

April 2019

Blickensderfer Dam

(46.3060 N, -102.2922 W)

Hettinger County

- Blickensderfer Dam is a small reservoir in southwest North Dakota (Figure 1). See map at (<https://gf.nd.gov/gnf/maps/fishing/lakecontours/bllickensderfer2004.pdf>)
- There is one primitive, unpaved fishing access on the west side of Blickensderfer Dam.
- The Blickensderfer Dam watershed is about 2,300 acres of mostly grassland/pasture and agricultural land. The most common crops grown are spring wheat, corn and sunflowers (Table 1).
- Blickensderfer Dam is a Class II fishery, which are “capable of supporting natural reproduction and growth of cool water fishes (e.g., northern pike and walleye) and associated aquatic biota.”
- Blickensderfer Dam is managed for walleye, with fingerlings stocked annually. Northern pike, however, are the dominant fish in the lake. Yellow perch and bluegill were also found during the last sample by the ND Game and Fish.
- Blickensderfer Dam was previously assessed in 2003-2004.

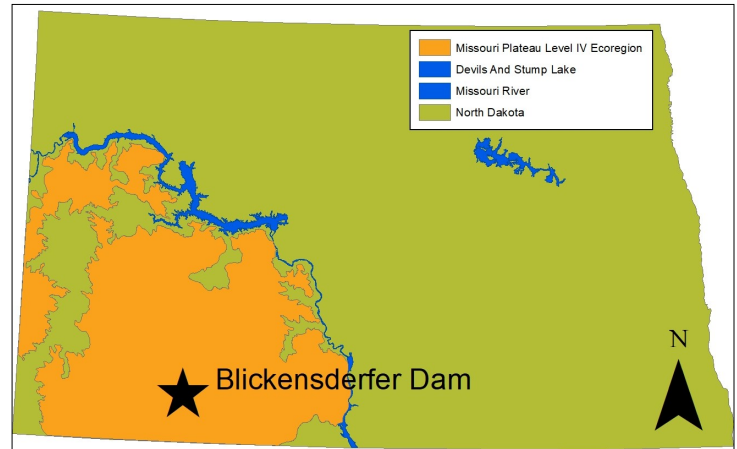


Figure 1. Location of Blickensderfer Dam within the state

Table 1. Percentage of land cover in the watershed and near the lake (NASS, 2013). Value listed of crop type represents percentage of total production.

Land Cover Type	% in Watershed	% within 500 meters
Agriculture	69.3%	42.9%
Spring Wheat	59.0%	1.2%
Corn	13.5%	5.5%
Sunflower	13.3%	63.0%
Grassland/Pasture	26.5%	51.6%
Developed	2.7%	3.4%
Open Water	1.1%	1.1%
Wetlands	0.2%	0.6%
Barren	< 0.1%	NA

Temperature and Dissolved Oxygen

- Blickensderfer Dam commonly 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 recorded in May and July 2014. Temperature change in the water column was 2.66 degrees Celsius (°C), 5.33°C and 0.00°C in May, July and October, respectively.
- All samples showed most of the lake as well-oxygenated, except during thermal stratification.

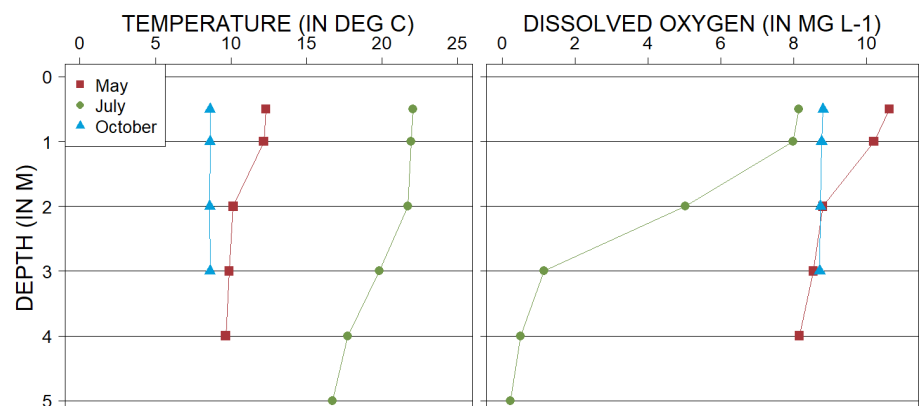


Figure 2. 2014 profiles of temperature (left) and dissolved oxygen (right) in milligrams per liter ($mg L^{-1}$)

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.
- Blickensderfer Dam is a eutrophic lake (Figure 3) that has moderate nutrient concentrations and moderate algal growth.
- Current trophic state has declined compared to historical indices.
- There have been no confirmed **harmful** algal (cyanobacteria) blooms at Blickensderfer Dam.

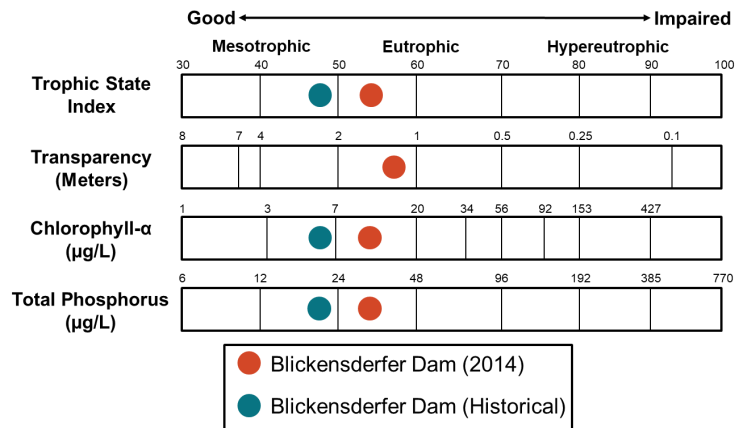


Figure 3. Trophic state indices for 2014 and historical samples

Nutrients

- Median concentration of total nitrogen (TN) in 2014 was less than the historical median but similar to the median for the Missouri Plateau Level IV Ecoregion (hereafter, Missouri Plateau) where Blickensderfer Dam is located (Figure 4).
- Median concentration of dissolved TN was slightly less than TN.
- Median TP concentration in 2014 was similar to the historical median and less than the median for the Missouri Plateau (Figure 4).
- Median concentration of dissolved phosphorus was slightly less than TP.
- Ammonia was detected twice in Blickensderfer Dam in 2014, while there were no detections of nitrate plus nitrite.

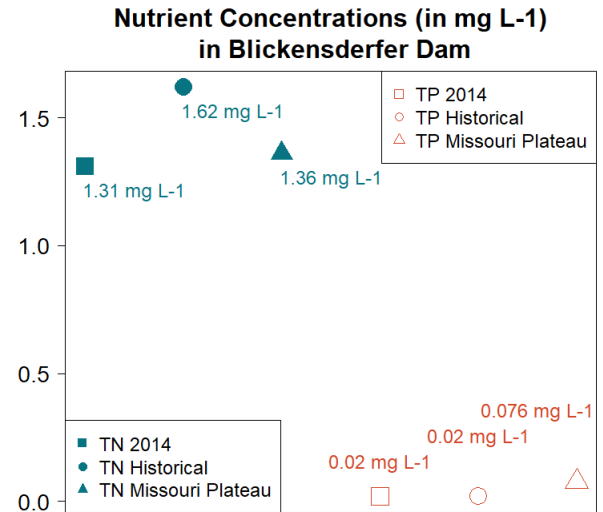


Figure 4. Median concentrations of TN and TP in mg L⁻¹ compared to regional medians

Water Chemistry

Table 2. Median concentrations of selected constituents for 2014 and historical samples and from all Missouri Plateau reservoirs.

Measure	2014 Median	Historical Median	Ecoregion Median
Alkalinity	221 mg L ⁻¹	279 mg L ⁻¹	280 mg L ⁻¹
Bicarbonate (HCO ₃ ⁻)	259 mg L ⁻¹	323 mg L ⁻¹	291 mg L ⁻¹
Calcium (Ca ²⁺)	111 mg L ⁻¹	108 mg L ⁻¹	49.3 mg L ⁻¹
Carbonate (CO ₃ ²⁻)	2 mg L ⁻¹	9 mg L ⁻¹	19 mg L ⁻¹
Conductivity	3,010 µS cm ⁻¹	4,090 µS cm ⁻¹	1,790 µS cm ⁻¹
Dissolved Solids	2,420 mg L ⁻¹	3,410 mg L ⁻¹	1,270 mg L ⁻¹
Magnesium (Mg ²⁺)	178 mg L ⁻¹	237 mg L ⁻¹	62.3 mg L ⁻¹
Sodium (Na ⁺)	390 mg L ⁻¹	569 mg L ⁻¹	258 mg L ⁻¹
Sulfate (SO ₄ ²⁻)	1,560 mg L ⁻¹	2,260 mg L ⁻¹	681 mg L ⁻¹

- Sulfate is the dominant anion in Blickensderfer Dam, while sodium and magnesium are co-dominant cations (Figure 5).
- Median concentrations of most cations and anions are less than the historical median for the lake but greater than the median for the Missouri Plateau.

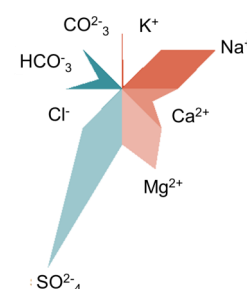


Figure 5. Maucha diagram showing ionic balance based on 2014 data