

NC Drought Management Advisory Council

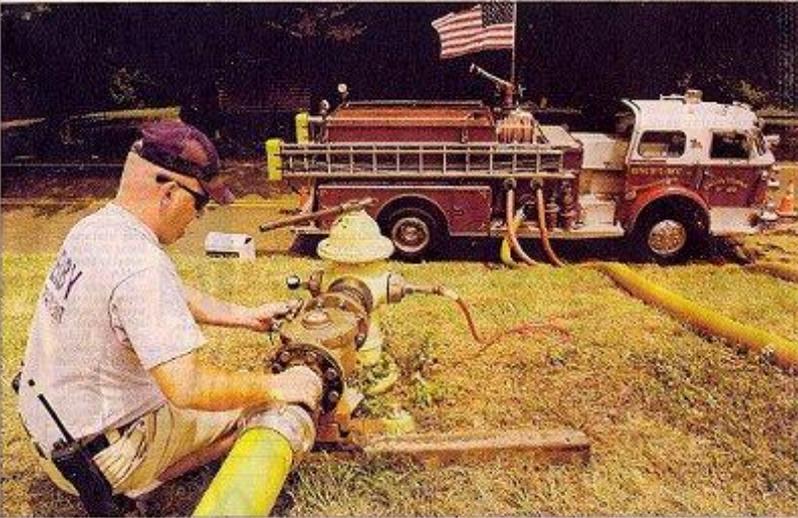
NC Drought Toolbox

**Annual Meeting
April 1, 2010**

**Tom Fransen
Division of Water Resources**

Drought of 1998-2002

Towns desperate for water

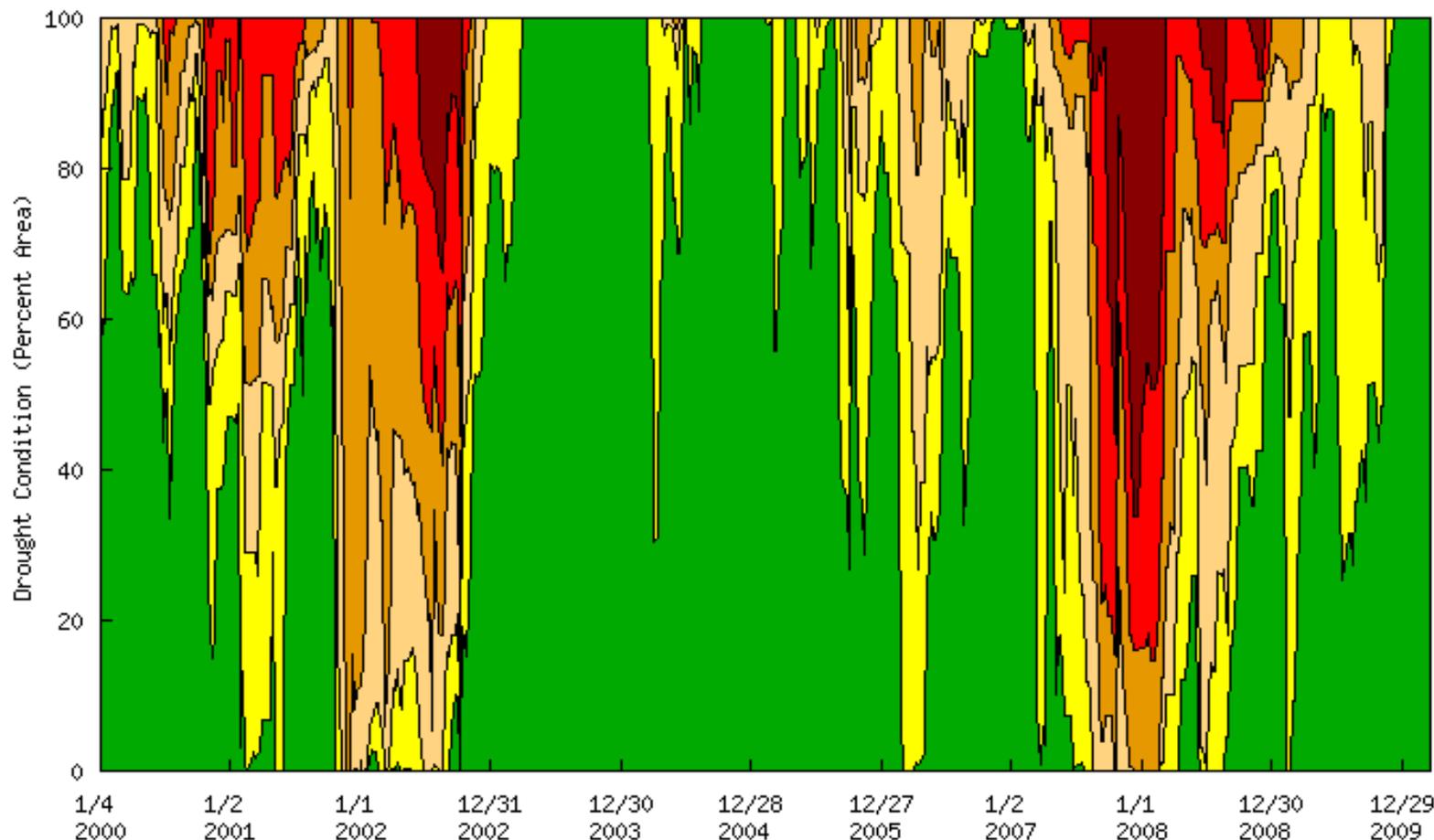


Above, Clint Beers, a Shelby firefighter, monitors a jury-rigged system that draws water from the City of Kings Mountain through the Cleveland County water system to Shelby. Using the fire truck as a pumping station, 870 gallons per minute are processed.



Drought Status for North Carolina

(1/4/2000 -- 3/23/2010)



NCDWR

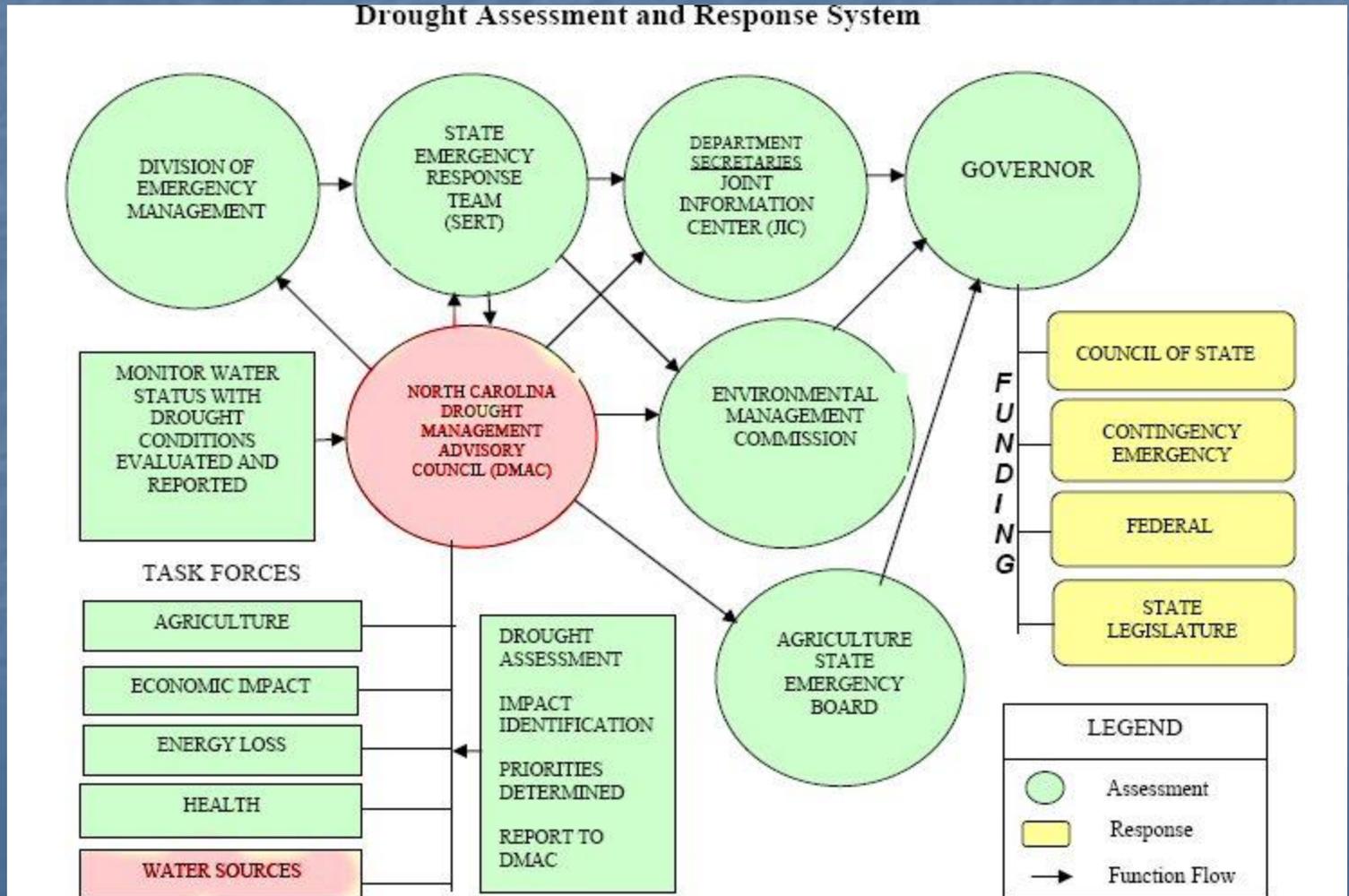
■ Exceptional Drought	■ Extreme Drought	■ Severe Drought
■ Moderate Drought	■ Abnormally Dry	■ Normal

http://www.ncwater.org/Drought_Monitoring/dmhistory/
Animated Map - <http://www.ncdrought.org/archive/index.php>

§143-355.1

Drought Management Advisory Council Appendix 3 to Annex B – Drought Assessment and Response Plan

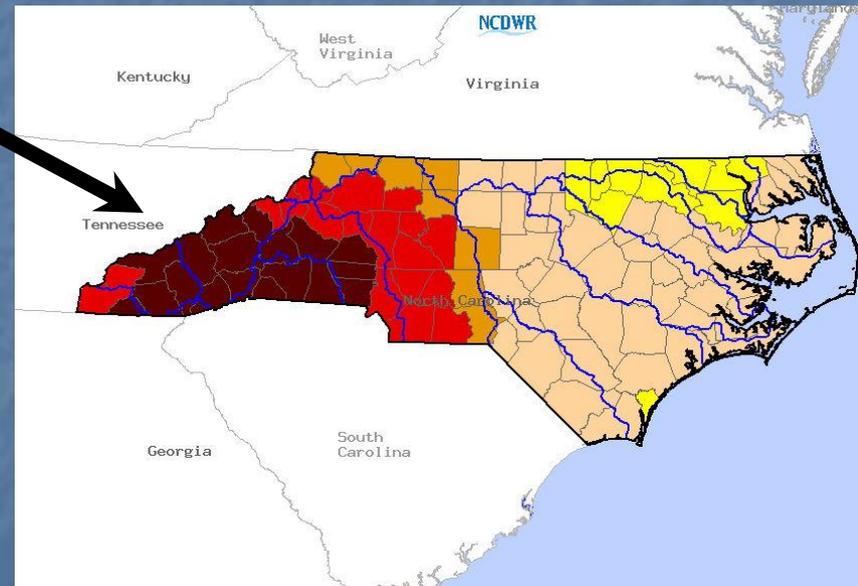
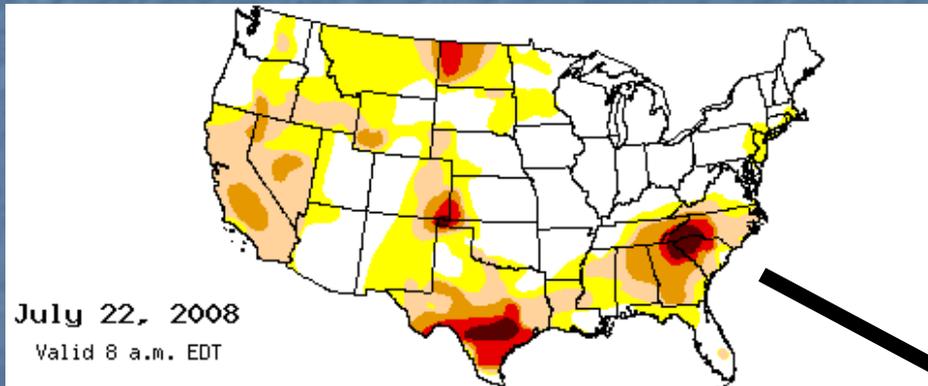
Drought Assessment and Response System



2008 Drought Bill Overview

- **HB 2499 ratified by NCGA on July 18.**
- **Contains new initiatives for drought response:**
 - **Registration & reporting**
 - **DENR approval of WSRP**
 - **Mandatory implementation of WSRP tiers**
 - **Enhanced enforcement measures**
 - **Water efficiency standards**
 - **Other provisions**

2008 Drought Bill Drought Designations



County designation = highest designation for 25% or more of county land area.

NC Drought Management Advisory Council Technical Drought Advisory Team

NORTH CAROLINA Drought Management Advisory Council

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Hot Topics: [North Carolina Drought Workshop - Drought Tools for Agriculture](#)

US Drought Monitor of NORTH CAROLINA

March 23, 2010
Valid 8 a.m. EDT

Drought Classifications

- County Boundaries
- Major River Basins ([View Map](#))
- A** = Agricultural (crops, pastures, grasslands)
- H** = Hydrological (water)
- [Hi-Resolution Image](#) | [Print Version](#) | [Animation](#)

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NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

DIVISION OF WATER RESOURCES

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DROUGHT ... a period of abnormally dry weather sufficiently prolonged from the lack of rainfall to cause a hydrologic imbalance.

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[2008 Drought Bill](#) | [Summary](#)

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LOGIN

Current County Advisories as of March 23, 2010

Drought Classifications

- D0** - Abnormally Dry
- D1** - Moderate Drought
- D2** - Severe Drought
- D3** - Extreme Drought
- D4** - Exceptional Drought

Published by the [NC Drought Management Advisory Council](#) every Thursday.

Click on a county for county drought information or click on [statewide](#) information on all counties.

North Carolina Division of Water Resources
1611 Mail Service Center, Raleigh, NC 27699-1611
Tel (919)733-4064 - Fax (919)733-3558

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NC DMAC - <http://www.ncdrought.org/>

NC DWR - <http://www.ncwater.org/drought/>

Automated Updates



North Carolina Department of Environment and Natural Resources
Division of Water Resources

Beventy Eaves Pardee, Governor

Des Freeman, Secretary
Thomas A. Reeder, Director

Drought Update
3/25/2010

2009 - 2010 Comparison of US Drought Monitor

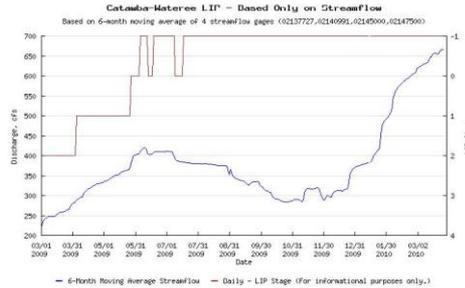


Percent of North Carolina in the Various Drought Category

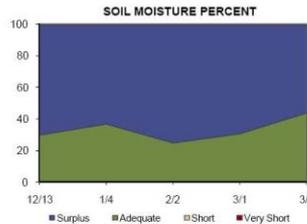
Week	No Drought & D0	All Levels of Drought D1 - D4	D1	D2	D3	D4
3/16/2010	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
3/23/2010	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
3/24/2009	75.8%	21.2%	13.4%	7.7%	0.6%	0.0%
% Difference (Current Compared to Last Year)	28.9%	-100.0%	-100.0%	-100.0%		

	cfs	cfs	%	cfs	%	Difference
Falls Lake	711	2,410	339.0%	754	106.0%	-68.7%
Jordan Lake	1,564	4,258	272.3%	1,856	125.1%	-64.1%
Jordan N. Kerr Reservoir	8,154	10,921	132.9%	13,166	161.5%	20.6%
W. Kerr Scott Reservoir	627	540	86.1%	1,000	160.7%	68.7%

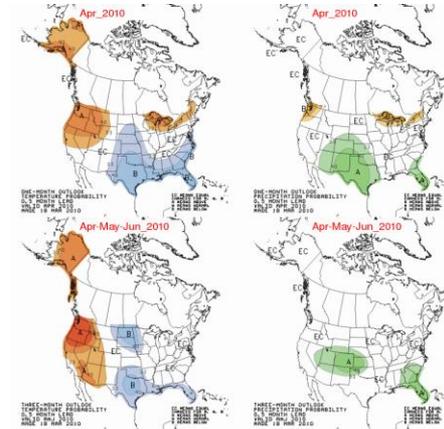
2009 - 2010 Comparison of Catawba Streamflow



Agricultural Statistics - Weather & Crops Report



Forecast



Weekly update that includes current conditions compared to last year. Information includes the weekly drought monitor, Corps of Engineer reservoirs, soil moisture, and seasonal outlook.

http://www.ncwater.org/Drought_Monitoring/droughtupdate/

Water Sources Task Force

http://www.ncwater.org/Drought_Monitoring/wstaskforce.php

County/River Basin Public Water Systems Summary

[DWR Home](#) > [drought](#)

Date: County Summary Basin Summary County:

County	Current Advisory	Emergency Water Restrictions	Mandatory Water Restrictions	Voluntary Water Restrictions	Not Restricted	Tier 1	Tier 2	Affected Population	Current Weekly Water Use (% Change from last week)
ALAMANCE	None			Alamance (Drought) Burlington () Elon College (Drought) Graham (Drought) Green Level (Drought) Haw River (Drought) Mebane (Drought) Ossipee SD (Drought) Swepsonville (Drought)				96,706	Burlington 11,344,000 (-0.61%) Graham Mebane
ALEXANDER	None			Energy United WC/Alexander Co WC (Drought) TAYLORSVILLE, TOWN OF (Drought)	Alexander County WDs		Energy United WC/Alexander Co WC	24,181	TAYLORSVILLE, TOWN OF
ALLEGHANY	None			SPARTA, TOWN OF (Drought)				1,824	
				Anson County (Drought)					

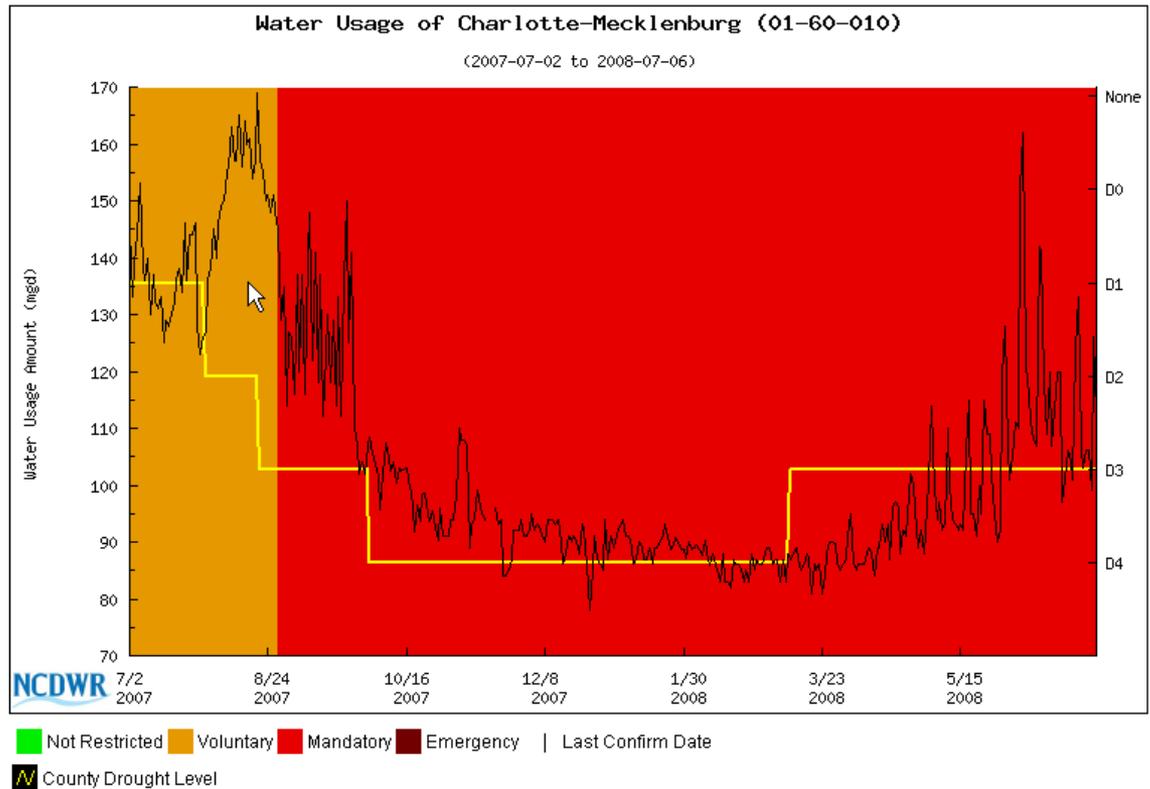
<http://www.ncwater.org/drought/summary.php>

County Summary Tab - <http://www.ncwater.org/drought/>

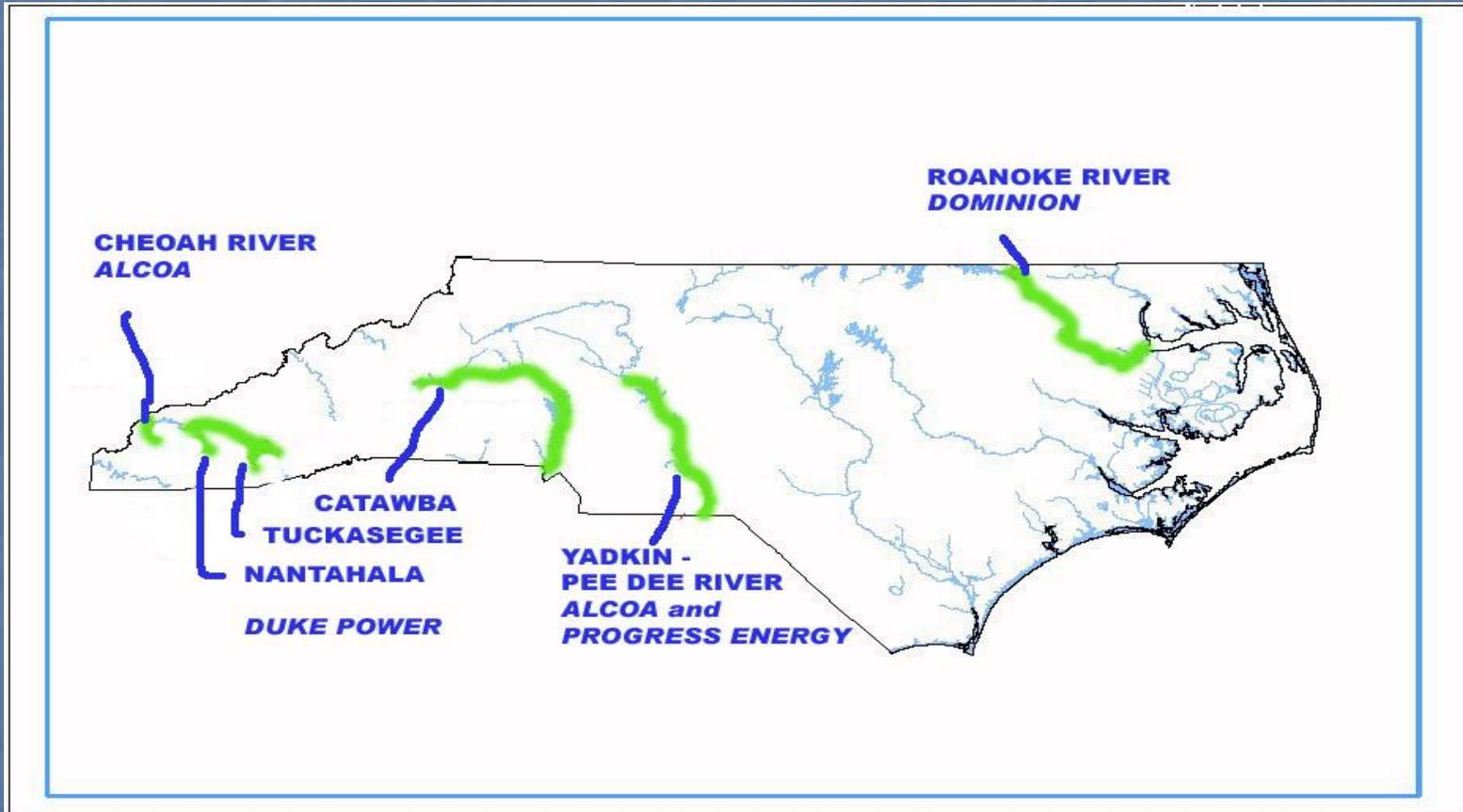
Water Use Reporting – Weekly Water Use

Start Week: 2007-07-02 End Week: 2008-06-30

Date	Water Use (gpd)	System Status	Tier	County Drought Level
2007-07-02	145,000,000	Y		D0 - Abnormally
2007-07-03	133,000,000	Y		D1 - Moderate
2007-07-04	139,000,000	Y		D1 - Moderate
2007-07-05	144,000,000	Y		D1 - Moderate
2007-07-06	153,000,000	Y		D1 - Moderate
2007-07-07	138,000,000	Y		D1 - Moderate
2007-07-08	136,000,000	Y		D1 - Moderate
2007-07-09	140,000,000	Y		D1 - Moderate
2007-07-10	130,000,000	Y		D1 - Moderate
2007-07-11	137,000,000	Y		D1 - Moderate
2007-07-12	132,000,000	Y		D1 - Moderate
2007-07-13	131,000,000	Y		D1 - Moderate
2007-07-14	133,000,000	Y		D1 - Moderate
2007-07-15	125,000,000	Y		D1 - Moderate
2007-07-16	129,000,000	Y		D1 - Moderate
2007-07-17	128,000,000	Y		D1 - Moderate
2007-07-18	130,000,000	Y		D1 - Moderate
2007-07-19	132,000,000	Y		D1 - Moderate
2007-07-20	136,000,000	Y		D1 - Moderate
2007-07-21	138,000,000	Y		D1 - Moderate
2007-07-22	134,000,000	Y		D1 - Moderate
2007-07-23	146,000,000	Y		D1 - Moderate
2007-07-24	136,000,000	Y		D1 - Moderate



Another Drought Response Driver FERC Relicensing in NC



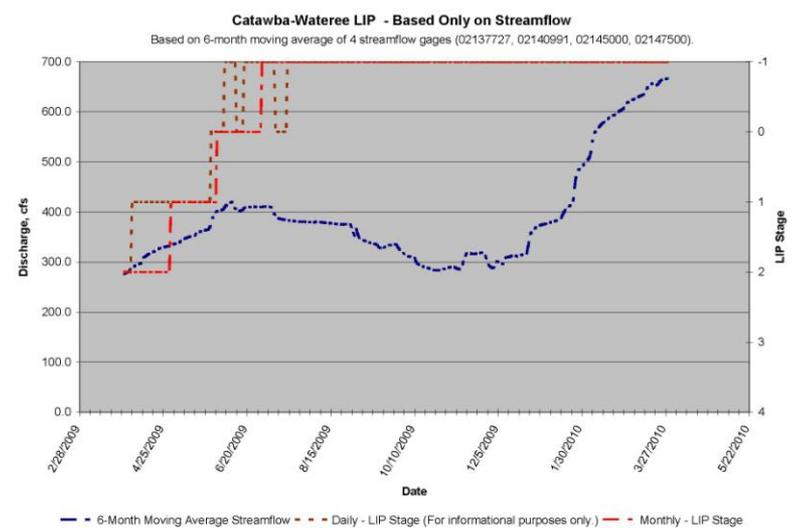
Low Inflow Protocol Indicators for the Catawba-Wateree Basin

Catawba-Wateree Low Inflow Protocol (LIP) Trigger Status

	Reservoir Storage as a % of Target	% of 6-Month Long Term Avg Streamflow	3-Month Avg of U.S. Drought Monitor	Groundwater Level
Normal	100%	85%	0	
LIP Stage 0	96.8 (up 6.6%) 90%	78%	1	
LIP Stage 1	75%	65%	2	
LIP Stage 2	57%	55%	3	Langtree
LIP Stage 3	56% on 12/12/07 42%	51.3 (up 6.4%) 40%	3.33 (up 1) 4	Linville
LIP Stage 4		30% on 1/31/07	4.0 on 12/07/07	Glen Alpine

Here 9/12/08

= Trigger data point on 9/12/08 (30-day change)
 = Lowest trigger data point reached since LIP implemented in August 2006



How to get to the data.

North Carolina Department of Environment and Natural Resources
Division of Water Resources
 Water Resources Information, Storage, Analysis, and Retrieval System (WRISARS)
 DWR Home > Water Data Retrieval Site
 Access Point to the Division of Water Resources River Basin Data

Text Version Internal User

Note: Products that use current conditions, recent months, may contain estimates and provisional data and therefore are likely to change. For example, many rainfall observations include radar estimates for missing values. Also for some streams, flow statistics may have been computed from regulated and unregulated flows. This can lead to inaccurate depictions of flow conditions. This site represents a collaborative effort between the NC Division of Water Resources, the NC State Climate Office, the US Army Corps of Engineers, the NC DWR Ground Water Management Section, and the US Geological Survey (USGS). If you have any questions or comments, please contact us at wrisars@lists.ncmail.net

Disclaimer FAQ Contact-Us-Online User's Guide

State Climate Office of North Carolina

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NC CRONOS Database

NC Climate Retrieval and Observations Network Of the Southeast Database

The NC CRONOS/ECONet Database, developed by the State Climate Office of North Carolina, enables the public to quickly and easily retrieve archived observations from **23,969** (11,371 active) weather sites and **14,496** water sites in and around North Carolina. To retrieve "water" observations, click [here](#).

Not sure what you're looking for? Click [here](#) to download an Excel spreadsheet listing all weather stations in the CRONOS database, as well as which parameters they measure.

WEATHER

Surface weather observations, such as temperature, dewpoint, rainfall, etc. Use the search box below or click the map to browse stations.

Search by station id, name, county, and/or city.

Weather Station Search

Point and Click

 Weather Map

Need help? Check out the [user guide](#)
[About CRONOS](#)

Internal users login

Division of Water Resources – <http://www.ncwater.org/wrisars/>

State Climate Office - <http://www.nc-climate.ncsu.edu/cronos>

2007-08 Drought Fontana Lake (Sept 9-10, 2007)



This is why we need data outside NC.

Drought Map Server

The screenshot shows a web browser window titled "NC Drought Status Map - Mozilla Firefox". The address bar contains the URL: http://mapserver.ncwater.org/DM/frames_dhtml.html?layer=basins&layer=nc&zoomsize=2&map=%2Ffags%2Fwww%2Fhdocs%2FDM. The map displays drought status across North Carolina and surrounding regions, with a legend on the right for layer and label control.

Layers Legend

Only show NC Yes No

Drought Status Layers: U.S. Drought Monitor

Calculation Methods: Default

USDM USGS

7-day Average Streamflow Percentiles (10/6/2008)

Unregulated Streamflow Other Streamfl

Drought Wells Other Wells

Label

Water Conservation Status (Drought) All

Water Use Amount Change

Based on Last Month Average

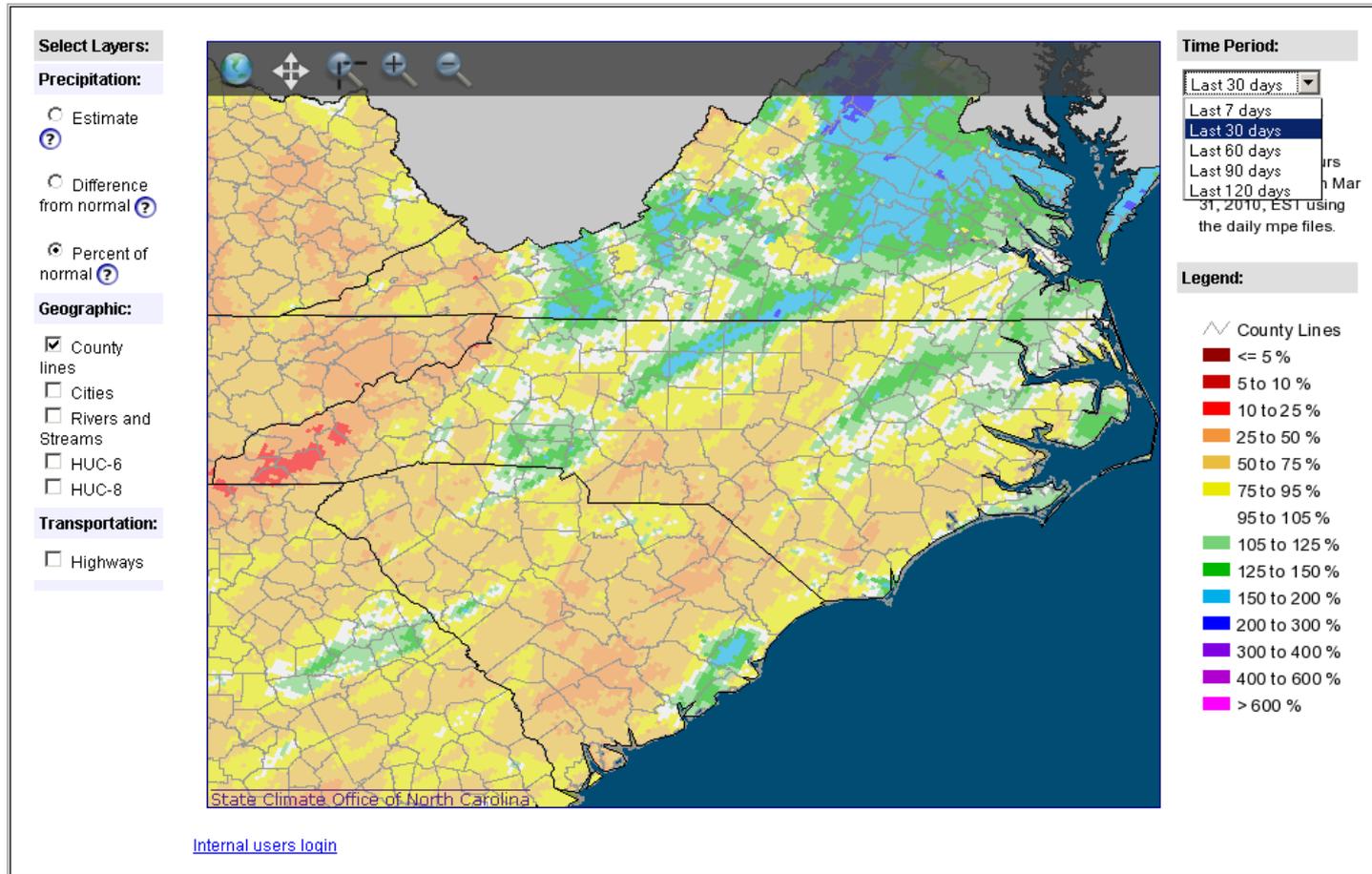
- Catawba-Wataree Basin
- IBT Basins
- Basins
 - 2-Digit HUCs
 - 4-Digit HUCs
 - 6-Digit HUCs
 - 8-Digit HUCs
- Hydrography
- State Boundary of NC
- NC Geographic Regions
- NC DENR Regions
- Climate Divisions/NC Agricultural Districts
- Counties

<http://mapserver.ncwater.org/DM/>

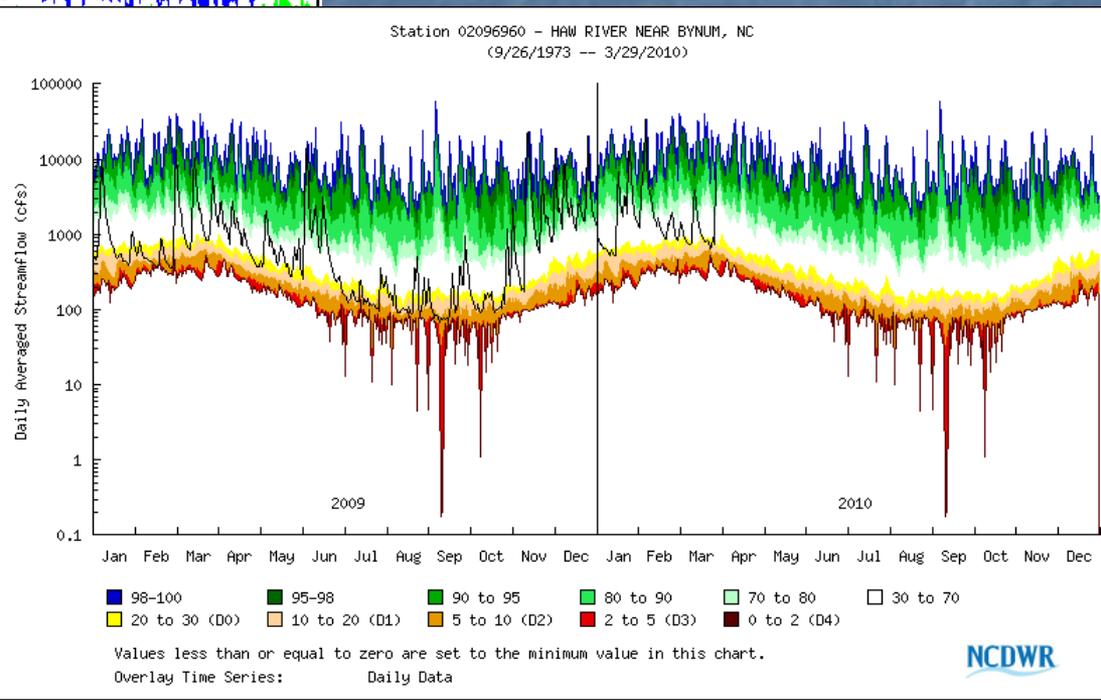
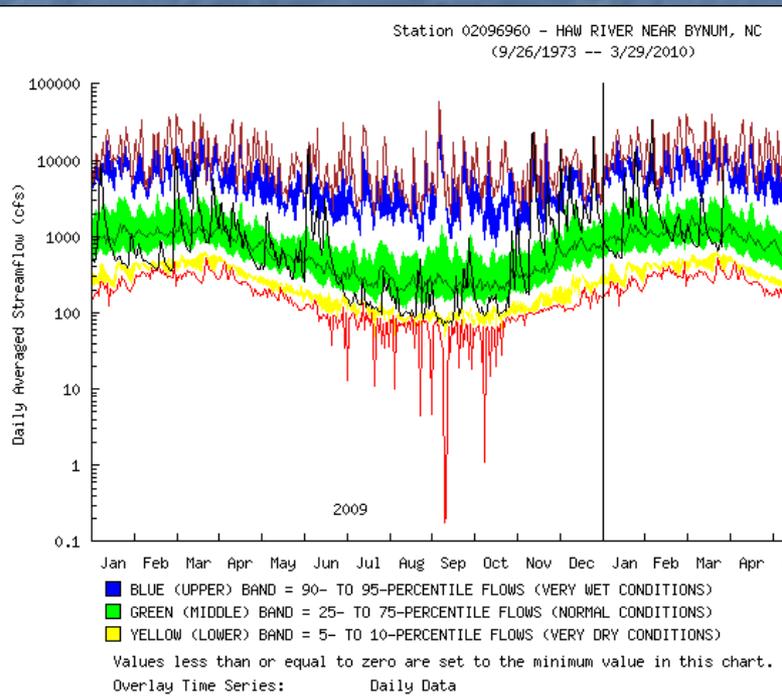
SCO Precipitation Estimates

State Climate Office of North Carolina Multi-sensor Precipitation Estimates (MPE)

There are possible errors associated with these radar-based precipitation estimates. This product is in beta.



Duration Hydrographs



NC DWR HEC-DSSVue CRONOS Plug-in

NC DWR CRONOS Download

File View Edit Help

Data Type: Weather Data Table: Weather Daily

Get Stations by State Get Stations by HUC Clear Stations Use WRISARS Search Tool

Import Data	CRONOS Station IDs		Station Name (B Part)	Other Qualifier (F Part)	Available Start	Available End
<input type="checkbox"/>		Weather Daily				
<input type="checkbox"/>		Daily Percentile				
<input type="checkbox"/>		COOP Daily Normal				
<input type="checkbox"/>		COOP Monthly Normal				

Retrieve Period of Record Start Date: 01Jan2008 End Date: 11Jan2009

Import to DSS Select All Unselect All Refresh Available Dates

Column	Description
precip	Precipitation (Daily), inches
gh_max	Stage Daily Maximum, feet
gh_min	Stage Daily Minimum, feet
gh_mean	Stage Daily Mean, feet
7day	7-Day Average
14day	14-Day Average
30day	30-Day Average
60day	60-Day Average
90day	90-Day Average
1mo	1-Month Average
2mo	2-Month Average
3mo	3-Month Average
4mo	4-Month Average
5mo	5-Month Average
6mo	6-Month Average
9mo	9-Month Average
12mo	12-Month Average
18mo	18-Month Average
24mo	24-Month Average

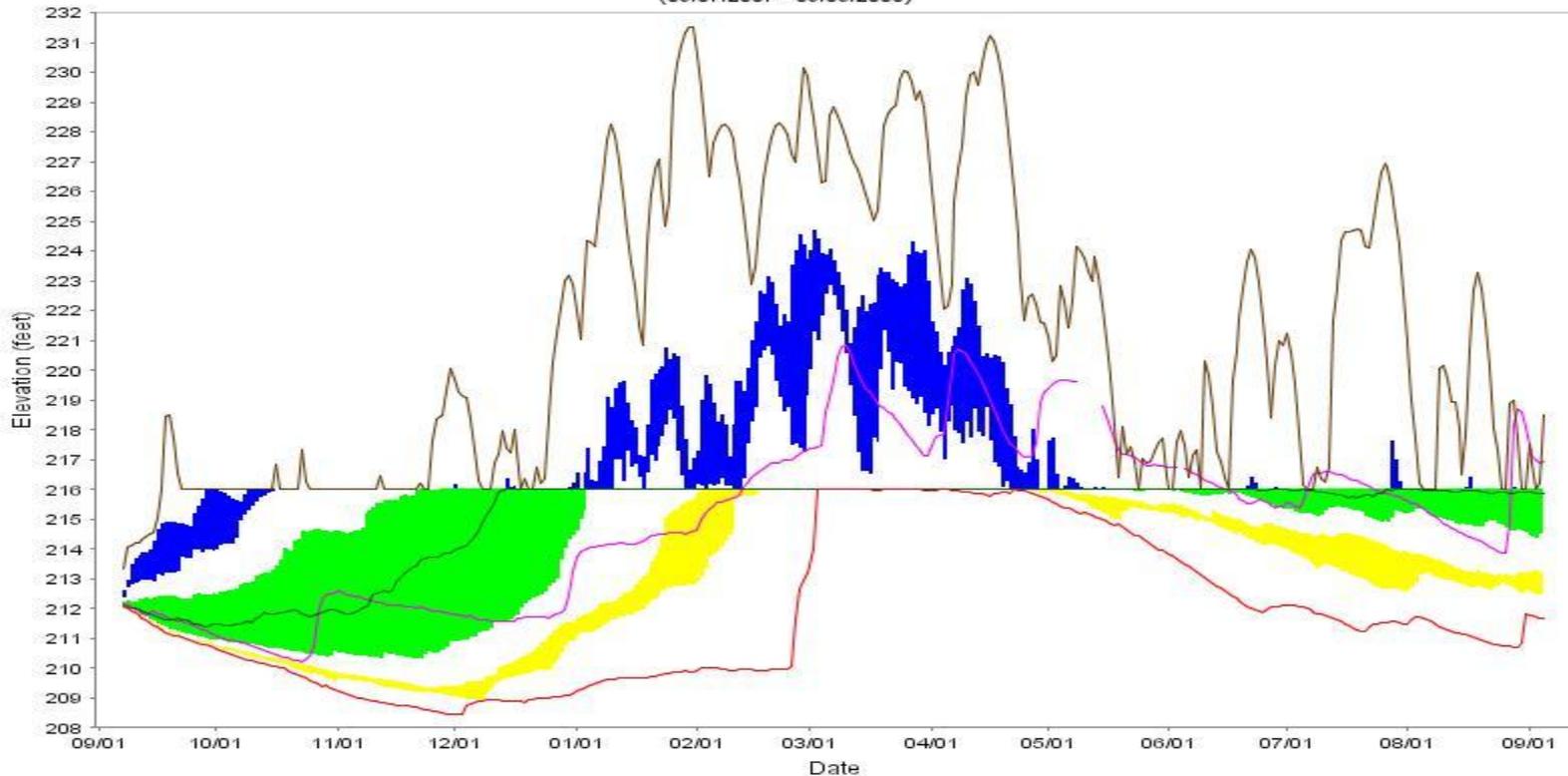
River Basin Models

Ensemble Forecasting

Jordan 9/2007 Forecast

Jordan Lake Elevation Forecast

Compare Forecast To Actual Lake Elevations
(09/07/2007 - 09/05/2008)



- Min — Median — Max — Actual Jordan Elevation
- YELLOW (LOWER) BAND = 5- TO 10-PERCENTILE
- GREEN (MIDDLE) BAND = 25- TO 75-PERCENTILE
- BLUE (UPPER) BAND = 90- TO 95-PERCENTILE

Questions?

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