

**U.S. Climate Change Science Program Workshop:  
Climate Science in Support of Decisionmaking  
November 14-16, 2005**

1	Introduction.....	1
2	Workshop Sessions .....	2
	Day 1: Session 1 – Climate Information Needs for Decision Making .....	2
	Day 1: Session 2 – Evaluating Assessments.....	3
	Day 2: Session 3 – Climate Information for Adaptive Management.....	6
	Day 2: Session 4 – Applications of Climate Science.....	6
	Day 3: Session 5 – Setting Priorities: Observations, Research, Decision Support.	9
3	Acknowledgements.....	12
4	Appendices.....	13
	Appendix I Glossary of Acronyms Used.....	13
	Appendix II Selected Participant Demographics.....	13
	Appendix III Summary of CCSP Workshop and Decision Support Survey .....	14

## **1 Introduction**

The U.S. Climate Change Science Program (CCSP)\* held a workshop on November 14-16, 2005, in Arlington, Virginia, addressing the capability of climate science to inform decision making. The workshop served as a forum to address the Program’s progress and future plans regarding its three decision support approaches:

1. Prepare scientific syntheses and assessments on key climate science issues.
2. Develop and illustrate adaptive management and planning capabilities.
3. Develop and evaluate methods to support climate change policymaking.

The workshop included discussion of decision-maker needs for scientific information on climate variability and change, as well as expected outcomes of CCSP’s research and assessment activities that are necessary for sound resource management, adaptive planning, and policy formulation.

Approximately 700 individuals from the U.S. and abroad attended the workshop, including representation from academia; governments at the state, local and national levels; non-governmental organizations (NGO); decision makers, including resource managers and policy developers; Congress; and the private sector. Their interests ranged from exchanging ideas on climate research, observations, and information tools useful for climate-related decision making to providing input to the evolution of the Program’s activities. A list of participants can be found at <http://www.climatescience.gov/workshop2005/participants.htm>. See Appendix II for selected participant demographics.

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\* Please see Appendix I for a *Glossary of Acronyms Used* in this document.

A Call for Presentations resulted in over 260 abstract submissions. Abstracts can be viewed at <http://www.climate-science.gov/workshop2005/abstracts/default.htm>. Approximately 40 abstracts were chosen for oral presentations based on the workshop themes and objectives, and approximately 170 were presented in a poster session on the first evening of the workshop. The poster session was well attended, and received positive feedback from attendees, both those viewing and those presenting. Most posters can be found on the CCSP website at <http://www.climate-science.gov/workshop2005/posters/default.htm> and speakers' presentations at <http://www.climate-science.gov/workshop2005/presentations/default.htm>.

A workshop agenda can be found on the CCSP website at <http://www.climate-science.gov/workshop2005/agenda.htm>. Other information from the workshop can be found on the website at <http://www.climate-science.gov/workshop2005>. Rapporteurs took notes in each of the workshop sessions, and their notes were used in compiling this report. It is intended that the workshop discussions and this report will be valuable resources to guide future program activities in decision support. This report attempts to capture the nature of the discussions at the workshop and does not necessarily represent the Program's position.

After the workshop, several participants responded to an evaluation request. They provided positive feedback on the opportunity to learn about CCSP's activities and exchange information with other scientists and decision makers. CCSP will use insights from the workshop, including those described in the post-workshop evaluation, to guide current and future CCSP activities. An overview of the post-workshop evaluation responses is provided in Appendix III.

If you would like to provide additional comments, or if you have any questions about CCSP decision support resources development, please contact us at [decision\\_support@climate-science.gov](mailto:decision_support@climate-science.gov).

## **2 Workshop Sessions**

### ***Day 1: Session 1 – Climate Information Needs for Decision Making***

The first day of the workshop focused on keynote presentations from senior level officials in government, the National Academy of Sciences, and the private sector. The first keynote speaker was **David K. Garman**, Under Secretary, U.S. Department of Energy, who spoke on behalf of Secretary Bodman. His comments focused on the need to improve technologies to provide better access to energy resources, while not diminishing economic growth, through options such as carbon capture, nuclear power, and solar energy.

**Mike Johanns**, Secretary, U.S. Department of Agriculture, drew from his experience as the former Governor of Nebraska and dealing with the development of NIDIS, the National Integrated Drought Information System. NIDIS seeks to improve national drought preparedness by providing an incentive for agencies and partners to share

information, technology and research to assess and respond to drought risk. He pointed out that one of the next big steps in science and technology is integrated global earth observation, which will revolutionize not only climate prediction, but also our understanding of the planet. He also gave examples of USDA activities that support climate-related decision making.

**Peter Lichtenbaum**, Acting Deputy Undersecretary for International Trade, U.S. Department of Commerce, discussed the Asia-Pacific Partnership for Clean Development and Climate to accelerate clean technology development, which is a new climate agreement between the United States, Australia, India, China, South Korea and Japan. It will create new investment opportunities, remove barriers, improve energy security, develop new technologies to reduce pollution, and address challenges in climate science, without a negative impact on the economy.

**Ralph J. Cicerone**, President, U.S. National Academy of Sciences focused on the science of climate change, noting the increasing evidence that climate is changing, and that a significant portion of those changes are due to human activities. He indicated that the National Academy of Sciences stands ready to help CCSP.

**John Stowell**, Vice President of Federal Affairs, Environmental Strategy and Synergy, Cinergy Corporation, the final keynote speaker, noted that Cinergy is merging with Duke Power, making it among the nation's largest energy producers and coal users. It is accounting for climate change in its long range planning, including the prospect of new greenhouse gas emission regulations. Mr. Stowell's comments can be found at [http://www.climatescience.gov/workshop2005/presentations/Mon\\_plenary\\_Stowell.htm](http://www.climatescience.gov/workshop2005/presentations/Mon_plenary_Stowell.htm)

**James R. Mahoney** provided an update on CCSP activities and a workshop overview. His presentation can be found at [http://www.climatescience.gov/workshop2005/presentations/Mon\\_plenary\\_Mahoney.pdf](http://www.climatescience.gov/workshop2005/presentations/Mon_plenary_Mahoney.pdf), His talk was followed by that of **Richard Moss**, Director of the Climate Change Science Program Office. He discussed the Program's decision support approaches and related activities. His presentation can be found at [http://www.climatescience.gov/workshop2005/presentations/Mon\\_plenary\\_Moss\\_session1.pdf](http://www.climatescience.gov/workshop2005/presentations/Mon_plenary_Moss_session1.pdf).

### ***Day 1: Session 2 – Evaluating Assessments***

Session 2 of the workshop was divided into three parallel sessions: climate forcing, climate variability/change, and sensitivity/adaptability. In each of these sessions, speakers reported on updates to recent and ongoing assessments (some CCSP Synthesis and Assessment (S&A) Products were presented in the poster session). Presentations in each session were followed by panel discussions in which panelists, speakers, and participants were asked to reflect on four cross-cutting questions and report back to plenary:

1. *Effectiveness*: What makes assessments more or less helpful to their intended users, and what can be done to improve their effectiveness?

2. *Assessment coverage*: Given the range of assessments being conducted, what should the priorities be for future assessments?
3. *Process*: What is needed to improve the process of framing, conducting, and communicating assessments? How can we improve the connection between basic knowledge generation and applications?
4. *Integrating assessments*: What are the opportunities for integrating assessments in the areas of forcing, climate variability/change, and sensitivity/adaptation, as well as for integrating U.S. and international assessments?

## **Illustrative Examples of Outcomes**

Some of the main messages voiced by session participants are summarized below.

### ***Effectiveness***

- Improve engagement and participation of:
  - Stakeholders
  - NGOs
  - private sector
  - adaptation research community
  - climate scientists;
- Produce regional assessments;
- Put assessment information into accessible forms for users (downscaled and intellectually accessible);

### ***Assessment coverage***

- Examples of gaps in assessment coverage include:
  - Climate variability and seasonal-to-interannual prediction (to complement current suite of S&A Products which tends to emphasize climate change);
  - Regional and local issues (follow-on to U.S. National Assessment);
  - Users’/stakeholders’ need for digestible answers to first-order questions of local importance.
- Methane’s potential role in climate change mitigation assessments should receive more attention;
- Many new assessments are not needed; we need to work more effectively to use existing information;
- Strategies should be explored that allow flexibility to “adapt as we go”;
- There is a need for a comprehensive economic analysis of the impacts of climate variability and change;
- Improvements are needed in modeling the relationship between gradual changes and natural variability;
- Better management tools and strategies are needed to manage in situations of uncertainty and change.

### ***Integrating assessments***

- Improve engagement of scientific organizations, especially international organizations (e.g. WCRP, IGBP, IHDP, DIVERSITAS\*);
- Improve coordination across assessment activities, specifically regional, national, and international assessments and the current CCSP S&A Products;
- Assessment of adaptation and mitigation options should, in many cases, be considered jointly;
- Improve integration across climate variability and change research activities;
- Take advantage of existing integration tools, e.g., PCMDI, NIDIS.

### ***Process***

- A fully transparent process is crucial, especially with the potential for changes to be introduced in the final federal approval process of S&A Products;
- Widen participation to reduce the likelihood of small communities writing and reviewing their own work;
- Introduce a broader spectrum of knowledge by recruitment of young scientists;
- Explicitly address the requirements for availability and documentation of data (how much should be required; formatting requirements, etc.);
- Find effective methods to communicate findings to a broader list of recipients (scientists, stakeholders, legislators, general public);
- Gather and share information on how S&A Products will be used;
- Ensure consistent use of terms;
- Scenarios need to be better explained, e.g., in terms of
  - Their definition (e.g., not a forecast);
  - Understanding the plausibility, esp. for “business as usual;”
  - Probabilities;
  - Uncertainty of demographics, labor productivity, and energy technology.
- Stakeholders need to be involved early and often, and they should be involved in framing the questions to help ensure results are used;
- Disasters such as Katrina are opportunities for changes in management approaches. The probability that huge re-investments such as this will occasionally occur should be anticipated by the scientific community in its decision support approaches.

### ***Some Additional Points Noted in Sessions***

- There is a need within CCSP S&A Products for a clear, consistent meaning of decision support;
- CCSP needs to develop methods to scale assessments so lessons learned can be transferred;
- Forcing scenarios should not be limited to well-mixed greenhouse gases and aerosols; they should also incorporate land cover/land use.
- There is a need for a more thorough analysis of past climate, especially the 20<sup>th</sup> century.

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\* Please see Appendix I for expansion of these acronyms.

## ***Day 2: Session 3 – Climate Information for Adaptive Management***

The workshop reconvened on Day 2 with Session 3. In this session, the objectives were to:

1. *Describe efforts to facilitate application of climate and global change observations in decision making*
2. *Report on Session 2 breakouts*
3. *Examine role of research in supporting adaptive management*
4. *Define goals for Session 4*

**Vice Admiral Conrad C. Lautenbacher, Jr.**, Under Secretary of Commerce for Oceans and Atmosphere and NOAA Administrator, was the first speaker in this session. He discussed the Global Earth Observation System of Systems (GEOSS) and the critical role it plays in climate change research. His presentation can be found at [http://www.climatescience.gov/workshop2005/presentations/Tue\\_plenary\\_Lautenbacher\\_GEOSS.pdf](http://www.climatescience.gov/workshop2005/presentations/Tue_plenary_Lautenbacher_GEOSS.pdf).

Admiral Lautenbacher was followed by **Senator Ted Stevens**, Chairman, Senate Committee on Commerce, Science and Transportation. Senator Stevens referred to the work of Dr. Akasofu, who acknowledges that it is clear that climate is changing, but believes it is unclear why. The Senator stated he has been told there are many alternative explanations for the recent warming, such as an increase in solar output. He said we need to better understand the causes of climate change, including the causes of changes in hurricane activity. The Senator noted that the United States needs to prepare for climate changes on the basis of sound science. Senator Stevens and his co-chair have created two bipartisan subcommittees to advance understanding of climate change.

**Joel Scheraga** then chaired the reports back from Session 2 breakouts. Following the reports, there were two presentations to set the stage for Session 4. **Mary Altalo** presented her talk, “Don’t Ask Me What I Want, Ask Me What I Do: The Key to Valid Requirements Documentation” (see [http://www.climatescience.gov/workshop2005/presentations/Tue\\_plenary\\_Altalo.pdf](http://www.climatescience.gov/workshop2005/presentations/Tue_plenary_Altalo.pdf)) in which she addressed the need for working with users, and **Roger Pulwarty** discussed “Climate Science and Adaptive Management: What are we learning while we’re doing?” in which he discussed recent experiments and pilot projects related to adaptive management.

## ***Day 2: Session 4 – Applications of Climate Science***

Session 4 of the workshop consisted of five breakout sessions focusing on applications of climate science in the management of water, ecosystems, coasts, air quality, and energy systems. Session objectives were to:

1. *Discuss how well research is meeting the needs of decisionmakers*
2. *Describe development and application of resources to support adaptive management and climate policy development*
3. *Identify program needs and gaps*

Each breakout session was asked to address four cross-cutting questions to report back to plenary:

1. *Effectiveness*: What are the barriers to using decision support resources in decision making, and how can these barriers be overcome? How can we continuously evolve our approach to decision support as we evaluate experiences and learn more?
2. *Information needs*: Across the applications covered in your breakout group, are there unmet high-priority information needs shared by user groups?
3. *Research priorities*: What observations and research are most needed to develop resources for meeting the needs identified in question 2?
4. *Communication*: What are the characteristics of effective communication of science to decision makers, and what is needed to better sustain a continuing dialogue? What are examples of successful decision support collaborations that should inform program design?

### **Illustrative Examples of Outcomes**

The main messages reported in the breakout sessions in response to the cross-cutting questions are summarized below.

#### *Effectiveness*

- **Barriers to use in decision making**
  - Communication – information prepared by scientists is not always completely understood or used by decision makers;
  - Absence of users at science meetings;
  - Lack of integration with and tools addressing other community management concerns, and (e.g. water management, hazards management);
  - Decision makers' lack of familiarity with climate issues, and related associations and impacts;
  - Lack of trust of scientists by decisionmakers;
  - Climate change work (e.g., modeling) done on a global scale, may not be relevant to local decisionmakers.
- **How can the barriers be overcome?**
  - Improve regional coverage of observations, data, models, impacts, and applications;
  - Encourage scientists to attend user forums and vice versa;
  - Identify tools needed by decision makers (e.g., monitoring, maps), and make them user-friendly. This includes modifying language in climate forecasts, especially probabilistic climate forecasts;
  - Increase understanding of decision maker motivations, timelines for decisions, resources and constraints;
  - Increase education and outreach to user communities;

- Assess and communicate what the socioeconomic consequences would be if climate variability and change were not accounted for in decision making;
- Provide tangible, visual evidence of climate variability and change;

### ***Information Needs***

- Improved and consolidated water supply information provided through data portals;
- Information on forecast confidence and illustrative distributions of model outcomes;
- Descriptions of the major scientific uncertainties and our ability to resolve them,
- Climate forecasts with consistency, quality, and timeliness;
- Model-blended representations of hydrology, weather, and climate, elements developed through the use of testbeds;
- Information on socioeconomic context and impacts;
- Information in the context of multiple stressors;
- Linkage of predictions to consequences and outcomes;
- Iterative decision frameworks to accommodate adaptive responses;
- Information on what others are doing, including climate information users and decision support resource developers;
- Information on multiple spatial scales, including regional and local;
- Ensemble modeling to achieve greater robustness and confidence in results ranging from air quality, human health, costs, technologies, and emissions;
- Assessments of full public health impacts and costs;
- Scientists' understanding of what decisionmakers do (and in what context) to help assess their information needs and ultimately to provide more useful information.

### ***Research Priorities***

- Higher resolution, regional knowledge of climate models;
- Use of teleconnections in predictions and impact assessments;
- Improved understanding of the hydrologic cycle, particularly as it relates to society and ecosystems;
- Improved understanding of mountain climate and processes;
- Closer engagement with the social scientists;
- Economic indicators, such as the costs of response options and the value of taking action;
- Development of decision support tools that incorporate historical and real time data;
- Development of decision support tools that address multiple factors/drivers with positive and negative feedbacks, e.g. Ability to address carbon sequestration and nutrient management;
- Prioritization of decision support activities based on regional vulnerabilities;
- Continuous ecosystem monitoring;
- Improved observations of atmospheric composition, and integration of that information into modeling studies related to human health and ecosystems;



- Improved understanding of the impacts of seasonal to inter-annual climate variability;
- Improved prediction and statistical characterization of extremes – low probability, high impact events.

### *Communication*

- **What is needed to sustain the dialog?**
  - Engagement of stakeholders prior to a disaster;
  - Communication through a variety of effective media (e.g. newsletters, web sites);
  - Sustained funding;
  - Building the capacity of users;
  - Product evaluation;
  - Education and outreach.
- **Examples of successful decision support collaborations that should inform program design**
  - NOAA RISA (Regional Integrated Sciences and Assessment) ;
  - National Integrated Drought Information System.
- **Other recommendations**
  - Listen to users/clients and include them up-front when building tools for them;
  - Don't "dumb down" the information too much
    - Convey the complexity of potential effects in ways that highlight options for decisionmakers;
    - Instill confidence that information is based on sound science by providing enough detail.
  - Convey data in forms that can be grasped by users
    - Employ technology familiar to the users;
    - Managers need desktop visualization and manipulation tools to facilitate routine use of satellite and other environmental data.
  - Decision makers and managers should share lessons learned;
  - Is a climate extension service needed?

### *Day 3: Session 5 – Setting Priorities: Observations, Research, Decision Support*

In this final session, the objectives were to report on the Session 4 breakouts, and to discuss workshop findings and recommendations. For the discussion, a panel was convened with moderator **William H. Hooke**, American Meteorological Society, and panelists **Susan Avery**, University of Colorado, **Antonio J. Busalacchi**, University of Maryland, **Anthony C. Janetos**, Heinz Center, and **Aristides Patrinos**, Department of Energy.

The panel addressed four cross-cutting questions:

- *Needs:* What information do we need to better support decision makers and refine CCSP's future decision support priorities? What are the most promising areas for future application of climate science?
- *Current knowledge:* Given the answers to question 1, what types of research and observations would provide the greatest benefit to decision makers?
- *Communication:* How can we better communicate knowledge to decision makers, and how can we more effectively maintain a continuing dialogue? What activities might CCSP contemplate in order to better connect the whole of the research enterprise to the public interest?
- *Capacity:* What types of capacity do we most need to strengthen to build trust with and provide effective support to decision makers? (e.g., observations, data/information systems, nodes linking existing resources at a variety of spatial scales, training for use of climate and environmental data in decision support, analytic methods, tools, etc.)

Dr. Hooke asked the panel to take stock of the last two and a half days in considering guidance on priority setting for advancing research and its application.

**Dr. Avery** recommended several areas of need within the Program.

1. It is essential that programs connect the supply of information and new knowledge with its specific demand. This is a process that requires on-going interaction.
2. There is a need for continual development of enabling technologies, such as GIS visualization, query-based data bases, etc.
3. The Program should review the flow of information to ensure it is generating and inspiring solutions and changes, such as application to adaptation strategies, and the extent to which the information is incorporated into operational decisions.
4. More emphasis should be placed on activities that bridge across science, economics, and humanities, as well as sustaining partnerships and inspiring innovation and organizational learning.
5. Take stock of current knowledge. Are research needs being funded, and do they have high enough priority in the agencies?
6. Use multiple approaches to identify and describe what is known versus what remains unknown -- where degrees of freedom are defined, where models can be developed, and where climate can be characterized.
7. Improve and develop a variety of approaches for communications.
8. Develop partnerships. They require time, effort, and trust. A commitment to a range of sustained communications is essential to the CCSP effort.
9. Build capacity to engage a broad set of partners. Early adapters and pioneers are critical to the overall effort. CCSP should focus on its unique role in the context of what others are doing in related areas. Its role should be influenced by expected outcomes that the Program hopes to influence in the context of a broad set of public goods that represent an investment in solutions.

**Dr. Busalacchi** emphasized that for this community, the mantra should be regional, regional, regional—place-based science. His recommendations were:

1. Integration: Work toward a research agenda that doesn't divide by time scale. Our scientific inquiries should be fully integrated, from climate variability through climate change and back toward extreme events.
2. Data management and information activities such as PCMDI and NIDIS provide an important opportunity for integration.
3. CCSP needs to consider the process for identifying emerging public policy issues that require the attention of science.
4. Develop a plan for transition from research to applications.
5. Develop an assessment of our ability to predict climate on seasonal to interannual timescales.
6. CCSP needs to consider a strategy for forcings beyond greenhouse gases, including aerosols, air quality, and land use/land cover change.
7. Improve communication across all disciplines to link science to decision options. This includes engaging user communities at all stages to understand their needs and how information products are used.
8. Build additional capacity for scientific integration and decision support. This includes regional assessments in parallel with the existing 21 Synthesis and Assessment Products.
9. Programs such as NOAA's Regional Integrated Sciences and Assessment (RISA) Program, should become national and should be more than a NOAA program.
10. Use constituent-driven strategies where stakeholders are engaged enough to weigh in on a consistent basis on funding priorities.
11. Change from using a top-down strategy, as this has not worked in government.

**Dr. Janetos** began by referring to the CCSP decision support efforts as a “natural and logical outgrowth of one of the most innovative parts of the CCSP plan.” His recommendations emphasized the process of supporting decision makers:

1. Support for decision-making throughout the Program requires constant dialogue. CCSP has to identify who the beneficiaries are, who the operational agents are, and who actually provides data and observations.
2. Program managers need to engage beyond the federal level. All kinds of decisions are being made and will be made; only some are about policy. Some are about capital and private economic activities.
3. Implement structures in the Program that routinely provide a voice for people from a variety of perspectives. There are institutions that can do this – engage them. Enhance the effectiveness and credibility of federal science programs.
4. Invest judiciously with regard to the rest of the world. One half of the world's budget for global change research resides in the CCSP.
5. On the subject of uncertainty, “Say what you know.” The elaboration of uncertainty is the foundation of scientific curiosity. Some uncertainty is tolerable and some is not depending on the decision. It's most important to be clear and to acknowledge what the boundaries are.
6. The inertia in the physical system means that we will be adapting for a very long time. What can the science in the CCSP do to make adaptation more effective?
7. CCSP needs to follow up on how the information it produces is used. This will be critical to the health of the decision support effort within the CCSP.

8. Public perceptions of the issue are changing. There are documented effects now. It is important for the CCSP to understand that decision-making with respect to climate is not something that is far off in the future, but is happening now, and it is equally important to be engaged for the long term.

**Dr. Patrinos** recommended what he called, “an additional dimension” in the form of closer connections between the climate science community and disciplines in other departments and agencies. The climate science community should clearly justify what it is doing in terms of service to society.

Dr. Mahoney closed by addressing some of the issues raised during the workshop. He noted that the panelists made some very provocative recommendations, and that these recommendations will be considered in the development of the Program’s future directions. He emphasized the need for the Program to focus on interactions between science and “action.” The program will attempt to direct energy to user interactions, as well as continue to advance better observations and basic science.

Dr. Mahoney noted that a survey would be sent to participants requesting their feedback on the workshop and the Program’s decision support activities. Results from the survey will be used to help guide current and future CCSP programs. A brief summary of the survey results can be found in Appendix III.

Given the current national financial situation, the Program is being asked to make hard choices, but the Program will continue to push for progress and strive to provide this nation with the most credible climate information possible.

### **3 Acknowledgements**

In his closing remarks, Dr. Mahoney thanked all participants and acknowledged the work and contributions of a wide variety of organizations and individuals: the workshop sponsors including the National Polar-orbiting Operational Environmental Satellite System (NPOESS) Program, NOAA Office of the Federal Coordinator for Meteorology, USDA Global Change Program Office, University Corporation for Atmospheric Research, and Lockheed Martin; workshop speakers; workshop Chair, Mary Glackin; CCSP Principals; Richard Moss; Fiona Horsfall; Peter Schultz; Sandy MacCracken; David Dokken; Nick Sundt; Sean Potter; Ahsha Tribble; Cathy Clark; Leslie Branch; and the Crystal Gateway Marriott.

## 4 Appendices

### *Appendix I Glossary of Acronyms Used*

CCSP	Climate Change Science Program
DIVERSITAS	An international programme of biodiversity science
GEOSS	Global Earth Observation System of Systems
IGBP	International Geosphere-Biosphere Programme
IHDP	International Human Dimensions Programme on Global Environmental Change
NIDIS	National Integrated Drought Information System
NGO	Non-Governmental Organization
NOAA	National Oceanic and Atmospheric Administration
NPOESS	National Polar-orbiting Operational Environmental Satellite System
PCMDI	Program for Climate Model Diagnosis and Intercomparison
RISA	Regional Integrated Sciences and Assessment
S&A	Synthesis and Assessment
USDA	U.S. Department of Agriculture
WCRP	World Climate Research Program

### *Appendix II Selected Participant Demographics*

<b>Registrant Category</b>	<b>No.</b>
International participants (from Australia, Belarus, Cameroon, Canada, Congo, Denmark, Germany, Ghana, India, Japan, Libya, Nepal, Nigeria, Sri Lanka, Tajikistan, United Kingdom, Zambia)	231
Media	21
NGOs	49
Congressional staff	2
Poster presenters	153
Poster session only	18
Rapporteurs	15
Retired	8
Self employed	11
Senior scientists	40
Session leaders	9
Speakers	78
Staff	32
Students	63
<b>Total</b> (The total is not the sum of the selected categories listed above.)	<b>697</b>

## ***Appendix III Summary of CCSP Workshop and Decision Support Survey***

### **Synopsis**

An extensive survey was sent to all workshop participants with the purposes of learning how to improve any future workshops and to gain additional insight into how CCSP might improve its decision support activities. The comments received from 56 respondents constitute a valuable set of inputs. Below is a very brief overview of these comments.

### **CCSP Workshop**

The first part of the survey dealt with the November workshop. The respondents generally felt that it was worthwhile, with 86% saying they would attend a similar workshop in the future and 62% saying that the workshop was “above average” or “among the best.” The most highly rated session was the poster session and the lowest rated session was the first plenary. Respondents reported that the networking/off-line discussions were the most valuable aspect of the workshop. The aspect that was of least value was the set of plenary talks by politicians/political appointees. The two main improvements that attendees would like to see for future workshops of this type are more opportunity for discussion/participation during the sessions and more interdisciplinary, cross-cutting breakout sessions. One of the workshop’s main challenges was in attracting stakeholders and decision makers. There were several recurring recommendations for how to improve engagement with these communities: (a) users should be among the workshop planners and/or included in the early stages of the planning process for future workshops of this type; (b) researchers and CCSP representatives should make presentations at meetings of end users; and (c) regionally- or sector-focused workshops should be convened.

### **CCSP Decision Support Activities**

The second half of the survey concerned CCSP’s decision support activities, specifically regarding assessments and the utilization of climate information. One of the most frequently recurring recommendations regarding assessments was that they should be framed with more user input and involvement to increase salience, legitimacy, and trust. This dialogue should begin when an assessment is initiated to maximize opportunity for input from stakeholders and increase understanding of the assessment process. Regarding the utilization of climate information, one of the most common themes was that the information must be communicated in a way that stakeholders and decision makers can understand and respond. This process should encourage the role of intermediaries and bridging organizations to work with users to help them develop the capacity to use the information effectively, in part through relating the information to their unique decision-making approaches. Several respondents made suggestions for educating users and improving the ease of access to climate information. A wide range of other recommendations were made for ways in which the Program’s decision support activities could be improved.