

Summary of Six Ponds Water Quality Results (Fall 2016)

In September of 2016 a team of Six Ponds volunteers collected water samples from each of our six ponds. A top sample and a bottom sample was drawn at the deepest location in each pond. The samples were analyzed at Envirotech Laboratories in Sandwich, and these analyses were paid for by the Town of Plymouth.

A few years ago the Town of Plymouth changed some of the parameters which Six Ponds had been measuring since 2002. While some of the parameters measured were the same, others were dropped and a couple of new ones were added.

For a number of years, it has seemed easiest to understand the water quality results by examining some of the differences in results among our six ponds. Three things which have characterized differences among the ponds are the results for Phosphorus, the results for Nitrate and other Nitrogen measures, and the results for Salts and chemical components of salts.

Phosphorus

Last fall, eutrophic levels of Phosphorus were found in several samples (top and bottom samples from Little Long, bottom sample from Long, bottom sample from Round). The Phosphorus levels in the other ponds were considerably lower.

The results for Little Long continue to highlight a consistent problem since virtually every sample taken since 2002 has been at eutrophic levels. The level of Phosphorus in the bottom sample from Long was higher than from any of the other ponds, but over the years elevated levels in Long have only been found about half the time. The same is true of Round pond. Several years ago, it was common for Halfway to have Phosphorus levels right up there with Little Long, but this year the results for Halfway were very good. It should be noted that Phosphorus results for Halfway appear to have gradually improved over the past few years.

Overall, with the exception of Little Long, the Phosphorus levels in our ponds were better than what has been found in past years, but it may be a few more years before we will know whether this is a reliable trend.

Top and bottom samples drawn from various locations since 2002 reveal the following pattern:

Little Long – 21 of 24 samples taken from this pond since 2002 were high
Halfway – 19 of 24 samples were high
Long – 12 of 22 samples were high
Round – 9 of 17 samples were high
Bloody – 8 of 18 samples were high
Gallows – 6 of 17 samples were high

Nitrate and Other Nitrogen Measures

Over the past fifteen years, samples from Little Long have contained more Nitrate than samples from any of our other ponds, and this year was no exception. The Nitrate levels in the Little Long samples were again higher than those found in any of the samples from in any of our other ponds. Sometimes similar levels of Nitrate have been detected in Bloody and Long.

In water quality studies done by the Town in 1980 it was stated that Nitrate levels found in Little Long bordered on critical levels for the environment. The situation has not improved.

This fall, a Total Nitrogen measure indicated that Little Long, Long and Round were considerably higher than the other ponds. Likewise, a Kjeldhal Nitrogen measure revealed a similar pattern. These results were consistent with the Nitrate results, but these measures should prove to be far more informative than the Nitrate measure once we have more years of these results to review.

Also, it should be pointed out that water samples from the ponds surrounded by the most houses and the steepest slopes down to the water have yielded the highest evidence of Nitrogen in the water. Septic systems, fertilizers and pesticides are the obvious causes, and people must attempt to minimize their negative impacts on their environment.

Salt Components

For a number of years, the chemical analyses of our samples included salt components such as Chloride, Sodium and Potassium. The sampling results showed that all three of these were highest in Bloody, next highest in Little Long, third highest in Long, and much lower in the rest of our ponds. For a while, specific conductance which can indicate the presence of salt was measured, and these results were consistent with what was just described.

This past fall, Chloride was the only salt indicator included in the analyses, but the results were completely consistent with past findings. Bloody was the highest, Little Long was next, Long was third, and the rest of our ponds were much lower.

In any case, the years of similar numbers consistently suggest that salt and salt components in winter road runoff from Route 3, Long Pond Road, Clark Road and Oar and Line Road are negatively affecting the water quality of our ponds.

Stormwater Runoff Samples

This past summer, stormwater runoff samples were gathered at three locations by two dedicated Six Ponds volunteers. They went out shortly after a pouring rain began in order to collect water samples at outfall pipes coming from drains on Oar and Line Road and Clark Road. Two of the pipes empty directly into Little Long, and one empties into the stream flowing from Little Long to Long.

The E-Coli results in these samples were astounding because any number over 50 can be cause for great concern, beach closings and investigations. The results were 15000, 2200 and 480.

But the E-Coli results weren't the only alarming ones in the stormwater being flushed into Little Long and the stream. The Phosphorus results were far higher than the eutrophic level (.772, .696, and .564). The Nitrate levels were 2 to 4 times higher than the level which greatly accelerates algae and plant growth (1.12, 1.07, .76). Also, Total Nitrogen and Kjeldhal Nitrogen results were from 4 to 10 times higher than the highest levels found in any of our ponds. The Chloride results were lower than what was found in the water of most of our ponds, but the samples were collected in the summer.