

Granite Lake Monitoring Report

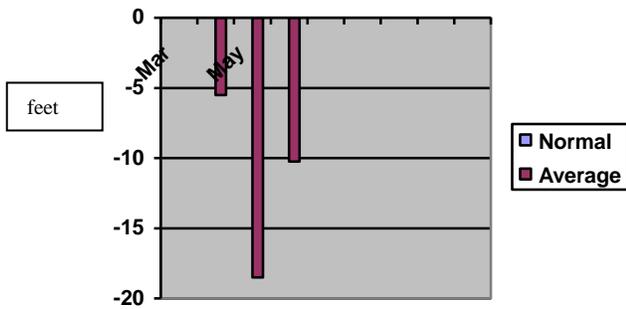
Spring 2010

April – June

Open Water

The lake was completely free of ice on April 1st at 10:00 a.m. as the last chunk of ice drifted against the northeast shore. Installed the lake water level gage to read 1.64 feet at 11:00 a.m. This places the actual lake water level at 8.5 inches above normal. The water temperature at ice-out read 45.1 degrees. Amazing, the lake just opened up and already 73 pelicans and 61 cormorants started fishing the lake. These birds migrate north at the rate the lakes become ice-free. These birds never stopped feeding on Granite Lake so far this spring. The transparency of the open water was not good. It was estimated at 4-5 feet. Generally, the clarity is in the range of 8-10 feet immediately after the ice goes out.

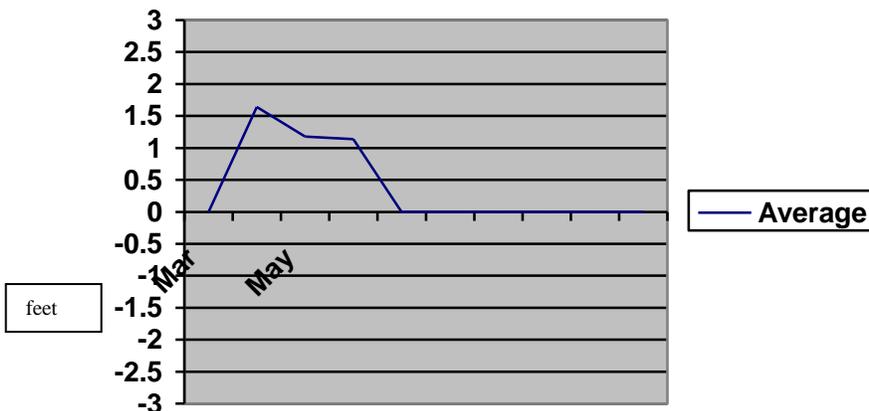
Transparency



No transparency readings were taken during March, since ice out on lake did not occur until April 1st. The average ice out occurs around April 8th for area lakes.

The transparency depicted in the graph is monthly averages taken from April thru June. The water was crystal clear just prior to ice out, but after ice out it turned very dirty with an estimated clarity of 4-5 feet

of transparency. Transparency increased during April and May from 5.5 to 19 feet. It peaked at 19 feet the first week of May. The water clarity decreased to 8.5 feet the third week of May. Then it did a strange turn-around the fourth week of May and increased to 13 feet. This is the first time in ten years there has been such a bouncing ball in clarity readings. The clarity continued to decrease during June to a little over 10 feet. This is very good water clarity for the end of June with only a light green tint in color. There should be no complaints for the July 4th holidays.



Lake Level (2009)

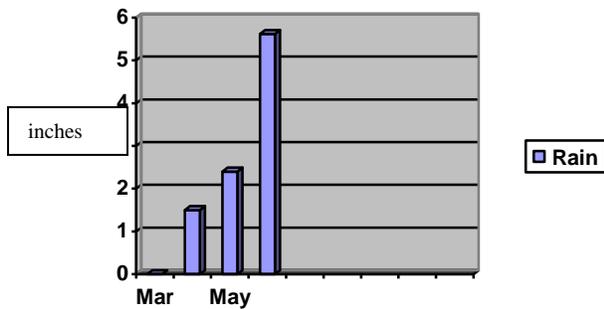
The graph shows the average scale readings of the gage for each

month of open water. Average readings are used to create a smooth flowing graph line where a trend is easily seen. No Lake Level Gage readings were taken until after April 1st when the lake became free of ice. The Lake Level Gage was placed back into the water on this date and set to read 1.64 feet. The surveyed level of the gage was not obtained, so actual calculations for water level could not be made. Actual levels will be depicted in a graphic the DNR Waters provides the Granite Lake Watershed Association each spring. The normal historic lake level is 1021.0 above sea level.

As the graph depicts, the water level in the lake peaked at 1.64 feet on April 1st. The DNR surveyed the lake level gage on April 13th and set the gage zero mark at 1020.06 feet. To get the actual water level just add the gage reading to 1020.06 and subtract 1021.0 from the above sum. Then take that remainder and multiply by 12 inches and it gives the inches above normal of the lake water. After that, water levels started to decline and it continued through the rest of April. During May and June a sufficient amount of rain fell on a weekly basis to maintain a lake level gage reading of 1.18 feet.

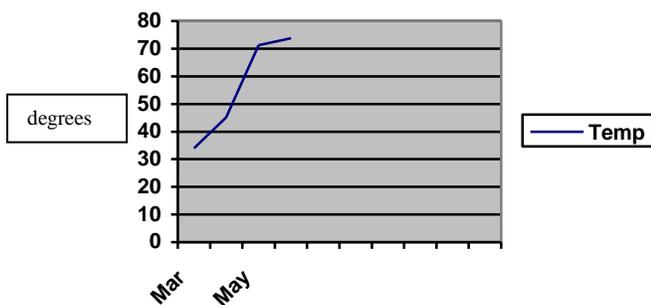
A good question that might be asked, how much does the water level change each day. If the sky is clear with plenty of sunshine and a little wind the lake level will drop a ¼ of an inch each day. This gives one an idea as how much rain is required just to maintain the water in the lake at the same level.

Precipitation (2009)



With a fair amount of snow cover early in the winter, it produced sufficient runoff to peak the lake water level during April. Even though sufficient rain fell during June, the rain amounts were spaced so that it caused no runoff. The rain amounts equaled the amount that evaporated between rains. The amount of rain that fell in June was 5.62 inches making it wet month. Total rainfall for April thru June was 9.52 inches.

Water Temperature (2008)



Late March is a very difficult time of the month to obtain accurate water temperature readings since the lake may still be ice cover or so treacherous that it becomes a safety issue. If the lake is ice covered, generally, the temperature ranges from 34-36 for the first 10 feet of depth.

The same day the ice went out (April 1st), the water temperature rose to 45.1 degrees. During April the water climbed from 45 to 56.1 degrees. This rise was slower than last year because of colder nights. In May, the graphic shows a rapid increase in water temperatures, reaching a high of 71 degrees by month's end. In June, the temperatures flattened out with cloudy days and consistent rain. The water temperature struggled to reach 73.8 degrees by end of June. Lack of sunshine helped by reducing the aquatic vegetation in the lake.

Orthophosphate Monitoring of Inlets (2010)

Samples were collected at each of the inlets, one outlet and the lake during March 2010. Each sample was tested for phosphorous content. Each time the samples are test more information is extracted and understood. A good example is Site 12, the lake water benchmark sample that had an exceedingly high phosphorous content. The ice had only melted out four to five feet from shore, so all the winter pollution was trapped in that narrow strip of open water where the sample was taken. Inlets will again be monitored in 2011. It is extremely important that these inlets are monitored annually to support the upcoming TMDL for Granite Lake in 2011. The only way Granite Lake will have access to TMDL monies is have supporting documentation to establish the need for additional funding to improve water quality in the lake.

Inlets and Outlet Phosphorous Readings

Site No.	Reading 1 April 5 2007	Reading 1 April 9 2008	Reading 1 April 9 2009	Reading 1 March 15 2010	Reading 1	Reading 1
1	166	246	No Test	107		
2	333	200	No Test	347		
3	100	66	No Test	67		
4	233	286	No Test	233		
5	153	266	No Test	167		
6	100	200	No Test	160		
7	266	60	No Test	60		
8	67	73	No Test	213		
9	333	470	No Test	347		
10	253	267	No Test	340		
11	100	40	No Test	200		
12	Not Sampled	46	No Test	330		

Note: All readings in micrograms per liter (ug/l).

- Site 1. Public Access Culvert
- Site 2. Mattson County Rd 5
- Site 3. Kraft Avenue NW
- Site 4. Schwebel 30th Street
- Site 5. Libby Lake 30th Street Culvert
- Site 6. Peterson Kimball Ave

Site 7.	Kimball Ave (20 th Street)
Site 8.	Knowles Ave NW
Site 9.	Kraft Avenue SE Corner
Site 10.	County Rd. 5 (inlet)
Site 11.	County Rd. 5 (outlet)
Site 12.	Lake Water (benchmark)

The Site 6 will be the one to watch over the next several years to see if the phosphorous loading into lake starts to drop. This will be one way of measuring the effectiveness of the holding pond created last fall. An immediate phosphorous drop will not occur until the vegetation is firmly established. Site 4 is the phosphorous loading being deposited into the holding pond on the north end of the lake. It is difficult to measure this site since the runoff water is filtered through the soil column. Site 10 is consistently high in phosphorous loading. There is definitely some opportunity to improve this watershed. Site 9 has a large drainage from fields that slant towards the lake. The storm water runoff from these fields can be very rapid. It is constantly high with phosphorous. That needs a holding area with a filter to guard against field residue from block the culvert and causing the road to overflow and wash out. Road washout has occurred in the past. Site 7 monitoring will now change. The East Side Project closed the culvert beneath the road that was Site7. Site 3 is the most improved site on the lake that can be measured. That tree plot on the northwest corner of lake has removed a lot of phosphorous from the water runoff. That site is impacting the lake very little. It would be just great if all the inlets had such minimal impact on the lake.

Core Water Column Sampling

Core water column sampling training was held at the Annandale Middle School on May 22nd, just one day before a sample needed to be taken. Again, Wright Soil & Water Conservation District, Minnesota Waters, and RMB Labs hosted the training session and distributed coolers containing materials for sampling. The most interesting part of the presentation provided information on how the TMDL will be conducted. The TMDL will now be conducted on the entire regional watershed. Granite Lake is part of the North Fork of the Crow River watershed. So monies that Granite may receive are from funds allocated to the watershed. So those lakes, rivers, and watersheds in most need and would provide the biggest bank for the money will have first crack at the available funding. TMDL for the Crow River Watershed is now scheduled for 2011. Samples are taken each month from May through September for delivery to RMB Labs who tests the samples for phosphorous and chlorophyll-a concentrations within the samples. Any member is encouraged to volunteer and take the training in May. Core sampling is certified by lab testing and accepted by MPCA. The core sampling results can be viewed at www.rmbel.info.

Minnesota Star Lakes & Rivers Program

Also at the training session above, Dale Gustafson presented legislation enacted star lake and rivers program. A lake receiving this designation is entitled to \$500 worth of grant

monies. Granite Lake has submitted an application for this designation. The application will be reviewed by the board overseeing the funding and decision is expected sometime in August.

Why is Improving Water Quality Important?

The federal government water resource people have just completed their study on available water for drinking and commercial use. The study contained projections for water needs in the next 30-40 years. These projections indicated that 70% of the counties in the lower 48 states are expected to experience water shortages. Of those counties, 35% will experience extreme shortages where rationing may be necessary. Minnesota is blessed with a lot of surface water in the form of lakes and rivers. The intelligent direction would be to protect these water resources for they will certainly become drinking water in the future. A scientist looks for water on other planets. If none is found, the planet will not support life.

There remain many things that can be done on Granite Lake to improve water quality. The use of rain barrels to catch rainwater runoff from roofs and use this water to for flowers, garden plants, and trees. Rain gardens are another good way to divert and hold water from roofs and impervious surfaces rather than have the runoff rush directly into the lake or river. A buffer strip between the lawn and the lake is an excellent way to catch grass clippings and fertilizer from entering the lake. Plant more trees, since runoff from lawns is ten times greater than from forested areas.

Pelicans, Cormorants and Swans

This summer a greater number of pelicans were feeding in Granite Lake and the increased numbers has lead to some concern by people living on the lake that fish populations would be decreased. The feeding habits of the white pelican differ from the brown pelican that dives for food. The white pelican is not efficient at feeding since it must ply only the first two feet of the water column. It generally forms a line with a flock and herds the fish into the shallow water where they are able to scoop the fish up. In deeper water, pelicans need the assistance of cormorants that push the fish towards the surface where the pelicans form a circle and are able to scoop up the fish. Pelicans take very few larger fish, since they need to hook the fish with their beak and toss it into air so it goes down their throat headfirst. According to data collected from studies that have been done, the majority of the pelicans diet is composed of rough fish, such as carp, suckers, bullheads, sunfish, salamanders, and crayfish. Game fish, such as northerns, walleyes, crappies, and bass make up only a small percentage. These fish tend to prefer the deeper water for protection. There were several times the pelican and cormorant numbers reached well over 200 birds for each species on Granite Lake. That number of fishing eating birds does have an impact on the lake.

The double-crested cormorant is the bird that is seen out on Granite Lake. The cormorant is a far more efficient fish feeder since it can fish the entire water column to a depth of 50

feet. Cormorants hang around Minnesota for approximately 135 days each year. During this time, they will consume approximately one pound of food each day. That amount of food each day represents about 25% of their body weight. This food is comprised of brook stickleback, logperch, yellow perch, sunfish, cisco, white suckers, black bullheads, white crappies, crayfish, northern pike, walleyes, and tiger salamanders. Studies have shown that walleyes and northerns make up less than 1 percent of their total diet. The average size of the fish they take are 5.3 inches or less. Cormorants generally feed about 60 minutes each day. Studies show that cormorants take approximately 0.5% of the fish in a lake, while the prey fish like northerns, walleyes, and bass will take about 13.5% of the fish. They nest in trees and usually hatch out 2 chicks. The most noticeable impact is on trees they nest and roost in. After several years, the trees usually die.

The swans of Maxim Lake continue to hatch out cygnets by the numbers, adding another 5 cygnets in this year's hatch. This year the two adult swans moved the cygnets over to Libby Lake within two weeks of hatching. The predators at Maxim Lake are too challenging. It is suspected that Maxim Lake lies within the home range of a pair of otters that are raising young within the area. As an aquatic mammal, the otter is at the top of the food chain and is far too challenging for the swans to cope with. The five cygnets continue to thrive at Libby Lake and at this it appears as a great success for the year.

Loons

While conducting my weekly data collection on water clarity, it was noticed that two loon chicks were observed on the lake. This indicates that two pairs of loons nested and hatched out a chick each. One chick is observed at the south end of the lake out from the point on the west side. The other chick is seen north of the grass island. The chick at the north end is more mature and larger than the chick at the south end. This indicates the northern loon was hatched out a couple weeks earlier. The adult loons generally leave in August. The immature loons will hang around until just before ice-over on the lake. These young loons will not return for at least two years. There is probably a small number of these loons that choose not to return.