

NORTH CAROLINA EMERGENCY OPERATIONS PLAN (NCEOP)  
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**DROUGHT ASSESSMENT AND RESPONSE PLAN**  
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**I. INTRODUCTION**

**A. PURPOSE**

This appendix outlines the coordinating actions taken by the State Emergency Response Team (SERT) when significant drought conditions impact North Carolina.

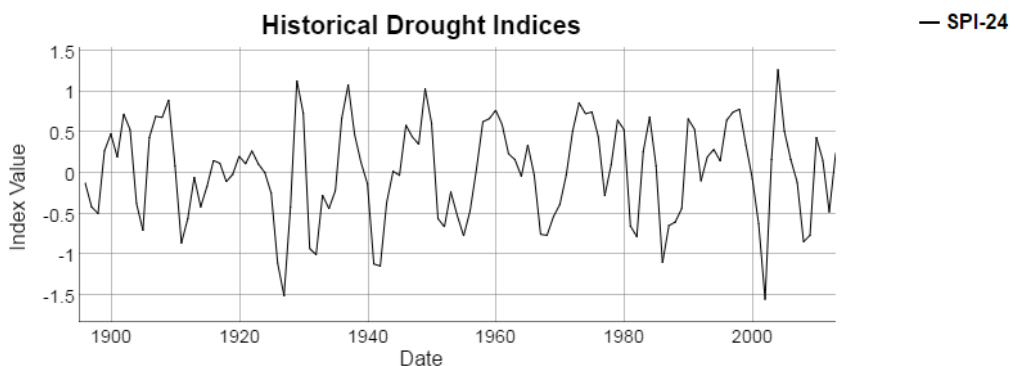
**B. SCOPE**

This appendix includes the anticipated actions of the Federal, State and local agencies, as well as private sector organizations.

**II. SITUATION AND ASSUMPTIONS**

**A. SITUATION**

Drought is a broad term to describe below normal precipitation or abnormally dry conditions. Historically, North Carolina experiences drought conditions every few years with a significant drought occurring every 10-20 years (Fig. 1).



**Figure 1:** Example 24-Month Standardized Precipitation Index over a period of approximately 120 years. This index roughly depicts periods of drought vs periods of above normal precipitation. The values can range from 2 to -2, with negative values indicating drought conditions. This graph shows that drought is a cyclic process occurring at regular intervals through the period of record. (North Carolina State Climate Office)

The timeframe and duration of drought, as well as the effects on different sectors, result in a series of more specific impacts across North Carolina. Generally speaking, there are four definitions of drought. Meteorological drought is defined as below normal precipitation at a given location for a specified amount of time. Since North Carolina has several regions and

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associated climates, conditions that are considered below normal differs by region. Agricultural drought is defined as insufficient moisture (typically soil moisture) to support the needs of crops during the growing season.

This type of drought is highly dependent on the type of plant and available water supplies from lakes or groundwater. Hydrological drought refers to reduced water flow in streams, low lake levels, or limited groundwater due to the accumulated effects of drought over a period of months or years. Socioeconomic drought refers to the combined effects of human demand for water and reduced water supply due to drought. This is typically the result of the other three drought definitions accumulated over time and may include increased food costs, reduced water quality and ultimately an impact on the economy of North Carolina.

The North Carolina Drought Management Advisory Council (DMAC) was created in 2003 under North Carolina General Statute 143.355.1. It is an interagency organization responsible for issuing drought advisories based on technical data to address varying conditions throughout the State. The drought advisories provide accurate and consistent information to assist local governments and other water users in taking appropriate drought response actions in specific areas of the State that are exhibiting impending or existing drought conditions.

**B. ASSUMPTIONS**

1. Statewide impacts from a severe drought have occurred across North Carolina, resulting in significant effects.
2. Crops have been severely impacted. Many are wilted or withered and a large amount of the harvestable plants are lost. Grasslands used for pasture land or hay have stunted in growth or are overgrazed and cannot support livestock without supplemental feed.
3. Natural vegetation has become dry, enhancing the risk of wildfires that spread rapidly. Major wildland forest fires can occur over several locations causing a strain on firefighting resources. The North Carolina Forest Service will ban open burning when there is an increased fire weather risk.
4. Drinking water supplies are dangerously low. This may include dry wells due to low groundwater or low lake and river levels.
5. Due to the reduced water supplies, water quality is becoming poor. People are becoming sick and water may be unpotable in some cases.

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6. With a long term drought, State revenue is down and the economy is hurt due to a combination of reasons. These may include, low crop yields, increasing food costs, increasing water costs, reduced tourism due to low water at recreation areas, etc.
7. Emergency transportation of resources (inbound response and outbound disposal) may require permits, licenses, or exemptions.
8. Less-impactful droughts may only require partial activation of this appendix and may involve coordination between NCEM and other supporting State agencies.

**III. ORGANIZATION AND ASSIGNMENT OF RESPONSIBILITIES**

**A. LEAD STATE AGENCY**

**1. NC DEPARTMENT OF PUBLIC SAFETY (NCDPS)**

**NORTH CAROLINA EMERGENCY MANAGEMENT (NCEM)**

- a. Support local government efforts during drought emergencies and to coordinate State and Federal emergency activities.

**B. LEAD TECHNICAL AGENCY**

**1. NC DEPARTMENT OF ENVIRONMENTAL QUALITY (NCDEQ)**

- a. Serve as the lead agency for the North Carolina Drought Management Advisory Council (DMAC) and designates an employee of the department to serve as chair of the DMAC.
- b. Monitor municipal water/sewer systems, water sources, and assist with water system leak detection.

**C. SUPPORTING AGENCIES**

**1. NORTH CAROLINA DROUGHT MANAGEMENT ADVISORY COUNCIL (DMAC)**

- a. Organizations currently serving on DMAC:
  - o NC Division of Environmental Quality (chair)
  - o NC Cooperative Extension Service
  - o State Climate Office of North Carolina State University

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- NC Public Staff of the Utilities Commission
- NC Wildlife Resources Commission
- NC Department of Agriculture and Consumer Services
- NC Department of Commerce
- NC Department of Public Safety
- US National Weather Service, NOAA
- US Geological Survey
- US Army Corp of Engineers
- US Department of Agriculture
- Federal Emergency Management Agency

- b. Makes water resource assessments and projections.
- c. Selects or develops specific formats for routine and special reports regarding water resources.
- d. Identifies need for additional water supply information.
- e. Compiles all assessments of water resource capability to withstand drought impact.

### **2. NC DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES (NCDA&CS)**

- a. Promote water conservation measures for agriculture.
- b. Interface with Federal agriculture agencies and lead disaster/emergency assistance for crop owners.
- c. Fire suppression of wildlands and grasslands.

### **3. PUBLIC STAFF OF THE NC UTILITIES COMMISSION**

- a. Monitor utility impacts and potential energy loss.

### **4. NC DEPARTMENT OF INSURANCE (NCDOI)**

- a. Ensure water resources for firefighting.

### **5. NC DEPARTMENT OF HEALTH AND HUMAN SERVICES (NCDHHS)**

- a. Coordinate well water testing for contaminants.
- b. Monitor the impact of water shortages on public health.

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**IV. CONCEPT OF OPERATIONS**

**A. GENERAL**

A Drought Response Plan specific to North Carolina has been developed to provide a system for assessing a drought cycle's progress and for determining when to institute a formal drought response. This plan enhances North Carolina's ability to apply limited resources and reduce the effects of drought.

Drought conditions may be monitored through the US Drought Monitor via the North Carolina DMAC website or the National Drought Mitigation Center website. This tool outlines drought categories that define the severity of the drought. Categories include Abnormally Dry, Moderate, Severe, Extreme and Exceptional drought. These categories are determined based off a combination of factors including stream flows, amount of water stored in reservoirs, groundwater levels, agricultural information, forestry sensors, weather forecasts, and time of year. The North Carolina DMAC may declare drought conditions not necessarily based on the US Drought Monitor.

**B. RESPONSE ACTIONS**

The North Carolina DMAC assesses drought conditions on a weekly basis using input on the status of water resources across the State from the technical organizations described above. Each drought category may require a different level of response as described in Tab A, Sequence of Drought Actions.

In the event the Governor declares an extreme water supply emergency, the Environmental Management Commission (EMC) under NC General Statute 143 may authorize "any county, city, or town, in which an emergency has been declared to divert water in the emergency area sufficient to take care of the needs of human consumption, necessary sanitation and public safety", and "to make such reasonable rules and regulations governing the conservation and use of diverted waters...". The NC Department of Environmental Quality, Division of Water Resources, in representing the Commission, monitors existing raw water supplies and identifies alternate/emergency sources and evaluates system operations.

This plan is anticipated for use only when the Governor declares a State of Emergency as a result of drought. Local municipalities may enact their own plans which may require reporting on their water supplies, as well as implement voluntary or mandatory water restrictions during times of extreme

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drought.

**1. INITIAL**

- a. North Carolina uses a dual system of assessment and response to deal effectively with drought.
- b. The assessment system calls for representatives from State and Federal agencies to form task forces that can rapidly evaluate and assess water availability and drought impacts and disseminate the information.
- c. Task forces are designed to assess the range of needs that can result from drought.
- d. Task forces are generally chaired by a middle or senior level management employee in the responsible State agency.

These task forces will make assessments on various sectors of North Carolina and will report them to the North Carolina DMAC, the SERT and other State agencies as appropriate. The findings and recommendations of the task forces are assimilated into the overall State drought assessment and are intended to assure effective response capabilities, as well as to provide documentation for any emergency declaration. The task forces do not become involved in the response of various agencies to a declared drought emergency nor do they have authority over its member agencies. These task forces will meet according to a schedule established by its chairperson (from the lead agency) and terminate activities based on the sequence of drought actions (Tab A) and in coordination with the DMAC.

Agriculture Task Force:

This task force will monitor the State's agriculture industry. The NC Department of Agriculture and Consumer Services is the lead agency and, in conjunction with the DMAC, is responsible for activating this task force. Members of this task force also include (but not limited to) the US Department of Agriculture State Emergency Board, Small Business Administration, North Carolina Forest Service, Division of Water Resources, and North Carolina Cooperative Extension Service. The response actions of the Agriculture Drought Task Force include:

- a. Review and update guidelines and procedures for drought response.
- b. Assess current and potential agricultural drought severity.

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- c. Evaluate impact data. Assessments will detail crop and livestock loss, soil erosion, and insect/pest problems.
- d. Develop action plan for drought response with ESF-11 partners.
- e. Identify potential sources for drought assistance.
- f. Recommend SERT response levels and activities.
- g. Prepare agricultural assessment reports for the DMAC and the SERT.
- h. Formulate guidance, recommendations, and information through approved channels to SERT partners, industry leaders, and agriculture producers.
- i. Maintain supporting data and records of activities.

**Agriculture Task Force Recovery Actions:**

- a. Evaluate and amend action plan for drought response with ESF-11 partners as events and circumstances change.
- b. Update inventory and maintain information on special resources with cost data and procedures for activation.
- c. Create, sustain and distribute contact information of support service agencies and agricultural industries stakeholders, agencies, personnel and resources for drought response.
- d. Issue guidance, recommendations, and information through approved channels to SERT partners, industry leaders, and agriculture producers of appropriate and available response actions.
- e. Develop and distribute projections of drought impacts on the agricultural economy.
- f. Issue regular and special reports to the North Carolina DMAC, the SERT and other government agencies as appropriate.
- g. Analyzing and identifying procedures for coordinating with other drought task forces.

**Economic Impact Task Force:**

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This task force is created to monitor the impact of the drought on the State's economy. The task force will identify the potential impacts of drought and track their occurrence and intensity. The Department of Commerce is the lead agency and, in conjunction with the DMAC, is responsible for activating this task force. Members of this task force also include (but not limited to) the Department of Revenue, Division of Social Services, Department of Labor, Department of Agriculture and Consumer Services, and Council of Governments. The response actions of the Economic Task Force include:

- a. Study the feasibility and enlist involvement of appropriate individuals concerned with the use of economic simulation models to project drought related economic impacts on a regional and statewide basis.
- b. Identify actual and potential economic impacts in regions of the State identified by other task forces as most likely to be affected by drought.

### Economic Impact Task Force Recovery Actions:

- a. Identify assessment resource shortfalls and necessary tools for effective assessment procedures and take action to meet these assessment needs. Assessments should also include loss of sales tax revenues, increase in unemployment, and decreases in tourism levels and lodging receipts. Assessments should identify major commercial and industrial problem areas.
- b. Provide recommendations for mitigation and response to actual and potential economic drought impacts.
- c. Prepare regular and special reports for the North Carolina DMAC, the SERT, and other government agencies as appropriate.

### Energy Loss Task Force:

This task force will assess the impact on the capability to meet energy needs—specifically in those areas of the State that depend on generation of hydroelectric power. The Department of Environmental Quality, Division of Energy, Mineral, and Land Resources is the lead agency and, in conjunction with the DMAC, is responsible for activating this task force as necessary during periods of drought. Members of this task force also include (but not limited to) North Carolina Utilities Commission and Division of Water Resources. The response actions of the Energy Loss Task Force include:

- a. Contact and coordinate with appropriate utilities to provide a continuing assessment of all impacts on the energy operating system.



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- b. Identify, outline, and determine impacts resulting from loss of adequate water levels. Assessments include total energy loss attributable to drought. Assessments will include an evaluation of water shortage impacts on electrical power generation, as well as identification of other major potential problem areas.
- c. Assist private and public utilities in implementing their response plans.
- d. Assess all apparent and ramifying implications pertinent to the immediate problems such as societal, social, economic, and environmental consequences of the situation.
- e. Gather information on energy loss, make impact assessments and prepare regular and special reports for the North Carolina DMAC, SERT, and other government agencies as may be required.
- f. Establish procedural tasking for the evaluation of specific hydroelectric energy loss.
- g. Exchange timely information with private and public utilities on hydroelectric energy loss assessment and response requirements.

### Energy Loss Task Force Recovery Actions:

- a. Advise and recommend courses of action in energy loss response and recovery to the DMAC and the SERT.
- b. Emphasize and suggest appropriate actions (including conservation) to the geographical area concerned.
- c. Monitor and report adverse effects of water shortage on hydroelectric plants including utility redirection of energy supply.

### Health Task Force:

This task force investigates and specifies adverse health conditions caused by water shortages during drought. The Department of Health and Human Services, Division of Public Health, is the lead agency and in conjunction with the DMAC is responsible for activating this task force. Members of this task force also include (but not limited to) Division of Human Ecology and Epidemiology, Division of Food and Drug Protection, Veterinary Division, Division of Health Service Regulation, Division of Aging and Adult Services, and Division of Mental Health, Developmental Disabilities, and Substance Abuse Services. The response actions of the Health Task Force include:

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- a. Contact and coordinate with appropriate government and private agencies concerning drought related health problems.
- b. Investigate and evaluate environmental health aspects of the drought situation. Assessments will include impact of water restriction measures on community health.
- c. Investigate and evaluate epidemiological ramifications of the drought throughout the affected area.
- d. Examine the effects of water shortage on foods and drugs.
- e. Evaluate drought related veterinary health problems, particularly those associated with meat and poultry diagnostics which may pose a danger to human consumption.
- f. Evaluate and report drought effects on home health services, group care, detention centers, and medical centers.
- g. Evaluate and report the effects of drought on the aging population.
- h. Determine the requirements for mental health counseling for drought related difficulties.

### Health Task Force Recovery Actions:

- a. Assess the effects of water restriction measures on community health.
- b. Prepare reports to the North Carolina DMAC and the SERT as required.

### Water Sources Task Force:

This task force is established to investigate and specify available water sources during drought. The Department of Environmental Quality, Division of Water Resources, is the lead agency and in conjunction with the DMAC is responsible for activating this task force. Members of this task force also include (but not limited to) Division of Water Quality, Division of Soil and Water Conservation, Division of Emergency Management, North Carolina State Extension Service, North Carolina Department of Agriculture and Consumer Services. The response actions of the Water Sources Task Force include:

- a. Identify and locate alternative water sources within the drought afflicted areas.
- b. Identify water conservation measures to minimize water consumption

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and extend available resources.

- c. Monitor water supply and demand to make recommendations on how to allocate existing supplies.
- d. Form special working teams as necessary.
- e. Establish procedures for evaluation of specific water resources.
- f. Provide weekly assessments of current and potential water supply.
- g. Monitor and evaluate local methods for measuring water supply and water use during water shortage conditions.
- h. Provide timely information to local officials to encourage community cooperation for water conservation.
- i. Explore and report possibilities for supplementing local water supplies.
- j. Emphasize mandatory conservation as soon as there are visible or measurable signs that water supplies are significantly lower than seasonal norms and are diminishing.
- k. Stress stringent conservation measures during water shortage emergencies.
- l. Recommend rationing only when supply is clearly inadequate to meet projected demands.

Water Sources Task Force Response Actions:

- a. Prepare reports to the North Carolina DMAC and the SERT as required.
- b. Monitor water supply conditions and the effectiveness of water conservation measures.
- c. Advise and recommend water conservation phasing to agriculture and community water supplies.
- d. Emphasize voluntary conservation when conditions indicate the potential for serious water supply shortages.

**2. CONTINUING**

- a. Upon request of the governing body of a county, city, or town, determine

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whether satisfaction of water needs for human consumption, necessary sanitation, and public safety require emergency action.

- b. Provide direction for all drought response activities within their assigned areas of responsibility using normal programs and available resources.
- c. Identify and report to the North Carolina DMAC all drought related problems and response activities.
- d. Identify and report to the State Hazard Mitigation Officer potential drought-effect mitigation measures that may be selected for funding under Section 404 of the Stafford Act (Hazard Mitigation Grant Program) in the event of a presidentially declared disaster.
- e. As emerging drought conditions are identified and assessed, impacts are reported to the State Emergency Operations Center, concerned departments of State government, and the North Carolina DMAC for further analysis and development.
- f. Response might range from media announcements to funding and allocation of resources.

**V. References:**

- A. Chapter 166A of the North Carolina General Statutes, North Carolina Emergency Management Act, as amended

**VI. TABS**

- A. Sequence of Drought Actions

## SEQUENCE OF DROUGHT ACTIONS

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The North Carolina Drought Management Advisory Council (DMAC) normally uses the US Drought Monitor and/or the Palmer Drought Severity Index to trigger a sequence of response actions (listed below) when drought occurs. The use of the US Drought Monitor and Palmer Index does not preclude use of other indices or information as appropriate to help depict drought for water supply, agriculture, or forest resources and particularly to decide when to activate Task Forces or when to request SERT activation.

<b>DMAC Determinations</b>	<b>Drought Severity</b>	<b>Actions To Be Taken</b>
Normal	Normal Conditions	Technical data is monitored periodically by the Division of Water Resources and significant information is sent to North Carolina Emergency Management (NCEM)
Drought Emerges	Normal to Dry Conditions	The Division of Water Resources monitors, maps, and discusses trend with the DMAC.
DMAC determines threshold conditions for drought have been met	Entering Phase 1 (Moderate Drought)	DMAC monitors technical data and developing trends.  DMAC begins issuing drought advisories and provides drought status information to NCEM and other State agencies.
DMAC determines drought has increased in severity.	Entering Phase 2 (Severe Drought)	DMAC may request SERT activation if drought impact requires.  DPS appoints a Joint Public Information Officer when/if SERT is activated.

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<b>DMAC Determinations</b>	<b>Drought Severity</b>	<b>Actions To Be Taken</b>
	Phase 2 (Severe Drought) Continued	<p>The assigned PIO establishes the Joint Information Center (JIC) which provides media status information.</p> <p>DMAC and/or NCEM activate appropriate task forces.</p> <p>Activated task forces make assessments of drought impact.</p> <p>If activated, the SERT provides Situation Reports as required.</p> <p>If the SERT is activated, task forces keep JIC advised of drought impacts.</p> <p>Lead agencies use available resources to undertake response actions within their normal programs.</p> <p>If activated, the SERT documents unmet needs and assigns response to appropriate lead departments.</p>

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<b>DMAC Determinations</b>	<b>Drought Severity</b>	<b>Actions To Be Taken</b>
<p>DMAC determines indicators and forecasts worsen and unmet needs prevail.</p>	<p>Entering Phase 3 (Extreme Drought)</p>	<p>The Environmental Management Commission (EMC) may take action within statutory authority as requested by the Division of Water Resources.</p> <p>Task Forces continue to make assessment reports.</p> <p>DMAC reports unmet needs to the SERT.</p> <p>The SERT determines which needs can be met by reallocation of existing resources. Those that cannot be met are forwarded to the Governor with SERT recommendations.</p>

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<b>DMAC Determinations</b>	<b>Drought Severity</b>	<b>Actions To Be Taken</b>
<p>DMAC determines indicators and forecasts worsen and unmet needs prevail.</p>	<p>Entering Phase 4 (Exceptional Drought)</p>	<p>The Environmental Management Commission (EMC) may take action within statutory authority as requested by the Division of Water Resources.</p> <p>Task Forces continue to make assessment reports.</p> <p>The SERT assembles data necessary to support a Governor’s request for a Presidential Disaster Declaration or a declaration from the US Secretary of Agriculture.</p> <p>The Governor may request a Presidential Disaster Declaration or an Agricultural Disaster Declaration from the US Secretary of Agriculture.</p> <p>A Presidential Disaster Declaration established the Director of Emergency Manage (or other designated State official) as State Coordinating Officer (SCO) for Drought.</p> <p>The State Coordinating Officer works with FEMA to secure necessary federal assistance.</p>



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<b>DMAC Determinations</b>	<b>Drought Severity</b>	<b>Actions To Be Taken</b>
The DMAC determines the drought has subsided.	Leaving Phase 4 (Exceptional Drought) and returning to Phase 3 (Extreme Drought)  Leaving Phase 4 continued	The SERT determines whether all requirements for assistance are being met within established channels.  Task forces continue to make assessments and reports.
The DMAC determines the drought has further subsided.	Leaving Phase 3 (Extreme Drought) and returning to Phase 2 (Severe Drought)	The SERT determines whether all requirements for assistance are being met within established channels.  Task forces continue to make assessments and reports.
The DMAC determines the drought has further subsided.	Leaving Phase 2 (Severe Drought) and returning to Phase 1 (Moderate Drought)	Task forces terminate activity and issue final reports.
The DMAC determines the drought has ended.	Leaving Phase 1 (Moderate Drought) and returning to Normal Conditions	DMAC returns to normal operations.  The Divisions of Water Resources and NCEM continue to monitor drought indicators.