New Hampshire Drought Management Team (DMT)

5 November, 2020

Announcements:
- If WebEx crashes, this meeting will be rescheduled for next week.
- Note that this meeting is being recorded for later posting.
- Please hold questions till the end to ensure we have time to cover all material.
Introduction and Agenda, Tom O’Donovan, Chair and Director, Water Division, NHDES

Current Drought conditions and Forecast for New Hampshire, Mary Stampone, UNH, State Climatologist

Drought Impacts
  - Rivers and Streams, Ted Diers, Administrator, Watershed Bureau, Water Division, NHDES
  - Reservoirs, Jim Gallagher, Administrator, Dam Bureau, Water Division, NHDES
  - Groundwater, Shane Csiki, NHGS
  - Drinking Water, Brandon Kernen, Administrator, DWGB, Water Division, NHDES
  - Agriculture, Commissioner Jasper, NH Dept. of Agriculture
  - Forest Fire, NH Dept. of Natural and Cultural Resources

Overview and status of the new Emergency Drought Assistance Initiative (EDA) (bOTTLED WATER, WELL ASSISTANCE, CONNECTION ASSISTANCE)

Review of initial observations for Lessons Learned for the 2020 Drought

Long term forecast and review of multiyear drought experienced by NH, ’64-’66

Ongoing Actions
  - Messaging: Informing and Public Messaging Stacey Herbold, NHDES

Drought Management Team Discussion (input from all DMT participants)

Next session; on request
The tough question of the day; “It’s been raining, why are we still talking about drought?”
II. Current Drought and Forecast for New Hampshire, Mary Stampone, State Climatologist

September 29, 2020

**U.S. Drought Monitor**

**New Hampshire**

- Drought improvement (from 10/13)
- Drought intensification (from 8/18-10/6)

November 3, 2020

- Drought intensification (from 8/18-10/6)
- Extreme drought persists (from 9/22)

**Intensity:**
- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

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http://droughtmonitor.unl.edu/
II. Current Drought and Forecast for New Hampshire

US Drought Monitor Change
October 6 to November 3, 2020

Total Precipitation
October 2020

http://droughtmonitor.unl.edu
II. Current Drought and Forecast for New Hampshire

US Drought Monitor Change
October 6 to November 3, 2020

- Drought improvement (from 10/3)
- Extreme drought persists (from 9/22)

Total Precipitation
October 2020

- Much above normal
- Near normal
- Below normal

http://droughtmonitor.unl.edu
II. Current Drought and Forecast for New Hampshire

US Drought Monitor Change
October 6 to November 3, 2020

Drought improvement (from 10/3)

Extreme drought persists (from 9/22)

28-Day Streamflow
November 3, 2020

Above normal
Normal
Below normal
Much below normal (moderate drought)

Below normal

http://droughtmonitor.unl.edu
II. Current Drought and Forecast for New Hampshire

US Drought Monitor
November 3, 2020

Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
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- D4 Exceptional Drought

Drought improvement (from 10/3)

Extreme drought persists (from 9/22)

http://droughtmonitor.unl.edu/

6 mo Precipitation Deficit
May-October 2020

-2 in
-4 in
-6 in
-8 in
-10 in
-12 in

Mary Stampone, NH State Climatologist • Department of Geography, University of New Hampshire
II. Current Drought and Forecast for New Hampshire

*U.S. Monthly Drought Outlook*

**Drought Tendency During the Valid Period**

Valid for November 2020
Released October 31, 2020

**Improvements:**
- Increased precipitation & streamflow
- Declining temperature
- End of growing season

**Drought persists:**
- 6-mo precipitation deficits < 75% of normal
- Groundwater levels remain below normal

http://go.usa.gov/3eZGd
Instream Flow Program

- Users in both Souhegan and Lamprey Rivers have been implementing water management plans.
- Lamprey River is now above Critical and Rare flows. Four relief pulses conducted. Lake is now being drawn down for the winter. Concerns about alewife out migration.
Souhegan River --

- Users in both Souhegan and Lamprey Rivers have been implementing water management plans.
- Souhegan River is above the Rare flow but below the Critical flows.
Wells in towns highlighted in pink experienced continued level decreases from September to October.

Range = -0.16 foot drop at Concord to -0.97 foot drop at New London

Wells in northern New Hampshire and in Nashua have risen since last month.
Drought Impacts, Groundwater, Shane Csiki, NH Geologic Survey, NHDES

NFW-53 (New Durham) - Monthly Averages/Standard Deviations Compared to 2020

CVW-04 (Concord) - Monthly Averages/Standard Deviations Compared to 2020
Drinking Water – Public Water Systems

- 117 Water systems have mandatory restrictions/50 have voluntary restrictions (345,000 people impacted)

- 8 Municipalities have implemented outdoor water use restrictions (6 mandatory/2 voluntary – 66,000 people impacted)

- Only a few public water systems have had to develop emergency water sources

- Only a few public water systems have had to haul bulk water in to meet demand

Drought Impacts, Drinking Water, Brandon Kernen, Administrator, DWGB, Water Division, NHDES

Known Water Use Restrictions
Last Update: 11/5/2020
Drinking Water – Residential Wells

• 190 Reports for wells being replaced or deepened have been filed since late June (data are still coming in). Towns with the most wells
  • Tamworth (7) Pittsburg (7) Swanzey (6)
  • Stewartstown (5) Enfield (4) Errol (4)

• Call to large water well contractors the week of October 19th indicated that 1000+ residential wells were impacted.

• Approximately 110 people with residential wells have asked for assistance under the Emergency Drought Assistance initiative for income qualified households
Water Conservation

• Ensure plumbing fixtures are not leaking & toilets are not running.

• Winterize water lines. Running water to avoid freezing could result in failed wells.

• Modernize appliances and fixtures and reduce indoor water use by up to 50% (toilets, clothes washer, showerheads & faucets)
Critical messaging; NH Farmers are impacted, but still in business. They need our support. Buy local. “Smaller this year, but sweeter.”
NEW HAMPSHIRE
FOREST PROTECTION
BUREAU

WILDFIRE UPDATE

November 5, 2020
Presenter: Captain Doug Miner
Current Conditions

The threat of wildfires in the state has stabilized with the precipitation received in the last 30 days despite the remaining drought conditions.

Map released: Thurs. October 29, 2020
Data valid: October 27, 2020 at 8 a.m. EDT

Intensity:
- None
- 00 (Abnormally Dry)
- 01 (Moderate Drought)
- 02 (Severe Drought)
- 03 (Extreme Drought)
- 04 (Exceptional Drought)
- No Data

Author(s):
David Miskus, NOAA/NWS/NCEP/CPC

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.
Keetch-Byram Drought Index (KBDI) Indices Show Significant Improvement

- A drought index specifically for fire potential assessment.
- It is a number representing the net effect of evapotranspiration and precipitation in producing cumulative moisture deficiency in deep duff and upper soil layers. It is a continuous index, relating to the flammability of organic material in the ground.
- Zero is the point of no moisture deficiency and 800 is the maximum drought that is possible.
- 400 and above is when we start seeing fires become deep burning and more challenging to suppress.
The ERC is a number related to the available energy (BTU) per unit area (square foot) within the flaming front at the head of a fire. The ERC is considered a composite fuel moisture index as it reflects the contribution of all live and dead fuels to potential fire intensity.

Indices are back to 0
Burning Index (BI)

- An estimate of the potential difficulty of fire containment as it relates to the flame length at the head of the fire. A relative number related to the contribution that fire behavior makes to the amount or effort needed to contain a fire in a specified fuel type.

- The BI shows us day to day fluctuations based on a 2pm snapshot of temp, RH, wind, daily temp. & RH ranges and precipitation duration.

- Burn Index is back to 0.
Fire Restrictions

- Proclamation signed by the Governor on 9/24/2020 remained in effect until a second proclamation was issued on 10/20/20. It was a very effective tool!
- The restrictions regarding smoking and open fires on public land except in campgrounds was rescinded.
- The restriction on category 3 fires was rescinded.
- White Mountain National Forest has also rescinded fire restrictions on USFS lands in NH.
As We Continue Through Fall…

- Drought conditions continue to impact the state at various levels, we remain vigilant to the wildfire threat this fall and next spring.
- Cooler temperatures, increased 1, 10, 100 & 1000 hr. fuel moisture levels are positive.
- KBDI indices in Coos County are in the teens and range from 44-365 in southern counties.
- Spring wildfire conditions are influenced in part by prior fall and winter precipitation.
Contact Information
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State of New Hampshire
Department of Natural and Cultural Resources
Division of Forests and Lands
Forest Protection Bureau
172 Pembroke Road
Concord NH 03301
(603) 227-8734
Douglas.miner@dnrc.nh.gov
Emergency Drought Assistance Initiative Overview
Who is Eligible?

- Assistance available for low-income New Hampshire homeowners served by residential wells
- Low-Income defined as at or below 80% of the MHI of their area
- Homeowner must demonstrate that the primary residence lacks a safe or reliable source of drinking water due to drought.
- Pre-Approval Process by NHDES
  - Low-income determination
  - Verification the current condition of the well is related to drought
- NHDES will determine eligibility and financial assistance amount
What Drought Mitigation Actions are Eligible?

1. Short-term Provision of Water for Eligible Households with Insufficient Water Due to Drought

2. Improving or Replacing Residential Wells with Insufficient Water Due to Drought

3. Connection to an Existing Community Water System, if available, for Residential Wells with Insufficient Water Due to Drought
Emergency Drought Assistance Initiative Overview – Financial Assistance

• Households with less than 50% of the median statewide household income ($37,028) will be eligible for 100% assistance minus $250

• Households with 50%-80% of the median area household income will be eligible for 50% assistance
Drought Mitigation Action – Water Supply Improvements or Replacement

Eligible mitigation measures include:

- Well deepening
- Lowering the pump
- Replacing the existing wells
- Hydrofracturing the wells
- Installing additional storage
- All associated materials and labor to connect and activate the water supply
Emergency Drought Assistance Initiative Overview – Eligibility Dates

• Effective Date: **Retroactive to June 23, 2020** - First week US Drought Monitor classified NH as being in a moderate drought

• End date: Four consecutive weeks of as being classified as a non-drought conditions
  • Determined by the classification of the county and adjacent counties
  • Approach addresses the potential for conditions improving and then deteriorating again
Emergency Drought Assistance to Low-Income Residential Well Owners

Information on NHDES’ Homepage DES.NH.GOV
https://www.surveymonkey.com/r/wellwaterhelp
droughtwellinfo@des.nh.gov or (603) 271-1355
Emergency Drought Assistance - Inquiries to Date

Survey responses by county:
- Belknap County: 7
- Carroll County: 11
- Cheshire County: 6
- Coos County: 3
- Grafton County: 15
- Hillsborough County: 11
- Merrimack County: 11
- Rockingham County: 20
- Strafford County: 6
- Sullivan County: 5
Review of initial lessons learned for the 2020 Drought

“Observations become lessons, lessons can be learned….or not.”

+ Early identification of the drought, dam refills went well, perhaps at a downstream cost, enabled earlier messaging may have helped
+ Improved messaging on Drought Monitor, with increased understanding of how Drought Designations are developed and used
- Groundwater monitoring and notification needs improvement;
  - For NHGS; increase in frequency sooner / improve resolution and communication, including graphics, effective integration of NHGS / USGS
  - For DES; Well Watch / Warning System needs to be finalized and used
  - For well drilling industry; timeliness of drill reporting
  - For the public; improved reporting of residential well status

+ Drought updates / drought webpage worked well
- DMT needs improvement, potentially a legislative role developed. Drought Plan works well up to a point, needs to be given authority, needs to be in SEOP
+ Coordination with Governor’s office went well
- Instream Flow program worked well for two rivers, but...
  - Challenges in water management, only two of 19 designated rivers are in the program
“Observations become lessons, lessons can be learned….or not.”

+ Emergency Drought Assistance (EDA) was a big step forward
- Need improved understanding of current climate models for impacts on New Hampshire
- Water usage statewide during a drought is problematic; landcapers, corporately owned businesses, drought resistance landscaping, water reuse,
+ Fire restrictions was effective
- Towns had a mixed experience
  - Warren well going dry
  - Mandatory vs voluntary restrictions and effectiveness
  - Role of Drinking Water Trust Fund
  - Resiliency considerations

“We need to prepare better for the next drought, need a statewide strategy.”
The seasonal drought outlook for the Northeast Region is especially problematic at this time, because of the unexpectedly prolonged duration of dryness and drought in this region.

La Niña composites, recent widespread ample rains (1-3”), forecast short-term heavy precipitation, and a non-dry climatology, are thought to be enough to warrant some improvement/removal of drought for most of the Northeast, with the exception of the vicinity of Pennsylvania, which has less support for any drought mitigation.
Perspective from 1960’s Drought
1965

Drought conditions persisted and intensified throughout much of the Northeast during the year ended September 30, 1965. Streamflow was much below normal, and during the year many streams reached record lows, partly as a result of a carryover of groundwater deficiency from the previous growing season. At the year's end, the salt front of 250 ppm (250 parts per million of chloride) was advancing upon the Philadelphia water intake as a result of the exceptionally low flows in the Delaware River.

Ground-water levels for the year ended March 31, 1966, registered new record lows in 14 observation wells. Of the 72 observation wells, 45 recorded lows more than 25 percent below the average of the lows recorded in the base period. In only 11 wells were the annual lows near normal or above.

On August 18, President Johnson declared that those parts of the States of Delaware, New Jersey, New York, and Pennsylvania included within the Delaware River Basin and its service area were affected by the drought to the extent that Federal assistance was warranted to accomplish certain specific emergency actions. Critical water shortages were identified in almost a score of public water supplies outside the Delaware Basin ranging from New Hampshire to Pennsylvania. Federal assistance was provided to them. Several hundred communities in the region experienced water shortages sufficient to require restrictions on water use during the year; many of these were in Massachusetts.
The drought has emphasized the need for solid, substantial, courageous long-range planning.
Perspective from 1960’s Drought

Quabbin Reservoir 1966

Lake Massabessic 2020
- Level in October was the lowest on record (1865).
- Water use restrictions rarely implemented.

Perspective from 1960’s Drought

- Drought occurred from 1963-1967
- Came on a bit slow, by 1965 it was the worst (28” below average ppt for the 3 years).
- Many wells dry, surface waters extremely low (Quabbin Reservior as 40% lower than normal)
- People struggled to get adequate water to drink and for sanitation
- There was little preparation or guidance on what to do/how to react
- Promoted regional studies on drought and impacts to public, agriculture, groundwater and surface water (President Johnson ordered one – and called state of emergency for areas around CT, NY, NJ).
- Caused NH to fund a large number of statewide and regional water supply planning documents and groundwater investigations from the late 60s through the early 80s

Where are we now?
Created and utilized planning documents – especially related to resiliency in backup sources
Developed laws related to groundwater withdrawals, water use and conservation – state and local level
Began more long-term monitoring of groundwater levels
Regional cooperation in the management of water resources is being embraced at all levels of government in NH. Legal and philosophical barriers are being removed.
Drought Communications and Messaging
Stacey Herbold, Water Conservation and Water Use Registration and Reporting Program Manager

Drought: water restrictions and cutting out water waste

Unlike other natural disasters, a drought is invisible in nature. Its impacts are often not observed by the general public until the drought has developed in a community. Unfortunately, at that point, drought impacts are often more difficult to manage. That’s why NHDES, as the lead agency of the state’s Drought Management Team (DMT), continually tracks drought conditions and impacts in New Hampshire, as well as provides timely drought guidance. Long before a drought emerges, NHDES is tracking drought development and preparing for a drought response. For example, while parts of the state were not yet designated as experiencing drought until the end of this past June, NHDES began carefully tracking conditions in early spring. As drought intensified and below normal precipitation in the spring, the groundwater recharge is usually at its peak, signal certain drought. At the precipitation deficit continued and dry conditions took hold in mid-summer. NHDES began a variety of efforts including keeping hundreds of drinking water systems informed, and publicly informed of drought development and conservation measures that should be taken.

Supply Lines with the Source

2020 Drought: Behind the Scenes

NHDES has been carefully tracking the development of drought conditions since the spring. Due to a low snowpack and below normal precipitation, by the end of May, abnormally dry conditions developed across the state. Dry conditions persisted and a month later, approximately 70% of the state was experiencing moderate drought conditions—the first of four stages of drought (D1-D4) classified by the U.S. Drought Monitor. Over the summer, drought has persisted or intensified in some regions of the state, while in other localities, reduced drought conditions, but only temporarily as more

To: Municipalities and Community Water Systems
Subject: Drought Update 19
Date: 11/5/2020

The Municipal Ecolink
An e-bulletin from the NH Department of Environmental Services

Media Center
FOR IMMEDIATE RELEASE: DATE: October 2, 2020
CONTACT: Jim Martin, (603) 568-9777

Drought Conditions in New Hampshire Predicted To Persist Through the Fall
State Drought Management Team Congres To Discuss Current Conditions and Impacts

Media Center
FOR IMMEDIATE RELEASE: DATE: October 23, 2020
CONTACT: Jim Martin, (603) 568-9777

Emergency Drought Assistance to Low-Income Residential Well Owners
Drought Management Team Discussion
(input from all Drought Management Team participants)

a. Recommended responses to any specific impacts
b. Recommended public messaging
c. Next steps
d. Next session; on request
Perspective from 1960’s Drought

Figure 11.—Drought severity in the northeastern United States as of July 25, 1965 (from [7]).