

April 2019

Bylin Dam

(48.36736 N, -98.01221 W)

Walsh County

- Bylin Dam is a reservoir in northeast North Dakota (Figure 1). See map at (<https://gf.nd.gov/gnf/maps/fishing/lakecontours/bylin2004.pdf>).
- There is one public boat ramp on Bylin Dam on the east side of the lake near the dam.
- The Bylin Dam watershed is about 13,000 acres of mostly agricultural land, wetlands and grassland/pasture. The most common crops grown are spring wheat, canola and soybeans (Table 1).
- Bylin Dam is a Class III fishery, which are “capable of supporting natural reproduction and growth of warm water fishes (e.g., largemouth bass and bluegill) and associated aquatic biota.”
- Bylin Dam is managed for walleye, with fingerlings stocked annually. Walleye, yellow perch and northern pike were found during the last sample by the ND Game and Fish.
- Bylin Dam was previously assessed in 1996-1997.

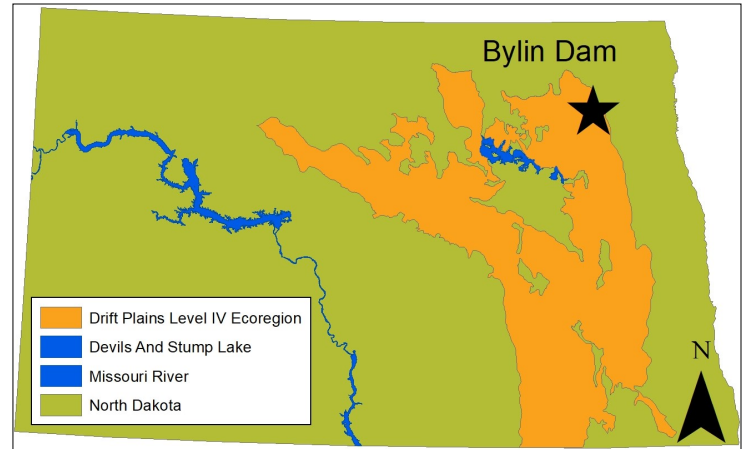


Figure 1. Location of Bylin Dam within the state

Table 1. Percentage of land cover in the watershed and near the lake (NASS, 2014). Value listed of crop type represents percentage of total production

Land Cover Type	% in Watershed	% within 500 meters
Agriculture	55.4%	52.7%
Spring Wheat	41.2%	18.9%
Soybeans	26.2%	45.9%
Canola	14.3%	16.8%
Wetlands	21.6%	6.4%
Grassland/Pasture	16.8%	33.9%
Developed	4.8%	3.4%
Open Water	0.9%	1.2%
Forest	0.3%	1.8%

Temperature and Dissolved Oxygen

- Bylin Dam regularly stratifies in the summer, with warm, well-oxygenated water at the top of the water column, and cold, low-oxygen water near the bottom.
- There was thermal stratification in May and July 2015. Temperature change in the water column was 1.85 degrees Celsius (°C), 6.68°C and 0.06°C in May, July and September, respectively.
- Dissolved oxygen concentration was relatively high in Bylin Dam, except near the bottom during thermal stratification.

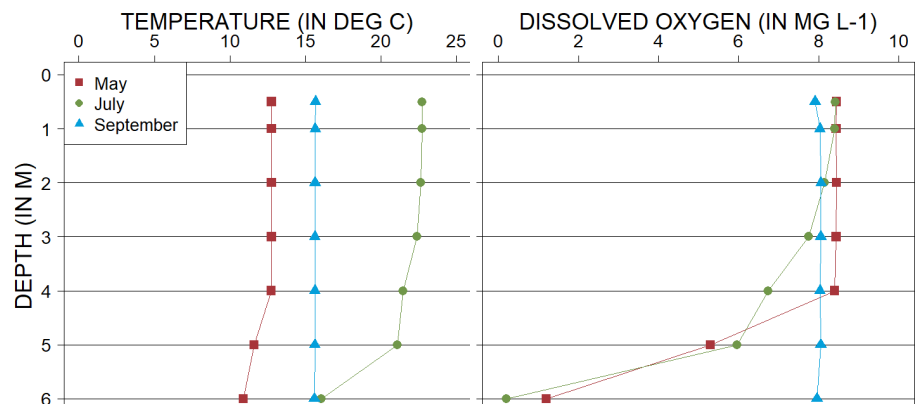


Figure 2. 2015 profiles of temperature (left) and dissolved oxygen (right) in milligrams per liter ($mg\ L^{-1}$)

Trophic State Indices

- Trophic state is a measure used by scientists to assess the condition (where lower scores indicate better water quality) of a lake using three common measures: total phosphorus (TP), Secchi disk transparency and chlorophyll-a concentration.
- Bylin Dam is a eutrophic reservoir (Figure 3) that has high nutrient concentrations but moderate algal growth.
- Current trophic state has improved compared to historical indices.
- There have been no confirmed **harmful** algal (cyanobacteria) blooms at Bylin Dam, but the lake is known to have large blooms.

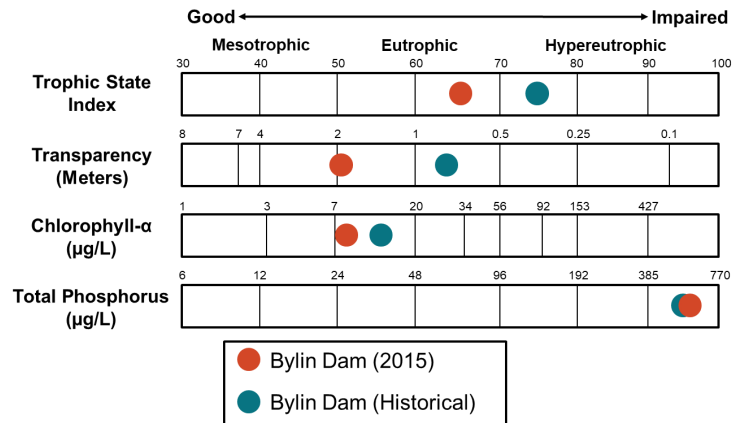


Figure 3. Trophic state indices for 2015 and historical samples

Nutrients

- Median concentration of total nitrogen (TN) in 2015 was greater than the historical median for the lake and greater than the median for the Drift Plains Level IV Ecoregion (hereafter, Drift Plains) where Bylin Dam is located (Figure 4).
- Median concentration of dissolved TN was similar to TN.
- Median TP concentration in 2015 was greater than the median for the lake and much greater than the median for the Drift Plains (Figure 4).
- Median concentration of dissolved phosphorus was slightly less than TP.
- Ammonia was detected in all samples at Bylin Dam in 2015, while there were two detections of nitrate plus nitrite.

Nutrient Concentrations (in mg L⁻¹) in Bylin Dam

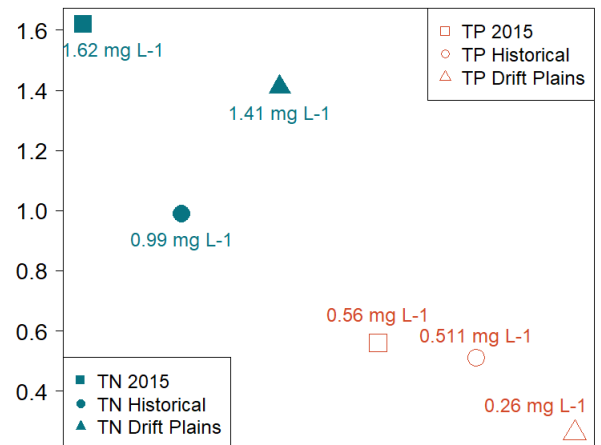


Figure 4. Median concentrations of TN and TP in mg L⁻¹ compared to regional medians

Water Chemistry

Table 2. Median concentrations of selected constituents for 2015 and historical samples and from all Drift Plains reservoirs.

Measure	2015 Median	Historical Median	Ecoregion Median
Alkalinity	236 mg L ⁻¹	198 mg L ⁻¹	311 mg L ⁻¹
Bicarbonate (HCO ₃ ⁻)	243 mg L ⁻¹	206 mg L ⁻¹	341 mg L ⁻¹
Calcium (Ca ²⁺)	90.3 mg L ⁻¹	69.2 mg L ⁻¹	73.8 mg L ⁻¹
Carbonate (CO ₃ ²⁻)	14 mg L ⁻¹	7 mg L ⁻¹	14 mg L ⁻¹
Conductivity	1,370 µS cm ⁻¹	744 µS cm ⁻¹	1,081 µS cm ⁻¹
Dissolved Solids	920 mg L ⁻¹	505 mg L ⁻¹	713 mg L ⁻¹
Magnesium (Mg ²⁺)	55.0 mg L ⁻¹	28.6 mg L ⁻¹	52.5 mg L ⁻¹
Sodium (Na ⁺)	138 mg L ⁻¹	53.3 mg L ⁻¹	106 mg L ⁻¹
Sulfate (SO ₄ ²⁻)	490 mg L ⁻¹	227 mg L ⁻¹	271 mg L ⁻¹

- Sulfate is the dominant anion in Bylin Dam, while magnesium, calcium and sodium are co-dominant cations (Figure 5).
- Median concentrations of most cations and anions are much greater than the historical median for the lake and greater than the median for the Drift Plains.

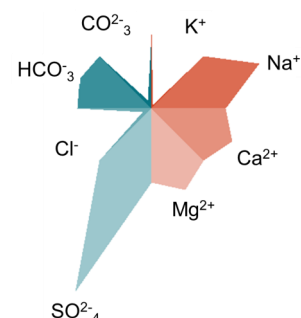


Figure 5. Maucha diagram showing ionic balance based on 2015 data