

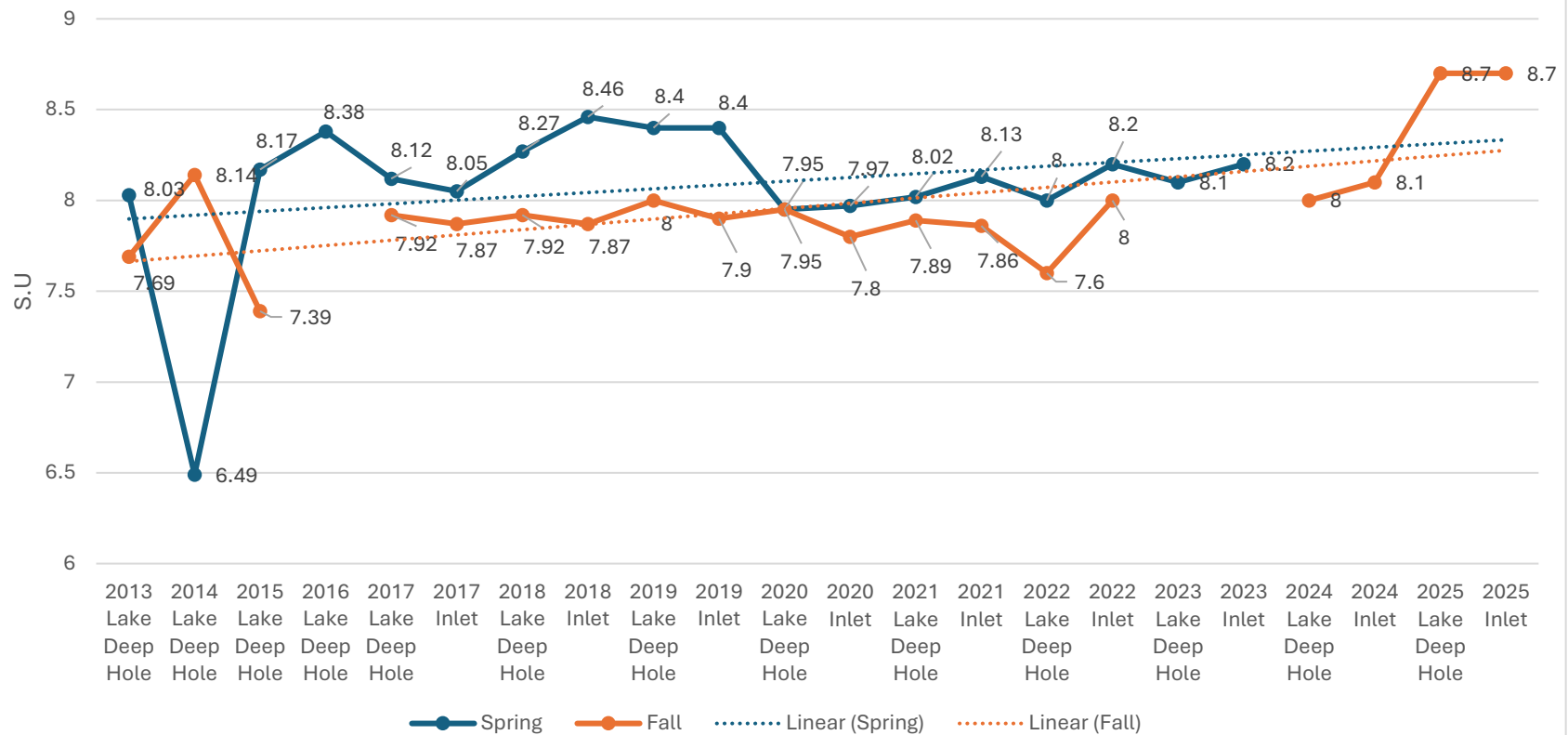
**Comparing pH, Alkalinity, Secchi Disk, Lake
Temperature, Total Phosphorus, Ammonia Nitrogen,
and Total Nitrogen Between 2009/2013-2025 in Lily
Lake (Nashville, WI 54465)**

pH

Freshwater lakes, ponds and streams usually have a pH of 6-8 depending on the surrounding soil and bedrock. The definition of pH refers to how many hydrogen ions are present in the water. A high concentration of phytoplankton can increase the pH due to the decrease of carbon dioxide in the water (making the water more basic). When bacteria break down the dead material on the bottom of the lake; the pH level decreases because carbon dioxide is released into the water (making the water more acidic).

Comparing Spring and Fall PH Levels (S.U) from 2013-2025 (Inlet from Roberts Lake Included 2017-2025)

**As of 2024, they no longer sample in Spring*

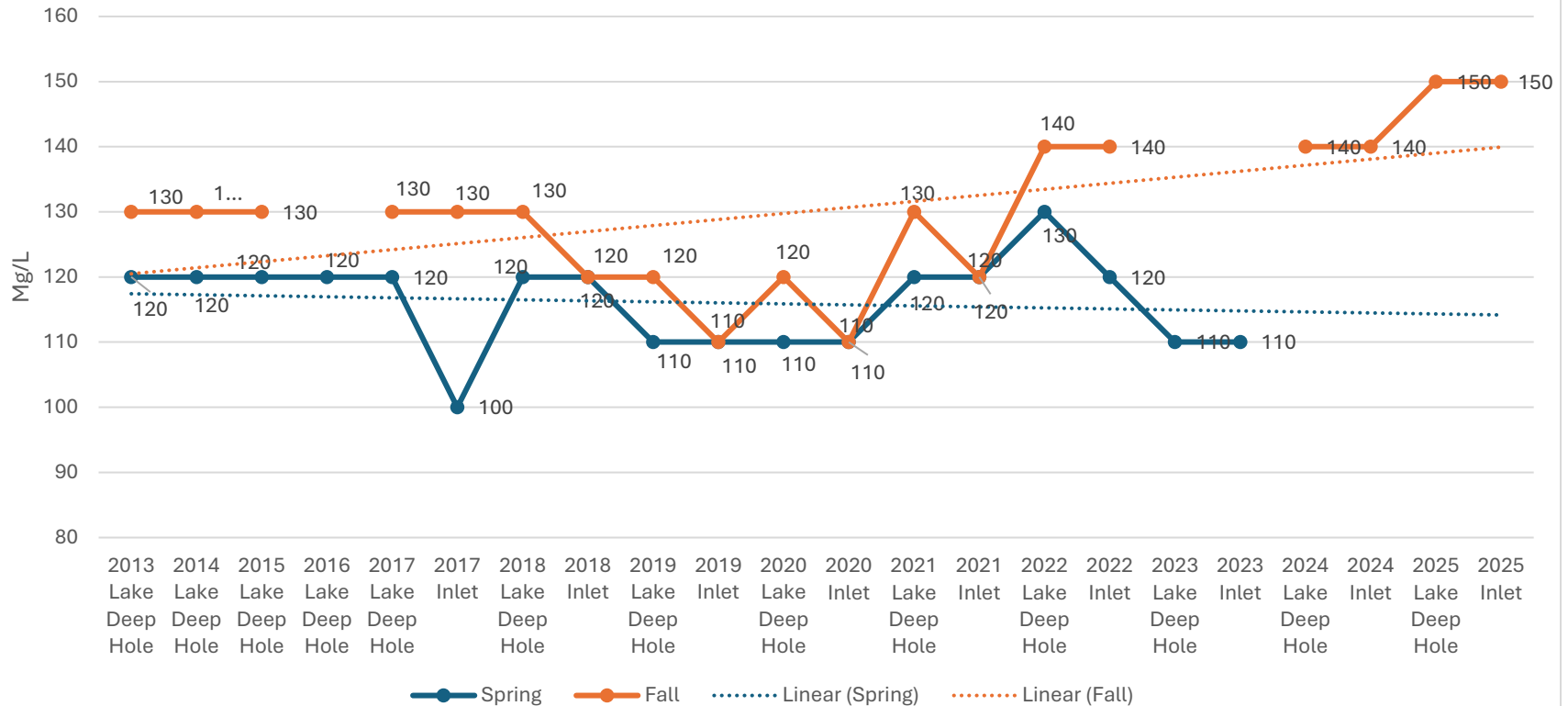


Alkalinity

Alkalinity is a measure of the lakes' ability to neutralize acids and bases and maintain a stable pH level. Water with a high alkalinity will experience less of a change in its own acidity, for instance, when acidic water, such as acid rain or an acid spill, is introduced into the water body. Aquatic organisms benefit from stable pH values, and waters with a high alkalinity are better able to maintain a constant pH. The alkalinity in the water comes mostly from the rocks and land surrounding the lake. If the landscape is in an area containing rocks such as limestone then the runoff picks up chemicals such as calcium carbonate, which raises the pH and alkalinity of the water.

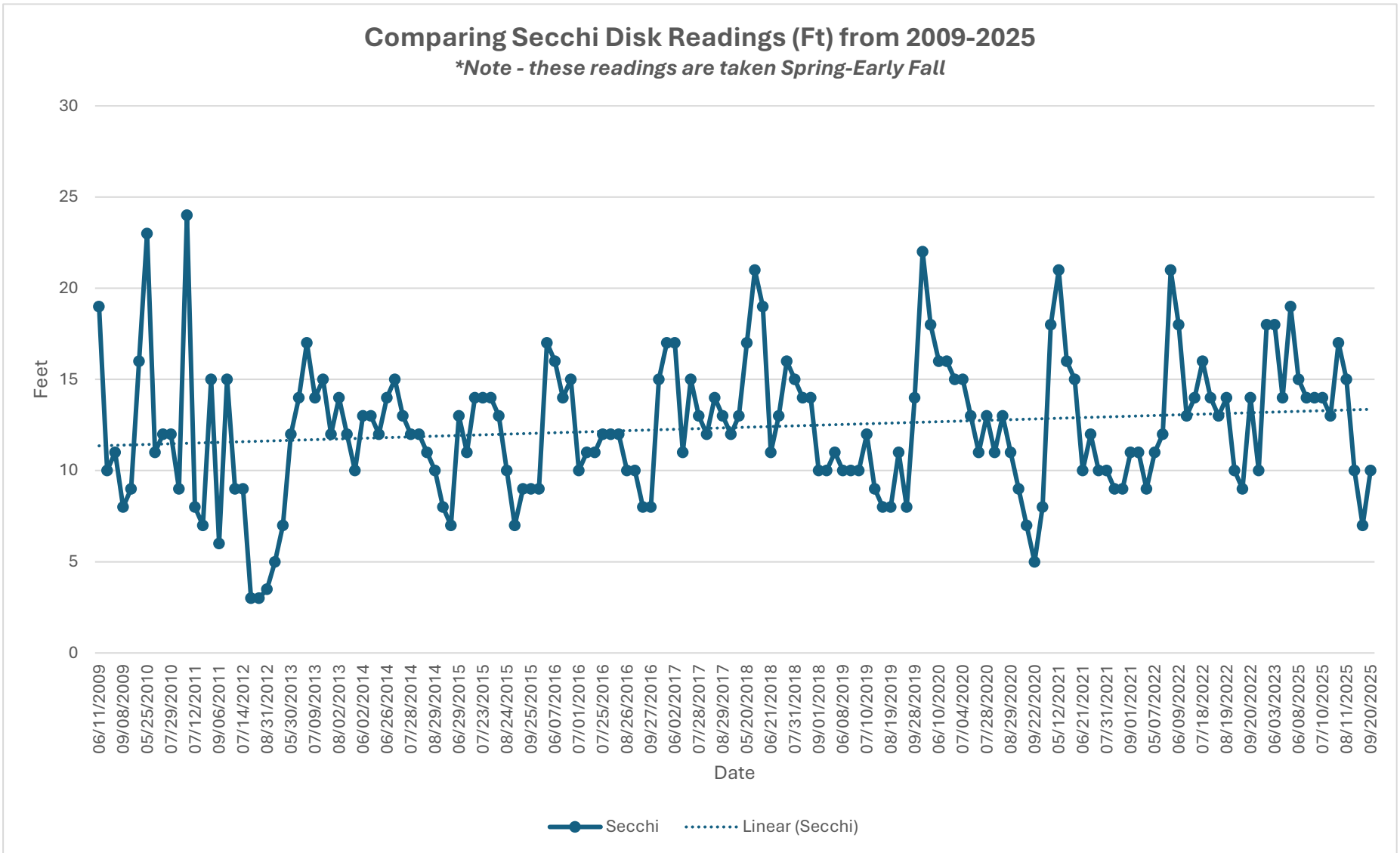
Comparing Spring and Fall Alkalinity Levels (Mg/L) from 2013-2025 (Inlet from Roberts Lake Included 2017-2025).

**As of 2024, they no longer sample in Spring*



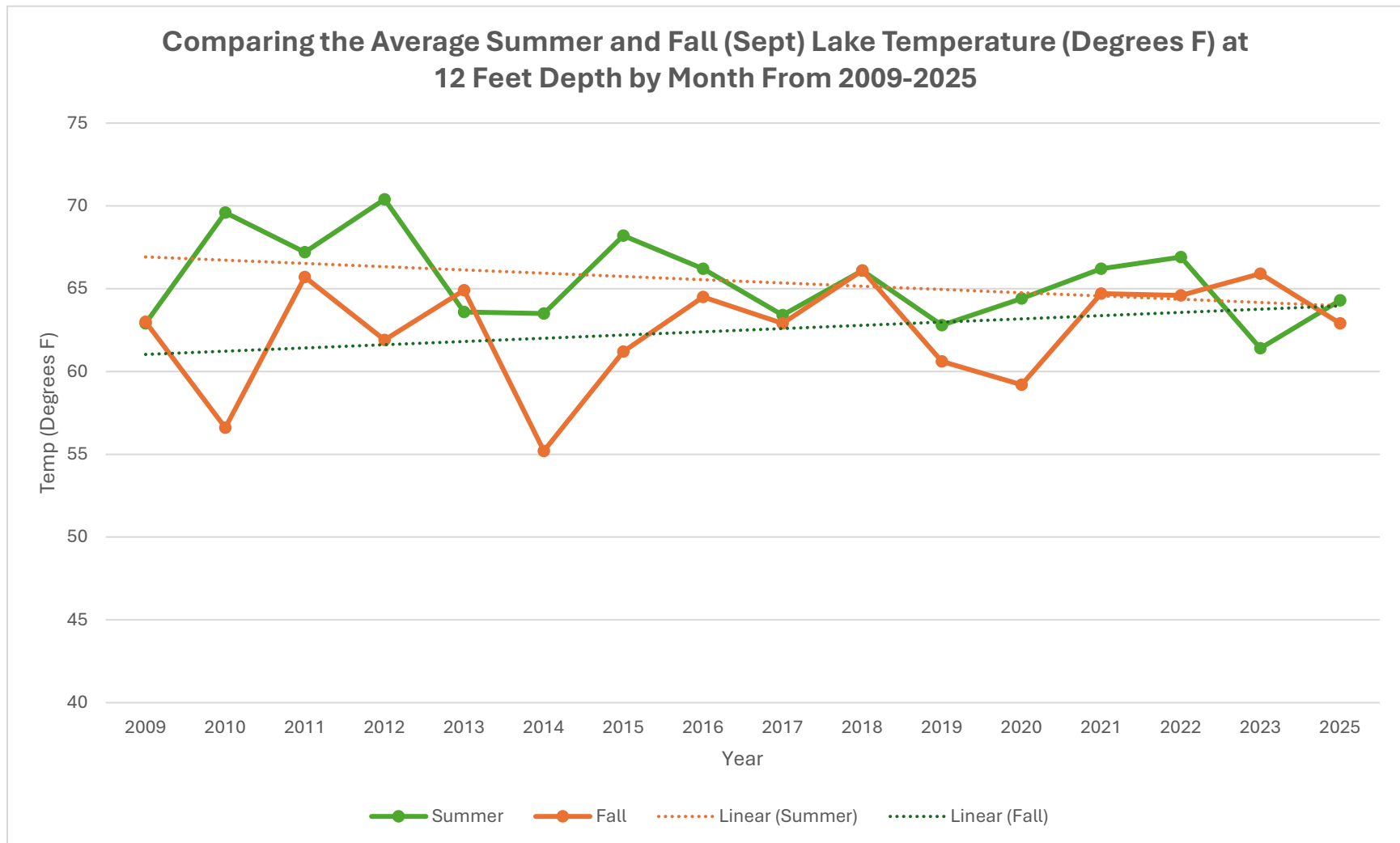
Secchi Disk

A Secchi disk is used to measure the transparency or clarity of water. A higher Secchi depth indicates clearer water, while a lower depth means more turbidity (suspended particles) in the water.



Temperature

Temperature affects almost every aspect of the lake ecosystem including water quality, water density, chemical reactions (algal growth), lake layers, and lake ice. It is also related to the dissolved-oxygen concentration in water, which is very important to all aquatic life. Since warm water is less dense than colder water, it stays on top of the lake surface. In fall, some lake surfaces can get very cold. When this happens, the surface water becomes denser than the deeper water with a more constant year-round temperature (which is now warmer than the surface), and the lake "turns", when the colder surface water sinks to the lake bottom.

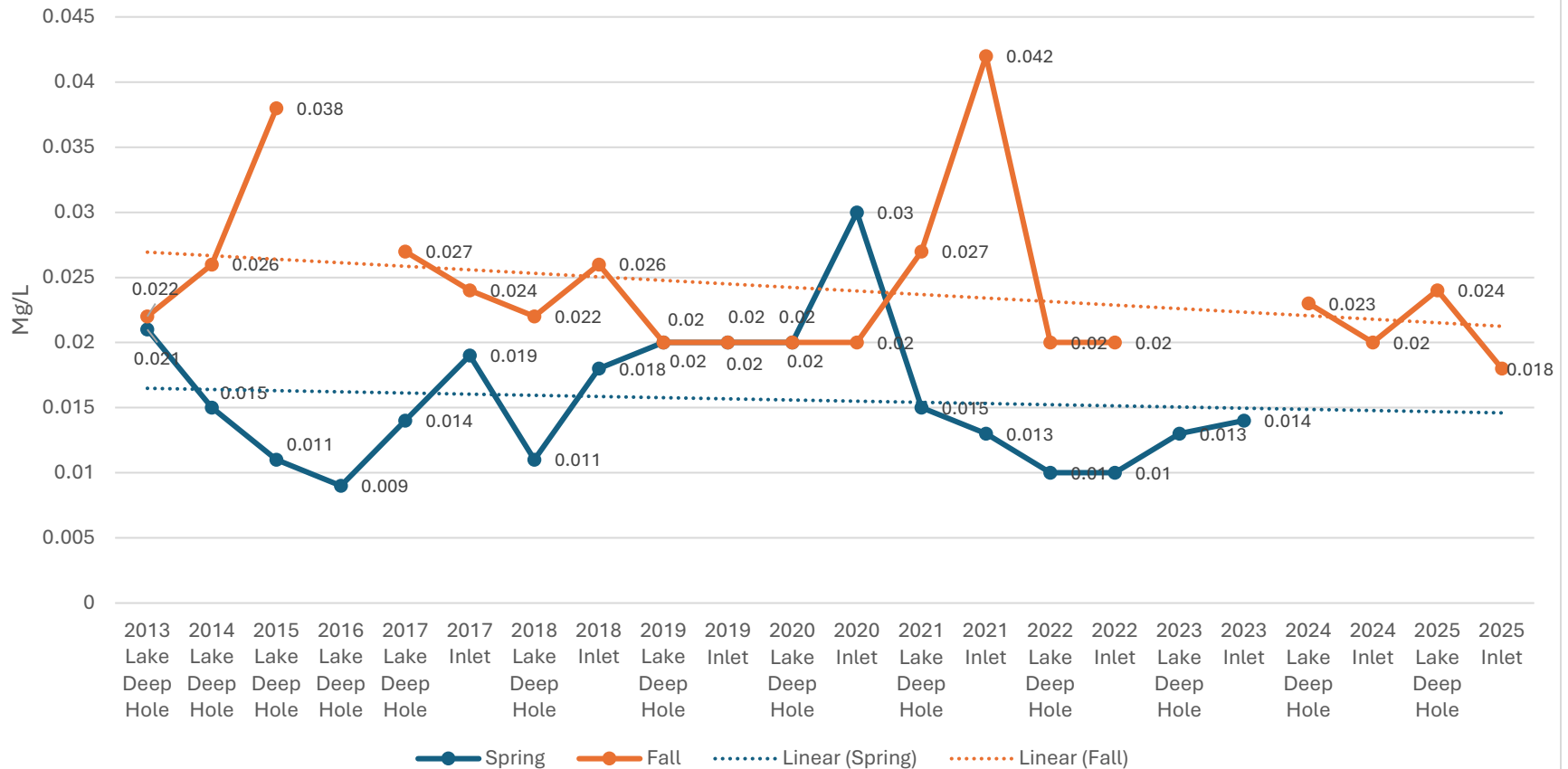


Phosphorus

Phosphorus is an essential mineral found in agricultural fertilizers, manure, and organic wastes in sewage. Runoff, and soil/bank erosion are the major contributors of phosphorus to lakes and streams. While it is important to plant life, when there is too much of it in the water, it can speed up eutrophication (reduction of oxygen). This in turn leads to excess algae growth, harmful algal toxins, and blockage of sunlight needed by organisms and plants in the water.

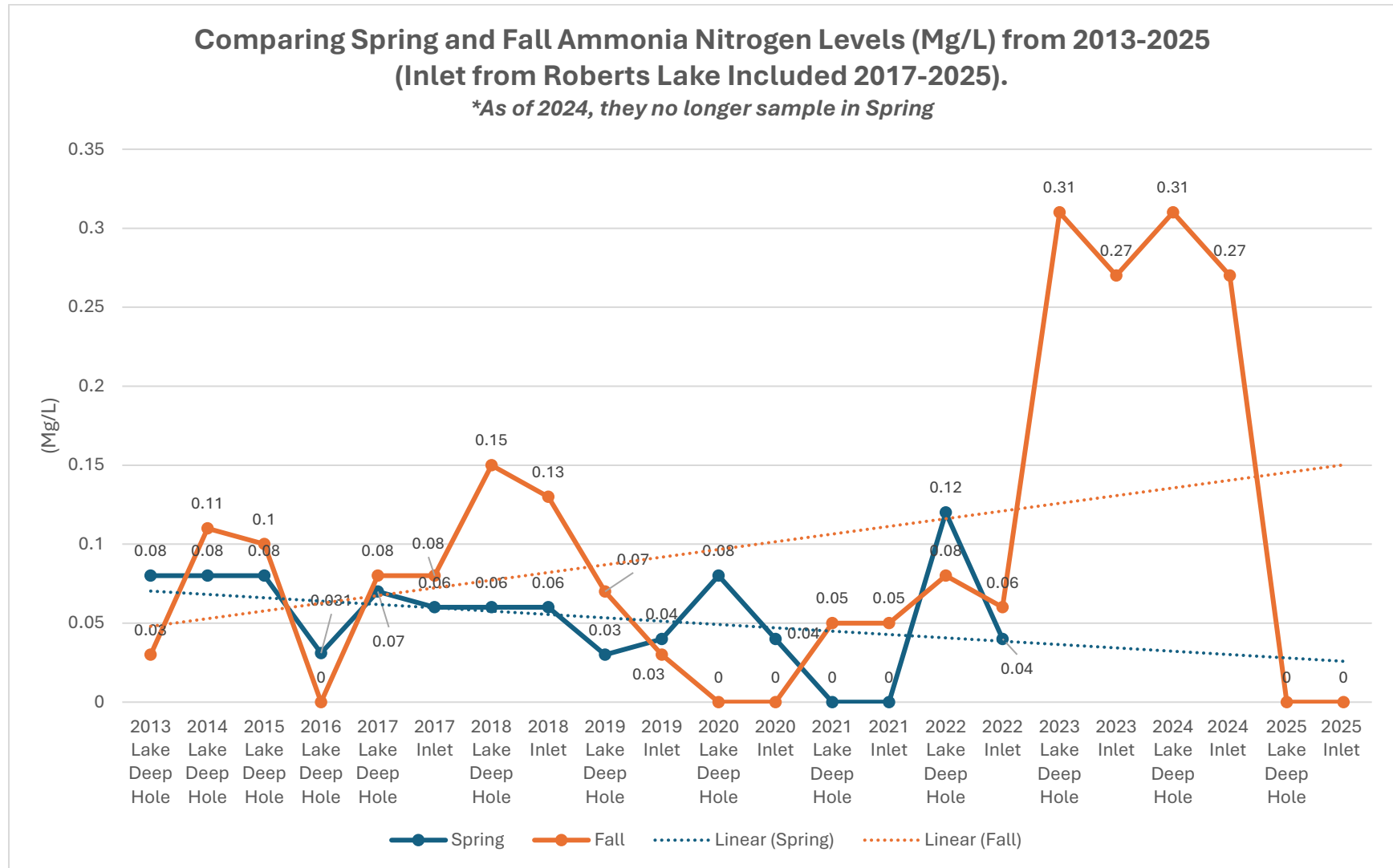
**Comparing Spring and Fall Total Phosphorus Levels (Mg/L) from 2013-2025
(Inlet from Roberts Lake Included 2017-2025).**

**As of 2024, they no longer sample in Spring*



Ammonia Nitrogen

Ammonia Nitrogen is a measure of the total nitrogen present in the form of ammonia and ammonium in a water body. It can enter the lake environment via municipal discharges, waste from animals, and runoff. Excess ammonia can damage vegetation and is incredibly toxic to aquatic life, especially at elevated pH and temperature levels.



Total Nitrogen

Just like phosphorus, nitrogen is an essential mineral that has negative impacts in excess amounts. Nitrogen is more abundant than phosphorus and usually comes from transportation, industry, agriculture and fertilizer application, while phosphorus is more commonly the result of sewage waste, amplified soil erosion, and runoff from urban watersheds. While it is important to plant life, when there is too much of it in the water, it can speed up eutrophication (reduction of oxygen). This in turn leads to excess algae growth, harmful algal toxins, and blockage of sunlight needed by organisms and plants in the water.

