NORTH Dakota | Environmental Quality

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Contact: Watershed Management Program

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June 2024

Davis Dam

(46.54624 N, -103.66072 W)

Slope County

- Davis Dam is a Dam in southwestern North Dakota (Figure 1). See map at (https://gf.nd.gov/gnf/maps/fishing/lakecontours/davisdam2023.pdf)
- There is one public boat ramp on Davis Dam on the north end of the lake.
- The Davis Dam watershed drains about 12,300 acres. Land cover in the watershed is largely trees and forested land, and rangeland. Agriculture is dominated by wheat, alfalfa, and small grains (i.e., barley and oats) (Table 1).
- Davis Dam is a Class II, cool-water fishery, which are "capable of supporting natural reproduction and growth of cool water fishes (e.g., walleye and northern pike) and associated aquatic biota."
- Davis Dam is managed for rainbow trout, largemouth bass, and bluegill. The lake was last stocked in 2023 with "catchable" rainbow trout. Largemouth bass and bluegill were found during the last survey by the ND Game and Fish (2023).
- Davis Dam was last sampled in 2011.

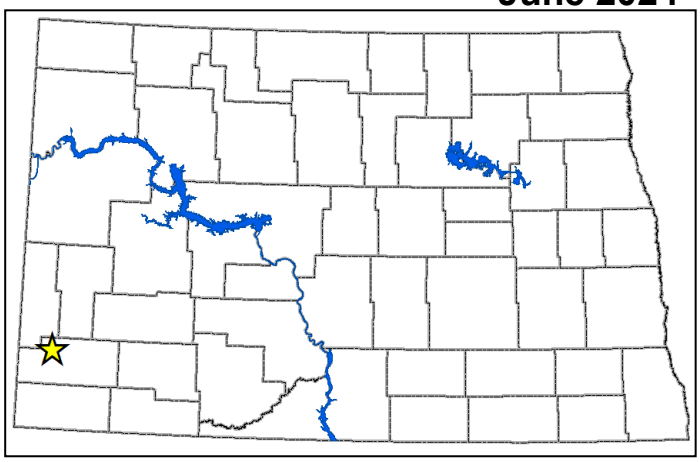

Figure 1. *Location of Davis Dam within the state*

Table 1. *Percentage of land cover in the watershed and near the lake (NASSCDL, 2021). Value listed of crop type represents percentage of total production*

Land Cover Type	% in Watershed	% within 500 meters
Agriculture	2.6%	0%
Wheat	*<1%*	*0%*
Alfalfa	*1.1%*	*0%*
Small Grains	*<1%*	*0%*
Trees	55.8%	26.6%
Rangeland	39.5%	59.4%
Water	0.2%	5.0%
Bare	1.9%	9.0%

Temperature and Dissolved Oxygen

- Davis Dam stayed stratified throughout most of the sampling season, with warm, well-oxygenated water at the top of the water column, and cold, low-oxygen water near the bottom.
- Thermal stratification took place in May, June, and July. The greatest temperature change in the water column during these months was 2.3 degrees Celsius (ºC), 7.4ºC, and 6.4ºC (Figure 2).
- Dissolved oxygen (DO) concentrations were relatively high throughout the water column, but low DO conditions near the bottom were present (Figure 2).

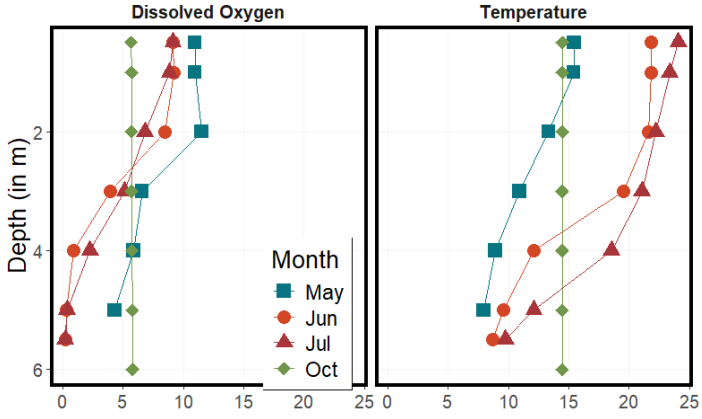

Figure 2. *2023 profiles of dissolved oxygen (left) in milligrams per liter (mg L^{-1}) and temperature (right) in degrees Celsius.*

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.
- Davis Dam is a eutrophic lake (Figure 3) that has high nutrient concentrations and moderate algal and plant growth.
- Trophic state in 2023 was similar to historical conditions.

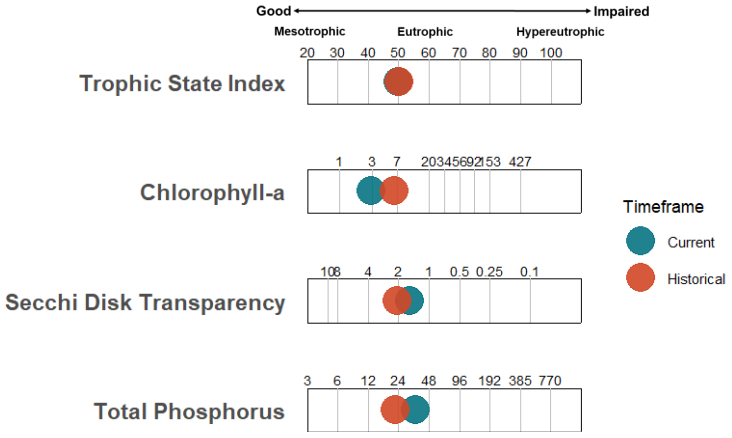

Figure 3. *Trophic state indices for 2023 and historical samples*

Nutrients

- Median concentrations of total nitrogen (TN) in 2023 were greater than the historical and Missouri Plateau Level IV Ecoregion medians where Davis Dam is located (Figure 4).
- Median concentration of dissolved TN was less than TN (2023).
- Median TP concentration in 2023 was less than the historical and ecoregion medians (Figure 4).
- Median concentration of dissolved phosphorus was less than TP (2023).
- Ammonia was found above the detection limit of 0.03 mg/L in Davis Dam during the 2023 spring (May) and fall (October) sampling events.

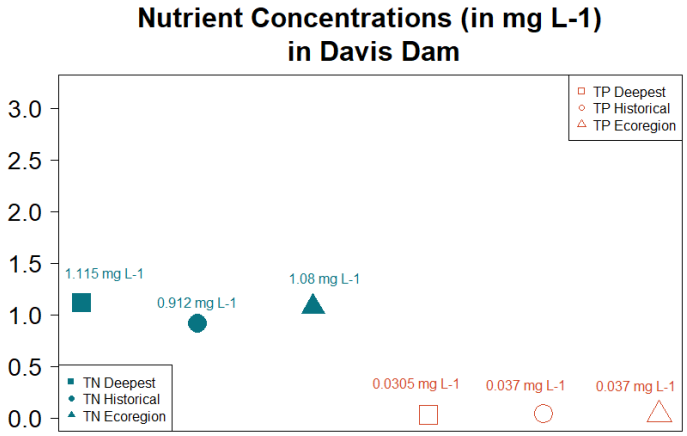

Figure 4. *Median concentrations of TN and TP in mg L^{-1} compared to regional medians*

Water Chemistry

Table 2. *Median concentrations of selected constituents for 2023, historical samples and from all ecoregion natural lakes and reservoirs.*

Measure	2023 Median	Historical Median	Ecoregion Median
Alkalinity	190.5 mg L^{-1}	198.5 mg L^{-1}	201 mg L^{-1}
Bicarbonate (HCO^{-}_{3})	233 mg L^{-1}	234 mg L^{-1}	217 mg L^{-1}
Calcium (Ca^{2+})	50.1 mg L^{-1}	54.35 mg L^{-1}	47.5 mg L^{-1}
Carbonate (CO^{2-}_{3})	0.5 mg L^{-1}	0.5 mg L^{-1}	11 mg L^{-1}
Conductivity	1155 µS cm^{-1}	1290 µS cm^{-1}	823.5 µS cm^{-1}
Dissolved Solids	762 mg L^{-1}	903.5 mg L^{-1}	521.5 mg L^{-1}
Magnesium (Mg^{2+})	60.9 mg L^{-1}	70.45 mg L^{-1}	24.7 mg L^{-1}
Sodium (Na^{+})	113 mg L^{-1}	121.5 mg L^{-1}	94.4 mg L^{-1}
Sulfate (SO^{2-}_{4})	402 mg L^{-1}	493 mg L^{-1}	206 mg L^{-1}

- Sulfate is the dominant anion in Davis Dam, while sodium is the dominant cation (Table 2).
- 2023 median concentrations of most cations and anions are similar to historical medians for the lake and greater than the ecoregion medians (Table 2).

Figure 5. *Photo of Davis Dam in June of 2023 taken by Emily Brazil*