

Drought Management in NH

July 30, 2020



National Drought Monitor Classification

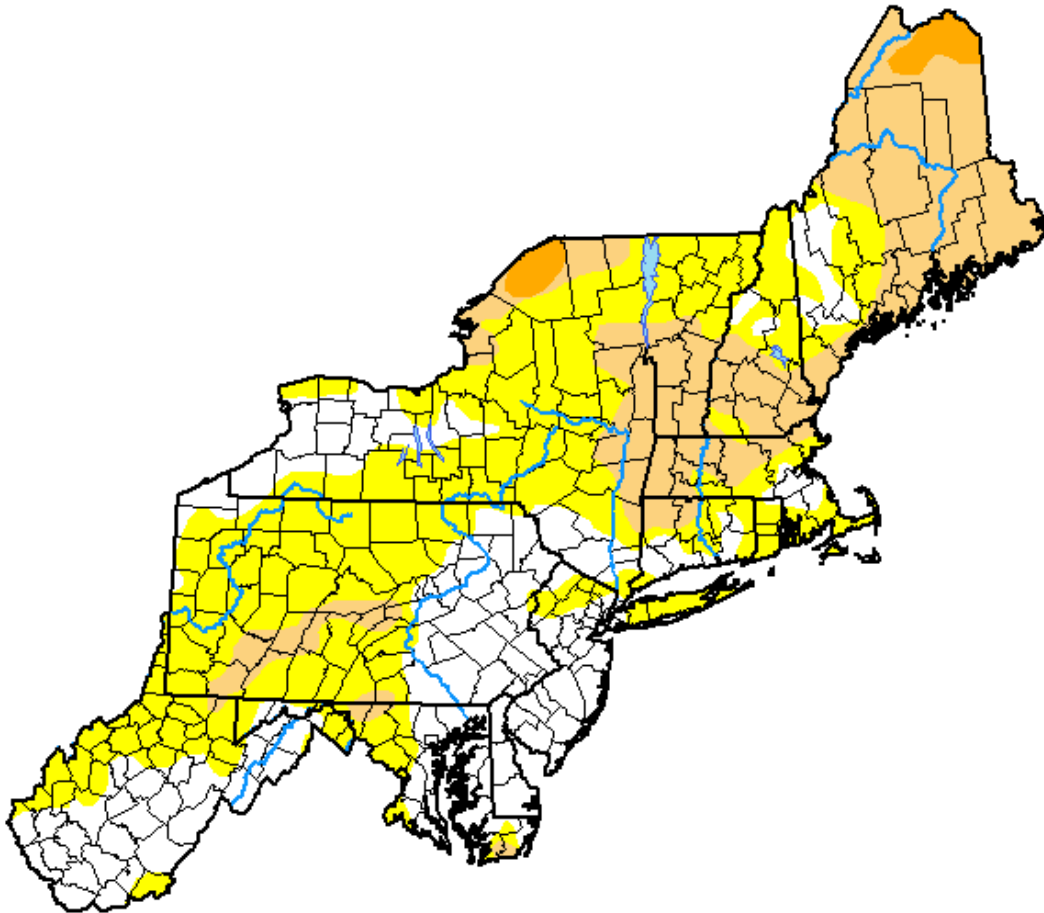
Category	Description	Possible Impacts
D0	Abnormally Dry	<p>Going into drought:</p> <ul style="list-style-type: none">▪ short-term dryness slowing planting, growth of crops or pastures <p>Coming out of drought:</p> <ul style="list-style-type: none">▪ some lingering water deficits▪ pastures or crops not fully recovered
D1	Moderate Drought	<ul style="list-style-type: none">▪ Some damage to crops, pastures▪ Streams, reservoirs, or wells low, some water shortages developing or imminent▪ Voluntary water-use restrictions requested
D2	Severe Drought	<ul style="list-style-type: none">▪ Crop or pasture losses likely▪ Water shortages common▪ Water restrictions imposed
D3	Extreme Drought	<ul style="list-style-type: none">▪ Major crop/pasture losses▪ Widespread water shortages or restrictions
D4	Exceptional Drought	<ul style="list-style-type: none">▪ Exceptional and widespread crop/pasture losses▪ Shortages of water in reservoirs, streams, and wells creating water emergencies

U.S. Drought Monitor Northeast

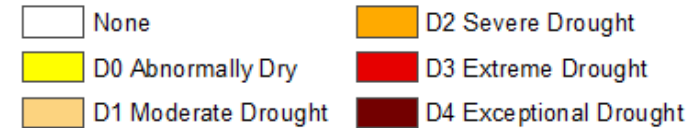
July 21, 2020
(Released Thursday, Jul. 23, 2020)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	30.12	69.88	25.98	1.71	0.00	0.00
Last Week <i>07-14-2020</i>	32.41	67.59	24.59	1.71	0.00	0.00
3 Months Ago <i>04-21-2020</i>	100.00	0.00	0.00	0.00	0.00	0.00
Start of Calendar Year <i>12-31-2019</i>	99.61	0.39	0.00	0.00	0.00	0.00
Start of Water Year <i>10-01-2019</i>	48.74	51.26	8.49	2.23	0.00	0.00
One Year Ago <i>07-23-2019</i>	100.00	0.00	0.00	0.00	0.00	0.00



Intensity:



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

Author:

Richard Heim
NCEI/NOAA





Precipitation & Deficit for the last 3 months as of 7/28/2020 (inches)

County	Precipitation	Deficit
Belknap	19.25	-3.19
Carroll	24.09	-0.70
Cheshire	20.31	-2.82
Coos	22.68	-0.13
Graton	20.61	-2.50
Hillsborough	19.79	-3.69
Merrimack	19.35	-3.70
Rockingham	17.84	-5.66
Strafford	19.57	-4.18
Sullivan	18.42	-3.97

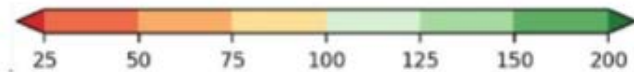
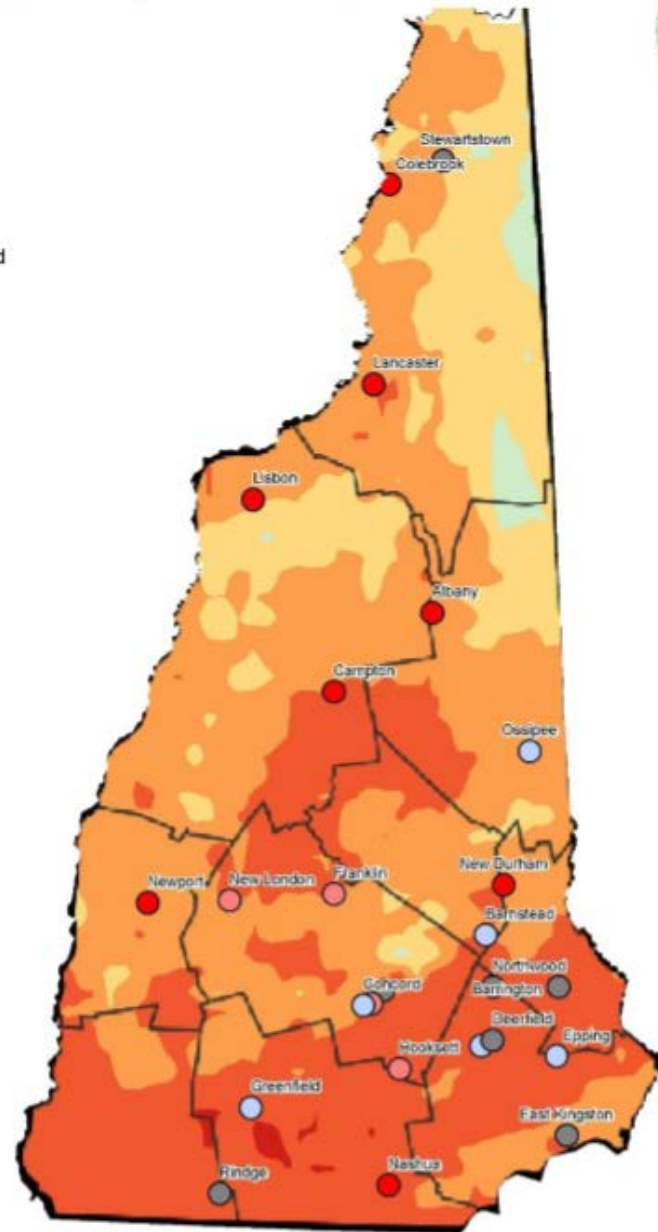
Groundwater Level Network

June 2020 Groundwater Levels and June Precipitation (percent normal)



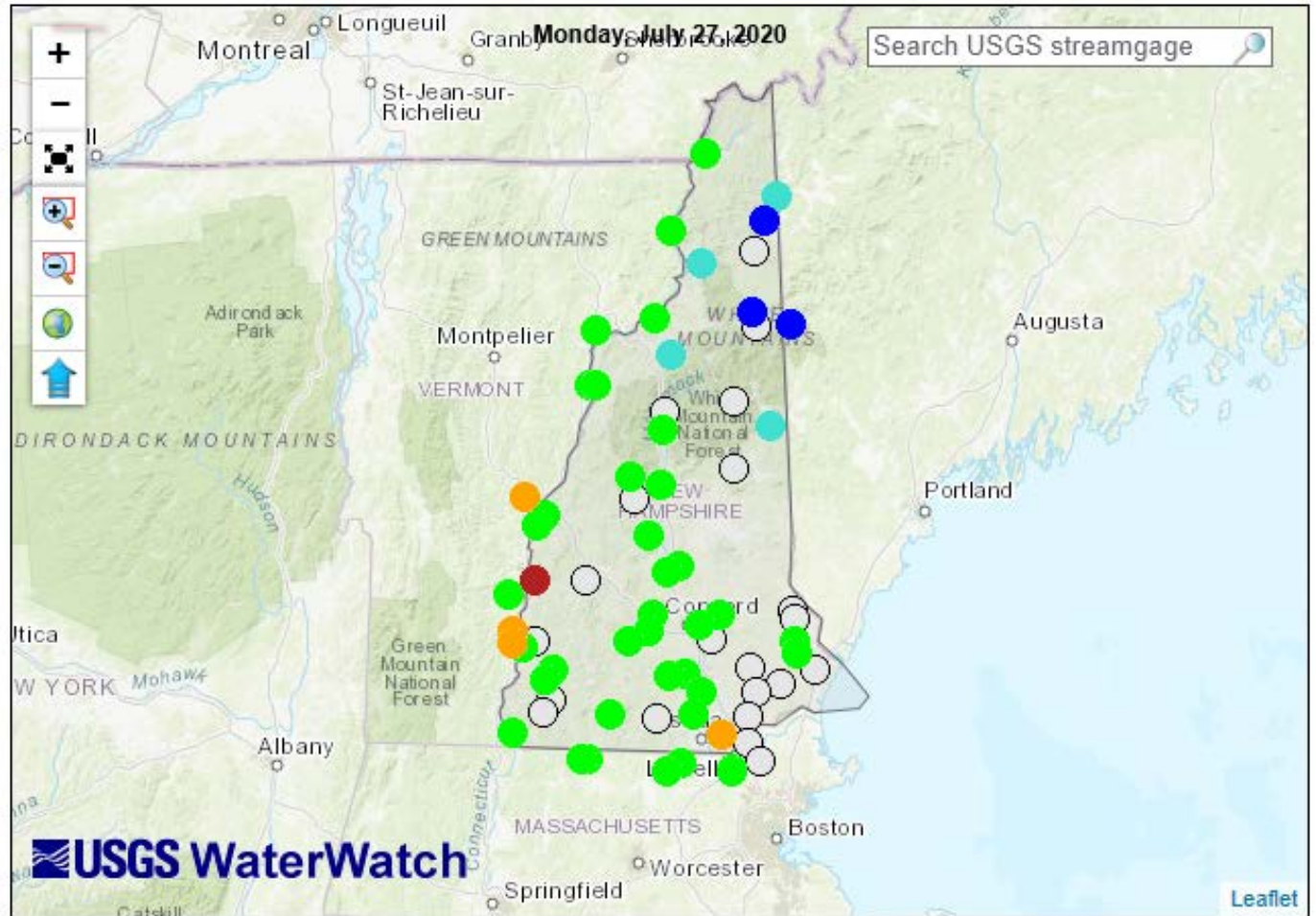
Monthly Status

- High
- Above norm
- Normal
- Below norm
- Low
- Not Analyzed
- Counties



7/28/2020

Map of 28-day average streamflow compared to historical streamflow for the day of the year



Explanation - Percentile classes							
Low	<10 Much below normal	10-24 Below normal	25-75 Normal	76-90 Above normal	>90 Much above normal	High	Not-ranked



2016 Drought Emergency in NH

Impact Summary:

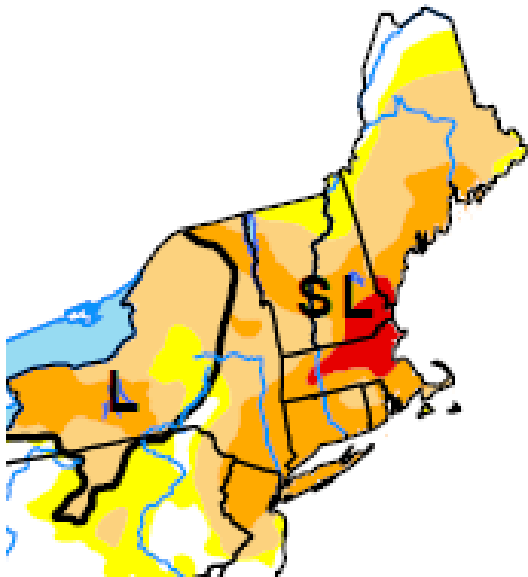
- Hundreds of wells failed
- Residential well drilling
 - Backlog of many weeks to deepen/replace wells
 - Deferring well drilling for new construction
- Limited financial assistance options for homeowners
- Agriculture was significantly impacted –
 - Federal grant and loan programs were implemented
 - State financial assistance funds was considered
- A few large community water systems pursued emergency approvals
- Ecosystems were stressed
- Fire danger was elevated



2016 Economic Impact Survey: Homeowners on Residential Wells

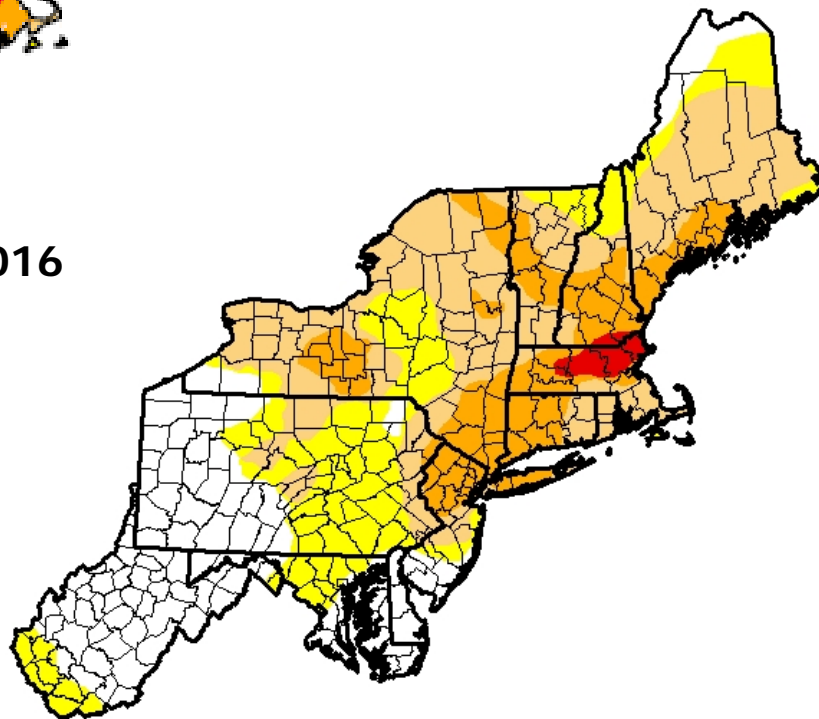
Activity	Number of Respondents	Approximate Cost
Replacement drilled well	77	\$10k-20k
Hydro-fractured well	5	\$5k-10k
Deepened well	6	\$3k-8k
Replacement/deepening pump	10	\$1k-5k
Trucking water in	24	\$180 per 3,000 gal
Nothing done	93	

2016/2017 Results



U.S. Drought Monitor Northeast

October 25, 2016



November 8, 2016

November 8, 2016
(Released Thursday, Nov. 10, 2016)
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	28.37	71.63	50.70	17.62	1.37	0.00
Last Week <i>11/1/2016</i>	31.31	68.69	51.24	19.86	1.37	0.00
3 Months Ago <i>8/9/2016</i>	40.04	59.96	28.57	12.96	0.15	0.00
Start of Calendar Year <i>12/29/2015</i>	62.10	37.90	6.60	0.00	0.00	0.00
Start of Water Year <i>9/27/2016</i>	21.72	78.28	40.32	19.59	6.68	0.00
One Year Ago <i>11/10/2015</i>	76.32	23.68	6.39	0.00	0.00	0.00

Intensity:

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

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:
Deborah Bathke
National Drought Mitigation Center



<http://droughtmonitor.unl.edu/>

NHDES Drought Webpage

Look under
"A to Z List"



The screenshot shows the NHDES Drought Webpage. At the top is a banner with the NHDES logo and several landscape photos. Below the banner is a navigation bar with links for PUBLIC, GOVERNMENT, BUSINESS, and A to Z LIST. The A to Z LIST link is circled in red. On the left is a vertical menu with links like NHDES Home, A to Z List, About NHDES, Media Center, Public, Government, Business, Programs, Rules/Regulatory, and Contact Us. Below the menu are 'OneStop Data and Information' and 'ALERTS' sections. The main content area is titled 'Drought Management Program' and includes a breadcrumb trail: Divisions > Water Division > Programs/Bureaus/Units >. It features a photo of a dry pond and a paragraph explaining drought. Below this is a 'Hot Topics' section with several links. On the right is a search bar and three sidebars: 'Drought Program' with a list of sub-links, 'Water Division' with a list of sub-links, and 'The Department' with a link to the Commissioner's Office.

- NHDES Home
- A to Z List
- About NHDES
- Media Center
- Public
- Government
- Business
- Programs
- Rules/Regulatory
- Contact Us

[Divisions](#) > [Water Division](#) > [Programs/Bureaus/Units](#) >

Drought Management Program



A drought occurs when a region experiences below-average precipitation over an extended period of time, resulting in low stream flows and low surface water and groundwater levels. Many people mistakenly consider drought a rare and random event, but it is actually a normal, recurrent feature of climate. Although New Hampshire is typically thought of as a water-rich state, it may be even more susceptible to drought than other states due to its geology.

In New Hampshire, drought response efforts are coordinated through a Drought Management Team (DMT), comprised of stakeholders representing specific activities or interests that can be impacted by drought and representatives from relevant state and federal agencies. NHDES is the lead agency for the DMT and designates an employee of the department to serve as Chair of the DMT. [more...](#)

Hot Topics

- [Drought Conditions](#)
- [NH Drought Management Team meeting presentation July 9, 2020](#)
- [Water System and Municipal Outdoor Water Use Restrictions List](#)
- [Residential Well Drought Impact Survey](#)
- [Report Water System and Municipal Outdoor Water Use Restrictions to NHDES](#)
- [Press Release: Drought Conditions in New Hampshire Predicted to Persist Through July](#)
- [Press Release: Moderate Drought Declared for Part of New Hampshire](#)
- [Press Release: NHDES Encourages Residential Well Users to Conserve and the Public to Follow Water Use Restrictions](#)

Publications

search this site

Drought Program

- Program Home
- Overview
- Hot Topics
- Publications
- Rules/Regulatory
- Education/Outreach
- Technical Assistance
- Grants/Loans
- Related Programs
- Resources/Links
- Contact Us

Water Division

- Water Home
- Division Overview
- Programs/Bureaus/Units
- Rules/Regulatory
- Publications
- Contact Us

The Department

- Commissioner's Office



- Air Quality
- Beach Advisory
- Cyanobacteria
- Drinking Water Advisory



NHDES Drought Webpage

Hot Topics

- [Drought Conditions](#)
- NH Drought Management Team meeting presentation July 9, 2020
- [Water System and Municipal Outdoor Water Use Restrictions List](#)
- Residential Well Drought Impact Survey
- Report Water System and Municipal Outdoor Water Use Restrictions to NHDES
- Press Release: Drought Conditions in New Hampshire Predicted to Persist Through July
- Press Release: Moderate Drought Declared for Part of New Hampshire
- Press Release: NHDES Encourages Residential Well Users to Conserve and the Public to Follow Water Use Restrictions

Current Drought Conditions

A Situation Summary for New Hampshire

US Drought Monitor ¹ Classification for New Hampshire	Updated Thursdays based on data as of 7:00 AM Tuesday at US Drought Monitor
U.S. Seasonal Drought Outlook and Other Forecasts	Northeast Drought Early Warning System
Precipitation	Daily updates at Weather Service Precipitation Analysis Tool or Northeast River Forecast Center
Stream Flow Conditions	Daily updates at USGS WaterWatch - Streamflow conditions USGS Drought Streamflow Probabilities
Groundwater Levels	Updated monthly at USGS Groundwater Watch and summarized by the NH Geological Survey
Drinking Water Supply Reservoirs	Contact the Drinking Water and Groundwater Bureau at 271-0660 for information.
Recreational Lake Levels	Lake water levels for several water bodies in NH can be accessed at NHDES Real-Time Data & Information for Watersheds in New Hampshire .
Fire Danger	Check daily. Conditions change frequently. (updates at NH Division of Forest & Lands)

Known Water Use Restrictions

Last Update: 7/23/2020

Legend

Municipality or Water System Status

- Voluntary Restriction
- Mandatory Restriction

▭ County Boundary

▭ Town Boundary

Drought Condition

- Abnormally Dry
- Moderate Drought
- Severe Drought
- Extreme Drought

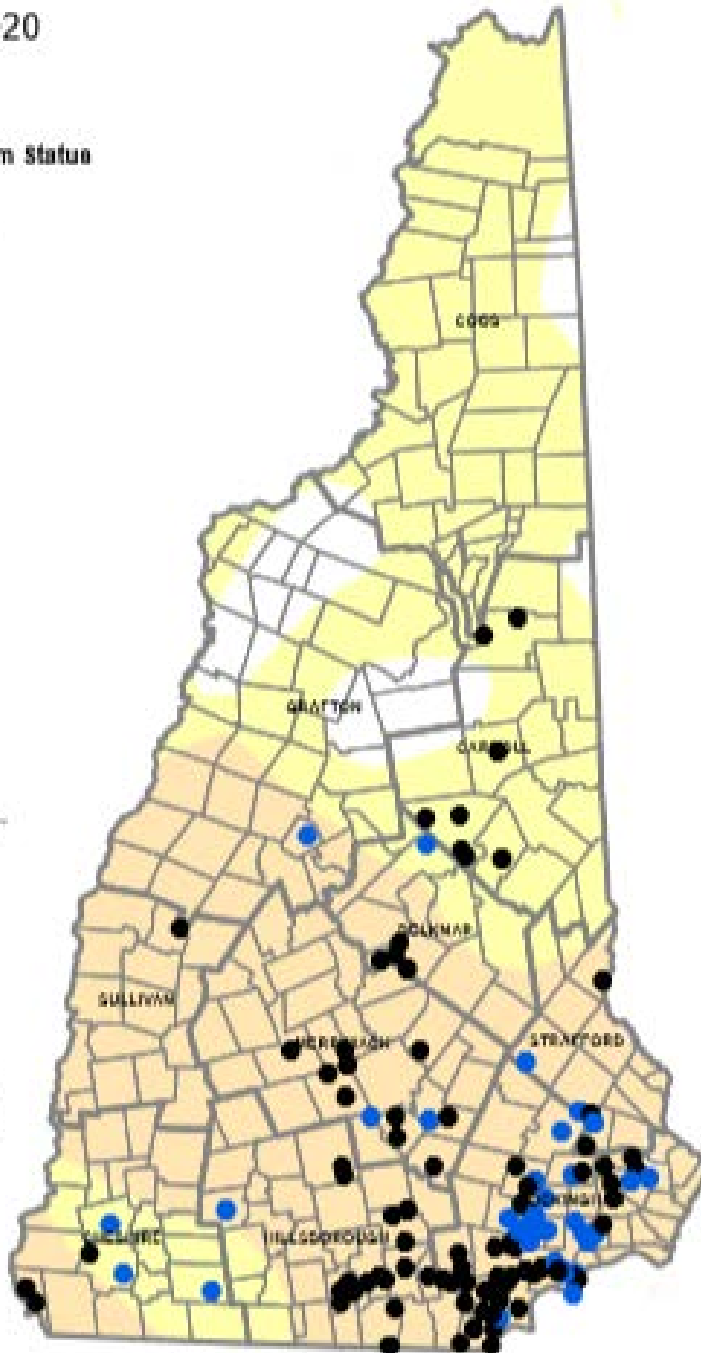


0 5 10 20 Miles



Drought Conditions based on
United States Drought Monitor
([http://droughtmonitor.unl.edu/
CurentMap/
StateDroughtMonitor.aspx?NH](http://droughtmonitor.unl.edu/CurentMap/StateDroughtMonitor.aspx?NH))

Disclaimer: The status of water
use restrictions is based on
information submitted to the New
Hampshire Department of
Environmental Services and may
not be comprehensive.



NHDES Drought Webpage

Publications

- 2016 Drought Management Plan
- UNH Study: An Analysis of Drought Conditions in New Hampshire
- Water Resources Primer/Floods and Droughts Chapter

NHDES Drought Webpage

Rules/Regulatory

- RSA 41:11-d Restricting the Watering of Lawns by Municipalities
- Env-Dw 503 Public Water System Operational Requirements (For limiting water use: See Env-Dw 503.09 and Env-Dw 503.18-503.20)
- RSA 482 Dams, Mills, and Flowage
- Water Conservation Rules

NHDES Drought Webpage

Education/Outreach

- Drought Guidance for Municipalities
- Drought Guidance for Residential Well Owners
- Drought Guidance for Public Water Systems
- Drought Guidance for the Public
- Water Efficiency Information

NHDES Drought Webpage

Technical Assistance

- Licensed Well Drillers and Pump Installers Search Tool
- Emergency Bulk Water Supply for Public Water Systems
- Drought Data Analysis (2012 to current)
- Drought Conditions
- Model Regulation: Municipal and Village District Lawn Irrigation Restriction
- Model Regulation: Public Water System Outdoor Water Use Restrictions

NHDES Drought Webpage

Grants/Loans

- Residential Well Financial Assistance for Very-Low Income Households/USDA Federal Grant Assistance

NHDES Drought Webpage

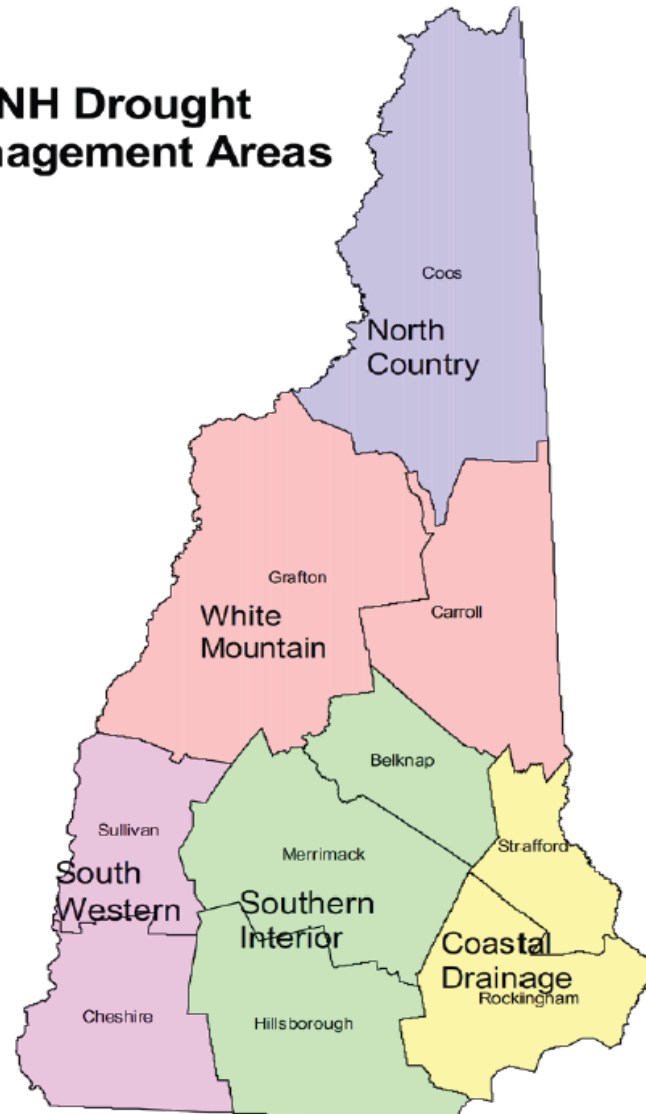
Resources/Links

- Drought Conditions
- We're for Water – Save Water, Energy and \$
- National Weather Service Regional Forecast
- U.S. Drought Portal
- Homeland Security & Emergency Management
- National Drought Mitigation Center
- UNH Cooperative Extension
- USDA: New England Weekly Crop Progress & Condition Report
- NOAA Climate Monitoring

NH Drought Management Areas

- 1) Coastal Drainage**
Stratford County
Rockingham County
- 2) Southern Interior**
Hillsborough County
Merrimack County
Belknap County
- 3) South Western**
Cheshire County
Sullivan County
- 4) White Mountain**
Grafton County
Carroll County
- 5) North Country**
Coos County

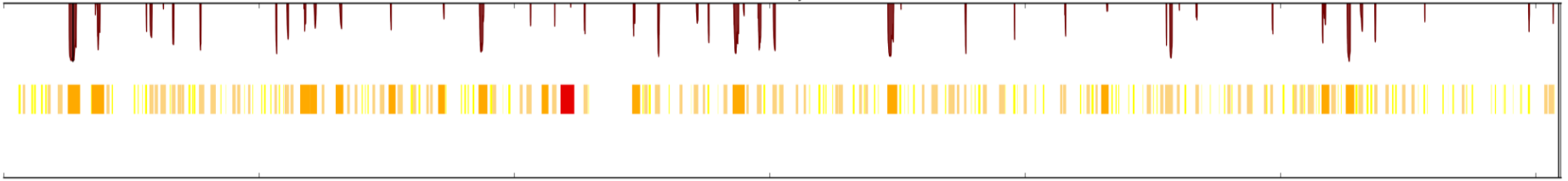
NH Drought Management Areas



Drought Occurrence in NH

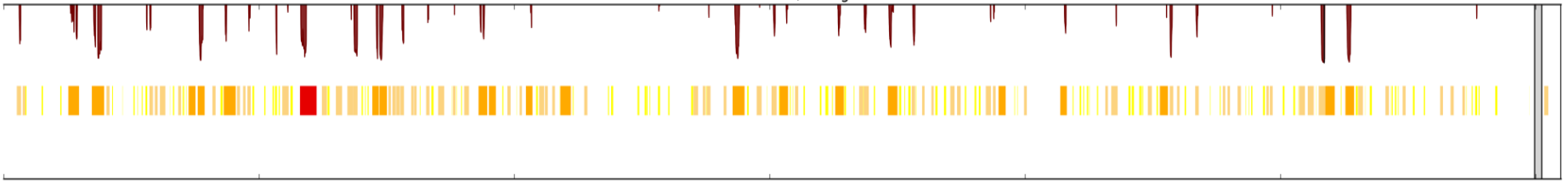
Drought Management Area 5

DMA 5



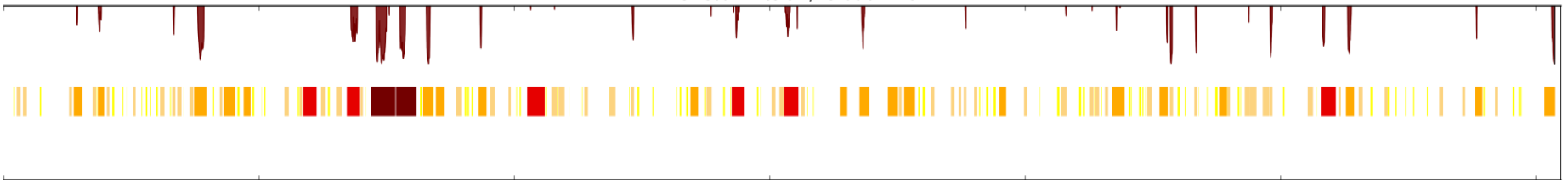
DMA 4

DMA 4: White Mountains, Pemigewasset River



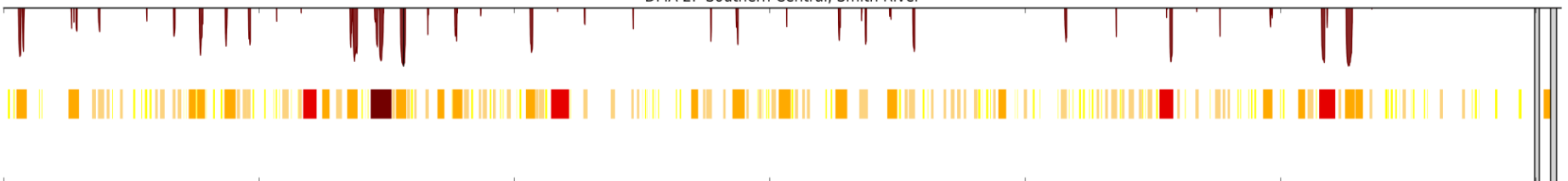
DMA 3

DMA 3: South Western, Ashuelot River



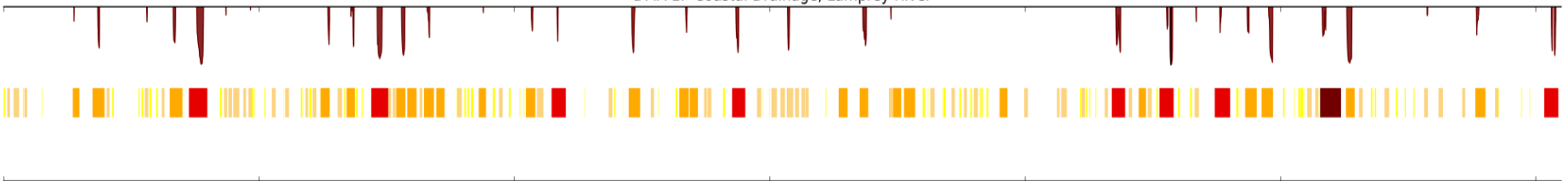
DMA 2

DMA 2: Southern Central, Smith River



DMA 1

DMA 1: Coastal Drainage, Lamprey River



1950 1960 1970 1980 1990 2000 2010

Historic Drought Related Inquiries/Issues

- **Lake levels**
- **Stream flow**
- **Dam management**
- **Failing water supply wells (residential & public)**
- **Public water supply shortages**
- **Restricting outdoor lawn watering**
- **Impacts on business, industry and agriculture**
- **Roadside withdrawals by tanker trucks**
- **Fire danger**



Drought Assistance for Residential Wells

- Answer calls from residential well owners
- Conservation tips
- Well failure symptoms
- Well improvement options
- Well Information
- Licensed well drillers and pump installers
- Financial Assistance – USDA loan/grant for very low income households
- Coordinate with local officials to establish emergency water sources
 - NHDES conducts testing if the source is not a public water system
- Guidelines & prohibitions on “filling” dry wells with bulk water
- Compile data on drought impacted areas, remedies sought and financial burden



Private Well Financial Assistance Program for Very-Low Income Households

The United States Department of Agriculture Rural Development can provide loans to very-low-income homeowners to repair, improve or modernize their homes, as well as to remove health and

\$20,000 loan at 1% interest

\$7,500 grant for those over 62

Funds may be used for:

- New Well Construction
- Well Pump Installation
- May Not Be Used for Hydro-fracturing

Eligibility based on family income being <50% of area's median income



Drought Assistance for Municipalities and Public Water Systems

- Drought condition summary
- Water use restriction examples
- Tools available for implementing voluntary and mandatory restrictions
- Promote relationship between towns and community water systems.
- Weekly emails to community water systems updating them on the status of drought and providing recommendations and resources.

NH Drought Management Plan

- **Technical criteria updated by UNH in 2014**
- **Drought Management Plan Updated in 2015 – Stakeholder review in 2012**
- **Currently being adapted as an annex for the State’s Emergency Operation Plan**
- **Additional stakeholder comments were welcomed through August**
- **Coordinated by NHDES**
- **Administered by a Drought Management Team**
 - **30+ entities**
 - **Government/Water Supply/Business/Recreation**

Drought Management Team

- 1) Assembles after a sustained moderate drought is occurring**
- 2) Assesses data and makes drought classification determination for each management area**
- 3) Determines public relations messaging**
- 4) Makes recommendations to each other, State agencies and Governor**
- 5) Assists in capturing economic damage and other impacts**
- 6) Forum for information sharing and collaboration**

Legal Mechanisms to Address Drought

- Large groundwater withdrawal permits – reduce withdrawals based on phase of drought
- Emergency authority to approve new large groundwater withdrawals
- Municipal authority to restrict or ban residential lawn watering during drought (applies to public and *residential wells*)
- Authority to require dam owners to release water
- Authority to require a public water system to extend service to address a nearby emergency
- Instream flow rules
- Surface water quality standards

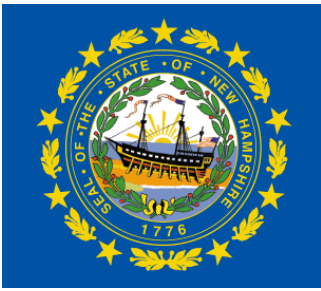
Other Drought Mitigation Strategies

- Emergency interconnections for water systems
- Source diversification/water resource management
- Artificial recharge
- Water conservation
 - Leak detection, water audits/metering, water use restrictions, model landscaping bylaws, indoor fixtures
- Wastewater reuse (biomass, snowmaking, golf courses)
- Economic planning, insurance
- Emergency bulk water for public water systems
- Federal emergency financial assistance for public/residential wells
- Well filling
- Model residential well ordinances (quantity and quality)

Examples of Seacoast Water Drought

Mitigation Efforts (01-03 vs. 16)

- Seabrook – Source management, metering & water rates
- Aquarion – Leak detection/repair, new sources & additional usable storage
- Portsmouth – Water conservation, water supply management plan, source replacement & leak detection repair
- Dover – Artificial recharge, leak detection & additional sources
- Durham/UNH – Water conservation, new sources & artificial recharge



RSA 41:11-d Municipal Lawn Watering Restrictions

- Municipalities can restrict/ban lawn watering if the State or Federal government declare a stage of drought.
- Governing body can adopt rules and enforce them within a few days
- Applies to lawn watering using water from residential wells or public water systems
- Every two years legislative efforts to expand or reduce the authority for implementing water use restrictions have been pursued in the Legislature.
- One of the only states to extend restrictions to residential wells.

New Hampshire - Top Ten Public Water System's Pumpage

'08-'09 '09-'10 '10-'11

