City of Portsmouth

Department of Public Works

December 5, 2016

Portsmouth Water Supply Status Report

Overview

The following Portsmouth Water Supply Status Report provides the Portsmouth Water customers an assessment of the current water supply conditions. This report is distributed routinely via the City of Portsmouth's website at:
www.Cityofportsmouth.com/publicworks - water

Water Use Restrictions

Customer Water Restrictions
N/A
None
Voluntary Measures
Odd/Even Watering
Two-Days per Week Watering
No Lawn Watering

Due to current water supply conditions, the Mandatory Ban of Lawn Watering that began on September 8th remains in effect.

Drought conditions continue to persist with respect to water supply resources. Recent precipitation events have helped to recharge the Bellamy Reservoir and increase stream flows; however, groundwater levels remain below average for this time of year. Minimal recharge to the water supply aquifers is expected over the coming months due to freezing temperatures. Water use restrictions are still requested in order to minimize water demand and extend the existing supply resources through the winter.

Compliance with this water use restriction is enforced with two warning notifications and fines of $100 per violation after that.

Additional updates and tips regarding water efficiency can be accessed at the cityofportsmouth.com website or by calling the water/snow ban hotline at: 603-766-7669.

Current Customer Water Demand

Current Water Demand
Below Normal
Normal
Above Normal
High
Very High
Historic High

Water demand is considered **Below Normal** at this time.

Customer's continued efforts to conserve water have helped to keep water demand in November below normal. Water Demand is a factor in the supply status assessment that is measured by the amount of water delivered through the water system. This factor reflects customer usage and variations caused by daily, weekly and seasonal changes in business, residential and irrigation demands.

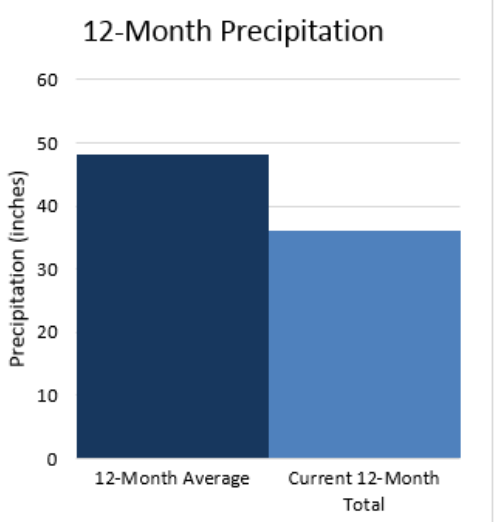
Month	Current Demand (Million Gallons per Day (MGD))	Average Demand (ten-year average (MGD))
January 2016	3.97	4.16
February 2016	4.07	4.17
March 2016	4.09	4.18
April 2016	4.21	4.19
May 2016	4.77	4.73
June 2016	5.62	5.07
July 2016	6.09	5.49
August 2016	5.66	5.52
September 2016	4.47	4.96
October 2016	3.89	4.23
November 2016	3.59	4.01

Average daily water demand was 3.59 million gallons per day (MGD) in November, which is approximately 10.5% lower than the ten-year mean November demand of 4.01.

Precipitation Status

Precipitation
Above Average
Average
Below Average
Dry
Very Dry
Drought

Total November precipitation in Portsmouth was 3.45 inches. This is 1.58 inches less than the historic November average. The majority of this precipitation occurred on the 15th-16th (1.71 inches) and on the 29th-30th (0.91 inches). The remaining precipitation occurred sporadically throughout the month.



In order to assess annual precipitation conditions, total precipitation over a rolling 12-month period is compared to the 30-year mean annual precipitation of 47.39 inches. As the accompanying graphic shows, precipitation over the past 12-months equals 37.06 inches which is 10.33 inches below normal, 78% of the normal annual amount.

The precipitation status is currently considered as **Dry** conditions

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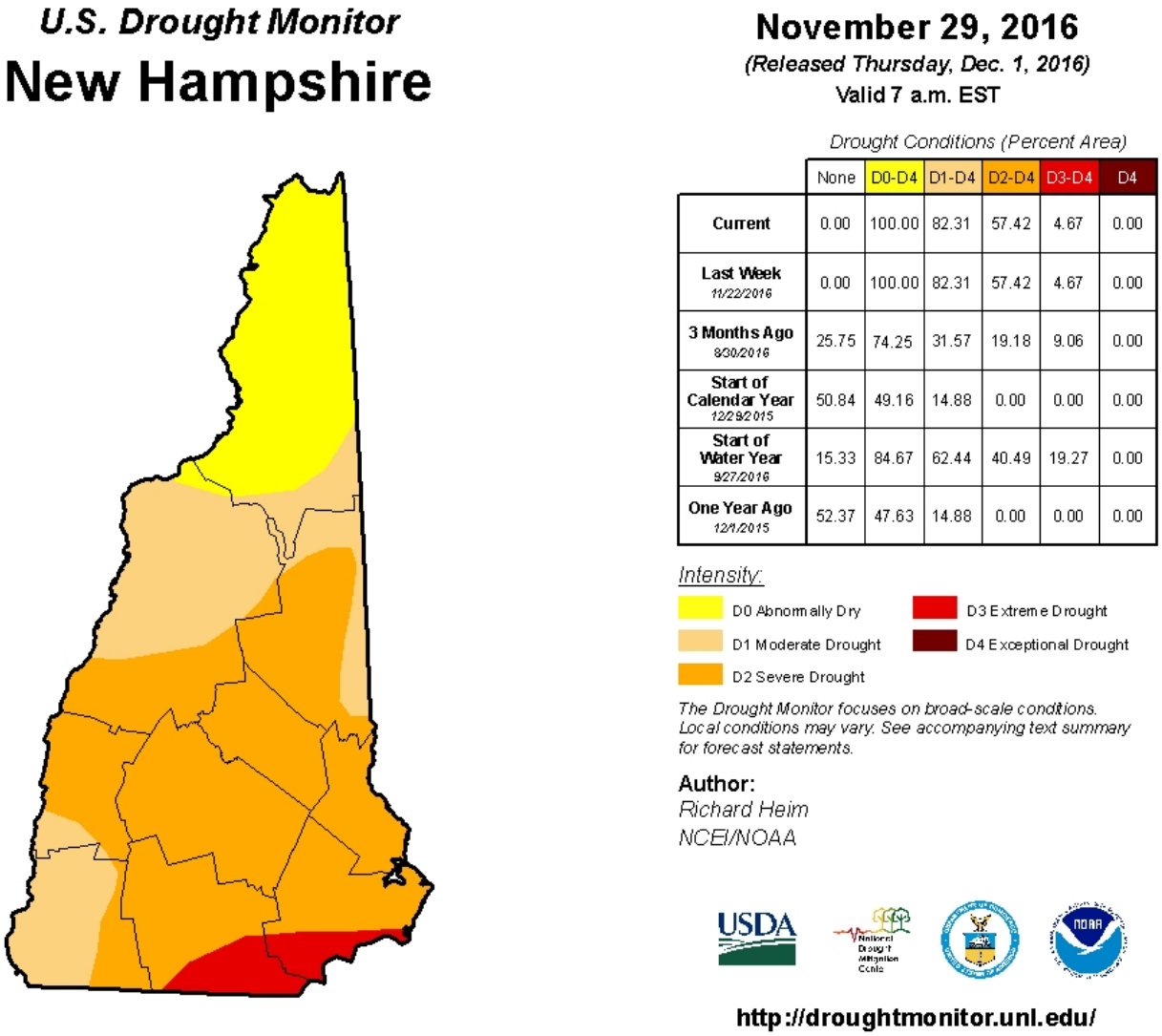
New Hampshire Drought Monitor

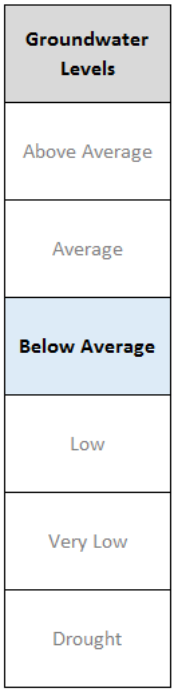
The following graphic summarizes the drought conditions in New Hampshire:



The National Drought Summary for November 29, 2016 identifies the seacoast area along with much of New Hampshire in Severe Drought conditions.

To stay informed on the latest drought conditions and current drought related information go to the NHDES Drought Management Program webpage at: *http://des.nh.gov/organization/divisions/water/dam/drought/index.htm*.

Groundwater Levels

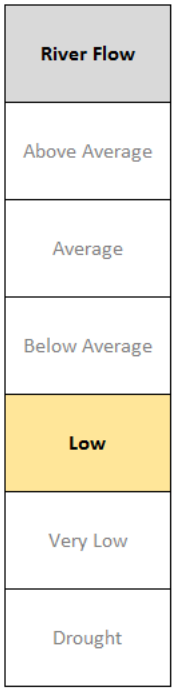


Currently the groundwater levels considered **Below Average.** Groundwater levels in the Portsmouth, Pease and Madbury wells are lower than normal.

Overall conditions of aquifer water levels are assessed with respect to water levels that are continuously monitored in the Portsmouth Water Supply wells. Based on historic water-level data, average water levels have been identified for a representative well in each well-field area for each month of the year. Assessments of the aquifer levels are made relative to average levels, historic low levels, and available drawdown in the wells.

Groundwater from wells in Madbury, Portsmouth and Greenland typically provide between 34% and 45% of the water supply to Portsmouth customers with the remaining 55% to 66% from the Bellamy Reservoir. Over the summer approximately 37% of the supply came from the wells. In November 35% of the supply came from wells.

River Flow



Portsmouth Water System operators track the USGS stream flow gauges in the Oyster River and Lamprey River to assess flow conditions. These gauged watersheds are used to assess the relative recharge to the Bellamy Reservoir through its tributaries, the Bellamy River and Mallego Brook.

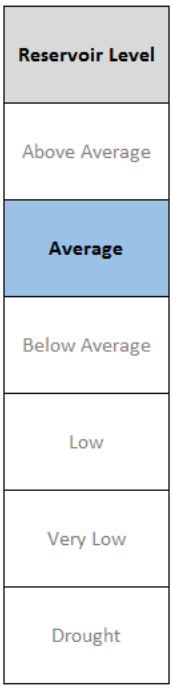
The monthly mean stream flow in the Oyster River at the USGS gauge was 7.70 cfs in November. This is 12.9 cfs (63%) lower than the 30-year November mean flow rate of 20.6 cfs.

The monthly mean November stream flow in the Lamprey River at the USGS gauge was 119 cfs, which is 214 cfs (64%) lower than the 30-year November mean flow rate of 334 cfs.

Freezing temperatures over the winter typically results in a reduction in stream flow since runoff is minimal and streams are fed by groundwater discharge through this period. Given low groundwater levels, lower than usual stream flow is expected over the winter.

At this time the current river flow rates are considered at **Low** levels for this assessment due to their below normal rates in November.

Reservoir Level

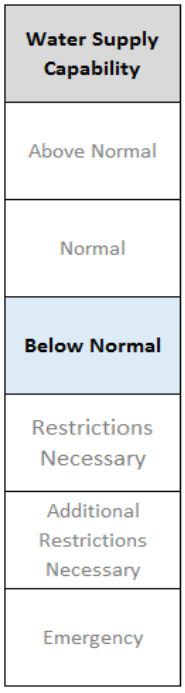


The current stage of the reservoir is considered to be **Average** for this time of year. The above average amount of precipitation that occurred in October has causes the reservoir to fill. Water is currently flowing over the spillway at a rate that is typical for this time of year.

As the surface water source for the Madbury Water Treatment Facility, the Bellamy Reservoir is monitored to assess and predict the overall amount of water available for the Treatment Facility. Reservoir water levels are compared to typical monthly levels to assess the reservoir conditions.

The Bellamy Reservoir reached a low level of 4.1 feet below the spillway on October 20th prior to the large precipitation event on the 21st and 22nd. Subsequent precipitation events in November recharged the reservoir to a level that was 0.55 feet above the spillway at the end of November. This equates to approximately 691 million gallons (MG) of water available above the lower intake. This is about 109% of the reservoir storage capacity of 637 MG at the spillway elevation.

Water Supply Capability



Water Supply Capability is a measure used to identify any issues with the Portsmouth Water Supply System that would result in a limitation to the amount of water that could be supplied. These could be lack of supply, issues with source water quality, or mechanical failures of system components.

The loss of the Haven Well as a water source (which contributed approximately 10% of the water system's overall capability) has reduced the amount of water that can be provided to the system. Portsmouth #1 Well is currently out of service for maintenance and cleaning. This well supplies approximately 9% of the water supplied to the Portsmouth System. Due to these factors, the water supply capability is considered **Below Normal** at this time.

Further Updates and Information

This information will be distributed electronically on the City of Portsmouth's website in the Department of Public Work's "Water" section. If anyone needs additional information or has questions contact Brian Goetz, Deputy Director of Public Works at 766-1420 or Al Pratt, Water Resource Manager at 520-0622.

Water Supply Status
Portsmouth Water Division
December 5, 2016

Precipitation	Groundwater Levels	River Flow	Reservoir Level	Water Supply Capability	Current Water Demand	Customer Water Restrictions
Above Average	Above Average	Above Average	Above Average	Above Normal	**Below Normal**	N/A
Average	Average	Average	**Average**	Normal	Normal	None
Below Average	**Below Average**	Below Average	Below Average	**Below Normal**	Above Normal	Voluntary Measures
Dry	Low	**Low**	Low	Restrictions Necessary	High	Odd/Even Watering
Very Dry	Very Low	Very Low	Very Low	Additional Restrictions Necessary	Very High	Two-Days per Week Watering
Drought	Drought	Drought	Drought	Emergency	Historic High	**No Lawn Watering**