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Why is Lake Macatawa Green?

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If you have been at Lake Macatawa at all this summer, you will have noticed a noteworthy change for our typically brown lake – it's green! This summer has seen unprecedented algal blooms, easily the largest in the past fifty years. Although this is not particularly attractive, nor timed to coincide with St. Patrick's Day, this is actually a good sign for the health of our lake!

While the drought that we have been mired in all summer has had many negative effects on the region, it has actually been beneficial to the water quality of the lake. During a typical year, large amounts of sediment and nutrients are carried into the lake by the runoff created by periodic heavy rains. This regular influx keeps large quantities of these pollutants in the lake, giving the lake its typical brown and murky appearance. With the exception of one period of rain in May, we have otherwise been dry this year since February. The water within Lake Macatawa replenishes completely every 3-4 months, so with the prolonged drought, there is not a fresh supply of sediment coming in with the stream water. The result has been clearer water in the lake, which gives algae enough sunlight to be able to grow.



Lake Macatawa Algae Bloom, September 14, 2012

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As part of the larger sediment and bacterial monitoring effort involving the Outdoor Discovery Center Macatawa Greenway, Hope College and the MACC, research students from Hope College continued to monitor conditions throughout the watershed this summer. The lack of rain did not provide many opportunities to further our sediment collection study, but it did give interesting drought-year data, not the least of which was the green lake. Phosphate measurements – the main nutrient of concern in the Macatawa Watershed – were taken at five locations several times during the summer. Typically, the phosphate in Lake Macatawa is inorganic, meaning it is attached to sediment or dissolved. This summer, these levels were at record lows, with most of the phosphate now in use by the algae, making it organophosphates. If the algae wash out into Lake Michigan, or die and become trapped on the lake bed, it will remove these nutrients from the water. In addition to lower nutrient levels, there has been almost no *E. coli* found during sampling this summer. This absence is likely due to increased sunlight and competition from the excess algae. Most of the algae found within Lake Macatawa over the past three summers, however, are normal green algae, which are not harmful to humans. With the massive increase this summer, the type of algae present would have to be re-tested.

This is not the first dry summer to hit the Macatawa Watershed in recent history. The most recent year with comparable weather was 1997, which also had a long dry summer. So why was the lake brown that year and green this year? This is likely due in part to efforts that have already been made to help improve water conditions, including but not limited to efforts such as the ban on phosphate-containing fertilizers, wetland restoration projects such as the Upper Macatawa Natural Area and former Holland Country Club (both part of the Macatawa River Greenway), and public and private efforts to better control stormwater runoff. Unfortunately, the algae will likely only last as long as these dry conditions hold. The next big rain storm in this area will bring a fresh supply of sediment and nutrients into the lake, returning it to its normal shade of brown. However, this summer has shown us that change can come relatively quickly to the lake. While the green lake is not a healthy lake, it is a step in the right direction. If the sediment and nutrients can be kept out of the lake and rivers during big rains, the water in Lake Macatawa will no longer be brown or green, but clear with a dark bottom. Now that will really be a noteworthy summer!