Approved Minutes
New Durham Water Quality Committee Meeting
November 17, 2021 at 6PM
Community Room

Present: Fred Quimby, Bill Meyer, Penny Meyer, Mike Gelinas, Keith Barnard, Casey Buell, and Maureen Knepp

Absent: Cynthia Quimby(alt)

Guest: Bob Craycraft

Fred called the meeting to order at 6:09PM

After a brief discussion, Bill Meyer moved and Penny seconded a motion to accept the Draft Minutes of the October 20, 2021 meeting as written. The vote in favor was 6 approved and 1 abstained. The motion carried.

Bob Craycraft, Head of the UNH Laboratory of Freshwater Biology and the Lay Lakes Monitoring Program (LLMP) summarized the results of water quality testing for the Spring-Summer-Fall season with a 15 slide power point presentation.

The presentation began with a summary of the tests conducted and examples of the data retrieved from them. Next, average seasonal measures of Phosphorus (TP),Transparency (SDT), Chlorophyll-a (CHL) and dissolved color(DC) were provided for each of New Durham's 7 lakes and ponds as well as Wentworth Pond in Alton. Notable among this data were the high levels of TP in Marsh, Jones, Downing and Wentworth Ponds and the low levels seen in Merrymeeting Lake (MML), Chalk, Marchs and Shaw's Ponds. There was a corresponding high level of CHL in all the high TP ponds and lower levels in the low TP ponds. Secchi Disk Transparency was high where the TP and CHL were low and SDT was low where the TP and CHL were high. CHL, which increases with higher levels of TP, blocks the penetration of sunlight making visibility of the Secchi Disk difficult. Seasonal average amounts of dissolved color was low in all ponds except Wentworth Pond, which was quite high. Color is due to the breakdown of organic material in the water and while it may interfere with transparency it is unrelated to either TP of CHL. It was noted that Coffin Brook, which enters the Merrymeeting River above Wentworth Pond, has a lot of dissolved color and the Merrymeeting Marsh Wildlife Area is very productive giving rise to many plants which will break down and contribute to dissolved color.

In the next series of figures each of the same test results (TP, DC, SDT, and CHL) were presented as individual monthly test results, for each month of the season in each of the 7 ponds(excluding MML).Here we see CHL tends to increase as the summer progresses and the water becomes warmer. Transparency was quite low in Wentworth Pond in August and this corresponds to the high dissolved color at that time. The decrease in TP concentration seen especially in July was likely due to dilution due to 12.65 inches of rainfall seen during that month.

TP in the Tributaries to Chalk, Marchs and Shaw's Ponds were studied after snow melt and major rain events. The July rain did not seem to contribute to TP except in Maggie Ln culvert #2. Country Ln3 had quite high TP (29.5ppb and 37.4ppb) TP during both samplings. We should follow up on these two sites next year.

Next Bob presented the dissolved oxygen (DO) profiles at 4 deep sites (Marsh, Jones, Shaw's and Marchs Ponds). Each pond showed some stratification of DO at some time during the season, especially in July and August. However, the DO levels went to zero in Jones and Marsh Ponds as the samples got close to the bottom. In these ponds, cyanobacteria may be dying off and metabolized by bacteria on the bottom. This process is aerobic and consumes oxygen from the water producing an anoxic state.

Marsh Pond was selected to demonstrate the process of internal phosphorus loading (IPL) which may occur under such anoxic conditions. The next slide illustrated the monthly changes at Marsh Pond between TP concentration at the surface and the bottom of the pond. A dramatic increase in TP was seen especially in July and August. This increase in TP is thought to feed cyanobacteria resulting in a bloom. This IPL disappears as the pond turns over and is less stratified and DO re-appears.

Next the TP results of monthly testing at 4 New Durham River sites was presented. TP was very low in early Spring when snow melt and lake spillway water contributed to high flow in the river. Once the spillway is closed and the dryer weather comes the concentrations rise. But after the July tropical storms, the concentration of TP falls. However, it is important to note that this is also when we have the highest stream gauge readings and since water volume is multiplied by TP concentration to yield Load, we would expect a large amount (in pounds per day) of phosphorus leaving New Durham following these storms.

The last 2 slides plot the monthly TP concentrations for the last 4 consecutive years for each of the 7 Merrymeeting River sites. The three figures covered the months of July, August and September. Remember, July was an extremely wet month, August had below average rainfall and September was an average month. Many of the river sites show a decrease in TP compared to previous years, this was particularly true for the three New Durham sites which had lower TP concentrations in all three months plotted. It will be interesting to see if this trend continues in the future as new Best Management Practices (BMPs) are improved at the Powder Mill Fish Hatchery.

The presentation was followed by a discussion of which tests should be performed next summer. Forrest Bell and Laura Diemer thought we should continue to monitor all sites downstream from places where new BMPs are being implemented for hatchery wastewater treatment and stormwater management. Everyone seemed to agree. Forrest and Laura also thought attention should be paid to any tributaries presenting problems. There was a brief discussion about the tributaries to MML and the fact that one had an in-stream algal bloom this year. Since we have not sampled the MML tributaries in the past 2 years, perhaps next year we could sample them during low flow and high flow conditions to see if stormwater runoff adds significantly to the phosphorus load entering the lake. This will continue to be discussed. Mike Gelinas remarked about the amount of sediment captured in the infiltration basins he and Russ Weldon constructed at the Bracket Road SELT Parking Lot. Bob commented about the prevalence of red water produced by iron oxidizing bacteria this year. Bob also mentioned that he will be getting all the data the NH DES has collected in their survey of Marsh Pond this year. Keith asked about the impact of waterfowl excrement on TP concentrations and it was noted that this was a separate category of phosphorus source in the Watershed Management Plan.

The meeting was adjourned at 7PM.

Respectfully Submitted, Fred Quimby, Chairman