

# IOWA DEPARTMENT OF NATURAL RESOURCES

LEADING IOWANS IN CARING FOR OUR NATURAL RESOURCES

CHUCK GIPP, DIRECTOR | BRUCE TRAUTMAN, DEPUTY DIRECTOR

## 2000-2015 Lake Water Quality Summary

Iowa's lakes are an incredible and important water resource. They support excellent fisheries, provide a home to numerous plants and animals, create recreational opportunities for Iowans and tourists, and in some cases, supply Iowans with drinking water. State wide water quality monitoring is important so that we can better understand the health and status of our lakes.

The Iowa DNR Monitors 138 publically-owned lakes three times each summer, once in early summer (May-June), once in mid-summer (July), and once in late summer (August-September). Lakes are monitored for a number of chemical and biological parameters. Descriptions of parameters can be found in the "[Descriptions of water quality parameters 2015](#)" document. Table 1 shows the proportional range of the water quality values for the 2000 through 2015 sampling seasons. Results from monitoring are used to inform Iowan's about water quality in their lakes, used to track trends in water quality in order to target individual lakes for restoration activities, as well as used to perform Water Quality Assessments on lakes as mandated to the state by the Federal Clean Water Act.

Table 1. 2000-2015 Water Quality Parameter ranges

Water Quality Parameter	Minimum Value	Percentiles			Maximum Value
		25 <sup>th</sup>	50 <sup>th</sup>	75 <sup>th</sup>	
Total Phosphorus as P (µg/L)	4.6	46.5	78.4	130.0	2,800.0
Orthophosphate as P (µg/L)	< 1.0	2.8	7.0	18.4	720.0
Total Kjeldahl Nitrogen (mg/L)	< 0.1	0.9	1.2	1.8	14.0
Nitrate +Nitrite as N (mg/L)	< 0.05	0.03	0.18	0.85	24.53
Ammonia (µg/L)	< 10	25	41	80	1,734
Total Suspended Solids (mg/L)	< 1.0	6.4	11.5	20.0	452.0
Inorganic Suspended Solids (mg/L)	< 1.0	2.0	4.0	9.0	378.0
Volatile Suspended Solids (mg/L)	< 1.0	4.0	6.0	11.0	130.0
Dissolved Organic Carbon (mg/L)	< 1.08	3.8	6.2	8.3	63.6
Temperature (°C)	7.0	21.0	24.1	26.3	33.8
Dissolved Oxygen (mg/L)	0.1	7.2	8.7	10.4	30.1
pH	6.1	8.2	8.4	8.7	10.8
Turbidity (NTU)	< 0.3	7.0	15.3	30.8	2,332.7
Secchi Depth (m)	0.1	0.5	0.8	1.4	10.0
Chlorophyll a (µg/L)	<1	10	26	51	743
Phytoplankton Wet Mass (mg/L)	<1	9.2	25.1	65.8	21,502.8
Zooplankton Dry Mass (mg/L)	<1	56.0	140.2	313.7	134,688.2

µg/L – micrograms per liter (parts per billion)    mg/L – milligrams per liter (parts per million)

NTU – Nephelometric Turbidity Units    < - less than detection limit shown

Note: This summary only includes data collected as a part of the Iowa DNR ambient lake monitoring program. Raw data available through IASTORET: <http://programs.iowadnr.gov/iastoret/>

The Carlson's Trophic State Index (TSI) is an index that was developed to compare different lake water quality values against one another on the same scale. The ranges of the index numbers inform the reader about the overall nutrient status and productivity of the lake. While nutrients are important for aquatic life, an overabundance of nutrients can lead to nuisance algae blooms, limit water clarity, and have other negative impacts on the lake. The DNR uses the TSI values for Secchi depth (water clarity) and Chlorophyll a (algal biomass) to assess water quality in our public lakes under the Clean Water Act. There are 4 classes of lakes that are described within this index. Based on 15 years of data, the majority of the lakes in Iowa fall into 3 of the 4 classes (figures 1 and 2).

Figure 1. 2000-2015 Average Carlson's Trophic State Index for Secchi Transparency

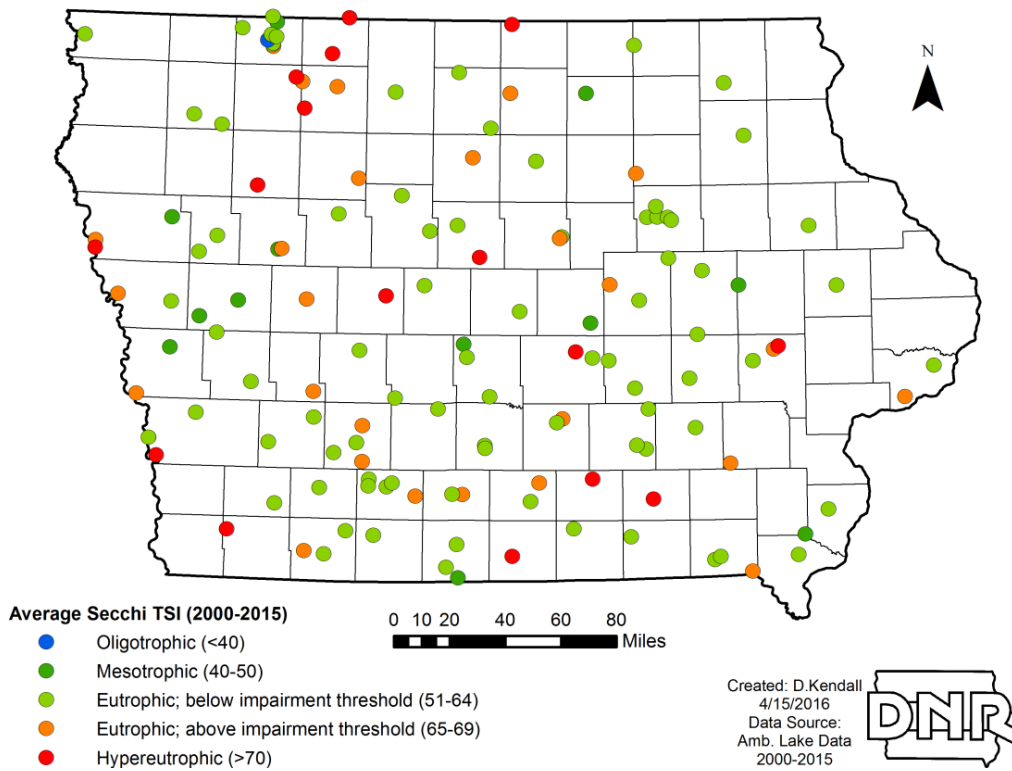
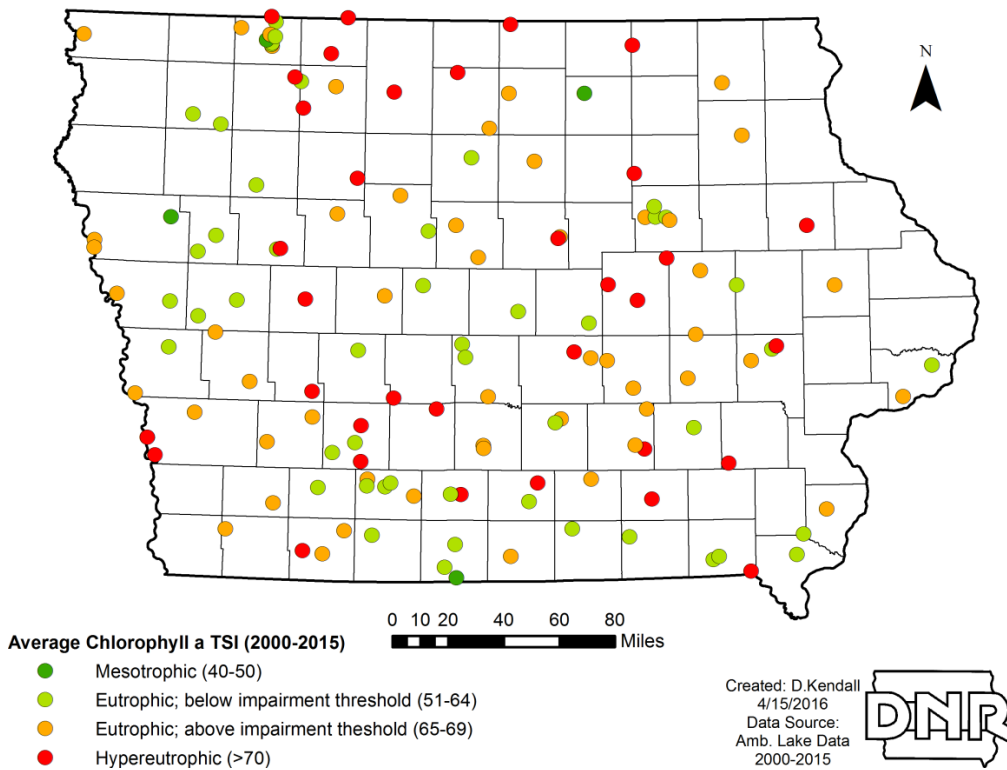


Figure 2. 2000-2015 Average Carlson's Trophic State Index for Chlorophyll a



Summary Completed by:  
Daniel Kendall  
Lake Monitoring Coordinator  
April 18, 2016  
[Daniel.Kendall@dnr.iowa.gov](mailto:Daniel.Kendall@dnr.iowa.gov)