

February 2019

Jensen Lake

(48.99251 N, -99.92772 W)

Rolette County

- Jensen Lake is a small natural lake in northern North Dakota (No contour map).
- Jensen Lake is accessible by one public, unpaved lake access on the north side of the lake.
- The Jensen Lake watershed is about 220 acres of mostly deciduous forest and open water. The only crops are alfalfa and other hay/non-alfalfa (Table 1).
- Jensen Lake 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.”
- Jensen Lake is no longer managed by the ND Game and Fish. The last time the lake was netted, the ND Game and Fish reported good numbers of small yellow perch.
- Jensen Lake was previously sampled in 1995-1996.

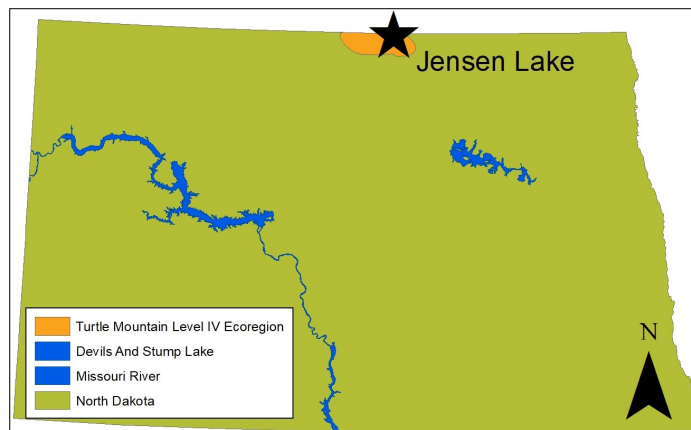


Figure 1. Location of Jensen Lake within the state

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
Deciduous Forest	63.7%
Open Water	30.8%
Developed	2.0%
Grassland/Pasture	1.8%
Agriculture	1.7%
Alfalfa	88.2%
Other Hay/Non-Alfalfa	11.8%

Temperature and Dissolved Oxygen

- Jensen Lake 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.
- Stratification was observed in May and July of 2015, with temperature changes of 5.56 degrees Celsius (°C) and 11.38°C, respectively (Figure 2).
- All samples showed the lake as well-oxygenated, except near the bottom during thermal stratification.

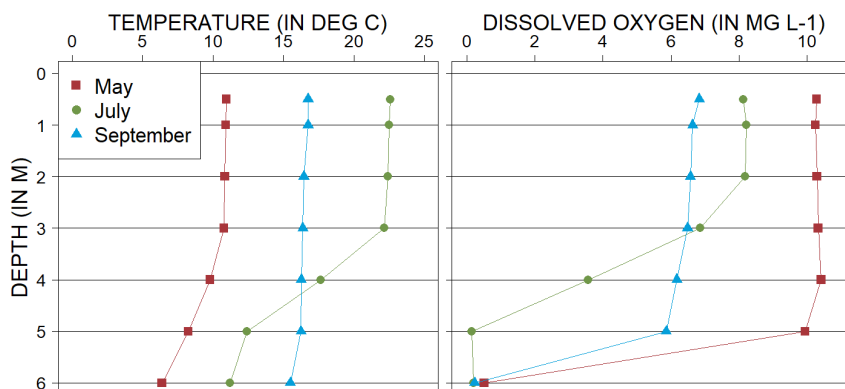


Figure 2. 2015 profiles of temperature (left) and dissolved oxygen (right) in milligrams per liter ($mg L^{-1}$)

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.
- Jensen Lake is a borderline mesotrophic-eutrophic lake (Figure 3) that has low nutrient concentrations and moderate algal growth.
- Trophic state has improved compared to historical indices.
- There have been no confirmed **harmful** algal (cyanobacteria) blooms at Jensen Lake.

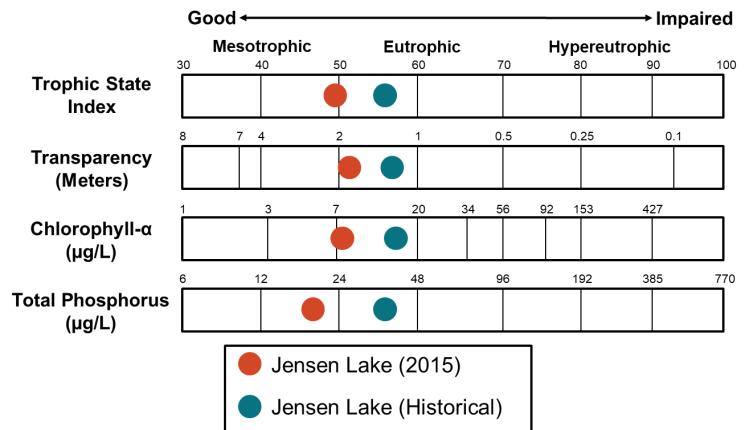


Figure 3. Trophic state indices for 2015 and historical samples

Nutrients

- Median concentration of total nitrogen (TN) was lower in 2015 compared to the historical median and the median for the Turtle Mountains Level IV Ecoregion (Figure 1; hereafter, Turtle Mountains) where Jensen Lake is located (Figure 4).
- Median concentration of dissolved TN was similar to TN.
- Median TP concentration in 2015 was less than historical concentrations and the median for the Turtle Mountains (Figure 4).
- Median concentration of dissolved phosphorus were similar to TP.
- Ammonia and nitrate plus nitrite were not detected above detection limits in Jensen Lake in 2015.

Nutrient Concentrations (in mg L⁻¹) in Jensen Lake

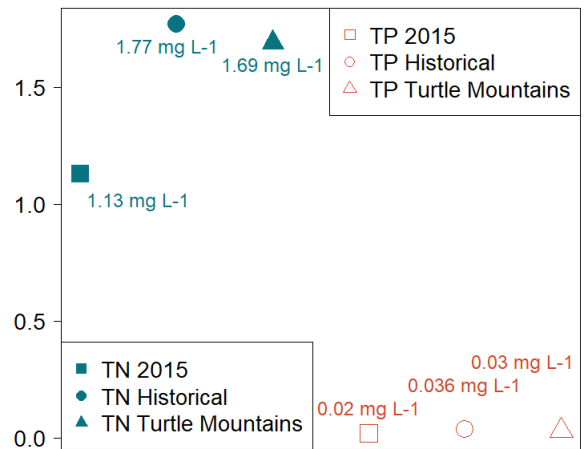


Figure 4. Median concentrations of TN and TP in mg L⁻¹ compared to regional medians

Water Chemistry

Table 2. Median concentrations of selected constituents for 2015 and historical samples and from all Turtle Mountain natural lakes.

Measure	2015 Median	Historical Median	Ecoregion Median
Alkalinity	244 mg L ⁻¹	286 mg L ⁻¹	290 mg L ⁻¹
Bicarbonate (HCO ₃ ⁻)	270 mg L ⁻¹	308 mg L ⁻¹	325 mg L ⁻¹
Calcium (Ca ²⁺)	24.3 mg L ⁻¹	30.4 mg L ⁻¹	32.4 mg L ⁻¹
Carbonate (CO ₃ ²⁻)	14 mg L ⁻¹	15 mg L ⁻¹	12 mg L ⁻¹
Conductivity	483 µS cm ⁻¹	636 µS cm ⁻¹	685 µS cm ⁻¹
Dissolved Solids	267 mg L ⁻¹	346 mg L ⁻¹	382 mg L ⁻¹
Magnesium (Mg ²⁺)	47.5 mg L ⁻¹	56.3 mg L ⁻¹	61.9 mg L ⁻¹
Sodium (Na ⁺)	5.6 mg L ⁻¹	6.3 mg L ⁻¹	8.9 mg L ⁻¹
Sulfate (SO ₄ ²⁻)	28.5 mg L ⁻¹	67 mg L ⁻¹	60 mg L ⁻¹

- Bicarbonate is the dominant anion in Jensen Lake, while magnesium is the dominant cation (Figure 5).
- Median concentrations of most cations and anions are lower than the historical median and the Ecoregion median.

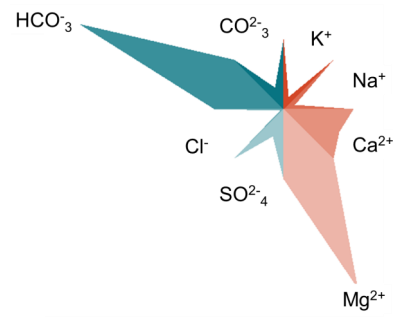


Figure 5. Maucha diagram showing ionic balance based on 2015 data