

Detroit Water Quality 2009

The Detroit-Rice Lake Water Quality Management Area (LWQMA) is one of eight Lake Water Quality Management Areas identified by the District in its 2005 plan. Each of the areas includes one or more sub-watershed (drainage) areas which contain lakes for which the District has developed specific goals and identified specific management activities for the 2006-2015 planning period.

The Detroit– Rice LWQMA has over 24,500 acres of drainage area. This drainage area includes portions of the Pelican River and its tributaries which flow to Big Detroit. The LWQMA also receives some flow from the Floyd/Campbell LWQMA. Though this area contains a portion of the City of Detroit Lakes, more than 90% is in forest, wetland, grassland or cropland. Much of the shoreline has been developed for more than 75 years. Shoreline development is dense and modifications to natural conditions are quite extensive.

The principle goals for the Detroit-Rice LWQMA include reducing the trophic index of Big Detroit by about 5% while at the same time maintaining improvements in Little Detroit’s water quality. To accomplish these goals, the District will:

1. Manage the Rice Lake area in such a way as to reduce bio-available external phosphorus loads to Big Detroit.
2. Continue investigations of Big Detroit’s internal loading problem.
3. Attempt to evaluate and control exotic aquatic plants and other nuisance aquatic species.
4. Reduce untreated urban stormwater discharges by adding treatment and upgrading existing facilities.
5. Gather basic data on small lakes in the LWQMA—Schultz, Patrick and Leitheiser.



211 Holmes Street West
Wells-Fargo Bank Building, Suite 201
PO Box 1043
Detroit Lakes, MN 56502

Phone: (218) 846-0436 Fax: (218) 846-0778
www.prwd.org

The PRWD Monitoring Program

The PRWD monitoring program is focused on lakes and streams. Measurements on some District lakes are taken monthly during the growing season, others on a biweekly basis. Data collected on lakes include samples tested for phosphorus, ortho-phosphorus, chlorophyll-a and readings of clarity, pH, and conductivity. Temperature and dissolved oxygen observations are made at one-meter intervals from the surface to the lake's bottom.

Baseline data has been collected on District lakes since 1995. Starting in 2005 more lakes were sampled, but lakes for which water quality is well understood have been sampled less frequently. More volunteers have been recruited to assist in the District's monitoring, and there is coordination with Becker County COLA's monitoring efforts.

Few District lakes exhibit limitations for swimming or boating as defined by the Minnesota Pollution Control Agency, and only one, Lake St. Clair has been designated as "Impaired". Nevertheless, the District holds its lakes to higher standards. Lake specific goals call for water quality improvements, or at least protection on all lakes. Such goals are to be accomplished by implementing best-management practices, especially shoreline protection, stormwater runoff controls, or other means.

A routine component of the District's monitoring program involves surveys of shoreline conditions around district lakes. The object is to provide current data on shoreline, and to assist in the District's rule-enforcement efforts. Shoreline surveys are repeated for main district lakes on a 5-year schedule.

Stream observations and sampling also are conducted on a biweekly or monthly basis, depending on the season and the site. Protocols for storm-event sampling are also in place. Samples are analyzed for phosphorus and sediments. Gage readings provide important information on stream flow which determine patterns of nutrient and sediment inputs to lakes.

Results from nutrient and sediment samples are provided by RMB Environmental Laboratories. Together with other monitoring data, lake and stream conditions are described and summarized by PRWD staff. Trends are identified, as are any special problems on specific lakes or stream segments. Results of these data are reported to state and federal agencies. The District's website contains records of lake levels, water quality data and interpretations, ice-in and ice-out information, climate data, stream flows and loading, and others. See www.PRWD.org

Program Costs

The District's monitoring program derives from the need to understand and address water quality problems for lakes. About \$25,000 is expended each year for staff and student intern wages, chemical analysis, equipment and transportation costs

Describing and Summarizing Water Quality

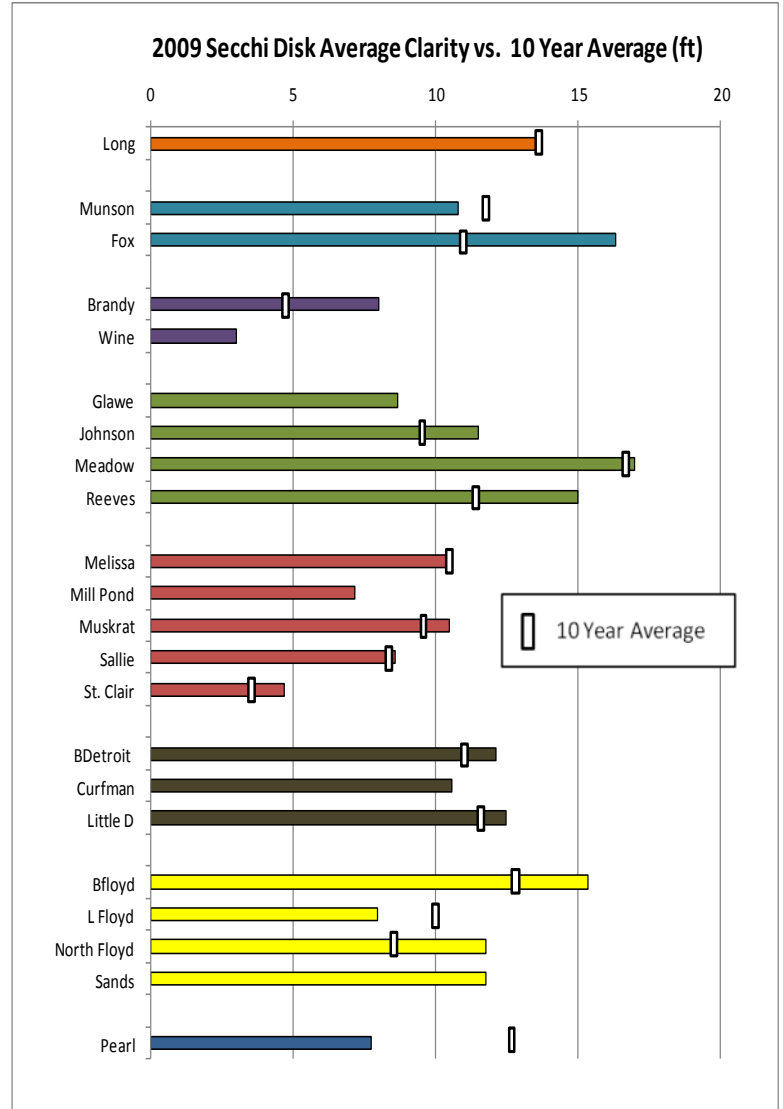
In 2009, the District made slight modifications in its approach to summarizing water quality data for lakes. Previously the three main indicators, clarity, total phosphorus and chlorophyll-a results were indexed in order to characterize a lake's water quality, and to facilitate trend analysis and comparisons among lakes. The so-called Trophic Status Index (TSI) assumes that there is a high degree of correlation among the three indicator variables, and it is common to use the resultant scaled variables interchangeably or to average them. However, District data shows that the three variables are not always closely related, and that averaging the three disguises some important differences. Henceforth in characterizing lake water quality, the District will look at the variables independently. The District's monitoring program derives from the need to understand and address water quality problems for lakes. About \$25,000 is expended each year for staff and student intern wages, chemical analysis, equipment and transportation costs.

2009 Water Quality Overview

2009 - Lake Water Quality

2009 was an outstanding water quality year — nearly all lakes with a substantial monitoring history showed near- or better-than record conditions. This is the second year in a row that results have been very good. Once again weather conditions are believed to have helped. The spring ice-out date April 23rd, came a few days later than the long-term average, and summer high temperatures were noticeably below the long-term average. Both of these are conditions which help to curtail nuisance algae blooms.

Adding to the favorable conditions, the incidence of runoff events capable of carrying large amounts of nutrients to the lakes were somewhat below average and most of those occurred outside the growing season. The graph indicates that all but three lakes (Pearl, Munson and Little Floyd) exhibited better-than-average clarity. Phosphorus and chlorophyll-a measures generally showed similar better-than-average patterns.



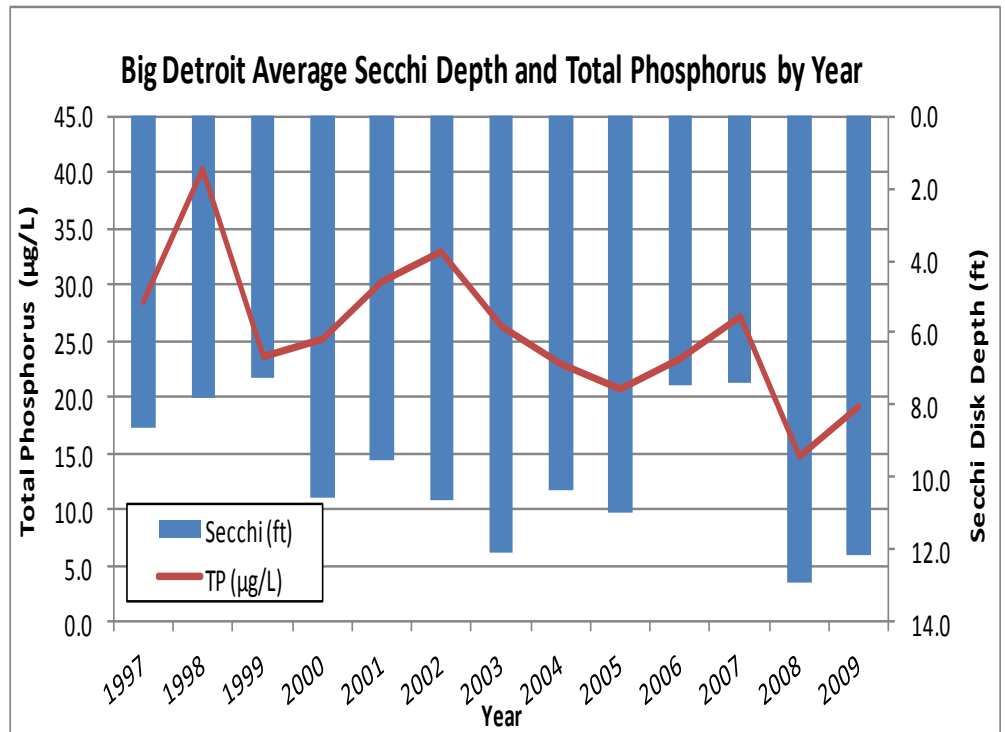
PRWD 2009 Lake and Stream Sampling			
Lakes Sampled	22		
Streams Sampled	17		
Shoreline Surveys	Pearl, Munson, Big Floyd, North Floyd and Little Floyd.		
Lake Secchi Readings	216		
Parameter	Lake	Stream	Total
Total Phosphorus	147	134	281
Ortho Phosphorus	114		114
Chlorophyll A	114		114
Suspended Solids		29	29
Gage Readings		341	341

Thanks to 2009 Monitoring Volunteers

- Curfman:** Ed Welke
- Big Floyd:** Mark Geihl, Les Froiland
- North Floyd:** Mark Geihl, James McGough
- Little Floyd:** Arnold Hilde,
- Big/Little Detroit:** Dick Hecock
- Fox:** Sue Portilla
- Long:** Curt Noyes, Shirley Fihn
- Pearl:** Ryan Kalberer
- Melissa:** Clayton Jenson
- Sallie:** John McLaughlin

Detroit Water Quality 2009

Big and Little Detroit Lakes enjoy relatively good water quality. Little Detroit Lake has exhibited some improvements over the last decade due to the fact that sanitary sewers now serve almost all lakefront properties and most stormwater has been diverted from that basin. Big Detroit is a little worse off than Little Detroit, though there is little evidence that general water quality conditions are deteriorating. Indeed, in-lake phosphorus levels appear to be declining, though the District still considers the lake "at risk" because the lake absorbs a large upstream phosphorus load from the Pelican River. This leads to mid-summer episodes of moderate to severe algae blooms. There is some evidence that internal loading from bottom sediments contributes to this condition now and with the build-up of phosphorus-laden sediments on the lake's bottom, that situation could worsen.



The District is nearing completion of a project to reduce the largest remaining amount of nutrients to Big Detroit. This project involves restoring the Rice Lake Wetland complex back to historic water levels, an effort intended to capture and retain phosphorus. As a result phosphorus exports from Rice Lake are expected to decrease by about 1,300 to 3,500 lbs each year.

All three lakes are heavily impacted by intensive shoreline development. Increased near-shore Imperviousness, drainage alterations and the removal of native shoreline vegetation, all promote nutrient runoff to the lake. Ice-ridge alterations and the addition of rip-rap and retaining walls have negative long-range impacts on the physical and biological habitat.

The issue of aquatic invasive species (AIS) continues to be a hot topic for this LWQMA. The lakes are infested by both Flowering Rush and Curlyleaf pondweed which interfere with boating and swimming, cause damage to shorelines, and tend to reduce the productivity of more desirable aquatic plant species. In the past the district has used mechanical harvesters to control these problems. Since 2006 herbicide treatment has become the dominant control measure.

After a complete review of the situation, including detailed analysis of recent herbicide treatments, solicitation of views from lakeshore owners and others, and consultations with experts from across the country, the District recently has prepared a ten-year plan to address Flowering Rush, Curlyleaf pondweed, and other potential aquatic invasive Species.

Key Features of the District's 2010 Aquatic Plant Management Plan

- Basic research on Flowering Rush
- Research on efficacy of alternative herbicides
- Testing of alternative herbicides in Detroit
- Increase education on AIS
- Partner with City of Detroit lakes to reduce infestations in public use areas (beaches and boat launches)