



October 4, 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

Odd/Even 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 supply and demand conditions, the Mandatory Ban of Lawn Watering that began on September 8th remains in effect. Customers are allowed to hand water vegetable gardens, perennial plants and nursery stock. Golf courses are allowed to water Tees and greens.

Water use restrictions are requested at this time due to the continued extreme drought conditions on the Seacoast. As the accompanying information shows, the recent weather conditions continue to be very dry. This has caused extremely low reservoir levels, groundwater levels and stream flow.

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.

With great thanks to customers following the No Lawn Watering restrictions, water demand dropped in September to below normal amounts. 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

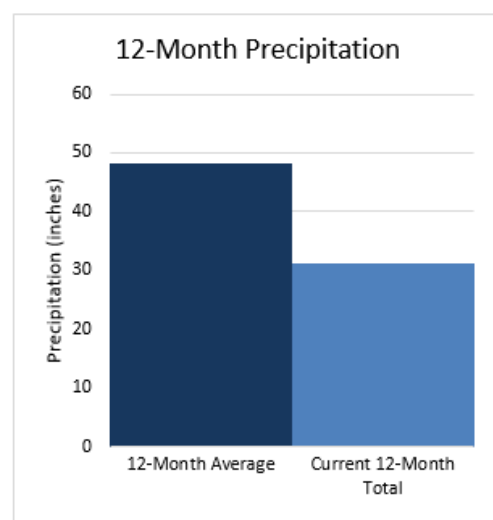
Average daily water demand was 4.47 million gallons per day (MGD) in September, was approximately 10% lower than the ten-year mean September demand of 4.96.

Precipitation Status

Precipitation
Above Average
Average
Below Average
Dry
Very Dry
Drought

Total September precipitation in Portsmouth was 1.76 inches. This is 2.00 inches less than the historic September average. The largest storm in September yielded 1.06 inches on the 19th. Five other rain events occurred over the month of September, each producing between 0.02 and 0.23 inches. **This is the twelfth consecutive month with less than average precipitation.**

In order to assess annual precipitation conditions, total precipitation over a rolling 12-month period is compared to the normal annual precipitation of 48.19 inches. As the accompanying graphic shows, precipitation over the past 12-months equals 31.28 inches which is 16.91 inches below normal, 65% of the normal annual amount. The precipitation status is currently considered to be in **Drought** conditions

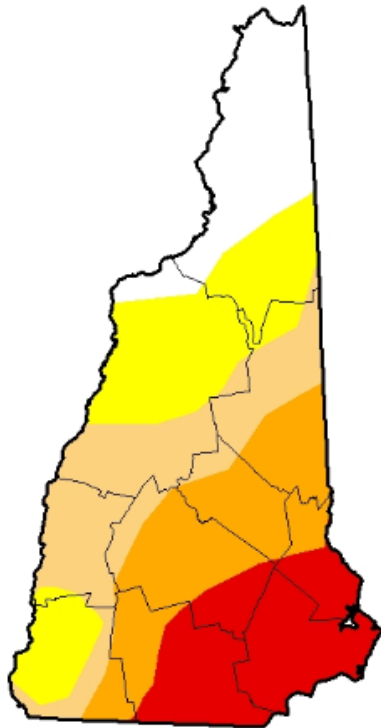


New Hampshire Drought Monitor

The following graphic summarizes the drought conditions in New Hampshire:

U.S. Drought Monitor New Hampshire

September 27, 2016
(Released Thursday, Sep. 29, 2016)
Valid 8 a.m. EDT



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.

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NCEM/NESDIS/NOAA



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

New Hampshire Department of Environmental Services has published the following in drought emergency notices:

Southern New Hampshire is experiencing a drought emergency. Southern New Hampshire has received about 50% of its normal rainfall over the last six months. Streamflow and groundwater levels are at historic low levels. Some New Hampshire residents on private wells, as well as some community water systems are experiencing water supply shortages. More widespread shortages are imminent if rainfall does not replenish our lakes, streams and groundwater supplies before winter weather sets in, as our water resources will probably not be substantially refilled until after the snowmelt during the spring of 2017. The drought condition is a very slow-moving natural disaster that may continue to worsen.

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>. now to avoid or at least delay potential impacts from water shortage emergencies if drought conditions persist.

Groundwater Levels

Groundwater Levels
Above Average
Average
Below Average
Low
Very Low
Drought

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.

River Flow

River Flow
Above Average
Average
Below Average
Low
Very Low
Drought

Portsmouth Water System operators track the USGS stream flow gauges in the Oyster River and Lamprey River to assess flow conditions. The monthly mean stream flow in the Oyster River at the USGS gauge was 0.37 cfs in September. This is 5.66 cfs (94%) lower than the 30-year September mean flow rate of 6.0 cfs. **This is the lowest average monthly flow measured for September over the 80-year historic record at this gauge.**

The monthly mean September stream flow in the Lamprey River at the USGS gauge was 5.3 cfs, which is 76 cfs (93.5%) lower than the 30-year September mean flow rate of 81 cfs.

At this time the current river flow rates are considered at **Drought** levels for this assessment. This condition reflects the absence of recharge to the Bellamy Reservoir from its tributaries.

Reservoir Level

Reservoir Level
Above Average
Average
Below Average
Low
Very Low
Drought

The current stage of the reservoir is considered to be in **Drought** conditions 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 ceased flowing over the spillway during the last week of May. This typically occurs at the end of June or early July. This was a result of the deficit in precipitation over the winter and spring. Generally, recharge to the reservoir can occur with storm events that produce substantial runoff from the 22 square mile watershed. Currently the reservoir level is **3.6** feet below the spillway. However, this level is better than it was during the last drought in 2002 when the reservoir was 5 feet below the spillway. This is due to water operations staff reducing the surface water withdrawals and increasing use of groundwater in addition to the reduction in water demand due to the restrictions.

Water Supply Capability

Water Supply Capability
Above Normal
Normal
Below Normal
Low
Additional Restrictions Necessary
Emergency

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. Also, the very low water level of the reservoir and declining water quality in the reservoir are prompting the need for reducing withdrawal from the reservoir. At this time the water supply capability prompts the need to apply **Additional Restrictions of No Lawn Watering**.

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

October 4, 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	Low	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
- 17 inches below normal annual precipitation (65% of normal)	- Integrated Management of supply has helped preserve aquifer levels	- Historic low-level record streamflow (82 years of record)	- 3.6 feet below dam spillway. Better than 2002 drought when level was 5 feet below spillway	- Loss of Haven Well has reduced overall supply by 10%	- Demand was 10% below normal September average	- Very good compliance since No Lawn Watering Restrictions went into effect Sept 8, 2016. No need for 3rd notices or penalties.