RISA WORKSHOP REPORT:

Looking ahead at climate service, assessment, and adaptation

Editors: Adam Parris | Caitlin Simpson | Sarah Abdelrahim
NOAA Climate Program Office

RISA WORKSHOP REPORT:

Looking ahead at climate service, assessment, and adaptation

Editors: Adam Parris | Caitlin Simpson | Sarah Abdelrahim
NOAA Climate Program Office

Overview of the Workshop 3

About the RISA Program 4

Executive Summary 5

RISAs and the State of Decision Support Research 7

- Co-production of Knowledge & Establishing Trust Relationships
- Transitioning Knowledge

NOAA Assessment Services – Building a Community of Practice 12

- NOAA & USGCRP Coordination
- User Engagement in the RISA Network – Scaling Up and Across

Regional Partnerships – Networking Networks 15

- Existing and Planned Coordinating Mechanisms
- Elements of a Regional Coordination Plan
- Vetting the Coordination Plan
- Cross-Regional Issues

References 18

Appendix A: Participant List 18

Appendix B: Agenda 22

Cover photo courtesy of Zack Guido, CLIMAS

For more information about the workshop, contact:

Adam Parris
adam.parris@noaa.gov
(301) 734-1243

Caitlin Simpson
caitlin.simpson@noaa.gov
(301) 734-1251

OVERVIEW OF THE WORKSHOP

On September 29 – October 1, 2010, the National Oceanic and Atmospheric Administration (NOAA) hosted a three-day workshop primarily focusing on current and future research as part of the Regional Integrated Science and Assessment (RISA) Program. The RISA teams play a critical role in both NOAA's climate service efforts and the National Climate Assessment (NCA). As such, the objectives of the meeting were to:

- Refine current and future objectives for RISA program including their role in climate services and decision support research
- Coordinate regional assessment service activities in support of the National Climate Assessment across NOAA Regional Enterprise Partners
- Support regional, interagency partnerships among regional groups engaging in science, service, adaptation, and mitigation

Participants included three or four researchers from each of the eleven RISA teams. They met with representatives of NOAA and over ten different internal and external NOAA partners, in many cases for the first time in the history of the program. The workshop agenda included meetings with representatives from the Office of Science and Technology Policy (OSTP), International Research Institute (IRI) for Climate and Society (IRI) at Columbia University, United States Global Change Research Program (USGCRP)), Department of the Interior – Climate Science Centers (CSC), Joint Global Change Research Institute (JGCRI), Computer Science Corporation (CSC), Sea Grant, NOAA Regional Climate Service Directors (RCSD), Regional Climate Centers (RCCs), American Association of State Climatologists (AASC), NOAA National Climatic Data Center (NCDC), and the NOAA Coastal Services Center (NCSC).

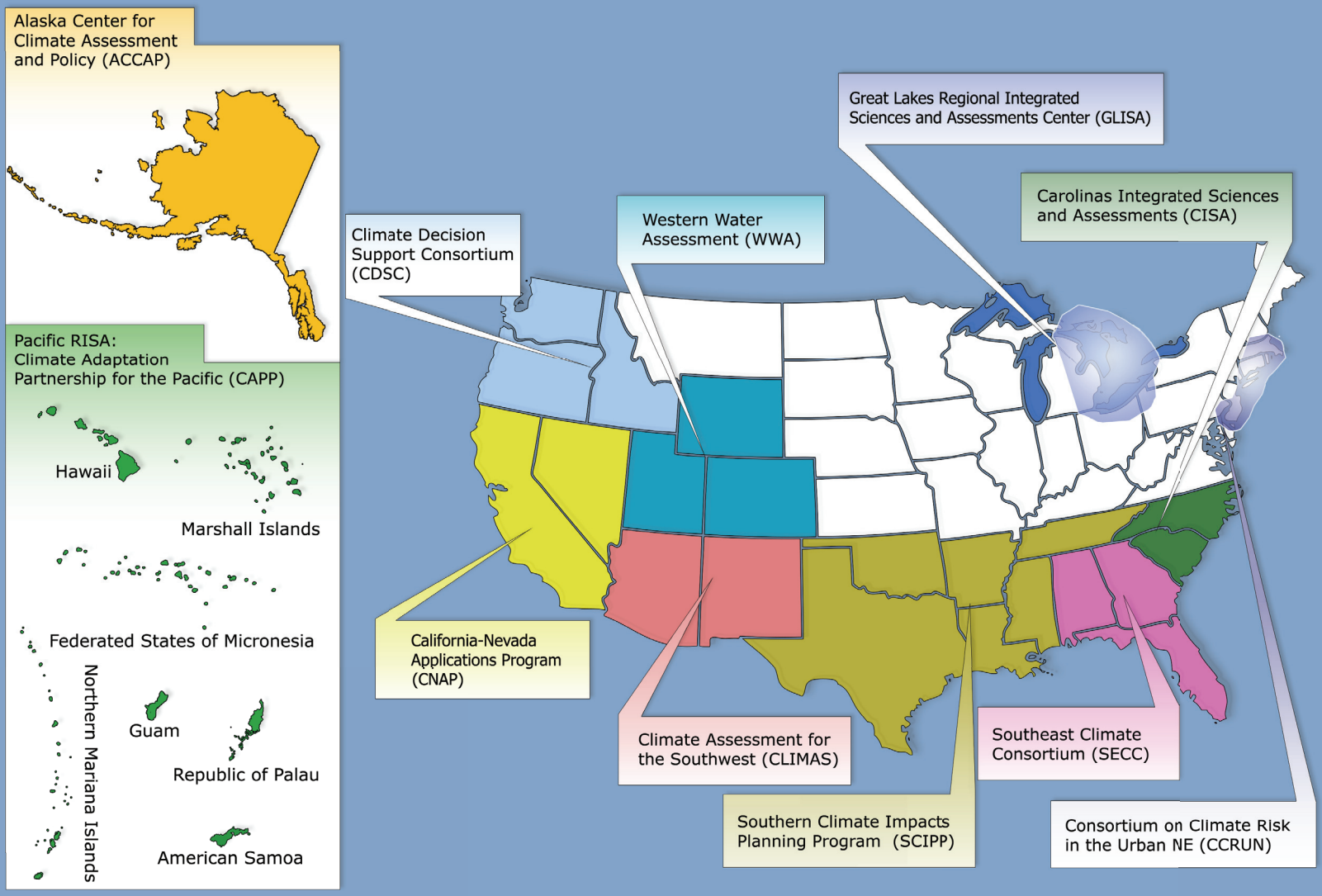
The meeting was organized around three broad themes: (1) the state of decision support research in climate services; (2) coordinating and scoping efforts between NOAA entities supporting regional service and assessment; (3) coordinating regional climate service, assessment, and adaptation activities. This report provides an overview of the format of the workshop and a synthesis of the insights and recommendations collected at the workshop.

The participant list is attached as Appendix A and the agenda is Appendix B.

The editors would like to thank Cathy Clark, Loretta Quinn, and Christina Tasset at UCAR for their tremendously helpful efforts in organizing this workshop. We would also like to thank Melissa Kenney, AAAS Fellow for the Climate Program Office, for help with coordination, recording the discussion on day two of the workshop, and help with preparation of this report. We would like to thank Mike Bykowski of Consolidated Solutions and Innovations for recording the notes for day one. We are grateful for editorial comments from Kathy Jacobs at OSTP and Sarah Trainor at the Alaska Center for Climate Assessment and Policy (ACCAP).

Editorial, design and production support was provided by Caitlyn Kennedy and Richard Rivera, NOAA Climate Program Office.

CURRENTLY FUNDED RISA TEAMS



ABOUT THE RISA PROGRAM

NOAA has been funding various regional assessment activities for close to 15 years. As part of this effort, RISA teams have helped pioneer climate services by developing use-inspired science and knowledge through collaboration with decision makers. RISAs work closely with resource managers, policy planners, non-governmental organizations, and the private sector to analyze how climate variability and change will impact resources and planning. Through their research, they address key climate-sensitive issues of significance to their region in areas such as water resource management, drought, agriculture, coastal communities and ecosystems, transportation, public health and hazards planning. More information on the RISA teams, affiliated institutions, and the regions they cover can be found on the web at: www.climate.noaa.gov/cpo_pa/risa.

EXECUTIVE SUMMARY

Summary recommendations collected from the workshop are summarized here according to the broad themes of the workshop: the state of decision support research, regional assessment services within NOAA, and coordination of regional climate service, assessment, and adaptation activities. Additional recommendations and a detailed summary of the workshop process and discussions on each day follows.

THE STATE OF DECISION SUPPORT RESEARCH

RISA teams have made significant contributions to NOAA's science and service mission by investigating regionally significant patterns and problems that constrain decision makers. Over time, stakeholders' demand for RISA expertise has increased, presenting new challenges for NOAA and its external academic partners who want to investigate new patterns and problems while still satisfying these demands. At the workshop, participants sought to review and refine their understanding of the decision support function of RISAs in the context of climate services. These discussions led to several insights and recommendations:

- NOAA's climate services require individuals or entities that can effectively manage the interface between scientists and decision makers. This need may require establishing a new field of science or career path either within the academic community or the climate service (e.g. Regional Climate Service Directors).

- NOAA and RISAs could help develop best practices for managing the interface between science & policy, as well as:

    - Establish vetted rules and responsibilities (i.e. code of ethics) for scientists and for decision makers who are co-producing knowledge and information

    - Continually evaluate and identify the advantages and disadvantages of different degrees of interaction according to the problem being analyzed

- Problem definition is not just important for defining the analysis required to support certain decisions but also for establishing and managing trust relationships that define the context for interaction between scientists and decision makers.

- Climate is often most tangible for decision makers on shorter time scales because it is more immediately relevant to ongoing and short-term planning and management decisions. Analysis of patterns and extremes derived from pre-historic and observed records of climate help to overcome value, cultural, and belief barriers that may be associated with discussions of climate change.

- A broader definition of transition than purely (research tools to operations) is required for climate services and could be accomplished through close coordination between regional climate service offices and RISAs. This research to service relationship would require rules of ownership governing use and management of information and data.

- Transition occurs most effectively when the operational entity or group is involved in the development process from an early stage and stakeholders are engaged early on as well.

- NOAA should conduct feasibility assessments to ensure that a transition will work in the face of any technological and financial constraints. These assessments would include cost-benefit analysis, where applicable, to determine the worthiness of investing in transition as well as some consideration of the consequences of losing the developer or operational entity.

REGIONAL ASSESSMENT SERVICES WITHIN NOAA

NOAA received funding in 2010 to initiate foundational activities for Assessment Services as part of the emerging NOAA Climate Service. Concurrently, the Office of Science and Technology Policy and the US Global Change Research Program, in collaboration with NOAA and other federal agencies, is coordinating the next phase of the National Climate Assessment (NCA). Because of their role in developing climate services and the breadth and depth of issues that they investigate, RISAs could be key players in the NCA.

At the workshop, participants discussed opportunities for supporting the NCA, as well as potential issues that could present barriers to fully participating in the NCA process. Challenges included the lack of adequate funding and concerns that stakeholders may think that downscaled climate data is the answer to their questions. Participants emphasized that rather than solely downscaling, service, assessment, and adaptation require a suite of information, including social and demographic changes, economics (local and global) as well as upscaled information from resource managers and others.

Workshop participants had several recommendations for NOAA and NCA leadership:

- NOAA should develop a community of practice (through dialog between RISAs and regional partners) for developing open source tools, sharing social science methods and insights, scenario development, and assessment of the effectiveness of climate mitigation and adaptation tools.
- The NCA should contract experts in human subjects protection to determine guidelines for collecting and documenting data from stakeholders participating in the NCA.
- The federal government should develop clear statements of how regional assessments for NCA will differ from, complement, and provide a foundation of information for regional services under a NOAA Climate Service.
- NCA leadership needs to provide guidance as soon as possible on how to document data and information collected from stakeholders if the data is to be collected and coded in a particular way.
- Regional boundaries for the 2013 NCA should be reconsidered, possibly in the context of existing consortia of decision makers or stakeholder groups thereby aligning the regional boundaries with action.

REGIONAL SERVICE, ASSESSMENT, AND ADAPTATION ACTIVITIES

Integration of NOAA's regional efforts is a priority both in general and for the climate service. However, few opportunities exist to bring together partners from within NOAA and from other agencies to explicitly discuss how best to coordinate climate science, service, and assessment regionally. At the workshop, participants addressed the idea of developing a "regional coordination plan" for climate service, assessment, and adaptation and outlined some of the requirements and needs that such an activity would require:

- Regional partners need consistent guidance from the federal government on elements of a coordination plan, and to accomplish this task, the federal government needs to map regional capacity for research and for action.
    - A small steering committee of federal agencies that have a strong regional presence (i.e., a committee of equals with outside facilitators) could help define roles and oversee service, assessment, and adaptation within a region.
- Regional coordination leads need funding to motivate people to participate in the development of regional coordination plans.
- Regional entities responsible for coordination need a clear delegation of authority and resources to engage regional partners.
- A system for evaluating and learning from adaptation measures is critical for building credibility among the partners, making them more willing to participate in coordination activities.
- Regional climate service partners must address cross-sectoral issues if we are to sufficiently engage regional stakeholders and address their needs.

RISAS AND THE STATE OF DECISION SUPPORT RESEARCH

RISA teams have made significant contributions to NOAA's science and service mission by investigating regionally significant patterns and problems that constrain decision makers. Increasing demand for RISA expertise presents challenges for NOAA and its external academic partners who want to investigate new patterns and problems while still satisfying the demands of stakeholders. Academic institutions do not recognize the boundary activities and use-inspired scientific endeavors of RISAs and similar entities as activities worth tenure. Moreover, RISAs and other external partners of NOAA are not operational entities and must compete for funding.

The main goal of the first day of the RISA workshop was to refine our understanding of the decision support function of RISAs in the context of climate services by discussing the co-production of knowledge, establishing trust relationships with decision makers, and transitioning knowledge to service.

Representatives of NOAA and other external partners joined the RISA teams for this discussion. The following organizations were represented:

- The International Research Institute for Climate and Society at Columbia University (IRI)
- The United States Global Change Research Program (USGCRP)
- The Joint Global Change Research Institute (JGCRI)
- The Computer Science Corporation (CSC)
- Regional Climate Centers (RCCS)

CO-PRODUCTION OF KNOWLEDGE AND ESTABLISHING TRUST RELATIONSHIPS

The process of co-producing knowledge between scientists and decision makers is intricately linked with the management of the trust relationships established between these groups. Therefore, this section synthesizes the first two workshop sessions on co-producing knowledge and establishing trust relationships.

One primary issue is that there are many different definitions for *co-production*, which results in different approaches for accomplishing this style of decision support. One general definition offered during the discussion was:

> *A process where scientists and decision makers interact over time to refine the research questions resulting in science that can be more readily applied to making better decisions.*

Within the community, there are also different perceptions about the need for interaction or the degree of interaction required in relation to the problem being addressed. Co-production is associated with sustained interaction and iterative refinement (Whitley-Binder *et al*. 2009, Lemos and Morehouse 2005). However, interaction with users can increase or decrease depending on whether information and knowledge are available to be readily and easily utilized in decision-making, or as the originally defined problem becomes more or less of a priority. It may, therefore, be useful to define degrees of interaction (see page 8) with decision makers depending on the nature or severity of the defined problem.

Degrees of Interaction with Decision Makers

RISAs have identified a continuum of interaction categories for different decision makers. They range from:

- **Communication** – a one-way relationship, but important for establishing and maintaining visibility, which also helps build credibility
- **Consultation** – involves gathering feedback on ideas and perceptions of needs or priorities
- **Collaboration** – working together on specific projects around specific problems
- **Partnering** – a longer term relationship that includes sharing resources (i.e. time and funding)

Scientists and often decision makers think and act differently, and therefore, numerous legal, political, and scientific issues often arise during interactions. These constraints or challenges are described in detail throughout the literature on the topics of RISAs, co-production, linking knowledge to action, adapting science, and decision support (Averyt 2010, Whitley Binder *et al*. 2009, Pulwarty *et al* 2009, Lemos and Morehouse 2005, Cash and Buizer 2005, Jacobs *et al* 2005). The constraints raised at the meeting reflect the insights from the literature and are briefly summarized here around three central themes: credibility, timeliness, and iteration.

CREDIBILITY

Credibility is essential for RISAs and other similar entities to become trusted sources of information for decision makers and to maintain status within the academic community. Maintaining credibility is difficult because decision makers often require answers that scientists might not be able to provide given the limitations of their knowledge or technology. Even at an appropriate resolution or scale for decision-making, scientists' knowledge can limit or challenge the mission or objective of a decision-making body. Although initially counterintuitive, there are cases where decision makers actually do not want more information because it constrains their options. In part for these reasons, some researchers among the academic community perceive that their interactions with decision makers introduce bias or impurity in science; traditional academics think that they should be completely free to pursue their own questions.

TIMELINESS

Once credibility of a scientific organization is established, decision makers may build an expectation for new knowledge on a frequent or ongoing basis and sometimes may request to have information at their disposal in real-time. Realistically, the process of scientific inquiry requires time. Scientists must identify appropriate research questions and methods, compile data and observations, perform analysis, and interpret results. Even as the scientific evidence on a particular problem converges, the application and translation of the results for use in decision-making still consistently requires specialization. While certain scientific methods or assessment processes could be streamlined or standardized, the creation, application, and translation of knowledge remains specialized to specific categories of decision makers. The gap between expectations of decision makers and actual progress in developing useful science or assessment can threaten a scientific organization's credibility. For these reasons, scientists may need, in some cases, to help stakeholders ask different questions—ones that can more easily be answered in a reasonable time frame, for example.

ITERATION

Establishing credibility and answering the demand for timely information require an iterative process regardless of the level of interaction between scientists and decision makers. Once a piece of information has been established as useful, the demand for that information becomes a constant demand on time without the presence of a service provider (see discussion on *Transitioning Knowledge* on page 9). Because science, particularly co-produced science, is iterative, decision makers sometimes perceive diminishing returns. To preserve credibility, RISAs and other entities must manage expectations on the development of new knowledge while striving to meet stakeholders' demands by delivering existing useful information.

RISAs overcome these hurdles by managing the interface between science and decision-making and developing new science and services for use. This boundary role of RISAs demands time and resources beyond their capacity as grant-funded researchers and academics, and may be an unrecognized aspect of climate service. An overarching recommendation that arose in this discussion ***was to develop a community of practice for managing the interface between scientists and decision makers, particularly in a climate service context, which may require establishing a new field of science or career path either within the academic community or the climate service (e.g. Regional Climate Service Directors)***.

Specific recommendations for NOAA, RISAs, and the decision support community include:

- Establish vetted rules and responsibilities (i.e. code of ethics) for scientists and for decision makers who are co-producing knowledge and information
- Continually evaluate and identify the advantages and disadvantages of different degrees of interaction according to the problem being assessed or analyzed

- Help identify objectives for partnerships between scientists and decision makers
- Enhance communication and understanding by continually defining terms (e.g., mitigation means something completely different to water managers than those working in climate)
- Manage expectations of decision makers and other users regarding the timeliness of products and services
- Utilize new technologies to establish transparency for scientific findings and to reduce time required to release useful information
- Identify "chains of information/custody" to connect decision makers to trusted sources of scientific information
- Promote the concept of expertise in addition to the concept of science
- Create and support fellowships and career paths for use-inspired, service-centric scientists (e.g., the Post-docs Applying Climate Expertise PACE program).

The RISA program is designed to be participatory or interactive but also to explore problem-focused issues relevant to the region in which they are situated. ***Problem definition was a recurrent theme in the discussion not just in terms of defining the analysis required to support certain decisions but also establishing and managing trust relationships by defining the context for the interaction***.

Specific recommendations for NOAA, RISAs, and the decision support community include:

- Climate is often most tangible for decision makers on shorter time scales because it is more immediately relevant to ongoing and short-term planning and management decisions. Gradually, as the relationship develops, climate change can be explored in the context of problems related to long-term decisions.
- Users who represent different or conflicting objectives are often challenged by the same problem.
    - The energy of conflict can be transformed into motivation for working with groups with different objectives, while overlapping resources or planning environments.
- Embedding climate within existing problems, issues, or research agendas is useful for establishing a relationship with a decision-making body or another sector outside of climate (e.g., public health).
    - Finding a champion who takes on climate variability and change as an important issue is often critical to embedding climate within their problem-focus or issue agenda.
- Be prepared. It may take a focusing event to bring stakeholders to the table (e.g., the 2002 Colorado drought), so you have to be prepared to support decision makers when those events occur. These events provide an opportunity for educating decision-makers about the benefits of preparing for the future events.

TRANSITIONING KNOWLEDGE

The increasing demand for climate information from regional, state, and local decision makers increases pressure for RISAs to play a quasi-operational or operational role. Over time, decision makers request information or services from trusted experts in the RISA community that lie outside of the activities explicitly intended for NOAA funding. However, ignoring these requests threatens the credibility and trust that RISAs establish with decision makers—individuals who are an integral part of the experimental learning environment in which RISAs excel.

Case Studies

Experiences between RISAs and operational entities that serve as transition endpoints.

Alaska Center for Climate Assessment and Policy (ACCAP): "Transitions Case Study - Fire Forecast Tool in Alaska" Contact Sarah Trainor, sarah.trainor@alaska.edu

Southeast Climate Consortium (SECC): "From AgClimate to AgroClimate: Case study of transition from research to operation" Contact Keith Ingram, ktingram@ufl.edu

Carolinas Integrated Sciences and Assessments (CISA): "Transitioning from Research to Operations: An example of moving the Drought Index Tool to the Regional climate Center's Applied Climate Information System" Contact Greg Carbone, carbone@mailbox.sc.edu

Southern Climate Impacts Planning Program (SCIPP): "Regional Climate Center and Regional Integrated Sciences and Assessments (RISA) Collaborations: An example from the Southern Climate Impacts Planning Program RISA" Contact James Hocker, James Hocker@ou.edu

Climate Assessment for the Southwest (CLIMAS): "Research to Operations Case Study: The Forecast Evaluation Tool" Contact Holly Hartmann, hollyoregon@juno.com

The traditional solution to this predicament is to emphasize transitioning "research to operations," where the research developed in an experimental mode is transferred to a public agency (e.g., NOAA), non-governmental organization, or private entity. Traditionally, the word 'transition' refers to tools for using or applying climate information to support decision-making. Several attempts at transition have been made within the RISA community and through formal partnerships between RISAs and other groups such as the Regional Climate Centers (RCCs), the State Climatologists, NOAA's Climate Prediction Center, and boundary organizations like Cooperative Extension Services. Look above for a list of related case studies.

Experience from collaborations between RISAs and operational entities illustrates that transition does not always occur smoothly. RISAs are not always in a position to ensure the long-term sustainability of products that deliver climate information, and the resources required to maintain these products distract from experimental and innovative research. Both the developer and the operational entity are often constrained by the availability of funding and stipulations set forth by those allocating the funding, particularly when they are being funded through competitive grants. The operational endpoint also must have the in-house technical expertise to maintain and update the product, even with the presence of a "maintenance plan" or operational guide. In addition to funding for research and service delivery, financial resources for the handoff itself are crucial to success and are often not readily available. Budgets for transition are often some of the first budgets to be cut when resources become constrained. However, eliminating these budgets inhibits successful handoffs.

One of the important insights discussed by the group is that ***transition occurs most effectively when the operational entity or group is involved in the development process from an early stage, and stakeholders are engaged early on as well***. Even then, RISAs and operational entities recommend that:

- Transition should be looked upon as an ongoing process requiring commitment from the developer and the operational entity. There must be a two-way interaction involving a high level of trust and shared commitment between the two organizations.
- It is important to establish a very specific operations and maintenance plan that outlines responsibilities for when the product becomes operational.
- Tools and products should be transitioned to an endpoint that is sustainable and delivers services to the maximum number of customers.
- Restrictions on code and system security at the receiving institution must be thoroughly evaluated, even minor ones. This process is timely but beneficial in the long run.
- A virtual server allows for collaborative programming and testing before the product becomes operational. This also reduces costs and eliminates security risks for the institution adopting the tool.
- It is useful to track the development process and to develop bug-reporting tools.
- Open-source code applications allow for easy transfer to other institutions. They make it easier for institutions in other regions and sectors to adopt tools to fit their need.
- Some products need regular updates, and automation systems can be extremely useful in data updates and quality control systems

Given the complexity of the transition process, it is important to keep in mind that not all tools and products can be transitioned.

Thus, another important recommendation is to conduct feasibility assessments to ensure that a transition will work in the face of any technological and financial constraints. These assessments would include cost-benefit analysis, where applicable, to determine the worthiness of investing in transition as well as some consideration of the consequences of losing the developer or operational entity. It is important that assessments are conducted to ensure that information is being transitioned to an operational endpoint that has a customer base and will successfully deliver services to stakeholders. If a product is handed off smoothly, yet the product is not used once transitioned, the process has not been successful. Mechanisms must be put in place to ensure that limited transitions resources are being used most efficiently, and that the partnerships that are developed ensure that services are actually delivered. ***However, while this is an important consideration, it is also important that requirements for such assessments and cost-benefit analyses be made simple so as to avoid slowing down the efficiency and effectiveness of transitions, especially given that transitions require close partnerships between multiple organizations.***

Other specific recommendations include:

- Given a market, the private sector may serve as an operational endpoint to the academic research, but the relationships have to be mutually beneficial including consideration of equity.
    - Decision makers can be trained and educated to apply science in order to build capacity.
    - Agencies may need help with network design to facilitate easier use of climate information.
- Since different types of users will turn to different types of systems, they will probably desire multiple avenues to access information.
- Separate but related activities will require coordination for maximum impact.

As societal awareness of climate variability and change grows, *climate information is being infused into public spheres in richer ways by placing more emphasis on transition of knowledge than previously exemplified by "snapshot" assessments (e.g., the Intergovernmental Panel on Climate Change assessment reports) or by tools or products alone*. As the scope of RISA services and activities expands, the definition of "transition" has broadened beyond the focus on tools or products. Recommendations for this expansion include the delivery of services and information through:

- Websites
- Newsletters
- Webinars
- Regional climate outlooks
- Maps
- Reports
- Set of indicators that can guide adaptation decisions
- Guidebooks for adaptation, vulnerability, and risk assessments

This broader definition of transition could be accomplished through close coordination between regional climate service offices and RISAs. Over time, NOAA could manage the production of and infrastructure for communicating and disseminating materials produced in experimental research while RISAs and other researchers develop content and information. ***This research to service relationship would require rules of ownership governing use and management of information and data.***

NOAA ASSESSMENT SERVICES - BUILDING A COMMUNITY OF PRACTICE

NOAA received funding in 2010 to initiate foundational activities for Assessment Services as part of the emerging NOAA Climate Service. Concurrently, the Office of Science and Technology Policy (OSTP) and the US Global Change Research Program (USGCRP), in collaboration with NOAA and other federal agencies, is coordinating the next phase of the NCA. Previous interpretations of the Global Change Research Act of 1990 (GCRA) resulted in assessments that describe climate change impacts and vulnerabilities across regions and sectors. There is initial agreement among members of OSTP, USGCRP, NOAA, and the stakeholder community that the next phase of the NCA should move its focus onto establishing a process for adaptation and mitigation decision support. The NCA and NOAA Assessment Services are complementary in that they are supporting ongoing climate decision support.

The second day was devoted to coordinating and scoping efforts between NOAA entities supporting Assessment Services. The Southeast Climate Consortium, the Consortium for Climate Risk in the Urban Northeast, Great Lakes Integrated Sciences and Assessments, and the Southern Climate Impacts Planning Program planned breakout sessions and discussion topics that generally addressed the cross comparison of RISA and Assessment Services activities. RISA teams were joined by regional Assessment Services partners including:

- United States Global Change Research Program (USGCRP)
- Office of Science and Technology Policy (OSTP)
- NOAA Regional Climate Service Directors (RCSD)
- NOAA Regional Climate Centers (RCCS)
- American Association of State Climatologists (AASC)

NOAA AND USGCRP COORDINATION

Kathy Jacobs of OSTP presented the vision for the NCA, which is being conducted under the auspices of the GCRA. Under the GCRA, there have been two assessments in the past 20 years; the first including a large stakeholder engagement process and the second more focused on individual science products. The current NCA will be focused on building a sustainable process to engage stakeholders in the understanding and use of scientific information about climate variability and change, and how the information relates to adaptation and mitigation issues.

[1] The Federal Advisory Committee Act guides the formation of official committees providing advice to the agencies of the executive branch of the U.S. government.

Some of the key efforts of the NCA will include:

- Regional and sectoral analysis and network building/coordination
- Analysis of cross-sectoral issues (e.g., energy and water; cultural resources)
- A consistent set of national indicators
- An international context for the assessment
- Education and communication
- Deploying the assessment in a web-based portal to complement the process of stakeholder engagement
- Carefully reviewed but not published data derived from stakeholder information
- Process workshops to build long-term assessment process

Eighteen federal agencies are involved, and a FACA (Federal Advisory Committee Act[1]) committee will issue the national report required by law. More details about the NCA structure and plans can be found in the federal register notice at http://www.globalchange.gov/what-we-do/assessment/notices.

Ms. Jacobs anticipates that RISAs will help build the assessment by: bringing information to and from the national assessments; helping to determine appropriate indicators; providing a coordination and science integrating role; possibly hosting regional workshops; contributing to writing the document; helping to define the process needed and how to improve the ongoing assessment effort; and transferring information across networks. RISA assessment services work on social networking, decision support and prototype assessments in 2010-11 will be important, and results should be shared broadly (i.e., outside of regions/RISAs) to help inform the national assessment process. Ms. Jacobs stressed the importance of communicating scientific findings to stakeholders and of developing and sustaining regional networks. She noted that the RISAs do both of these well.

Workshop participants identified potential issues that could present barriers to participating fully in the NCA process. One concern is that ***regional and local partners will need funding to participate in the NCA activities, particularly in a constrained budget environment***. The NCA leadership needs to ensure that native communities, in particular, are engaged and that the information needs of managers of transboundary resources are addressed.

There were also concerns that stakeholders might be thinking that downscaled climate model data is the answer to their questions. Instead, ***we need to be thinking about a suite of information, including social and demographic changes, economics (local and global) as well as upscaled information from resource managers and others***. We also need to consider a mix of contemporary and projected climate information. In addition, some stakeholders require interpretation of climate information and assistance in understanding the application of that information and the implications of a changing climate on their decisions and within their sector.

A number of participants raised questions about which findings can and cannot be included in the formal assessment report(s). Ms. Jacobs responded that the grey literature will have to be rigorously peer-reviewed by the NCA peer review process if it is to contribute to major findings in the assessment. Moreover, the NCA wants to include information from indigenous communities, and this information may not be rigorously documented. Workshop participants suggested that the NCA FACA committee provide guidance on what information can be included. Moreover, ***a specific recommendation was made to include experts in human subjects protection as consultants to the NCA Task Force***.

Finally, questions arose as to the difference between what regional partners might contribute to a NOAA Climate Service (NCS) at the regional level and what they would contribute to the ongoing, regional assessment process and information provision components of the NCA. Ms. Jacobs articulated that the difference is that adaptation and mitigation information developed during the NCA process is only part of what would be provided in a National Climate Service. An NCS would also develop and provide tools, for instance. The national assessment process is likely to be a strong pull for information and engagement from our regional partners, such as RISAs, RCCs, and State Climatologists. ***It is an opportune time for the federal government to develop clear statements of how regional assessments for the NCA will differ from, complement, and provide a foundation of information for regional services under an NCS***.

USER ENGAGEMENT IN THE RISA NETWORK — SCALING UP AND ACROSS

Workshop participants gathered in two sets of breakout group sessions to discuss: 1) assessment methods and approaches, and 2) commonalities and differences across regional projects focused on particular sectors. Recommendations for enhancing regional work across the RISA network included: 1) sharing information on surveys or other data gathering methods; 2) utilizing new tools such as interactive media and open source decision support tools; and 3) supporting coordinating structures for sector-specific work.

SURVEYS AND DATA GATHERING

As RISA teams and other regional partners engage resource managers and planners in the national assessment process, they will gather data from surveys, interviews, etc. to gain information about decision makers' use of climate information and perspectives on climate change. This form of interaction through social science methods, if done in an ongoing assessment framework, can build partnerships especially with underserved communities within a region. However, some wondered if stakeholders are surveyed out. To address this concern, some RISA teams will begin their information gathering by reviewing existing documents on stakeholder needs/issues.

The data collected from surveys by NOAA and NCA regional partners will need to be quality controlled before analysis is undertaken. Quality control and transparency will be particularly important if information is to be included in the national assessment documents. There were many concerns about how to reconcile protection of human subjects' information, especially when reconciling the confidentiality of information and sources with the federal government's need to be transparent about sources feeding into the national assessment. As noted in the previous section, one recommendation was to include human subjects and/or lawyers as part of the formal NCA process, perhaps even through the FACA committee, to develop guidelines for engaging decision makers and collecting social science data. Another suggestion was to commission the National Academy of Sciences to conduct a workshop on knowledge management for social science contributions to NCA. In either case, time is of the essence as regional partners are already beginning their assessment projects, which could

provide valuable input to the final reports. ***Guidance soon from NCA on documenting data/information collected from stakeholders is critical if the data will need to be collected and coded in a particular way***.

The NCA would benefit from RISAs and other regional partners documenting their actual stakeholder engagement experiences including specific challenges and lessons learned in regions and sectors. For example, RISAs have found that ***analysis of patterns and extremes derived from pre-historic and observed records of climate help to overcome value, cultural, and belief barriers that may be associated with discussions of climate change***. Documenting the stakeholder process would help NCA regional partners understand when and how to engage different stakeholder groups. In addition, more peer-reviewed publications by RISA teams about the process of stakeholder engagement would benefit the RISA network and the NCA process over the long term.

FACILITATING DIALOGUE

Workshop participants advocated creating a wiki to share surveys, literature, common coding structure, etc. and holding regular network conference calls to discuss ways of undertaking decision support research in a more coordinated fashion. For example, if there is to be a call for proposals in 2011 for assessment services funding (in support of the NCA), it would be useful to have a video- or teleconference mechanism set up as soon as the call is posted to facilitate discussion and dialog about potential cross-RISA collaborations and coordination. Moreover, dialogue across all of NOAA's regional partners would be valuable as well.

There was also a call from participants to use more interactive media in communicating with stakeholders. Webinars and social media can be beneficial if used intentionally and carefully. However, some level of human interaction is also important in developing partnerships and co-developing information.

Following the workshop, the RISA network has begun initial discussions about sets of common questions to use in the surveys that they will conduct in different regions, and about sharing existing survey instruments that could be altered for assessment services projects.

OPEN-SOURCE DECISION-SUPPORT TOOLS

Some participants thought that developing more open-source decision support tools would be critical in ensuring that tools and information developed in one region can be transferred to another region and/or to an operational entity for long-term sustainability. The development and transferring of AgroClimate[2] and DDIT[3] both offer some important lessons learned about the process of developing appropriate code, including appropriate expertise (e.g., IT programming), and working with operational or application groups that would sustain the tools in the long run. ***Many felt that we need communities of practice (e.g., cross-RISA and/or cross regional partners dialogue) for developing open source tools, sharing social science methods and insights, developing scenarios, and assessing the effectiveness of climate mitigation and adaptation tools***.

RECOMMENDATIONS FOR SECTOR-SPECIFIC WORK

Participants were broken out into discussion groups by sector to come up with their own recommendations for how to share information in the future. The agriculture breakout group called for a shared space for agricultural research tools and topics of stakeholder engagement. The March 2011 Climate Prediction Applications Science (CPAS) workshop in Iowa was mentioned as a venue for sharing climate and agriculture work. However, the breakout group re-emphasized that a wiki or other form of shared space would allow the network to share information, tools, methods, and early insights and to engage in dialogue on an ongoing basis.

The coastal breakout group called for a coordinating structure within regions to focus on climate and coastal issues. It was noted that there are no explicit cross-RISA coastal collaborations, and this was seen as a gap in the program. Coasts are viewed as good microcosms of cross-sectoral connections because of their multi-stress environments in which infrastructure, ecosystems, and climate interact. RISAs, along with NOAA's other regional partners, could be conveners of regional coastal efforts to develop inventories of ongoing work and identify research and assessment gaps. Working with a broader network, they could contribute assessment methods, develop indicators, identify monitoring systems gaps, and co-produce impacts and adaptation information. An immediate next step would be to identify near-term opportunities for RISA coastal collaboration.

The water breakout group discussed the wide range of research underway across the network. Examples include: physical science (historic floods in California, hydrologic scenarios for urban water utilities, reconciling projections of Colorado River flow); engineering (infrastructure design); social science (cataloguing adaptation activities, evaluating usability of tools); and policy analysis (state drought plans). This group called for more two-way interaction between researchers and water managers.

[2] AgroClimate (www.agroclimate.org) is a decision support web site for climate and agricultural issues in the southeastern U.S.

[3] DDIT (www.cas.sc.edu/geog/research/cisa/DDIT.html) is the Dynamic Drought Index Tool, which is a web-based application that allows users to view drought indices in a way useful for their decisions.

REGIONAL PARTNERSHIPS – NETWORKING NETWORKS

Integration of NOAA's regional efforts is a priority both in general and for the climate service. An integrated regional climate services program moves beyond separately managed components by promoting partnerships among all levels of government, academia, non-governmental organizations (NGOs) and the private sector. NOAA is still engaging our external and internal partners to define regional climate services. The current mission for the NCA also requires regional partners from different agencies and institutions to work in a coordinated fashion.

Despite these goals, few opportunities exist to bring together partners from within NOAA and from other agencies to explicitly discuss how best to coordinate climate science, service, and assessment regionally. On the last day of the workshop, NOAA invited regional and national representatives from both internal and external partners to discuss regional coordination of climate activities. Participants included:

- United States Geological Survey - Climate Science Centers (CSC)
- United States Fish and Wildlife Service – Landscape Conservation Centers (LCCs) (Invited but could not attend due to last minute constraints)
- United States Global Change Research Program (USGCRP)
- Office of Science and Technology Policy (OSTP)
- NOAA Regional Climate Service Directors (RCSDs)
- NOAA Climate and Societal Interactions Program
- NOAA National Climatic Data Center
- NOAA Coastal Services Center
- Regional Climate Centers (RCCs)
- American Association of State Climatologists (AASC)
- Sea Grant

During the first session, participants were divided into discussion groups based on several of the regions of the most recent US Global Climate Change Impacts (GCCI) report (2009). The discussion groups were asked to answer the following questions:

- What are the existing and/or planned coordinating mechanisms that could be used to build regional coordination in support of climate service, assessment, and adaptation?
- If you were asked to write a "regional coordination plan" for climate service, assessment, and adaptation, what would be the components of that plan (i.e., the outline)?
- If you were asked to take this idea to build regional coordination back to your region, how would you suggest this idea be vetted with other federal and non-federal entities in your region to maximize their support for the idea?
- What are the cross-regional issues that your region want to work on and which other regions would you need to work with to accomplish them?

Many of the participants expressed concern over regional boundaries in the 2009 GCCI report because they do not align with any one regional group doing services, assessment, and adaptation. These regions were chosen because neither the GCCI report nor any other existing regional boundaries address this concern. ***There was some consensus among participants that the regional boundaries for the 2013 NCA should be re-considered, possibly in the context of existing consortia of decision makers or stakeholder groups thereby aligning the regional boundaries with action***.

EXISTING AND PLANNED COORDINATING MECHANISMS

Many regional groups that address aspects of service, assessment, and adaptation were identified. However, these groups all have different priorities or mission statements based on a particular sector(s). Each discussion group stressed the need to utilize existing networks groups to cover the breadth and depth of issues relevant to a given region. ***Regional partners need consistent guidance from the federal government on elements of a coordination plan (see next section), and to accomplish this task, the federal government needs to map regional capacity for research and for action***.

RISAs are supporting Assessment Services and the NCA by performing activities to help map regional capacities and, in doing so, can support coordination in the regions either by playing a lead role or a lead support role. However, ***the regional entities responsible for coordination need a clear delegation of authority and resources to engage regional partners. The regional coordination leads will need support to motivate people to participate, primarily funding and priority attention to regionally relevant issues***.

ELEMENTS OF A REGIONAL COORDINATION PLAN

As mentioned above, regional groups seek guidance from the federal government on elements of a coordination plan. A small steering committee of federal agencies that have a strong regional presence (i.e., a committee of equals with outside facilitators) could help define roles and oversee service, assessment, and adaptation activities within the region. One group or entity could assist the steering committee in leading coordination of regional partners, and one of the discussion groups at the workshop suggested that this role might be best achieved through an NGO. Other recommended elements from the discussion groups include:

- Mission statement
- Participants/Partners - A list of relevant entities or groups involved and their capacity
- Roles and Responsibilities – A clear description of expectations including the role of states, cities, and municipalities
- Overarching Themes – A description of themes relevant to all sectors (e.g., risk management and equity)
- Cross-Regional Issues
    - Regionally Specific Issues
- Existing and Planned Activities
    - Science
    - Assessment
    - Service
    - Adaptation
- Gaps

VETTING THE COORDINATION PLAN

Regional coordination plans require willingness of partners in order to be successful. Establishing a legitimate process of vetting the coordination plan is critical to making partners feel like their interests are being considered. Recommendations for this process range from having partners review the coordination plan to developing memorandums of understanding (MOUs) among regional partners to establishing metrics for "willingness to pay." One group of participants even suggests that the vetting process be reviewed by the National Academy of Sciences.

Some participants equated the process of vetting the coordination plans with evaluation of service, assessment, and adaptation. ***A system for evaluating and learning from adaptation measures is critical for building credibility among the partners for participating in the coordination process***.

CROSS REGIONAL ISSUES

The discussion groups identified both cross-regional and cross-sectoral issues as a clear priority for the group. These issues are not always adequately captured in current service, assessment and adaptation frameworks. For example, the societal challenges of the NCS (marine ecosystems, coastal communities, water resources, climate extremes, and climate policy) do not address the full range of critical multi-stress or multi-sectoral issues of concern to resource managers, planners and communities faced with climate challenges. Resource managers may need information at the nexus of water and energy, water supply and agriculture, or health, infrastructure, and transportation in coastal urban areas. ***Regional assessments must address cross-sectoral issues if we are to sufficiently engage regional stakeholders and address their needs***.

Issues or sectors that cross regional boundaries are broader in nature. Those identified by the discussion groups are:

- Coasts
- Indigenous knowledge
- Health
- Water
- Urbanization
- Invasive species
- Acidification
- Storm frequency and intensity

REFERENCES

Averyt, K. (2010) Are we successfully adapting science to climate change? Bull. Amer. Meteor. Soc., 723-726.

Cash, D. W., and Buizer, J. (2005) Knowledge-Action Systems for Seasonal to Interannual Climate Forecasting: Summary of a Workshop. Roundtable on Science and Technology for Sustainability Policy and Global Affairs Division, National Research Councils of the National Academies, The National Academies Press, Washington, D.C.

Jacobs, K.L., Garfin, G.M., and Lenart, M. (2005) More than Just Talk: Connecting Science and Decisionmaking, Environment, Volume. 47, No. 9, p 6-22.

Lemos, M.C. and Morehouse, B.J. (2005) The co-production of science and policy in integrated climate assessments. Global Environ. Chang., 15, 57-68.

Whitley-Binder, L., and Simpson, C. (2009) RISA 2020. Unpublished.

Pulwarty, R., Simpson, C., and Nierenberg, C. (2009) The Regional Integrated Sciences and Assessments (RISA) Program: crafting effective assessments for the long haul. In C. G. Knight & J. Jager (Eds.), Integrated Regional Assessment of Global Climate Change (pp. 367- 393). Cambridge, UK: Cambridge University Press.

APPENDIX A.
LIST OF WORKSHOP PARTICIPANTS

Sarah Abdelrahim
Transitions Program Manager
Climate and Societal Interactions
NOAA Climate Program Office

Cheryl Anderson
Pacific RISA II (CAPP)
Director, Hazards, Climate & Environment Program
Social Science Research Institute
University of Hawaii at Manoa

Don Anderson
Program Director
Modeling, Analysis, Prediction, and Projections
NOAA Climate Program Office

Adrienne Antoine
Coasts Program Manager
Climate and Societal Interactions
NOAA Climate Program Office

Kristen Averyt
Deputy Director
Western Water Assessment (WWA)
University of Colorado at Boulder

Walter Baethgen
Director, Latin America/Caribbean
Research Scientist; Impacts/Decision Systems
International Research Institute
for Climate and Society
Columbia University

Nancy Beller-Simms
Water Program Director
Climate and Societal Interactions
NOAA Climate Program Office

Haresh Bhojwani
International Development Officer
International Research Institute
for Climate and Society
Columbia University

David Bidwell
Program Manager
Great Lakes Integrated Sciences and
Assessment Center (GLISA)
Graham Environmental Sustainability Institute
University of Michigan

Norman Breuer
Research Scientist, Ag and Bio Engineering
Southeast Climate Consortium (SECC)
University of Miami, Florida

Tim Brown
Research Scientist
California-Nevada Applications Project (CNAP)
Western Regional Climate Center
Program for Climate, Ecosystem,
and Fire Applications
Desert Research Institute

Dave Brown
Regional Climate Service Director – Southern Region
NOAA National Climatic Data Center

James Buizer
Science Policy Advisor to the President;
Executive Director for Strategic Institutional
Advancement, Office of the President
Senior Sustainability Scientist, Global
Institute of Sustainability
Professor of Practice, School of Geographical
Sciences and Urban Planning, College
of Liberal Arts and Sciences
Arizona State University

Greg Carbone
Professor of Geography
Department Chair
Carolinas Integrated Science and Assessment (CISA)
University of South Carolina

Lynne Carter
Associate Director
Southern Climate Impacts Planning Program (SCIPP)
Louisiana State University

Dan Cayan
Director
California-Nevada Applications Project (CNAP)
Climate Atmospheric Science and
Physical Oceanography (CASPO)
Scripps Institution of Oceanography
Water Resources Discipline
U.S. Geological Survey

DeWayne Cecil
Regional Climate Service Director
– Southwest Region
NOAA National Climatic Data Center

Emily Cloyd
Public Participation and Engagement Coordinator
National Climate Assessment
United States Global Change Research Program

Chip Conrad
Associate Professor
Southeast Regional Climate Center
University of North Carolina – Chapel Hill

Margaret Davidson
Director
NOAA Coastal Services Center

Art DeGaetano
Associate Professor
Northeast Regional Climate Center
Department of Earth and Atmospheric Sciences
Cornell University

Mike Dettinger
California-Nevada Applications Project (CNAP)
Climate Atmospheric Science and
Physical Oceanography (CASPO)
Scripps Institution of Oceanography
Water Resources Discipline
U.S. Geological Survey

Tom Dietz
Director
Great Lakes Integrated Sciences and
Assessment Center (GLISA)
Professor of Sociology and Environmental
Science and Policy (ESPP)
Michigan State University

Kirsten Dow
Director
Carolinas Integrated Science and Assessment (CISA)
Associate Professor
Hazards and Vulnerability Research Institute
Department of Geography
University of South Carolina

David Dubois
New Mexico State Climatologist
Climate Assessment for the Southwest (CLIMAS)
New Mexico State University

Dan Ferguson
Program Director
Climate Assessment for the Southwest (CLIMAS)
University of Arizona

Darlene Finch
Mid-Atlantic Regional Coordinator
NOAA Coastal Services Center

Melissa Finucane
Director
Pacific RISA II (CAPP)
Senior Fellow
East-West Center

George Frisvold
Professor
Agricultural and Resource Economics
Climate Assessment for the Southwest (CLIMAS)
University of Arizona

Lisa Goddard
Research Scientist
ENSO, Climate Prediction Methodology,
Near-Term Climate Change
Columbia University
International Research Institute for
Climate and Society (IRI)

Eric Gordon
Program Manager
Western Water Assessment (WWA)
University of Colorado at Boulder

Stephen Gray
Research Scientist
Western Water Assessment (WWA)
University of Wyoming

Kevin Hamilton
Professor
Pacific RISA II (CAPP)
Department of Meteorology and
International Pacific Research Center
University of Hawaii

Steve Hilberg
Director
Midwestern Regional Climate Center
Illinois Water Survey
University of Illinois

James Hocker
Program Manager
Southern Climate Impacts Planning Program (SCIPP)
Oklahoma Climatological Survey
University of Oklahoma

Radley Horton
Research Coordinator
Consortium for Climate Risk in the
Urban Northeast (CCRUN)
NASA Goddard Institute for Space Science (GISS)
Columbia University

Keith Ingram
Program Manager
Southeast Climate Consortium (SECC)
Associate Research Scientist
University of Florida

Kathy Jacobs
Assistant Director for Assessments and Adaptation
White House Office of Science and
Technology Policy (OSTP)
US Global Change Research Program

Kurt Johnson
National Climate Change Scientist
Office of the Science Advisor
U.S. Fish and Wildlife Service

James Jones
Director
Southeast Climate Consortium (SECC)
Distinguished Professor
Department of Agricultural and Biological Engineering
University of Florida

Sonya Jones
Program Officer - Southeast Area Office
United States Geological Survey

Barry Keim
Director
Southern Climate Impacts Planning Program (SCIPP)
Louisiana State Climatologist
Department of Geography and Anthropology
Louisiana State University

Melissa Kenney
AAAS Science Fellow
NOAA Climate Program Office
Postdoctoral Research Fellow,
Environmental Decision Analysis
National Center for Earth-surface Dynamics
Johns Hopkins University

Doug Kluck
Regional Climate Service Director – Midwest
NOAA National Climatic Data Center

Paul Knight
Senior Lecturer in Meteorology
Weather World Host, Feature Writer & Producer
Pennsylvania State Climatologist
Pennsylvania State University

Chester Koblinsky
Executive Director
NOAA Climate Program Office

Denise Lach
Associate Director
Climate Decision Support Consortium
Professor
Transitional Director School of Public Policy
Sociology Program
Oregon State University

Kirsten Lackstrom
Program Manager
Carolinas Integrated Science and Assessment (CISA)
University of South Carolina

Nancy Lewis
Pacific RISA II (CAPP)
Director, Research Program
East-West Center

Philip Loring
Alaska Center for Climate Assessment
and Policy (ACCAP)
Assistant Professor
Institute for Northern Engineering
The Center for Cross Cultural Studies
University of Alaska – Fairbanks

John Marra
Regional Climate Service Director – Pacific Islands
NOAA National Climatic Data Center

Ellen Mecray
Regional Climate Service Director - Northeast
NOAA National Climatic Data Center

Richard Moss
Senior Staff Scientist V
Joint Global Change Research Institute
University of Maryland

Phil Mote
Director
Climate Decision Support Consortium
Professor
College of Oceanic and Atmospheric
Sciences (COAS)
Oregon State University

Jim Murray
Designated Federal Official
National Sea Grant Program
NOAA

Claudia Nierenberg
Special Projects Manager
NOAA Climate Program Office

James O'Brien
Director
Southeast Climate Consortium (SECC)
Professor Emeritus
Florida State University

Robin O'Malley
Policy and Partnership Coordinator
National Climate Change and Wildlife Science Center
United States Geological Survey

Jonathan Overpeck
Director
Climate Assessment for the Southwest (CLIMAS)
Professor - Geosciences
Office Institute of the Environment
University of Arizona

Adam Parris
Regional Integrated Sciences and
Assessment (RISA) Program Lead
NOAA Climate Program Office

James Partain
Regional Climate Service Director – Alaska
NOAA National Climatic Data Center

Laura Petes
AAAS Science Fellow
Regional Adaptation Consortia Team
NOAA Climate Program Office

Roger Pulwarty
Director
National Integrated Drought Information System
NOAA Climate Program Office
NOAA Earth System Research Laboratory

Andrea Ray
Physical Scientist
NOAA Earth System Research Laboratory

Kelly Redmond
California-Nevada Applications Project (CNAP)
Deputy Director and Regional Climatologist,
Western Regional Climate Center
Division of Atmospheric Sciences
Desert Research Institute

Kevin Robbins
Associate Professor and Director of the
Southern Regional Climate Center
Adjunct Associate Professor of Biological
and Agricultural Engineering
Department of Geography and Anthropology
Louisiana State University

Richard Rood
Great Lakes Integrated Sciences and
Assessment Center (GLISA)
Professor
University of Michigan

Chet Ropelewski
NOAA Climate Program Office

Cynthia Rosenzeig
Director
Consortium for Climate Risk in the
Urban Northeast (CCRUN)
Senior Research Scientist
NASA Goddard Institute for Space Studies

Don Scavia
Director
Great Lakes Integrated Sciences
and Assessment (GLISA)
Professor and Director of the Graham
Environmental Sustainability Institute
University of Michigan

Mark Shafer
Principal Investigator
Southern Climate Impacts Planning Program (SCIPP)
Director of Climate Information &
Acting Director of Outreach
Oklahoma Climatological Survey

Eileen Shea
Director
Climate Services and Monitoring Division
NOAA National Climatic Data Center

Caitlin Simpson
RISA Program Manager
Climate and Societal Interactions
NOAA Climate Program Office

Linda Sohl
Consortium for Climate Risk in the
Urban Northeast (CCRUN)
Columbia University, Center for
Climate Systems Research
NASA Goddard Institute for Space Studies

Danielle Swallow
Climate Program Office Liaison
NOAA National Climatic Data Center

Madeleine Thompson
Senior Research Scientist
Climate Information for Public Health
International Research Institute for
Climate and Society (IRI)

Dennis Todey
President
American Association of State Climatologists
South Dakota State Climatology/Associate Professor
South Dakota State Climate Office
South Dakota State University

Sarah Trainor
Coordinator
Alaska Center for Climate Assessment
and Policy (ACCAP)
Research Assistant Professor
and Stakeholder Liaison
School of Natural Resources and
Agricultural Sciences
University of Alaska – Fairbanks

Brad Udall
Director
Western Water Assessment (WWA)
University of Colorado at Boulder

Dan Walker
Computer Science Corporation

Anne Waple
Assessments Manager
NOAA National Climatic Data Center

Jess Weaver
Regional Executive Southeast Area
United States Geological Survey

Leigh Welling
Climate Change Coordinator (National Lead)
National Parks Service

Dan White
Director
Alaska Center for Climate Assessment
and Policy (ACCAP)
Director of the Institute of Northern Engineering (INE)
University of Alaska – Fairbanks

Jessica Whitehead
Regional Climate Extension Specialist
South Carolina Sea Grant Consortium
North Carolina Sea Grant
Carolinas Integrated Science and Assessment (CISA)

Steve Zebiak
Director General
International Research Institute for
Climate and Society (IRI)
Columbia University

APPENDIX B. WORKSHOP AGENDA

FALL MEETING OF RISA PRINCIPAL INVESTIGATORS: REVISITING WHAT RISAS DO

Hosted by NOAA's Climate and Societal Interactions Program (CSI)
September 29 – October 1, 2010
The Latham Hotel
3000 M St. NW
Washington, DC
http://www.thelatham.com/

Wednesday, September 29, 2010 - Day 1 - process

Objectives –

- Review current and future objectives for RISA program including role in climate services
- Refine functional description of RISAs to increase visibility and institutional support
- Explore state of decision support research through the eyes of RISAs and other climate service developers/providers supported by NOAA

8:30 – 8:45 am	**Welcome and Opening Remarks** – Chet Koblinsky, NOAA
8:45 – 9:15 am	**RISA Program - Past, Present, and Future** – Adam Parris, NOAA
9:15 – 10:30 am	**Meet and Greet – RISA teams**
10:30 am – 12:00 pm	**Maintaining Regional Focus – Eileen Shea, NOAA** "From global to local" is a phrase that NOAA employs to describe its science and service mission, in part to implicitly connect the global processes understood by science to the local decisions that resource managers and other stakeholders have to make. The RISA program has made significant contributions to NOAA science in this respect by investigating regionally significant patterns and problems that constrain decision makers. Over time, the demand for RISAs increases in any given region presenting challenges to RISAs who want to investigate new patterns and problems while still answering the needs of their stakeholders. During this session, we will explore the following questions: • How do RISAs fit within the NOAA regional enterprise in the context of a NOAA Climate Service? • How do partnerships and stakeholder relationships at the local level support regionally integrated science and assessment? • What service capacity is lacking within NOAA that would relieve stress on the RISAs?
1:00 – 5:00 pm	**Climate and Society Sessions:** The following three sessions are designed to facilitate detailed discussions of RISA functions and objectives to support discussion of roles and responsibilities for RISAs in supporting the NOAA Climate Service and regional adaptation.
1:00 – 2:00 pm	**Climate and Society: Co-Developing Knowledge – Adam Parris NOAA** With support from NOAA grants, RISA investigators have been pioneering "co-developed/usable/decision support" research for 15 years. NOAA and the community of RISA investigators have a strong sense of "lessons learned" for successful decision support research. However, many academic institutions, decision makers, and members of society are unaware of or unclear on what "co-developed/usable/decision support" is. This lack of recognition places pressures RISA investigators and other researchers who tackle real world problems to maintain essentially two different paths of research. NOAA's ability to increase recognition of "co developed/usable/decision support" research, to provide clarity on the objectives of the RISA program, and to inspire additional financial support for RISA-like activities could be enhanced by defining, in simple terms and with simple graphics, a conceptual framework for this bourgeoning field. Over a series of sessions, we will synthesize "lessons learned" starting with the following questions: • What are your 3 biggest challenges in maintaining your role as a boundary entity (i.e. an "honest broker")? • What are the key aspects of your RISA program structure and process that support co-development or co-production? • What can we learn from other fields of science that interact with society? • What essential elements in the "co-development" or "co-production" process could be standardized and what should remain diverse?

2:30 – 3:30 pm	**Climate and Society: Establishing trust relationships – Caitlin Simpson NOAA** Relationships between scientists and decision makers are essential for the co-development or co-production of knowledge. These relationships take time to develop and can be initiated in diverse ways. Over time, as usable science is produced, the relationship can change from an exploratory or development mode to a service provider or consultative mode. Within the context of a competitive 5-year R&D effort, how do/will RISAs manage the following scientist-stakeholder relationship issues? • What is the range of methods for initiating and then maintaining stakeholder relationships? How do RISAs balance existing stakeholder relationship needs with building new relationships? • How long or extensive must interactions be before information becomes salient or usable? Do certain relationships take more time and/or require different approaches? • What kinds of decisions require what kinds of relationships? How do they vary depending on the decision making framework (e.g., regional/state level policy, long-term planning of natural or built resources, shorter term operations, warnings/alerts, outreach for public awareness/literacy)? • How closely connected are scientists and stakeholders throughout the relationship? • How will the nature of these relationships change as RISAs address a range of adaptation options? How far should RISAs go in terms of engaging decision makers on identifying adaptation options? • How do/will RISAs manage relationships with users in an environment of conflicting demands on resources (e.g., water, land, fish) and conflicting interests in policy outcomes?

4:00 – 5:00 pm	**Climate & Society: Transitioning Knowledge – Sarah Abdelrahim NOAA**
	RISAs are facing increasing demand for climate information from all of their regional, state, and local stakeholders. This demand increases the pressure to play a quasi-operational or operational role, which complicates the experimental or "learning by doing" objective of the program. While RISAs themselves have been able to provide some of these services, there are also successful stories of transitioning research to other entities with greater operational capacities (e.g., RCCs). Furthermore, as the scope of RISA services and activities expands, the definition of "transition" could be broadened beyond the focus on tools or products to services. In this session, we will discuss how service provision can be better accomplished through more efficient transition processes by exploring the following questions:
	• How should "transition" be defined and what types of RISA activities involve transition?
	  • Does transition involve new research to already existing applications or solely newly developed products to operations?
	  • Does transition play a role in education and training activities?
	• What entities are best equipped to provide climate services?
	  • What is the extent of "service" that should be provided by the RISAs?
	  • What role should Regional Climate Centers, extension agencies, etc. play?
	  • What is the role of government, academia, NGOs, and private sector?
	  • Is there a gap in the capacity of institutions to provide services?
	• How can science and service developers best collaborate with science and service providers to facilitate transition?
	  • What are the costs and benefits of privatization of products and services versus equitable access to products and services?
	  • At what point do service providers need to be involved and to what extent?
	  • At what point in product development is it best to establish a transition plan?
	  • With scientific and technological advancements, how can updates to existing products and services best take place and who should take responsibility?

5:00 – 5:15 pm	**Wrap Up and Logistics**
7 – 9 pm	**Reception - Citronelle**

Thursday, September 30, 2010 - Day 2 - assessment

Objectives –

- Coordinate regional assessment service activities in support of the National Climate assessment across NOAA Regional Enterprise Partners
- To review examples of cross-RISA interactions and key lessons learned (specifically with respect to collaborating) and share best practices for collaborating on projects
- To develop strategies to support the cross-comparison and synthesis of research findings for both sectoral assessment and stakeholder engagement

9:00 – 9:30 am	**National Climate Assessment 2013** – Kathy Jacobs, OSTP Kathy Jacobs (OSTP) will present the strategy for the National Climate Assessment with an update on the process. She will then lead a discussion panel with representatives from NOAA to set the context for the day. Topics on the panel will include: • NOAA Assessment Services – Anne Waple, NOAA - NCDC • RISA Roles – Adam Parris, NOAA - CPO • Regional projections – Don Anderson, NOAA – CPO & Rickie Rood GLISA The remainder of the day will be devoted to "Cross Comparison and Synthesis of RISA Assessment Services activities." The following breakout sessions and discussion topics have been co-planned by the Southeast Climate Consortium (SECC), the Consortium for Climate Risk in the Urban Northeast (CCRUN), Great Lakes Integrated Sciences and Assessments (GLISA) and the Southern Climate Impacts Planning Program (SCIPP) RISAs
9:30 am – 10:00 am	**Overview** – Sarah Trainor (ACCAP)
10:00 – 10:10 am	**Charge to Breakout Groups** – Radely Horton (CCRUN)
10:10 – 11:30 am	**Breakout Session #1** – Lessons learned on collaboration Each group will discuss examples of sector-based cross-RISA research, including stakeholder engagement. The general question posed before each group will be: • What have been the successes and challenges of collaborative projects, and why? Groups will be organized by the following sectors: • Agriculture (Norman Breuer) • Urban Areas (Cynthia Rosenzweig) • Water management (Phil Mote) • Coasts (Lynne Carter)
11:30 – 12:00 pm	**Report back and discussion**
1:00 – 1:45 pm	**Assessment Services Projects 2010 – 2011** Each RISA and the RCCs will have ~ 2-3 minutes to summarize their Assessment Services activities. James Hocker (SCIPP) will facilitate.
1:45 – 1:55 pm	**Charge to group**
2:00 – 3:10 pm	**Breakout Session #2 - Assessment Services Collaboration** During breakout sessions, groups will discuss collaboration on a number of activities to ensure effective contribution to the National Climate Assessment. Among other questions, groups will discuss: • What is the best way to share research literature on stakeholder engagement and develop common research questions? • Should our teams collect any common sets of information, or is this even feasible given the different nature of the projects? Do you feel this would be beneficial? • If collecting some common data – what should those be? • How could we successfully coordinate? Groups will be organized by the following sectors: • Agriculture (Norman Breuer) • Urban Areas (Cynthia Rosenzweig) • Water management (Phil Mote) • Coasts (Lynne Carter)
3:10 – 3:30 pm	**Report back and discussion**
4:00 – 5:00 pm	**Looking ahead** During the last session, we will re-convene the workshop. Topics of discussion will include: • Tools/Infrastructure – Shared web space, calendars, and conferencing tools • Reporting requirements for the National Climate Assessment • Potential areas for further research in FY 2011.

Friday, October 1, 2010 - Day 3 – Partnerships

Objectives –

- Support regional, inter-agency partnerships among regional groups engaging in science, service, adaptation, and mitigation

7:30 – 10:00 am	**Looking ahead for RISAs – RISA PIs and NOAA Program Management** This session will reserve time for the RISA PIs and NOAA Program Management to discuss the insights and issues arising from the previous three days. The topics for discussion will remain open to develop questions and a rough agenda over the course of the meeting, but might include: • Institutional opportunities and constraints for supporting RISAs • NOAA's expectations for the next 5 years • RISA expectations for the next 5 years
10:30 am – 12:30 pm	**NOAA Regional Climate Service Enterprise & RISAs** – Eileen Shea, NOAA As NOAA moves forward with developing a climate service, it will strive to integrate the climate-related activities within its own distributed offices (CPO, NCDC, Coastal Services Center (CSC)) and among its close external partners (RISAs, RCCs, State Climatologists, National Weather Service/Climate Services Division, NWS/Climate Prediction Center, and Sea Grant). This session will provide an opportunity to discuss priorities for regional science and services and to improve coordination between internal and external entities. In keeping with coordination of activities, NOAA's Regional Climate Service Directors will be on hand to contribute to these discussions and discuss their role moving forward. During this session, participants were divided into discussion groups based on several of the regions of the most recent US Global Climate Change Impacts (GCCI) report (2009). The discussion groups were asked to answer the following questions: • What are the existing and/or planned coordinating mechanisms that could be used to build regional coordination in support of climate service, assessment, and adaptation? • If you were asked to write a "regional coordination plan" for climate service, assessment, and adaptation, what would be the components of that plan (i.e., the outline)? • If you were asked to take this idea to build regional coordination back to your region, how would you suggest this idea be vetted with other federal and non-federal entities in your region to maximize their support for the idea? • What are the cross-regional issues that your region want to work on and which other regions would you need to work with to accomplish them?
1:00 – 3:00 pm	**Regional Climate Adaptation – Networking networks** DOC (NOAA regional partners) and DOI (Climate Science Centers and Landscape Conservation Cooperatives) are both engaged in regional climate science and service in support of both adaptation and mitigation. The DOC and DOI groups are forming partnerships in each region, and it is important for the insights gained from these science and service activities to contribute to the National Climate Assessment.

For more information about the workshop, contact:

Adam Parris
adam.parris@noaa.gov
(301) 734-1243

Caitlin Simpson
caitlin.simpson@noaa.gov
(301) 734-1251