

# NIDIS Carolinas

## Drought Impacts Projects & Citizen Science Network



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**CAROLINAS INTEGRATED SCIENCES & ASSESSMENTS**  
**JANUARY 8, 2014**



# CISA's Work to Support NIDIS



- Spring 2010
  - Interviews and workshops to identify needs for a *drought early warning system*
    - ✦ Monitoring, forecasting, outlook tools
    - ✦ Management plans, response actions
    - ✦ Communications about conditions and impacts
- 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

# Drought-Related Impacts & Concerns in Coastal Ecosystems



Source: Dan Tufford



Source: Geoff Scott



Source: Michael Childress



Source: Geoff Scott

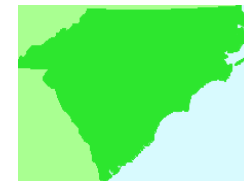


# Drought-Related Impacts & Concerns in Coastal Ecosystems



Source: Ed Christopher  
(Pocosin Lakes National Wildlife Refuge, NC)

# CISA's Work to Support NIDIS



- **Spring 2012**

- Steering committee meeting at Fort Johnson, SC, 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
- Clemson University
- 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

# Pilot Projects Identified by Stakeholders



- **Drought Impacts Reporting**
  - Improving understanding drought in coastal ecosystems was identified as a priority and will provide information for the other pilot projects.
  - This include improving the identification and documentation of impacts.
- **Evaluation of Drought Indicators & Indices**
  - This project has received funding support and will begin this year (2014).
  - January 7 ~ NIDIS/USGS Real Time Salinity Index Workshop
- **Public Health and Water Quality**
  - Seafood Safety
- **Drought Forecasting and Communications**

# Components of the Drought Impacts Project



- **Drought Impacts Interviews**

- 45 interviews between March and October 2013
  - ✦ Beaufort County, SC
  - ✦ Carteret County, NC
- Identified direct and indirect impacts, other compounding stressors
- Identified coping mechanisms and limits to these strategies
- Identified what drought information they use, or have needs for

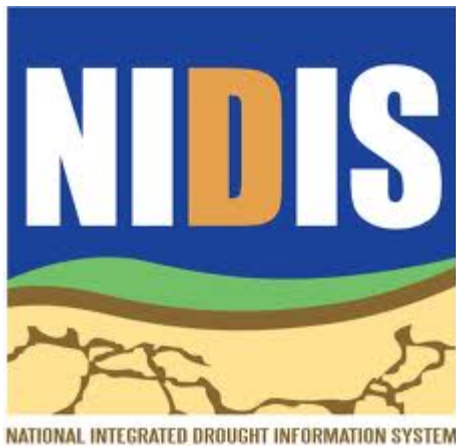




# Citizen Science Condition Monitoring



## PROJECT PARTNERS



**DNR**

**SC STATE CLIMATE  
OFFICE**



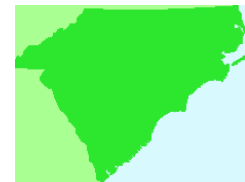
# Weekly Condition Monitoring



## Connecting weather and climate to the environment

- CISA is recruiting CoCoRaHS volunteers to submit weekly condition monitoring reports in addition to their daily precipitation measurements.
- Weekly condition monitoring helps to connect weather conditions to the local environment.

# Weekly Condition Monitoring



- Regular observations help to:
  - Identify the early signs of drought
  - Identify when conditions begin to improve
  - Identify any lingering impacts

# Weekly Condition Monitoring



- “Condition Monitoring” checkbox added to the CoCoRaHS Drought Impacts Report Form
- Link to additional instructions and examples also provided.

## Drought Impact Report Form

Submit Data Reset

Station Number : SC-RC-51

Station Name : Columbia 6.6 SE

The significance of drought is tied directly to the impacts that it causes. Identifying and documenting impacts as they first appear and as they continue is essential for comprehensive drought monitoring. Please refer to the [CoCoRaHS training slide show](#) for reporting drought impacts.

\* indicates required field

### Duration

Drought is a gradual, slow-moving phenomenon. The start date is an approximation. End dates are not required.

Impact Start Date 10/31/2013 \*

End Date

### Condition Monitoring

☐ Condition Monitoring Report

A **Condition Monitoring Report** allows a regular observer to describe normal conditions that are likely to change during drought, to create a basis for comparison. Please check Condition Monitoring Report if that's what you are submitting. If you aren't sure, please leave it unchecked. [More information on categories of drought impacts and reports.](#)

### Description

Please provide a description of how dry, normal or wet conditions are affecting you, your livelihood, your activities, etc. \*

### Report Categories

Please check at least one report category. If you check a category, please provide supporting information in the description. [More information on categories of drought impacts and condition monitoring reports.](#)

If an amount of money is associated with the impact, please consider providing that information in the box to the right of the category. Including a dollar amount means you agree to allow it to be used as a summary statistic.

<input type="checkbox"/> Agriculture	\$	
<input type="checkbox"/> Business And Industry	\$	
<input type="checkbox"/> Energy	\$	
<input type="checkbox"/> Fire	\$	
<input type="checkbox"/> Plants And Wildlife	\$	
<input type="checkbox"/> Relief Response	\$	
<input type="checkbox"/> Society And Public Health	\$	



# Audience Polling Question



What impacts data does your agency collect or use?

1. Agriculture
2. Business & Industry
3. Energy
4. Fire
5. Plants & Wildlife
6. Relief, Response & Restrictions
7. Society & Public Health
8. Tourism & Recreation
9. Water Supply & Quality
10. None

# Ideas for Weekly Condition Monitoring Reports



Items	Questions to Consider
Plants	Are plants lush and green, or are they droopy and dying? Have you noticed faster or slower plant growth?
Animals	Do you see animals visiting water sources more regularly, like birds at the birdbath? If you are a fisherman, have you seen any differences in the type and amount of fish you catch? Are the crabs or shrimp further upstream?
People	Are businesses affected by the weather at all, such as landscaping companies, garden centers, roadside markets, or seafood markets? Are people having to stay inside more because of hotter and/or drier days? Are there any seafood consumption restrictions?
Water Quality	Is the water in lakes, ponds, or waterways cloudy or murky? Do you see an increase in the amount of plants growing in ponds? Have you noticed any differences in the taste or color of your drinking water?
Water Supply	Are water levels in rivers or tidal creeks lower or higher than normal? If there are any lakes or ponds in your community, are the water levels lower or higher than normal? Have any water bodies flooded recently? Are there any water restrictions in place, such as whether or not you can water your lawn or wash your car?
Soil Conditions	Is the soil moist or is it dry and cracking? How does the soil look or feel in your lawn, garden or community?
Coastal Conditions	Do you see any indication that plant or animal species are suffering from a lack of water or excessive heat? Has there been any decline in fish catch? How are businesses doing that rely on local resources?

# Weekly Condition Monitoring



Everyone is a bit of an expert in one way or another.  
We ask observers to “Tell Us What You Know”...



# Sample Condition Monitoring Reports



- **November 23, 2013**

- Rain today, finally seeing an easing up of dry conditions. Some of the trees show stress. The leaves on the end of the branches are a different color than the leaves closer to the trunk. Crops are doing ok though.

- **December 4, 2013**

- Very dry, humidity is low for our area, creating sinus problems. Ground moisture is two to three inches dry. Ground water at shallow well depth seems to be plentiful. However, iron content seems to be higher.  
(NAC1402PPM)

- **December 9, 2013**

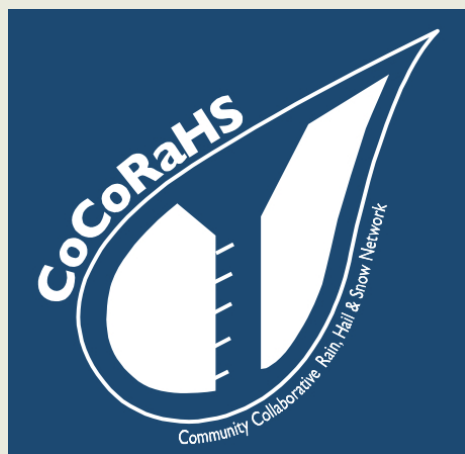
- 0.71" rainfall this past week along with the 1.20" rainfall the previous week has eased the dry period somewhat. Lagoon levels are back to 1-2" within the top of the drainage grates. Additionally, foggy mornings have helped retain moisture overnight.



# Participating Groups



- Current CoCoRaHS Observers
- Master Naturalists/Master Gardeners
- 2014 – North Carolina Citizen Science Groups



# Communications & Outreach



- In-person trainings with Master Naturalists
- Webinars with current CoCoRaHS observers
- Training and informational materials
- Ongoing communications with participants
  - Cuckoo for CoCoRaHS in the Carolinas blog
    - ✦ <https://carolinascocorahs.blogspot.com/>
  - Newsletter
  - Thank You postcards
- CISA Team CoCoRaHS Gauge



# Citizen Science Evaluation Component



- Are citizen scientist the best providers for this information?
- Connecting the information with decision makers

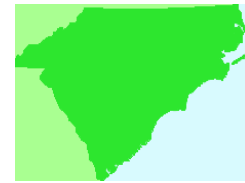
# General Citizen Science Engagement ?'s



- Why do certain groups or individuals participate in citizen science?
- What differences, if any, are there in interpretation and documentation of environmental phenomenon?
- What motivates participation among various groups, including those that have been historically underrepresented in citizen science efforts?



# ?’s about using citizen science to collect drought impacts information



- How effective is CoCoRaHS-citizen science as a tool to expand and inform drought impact reporting and monitoring efforts?
- How effective is CoCoRaHS-citizen science as a tool to improve understanding of drought impacts?
- Is information collected by CoCoRaHS observers considered credible, legitimate information by decision makers and resource managers?

# Audience Polling Question



Does your agency use drought impacts data collected through citizen science or similar efforts?

(e.g. CoCoRaHS reports, National Drought Impacts Reporter information)

1. Yes
2. Not currently - but there may be potential
3. No - this type of information is not useful for my agency
4. Undecided, not sure

# Thank You!



## QUESTIONS OR COMMENTS?



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