

April 2019

Mott Watershed Dam

(46.3738 N, -102.3277 W)

Hettinger County

- Mott Watershed Dam is a small reservoir in southwest North Dakota (Figure 1). See map at (<https://gf.nd.gov/gnf/maps/fishing/lakecontours/MottWatershed2004.pdf>)
- There is one public boat ramp on the southeast side of Mott Watershed Dam.
- The Mott Watershed Dam watershed is about 1,900 acres of mostly grassland/pasture and agricultural land. The most common crops grown are spring wheat, durum wheat and canola (Table 1).
- Mott Watershed 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.”
- Mott Watershed Dam is managed for rainbow trout, with catchable fish stocked annually. Largemouth bass and bluegill were also found during the last sample by the ND Game and Fish.
- Mott Watershed Dam was previously assessed in 2003-2004.

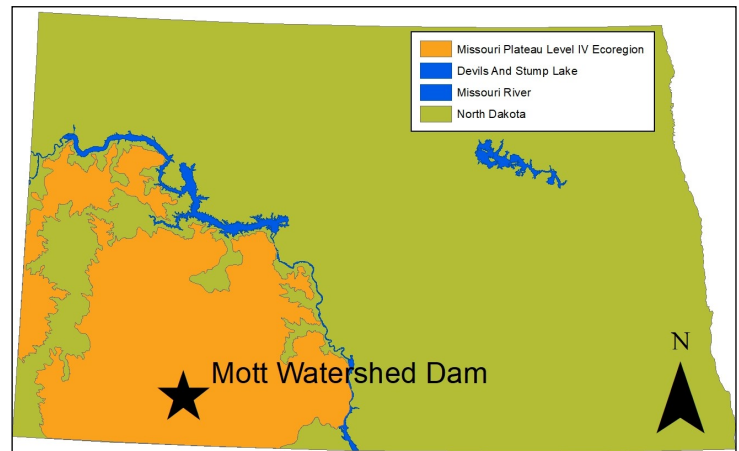


Figure 1. Location of Mott Watershed Dam within the state

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	70.3%	59.2%
Spring Wheat	56.0%	91.2%
Durum Wheat	16.0%	0.6%
Canola	13.2%	0.8%
Grassland/Pasture	22.5%	21.6%
Developed	6.0%	19.1%
Open Water	1.2%	< 0.1%
Wetlands	< 0.1%	NA

Temperature and Dissolved Oxygen

- Mott Watershed 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 3.04 degrees Celsius (°C), 5.74°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.

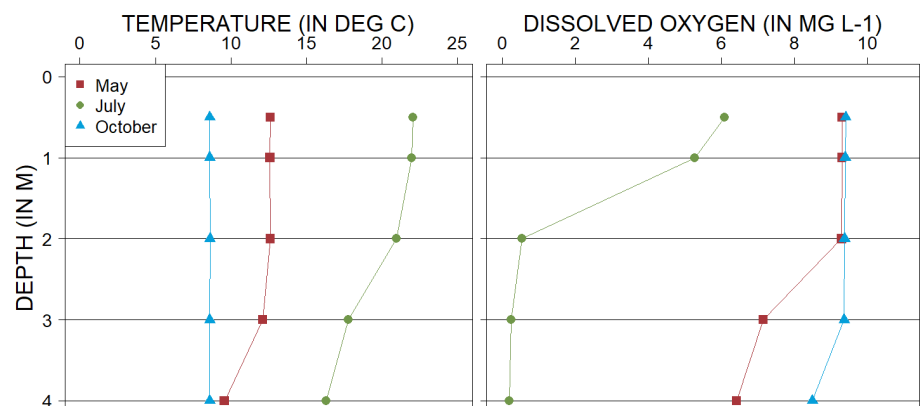


Figure 2. 2014 profiles of temperature (left) and dissolved oxygen (right) in milligrams per liter ($mg L^{-1}$)

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.
- Mott Watershed Dam is a eutrophic lake (Figure 3) that has high 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 Mott Watershed Dam.

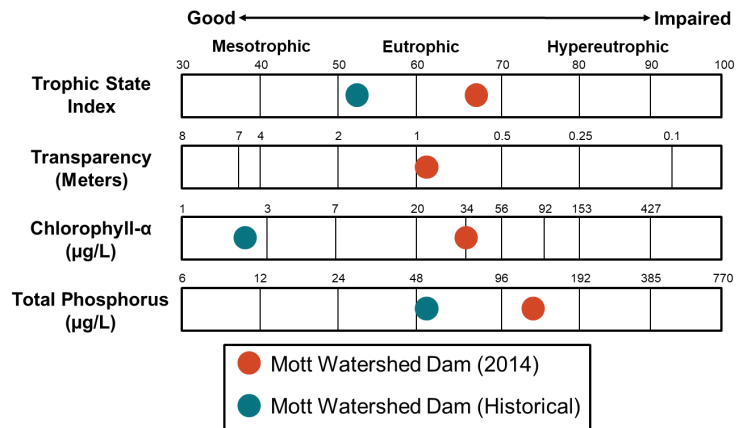


Figure 3. Trophic state indices for 2014 and historical samples

Nutrients

- Median concentration of total nitrogen (TN) in 2014 was less than the historical median but greater than the median for the Missouri Plateau Level IV Ecoregion (hereafter, Missouri Plateau) where Mott Watershed Dam is located (Figure 4).
- Median concentration of dissolved TN was slightly less than TN.
- Median TP concentration in 2014 was greater than the historical median and greater than the median for the Missouri Plateau (Figure 4).
- Median concentration of dissolved phosphorus was slightly less than TP.
- Ammonia and nitrate plus nitrite were each detected twice in 2014 at Mott Watershed Dam.

Nutrient Concentrations (in mg L⁻¹) in Mott Watershed Dam

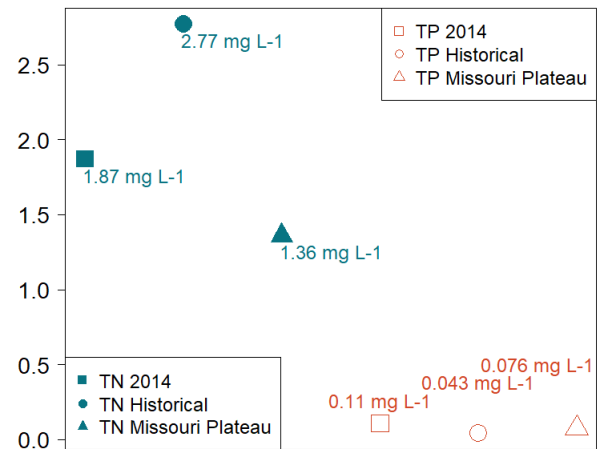


Figure 4. Median concentrations of TN and TP in mg L⁻¹ compared to regional medians

Water Chemistry

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

Measure	2014 Median	Historical Median	Ecoregion Median
Alkalinity	247 mg L ⁻¹	443 mg L ⁻¹	280 mg L ⁻¹
Bicarbonate (HCO ₃ ⁻)	255 mg L ⁻¹	426 mg L ⁻¹	291 mg L ⁻¹
Calcium (Ca ²⁺)	49.0 mg L ⁻¹	42.6 mg L ⁻¹	49.3 mg L ⁻¹
Carbonate (CO ₃ ²⁻)	2 mg L ⁻¹	59 mg L ⁻¹	19 mg L ⁻¹
Conductivity	1,140 µS cm ⁻¹	1,910 µS cm ⁻¹	1,790 µS cm ⁻¹
Dissolved Solids	762 mg L ⁻¹	1,365 mg L ⁻¹	1,270 mg L ⁻¹
Magnesium (Mg ²⁺)	52.9 mg L ⁻¹	90.2 mg L ⁻¹	62.3 mg L ⁻¹
Sodium (Na ⁺)	117 mg L ⁻¹	271 mg L ⁻¹	258 mg L ⁻¹
Sulfate (SO ₄ ²⁻)	360 mg L ⁻¹	667 mg L ⁻¹	681 mg L ⁻¹

- Bicarbonate and sulfate are co-dominant anions in Mott Watershed 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 and less than the median for the Missouri Plateau.

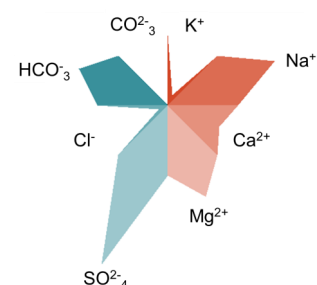


Figure 5. Maucha diagram showing ionic balance based on 2014 data