**Bacterial Water Quality – Year 2021 (to mid October)**

This report covers a reporting period of May 2021 to mid-October 2021. The report contains data and observations on both E. coli and cyanobacteria. High levels of either of these bacteria impact lake usage. The lake E-News is used to alert members if either of the bacteria reach levels of concern.

Previously only the E. coli measurements were collected and reported for the months of May through September. These results are officially the Recreational Water Quality (RWQ) measurements. The results have historically guided the recreational use of the lake since high E. coli numbers are correlated with illnesses for swimmers. High E. coli levels can be caused by leaking septic systems and the sampling process helps to identify and quickly address this issue. During 2021 ten E. coli samples were collected each month by Carole Vogel and Mark Vogel.

Recreational use of the lake has been impacted by cyanobacteria for the past three years. High concentrations of cyanobacteria form Harmful Algal Blooms (HABs) which are associated with toxins that can cause mild rashes to severe illness and have been known to cause death for animals. From this year forward we plan to closely monitor cyanobacteria. The level and mechanism for properly monitoring cyanobacteria is presently being explored. During 2021 we began using a Phycocyanin meter along with observations to determine if a HAB condition might exist. Notification of any apparent HAB is reported to the New Jersey Department of Environmental Protection (NJDEP). The NJDEP can collect water samples and measure toxin levels and specify an official alert level if warranted.

Results for the E. coli tests are reported as colony forming units per milliliter in the table below. The Lake Median is very good at 4.1 or less for the year. No sample even came close to the 100 geometric mean alert level.

**Recreational Water Quality (RWQ) – E. coli**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Year 2021 | | | | | | | | | | | | | |
| May | 19-May-21 |  | June | 23-Jun-21 |  | July | 22-Jul-21 |  | Aug | 30-Aug-21 |  | Sep | 29-Sep-21 |
| laberr |  |  | a05 | 3.1 |  | a20 | 1 |  | a03 | 1 |  | a13 | 4.1 |
| a10 | 6.3 |  | b34 | 4.1 |  | b01 | 1 |  | bauer | 1 |  | b22 | 1 |
| b40 | 25.3 |  | c15 | 7.4 |  | c18 | 3.1 |  | c08 | 2 |  | c15 | 1 |
| bauer | 7.4 |  | c25 | 12.1 |  | c22 | 1 |  | d01 | 14.6 |  | d01 | 10 |
| c02 | 19.9 |  | e03 | 1 |  | d03 | 1 |  | e08 | 2 |  | e02 | 4.1 |
| d02 | 1 |  | f10 | 1 |  | f05 | 3 |  | f02 | 2 |  | f10 | 1 |
| g06 | 1 |  | g08 | 4.1 |  | g20 | 2 |  | g22 | 1 |  | g15 | 1 |
| h30 | 1 |  | h21 | 1 |  | h13 | 4.1 |  | h32 | 1 |  | h14 | 3.1 |
| i05 | 1 |  | j03 | 4.1 |  | i16 | 1 |  | i07 | 3 |  | i10 | 1 |
| j-inlet | 4.1 |  | j-inlet | 2 |  | j-inlet | 7.5 |  | j-inlet | 1 |  | j-inlet | 3.1 |
| **median** | **4.1** |  | **median** | **3.6** |  | **median** | **1.5** |  | **median** | **1.5** |  | **median** | **2.05** |
| avg | 7.44 |  | avg | 3.99 |  | avg | 2.47 |  | avg | 2.86 |  | avg | 2.94 |

The NJDEP supplied phycocyanin meter provides an indication of cyanobacteria concentrations on a scale of 0-199. Mapping of meter readings to cell concentrations can be affected by several factors. Lake Owassa has tannins in the water which can influence the readings and this year’s effort was focused on learning the correspondence between readings and observations of possible HAB conditions. Toxins can increase as a HAB persists. The NJDEP has provided one set of toxin reports at the beginning of the bloom.

**Cyanobacteria Concentration and HAB Reporting for 2021**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Time Period | Observations | Phycocyanin Meter base | Water Temp(deg) | HAB Alert Status |
| Late June | Water very clear (very light tan to light yellow-green sample) | 3-7 | 76-85 | none |
| July 1-15 | Water very clear (very light tan to light yellow-green sample) | 4-7 | 78-80 | none |
| July 16-31 | Water very clear (light yellow-tan),significant rain and high water levels | 3-9 | 78-84 | none |
| Aug 4 | Water very clear (light yellow) | 10 | 76 | none |
| Aug 7 | Water clarity substantiality decreased, localized scum near shore (E-cove), meter reading 80, general readings around lake (16-43) | 24 | 78 | none |
| Aug 16 | Misty water (light yellow-green) | 34 | 82 | none |
| Aug 21 | Small blue-green blobs, misty (light yellow-green) | 46 | 82 | none |
| Aug 23 | After Hurricane rain – level very high, misty water, (light yellow-green) | 50 | 80 | none |
| Aug 25 | Paint-like green scum well beyond 20ft from shore (widespread), pea soup, blue green blobs up to 2”. Report HAB to NJDEP | 199 | 79 | Advisory (local) |
| Aug 28 | Scum gone, tiny blobs, misty water (yellow-green) | 53 | 77 | Advisory (local) |
| Aug 30 | **Official results from NJDEP collection - very high in cyanobacteria Phycocyanin 84, Concentration 167K, all four toxin tests were low** |  |  | **Advisory (official)** |
| Sep 1-15 | Misty water to pea Soup, Scum near Shore appears and disappears, 1” blobs, (yellow-green samples) | 80-199 | 76-79 | Advisory (official) |
| Sep 16-30 | Misty water to pea Soup, Scum near Shore appears and disappears, 1” blobs, (yellow-green samples) | 80-199 | 75-79 | Advisory (official) |
| Oct 4 | Green misty water, minor scum, 1” blobs, (yellow-green sample) | 84 | 74 | Advisory (official) |
| Oct 8 | Scum, pea soup over lake, up to 6” whitish green-blue blobs (thick yellowish green sample) | 199 | 68 | Advisory (official) |
| Oct 13 | Scum in center of lake not at shore, large whitish blue-green blobs in cove, water clarity improving, (yellow sample) | 23 | 66 | Advisory (official) |
|  | To be Continued |  |  |  |