

**Drought and Aquatic Ecosystems in the Southeast U.S.**  
**Informing drought response and ecological resilience to future low-flow events**

Raleigh, North Carolina | January 7 - 8, 2025

*Public Agenda: FINAL REVISED 12/31/24*

**Location:** Plant Sciences Building, North Carolina State University, 840 Oval Dr

<b>Day 1 - Tuesday, January 7</b>	
<b>Understanding drought/low-flow ecosystem impacts and response in the context of the Southeast</b>	
8:00 - 8:30	Registration, coffee and conversation
8:30 - 9:00	Welcome, meeting overview, and introductions
<p><b>Session 1. Setting the stage: Drought and Water Trends in the Southeast</b>            This session will set the stage for the entire workshop by providing an overview of hydro-climate trends and drought in the Southeast.  <i>Moderator: Meredith Muth, NOAA National Integrated Drought Information System (NIDIS)</i>  <i>*Virtual participation available</i></p>	
9:00 - 10:00	Presentations on drought and water trends <ul style="list-style-type: none"> <li>● Perspectives on drought impacts. <i>Jeff Lineberger, Duke Energy</i></li> <li>● Precipitation and droughts in the Southeast. <i>Lee Ellenburg, Alabama State Climate Office, University of Alabama at Huntsville</i></li> <li>● Historical flow trends and the future of water science needs. <i>Caleb Mitchell, U.S. Geological Survey (USGS) South Atlantic Water Science Center</i></li> <li>● Discussion and Q&amp;A</li> </ul>
10:00 - 10:20	Break ( <i>beverages and snacks provided</i> )
<p><b>Session 2: Impacts of low-flow conditions on Southeast aquatic species and habitats</b>            This session will provide an overview of how aquatic species and ecosystems are impacted by drought and low-flow conditions.  <i>Moderator: Corey Dunn, USGS North Carolina Cooperative Fish and Wildlife Research Unit and NC State University</i>  <i>*Virtual participation available</i></p>	
10:20 - 11:40	Panel discussion with insights from natural resource managers working with threatened and endangered species (freshwater fish, macroinvertebrates), recreational fishing and hatcheries, habitat conservation and restoration, and estuarine and coastal systems. <ul style="list-style-type: none"> <li>● Jennifer Archambault, <i>U.S. Fish and Wildlife Service</i></li> <li>● Dan Magoulick, <i>USGS/University of Arkansas</i></li> </ul>

	<ul style="list-style-type: none"> <li>● Rainee Tetreault, <i>Eastern Band of Cherokee Indians</i></li> <li>● Seth Wenger, <i>University of Georgia</i></li> <li>● Mike Osland, <i>USGS Wetland &amp; Aquatic Research Center</i></li> </ul>
11:40 - 11:50	Group photo
11:50 - 12:40	Lunch on-site ( <i>provided</i> )
<p><b>Session 3: Understanding water management in low-flow conditions</b></p> <p>This session will provide an overview of the U.S. Army Corps operations and environmental considerations across the region, and highlight emerging partnerships to address aquatic ecosystem needs in the context of water management operations.</p> <p><i>Moderator: Todd Hamill, National Weather Service (NWS) Southeast River Forecasting Center (SERFC)</i></p> <p><i>*Virtual participation available</i></p>	
12:40 - 1:40	<p>Presentations on regional and basin level water management practices</p> <ul style="list-style-type: none"> <li>● Overview of the U.S. Army Corps of Engineers operations during low flow conditions in the Southeast. <i>Matthew Parrish, USACE South Atlantic Division</i></li> <li>● Basin level response: Case study from the Apalachicola - Chattahoochee - Flint (ACF) River Basin. <i>Troy Ephriam, USACE Mobile District</i></li> <li>● Sustainable Rivers Program at Jordan Lake. <i>Ashley Hatchell, USACE Wilmington District</i></li> <li>● Discussion and Q&amp;A</li> </ul>
<p><b>Session 5: Response during low-flow conditions and incorporating ecological needs into decisions</b></p> <p>This session will increase our understanding of how water managers and natural resource managers monitor and respond during a drought, and will provide examples of effective practices for incorporating ecological needs into decision making during low-flow conditions.</p> <p><i>Moderator: Barrett Smith, National Weather Service (NWS), Raleigh Weather Forecast Office</i></p> <p><i>*Virtual participation available</i></p>	
1:40 - 3:00	<p>Panel on low-flow response</p> <ul style="list-style-type: none"> <li>● Wei Zeng, <i>Georgia Department of Natural Resources</i></li> <li>● Jennifer Sharkey, <i>Tennessee Valley Authority</i></li> <li>● Harold Brady, <i>North Carolina Department of Environmental Quality</i></li> <li>● Bernie Kuhajda, <i>Tennessee Aquarium Conservation Institute</i></li> <li>● Sonia Mumford, <i>U.S. Fish and Wildlife Service</i></li> </ul>
3:00 - 3:20	Break ( <i>beverages and snacks provided</i> )
<p><b>Session 4: Integrating Science and Management Needs for Drought in Aquatic Systems</b></p> <p>This session will focus on drought and low-flow in the context of integrating science and management, understanding how drought is perceived and monitored for natural resource management, and identifying information to help prepare and respond to droughts.</p>	

<p>Moderator: Kasia Nikiel, ORISE / USGS Southeast Climate Adaptation Science Center (SE CASC)</p> <p><i>*Virtual participation available for presentations segment only</i></p>	
3:20 - 3:50	<p>Presentations on low-flow science and management needs</p> <ul style="list-style-type: none"> <li>● Building Flow-Ecology Relationships. <i>Daren Carlisle, USGS Water Resources Mission Area</i></li> <li>● Defining and applying ecologically based low flow thresholds in a management context. <i>Laura Rack, University of Georgia</i></li> </ul>
3:50 - 4:50	<p>Breakout Discussions</p> <ul style="list-style-type: none"> <li>● Coastal Estuary</li> <li>● Coastal Wetland</li> <li>● Inland Wetland</li> <li>● Forested Riverine</li> <li>● Mountain Riverine</li> <li>● Lowland Riverine</li> <li>● Urban/Working</li> </ul>
4:50 - 5:00	Day 1 wrap up
5:00 - 7:00	<b>Poster session + networking event</b> ( <i>on site, light snacks provided, beer and wine for purchase</i> )
<p><b>Day 2 - Wednesday, January 8</b></p> <p><b>Incorporating drought/low-flow in planning and preparedness</b></p>	
8:00 - 8:30	Graduate student & early career networking breakfast ( <i>invitation only</i> )
8:00 - 8:30	Coffee and conversations
8:30 - 8:40	Welcome
<p><b>Session 8: Moving forward: Applying what we learned and where we need to go for drought preparedness and response</b></p> <p>This session will provide an opportunity for breakout groups to continue conversations started the previous day and identify needs, barriers and opportunities to improve drought preparedness and response.</p> <p>Moderator: Kasia Nikiel, ORISE / USGS Southeast Climate Adaptation Science Center</p> <p><i>*NO virtual participation available for this session</i></p>	
8:40 - 10:20	<p>The goal for this breakout is to document needs, gaps and opportunities in actions during a drought.</p> <ul style="list-style-type: none"> <li>● Coastal Estuary</li> <li>● Coastal Wetland</li> </ul>

	<ul style="list-style-type: none"> <li>• Inland Wetland</li> <li>• Forested Riverine</li> <li>• Mountain Riverine</li> <li>• Lowland Riverine</li> <li>• Urban/Working</li> </ul>
10:20 - 10:40	Break ( <i>beverages and snacks provided</i> )
<p><b>Session 6: Case studies on collaborative planning and management</b></p> <p>This session will highlight specific approaches and solutions towards addressing challenges of balancing water demand and ecosystem health during low-flow events, and lessons learned that can be applied across the region with a focus on connecting science, policy, and stakeholder engagement.</p> <p><i>Moderator: Rachel McGuire, The Jones Center at Ichauway</i></p> <p><i>*Virtual participation available</i></p>	
10:40 - 11:40	<p>Panel discussion with two initiatives: The Everglades Restoration and the Georgia Flow Incentive Trust (GA-FIT)</p> <ul style="list-style-type: none"> <li>• <i>Steve Golladay, Georgia Water Planning and Policy Center and the Jones Center at Ichauway</i></li> <li>• <i>Mark Masters, Georgia Water Planning and Policy Center</i></li> <li>• <i>Anna Truszczynski, Georgia Environmental Protection Division</i></li> <li>• <i>Amanda Kahn, South Florida Water Management District</i></li> <li>• <i>Walter Wilcox, South Florida Water Management District</i></li> </ul>
<p><b>Session 7: Tools and resources that can be applied in the Southeast</b></p> <p>This session will focus on how we can better use what we have available in the Southeast, through increased awareness and hands-on application of existing tools and resources. Organizations will share data, projects, and opportunities for collaboration and technical support.</p> <p><i>Moderator: Meredith Muth, NOAA National Integrated Drought Information System (NIDIS)</i></p> <p><i>*Virtual participation available for presentations segment only</i></p>	
11:40 - 12:00	Demonstration of Streamflow Drought Prediction Tool, <i>John Hammond, USGS MD-DE-DC Water Science Center</i>
12:00 - 12:45	Tool and Resource Fair
12:45 - 1:30	Lunch on-site ( <i>provided</i> )
<p><b>Session 10: Applications of Future Low-Flow Models in the Southeast</b></p> <p>This session will showcase examples of how future flow projections are currently being developed and used across the Southeast. Presentations will also address the assumptions and data limitations that exist in their development and application.</p> <p><i>Moderator: Beth Stys, U.S. Fish and Wildlife Service</i></p> <p><i>*Virtual participation available</i></p>	
1:30 - 2:30 PM	Presentations

	<ul style="list-style-type: none"> <li>• What do we know and not know about the future of water in the Southeast? <i>Kasia Nikiel, ORISE / USGS Southeast Climate Adaptation Science Center</i></li> <li>• Drought impacts on Chesapeake Bay Ecological Communities. <i>Taylor Woods, USGS Eastern Ecological Science Center</i></li> <li>• Modeling Flow-Ecology Changes in South Carolina and across the region. <i>Michele Eddy, RTI International</i></li> <li>• Discussion and Q&amp;A</li> </ul>
2:30 - 2:50	Break ( <i>beverages and snacks provided</i> )
<p><b>Session 11: Working towards aquatic resilience and adaptation to future low-flow events</b>  This panel session will highlight case studies, strategies, actions and approaches being utilized to plan for future drought and low-flow events in aquatic systems.  <i>Moderator: Katherine Smith, USGS Southeast Climate Adaptation Science Center</i>  *Virtual participation available</p>	
2:50 - 3:50	Panel discussion <ul style="list-style-type: none"> <li>• Robert Burgholzer, <i>Virginia Department of Environmental Quality</i></li> <li>• Eric Krueger, <i>The Nature Conservancy</i></li> <li>• Erin Rivenbark, <i>U.S. Fish and Wildlife Service</i></li> <li>• Dave Penrose, <i>Penrose Environmental Consulting LLC</i></li> <li>• Zack Edwards, <i>Working Lands for Wildlife</i></li> </ul>
<p><b>Session 12: Science needs for incorporating drought into long term adaptation planning</b>  This session will discuss how drought is being considered in long term adaptation planning (years to decades) for ecosystems, what tools and approaches could be applied, and what gaps exist that need to be addressed.  <i>Moderator: Katherine Smith and Kasia Nikiel, USGS Southeast Climate Adaptation Science Center</i>  *NO virtual participation available for this session</p>	
3:50 - 4:50	Breakout working groups, using a World Cafe Table approach, to capture what has been discussed over the previous sessions and document areas where more science is needed. <ol style="list-style-type: none"> <li>1. Species Management</li> <li>2. Hydrologic Data Collection and Delivery</li> <li>3. Conservation and Restoration</li> <li>4. Water Quality</li> <li>5. Ecological Modeling</li> <li>6. Hydrologic Modeling</li> <li>7. Climate Information and Projections</li> </ol>
4:50 - 5:00	Closing remarks, end of workshop, and safe travels!
5:30 - 7:30	Networking Event ( <i>Tin Roof, downtown Raleigh - 300 Glenwood Ave, Raleigh, NC 27603 - light appetizers provided</i> )