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 - 9, 2025

Draft Public Agenda: Updated December 11, 2024

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

Day 1 - Tuesday, January 7 **Understanding drought/low-flow ecosystem impacts and water resource management in the context of the Southeast**	
8:00 - 9:00	Registration, coffee and conversation
9:00 - 9:20	Welcome, meeting overview, and introductions
Session 1. Setting the stage: Drought and Water Trends in the Southeast This session will set the stage for the entire workshop by providing an overview of hydro-climate trends and drought in the Southeast. *Moderator: Meredith Muth, NOAA National Integrated Drought Information System (NIDIS)* **Virtual participation available*	
9:20 - 10:20	Presentations on drought and water trends ● Perspectives on drought impacts. *Jeff Lineberger, Duke Energy* ● Precipitation and Droughts in the Southeast. *Lee Ellenburg, Alabama State Climate Office, University of Alabama at Huntsville* ● Historical flow trends and the future of water science needs in the region. *Caleb Mitchell, U.S. Geological Survey (USGS) South Atlantic Water Science Center (SAWSC)* ● Discussion and Q&A
10:20 - 10:30	Review workshop agenda
10:30 - 10:50	Break (*beverages and snacks provided*)
Session 2: Impacts of low-flow conditions on Southeast aquatic species and habitats This session will provide an overview of how aquatic species and ecosystems are impacted by drought and low-flow conditions. *Moderator: Corey Dunn, U.S. Geological Survey (USGS) North Carolina Cooperative Fish and Wildlife Research Unit and NC State University* **Virtual participation available*	

10:50 - 12:30	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. ● Jennifer Archambault, U.S. Fish and Wildlife Service ● Dan Magoulick, U.S. Geological Survey/University of Arkansas ● Mike LaVoie, Eastern Band of Cherokee Indians, Natural Resource Department ● Seth Wenger, University of Georgia ● Mike Osland, U.S. Geological Survey (USGS) Wetland & Aquatic Research Center, Lafayette, LA
12:30 - 12:40	Group photo
12:40 - 1:30	Lunch on-site *(provided*)
Session 3: Understanding water management in low-flow conditions 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. *Moderator: Todd Hamill, NWS River Forecast Center* **Virtual participation available*	
1:30 - 3:00	Presentations on regional and basin level water management practices ● Overview of the U.S. Army Corps of Engineers operations during low flow conditions in the Southeast. *Matthew Parrish, USACE South Atlantic Division* ● Basin level response: Case study from the Apalachicola - Chattahoochee - Flint (ACF) River Basin. *Troy Ephriam, USACE Mobile District* ● Sustainable Rivers Program at Jordan Lake. *Ashley Hatchell, USACE Wilmington District* ● Discussion and Q&A
3:00 - 3:20	Break (*beverages and snacks provided*)
Session 4: Integrating Science and Management Needs for Drought in Aquatic Systems 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. *Moderator: Kasia Nikiel, USGS Southeast Climate Adaptation Science Center (SE CASC)* **Virtual participation available for presentations segment only*	
3:20 - 3:40	Presentations on low-flow science and management needs ● Building Flow-Ecology Relationships. *Daren Carlisle, U.S. Geological*

	Survey (USGS) Water Resources Mission Area ● Defining and applying ecologically based low flow thresholds in a management context. *Laura Rack, University of Georgia*
3:20 - 4:50	Breakout Discussions 1. Threatened and endangered species - macroinvertebrates 2. Threatened and endangered species - fish 3. Native and common species 4. Invasive species 5. Recreational fishing and hatcheries 6. Habitat land conservation 7. Estuary and coastal systems 8. Inland freshwater wetlands and peatlands
4:50 - 5:00	Day 1 wrap up
5:00 - 7:00	**Poster session + reception (*on site*)**
Day 2 - Wednesday, January 8 **Ecological Drought Monitoring and Response in the Near-Term**	
8:00 - 9:00	Graduate student & early career networking breakfast *(invitation only)*
8:30 - 9:00	Coffee and conversations
Session 5: Response during low-flow conditions and incorporating ecological needs into decisions 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. *Moderator: Barrett Smith, NWS Raleigh Weather Forecast Office* **Virtual participation available*	
9:00 - 9:10	Welcome and review of day
9:10 - 10:40	Panel on low-flow response ● Wei Zang, Georgia Environmental Protection Division ● Jennifer Sharkey, Tennessee Valley Authority ● Harold Brady, North Carolina Department of Environmental Quality ● Bernie Kuhajda, Tennessee Aquarium Conservation Institute ● Sonia Mumford, U.S. Fish and Wildlife Service, Edenton National Fish Hatchery
10:40 - 11:00	Break (*beverages and snacks provided*)

Session 6: Case studies on collaborative planning and management 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. *Moderator: Rachel McGuire, The Jones Center at Ichuaway* **Virtual participation available*	
11:00 - 12:15	Panel discussion with two initiatives: The Everglades Restoration and the Georgia Flow Incentive Trust (GA-FIT) ● Steve Golladay, Georgia Water Planning and Policy Center and the Jones Center at Ichauway ● Mark Masters, Georgia Water Planning and Policy Center ● Lori Miller, National Wildlife Refuge System, U.S. Fish and Wildlife Service ● Amanda Kahn, South Florida Water Management District ● Walter Wilcox, South Florida Water Management District
12:15 - 1:15	Lunch on-site (*provided*)
Session 7: Tools and resources that can be applied in the Southeast 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. *Moderator: Meredith Muth, NOAA National Integrated Drought Information System* **Virtual participation available for presentations segment only*	
1:15 - 1:45	Demonstrations of two region-wide tools ● Streamflow Drought Prediction Tool, J*ohn Hammond, U.S. Geological Survey (USGS) MD-DE-DC Water Science Center* ● U.S. Drought Portal (Drought.gov). *Meredith Muth, NOAA NIDIS*
1:45 - 2:45	Tool and Resource Fair
2:45 - 3:05	Break (*beverages and snacks provided*)
Session 8: Moving forward: Applying what we learned and where we need to go for drought preparedness and response 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. *Moderator: Meredith Muth, NOAA National Integrated Drought Information System* **NO virtual participation available for this session*	

3:20 - 4:50	The goal for this breakout is to document needs, gaps and opportunities in actions during a drought. 1. Threatened and endangered species - macroinvertebrates 2. Threatened and endangered species - fish 3. Native and common species 4. Invasive species 5. Recreational fishing and hatcheries 6. Habitat land conservation 7. Estuary and coastal systems 8. Inland freshwater wetlands and peatlands
4:50 - 5:00	Day 2 wrap up
5:30 - 7:30	Social gathering (*Tin Roof, downtown Raleigh, light appetizers provided)*
Day 3 - Thursday, January 9 **Incorporating drought/low-flow in long-term resilience and adaptation planning.**	
8:30-9:00	Coffee and conversation
Session 9: The Future of Water in the Southeast This session will lay the groundwork for projected hydroclimate changes in the Southeastern U.S. under future climate and development scenarios and highlight interpretation and application challenges. *Moderator: Katherine Smith, USGS Southeast Climate Adaptation Science Center* **Virtual participation available*	
9:00 - 9:10	Welcome and review of day
9:10 - 9:30	Plenary presentation ● What do we know and not know about the future of water in the Southeast? *Kasia Nikiel, ORISE, USGS Southeast Climate Adaptation Science Center (SE CASC)*
Session 10: Applications of Future Low-Flow Models in the Southeast 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. *Moderator: Beth Stys, U.S. Fish and Wildlife Service* **Virtual participation available*	
9:30 - 10:30	Presentations ● PRMS Application Example for CAP: Future of Aquatic Flows Project. *Charlotte Lee, USDA Climate Hubs*

	• Drought impacts on Chesapeake Bay Ecological Communities. *Taylor Woods, U.S. Geological Survey (USGS) Eastern Ecological Science Center* • Modeling Flow-Ecology Changes in South Carolina and across the region. *Michele Eddy, RTI International* • Discussion and Q&A
10:30 - 11:00	Break + early lunch on-site (*box lunches provided*)
Session 11: Working towards aquatic resilience and adaptation to future low-flow events This panel session will highlight case studies, strategies, actions and approaches being utilized to plan for future low-flow events in aquatic systems. *Moderator: Ben Emanuel, American Rivers* **Virtual participation available*	
11:15 - 12:15	Panel discussion • Robert Burgholzer, Virginia Department of Environmental Quality • Eric Krueger, The Nature Conservancy • Erin Rivenbark, U.S. Fish and Wildlife Service • Carolyn Lanza, Wildlands Engineering, Inc • Working Lands for Wildlife
Session 12: Science Needs for Incorporating Drought into Long Term Adaptation Planning 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. *Moderator: Katherine Smith and Kasia Nikiel, USGS SE CASC* **NO virtual participation available for this session*	
12:15 - 1:45	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. 1. Species Status Assessments/Species Management 2. Evaluation and Synthesis 3. Humans vs. Environment 4. Modeling, Data Collection, and Delivery 5. Aquatic Connectivity 6. Landscape Scale Change 7. Communication 8. Water Quality
1:45 - 2:00	Closing remarks, end of workshop, and safe travels!
2:30 - 4:30	**Optional Field Trips** (transportation provided, pre-registration required) • Jordan Lake Dam • Yates Mills Aquatic Conservation Center