



2021 Water Quality Summary Report

OVERVIEW

In 2021, Lake Poinsett Association partnered with SD DANR Watershed Protection Program for volunteer training and oversight with water quality sampling.

We collected water samples for eight parameters: *Total Phosphorous, Total Nitrogen, Nitrites/Nitrates, Ammonia, Chlorophyll-a, E.coli, Algal Toxins (Microcystin), and Water Clarity.*

The state monitors our lake water on a rotation basis with other lakes and streams, but there are years where no testing is done. Our volunteer water sampling not only fills in those gap years with consistent data, but we also test more areas around the lake. This creates a larger snapshot of vital information for researchers to track lake health trends.

Each year lake conditions affect all water quality samples differently such as lake water temperatures, cooler or

warmer summers, high or low water levels, wet or dry years, and calm or windy days.

For our sampled lakes, the obvious signs of water quality decline are increased weed and algae growth. These visible nuisances are symptoms of much larger watershed-wide cause - excessive phosphorus loading.

Our WQ Volunteers sampled once a month, May – September. Samples were then processed by the state lab in Pierre.

**In 2021 - 3 WQ Volunteers
38 samples at 5 locations
on Lake Poinsett**

The resulting data can also provide vital public health information to the community when water advisories are necessary to post.

2021 WQ Testing Summary

Total Phosphorous

SUMMARY: Lake Poinsett's Average: 0.140 mg/L Regional Lakes' Average: 0.192 mg/L
Total Phosphorus data shows plenty of variance over the past years.

WHY TEST FOR IT? High levels of phosphorus lead to excessive algae growth which produces harmful toxins to human and animal health and reduces water recreation due to unpleasant odors and unappealing water. Soil erosion is a major contributor of phosphorus overload in lakes. Phosphorus binds to soil particles and enters lakes as runoff from snowmelt and rainfall which adds to the sediment build up in the lake.

Total Nitrogen

SUMMARY: Lake Poinsett's Average: 1.507 mg/L Regional Lakes' Average: 2.024 mg/L
Total Nitrogen data shows consistent lower numbers. On all counts Lake Poinsett fared better than regional lakes.

WHY TEST FOR IT? Excess Nitrogen contributes to algal blooms, excess plant growth, and low dissolved oxygen. Lower dissolved oxygen levels make it harder for fish and other aquatic life to breathe and it weakens growth rates.

Ammonia, Nitrates, Nitrites

SUMMARY: None were detected in samplings.

WHY TEST FOR IT? Ammonia most often comes from fertilizers. High levels of ammonia is toxic to aquatic life. Nitrates sources are from agriculture, nitrogen-based fertilizer, sewage/septic waste, and animal manure. Nitrate reactions can cause oxygen depletion in water, which may cause fish kills.

Chlorophyll-a

SUMMARY: Lake Poinsett's Average: 20.506 (ppb) parts per billion. Regional Lakes' Average: 35.527 (ppb). In the last 5 years, Lake Poinsett has generally had chlorophyll-a results below the regional average. However, the lake does produce significant algae blooms in some years that are considered a high risk for producing algae toxins.

WHY TEST FOR IT? Testing the lake water for Chlorophyll-a measures the amount of algae growing.

E.coli (Escherichia coli)

SUMMARY: State's accepted level at or below 235 #/100 mL is considered safe. A sample of 330 #/100mL was taken in Sept. at the LP Rec. Area Swim Beach.

WHY TEST FOR IT? E. coli is a bacteria found in fecal waste from humans and animals. It can cause illness in people.

Algal Toxin (Microcystin, Blue-Green Algae)

SUMMARY: Two microcystin samplings exceeded the safe level, taken in Aug 9.9 micrograms/L and Sept. 16.9 micrograms/L. In some years the lake does produce significant algae blooms that are considered a high risk for producing algae toxins. Additional monitoring for algae toxins would provide a clearer picture of how common and severe algae blooms are on Lake Poinsett.

WHY TEST FOR IT? Microcystin is a toxin that is released by some species of blue-green algae, or cyanobacteria. Humans, pets, livestock, and wildlife can get sick from contact with it.

Water Clarity (Transparency)

SUMMARY: Lake Poinsett's Average: (2.154 meters or 7.07 feet) Regional Lakes' Average: (1.280 meters or 4.2 feet) High numbers are very good in this category.

WHY TEST FOR IT? A low clarity reading reflects excess algae or suspended sediment. Excess nutrients and sediment pollution are the main causes of poor water clarity. Water clarity is measured with a secchi (sec-kee) disk, which is lowered into the water until the disk disappears. The distance from when it disappears is the water clarity reading.

Data Not Collected – we need volunteers to help.

Large Algae Blooms Data

Document frequency and severity of Algae Blooms. Warming waters, heavy rainfall, and nutrient pollution are driving factors.

Rainfall Events

Total Moisture Documentation

Lake Ice Duration

Ice-In and Ice-Out documents lake seasonal cycles. The formation and break-up of ice are important milestones for a lake each year.

Mercury in Fish Tissue - Mercury is a neurotoxin that can bioaccumulate in the tissue of fish and pose a risk when consumed by humans.