Panel 3 Water Resources: Roger Pulwarty

- Discussing the service aspect of water and why the program spans from static to dynamic status?
- Various drivers: mandates for various orientations
- Applied research is not enough.
- Infrastructure type of information. How the knowledge evolves over time?
- Trap research-operation products
- RCC's provide state climate extremes
- Scales that are needed. Need to discover the data that are necessary. Avoid duplication.
- Make sure the information is used by decision makers
- NGOs are ahead of NOAA, but not for practices
- Outside communities to evaluate decision support research, transition and delivery
- NIDIS cannot do without partnerships. (RISA, USGS, Bureau of Reclamation, etc.)
- SBA (small business association) shares information on droughts to communicate drought information to communities
- How do we provide information across various time scales?
- Initial driver: provide information to reduce conflicts
- Precipitation Frequency Estimate: important. out of date
- NIDIS does not need to do things that have already been done, but understand how to systematize practices.
- Need knowledge of management structure.
- Networking requires a lot of time and resources. Need to target specifically, including work with other federal agencies (e.g. EPA drinking water development tools)
- NIDIS has 50 different implementation teams in the country
- Tribes. RISA SW. They do not have points of contact. Cross-spectrum Climate Variability and Change impacts. Huge demands.
- Western tribes. Need to know how to be engaged.

RCC's

- Shifts of business due to droughts/floods. Serve customers. 200 climate talks last year.

Roger Pulwarty

- This is not a one time service. How to know what they need?

Geoff Bonnin

- Civil engineers, hydrologists develop their strategies how to deal with emerging climate change. How to spatially plan for future. Communities face changes on climate.

Nancy Beller-Simms

- SAP water resource. Case studies for seasonal-interannual. Recommendations. So many people begin to understand the water issue. How to prioritize? Who to ask?

External Panelists

1. Eric Kuhn, Colorado River Water Conservation District

- Works with Bureau of Reclamation, environmental groups, etc.
- Regional water supply (Covers Boulder, Denver, Albuquerque, southern CA, etc.)
- Rich in natural resources. 10M visitors per year, 10-20M skiers. Rich in Oil shells(?), energy supply require water, danger for fish. Sustained energy supply.
- Day-to-day, month-to-month, year-to-year decisions on water supply are affected by climate
- Looking at Long-term decisions; NIDIS, IOOS, and RISA provide important information; operate and plan based on 2000-2004 data
- If dry in the region this year, we may be shortage of water supply in 2010-2011.
- Water supply is reliable. Move from culture of uncertainties to sustainable water supply planning (change of 10 yr planning to 4 yr planning)
- Annual variability on water supply (next 3-5 yrs) is important. Long-term variability is also important.

2**. Molly Hellmuth, IRI**

- Associated research scientists on water resources
- 60 scientists at IRI; 30 for climate/30 for agriculture.
- Work for developing countries. Gap between policy and practices.

- Historical to future data are being used
- Impacts of climate change on economy in developing countries are severe (e.g. agriculture etc.) Local mangers are to some degree unable to manage. IRI works with them.
- Multi-decadal information for disaster risk management (e.g. floods), climate decision making in South Africa. Work with Red-cross.
- Capacity building is important through working with World Bank, workshops etc.
- Stakeholders consultation used to develop indicator framework
- Values of economic evidence; Adding economic values of climate information to adapt to climate change.
- How do you show us the value of climate information? What is economic benefit? Why we need to invest the money in climate change?
- Work with IFRC on issue-based seasonal forecast. Began in 2007.
- Top down information was provided. Not the information that they need. They need regional /local information for their decision-making.
- 1000's of demands for risk management. Institutions/governments need to understand climate impacts (historical to future changes) for different problems they are facing- not just to provide information and walk away, but work with them
- What is useful information that helps stakeholders inform decision making and how valuable is it?

3. Chad Berginnis, Michael Baker Jr. Inc.

- Background: County planner in OH. Working at State (flood plain management, risk management), Chair for Planning Commission, a Representative of Association of Flood Plain Managers. Day job at private company.
- We should incorporate future climate conditions to flood plan management
- Concept. Adverse impacts
- Foundation that sponsors flood plan workshops.
- How long do we have we have structural integrity for the future? Structural longevity: 140-190yrs
- Three key points: data methods, information dissemination platform, and partnerships

- Data methods: Precipitation frequency analysis. Hindcast to true forecasting. They don't have base information, but NOAA does. Need long-term time-frame of climate information
- Science: focus on accuracy. (e.g. 24 hour precipitation forecast) It will change if climate information is incorporated.
- Focus is on public safety, not science.
- NCDC database. Storm event database from NCDC is used for mitigation planning. The database needs to be robust. And quality control needs to be done from practitioner stand point
- European approaches/models. Better information improves safety.
- Dissemination of data and manipulation (advanced hydrological prediction system-AHAPS?)
- Have to be careful in presenting data.
- Forecast dollar risk management using AHAPS
- Hazard U.S. FEMA platform to do risk assessment. It's free. Provide lower course level analysis and training materials. Hydrological/ inventory side of analysis. Develop framework to improve decision making.
- Partnerships and linking with Hazard U.S. is good.
- CMIP to bring down to regional level. Not many opportunities.
- Decision-making cannot be improved by climate change data
- Incorporation of climate data to their future planning/assessment/decision making
- Detailed post-storm analysis
- Existing partnerships (USACE, FEMA). There is a need to incorporate climate data for future flood map.

Open discussions

Jeanine Jones, Moderator

- How do NOAA products meet today's needs? How does NOAA climate information play an important role?

- Many looking for information on climate/climate application/climate information (a USACE report 1970's and now in FACA for review)
- Circular 1331 includes 4 federal agencies on water issues
- Issue of networks. Important to users. How to benchmark budget /deliverables?

Marina Timofeyeva, Panelist

- Climate is not stationary. Climate change is a scientific issue. Engaging in peer-reviewed scientific process. Networks with universities are important (e.g. University of Maryland) as well as working with other NOAA Line Offices and other federal agencies. Different techniques can be used to assess climate change
- Once we are comfortable with science, move to policy

Geoff Bonnin, Panelist

- Precipitation Frequency Estimate (Done by his office). Don't know how to adjust to climate change

-High resolution models provide some options (combined impacts of vulnerability).And hHow combining climate information affect planning?

Jake Rice, Review Team

- Observations of academic communities whether decisions by them are good or not.
- Water resources decision. Not top down decision. How do you negotiate neutral technical outcomes from partisan point of view?
- RISA-type approaching and information uses. Risk communication is multi-way. Federal agencies provide information to users to inform their decision. Academia plays an important role in transparency. Consulting firms provide better services than federal agencies.Best available coordinated information to users. What is the quality of the decisions? What are compromises? Comparison between feds, academia, private industries
- What is the biggest surprise to Roger for NIDIS? Lesson: If you cannot find the way that convinces stakeholders, they are not engaged.

Leigh Welling, Review Team

- Understand dynamic nature of climate variability - adaptive management perspective. Distinction between kind of information and kind of engagement. What can be done in terms of adaptive management vs. what can't be done in terms of adaptive management?

- How to best use paleo-climate information to adaptive management ?
- Adaptation needs long-term information (not just future data, but also paleo-data) How best to be informed to users?
- Evaluation should be included as a part of RISA assessment. Evaluate impacts of regional for 5 year cycle. Needs lots of resources. It is a compromise whether to use the resource for education. RISA recognizes the issue. Balance between research and R&D.

Jean Brennan, Review Team (Question for Molly)

- What is the strategic framework, in the NOAA selection program? or how are the selections determined? How do you interface with CG centers, other NOAA programs or other communities?

Answer (Molly)

- Climate change adaptation work. IRI has different perspectives from CG centers. Working on mid-grade risk assessments. Demands are substantial.
- How IRI decides what to do evolve in decades. The number of request overwhelms IRI capability. What are the issues on particular areas and how climate involves the areas?
- National security at IRI. NWS climate forecasts global climate forecast, not specific foreign regions. Provide tailored climate information for their decision making, a part of which was created by IRI?
- Close relationship between IRI and CPC on forecast methodology, monitoring tools etc. IRI is working with NIDIS to adapt climate change
- Seasonal adaptability. Seasonal, inter-annual projection is used for planning. Science is not so good at the subject. How do you characterize uncertainties?
- Global hazard assessment. CPC product with IRI.

Jeanine Jones, Moderate

- NOAA long-term strategic planning to leverage IRI resources on water resources?
- SARP provides funding on droughts in Canada. IRI worked with Canada on climate variability too.
- Interactions with IRI, RCCs. It is difficult to implement process. How can the role enhance? NIDIS pulled together group to share the problem. Focus on what the critical questions are rather than what we need. Delivery of process is most important considering what the critical questions are.

- How to communicate uncertainties? Are there better ways to explain cultural gamblers? Explain uncertainties in quantifiable term.