

National Aquatic Resource Assessment – Lakes, 2014 WDNR

In recent years the U.S. EPA has instituted a National Aquatic Resource Assessment program. The program assesses aquatic resources on a 5 years rotational basis. Lakes were assessed in 2007 and 2012. The goal of the survey is to address two key questions about the quality of the Nation's lakes, ponds, and reservoirs:

- What percent of the Nation's lakes are in good, fair, and poor condition for key indicators of trophic state, ecological health, and recreation?
- What is the relative importance of key stressors such as nutrients and pathogens?

The sampling design for this survey is a probability based network which will provide statistically-valid estimates of the condition of all lakes with known confidence. Samples sites were randomly selected throughout the conterminous U.S. A total of 1028 lakes were sampled. Wisconsin sampled 50 lakes. This number was greater than originally selected by the EPA (28) but the additional lakes strengthened the statistical inferences for the state. In 2007 the lakes that were chosen were at least 4 ha in size and had a maximum depth of at least 1m. For the 2012 assessment the minimum lake size was reduced to 1 ha.

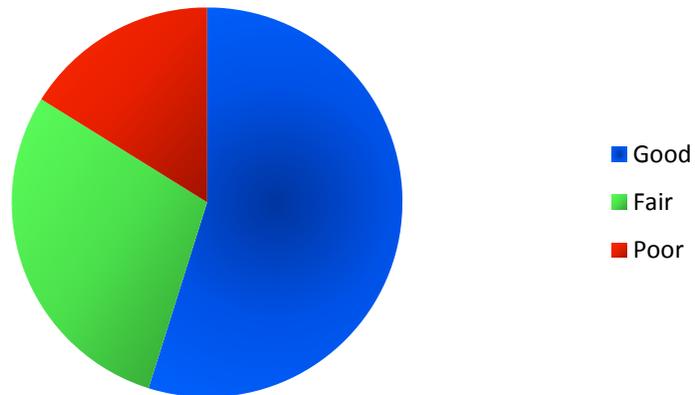
In 2007 the most widespread stressors were those that affect the shoreline and shallow water areas. In Wisconsin there were fewer lakes rated as poor for the lakeshore habitat metric compared with all lakes nationally. The number of lakes in Wisconsin rated as poor for the metrics physical habitat complexity and lakeshore disturbance was similar to lakes nationally. While these metrics are not yet available for the 2012 assessment, it is likely they will again be the most widespread stressors.

Comparing the trophic status of Wisconsin lakes (chlorophyll *a* and total phosphorus) in 2007 vs 2012, there were fewer oligotrophic lakes in 2012 and more eutrophic and hypereutrophic lakes in 2012. Recreational indicators (microcystin and chlorophyll) also indicated worse water quality in 2012 compared with 2007. The biological condition of the lakes in 2012 also appeared to be worse with fewer lakes classified as good condition (Figure 1). There were similar numbers of lakes in poor condition but the number of lakes in fair condition in 2012 was much greater than in 2007.

Were Wisconsin lakes really in worse condition in 2012 compared with 2007? Ten lakes that were sampled in 2007 were also sampled in 2012. The trophic variables of these lakes were generally similar both years. About 52 lakes in Wisconsin have been sampled annually for the last 25 years for trophic variables. Unlike the NLA, these lakes were not randomly chosen. Comparing these lakes in 2007 and 2012, their water quality was similar both years. It appears the reason for the conclusion from the NLA that water quality was worse in Wisconsin lakes was worse in 2012 was the result of the lakes chosen. Even though lakes were randomly chosen in both years, the lakes in 2012 tended to be shallower and smaller in size (Figure 2). In 2012 the minimum lakes size was reduced but removing lakes that are smaller than 4 ha does not change the conclusions.

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**Wisconsin 2007
Diatom IBI**



**Wisconsin 2012
Diatom IBI**

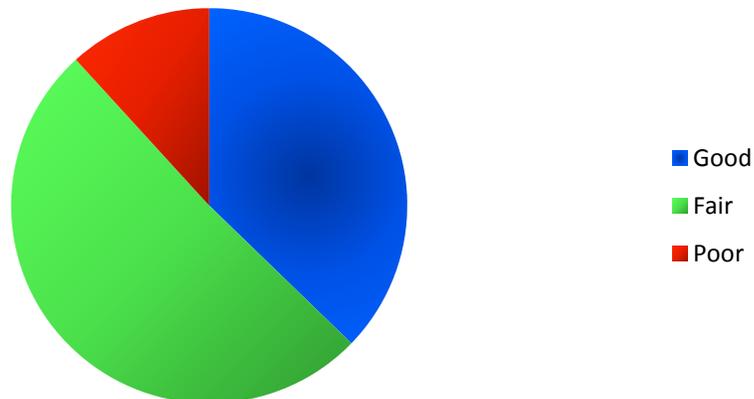


Figure 1. Comparison of biological condition as determined using surface sediment diatoms. The biological condition is worse in 2012 compared with 2007.

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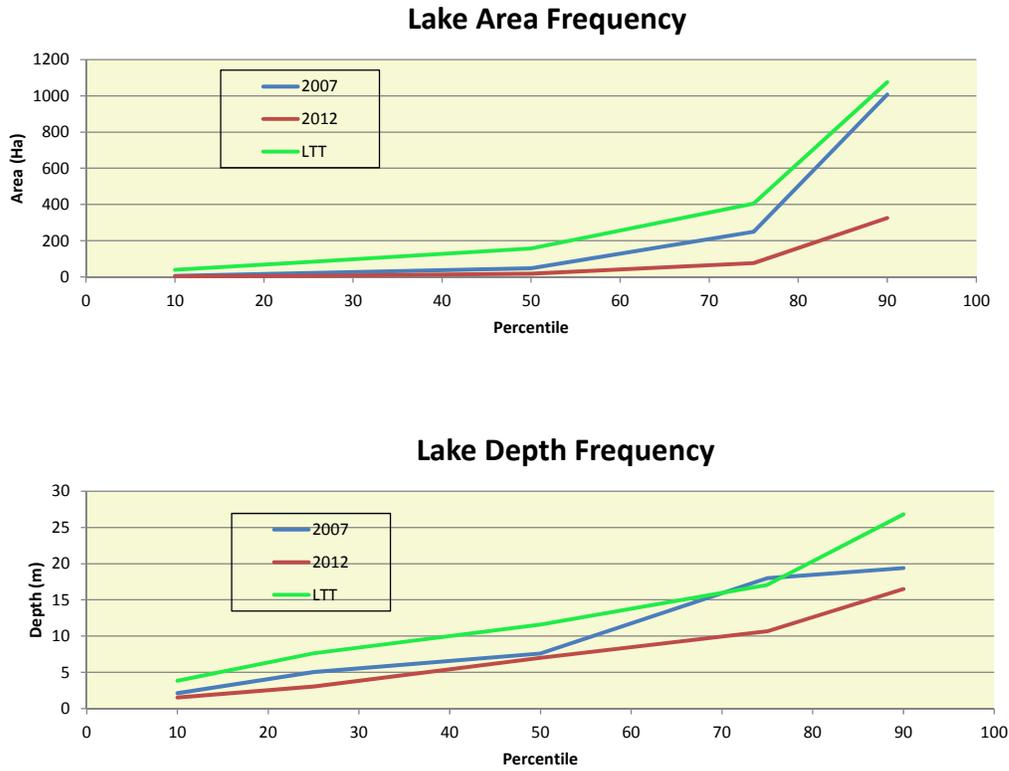


Figure 2. Lakes sampled in 2012 tended to be smaller in size and shallower. The DNR Long Term Trend lakes (LTT) were not randomly chosen. These lakes tended to be larger and deeper than the NLA lakes.