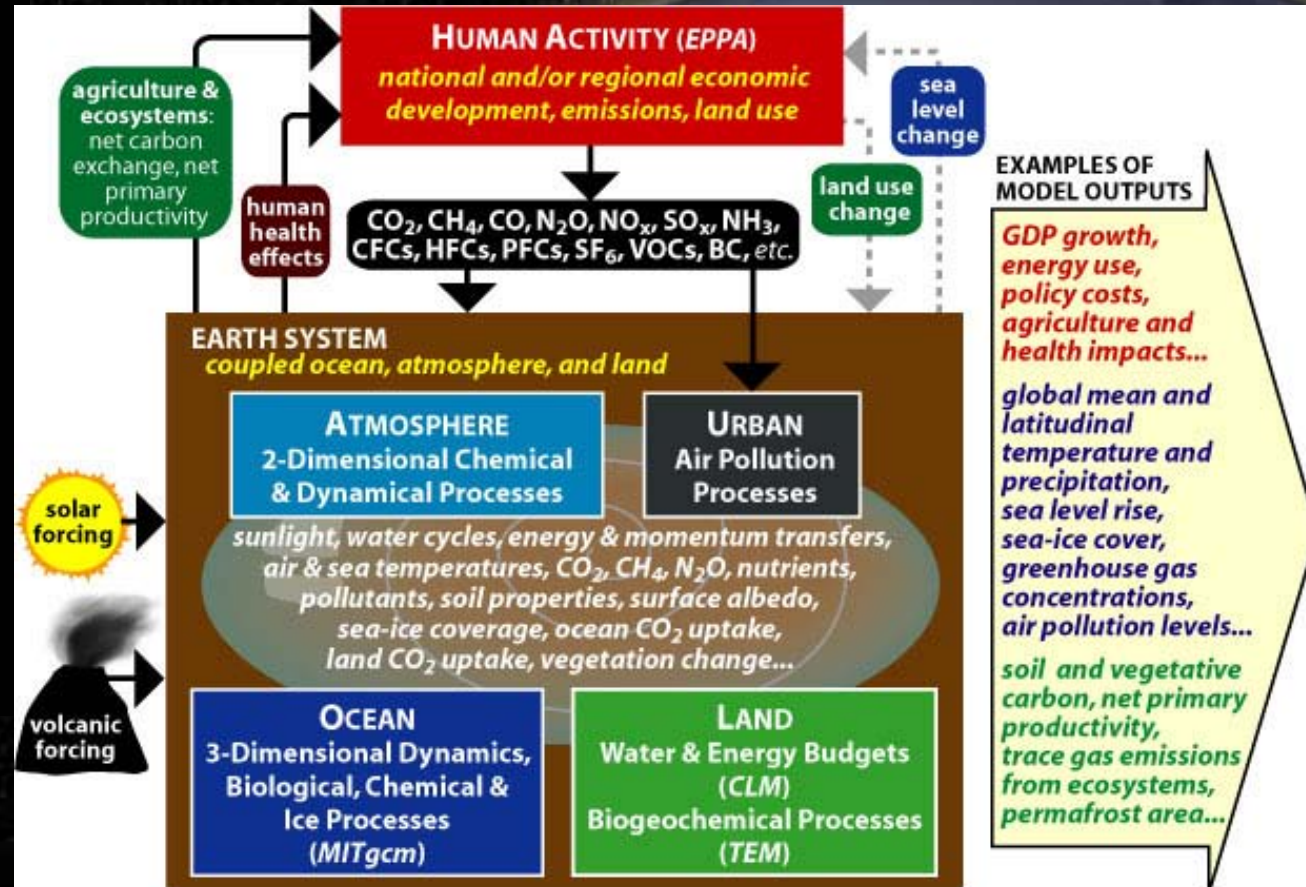
- Support evaluation of laws, regulations or other public actions
- CCSP is supporting research to
 - Develop models and analytical frameworks to support integrated evaluations, and
 - Conduct a limited number of case studies (comparative evaluation of responses)
- Some of the activities presented in Session 4 and the poster session fall into this category

Integrated Assessment Modeling

Integrated Assessment Models:

Computer-based models that combine, into an integrated framework, the socioeconomic and natural processes and systems that define the human influence on, and interactions with, the global climate.

Example: MIT Integrated Assessment Approach



Initial CCSP Case Examples

- SAP 2.1 Scenarios of GHG Emissions and Concentrations
- Alternative Incentive Designs for Practices to Raise Soil Carbon Levels
- Transportation Policy Options for Responding to Climate Change





**What Have We Learned, and How
Should We Refine and Prioritize our
Activities?**

General CCSP Principles for Decision Support

- Analyses structured around specific questions
- Early and continuing involvement of stakeholders
- Explicit treatment of uncertainties in the context of application
- Transparent public review of analysis questions, methods, and draft results
- Evaluation of ongoing CCSP analyses and incorporation of lessons learned

Programs in CCSP

Agencies/Departments

- DOE Integrated Assessment of Global Change Research Program
- EPA Global Change Research Program within the Office of Research and Development
- NSF Decision Making Under Uncertainty Program
- NASA Applied Sciences Program in the Earth-Sun Systems Division of the Science Mission Directorate
- NOAA Regional Integrated Sciences and Assessment (RISA) Program, Sectoral Applications Research Program (SARP), International Research Institute, and Climate Transition Program
- USAID FEWS-NET
- USGS, USDA, DOT, and others as well

Input is Needed to Refine and Prioritize Our Strategy

Examples of areas in which community input can help shape the program:

- Information needs
- Forums for communication
- Program gaps and balance
- Research priorities
- Capacity development
- Evaluation and feedback

See agenda for session-specific questions.

Introduction to Session 2: Assessments

- Three parallel sessions: forcing, climate variability/change, and sensitivity/adaptability
 - Updates on recent and ongoing assessments (some CCSP SAPs in poster session)
 - Panel discussion
- Suggested discussion questions (agenda)
 - Usefulness?
 - Assessment coverage?
 - Process?
 - Integration?
- Chairs to report to plenary in Session 3



U.S. Climate Change Science Program
Climate Science in Support of Decision Making

CCSP Workshop

14-16 November 2005 Arlington, Virginia

Thank you!

