

## **2015 LAKE MASSAPOAG OBSERVATIONS**

In 2015, the Lake Management Study Committee periodically posted observations of the lake level and discharge from the lake on its web page. These postings, collected between May 21, 2015 and October 1, 2015, are presented below in chronological order.

### **Lake Massapoag Update, May 21**

The lake level is currently at 10.2 feet, compared to a targeted maximum lake level of 10.5 feet. This is at least the fifth time in the last 20 years that the lake level did not rise to a level of 10.5 feet by May 15. The current lake level reflects the low quantity of groundwater and surface water flowing into the lake and the lack of significant precipitation this spring. In addition, the water level control structure was maintained at a level of about 9.8 feet in April (instead of gradually raising the control structure) because a temporary repair to the Hammershop Pond Dam was contemplated by the DPW. If a temporary repair was undertaken this spring, complete shutdown of water flow out of Lake Massapoag would have been necessary. The water level control structure was held at about 9.8 feet in April in order to reserve water storage capacity in the lake during a dam repair. When it was decided a temporary repair was not going to be undertaken, the Conservation Agent began to gradually raise the water level control structure.

As of May 21, the United States Drought Monitor (<http://droughtmonitor.unl.edu/>) has determined our region is experiencing “moderate drought” conditions.

Water discharge from the lake for the last three weeks has been at a minimum level and the water control structure has been maintained at a high level. Generally, the discharge has ranged between 1 and 1.4 cubic feet per second, compared to a minimum discharge rate of 1.5 cubic feet per second recommended in the management plan. The minimum discharge rate is recommended to maintain the biological integrity of downstream ponds and streams. The Conservation Agent has attempted to minimize the discharge from the lake in order to try to raise the lake level.

No water quality issues have been identified at this time. The daytime lake water temperature is around 70 degrees Fahrenheit, which seems high for this time of year. A high water temperature (particularly above 80 degrees) will cause water quality issues such as algae blooms.

Because it is early in the growing season, no visual observations have been conducted this year to evaluate the presence / absence of fanwort and variable milfoil. A herbicide treatment was conducted last year in two areas of the lake (Fletcher’s Cove and the South Cove) to kill these two invasive aquatic plants, and the results of the treatment were favorable (more information is presented in the report linked elsewhere on this web page). The presence / absence of Asian Clams has also not yet been evaluated this year.

### **Lake Massapoag Update, Saturday, May 30**

The lake level dropped over the last week and is now at 10.1 feet. Between May 21 and May 30, no precipitation occurred and the quantity of surface water flowing into the lake dropped compared to the previous week.

Water discharge from the lake continues to be at a minimum level and the water control structure has been maintained at a high level. Generally, the discharge has ranged between 0.8 and 1 cubic feet per second, compared to a minimum discharge rate of 1.5 cubic feet per second recommended in the management plan. The Conservation Agent has attempted to minimize the discharge from the lake in order to maintain the lake level.

No water quality issues have been identified at this time. A daytime lake water temperature of 76 degrees Fahrenheit has been measured on a number of days. As noted in a previous update, a high water temperature (particularly above 80 degrees) will cause water quality issues such as algae blooms.

### **Lake Massapoag Update, Wednesday June 3**

After two days of rain, the lake level has risen to 10.3 feet.

Following the end of rainfall, the discharge from the lake has ranged from 1.5 to 1.85 cubic feet per second. A minor quantity of debris (i.e., floating vegetation such as leaves and grasses) has been observed at the flume house during periods of a southwesterly wind. The Conservation Agent temporarily increased discharge from the lake to flush these debris out of the lake.

Water temperature has dropped to 64 degrees Fahrenheit as a result of the unseasonably cold temperatures we experienced over the last few days.

The Lake Management Study Committee sent a communication to Town Departments and Boards regarding use of the lake. A copy of the communication is provided under "Links."

### **Lake Massapoag Update, Friday June 12**

The lake level is 10.15 feet and the water temperature in the evening is 78 degrees Fahrenheit. Because of the high water temperature, the Conservation Agent has increased water discharge to about 11.5 cubic feet per second.

On June 11, the Conservation Agent sent the following communication to the Conservation Commission, the Board of Selectmen, and the Lake Management Study Committee:

"Hello: I wanted to let everyone know that there has been an unusually high number of dead fish washing up on the beach and boat launch areas. This does not appear to be the normal spawning mortality. There are multiple species, and various age groups. The water temperature at the flume house was 79 degrees yesterday afternoon. With higher temperatures come not just the danger of more species mortality but better conditions for the appearance of virus, algae, bacteria and weeds. The fish that have settled to the bottom have not been touched which means that the crayfish etc. are apparently gone or not as prevalent as in the past.

We had a warm, dry May with restricted flow to try to reach target levels. It will be a great challenge to try manage water temperatures at this point in order to satisfy the management priorities of swimming, boating and fishing in that order. I will resort to increasing discharge rates in order to keep the beaches open and protect the species that still survive in your Lake."

### **Lake Massapoag Update, Sunday June 21**

On Sunday afternoon (after the rainfall), the lake level is 10.09 feet, the water temperature (measured at the flume house) is 74 degrees, and water discharge from the lake is about 5.4 cubic feet per second.

### **Lake Massapoag Update, Tuesday June 30**

The lake level is 9.98 feet, the water temperature (measured at the flume house) ranges from about 71 degrees (morning) to 80 degrees (early evening), and water discharge from the lake is about 5 cubic feet per second.

The current lake level is about 4 inches lower than the average lake level measured on June 30 based upon measurements from the last 20 years. But, as explained in a previous update, the lake level did not attain its targeted level of 10.5 feet on May 15. This year's drop in lake level between May 15 and June 30 (about 2 ½ inches) is close to average; there have been instances when the lake level dropped more than 6 inches between May 15 and June 30.

Last year, when the lake level was lowered as required by the State prior to the herbicide treatment, the lake level on June 30 was 8.45 feet.

A brief survey for invasive weeds was conducted in the South Cove; fanwort was not observed. Monitoring will continue through the summer. We encourage lake users to look for invasive species and report your observations to the Conservation Administrator and the Lake Management Study Committee.

## **Lake Massapoag Update, Thursday July 9**

Today's lake level is 9.8 feet. Over the last week, the water temperature at the flume house has ranged from the mid 70s to mid 80s, and discharge out of the lake has ranged from 3.3 cubic feet per second to 5 cubic feet per second.

According to the Drought Monitor (<http://droughtmonitor.unl.edu/>), our area is still classified as "abnormally dry" despite the rain we received in June.

## **Lake Massapoag Update, Monday July 13**

The lake level is 9.76 feet.

We are in the midst of beach season and the Health Department is routinely collecting and analyzing water samples from a number of beach locations around the lake. Water samples are collected weekly by the Health Department from Memorial Park Beach (three locations: the swimming docks, the central portion of the beach, and the boat launch area) and Community Center Beach (the camps are responsible for testing at their beaches). Water samples may be collected more frequently based upon recent sample results and/or a recommendation by the Health Department. The water samples are analyzed for *Escherichia coli* (E. coli) which is a sensitive indicator of fecal contamination for freshwater beaches.

Samples results are reported as the number of colony forming units (cfu) present per 100 milliliters (ml) of water. The Massachusetts water quality standard established in Massachusetts Department of Public Health regulations is no sample shall exceed 235 cfu per 100 ml, and the geometric mean of the most recent five samples shall not exceed 126 cfu per 100 ml. When sample results exceed these standards, the current Board of Health policy is to close the beach, resample the water, and reopen the beach upon receipt of a sample result less than the standard. This policy is more conservative than state regulation; a 2014 amendment to the Massachusetts bathing beach regulations allows Lake Massapoag beaches to remain open after one sample exceeds the 235 cfu per 100 ml standard because the routine testing have shown consistently good water quality. More information about beach testing in Massachusetts is provided [here](#).

The most recent sampling event conducted on July 6 detected between 5 and 76 cfu per 100 ml at Memorial Park Beach and 104 cfu per 100 ml at the Community Center Beach. These results, as well as the geometric means for these locations, are well below the regulatory standard.

While the Health Department is responsible for water collection and analysis, the Lake Management Study Committee will share results that we receive on this website. If you have questions regarding the testing, please contact Beverly Anderson, the town's Health Administrator.

### **Lake Massapoag Update, Friday, July 24**

Today's lake level is 9.56 feet. The water temperature at the flume house this week has ranged from the mid 70s to mid 80s, and discharge out of the lake this week has ranged from 1.6 cubic feet per second to 2.5 cubic feet per second. No water quality issues have been identified at this time.

The most recent water sampling event for E. coli conducted at the beaches on July 20 detected 5 cfu per 100 ml at Memorial Park Beach (all three sampling locations) and 72 cfu per 100 ml at the Community Center Beach. These results, as well as the geometric means for these locations, are well below the regulatory standard. Further information about this testing program is presented below.

The current lake level is about 6 inches lower than the average lake level measured on July 24 based on measurements from the last 20 years. The lake level on July 24 has ranged from 9.55 feet to 10.7 feet based on measurements since 1996 (excluding last summer when the lake level was around 8 feet because of the herbicide treatment and two other summers when the lake level was not recorded).

The lake level has dropped 7 ½ inches since May 15. The average lake level decline from May 15 to July 24 has been about 5 inches using measurements from the last 20 years. There have been times when the lake level has dropped between 8 and 12 ½ inches over the same time period. During two summers (2009 and 2013), the lake level was 2 inches higher on July 24 compared to May 15.

### **Lake Massapoag Update, Tuesday, August 4**

Today's lake level is 9.35 feet. The water temperature at the flume house continues to range from the mid 70s to mid 80s, and discharge out of the lake this week has ranged from 1.1 cubic feet per second to 1.9 cubic feet per second. No water quality issues have been observed.

The recent water sampling event for E. coli conducted at the beaches on July 27 detected between 15 and 35 cfu per 100 ml at Memorial Park Beach and 5 cfu per 100 ml at the Community Center Beach. These results, as well as the geometric means for these locations, are well below the regulatory standard. Further information about this testing program is presented below.

### **Lake Massapoag Update, Tuesday, August 11**

Before the rain began, the lake level was 9.22 feet. Water temperature measured at the boat launch dock was 75 degrees. Discharge out of the lake this morning was 1.4 cubic feet per second.

### **Lake Massapoag Update, Sunday, August 16**

The lake level is 9.26 feet. Water temperature measured at the flume house in the evening was 82 degrees. Discharge out of the lake was 1.8 cubic feet per second.

Recent water sampling events for E. coli conducted at the town beaches on August 5 and August 10 detected between 5 and 48 cfu per 100 ml at Memorial Park Beach and 5 cfu per 100 ml at the Community Center Beach. These results, as well as the geometric means for these locations, are well below the regulatory standard. Further information about this testing program is presented below.

### **Lake Massapoag Update, Thursday, August 20**

The lake level is 9.26 feet (the lake level rose to 9.3 feet on Tuesday evening following the rain). Water temperature measured at the boat launch dock in the morning was 77 degrees. Discharge out of the lake this morning was 1.6 cubic feet per second.

The current lake level is about 5 inches lower than the average lake level measured on August 20 based on measurements from the last 20 years. The lake level on August 20 has ranged from 9.19 feet to 10.17 feet based on measurements since 1996 (excluding last summer when the lake level was around 8.6 feet because of the herbicide treatment and five other summers when the lake level was not recorded around this date).

The lake level has dropped 11 inches since May 15. The average lake level decline from May 15 to August 20 has been about 9 inches using measurements from the last 20 years. There have been at least 4 years when the lake level has dropped more than 12 inches over the same time period (excluding last summer). The drop in lake level between May 15 and August 20 was less than 5 inches during 3 summers.

### **Lake Massapoag Update, Monday, August 24**

The lake level is 9.25 feet. Discharge out of the lake this morning was 1.3 cubic feet per second.

The recent water sampling event for E. coli conducted at the town beaches on August 17 detected between 5 and 72 cfu per 100 ml at Memorial Park Beach and 44 cfu per 100 ml at the Community Center Beach. These results, as well as the geometric means for these locations, are well below the regulatory standard. Further information about this testing program is presented below in the update for July 13.

### **Lake Massapoag Update, Saturday, September 5**

The last water sampling event for E. coli was conducted at the Memorial Park Beach on August 31. E. coli was detected at 5 cfu per 100 ml. This result, as well as the geometric mean for this location, is well below the regulatory standard. Further information about

this testing program is presented below in the update for July 13. There were no closures of Memorial Park Beach due to E. coli levels during this summer.

A complete list of sampling results is presented on the Health Department website.

### **Lake Massapoag Update, Tuesday, September 8**

The lake level is 8.9 feet. Discharge out of the lake this morning was 1.3 cubic feet per second.

A small area of fanwort, an invasive plant species, has been observed in the south cove of the lake near the Community Center. This fanwort is outside of the area treated by Lycott last summer.

### **Lake Massapoag Update, Tuesday, September 15**

The lake level is 8.85 feet. Discharge out of the lake this morning was 1.2 cubic feet per second.

### **Lake Massapoag Update, Friday, September 25**

Lake level is about 8.66 feet; it's dropped about 4 1/2 inches since Sept 1. For comparison, last year the lake dropped 3 1/3 inches between Sept 1 and Sept 25, and the level on 9/25/14 was about 8.12 feet. The average lake level over the last 20 years has been about 9.3 feet.

Precipitation data from nearby weather stations, including the Norwood Airport, indicate about 11 1/2 inches of rain have fallen since April 1 compared to an average rainfall of 23 1/2 inches between April 1 and September 30.

### **Lake Massapoag Update, Thursday, October 1**

The lake level this morning is 8.91 feet compared to a lake level of 8.61 feet measured on Tuesday September 29 before the rain.