

February 2019

# West Park Lake

(47.36390 N, -100.77105 W)

## McLean County

- West Park Lake is a small canal lake in central North Dakota (Figure 1). See map at (<https://gf.nd.gov/gnf/maps/fishing/lakecontours/westpark2003.pdf>).
- West Park Lake does not have its own boat ramp, but is accessible by the public boat ramp on East Park Lake. All canal lakes are also accessible from anywhere along the canal.
- Land cover near the lake is mostly agricultural land, grassland/pasture and developed land. The most common crops grown are soybeans, spring wheat and corn (Table 1).
- West Park Lake is a Class II fishery, which means it is “capable of supporting natural reproduction and growth of cool water fishes (e.g., northern pike and walleye) and associated aquatic biota.”
- The lake is primarily managed for walleye, with fingerlings biennially. Yellow perch, white sucker, goldeye, black crappie, common carp and white bass were also found in the lake in 2018.
- West Park Lake was previously assessed in 1993-1994 and 2005-2006.



Figure 1. Location of West Park Lake within the state

Table 1. Percentage of land cover near the lake (NASS, 2017). Value listed of crop type represents percentage of total production.

Land Cover Type	% within 500 meters
Agriculture	65.9%
Soybeans	48.3%
Spring Wheat	26.3%
Corn	19.1%
Grassland/Pasture	18.6%
Developed	9.0%
Open Water	3.7%
Wetlands	2.8%

## Temperature and Dissolved Oxygen

- West Park Lake rarely stratifies in the summer, with the majority of the water column typically well-oxygenated
- There was thermal stratification in May of 2018, likely related to a rapid increase in surface temperature following ice-off. Temperature change in the water column was 2.04 degrees Celsius (°C) in May, but only 0.80°C and 0.05°C in July and September, respectively (Figure 2).
- All samples in 2018 showed the lake as well-oxygenated, except right at the bottom in May and July.

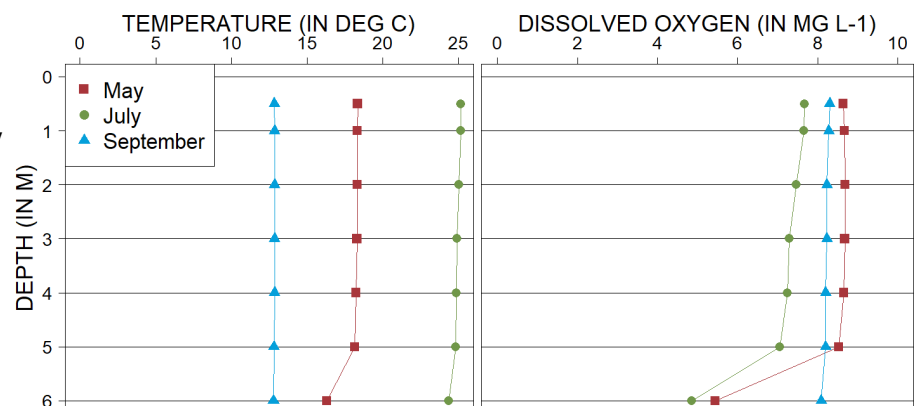


Figure 2. 2018 profiles of temperature (left) and dissolved oxygen (right) in milligrams per liter (mg L<sup>-1</sup>)

## 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.
- West Park Lake is a eutrophic lake (Figure 3) that has moderate nutrient concentrations and moderate algal growth.
- Trophic state has declined compared to historical indices.
- There have been no confirmed *harmful* algal (cyanobacteria) blooms at West Park Lake.

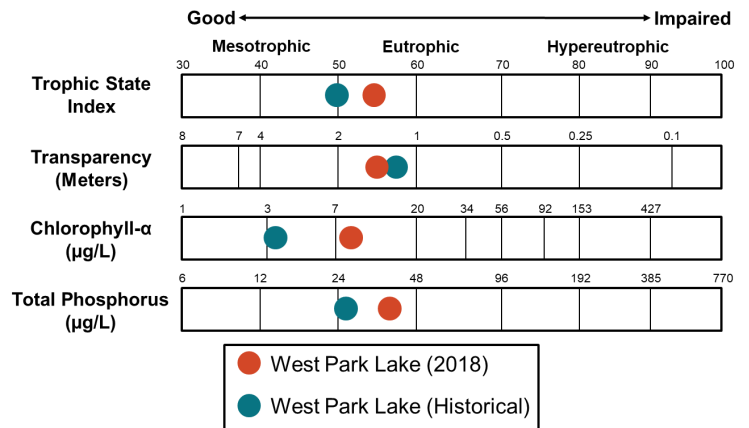


Figure 3. Trophic state indices for 2018 and historical samples

## Nutrients

- Median concentration of total nitrogen (TN) was greater in 2018 compared to the historical median but lower than the median for the Missouri Coteau Level IV Ecoregion (hereafter, Missouri Coteau) where West Park Lake is located (Figure 4).
- Median concentration of dissolved TN was slightly less than TN.
- Median TP concentration was the same in 2018 as historical concentrations but less than the median for the Missouri Coteau (Figure 4).
- Median concentration of dissolved phosphorus was slightly less than TP.
- Ammonia and nitrate plus nitrite were rarely detected in West Park Lake in 2018.

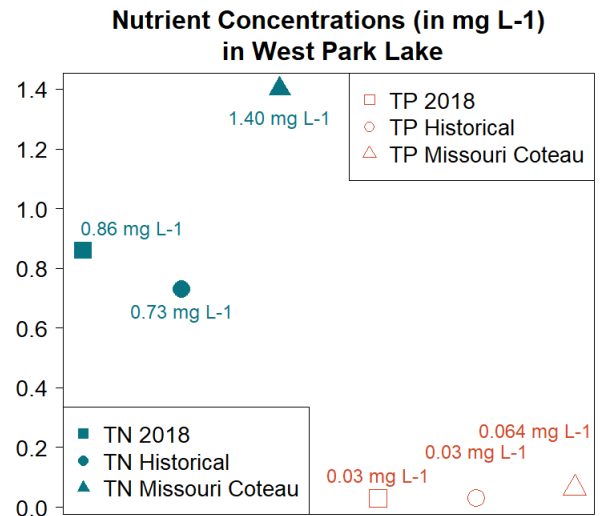


Figure 4. Median concentrations of TN and TP in  $\text{mg L}^{-1}$  compared to regional medians

## Water Chemistry

Table 2. Median concentrations of selected constituents for 2018 and historical samples and from all Missouri Coteau lakes.

Measure	2018 Median	Historical Median	Ecoregion Median
Alkalinity	242 $\text{mg L}^{-1}$	247 $\text{mg L}^{-1}$	274 $\text{mg L}^{-1}$
Bicarbonate ( $\text{HCO}_3^-$ )	264 $\text{mg L}^{-1}$	276 $\text{mg L}^{-1}$	289 $\text{mg L}^{-1}$
Calcium ( $\text{Ca}^{2+}$ )	47.0 $\text{mg L}^{-1}$	48.9 $\text{mg L}^{-1}$	39.8 $\text{mg L}^{-1}$
Carbonate ( $\text{CO}_3^{2-}$ )	13 $\text{mg L}^{-1}$	11 $\text{mg L}^{-1}$	21 $\text{mg L}^{-1}$
Conductivity	1,180 $\mu\text{S cm}^{-1}$	1,130 $\mu\text{S cm}^{-1}$	1,010 $\mu\text{S cm}^{-1}$
Dissolved Solids	780 $\text{mg L}^{-1}$	739 $\text{mg L}^{-1}$	642 $\text{mg L}^{-1}$
Magnesium ( $\text{Mg}^{2+}$ )	53.7 $\text{mg L}^{-1}$	48.3 $\text{mg L}^{-1}$	72.4 $\text{mg L}^{-1}$
Sodium ( $\text{Na}^+$ )	139 $\text{mg L}^{-1}$	133 $\text{mg L}^{-1}$	62 $\text{mg L}^{-1}$
Sulfate ( $\text{SO}_4^{2-}$ )	370 $\text{mg L}^{-1}$	346 $\text{mg L}^{-1}$	239 $\text{mg L}^{-1}$

- Sulfate is the dominant anion in West Park Lake (although bicarbonate is relatively high), while magnesium and sodium are co-dominant cations (Figure 5).
- Median concentrations of most cations and anions are greater than the historical median for the lake and for the Missouri Coteau.

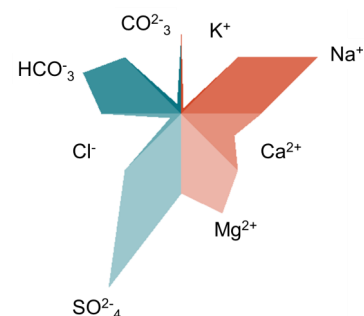


Figure 5. Maucha diagram showing ionic balance based on 2018 data