North Carolina

Drought Management Advisory

Council

Activities Report - 2008

Oct. 1, 2008 (Revised Dec. 18, 2008)
North Carolina Division of Water Resources
Department of Environment and Natural Resources

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Introduction

This is the fourth Annual Report of the North Carolina Drought Management Advisory Council on the implementation of North Carolina General Statute 143-355.1, which created the council in 2003. The General Assembly amended the statute in 2004 adding a new section requiring an annual report: "(g) (2003-387, s. 2; 2004-195, s. 2.5)" The Council shall report on the implementation of this section to the Secretary, the Governor, and the Environmental Review Commission no later than Oct. 1 each year was added. The report shall include a review of drought advisories issued by the council and any recommendations to improve coordination among local, state, and federal agencies, public water systems and water users to improve the management and mitigation of the harmful effects of drought.

Drought Management Advisory Council

The Drought Monitoring Council was an interagency coordination and information exchange body created in 1992. The council did a credible job of monitoring and coordinating drought responses in 2002 and increased public awareness of its functions and effectiveness. The General Assembly recognized the Drought Monitoring Council's leadership and performance by giving it an official statutory base and by changing its name to Drought Management Advisory Council (DMAC), reflecting the broader role of the council, which goes beyond monitoring drought conditions.

North Carolina General Statute 143.355.1., ratified 17-July 2003, assigned the DMAC an important new role, the need for which became evident in 2002. A number of local governments indicated that it would be helpful to have official, objective drought status advisories, to give them a reliable basis for their management responses. The new statute assigned that role to the DMAC and specifies the drought advisories to be based on technical data and crafted to fit varying conditions in different parts of the state. This process avoids the problems that some states have experienced in declaring drought warnings statewide, when conditions did not warrant it in all parts of the state.

Section 1 of this act also makes drought response provisions mandatory in local government water supply plans and extends this planning responsibility to all community water systems that serve 1,000 or more connections or 3,000 or more individuals.

The intent of the statute was for the DMAC to continue with essentially the same membership and functions that the Drought Monitoring Council previously exercised, but with new statutory authority and a new responsibility for providing a system of drought advisories when needed. Most importantly, the operation of the DMAC continues the same role as the Drought Monitoring Council did in support of the North Carolina Emergency Operations Plan.

Drought Legislation, Section 16 of Session Law 2008-143

An act to improve drought preparedness and response in North Carolina as recommended by the Environmental Review Commission was signed into law by Gov. Mike Easley on July 31, 2008. Section 16 of SL 2008-143 called for minor changes in the law (2003) establishing the Drought Management Advisory Council. The law now requires that appointees to the council have expertise in water resource evaluation and management related to drought and drought

impacts. It removes language that previously allowed DENR to expand the membership of the council. DENR can invite representatives of other organizations, including water systems regulated by the NC Utilities Commission, to "participate in the work of the Council." The DMAC will provide consistent and accurate information on drought conditions in the state to the U.S. Drought Monitor, the Environmental Management Commission, the secretary of the Department of Environment and Natural Resources, the Environmental Review Commission, and the public.

In the matter of DMAC issuing drought classification and response actions by county, SL 2008-143 requires that if the U.S. Drought Monitor of North Carolina shows more than one drought designation in a county, the drought classification for the county is the highest drought designation that applies to at least twenty five percent (25%) of the land area of the county. Drought response actions are based on the drought classification for each county within a drought area that is listed each Thursday on the DMAC Web page (<www.ncdrought.org>).

The law states that the council may recommend to the secretary a drought designation for a county that is different from the designation based on the U.S. Drought Monitor of North Carolina if the depiction of drought does not accurately reflect localized conditions. In recommending a drought designation that differs from the U.S. Drought Monitor designation, the council will consider stream flows, ground water levels, the amount of water stored in reservoirs, weather forecasts, the time of year and other factors that are relevant to determining the location and severity of drought conditions.

Drought Assessment Oct. 2007 -- Oct. 2008

Since the last DMAC Annual Report (#3) in 2007, drought continued to persist and expand in North Carolina. The drought in 2007 was the worst for North Carolina since record keeping began in North Carolina in 1895. In 2007, drought conditions in the state went from normal to record drought in less than year

The year 2007 was recorded as the driest year by the National Weather Service in more than 100 years in North Carolina and was #1 in the 2007 statewide temperature ranks (Figure 1). Records were set in many areas for number of days of low humidity and number of days with temperatures above 90 F (Figure 2).

Forest landowners and many residents in wildfire-prone areas were impacted by the drought. The lack of rainfall left pine straw and other vegetation crispy and dry and fueled far more wildfires than we typically average. As a result, local firefighters and the Division of Forest Resources fought 30 percent more wildfires than North Carolina's 5,000 wildfire-a-year average. The 7,200 wildfires in 2007 burned more acreage than had burned in any year during the last two decades.

Figure 1 - January-December 2007 Statewide Temp Ranks

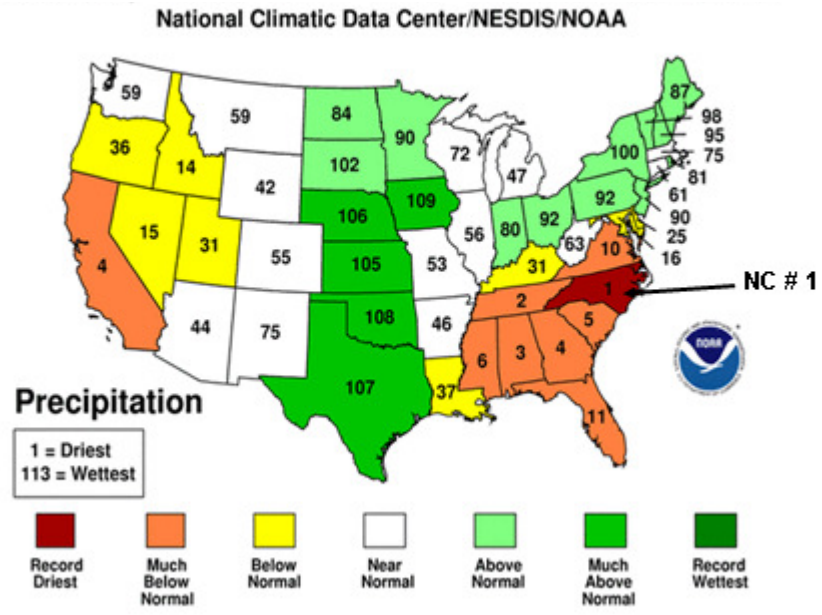
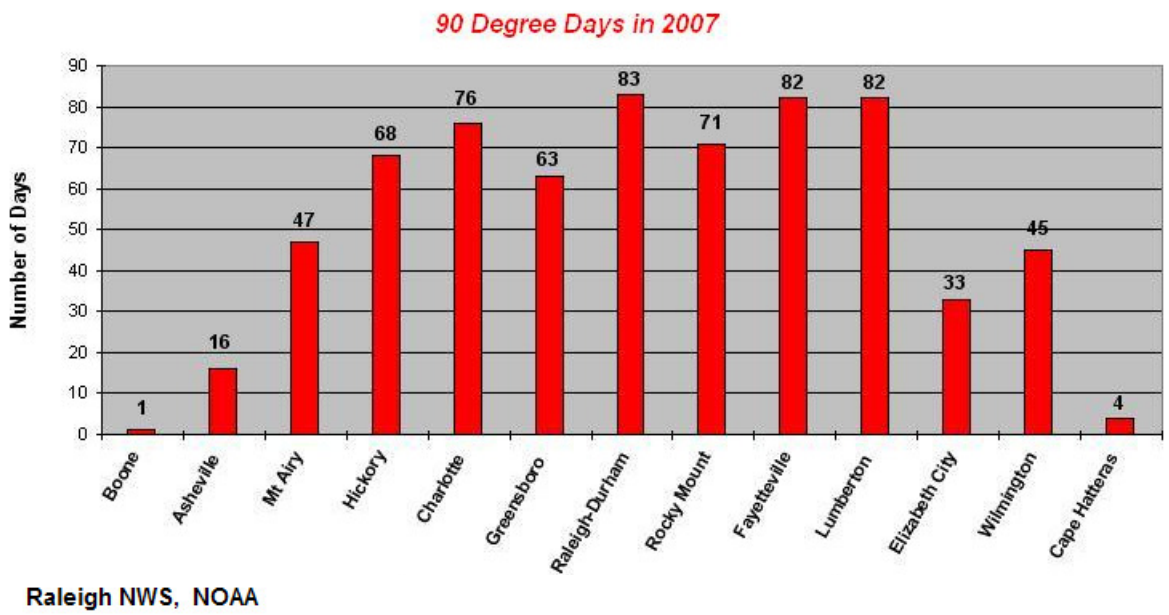


Figure 2 - Days at 90 Degrees or Greater in NC



The NC Dept of Agriculture and Consumers Services (NCDA) have worked to help producers with drought related issues during the fall of 2007 through the year of 2008. Many livestock farmers took advantage the NCDA Hay Relief effort that helped get much needed forage to livestock operations in the western part of the state. As 2008 came around, NCDA efforts

focused on what farmers could do to minimize their water usage. NCDA staff worked in cooperation with the Rural Center and the Soil & Water Conservation Districts to help farmers clean out ponds, dig new wells, and conserve more water in livestock operations. Staff is also a part of the many legislative activities surrounding water usage and drought management. USDA in partnership with NCDA&CS is now conducting a water usage survey to calculate the water usage by agriculture in the state so that the legislature can make a wise decision on drought management legislation and how it could affect NCDA agricultural economy.

Soil moisture was not a grave problem during the planting season of 2008. However the lack of rains through out the spring and summer months stunted or prohibited crop growth in some areas. Some areas had record low yields while some other areas seemed to make it through the drought because of isolated showers which doused fields at the right times of the growing season.

At one point, as many as 30 cities and towns were forced to confront the realization that they may run out of water or have to ration water. Many of those were within 100 days of running out of water. At one point, as many as 30 cities and towns were forced to confront the realization that they may run out of water or have to ration water. Many of those were within 100 days of running out of water.

In Siler City, officials had to ship in water supplies by truck. Rocky Mount sought and received the state's permission to extend a pipeline to Wilson to keep from running out of water.

In many ways, it was fortunate that in North Carolina we had confronted a serious drought before – just five years earlier. In 2002, we experienced what we thought was the drought to end all droughts.

In October, 2007 Gov. Mike Easley activated the State Emergency React Team at a Level 3 (SERT) of the North Carolina Emergency Operations Plan (NCEOP). In addition the Agriculture Task Force, Economic Impact Task Force, Energy Loss Task Force, and Health Task Force were activated to join in with the Water Sources Task Force that was activated in August 2007. The task forces are part of the Drought Assessment and Response Plan, NCEOP.

The U.S. Drought Monitor of North Carolina on 25-Dec 2007 (<www.ncdrought.org>) the reference for drought classifications and response actions, showed all 100 counties in drought; 78 counties with exceptional drought (D4) conditions with the remaining 22 counties with extreme (D3) or severe (D2) drought. The drought monitor labels drought by intensity, with D1 being the least intense and D4 as being the most intense. D0 signifies no drought but is a watch area either drying out and possibly heading for drought, or recovering from drought but not yet back to normal, suffering long-term impacts such as low reservoir levels or minimum streamflow for the time of year.

The Technical Drought Advisory Team, a sub group of the council participates each Tuesday in a telecom to gather and feed information to the National Drought Monitor author about local drought conditions in North Carolina that are valid on 8 a.m. EST each Tuesday. The team includes DMAC technical experts and National Weather Service offices located in

Tennessee, South Carolina, and Virginia. The Drought Monitor is published on Thursday morning of each week.

Council Meetings

The DMAC chairman called for meetings of the council on 20-Dec 2007, Mar. 6, 29-May, and 14-Aug 2008 in Raleigh. Average attendance was about 50 representatives including representatives from the Office of the Governor. The total number of people in attendance at the 20-Dec DMAC meeting was approximately 90 people, including Gov. Mike Easley and representatives from the media. Many of the meetings were available on web-casting.

Items on the meeting agenda included assessment and forecast reports about the seasonal drought outlook and the impact of drought on streamflow and ground water levels, lake and reservoir levels, agriculture, forestry and public water systems and special reports from the Office of the Governor.

Press Releases

Press releases were sent out after each DMAC meeting. More than 20 news releases were issued concerning drought conditions and current drought advisories.

On-Going Drought Assessment 2007-2008

1. The technical drought advisory team of the DMAC continued to hold a weekly telecom on each Tuesday to assess drought conditions. Information they pulled together was included in the weekly update reported to the author of the U.S. Drought Monitor that was released to the public each Thursday.

2. The Water Sources Task Force as part of the N.C. Emergency Response Plan was activated by the DMAC at the August 2007 council meeting. They joined the DMAC technical drought advisory team in the weekly telecom and worked with the Public Water Supply Section (PWSS) to identify and monitor the status of water systems considered to be the most vulnerable to drought.

3. The DMAC Web site, www.ncdrought.org provided real-time data and the reference for drought classifications and response actions each week for water users in the state.

4. The DMAC Web site allows users to search a statewide database of local water systems and weekly water use reports. This easy-to-use Web site provides information on total water use in local systems as well as the percentage change in water consumption. About half of the systems we track are reporting this information.

5. At the river basin level, weekly conference calls to coordinate releases from reservoirs, hydroelectric power generation, etc. to conserve as much water as possible and to balance upstream and downstream needs. The Corps of Engineers and the utility companies, owners of the biggest reservoirs, are all working together in this effort.

6. DENR personnel performed weekly, then bi-weekly, drought monitoring in the Neuse, Tar and Cape Fear river basins, beginning in early October 2007. Physical data and

field observations of the river conditions were collected and analyzed and these results were shared with the Army Corps of Engineers to assist in decision-making regarding the water releases from Jordan Lake and Falls Lake. Drought monitoring was also conducted in the Tar River, beginning in June 2007.

7. DENR personnel performed reconnaissance visits to about 50 sites in the Cape Fear River Basin. Based on these visits, much of the Cape Fear Basin was rescheduled for water quality sampling in 2009.

8. A fish community drought recovery study was initiated in March 2008 for three sites that had either no water or no flow in December 2007. These sites will be sampled monthly until the fish community returns to pre-drought conditions.

9. Additional sampling was conducted in the Little River in Durham and in Mill Creek in Moore County in January 2008 to better document impacts at sites where flow had ceased.

10. DENR staff and personnel from the U.S. Geological Survey monitored hundreds of surface water gauges and 46 groundwater wells to continually measure and assess drought conditions throughout 2007 and 2008.

Drought Response Activities

1. The Water Sources Task Force identified and monitored weekly 102 public water supply systems that area considered to be the most vulnerable to drought. Reference to Tier definitions and a Web site showing status of Tier-level systems.

Tier Definitions

- **Tier-1:** systems are considered to be in a crisis mode (or) have less than 100 days of present supply remaining (or) are likely to be in a crisis if conditions persist because they lack interconnections for emergency water supply.

- **Tier-2:** systems are not in crisis now but could be within the next few months.

- **Tier-3:** systems are not yet in a vulnerable position but are subject to change as the drought continues.

This ranking is a subjective assessment based on best professional judgment and experience of PWSS field staff coupled usually with recent communication with the systems. Systems remain at their highest Tier-level until a resource is online (operating) that will provide an emergency water supply to minimize the system's vulnerability to drought

<http://www.ncwater.org/Drought_Monitoring/reporting/weekstatust123.php>

2. League of Municipalities made arrangements for DENR and the League staff to have on-site Meetings with (33) Tier-1 and Tier-2 water system officials. .

3. The Water Sources Task Force and PWSS had meetings with all of the Tier-1 systems to help in identifying a near-term water supply solution and funding to obtain an emergency supply of potable water.

4. The North Carolina Emergency Operations Drought and Response Plan were activated at a Level 3 on 25-Oct, 2007, by Gov. Mike Easley. At a Level 3, the NCEO Drought and Response Plan would be carried out with the cooperation of the Division of Emergency Management, Department of Environment and Natural Resources and the DMAC.

5. The remaining task forces were activated in October 2007 and are designed to assess the range of needs that can result from drought. The task forces for Agriculture, Economic Impact, Energy Loss, and Health and the Water Sources Task Force met bi-weekly and made assessment reports of drought impacts and conditions.

6. In fall of 2007, Rocky Mount and Siler City reported to the DMAC that they were having a water supply emergency. Raw water from Jordan Lake, 200,000 + gallons per day, had to be shipped in by truck to the Siler City water treatment plant to maintain an adequate finished water supply to keep chicken processors in operation. The chicken processing operations are a major part of the Chatham County economy.

   Rocky Mount sought and received the state's permission to extend a pipeline to Wilson to keep from running out of water. Emergency assistance was provided by DENR, the U.S. Army Corps of Engineers, the Water Sources Task Force, and the N.C. Rural Center with fast-track permitting approvals and crisis drought funding. Additional water was obtained through interconnections between Rocky Mount and Wilson, Goldsboro and Wayne County and Siler City's potable water interconnection with Sanford.

7. DENR continue to track and be in regular contact with water systems most vulnerable to drought and identify their needs and resources, particularly in regard to connection to alternative or backup water sources.

8. On 22-Oct 2007, Gov. Easley requested that all community water systems reduce water-use consumption and start weekly water use reporting to DENR. <http://www.ncwater.org/Drought_Monitoring/reduction/weeklyreport.php>

9. Regional drought meetings were held in Raleigh, Greensboro and Asheville for local government officials and major water users. The meetings addressed current and future climate and water resource impacts, water conservation, water supply system efficiencies, rate structures and case studies from local water systems.

10. NC Utilities Commission issued an order in November 2007 requiring all of their water utilities to notify customers they must discontinue outdoor water use.

11. The Division of Pollution Prevention and Environmental Assistance (DPPEA) worked with local water systems to train their business and industries on water conservation approaches and sources of further assistance/information.

12. DPPEA conducted water conservation audits at some major water users or critically impacted facilities.

13. At the request of and in cooperation with the Department of Commerce, developed a brochure and pay envelope stuffer that companies can provide their employees on water conservation at home.

14. DPPEA started contacting home improvement companies (i.e., Home Depot and Lowes) about highlighting and expanding the number of water conservation devices and fixtures in their stores and on their Web sites.

15. Gov. Mike Easley brought 30 of the state's worst hit water systems together on Jan. 14, 2008 in Greensboro to review the status of these systems. Those at the conference reviewed what their plans are if the drought deepens and made sure they have reserve sources of water available. In addition, those water systems that needed assistance for water audits, funding for drought, and related water needs from the state were able to make sure they got the help they needed to have effective emergency plans in place.

16. Tier 1 systems met with Infrastructure Funding Agencies in Valdese that was called by the N.C. Rural Center on Jan 29, 2008.

17. The Division of Water Resources (DWR) reported 30 priority systems were identified for water audits. Twenty water systems requested help conducting water audits of their systems. DWR has obtained services of five engineering firms to conduct the water audits and report their findings to the DWR. Studies began in April, 2008, and 13 have been completed.

18. The NC Utilities Commission order issued in November 2007 requiring all of their utilities to notify customers they must discontinue outdoor water use was modified on May 23, 2008. These restrictions were modified depending on the current drought classification and advisory for their county as shown on DMAC Web page (www.ncdrought.org).

19. DPPEA is working successfully to provide technical help to more than 70 North Carolina organizations including industries, businesses and government agencies to identify ways to reduce and conserve water.

20. The NC Division of Forest Resources initiated a statewide ban on open burning and cancelled all burning permits 14-Feb 2008. The burn ban was lifted on 1-Mar, due to the rains at that time across the state.

21. State water resource experts have met several times since 25-Feb with water users of the Neuse River basin to discuss the future water usage plans in the basin, which includes a number of public water supply systems including Raleigh and New Bern.

22. On 11-Mar, Gov. Mike Easley announced a three-part legislative package to modernize North Carolina's public water systems, mandate water conservation and efficiency and upgrade the response to water emergencies. The governor also unveiled a new Web site, www.savewaternc.org, aimed at continued water conservation.

23. DWR sponsored a tabletop drought exercise in May to test the abilities of federal, state and local participants to respond to the crisis brought on by an increasingly severe drought. A "Drought Toolbox" was one product of the exercise and a follow-up workshop was conducted for systems in the Neuse River Basin.

24. On 3-Oct 2008, Gov. Mike Easley asked the U.S. Department of Agriculture to declare 59 of North Carolina's 100 counties disaster areas because of drought-related crop losses. Agriculture department loss assessment reports show excessive agricultural losses for at least one major crop, and significant losses on corn, soybeans, hay, and pasture and other forage crops.

25. Water systems continue to respond favorably to requests by Gov. Mike Easley to call for water conservation and water use restrictions and to work to reduce year-round water use. Millions of North Carolina residents, or most of those who receive water from systems the state tracks, are subject to voluntary or mandatory water use restrictions.

26. PWSS Regional offices and DWR staff continue to stay in touch with Tier 1 systems not taking action to help alleviate drought at this time to help in identifying a near-term water supply solution and funding to obtain an emergency supply of potable water.

Critical Local Government Drought Response Projects:

Introduction: The following table summarizes one of DENR's and Drought Management Advisory Council most critical, ongoing drought related activities. In response to the 2007 drought, DENR Staff identified those North Carolina communities that are most at-risk of "running out of water" and then identified the most practical short-term projects that could supply an expedient, supplemental water source to these "at-risk" communities. In order to facilitate the implementation of these supplemental water supply projects, DENR staff working with the League of Municipalities, coordinated and arranged meetings between these identified communities and agencies that could potentially fund their proposed water supply projects. DENR continues to monitor, provide technical assistance and assist with the ultimate completion of these much-needed projects.

Note: The following abbreviations are used in this table to designate the various funding sources:
NCRC – N.C. Rural Center

PWSS – DENR Public Water Supply Section State Revolving Fund
ARC – Appalachian Regional Commission
USDA – U.S. Dept of Agriculture

Project Description	*Tier Rating*	*Potential Funding*	*Comments*
Bessemer City – Interconnection with Gastonia	1	$100K funding in 2009 Governor's Budget.	Bessemer City could not provide the additional funding needed to go along with the State funds.
Boone – ASU Interconnection	1	$168K from NCRC.	Agreement for interconnection has been approved by both Boone and ASU.
Boone – New intake on South Fork of the New River.	1	Primary funding for this project is expected from USDA.	Intake site has not yet been secured. This should be resolved in May 2009.
Boone – Blowing Rock Interconnection	1	$1.5M pending approval from NCRC. Application for $2.2M to PWSS. $300K from ARC.	Environmental impact analysis will be required.
Hendersonville – Water main with temp pump station on French Broad.	1	$500K from NCRC. Application for $2.5M expected to PWSS.	Funds requested from Army Corps not available until 2009. Intake area will need to be reclassified by NC DWQ.
Lenoir – New raw water intake and pump station,	1	$500K from NCRC. $5.8M application undergoing review at PWSS. $300K from ARC.	NCRC approved. Plans for permanent intake are currently in the design phase.
Mars Hill – Weaverville Interconnection	1	$500K from NCRC. Application for $600K to NC Commerce. $300K from ARC. USDA low interest loan for $600K.	Mars Hill and Weaverville have both passed resolutions in support of this project.
Marshall – 2 new wells, storage tank, & line repair.	1	NC Commerce reviewing application for $600K. $300K from ARC. Low interest loan for $750K to USDA	Funding approved; in design phase project completion 2009.
Robbinsville – 3 new wells & piping.	1	$193K from NCRC. Possible funding in 2009 Governor's Budget.	Funding received from NCRC, test wells installed early 2009.

Project Description	*Tier Rating*	*Potential Funding*	*Comments*
Regional interconnect – Hendersonville, Saluda, Tryon, & Columbus	1	$1.73M from NCRC. $1.43M application expected to PWSS. $300K from ARC.	Columbus, Saluda, and Tryon have all passed resolutions of support.
Valdese – Temp water lines to Lake Rhodhiss.	1	$40K from NCRC. $80K from ARC.	In place 2008
Rocky Mount – interconnect with Wilson	1	$500K from NCRC	Operational early 2008
Siler City – interconnect with Sanford		$500K from NCRC	Operational 2007
North Wilkesboro – dredging intake pool & Wilkesboro connect	1	$259K from NCRC approved for dredging, application for Wilkesboro connect	Dredging to be completed in 2008.
Yadkinville – Possible interconnection with Davie County	1	$100K funding in 2009 Governor's Budget.	Yadkinville could not provide the additional funding needed to go along with the State funds.
King – Forsyth County interconnect.	2	$100K funding in 2009 Governor's Budget.	King to submit application to DENR

Water Reclamation and Reuse Activities:

- DENR personnel developed an expedited permitting process in order to respond to the high level of interest from municipalities and industries in using reclaimed water for non-potable water uses. Additional information on the use of reclaimed water can be found on the Division of Water Quality's Web site at:

  <http://h2o.enr.state.nc.us/admin/pubinfo/ReclaimedWaterInfoOct07.htm>

- DENR personnel are engaged in rule revisions that will provide even greater uses for reclaimed water in North Carolina in the future.

- In order to facilitate and encourage the collection and reuse of rain water, DENR personnel are developing a policy that will provide stormwater control and treatment credit for the harvesting and reuse of rain water. This policy is expected to become effective in 2009.

- DENR staff created a fact sheet on the use of gray water in an effort to address residents' questions concerning the residential use of gray water.

Informational, Outreach, and Educational Activities:

- DENR funded a production company to develop two drought response public service announcements for broadcast television stations across the state. The total cost for these public service announcements was approximately $100,000.

- DENR Staff produced and delivered a wide range of educational and water conservation materials for educators, children, and adults. These materials were distributed to a broad audience all across the State.

- DENR Personnel developed memorandums regarding the amount of allowable reduction of water usage in food service and lodging establishments. These memorandums have been distributed to county health departments.

- DENR Staff have participated in a variety of drought-related symposiums, outreach events, conferences and forums that are too numerous to list here.

- DENR Staff have provided numerous drought reports and updates to the news media, concerned citizens, the General Assembly, and the Environmental Management Commission.

- DPPEA is working successfully to provide technical help to more than 70 North Carolina organizations including industries, businesses and government agencies to identify ways to reduce and conserve water.

1. On 11-Mar, Gov. Mike Easley announced a three-part legislative package to modernize North Carolina's public water systems, mandate water conservation and efficiency and upgrade the response to water emergencies. The governor also unveiled a new Water Conservation Web site http://www.savewaternc.org/ providing information for citizens, water systems, state agencies, businesses, and industries. The Web site is a joint effort between the state departments of Environment and Natural Resources and Crime Control and Public Safety and the Governor's Office.

2. DWR sponsored a tabletop drought exercise in May to test the abilities of federal, state and local participants to respond to the crisis brought on by an increasingly severe drought. A "Drought Toolbox" was one product of the exercise and a follow-up workshop was conducted for systems in the Neuse River Basin.

3. On 3-Oct 2008, Gov. Mike Easley asked the U.S. Department of Agriculture to declare 59 of North Carolina's 100 counties disaster areas because of drought-related crop losses. Agriculture department loss assessment reports show excessive agricultural losses for at least one major crop, and significant losses on corn, soybeans, hay, and pasture and other forage crops.

4. Water systems continue to respond favorably to requests by Gov. Mike Easley to call for water conservation and water use restrictions and to work to reduce year-round water use. Millions of North Carolina residents, or most of those who receive water from systems the state tracks, are subject to voluntary or mandatory water use restrictions.

5. PWSS Regional offices and DWR staff continue to stay in touch with Tier-1 systems not taking action to help alleviate drought and encouraging in identifying a near-term water supply solution and funding obtaining an emergency supply of potable water.

River Basin Management

The DMAC and the Water Sources Task Force is participating in weekly conference calls with managers of major reservoirs, including the Corps of Engineers private power companies, and the Tennessee Valley Authority, to review specific drought conditions in each basin and discuss changes needed in reservoir management to conserve stored water. These conference calls have resulted in significant adjustments in reservoir release policies, with a resulting increase in the conservation of stored water and a reduction in our risk of depleting reservoirs. These changes are made with the participation of the Division of Water Quality, the U.S. Army Corps of Engineers, and the Wildlife Resources Commission. River basins with on-going telecoms include the Neuse, Catawba, Roanoke, Yadkin, Cape Fear and Tennessee Valley.

In September 2008 the Division of Water Resources sent a message to public water system managers statewide, reminding them of the necessity to monitor water supply and demand, and the requirement to mandate water use restrictions as indicated by their local water supply plans. Also, letters were sent to golf courses concerning water use registration requirements. These messages followed a press release by Gov. Easley asking for local water conservation actions to avoid a state government mandate for mandatory water use restrictions.

The USGS reported record low water levels in May for North Carolina rivers in Western North Carolina and in August 2007 reported the lowest streamflows in more than 110 years for some North Carolina rivers as drought conditions worsened.

DMAC Web Site

The DMAC Web site <www.ncdrought.org> presents a picture of the U.S. Drought Monitor (USDM) for North Carolina that is updated and released on Thursday of each week. The drought conditions reported are valid for 8 a.m. EST for the prior Tuesday of the week.

Drought advisories are based on the weekly USDM for all water users located in or dependent on water resources in the counties of the state experiencing drought conditions. The U.S. Drought Monitor establishes a baseline for hydrological and agricultural drought conditions. North Carolina is fortunate because it has the DMAC to work closely with the U.S. Drought Monitor to adjust designations weekly to better reflect North Carolina's local conditions. The USDM is defined as the official drought map nationally and for North Carolina.

The DMAC Web site also has a number of tabs that link to available resources of information, some with real-time data about current conditions, news, the DMAC, drought contacts, information and drought education, drought monitor archives, and water conservation tips.

Drought Classification and Status of Water Conservation

The DMAC issues official drought advisories based on drought classification to provide all water users with a reliable basis for managing and calling for drought response actions in their region. The list of counties under drought advisories is updated each week (www.ncdrought.org) to reflect local drought classifications on the weekly U.S. Drought Monitor for North Carolina.

The USDM-NC 24-Apr 2007 released showed severe drought conditions returning to the southern mountains with exceptional drought returning to North Carolina during the first week of October 2007.

From August 2007, to February 2008, the entire state experienced some level of drought classification. Figure 3 summarizes the percent of the state each week under drought advisories as issued by the DMAC.

A history of the drought monitor classifications for each week is available. Records start in 2000 and include classifications by percent of state and also by county. This drought monitor history can be found at: < http://www.ncdrought.org/archive/index.php>

DWR and PWSS maintain a Web site *Water Conservation Level Status* for more than 600 (Figure 3) tracked public water systems statewide. This online, real-time database provides a consistent way to document and track impacts of drought related causes on public water supply systems. To see if your community has enacted water conservation measures, go to:

<http://www.ncwater.org/Drought_Monitoring/reporting/displaystate.php>

Figure 3 – Water Conservation Level Status

Statewide summary data for tracked water systems

(October 2008) Status	Systems Number	Systems Percent	Population Number	Population Percent
Not Restricted	306	46.6	1,752,633	25.5
Voluntary Conservation	201	30.6	2,143,045	31.2
Mandatory Conservation	149	22.7	2,965,730	43.2
Emergency	0		0	
Total	656		6,861,408	

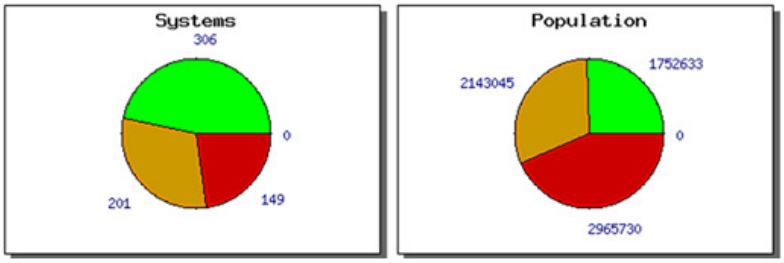


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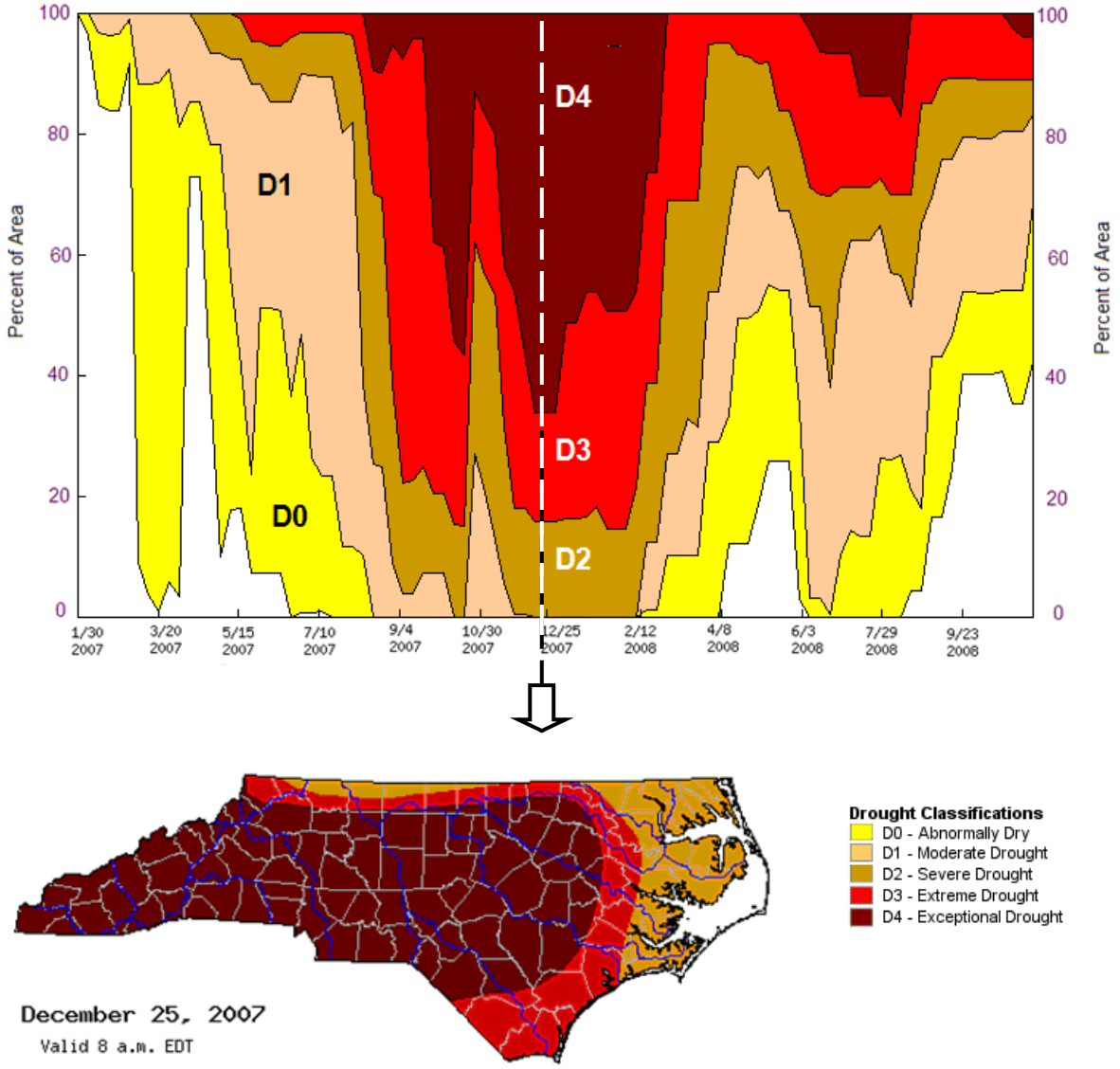
Figure 4 - Weekly Drought Classifications Jan 2007-Nov 2008



The DMAC issues official drought advisories based on drought classification to provide all water users with a reliable basis for managing and calling for drought response actions in their region. The list of counties under drought advisories is updated each week (www.ncdrought.org) to reflect local drought classifications on the weekly U.S. Drought Monitor for North Carolina.

Figure 4, shows severe drought conditions returning to North Carolina with exceptional drought returning in August 2007.

From August 2007, to February 2008, the entire state experienced some level of drought classification and a time when most of the state experienced the worst drought of record in North Carolina. Figure 4 summarizes the percent of the state each week under drought

advisories as issued by the DMAC for this period. Also Figure 4 includes the depiction of drought classifications in the state for 25-Dec., 2007, when 78 counties were under an exceptional drought (D-4) advisory with 9 counties with extreme drought (D-3) and 13 counties in the coastal plain under a severe drought (D-2) advisory.

Improving Coordination and Drought Depiction

Drought Indicator Wells -- Drought indicator wells are a network of wells that monitor the effects of droughts and other climate variability on groundwater levels in the surficial aquifers (water table). The Division of Water Resources' goal is to increase the number and geographic distribution of drought indicator wells. DWR has 46 actively monitored wells in the network and a short-term goal of adding two wells to that network this fiscal year. The long-term goal is to have at least 60 drought indicator wells. This will allow a much more complete assessment of impending or actual drought conditions in each of the major river basins of the state.

http://www.ncwater.org/Data_and_Modeling/Ground_Water_Databases/Drought_Indicator_Wells/

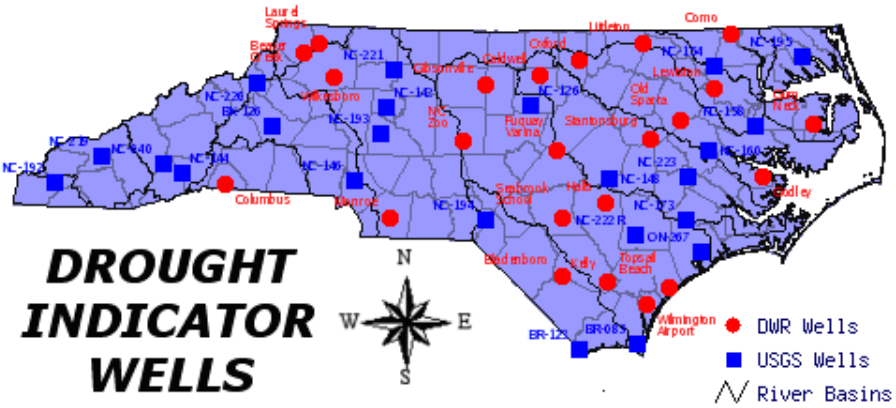


Figure 5

River Basin Drought Management Plans -- As part of the relicensing of hydropower projects in the Catawba-Wateree and Yadkin-Pee Dee river basins, procedures have been established and tested for adjusting operations during periods of low-inflow to conserve the limited water supply during the 2007 drought. The Low-Inflow Protocol (LIP) provides trigger points and procedures for how the projects will be operated as well as water withdrawal reduction measures and goals for other water users during periods of low-inflow. Planning is underway with stakeholders in the Neuse River Basin to work with the Division of Water Resources and others to fund and develop a drought management model for the basin. The Division of Water Resources is working with the U.S. Army Corps of Engineers and stakeholders on updating drought management plans on Falls and Jordan reservoirs.

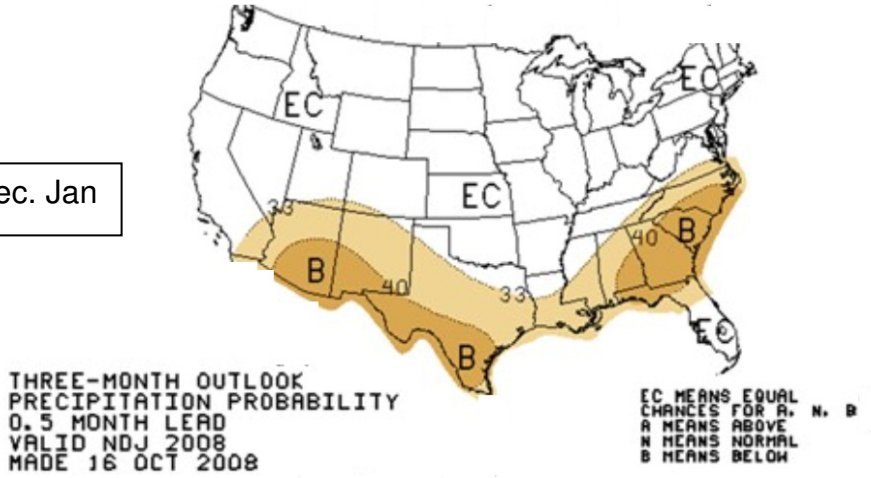
Water Resources Information -- The Division of Water Resources continues to work with the N.C. State Climate Office, the U.S. Army Corps of Engineers, the N.C. Ground Water Management Section, and the U.S. Geological Survey and have developed a water resources information, storage, analysis, and retrieval system (WRISARS). This program will provide an archive of historical and on-the-spot data about hydrology (including stream flow,

groundwater and reservoir data), weather and climate, and water use in North Carolina. Products are now available for public use at <http://www.ncwater.org/wrisars/index.php>.

Figure 6 - Outlooks Nov. 2008 through April, 2009

Climatic Prediction Center, NOAA

Nov. Dec. Jan



Feb. Mar. Apr.