

NIDIS Carolinas Drought Early Warning System Pilot Program

The Climate Connection Workshop Series: Climate Variability & Impacts to South Carolina's Natural Resources

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September 13, 2012 ~ Charleston, SC



Presentation Outline

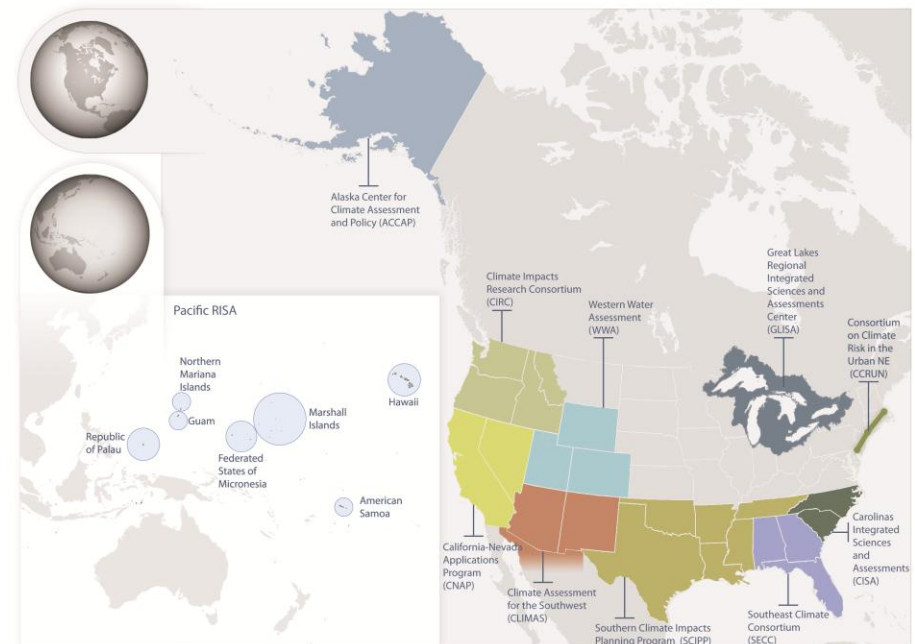
- ▶ CISA Background Information
- ▶ NIDIS Background Information
- ▶ NIDIS / CISA Collaborative Work on Drought
- ▶ NIDIS Carolinas Drought Early Warning System Pilot Projects

Regional Integrated Sciences & Assessments



- ▶ “NOAA’s RISA programs support research teams that help build the nation’s capacity to prepare for and adapt to climate variability and change.”
- ▶ RISA teams work with public and private user communities to:
 - ▶ Understand decision contexts
 - ▶ Develop actionable knowledge
 - ▶ Maintain diverse, flexible networks
 - ▶ Innovate services to enhance the use of science in decision making

Currently Funded RISAs

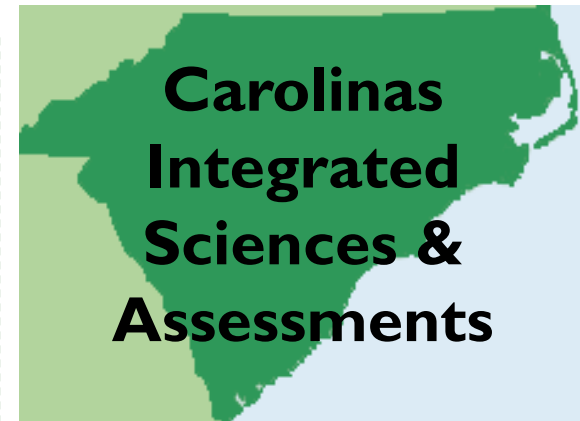


▶ CISAs Core Focus Areas

- ▶ Drought
- ▶ Climate and Watershed Modeling
- ▶ Coastal Management
- ▶ Health
- ▶ Adaptation

▶ CISA Partners

- ▶ Southeast Regional Climate Center
- ▶ NC Sea Grant
- ▶ SC Sea Grant Consortium
- ▶ NC & SC State Climate Offices
- ▶ Federal, State, and Local Agencies
- ▶ Private Sector
- ▶ Non-Governmental Organization



CISA works to be a regional resource for a variety of stakeholders to incorporate climate information into water and coastal management, public health, and related decision-making processes.

CISA Project Partners



East Carolina University

- Water resources scenarios

NOAA, Center for Coastal
Environmental Health & Biomolecular
Research

- Monitoring Carolina estuaries for *Vibrio*

Northeast Regional Climate Center

- Enhancement of the Dynamic Drought Index Tool (DDIT)

USGS, SC Water Science Center

- Assessment of the impact of saltwater intrusion in the Carolinas

North Carolina State Climate Office

- Drought Sensitivity Testing

South Carolina State Climate Office

- Assessing Drought Indicators and Triggers

National Integrated Drought
Information System (NIDIS)

- Workshop planning and partnership on drought and coastal ecosystems



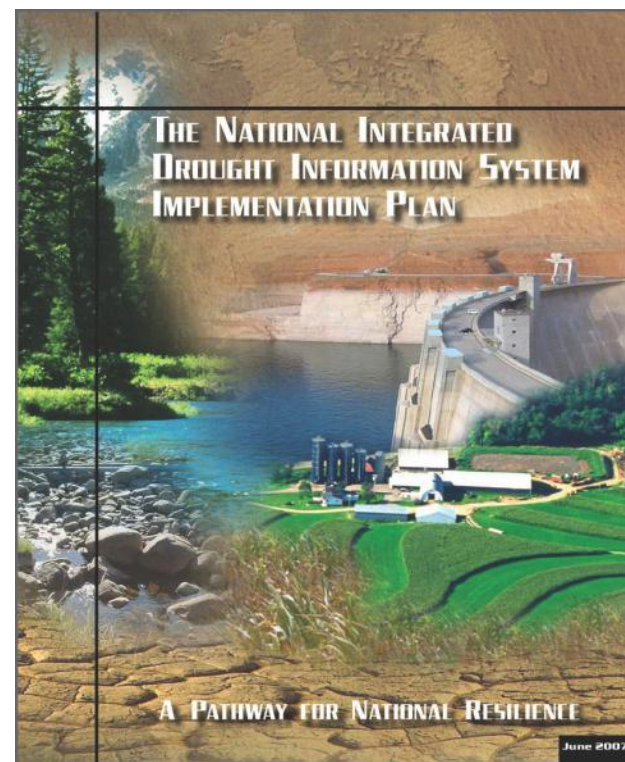
National Integrated Drought Information System

Drought Early Warning and Information Systems



About NIDIS

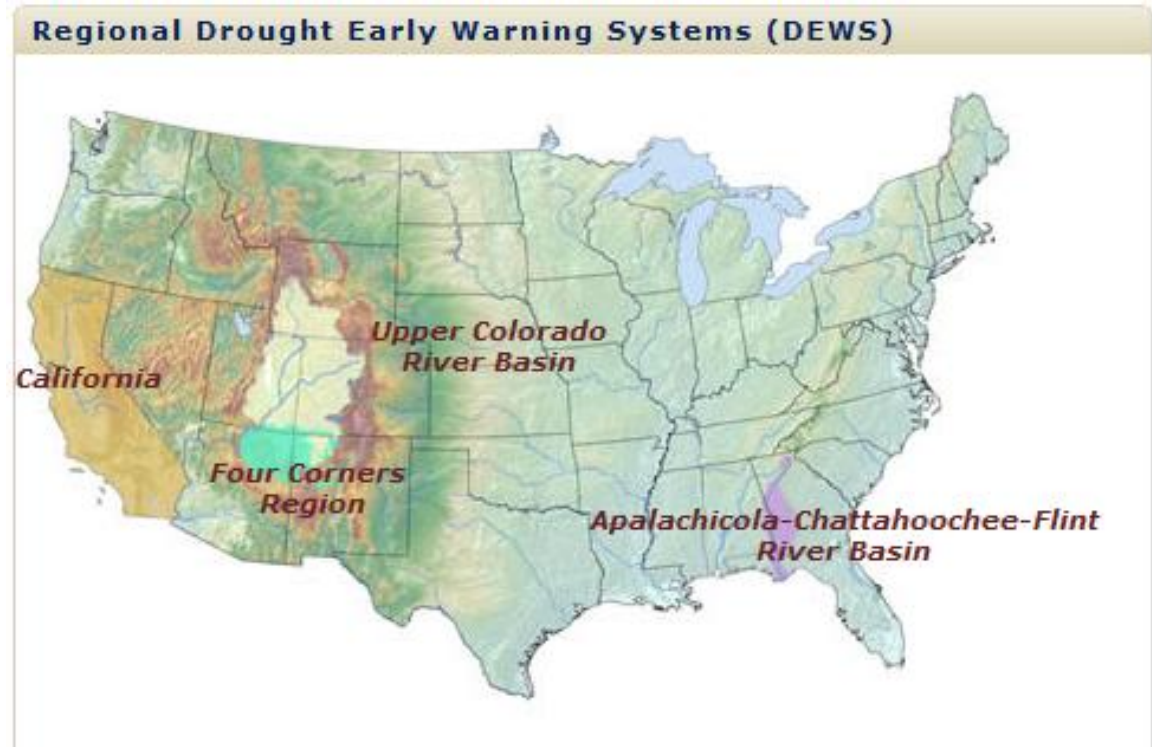
- ▶ **Established by the 2006 NIDIS Act**
 - ▶ “To enable the nation to move from a reactive to a more proactive approach to managing drought risks and impacts”
- ▶ **NIDIS Components**
 - ▶ NIDIS Program Office
 - ▶ US Drought Portal
 - ▶ Drought Early Warning Pilots





NIDIS Early Warning System Pilots

- ▶ Upper Colorado River Basin
- ▶ Four Corners Region
- ▶ Apalachicola-Chattahoochee-Flint River Basin
- ▶ Critical areas in California
- ▶ Coastal Ecosystems in the Carolinas



NIDIS Drought Early Warning Information System Objectives



- ▶ Coordinate national drought monitoring and forecasting systems
- ▶ Provide an interactive drought information clearinghouse and delivery system for products and services, including an internet portal and standardized products (databases, forecasts, Geographic Information Systems (GIS), maps, etc.)
- ▶ Design mechanisms for improving and incorporating information to support coordinated preparedness and planning

Elements of a Drought Early Warning System



- ▶ **Monitoring**
 - ▶ Hydrological and Meteorological

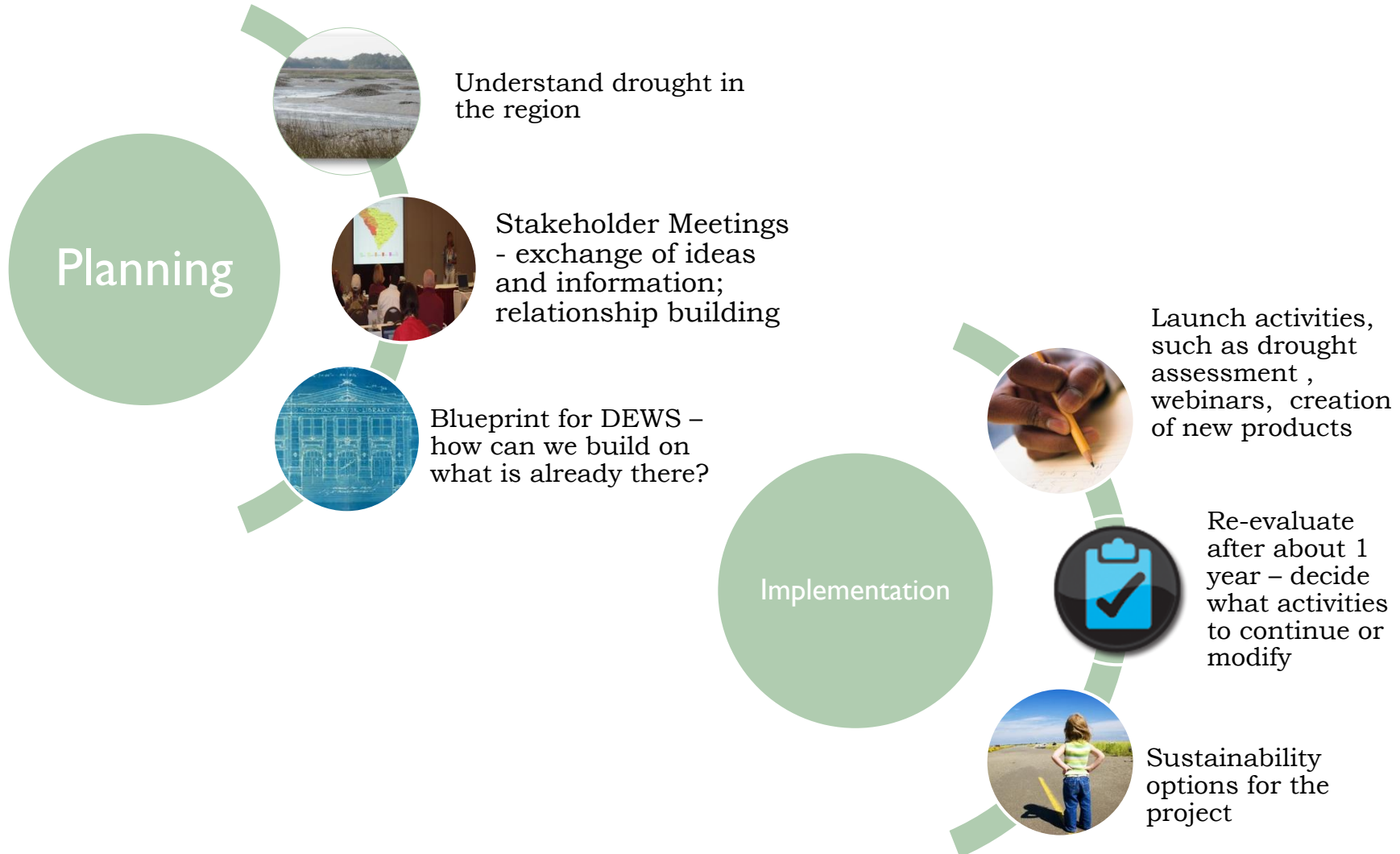
- ▶ **Forecasting/Outlook**
 - ▶ Onset, intensification and recovery

- ▶ **Management Triggers**
 - ▶ Assumes a drought plan is in place

- ▶ **Anticipated Impacts**

- ▶ **Effective communication to stakeholders**
 - ▶ Coordination of current activities

Pilot Program Iterative Process





CISA's Work to Support NIDIS

▶ Spring 2010

- ▶ Stakeholder workshop held to identify needs for a drought early warning system

▶ State of Knowledge Report

- ▶ *The Impact of Drought on Coastal Ecosystems in the Carolinas* (Gilbert et al., 2012)



The Impact of Drought on Coastal Ecosystems in the Carolinas

State of Knowledge Report January 2012



CISA's Work to Support NIDIS

▶ Spring 2012

- ▶ Steering committee meeting at Fort Johnson, May 1, 2012
- ▶ Identified interested organizations, agencies, and individuals for the scoping workshop

▶ July 31 – August 1, 2012 ~ Wilmington, NC

- ▶ Drought Early Warning System Scoping Workshop
- ▶ Goal: To develop pilot project ideas for a drought early warning system for coastal ecosystems in the Carolinas

Workshop Steering Committee & Participant Organizations



- ▶ Audubon South Carolina
- ▶ Beaufort-Jasper Water & Sewer Authority
- ▶ DOI Southeast Climate Science Center*
- ▶ East Carolina University
- ▶ Gullah/Geechee Nation
- ▶ Lumbee Tribe of North Carolina
- ▶ National Climatic Data Center
- ▶ National Drought Mitigation Center*
- ▶ NC Coastal Reserve & National Estuarine Research Reserve
- ▶ NC DENR, Division of Coastal Management
- ▶ NC DENR, Division of Water Resources
- ▶ NC Department of Health & Human Services, Division of Public Health
- ▶ NC Department of Public Safety, Division of Emergency Management
- ▶ NC Sea Grant*
- ▶ NC State Climate Office*
- ▶ NC Water Resources Research Institute
- ▶ NOAA Center for Coastal Environmental Health & Biomolecular Research*
- ▶ NOAA Fisheries, Southeast Regional Office*
- ▶ NOAA National Centers for Coastal Ocean Science, Center for Human Health Risk*
- ▶ NOAA National Weather Service
- ▶ NOAA Regional Climate Services, Eastern Region*
- ▶ NOAA Southeast and Caribbean Regional Team*
- ▶ North Inlet - Winyah Bay National Estuarine Research Reserve
- ▶ Pocosin Lakes National Wildlife Refuge
- ▶ South Atlantic Landscape Conservation Cooperative
- ▶ SC Sea Grant Consortium*
- ▶ SC State Climate Office*
- ▶ Southeast Regional Climate Science Center*
- ▶ The Nature Conservancy, NC & SC*
- ▶ US Army Corps of Engineers
- ▶ US EPA, Region 4*
- ▶ UNC Wilmington, Center for Marine Science
- ▶ USC Public Health Research Center, Dept. of Environmental Health Sciences
- ▶ US Fish & Wildlife Service, SC Coastal Program*
- ▶ US Fish & Wildlife Services, SC Lowcountry Refuges Complex*
- ▶ US Marine Corps, Camp Lejeune
- ▶ USGS NC Water Science Center
- ▶ USGS SC Water Science Center*

* Steering Committee Member Organization

Scoping Workshop



- ▶ Speaker presentations to discuss implications of drought in coastal ecosystems
- ▶ World Café style breakout sessions to brainstorm pilot project ideas
- ▶ Participants used the Turning Technologies Audience Response System to vote for pilot project ideas
- ▶ 4 projects were chosen to move forward





NIDIS Carolinas Early Warning System Pilot Projects

Evaluation of Drought Indicators and Indices

Seafood Safety Forecast

Drought Forecasting Communications

Drought Impacts Reporting

Evaluation of Drought Indicators & Indices



▶ Project Goals

- ▶ Determine which current drought indicators and indices are appropriate for assessing drought in coastal ecosystems
- ▶ Investigate the benefits and feasibility of creating a drought index based on real-time salinity data
- ▶ Collaborate with work being done on the North American Drought Indices and Definitions Study



Seafood Safety Forecast

▶ Project Goal

- ▶ Provide an early warning system for commercial, recreational and subsistence fishermen who harvest drought-sensitive seafood in both fresh and salt waters in the coastal regions of the Carolinas



Photo: SC DNR, Oyster Bed
http://www.dnr.sc.gov/news/yr2010/sept27/sept27_oyster.html

Drought Forecasting Communications



- ▶ **Project Goals**
 - ▶ Introduce stakeholders to current products used for drought forecasting, step them through the process of how a drought outlook is prepared, and educate them on the caveats and uncertainties in the outlook
 - ▶ Ascertain what additional drought forecasting products stakeholders need and what time scales are of most interest to them





Drought Impacts Reporting

▶ Project Goal

- ▶ Assess ways in which drought impacts might be monitored through stakeholders and citizen science engagement and investigate ways to improve the communication of coastal ecosystem drought impacts



Next Steps



- ▶ The workshop report has been completed and will be available online
- ▶ For each pilot project:
 - ▶ Steering committee conference calls are underway
 - ▶ Specific sectors and geographic focus areas are being refined
 - ▶ Potential partnerships and existing resources are being identified
 - ▶ Project action plans will be developed



Thank You!



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CISA Website

<http://www.cisa.sc.edu/>

NIDIS Carolinas Website

<http://www.drought.gov/portal/server.pt/community/carolinas>