



April 12, 2018

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:

<https://www.cityofportsmouth.com/publicworks/water/supply-status>

Water Use Restrictions

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

There are **no water use restrictions** at this time. There has been slightly less than the average amount of precipitation over the winter. The storm systems that occurred in March helped to recharge the reservoir after the winter snow pack had melted. At this time, the groundwater levels, reservoir levels and river flow rates are within typical ranges based on historic records for March.

We continue to ask our water customers to please use water wisely, minimize waste, and incorporate water efficient fixtures and appliances whenever possible. In an effort to support this goal, the City offers all residential water customers rebates for the installation of low-flow toilets and high-efficiency washing machines. More details can be found in the Public Works Billing Information section of the City's website.

Additional updates and tips regarding water efficiency can be accessed at the cityofportsmouth.com.

Water operations staff continue to assess the supply conditions and will provide updates monthly.

Current Customer Water Demand

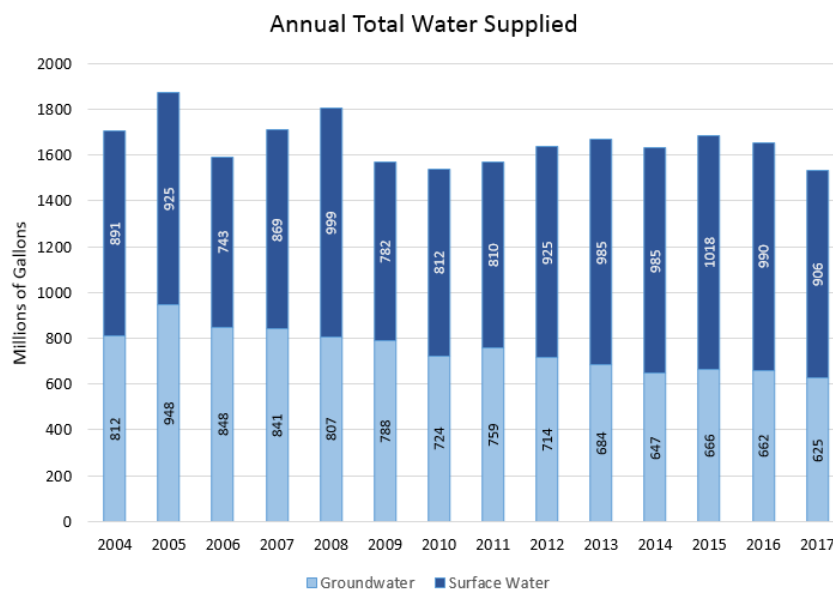
Current Water Demand
Below Normal
Normal
Above Normal
High
Very High
Historic High

Water demand is **Normal** for this time of year. Average daily water demand was 4.08 million gallons per day (MGD) in March 2018, which is 0.8% less than the 10-year normal for March.

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	Monthly Demand (Million Gallons per Day (MGD))	Historic Average Demand (ten-year average (MGD))
March 2017	3.68	4.18
April 2017	4.01	4.14
May 2017	4.14	4.73
June 2017	4.83	5.15
July 2017	5.15	5.46
August 2017	5.34	5.43
September 2017	4.45	4.92
October 2017	4.00	4.19
November 2017	3.64	3.94
December 2017	3.81	3.86
January 2018	4.36	4.03
February 2018	4.06	4.15
March 2018	4.08	4.11

The following chart illustrates the total water annual water demand over the past 14 years and the proportions of water from our groundwater and surface water sources. Note the relatively flat overall trend which may be attributed to water efficiency, infrastructure improvements, and leak repair efforts.

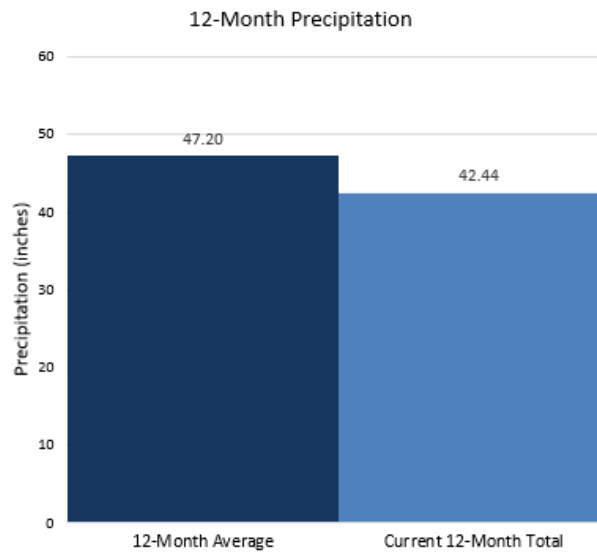
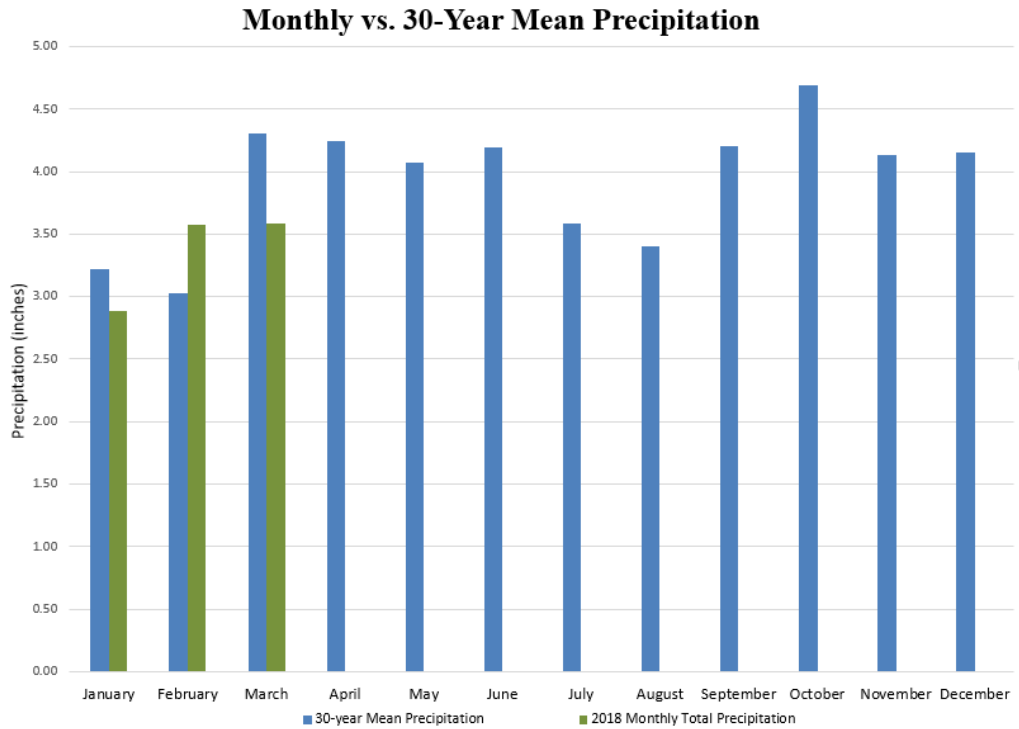


Precipitation Status

Precipitation
Above Average
Average
Below Average
Dry
Very Dry
Drought

Total March precipitation in Portsmouth was 3.58 inches. This is 0.72 inches less than normal for the month. Over the past six months there has been a total deficit of 4.59 inches from normal. There were four snow or rain events in March which yielded between 0.31 and 1.41 inches per storm in rain equivalents.

Precipitation over the past 12-months totaled 42.44 inches, which is 90% of the mean annual amount of 47.20 inches.



Groundwater Levels

Groundwater Levels
Above Average
Average
Below Average
Low
Very Low
Drought

Currently the groundwater levels are considered **Average**. Groundwater levels in the Portsmouth and Greenland aquifers are within ranges that are typical for this time of year. The groundwater levels at the well field in Madbury are above normal. This is a result of the integrated management of the water system sources leading to a reduction in the groundwater withdrawals and a slight increase in the withdrawal from the reservoir. Since the water quality in the reservoir is very good and there is sufficient volume in the reservoir to sustain seasonable downstream flow, we are utilizing the surface water resource more and resting our groundwater sources to allow for aquifer recovery and greater storage for drier seasons.

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. In March 2018, 33% of the supply came from wells, 67% from the reservoir.

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. These gauged watersheds are used to assess the relative recharge to the Bellamy Reservoir through its tributaries, the Bellamy River and Mallego Brook.

The stream gauge in the Oyster River was frozen for much of January and February so no flow data is available for this period. The monthly mean stream flow in the Oyster River at the USGS gauge was 35.7 cfs, which is 5.7 cfs (14%) lower than the 30-year March median flow rate of 41.4 cfs.

The gauge in the Lamprey River was also frozen for the first half of January. The flow in the Lamprey River over the second half of January averaged above normal. February flow was higher than normal.

The monthly mean March stream flow in the Lamprey River at the USGS gauge was 482 cfs, which is 29 cfs (5.7%) lower than the 30-year March median flow rate of 511 cfs.

The current river flow conditions are considered **Average**.

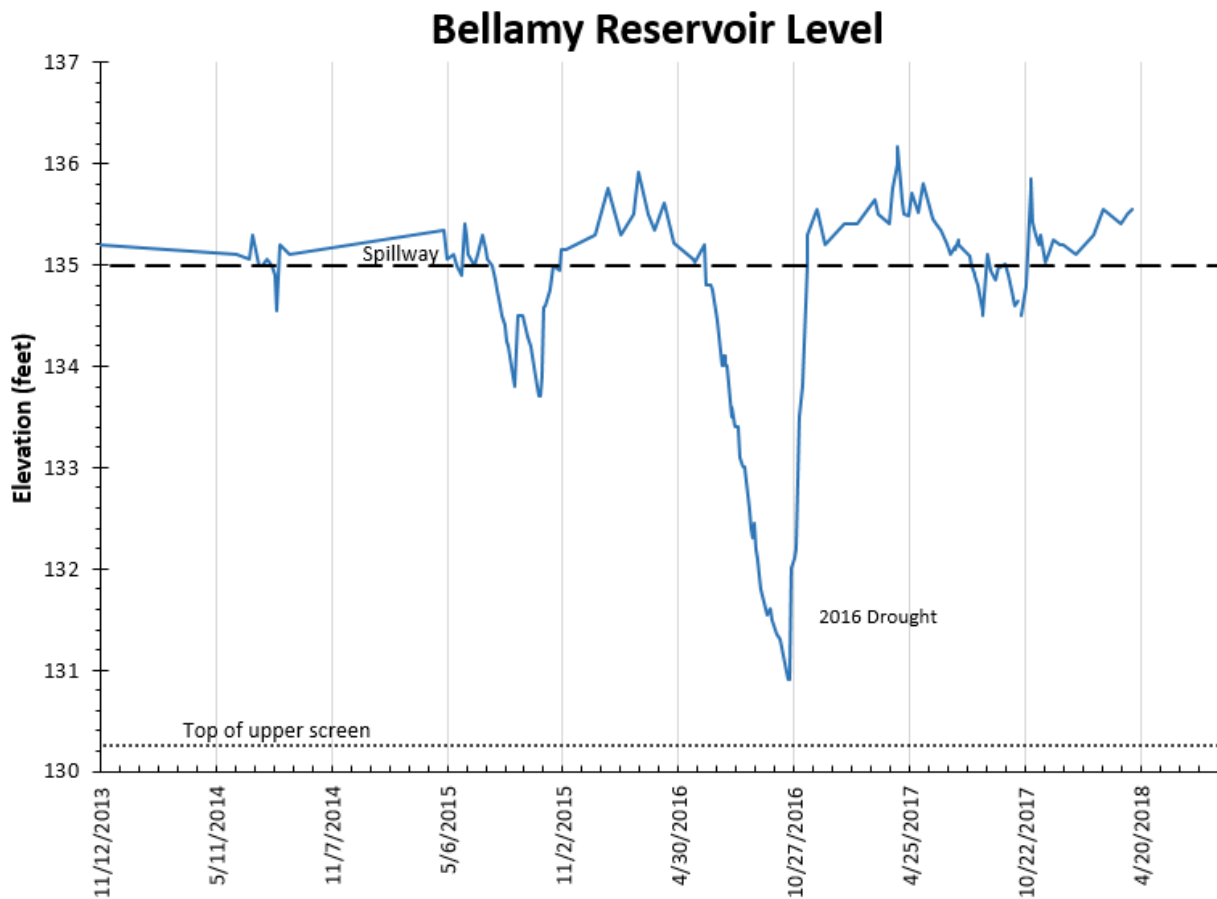
Reservoir Level

Reservoir Level
Above Average
Average
Below Average
Low
Very Low
Drought

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 current stage of the reservoir is considered to be **Average** for this time of year. The reservoir is flowing over the spillway as it typically does this time of year.

Water flow past the dam is controlled by an outlet valve. The flow into the Bellamy River is adjusted to rates that correlate with the Oyster River flow rate. The reservoir currently has approximately 690 million gallons of water above the lower surface water intake. The following graphic shows the last five years of water level at the reservoir as tracked by our water system operators.



Water Supply Capability

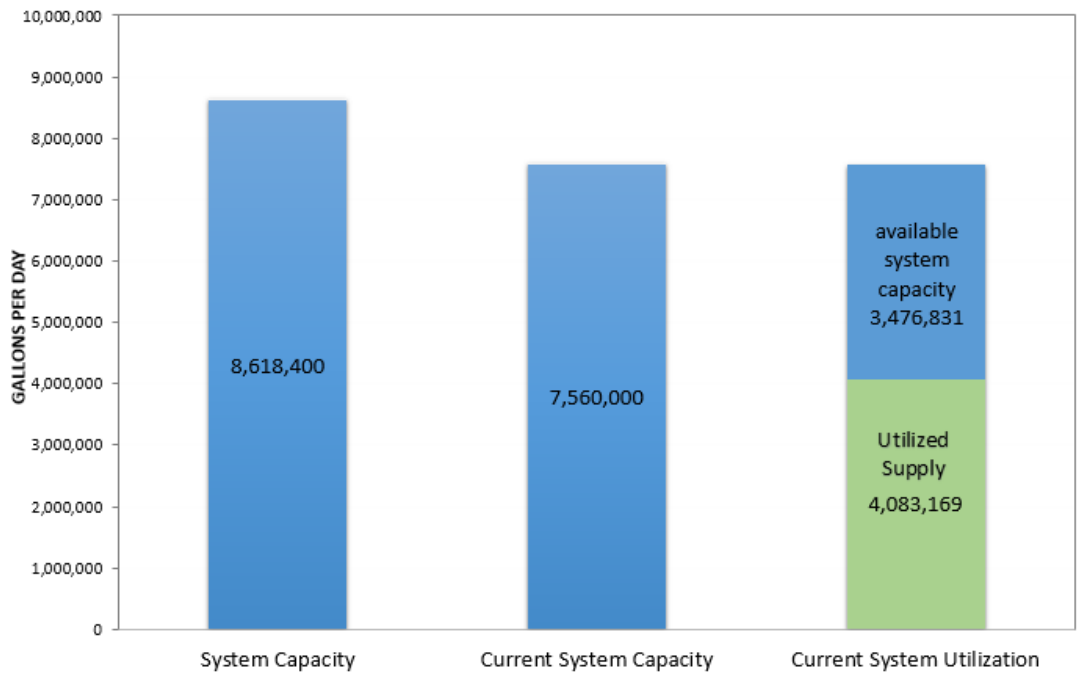
Water Supply Capability
Above Normal
Normal
Below Normal
Restrictions Necessary
Additional Restrictions Necessary
Emergency

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. As a result of this reduced capacity, the water supply capability is considered **Below Normal** at this time.

All of the other wells and the treatment facility are in excellent operational conditions, thus the water demand is currently being met with conservative protections and redundancy in the system. Average daily demand is currently 54% of the current system capability.

System Capacity & Utilization (March 2018)



Further Updates and Information

If anyone needs additional information or has questions contact Al Pratt, Water Supply Operations Manager at 520-0622 or Brian Goetz, Deputy Director of Public Works at 766-1420.