

**NIDIS Southeast Drought Early Warning Information System
Planning Meeting – 21&22 July 2009 – Chapel Hill, NC**

Meeting Notes

Day 1

Overview of Regional Activities

- **Roger Pulwarty provided an overview of NIDIS and its services.** He stressed the importance of looking at drought and its impacts across a range of scales; this allows for integration of ecosystem information. A document with the outcomes from the meeting in Peachtree City was made available and was asked to be considered during the discussions in Chapel Hill. He stressed the importance of an early warning system so that managers are not preparing for impacts during the drought itself. Three key components of the system were outlined: information, knowledge, and service. Key questions posed included: Who is involved in implementing an early warning drought system in the Southeast? What do we currently know about these systems? What experience do we have? From a service perspective, do we know what information is needed and can we provide that information?
- **Mike Brewer provided an overview of the US Drought Portal.** The portal was described as a clearinghouse which relies on information provided by other organizations and then distributes it in ways that are useful to particular clients. Although state-related resources are currently available through the portal, there is a paucity of regional information. Mike spent some time discussing the variables and data layers available in the map viewer and asked participants to provide feedback on content and structure. On-going developments include new visualization tools, new technologies, new state-related information, and new monitoring and recovery information. Mike posed the following question: How can information at the county or basin scale be integrated into the portal?
- **Jeff Payne provided an overview of the NOAA Southeast and Caribbean Regional Team.** He stressed the importance of partnerships from the perspective of watershed and coastal zone management. Forming efficient partnerships with stakeholders across the entire watershed is vital so that those with coastal interests are not negatively impacted by decisions made upstream.
- **Sonya Jones provided an overview of the USGS National Climate Change Wildlife Science Center.** The center was assigned to the USGS in 2008 and the Southeast region is its first test case. A draft document outlining how the center will operate has recently been developed. Topically, the initial Southeast pilot will focus on the impacts of climate change on avian and aquatic species as well as the impacts of sea level rise on fish species and coastal wildlife systems. The center will work with wildlife action plans already implemented at the state level.
- **Tim Schneider provided an overview of the NOAA Hydrometeorological Testbed.** The goal of the testbed is to integrate new tools, technologies, and results from the research field into an operational setting, specifically with the NWS Weather Forecast Offices and River Forecast Centers. A number of regional studies have been conducted, mainly west of the Rocky Mountains, to help local forecasters improve precipitation and runoff models. Tim showed results and demonstrations from the work conducted in the American River Basin/Sierra Nevada's. The anticipated start of the Southeast testbed is now 2011. Although the testbed focuses on precipitation and flooding, the

methods used and the lessons learned from current and past studies can be integrated into drought models.

Regional Drought Related Activities

- **Peter Robinson provided an overview of drought activities at the SERCC.** He stressed that state climatologists and other organizations are more involved in drought monitoring; however, the SERCC is heavily involved in research pertaining to impacts of drought in various sectors. Currently, these include initiatives aimed at understanding impacts related to urban planning and design as well as public health. The SERCC is also interested in questions related to drought and climate change. Particularly, the implications for water managers if the regional climate shifts to one characterized mainly by dry conditions with occasional wet spells.
- **Keith Ingram provided an overview of the Southeast Climate Consortium.** He stressed the restructuring of the SECC's strategic research themes and the need to look at a broader range of adaptation sectors in preparation for development of an early warning drought system: coastal ecosystems, agriculture, forests, and other terrestrial systems.
- **Jeff Dobur provided an overview of drought operations at the Southeast RFC.** He stressed the vital role of providing water resource support to customers and partners. The RFC is perhaps in a better position to do this than the NWS Forecast Offices. Although the focus of the RFC is on flood forecasting, the tools, techniques, and expertise are there to provide additional information on evolving drought conditions. A new position in Service Coordination Hydrology will greatly aid in providing the information necessary to customers. The weekly Water Resources Outlook video clip has been immensely popular and informative.
- **Greg Carbone provided an overview of the Dynamic Drought Index Tool.** The Drought Index Tool is a user-centric tool that allows the user to define what they want and at what scale they want their information. This allows stakeholders with different impact areas to tailor the output to fit their needs. The GIS interface is a dynamic and rich product that provides a variety of output maps as well as all the metadata.
- **Lisa Darby gave an overview of the NIDIS Upper Colorado River Basin Pilot activities**

Drought Early Warning Information System: Identifying Key Issues and People

- Discussion foci: choosing a basin for the pilot; the social science perspective; groups and organizations to be part of the implementation plan
- **Interdisciplinary Research and Applications (Kirstin Dow and Ryan Boyles)**
 - Added value of the social science perspective (a success of the RISAs)
 - Inter-basin water transfer
 - Inter-state regulatory agencies
 - Recreational development

- Coastal issues (e.g., salinity)
- Urban planning
- Ownership vs. Management
- Indigenous water rights
- Energy use
- Industrial discharge
- Regulated/managed vs. unregulated flow
- Differential levels of vulnerability
- Values, practices, and levels of stewardship
- Paper industry
- **Research Needs:**
 - Marsh/coastal impacts
 - Effects of managed flow and stream variability on ecosystems
 - Impacts on the “green” industry
 - Agricultural demand on the rivers and ground water
 - Wildfires and impact on subsurface soils/pedology
 - Decision-making structures and practices
 - Water-energy link
 - Closing the water budget
 - Ecosystem modeling (an integrative approach; rivers to estuaries)
 - Vulnerability analyses – we’re not very far along
- **Research Questions:**
 - What are the impacts on indigenous groups?
 - What are the connections between surface and groundwater non-linearity? How sensitive are they to short and long term climate? How does the underlying geology and aquifer structure affect recharge and extraction rates?
 - Is there a need for more groundwater well measurements?
 - Do we understand the different triggers and thresholds utilized by different drought-sensitive sectors? How do we integrate that information?
 - What are the chain of events that lead to economic impacts such as layoffs and small business failures?
- **Integrated Monitoring and Forecasting (David Stooksbury)**
 - The SCO’s are the missing links when it comes to decision-making, as initial decisions in response to water issues are made at the state level

- State funding is provided to make sure we are implementing reliable monitoring and forecasting procedures
- There are a number of data needs to help improve monitoring and forecasting
 - Water use data at the county/basin level (need to coordinate with what USGS is currently doing in this area)
 - More real-time ground water well information, especially near the Flint, with attendant rain gauges
 - More evapotranspiration data; what are the current satellite capabilities?
 - More weather stations providing soil moisture information
 - Coastal areas: salinity; pH; dissolved oxygen; water temperature; nutrient distribution; contaminants and pathogens
 - Predator/prey issues, e.g., as salinity changes, crab behavior may change
 - Need to identify and archive paleoclimate data
 - Need more information on drought impacts: economics; public health; ecological health; “green” industry; household impacts; landscaping; municipal impacts; tourism; energy
- Understanding the relationships between water use and energy demand from a forecasting perspective
 - Need to develop a standard for measuring local data
 - Requires coordination among federal, state, and local programs in the sharing of data and information. How is this achieved? Find common ground/interests/impacts
 - State climatologists could use more IT help with data management
 - Requires addressing the adaptive strategies of rural communities
 - Requires addressing the data exchange needs between municipalities and NIDIS; not just simply acquiring the data, but being disseminating it through a common database
 - How are we conveying the importance between water use and energy? Do we need to re-think our approach?
 - How are water use practices for energy currently being enforced? Do these need to change?
- Forecasting practices need to be sector-specific
- Need to improve forecasting skills necessary to make operational water retention decisions
 - We need to be careful, though, because bad forecasts can be disastrous; do we know the costs for making a bad forecast?
 - What are the social implications for risk communication? Which risks are acceptable?

- Need for more interoperability of forecast models: There needs to be an “open system” whereby information among federal, state, local, and university organization are integrated. If we share this information, even if there are differences among groups, we increase interoperability in terms of interpreting the determining standards
- How does an individual responsible for making a binary (yes-no) decision with respect to water management deal with probabilistic forecasts?

- **Engaging Preparedness Communities (Mike Hayes)**

- How is the information from the Southeast pilot going to be used?
- A drought “myth” – we cannot learn from other places. We know that is not true; there are a number of success stories and we need to use them as examples
- A fundamental question for stakeholders is where they turn to for drought information. A question for the Southeast pilot is how we can connect with people in other regions so that they may share their success stories on drought mitigation and preparedness.
- What do we need to accomplish this?
 - All the available resources for drought planning
 - Better coordination across boundaries
 - Strategies for coping with uncertainty
 - Better integration of science and policy
- What are the key issues and needs for the Catawba-Wateree?
 - Drought indicators
 - Meteorological and hydrological sciences
 - Trends in water use
 - Data on impacts
 - How to bridge the gap between drought forecasts and drought preparedness
- Who are the players? What groups and communities should be incorporated into the Southeast pilot? What are their water priorities?
 - Duke Energy
 - Water Resources Management Group
 - Drought Management Group
 - State Emergency Managers (extension)
 - Department of Water Resources (NC response plans)
 - NIDIS – provide a venue for discussion
 - Developers
 - Native/indigenous groups

- Conservation alliances and organizations
- Land trusts
- Education (K-12 and higher; consider continuing education credits for developers)
- Golf course superintendents
- CoCoRaHS
- Apalachicola/Chattahoochee/Flint Basin (ACF): who are the players?
 - Utility companies (Southern Co.)
 - River keepers
 - American Rivers
 - Alabama River Alliance
 - Homeowners associations near large lakes
 - KIA motors plant in West Point, GA (filling wetlands)
 - The Nature Conservancy
 - Pulp timber industry
 - Horticultural businesses in Florida

Day 2

Drought Early Warning Information System Design: Essentials for a Successful Pilot

- **What are the key geographical areas and issues to focus on?**
 - Ability to leverage federal resources
 - What political issues need to be taken into consideration?
 - Considerations of transferability (the topic of the upcoming round of NIDIS funding)
 - How to manage risk and provide information to reduce conflict
 - Role of NIDIS – facilitation, science, assessment; how could NIDIS apply itself to issues of coastal ecosystem management during drought?
 - Is there good coordination amongst federal, state, and local players? What/where are the best entry points to provide information and facilitation?
 - Is there equitable access to all information?
 - Do we take on a phased approach with multiple basins?

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- **Who should participate?**

Decision Makers (includes possible funding sources)	Information Partners	Boundary Organizations
-Southern Co. -Office of Water Resources (AL) -Dept. Natural Resources -Dept. Environmental Protection -Army Corp. Engineers -Drought Council -Duke Energy -Municipal water managers -Metro. Atlanta Water Authority -Chamber of Commerce -Dept. of Defense -WMDs -USFWS -Florida Fish and Wildlife Conservation Commission -FGRC -Native American groups -South Atlantic Alliance -Gulf of Mexico Alliance -Agriculture and Forestry -Council of Governments -Federal Regulation and Oversight of Energy	-Present attendees -National States Geographic Information Council -SCOs, RCCs, and NWS -RISAs and universities -State emergency managers -Association of State Floodplain Managers -USGS -CDE -USDA -EPA -NCDC -Northern Gulf Institute -Climate Prediction Center/Climate Testbed -RENCI -South Atlantic Alliance -Gulf of Mexico Alliance	-The Nature Conservancy -River keepers -Extension services (land, sea grants) -Alabama River Alliance -Media -K-12 education -Waterwise -SCOs, RCCs, and NWS -NC Coastal Federation -Soil-Water Conservation -Coastal Conservation Alliance -Institute for Business and Home Safety -National Association of Counties -FEMA -State emergency managers -Other non-gov't organizations

- **Who can provide financial support?**

- Southern Governors Association
- Catawba Water Management Group
- Military installations (SERDEP, DOD)

- **What will an early warning system in the Southeast look like? What will it incorporate?**

- A decision support and information portal
- Monitoring and forecasting
- Groundwater monitoring
- Educational tools
- Predictive capabilities
 - Historical analogs (recall presentation from last year's meeting)
 - Probabilities of tropical cyclones and other major storms; which ones are the ideal drought "busters"?

- ENSO signal
 - Downscaling forecasts to basin level
- Triggers, thresholds, and responses identified and shared among all groups; need information transparency
 - Creation of a matrix – which stakeholders need to be notified? System to be tailored to the needs of the user
 - Can include historical information on climate and biology
 - Status board created and updated to reflect current conditions and warnings
- **Drought Portal Community Building: Coordination of Information**
 - Installation of soil moisture sensors on CRN stations (a total of 40 to be installed by the end of the year)
 - Ultimate goal is to make drought information practical to the decision maker; make the overwhelming list of products and links more concise and structured to meet the needs of the decision maker
 - To facilitate collaboration, a web-based community for the Southeast pilot has been created on the portal; attendees had login information emailed to them
 - Additions:
 - Education
 - Contact information of all collaborators
 - More detailed layer analysis
 - Socioeconomic products and overlays
 - Stakeholders and collaborators will rely on the portal for updates and new products; we may build an application that sends updates via email and SMS

Workshop Wrap-up and Action Items

- Recommendations for pilot
 - A three-year phased approach
 - Years 1-3: develop a pilot in the ACF basin
 - Year 1: develop and implement a pilot in the Catawaba-Wateree Basin – working with key players to identify gaps
 - Years 2-3: Transfer/leverage work in the Catawaba-Wateree Basin to the Yadkin-Pee Dee Basin
 - Will include eco-coastal information and key players
 - Many of the decision makers will remain the same

- Upcoming meetings
 - Interim/preparatory/awareness meeting (1/2 or 1 day) in Columbus, GA in August
 - ACF workshop (David Stooksbury)
 - Next meeting of Carolinas pilot group
 - Suggestion made for late October in Asheville, NC
 - Send other suggestions, ideas, comments to Tim Owen

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