

**U.S. Climate Change Science Program  
Southern California Regional Listening Session  
Scripps Institute of Oceanography  
October 29, 2008**

**Background:**

In an effort to gain input from climate change stakeholders in Southern California, such as academia; local, state, and tribal governments; resource managers; the non-profit sector; and business and industry (see Appendix A for participant list), the U.S. Climate Change Science Program (CCSP) convened a listening session in San Diego on October 29, 2008. The purpose of this session was for CCSP to hear from a variety of stakeholders about their interests and activities, informational needs, and expectations for future directions for climate research, observations, decision support, and communication. This information will become valuable input to research planning efforts.

The session was designed to include background information on CCSP, which was presented by Allen Dearry, PhD, National Institute of Environmental Health Sciences. The session also included an overview of climate change challenges facing Southern California, as given by Daniel Cayan PhD; Scripps Institute of Oceanography & USGS. Lynne Carter, Ph.D., moderated this session.

The session brought together approximately thirty climate change stakeholders (see Appendix A for participant list) and a two-way discussion ensued, based on the following questions:

1. What major climate-related challenges or questions are you facing in the Southern California region?
2. How can climate change science and information needed to support your decisions and discussions be better provided?
3. What do you feel are the roles and responsibilities of the federal government in addressing climate change?

The report that follows summarizes some key comments provided by the participants.

Copies of this summary and presentation slides that were used by panel members during the session may be accessed at: <http://www.climatescience.gov/Library/stratoptions/all-sessions.php>

**Session Overview:**

There were three major sections of the discussion. The first addressed identification of the major climate-related challenges facing the Southern California region. The participants were able to identify numerous specific challenges that fell into the following categories: political support, water issues, marine and coastal concerns, energy issues, economics, national security, biodiversity, human health, land use planning, communication of climate issues and information, emergency response, and tribal lands.

The question of what information is needed to address those challenges was immediately met with a request for regionally and locally specific observations and impact information on shorter time scales than are available from global climate models. The participants identified numerous specific areas where they felt they needed more locally relevant information to make better decisions and regulations. They are looking for ways to engage residents in the issue (What is happening in my backyard?) and to assess the credibility of available information. They identified specific research needs (e.g. economics) and some data collection and management issues. The participants suggested that credible, understandable, and useable information must be much more readily available than it is right now.

In answering the question of what are the roles and responsibilities of the federal government in addressing climate change, the participants were quick to highlight the need for a coordinated effort to face climate issues. They identified that the federal government should be leading the coordination effort, identifying the major goals and standards (while allowing the states to achieve those goals as best suits them), and providing information on scales and timescales necessary to support local and regional decision-makers. Addressing how the required information can best be provided, the respondents immediately identified the need for a national climate service with regional centers that are locally responsive and focused.

### **Summary of Comments from CCSP Listening Session:**

*What major climate-related challenges or questions are you facing in the Southern California region? (The following list was generated by the participants and not from a presentation provided during this session.)*

Need for more political support around climate change issues

- For investments in climate change mitigation and adaptation efforts at the local level
- To establish a strong link between research information and policy options, choices, and actions
- Ethical issues
- Legislation
- Cooperation and collaboration with other regions around issues, for example, water

A variety of water issues were offered as present challenges, including:

- Availability and quality issues (drinking water)
- Transport of water (and the energy issues associated)
- Sewage and wastewater treatment
- Storm water/urban runoff
- Infrastructure (wastewater treatment, drinking water) and the need for economic models to support the decisions that will need to be made in the near future regarding infrastructure

Marine and coastal

- Impacts of climate variability on marine ecosystems
- Secondary impacts on such as fishers and other jobs related to marine ecosystems and their health
- Coastal and sea level rise issues, especially at vulnerable areas (i.e. airport, San Diego Bay, etc.)

#### Energy

- Use and conservation
- Carbon foot print of transmission
- Need for alternative sources

#### Economics:

- Fiscal impact on residents
- Economic opportunities that might lie in solving the problem
- Need for good economic models around climate impacts and opportunities

#### National security

- San Diego area is home to the largest naval base in the US and other marine facilities
- General issues on the national level
- International/global issues in terms of needing to provide military assistance, humanitarian assistance, etc.
- Border issues with Mexico (immigration, etc.)

#### Biodiversity:

- Species sustainability
- Invasive species
- Southern California is a “Biodiversity hot spot on the planet”; floristic province
- California more sensitive to change than other areas in the west

#### Human health:

- Heat wave impacts
- Ozone
- Waterborne diseases
- Vectorborne diseases (West Nile virus, dengue, malaria, etc);
- Fate and transport of toxics that result in human health and ecological risks
- Air quality impacts (localized CO<sub>2</sub> and other GHGs, ozone, fine particulates)
- Health and availability of natural resources (marine environment especially for Southern California) and how natural resources support industry and lifestyle interests

#### Land use planning:

- Addressing GHG emissions, etc. on individual projects
- Model building (how to develop good regionalization of climate models – for urban planning)
- Informing comprehensive regional planning
- Integrated watershed management

Communication:

- Consistent climate change messages (is climate change happening or not, natural or manmade, actions that can/should be taken, etc.)
- Clearly stated impacts messaging of what is likely to be seen at the regional and local levels vs. national vs. global

Other:

- Tribal lands and sovereignty
- Emergency response options for such things as: wildfires, other extreme events

*What are you using for data and information sources now to help you to address the above issues?*

California's Climate Activities that at present inform these participants include:

*The San Diego Foundation Regional Focus 2050 Study: Climate Change Related Impacts in the San Diego Region by 2050*, ([www.sdfoundation.org/news/pdf/Focus2050\\_Technical%20Assesment.pdf](http://www.sdfoundation.org/news/pdf/Focus2050_Technical%20Assesment.pdf))

The study is based on research undertaken by the San Diego Foundation's Regional Focus 2050 Study and the staff for this document reported that they "worked with a team of 40 experts from the region including universities, nonprofit organizations, local governments, public sector agencies and private sector entities to produce this document." The team utilized the most current scientific analyses and a wide range of experts "in climate science, demography and urban/regional planning, water, energy, public health and ecology." The session participants reported that the 2050 Report included downscaled information; will be presented in multimedia form; that there have been a number of events to promote the document; there is a web-based component; and the document includes a description of what the data mean, all in the hopes of limiting the likelihood of misinterpretation and increasing its use and usefulness.

A new state climate assessment is also being developed utilizing, among other sources, the 2050 document information, and will be distributed early next year. That document will also likely support participant's work and issue focus.

A good number of participants also reported that they utilize less location specific assessments as well. Many reported that they use the IPCC documents. Their issue with these and other more scientific documents is that while they are highly credible sources they are general (not region specific) and not written in a form to be directly utilized by the public – they are too technical and have no "lay language" companion documents. The participants reported that to use the information in the IPCC and some of the other climate documents requires translation into publicly understood parlance and application to their location so they are not directly useable in the present format. The participants reported that the OCP documents seem to be more geared toward general audiences and they like that in one sense—easier to understand—so they are somewhat more helpful. However, more economic information is needed and would be good to

include as well as more region specific information since that would be of more interest to the local residents.

*What additional data or information do you need to address your identified challenges?*

The participants expressed a desire for more regionally and locally specific observations and impact information on shorter time scales than are normally offered through global climate models. They want locally and regionally specific information that can be used to support actions that are based on observations of present, local climate changes as well as model data, and that could inform future impacts and choices. They specifically said they would like more work on land use and environmental regulation at the state and local level and would appreciate suggested land use and environmental regulations that are clearly evolved from scientific information; and documents that clearly explain what the right standards would be for planning or development efforts and why. Around land use and environmental regulation they asked for more certain information on what is a “significant environmental impact” and guidance on how to respond when one is detected. They mentioned the need for more guidance on what is an effective response option for any specific problem; what should the regulatory requirements be for specific issues; and strong science clearly stated to support the development of good regulations and legislation because it is difficult for legislators to make laws and regulations that don’t have strong agreed-upon scientific backing.

To assist in better conveying information to the public, the participants expressed the need for: images of sea-level rise in critical areas that could identify vulnerable locations; ways to talk about uncertainty to stakeholders (local and regional) so they could better understand how to make decisions under uncertainty; and help from information providers such that where there are uncertainties they are addressed in a clear and understandable way. They wanted information presented in a format that could help to individualize/personalize/regionalize the issues: they expressed the need for help in providing to others a way to understand why climate issues are relevant to each person/sector/group that might be hearing a presentation or reading a document. They want help in connecting the climate information to the person who hears it. They asked information providers to keep it regional, to provide good information that links to individuals and can be used in public education efforts. They requested that information providers focus on an actual topic or issue of interest to the readers rather than broad and vague discussions around generalized issues. They reported that people want to know “What is happening in my backyard?” They expressed that State level climate assessments are important for regional/local information and for information that is relevant to local and regional decision-makers.

Credibility of available information is an issue. The group reported feeling that there is a great deal of literature addressed to and for the scientific community but information that makes its way to the general public is limited and often advocacy-oriented. Advocacy information may or may not be provided by a credible and knowledgeable source. Too often the sources that are entirely credible (IPCC, NAS, CCSP, etc.) are written in such a way that they are not useful for public audiences without “translation.” There need to be climate change sources that are credible, regionally specific, and written in lay language or with a more popular focus or target audience so the average person can directly understand what is being conveyed. The participants

expressed that there were very few op ed articles that attempt to address global warming in a way the average citizen could understand and those are greatly needed.

There were some very specific issues that participants identified as needing more research and information. They are looking for information around and that would support the development of integrated watershed management plans that include ground water issues, landscaping issues, and what to do and how to do it related to climate change and the above listed watershed management issues. There is a need for good coastal topography and bathymetry measurements to address issues around marine ecosystems (they need to be addressed in addition to terrestrial ecosystems that have historically been the main focus). Previous reports do not link the economic impacts to the physical impacts nearly enough. "We don't need a whole Stearns report, but some amount of detail is needed, e.g. if you do it today it would cost \$x amount, if you do it in 20 years, it is more likely to cost closer to \$y amount." They also expressed that votes on propositions need much more explanation and information for people to act knowledgeably and that California's Environmental Quality Act and Greenhouse Gas Solutions Act especially add complexity.

Some data collection and management issues were also brought up in the discussion. The group expressed that the continuity and quality of data records are critical and require long term funding. They also reported that standardized collecting methods over time are critical to good and useful data. There are huge and important efforts all around the country to monitor and collect data. There has been a lot of technology developed to make monitoring happen and yet those data collected are not well integrated nor stabilized.

Availability of data and more importantly of information from those data were also seen as important issues and a few options were suggested. Make information that has been collated from original data more widely distributed: e.g. the information presented at this session by Dr. Dan Cayan, the San Diego 2050 document, the upcoming California assessment, and CCSP documents to name a few, because bringing together information from a variety of original sources to support a finding is beyond the ken of most even interested individuals. A catalog of available data and information, from any agency, where it is located and how to access it, in a standardized way (a virtual data warehouse), would be an incredibly useful tool for locating required data and making it accessible. There is a need for a National Climate Service that could make information more available in many useful ways. Some of those services might include: regionally focused (considered especially important) products and information, educationally focused products, ability to review proposals, and responses to specific questions. Such a service could be an acknowledged objective source of clear, lucid, specific, regional/local, credible, easy to understand information.

In terms of communications and outreach from the science community to the public, there is a lack of incentive for researchers to write public communication documents. They are not rewarded for that type of work. This region could really benefit from the development of a team made up of scientists in cooperation with communicators and educators that could provide credible information in a form that would be useful to recipients.

*What do you feel are the roles and responsibilities of the federal government in addressing climate change? What should be the role(s) of CCSP or another federal coordinating body?*

The participants stated that they needed to become more knowledgeable of policy and impacts as they relate to climate change and are looking for help on where to get that information.

Response: A synthesis of current legislation that is related to climate change can be found on [www.Thomas.gov](http://www.Thomas.gov)

The participants are looking to the government to create a stronger coordinated climate change program not just among the federal agencies but that would support state and other efforts as well. For example, the federal government could set the requirement or standards around what should be done but not prescriptive of how to accomplish the goal. Rather allow each state to determine how to best meet those goals depending on their local strengths, abilities, skills, and capacities. The group felt that just “stringing agencies together” results in less accessibility and more confusion for the public whereas if all the agencies were more together (coordinated and working in concert) credibility and usefulness of any information or suggested activities or regulations would be much higher.

On access to information, the suggestions included: CCSP could create a data warehouse (if it is not already in existence). Standardization around the information and access would be key in such a warehouse. They suggested the development of a one-stop-shop (virtual database) to serve as a catalog of where to find data and information, rather than having to search each federal agency individually. It was intended as an ongoing database collection. Dissemination of the information was considered crucial and believed to require a series of regional/local contacts.

On communication, the participants mentioned a regrettable lack of incentive for researchers to do communication outside of the scientific community (i.e. to the public). Two possible CCSP roles, expressed as great needs were: to encourage communication between scientists and a variety of target audiences and stakeholders beyond their peers; and more teaming of educators and communicators with the scientific community.

*The participants were asked how they would like this information provided* and they had a long list of suggestions. It began with a national climate service, whose mission should be to get out and educate. They expressed that regional centers would be very helpful because they could provide local examples, they would identify local actions, participate in local outreach, and provide locally tailored impacts information. All of that local focus would help climate issues to be more understandable and allow local audiences to relate to what is being presented. It was also mentioned that a climate service or its regional centers might also act as insurers of credible information perhaps through fact checking or other ways to discredit misinformation to the public. They suggested that new information and documents be presented to communities in person - “Put a face on it.” Increasing awareness at local communities requires bringing information to the people, bringing people together, and leaving them with confidence in knowing that the information exists, where to find it, and how to use it. To help accomplish this,

CCSP could develop a collection of local groups to help with the rollout of any new information or products. Some of the same local groups (e.g. aquariums, libraries, nature centers, etc.) could help to disseminate climate change information in a more effective way to reach and educate the public.

The participants discussed the need for education around climate issues. They identified numerous ways to get climate change into the education of students, teachers, and the informal education audience. The options identified below have been shown to be successful in assisting people to better understand other science issues and they would also likely be successful in helping people to better understand climate issues. While not all of the suggestions below are directly related to work that the CCSP office should be undertaking, it was suggested that some of the individual agencies could support these suggestions and others might be taken-up by CCSP committees such as the Education working group.

- Get into the education system. Kids need to understand this is an important issue. Capitalize on preexisting federal mandates for example: No Child Left Behind. The federal government should set standards of what information/goals need to be understood/reached and each state should be able to accomplish the goals in ways that work for them.
- Educators are hungry for curriculum ready information and iPod casts and audio slide shows could be prepared for their use. A simple visual representation of the concept of *Cap and Trade* could be demonstrated using musical chairs. While it is believed that teachers often are looking for ready curriculum, the idea of focusing an entire effort on climate change may be overboard and as a result unused. Teachers already have too many requirements that they are expected to meet in the education system so adding another will not necessarily accomplish the goal – rather work within the standards already in the curriculum and find places to fit climate change. (The group suggested that perhaps the CA EEI could change its standards to incorporate environment and ocean literacy.) Another issue around having curriculum used is that if all teachers don't have to learn everything new themselves but could utilize credible, prepared, science info on I-Tunes, for example, for free they might be willing to do so.
- The participants felt that the federal government should undertake an Education and environment initiative.
- NOAA training resources for teachers are really effective, e.g. Ocean literacy program. This agency and others might consider a climate change training program that could directly involve teachers. Other programs that bring people out into the field to better understand science issues have also worked in the past, perhaps they could be recreated and supported by agencies but this time around climate issues.
- CCSP agencies need to include communicators/educators who can work with scientists to develop information that is non-advocacy – just informative. Credibility is a crucial issue when communicating climate change information and the group suggested that it is important to keep communicators and scientists close – within the same agency or within CCSP or any national climate service that is developed. Also on credibility, being able to identify credible

information that is accessible is a critical need. Educators and non-scientists are often not able to identify whether any specific information is credible or not, or any particular group is offering credible information. If the government could somehow identify credible sources of climate information it would be a great help to the public.

- Encourage citizen science (observation and collections) as in other countries – because participating in the actual collection of data points broadens an individual's knowledge base and their interest in the issue.
- A suggestion was that the issue of climate change needs to be made into a compelling story and techniques from Hollywood (since this group is in S. CA) may be helpful in getting the climate story told in an understandable, scientifically credible, and yet compelling way.

Finally, there is no silver bullet in how to get information to people, in how to get people interested in climate change, in how to get individuals to make use of the information. Instead, be opportunistic and use all possible options as they emerge. And rather than competing with all the other important and critical issues pay attention to what is out there and find ways to cooperate.

**Appendix A:**

**U.S. Climate Change Science Program  
Southern California Regional Listening Session  
San Diego, CA  
October 29, 2008**

**Identified Participants:**

\*Please note that the list below may not capture all of the participants that were present in the session, only those that signed in or were known by CCSP Staff are included below.

Guillermo Auad, Scripps Institute of Oceanography  
Stephen Bennett, Scripps Institute of Oceanography  
Lynne Carter, Adaptation Network, Moderator  
Andrea Cook, California Center for Sustainable Energy  
John Cortinas, Climate Change Science Program  
Allen Dearry, National Institute of Environmental Health Sciences/CCSP  
Mark Ellis, Sempra Energy  
Dave Fege, U.S. Environmental Protection Agency-San Diego Office  
Sharon Franks, Scripps Institute of Oceanography  
Linda Giannelli Pratt, City of San Diego  
Jonathan Hardy, Senator Ducheny's Office  
Cody Hooven, Port of San Diego  
Elizabeth Keenan, Aquarium of the Pacific  
Deidre Kline, Citizens Climate Lobby  
Bob Knox, Scripps Institute of Oceanography  
Michelle Lapinski, Sustainbiz  
Mike Lee, San Diego Union Tribune  
Cary Lowe, Law Office  
Tanya Maslak, Climate Change Science Program  
Ken Melville, Scripps Institute of Oceanography  
Ryan Meyer, Arizona State University  
Keith Pezzoli, University of California-San Diego  
V. Ramanathan, University of California-San Diego/Scripps Institute of Oceanography  
Kathleen Ritzman, Scripps Institute of Oceanography  
Lynn Russell, University of California-Sand Diego  
Hiram Sarabea, University of California-San Diego  
Charles Smith, Entrepreneur  
Mary Tabaie, Scripps Institute of Oceanography  
Michelle White, Port of San Diego  
Amy Zimpfer, U.S. Environmental Protection Agency-Region 9 Office