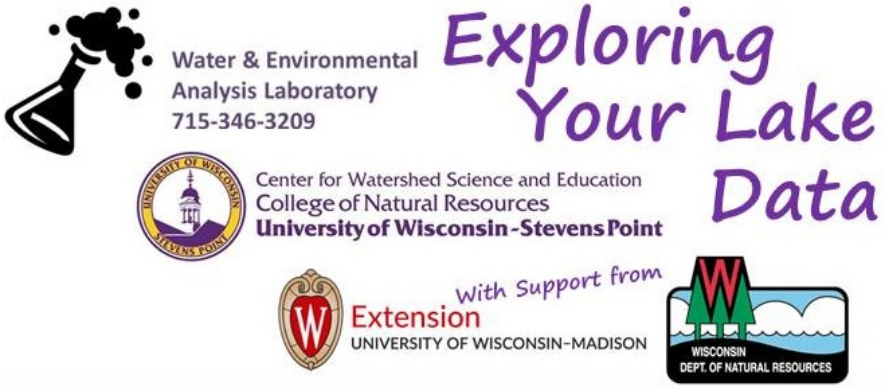
# Lake Monitoring Report
# Spring Lake (Fall NE), Waushara Co
# Fall 2021

The Water and Environmental Analysis Laboratory at the University of Wisconsin Stevens Point has provided lake monitoring reports to Wisconsin citizens and groups since the 1970s. Our new report allows us to combine results from some of your monitoring through our laboratory with results stored in the Wisconsin Department of Natural Resources Surface Water Integrated Monitoring System (SWIMS) database. In report that follows, we are showing results described as collected in the upper 6.5 feet (2 meters) of your lake and any concentrations reported as below the detection limit are plotted at one-half of the detection limit. If you see graphs with no data plotted, this means no data has been collected, or it has not been entered into the WDNR SWIMS database.

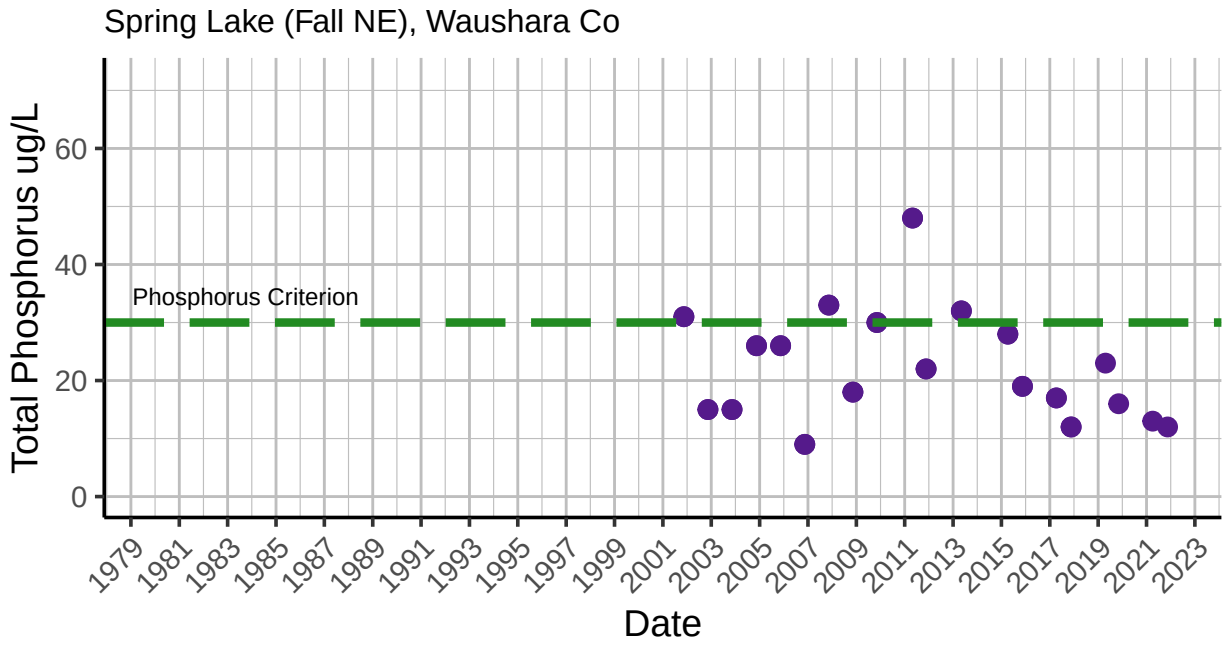
We are still improving this new report format and we encourage you to let us know if you believe something is missing, something is in error or the report could be improved. Your comments will be important to our ongoing efforts to develop new data presentation tools and for improving the report.

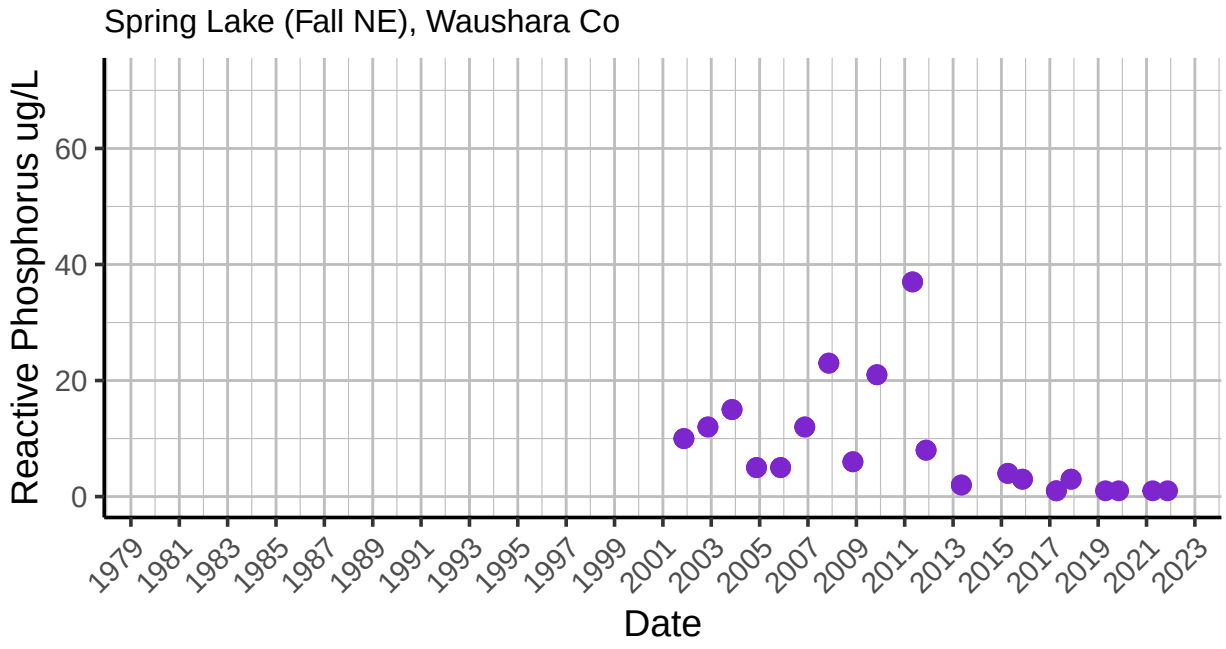
Please send your comments and questions to us at weal@uwsp.edu.

Thank you for your efforts to monitor and understand Wisconsin's water resources.



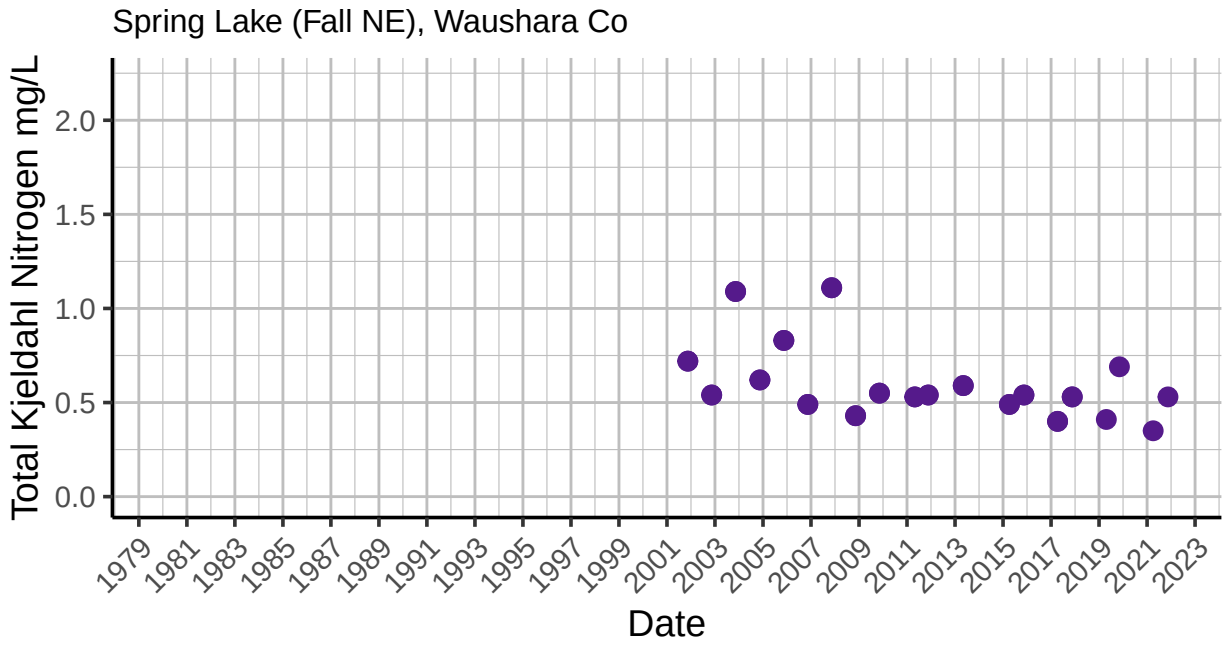
## Total and Reactive Phosphorus

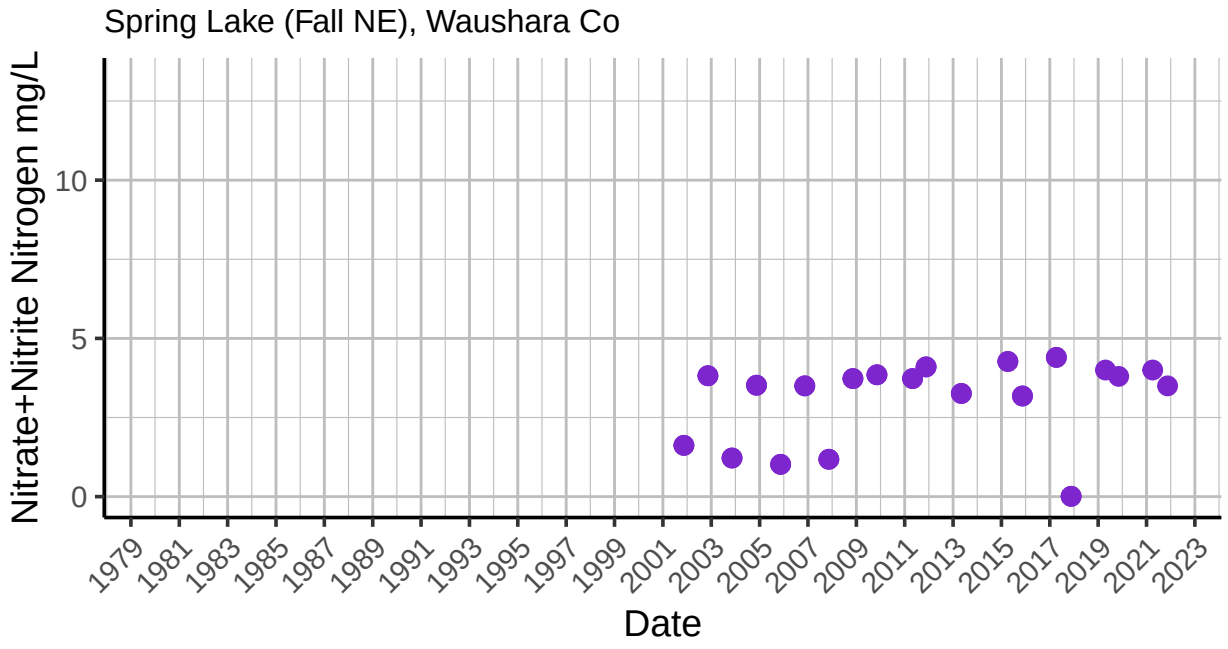



*Phosphorus concentrations likely control the growth and amount of algae in your lake. A trend in phosphorus concentrations over time may indicate changes in the watershed that lead to more (or less) phosphorus entering the lake. The horizontal line shows the upper limit for maintaining a lower likelihood of nuisance algal blooms in your lake type.*

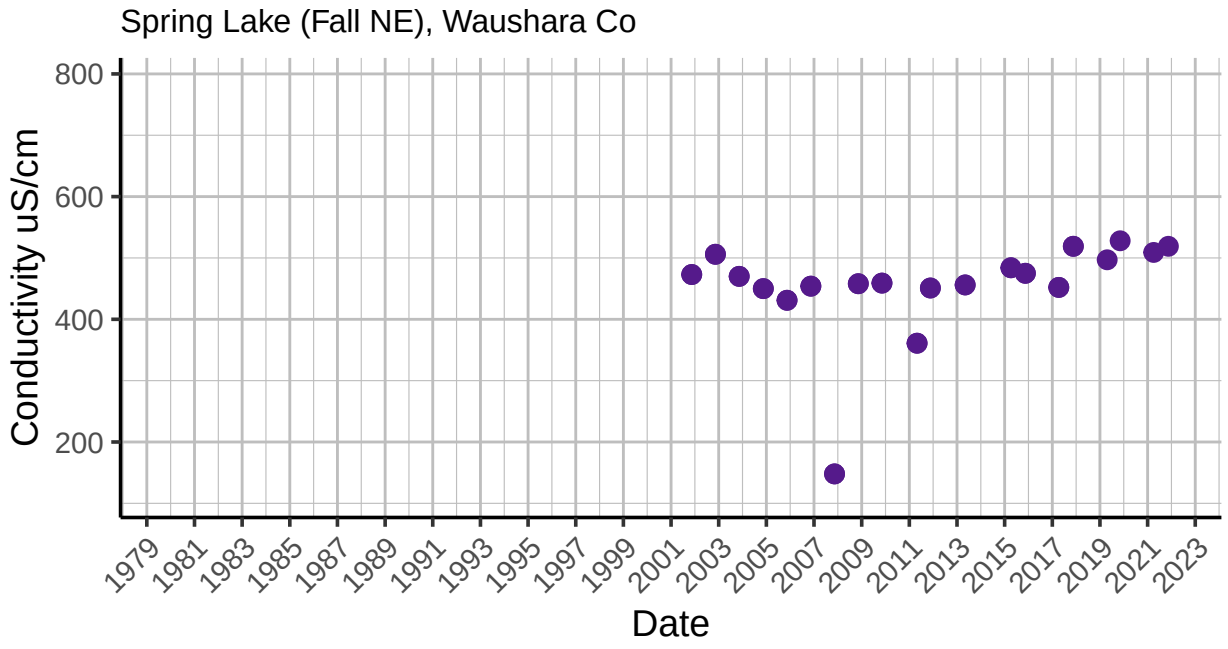
## Total Kjeldahl Nitrogen and Nitrate+Nitrite Nitrogen

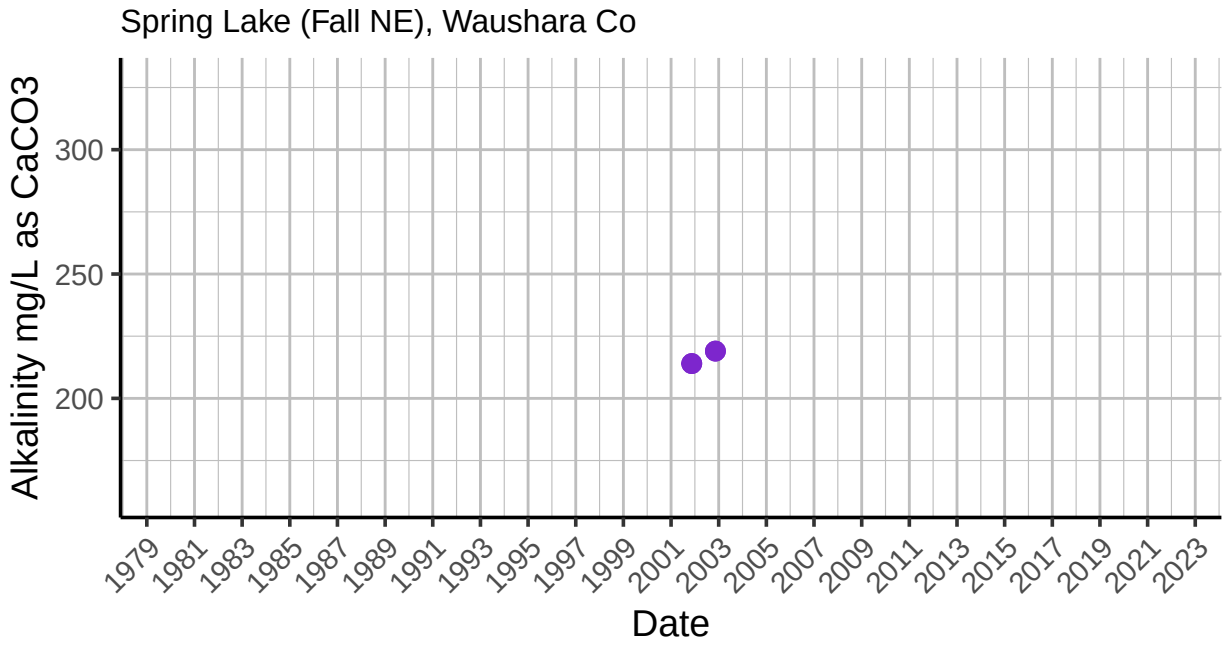



*Nitrogen is a critical element for the growth of algae and plants in a lake. Nitrogen concentrations are less likely to be controlling the overall biological productivity than phosphorus concentrations, but increasing nitrogen over time can lead to changes in amount and type of plant and algal communities.*

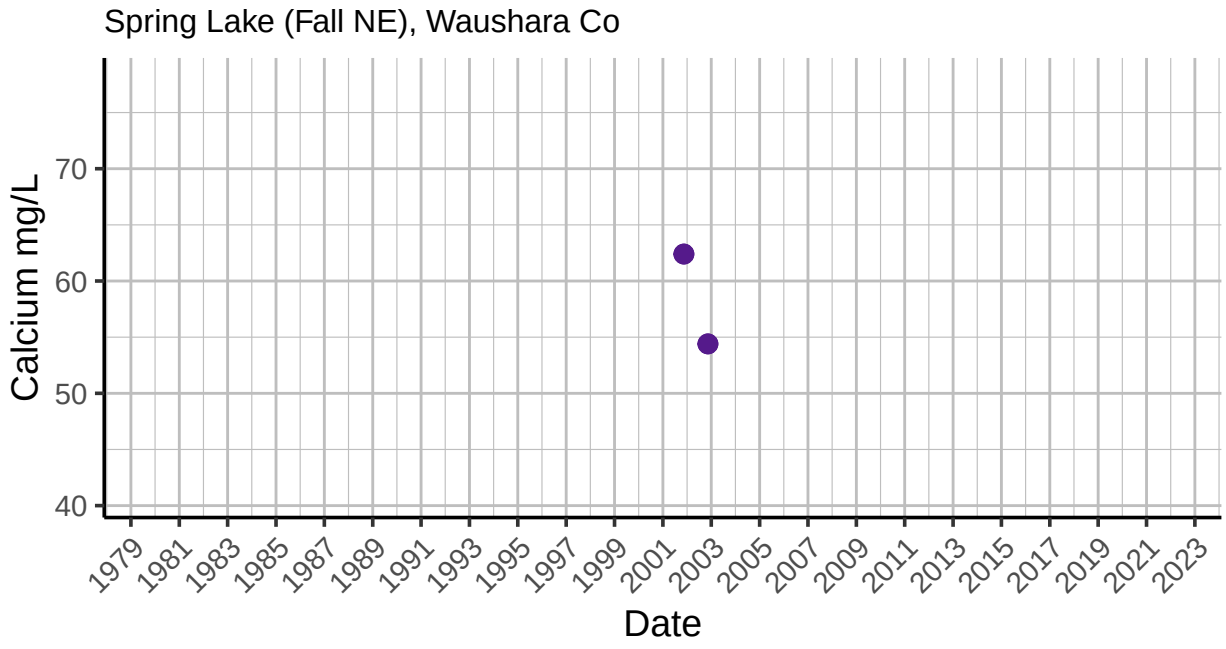
## Conductivity and Total Alkalinity

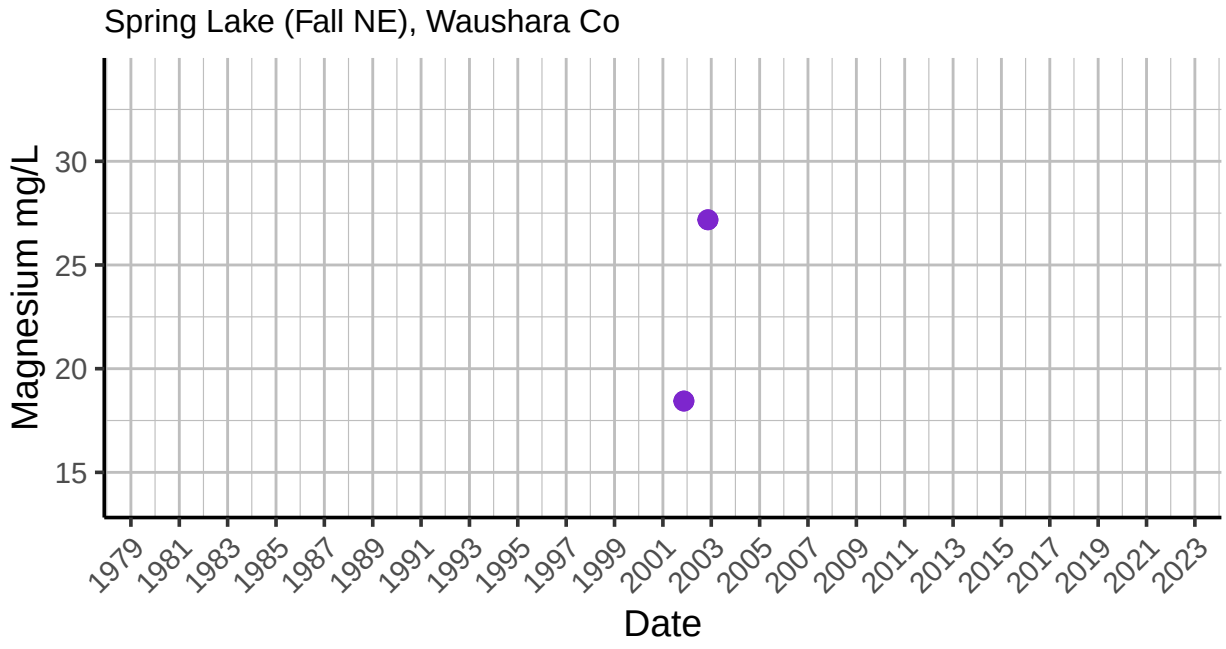



*Conductivity is a measure of all the dissolved minerals and salts in your lake. Much of this results from groundwater slowly dissolving the local rocks and minerals as it moves towards your lake. Changes over time may reflect variations in water levels and the addition of salts from deicing and water softening. Alkalinity measures those forms of dissolved minerals that resist changes to pH in the lake.*

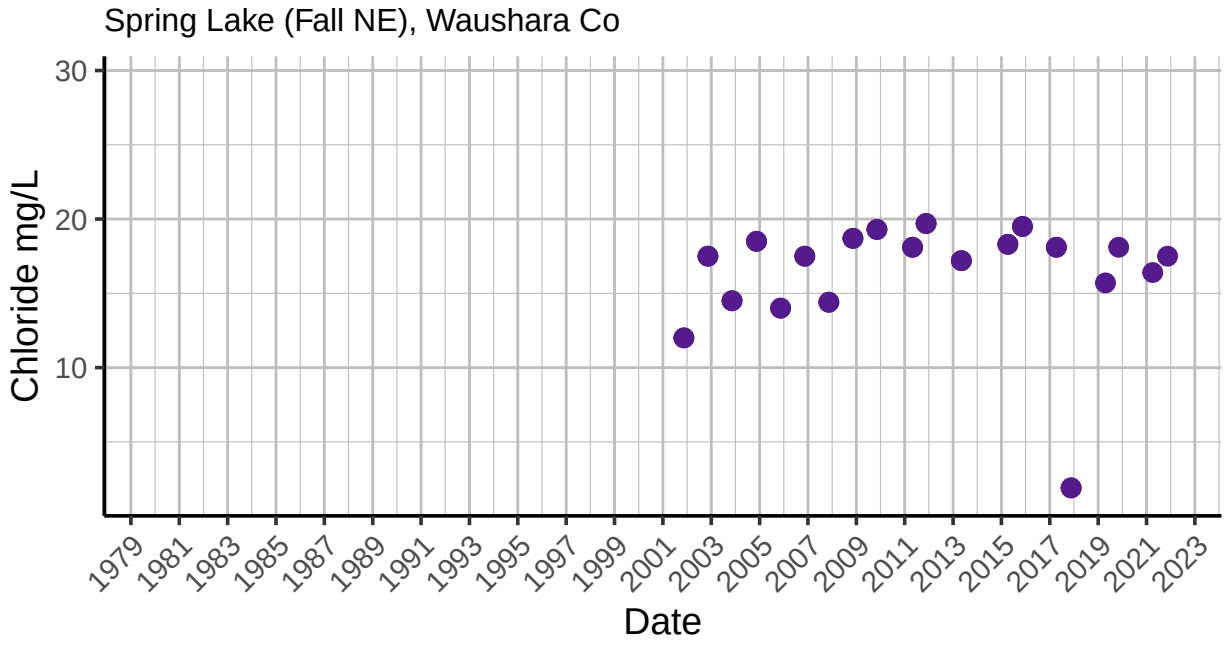
## Calcium and Magnesium

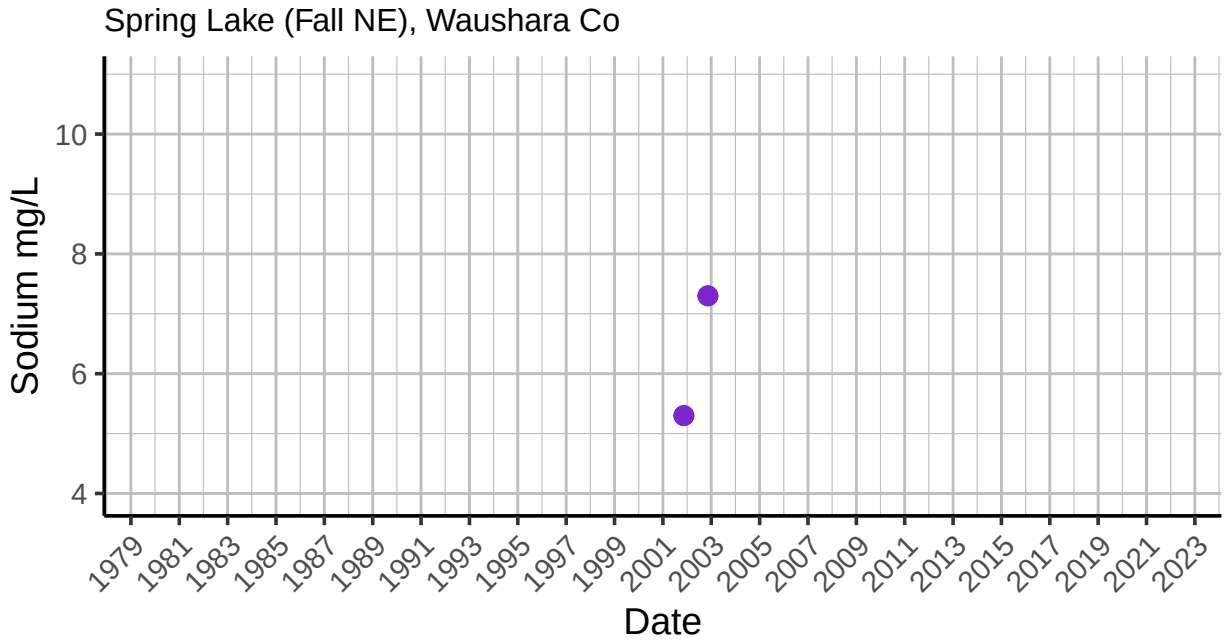



*Calcium and magnesium are two essential elements that enter your lake from the groundwater. Calcium is important for the formation of shells in mussels and snails. Lakes with more than 30 to 40 mg/l calcium are considered to be hardwater lakes while those with less than 10 mg/l are softwater.*

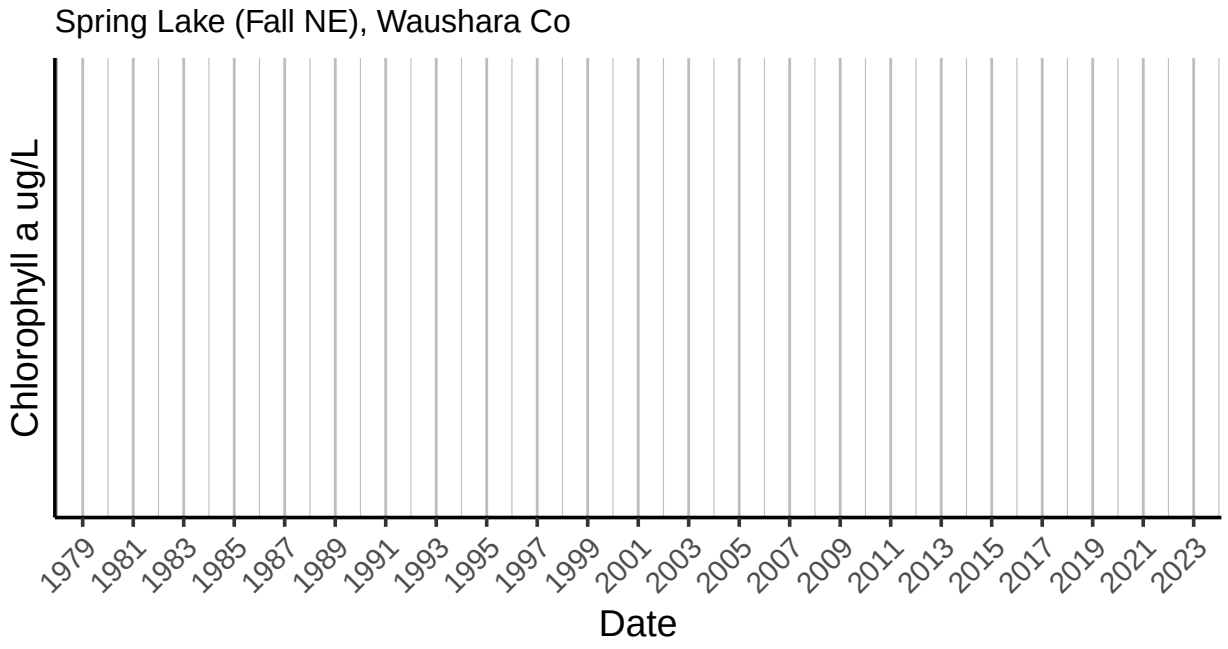
## Chloride and Sodium



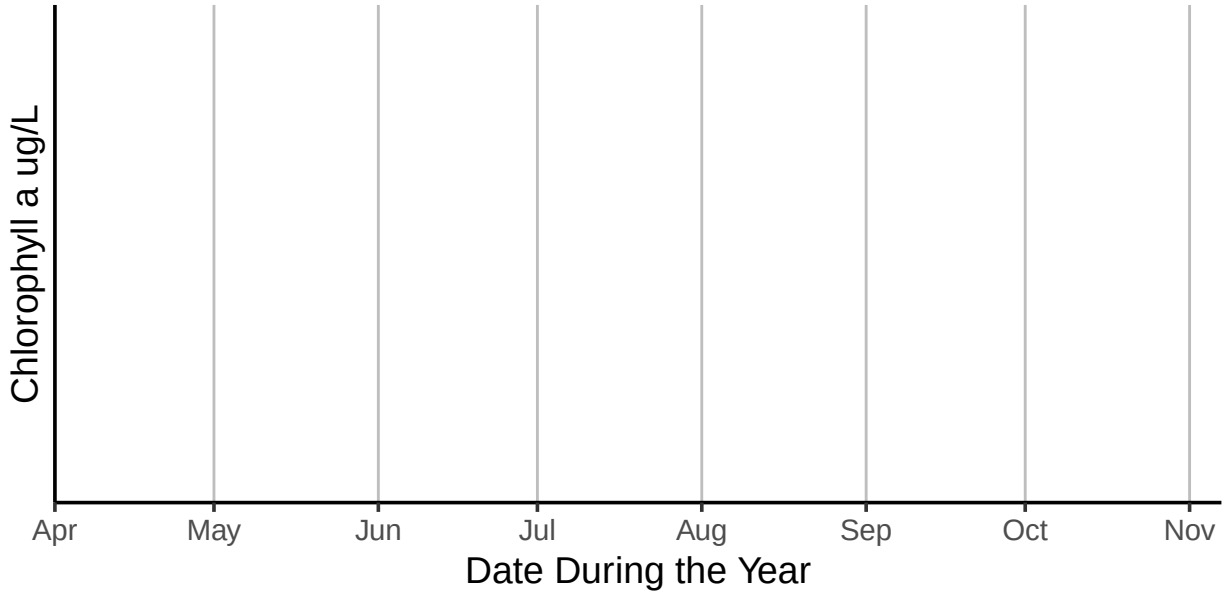




*Chloride and sodium concentrations can be naturally occurring at 2 to 3 mg/l in Wisconsin but higher concentrations, especially where trends indicate the concentrations are increasing, usually represent additions of salt from road deicing compounds, water softening salts and fertilizers.*

## Chlorophyll over time and during the growing season

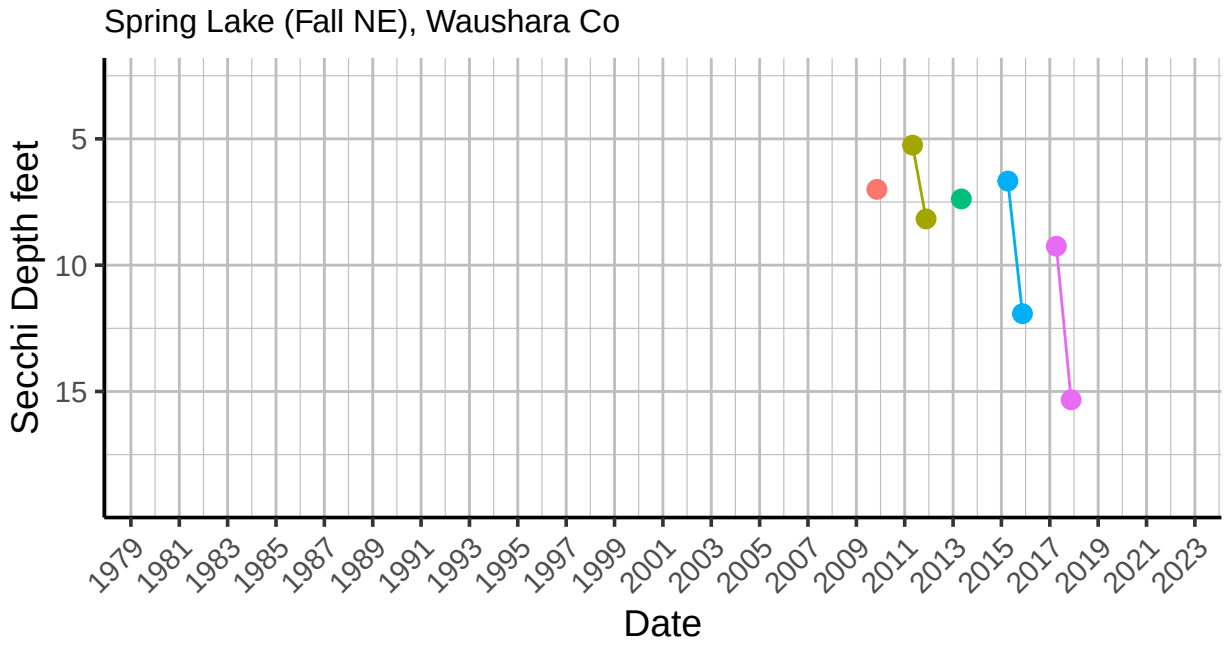



Plot below shows this during the year (only the last ten years shown):

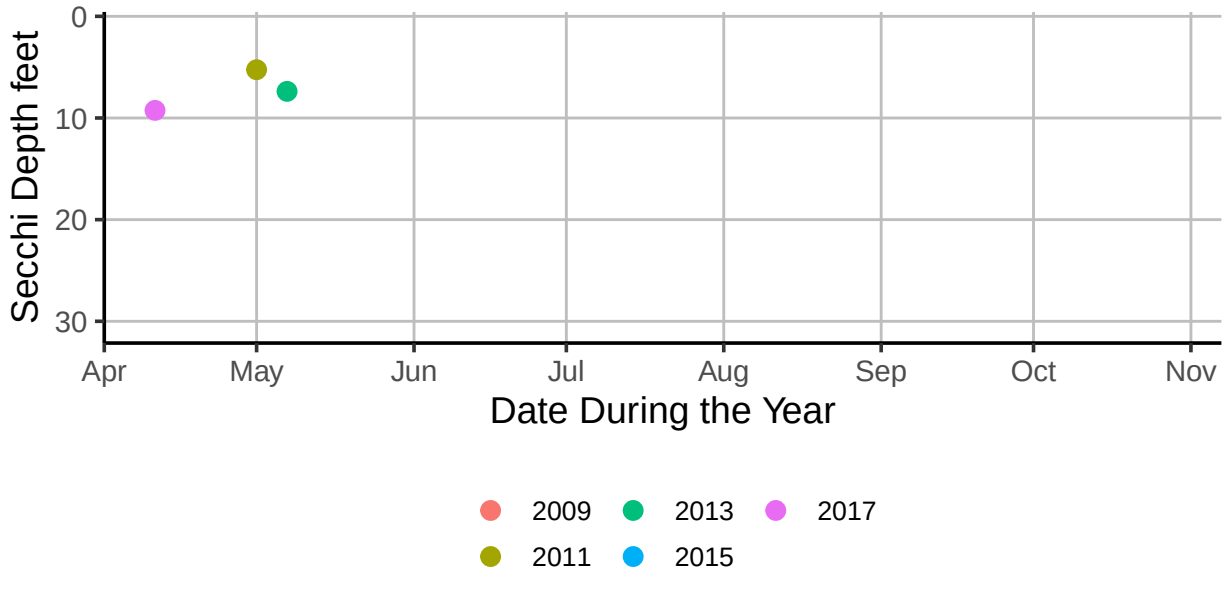



*Chlorophyll is an algal pigment and its concentration is a measure of the amount of suspended algae in the lake. The upper figure shows how chlorophyll concentrations have varied over time. The lower figure shows how the concentrations have varied within the year. Seasonal variation reflects how phosphorus concentrations, mixing and warming influence algal concentrations.*

## Secchi Depth over time and during the growing season



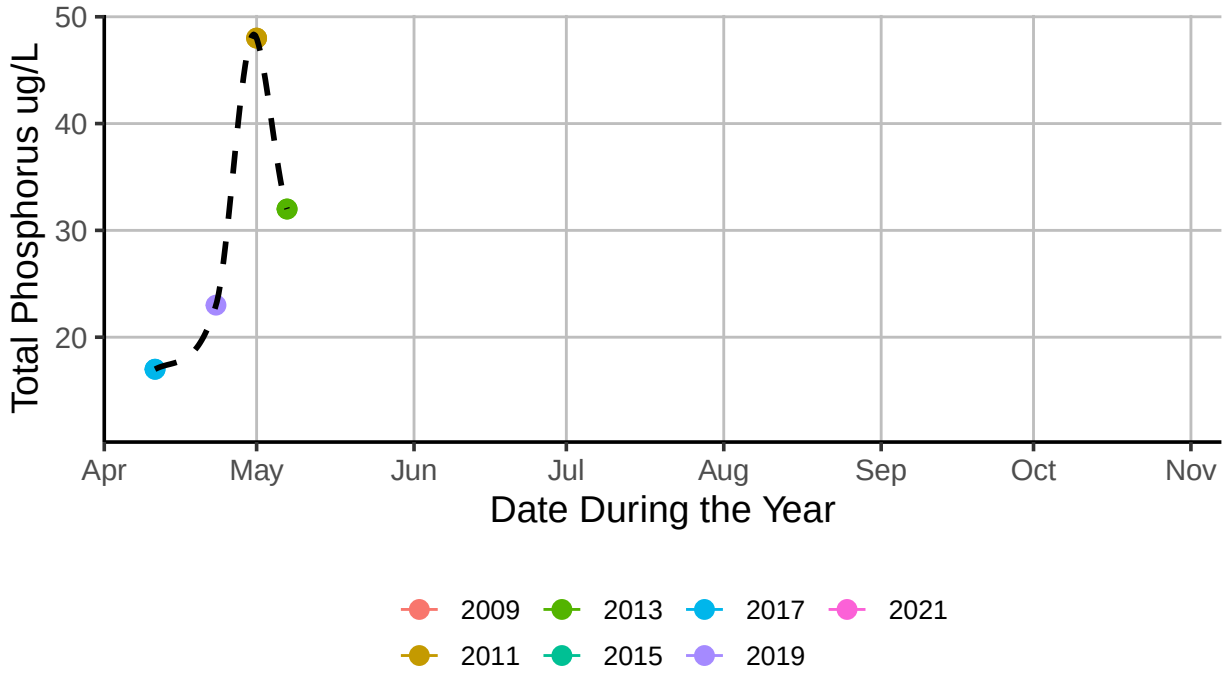

Plot below shows this during the year (only the last ten years shown):



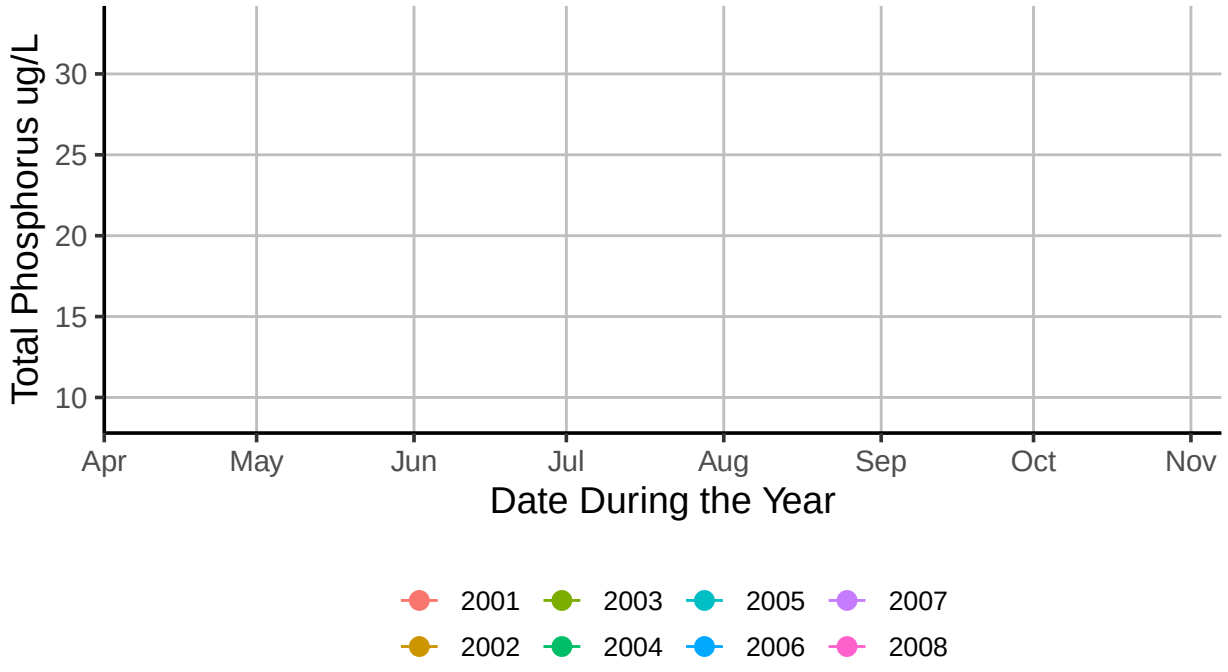

*Secchi Disk depth measurements can vary over time with changes in the amount of algae and they also vary during the year as algae respond to phosphorus additions and recycling, and increasing temperature, in addition to variations in turbidity from lake mixing. If you do not see data plotted above, this means that no Secchi Disk data has been collected, or the data has not been entered into the WDNR SWIMS database.*

## Total Phosphorus over time and during the growing season

Plot below shows this during the year (only the last ten years shown):

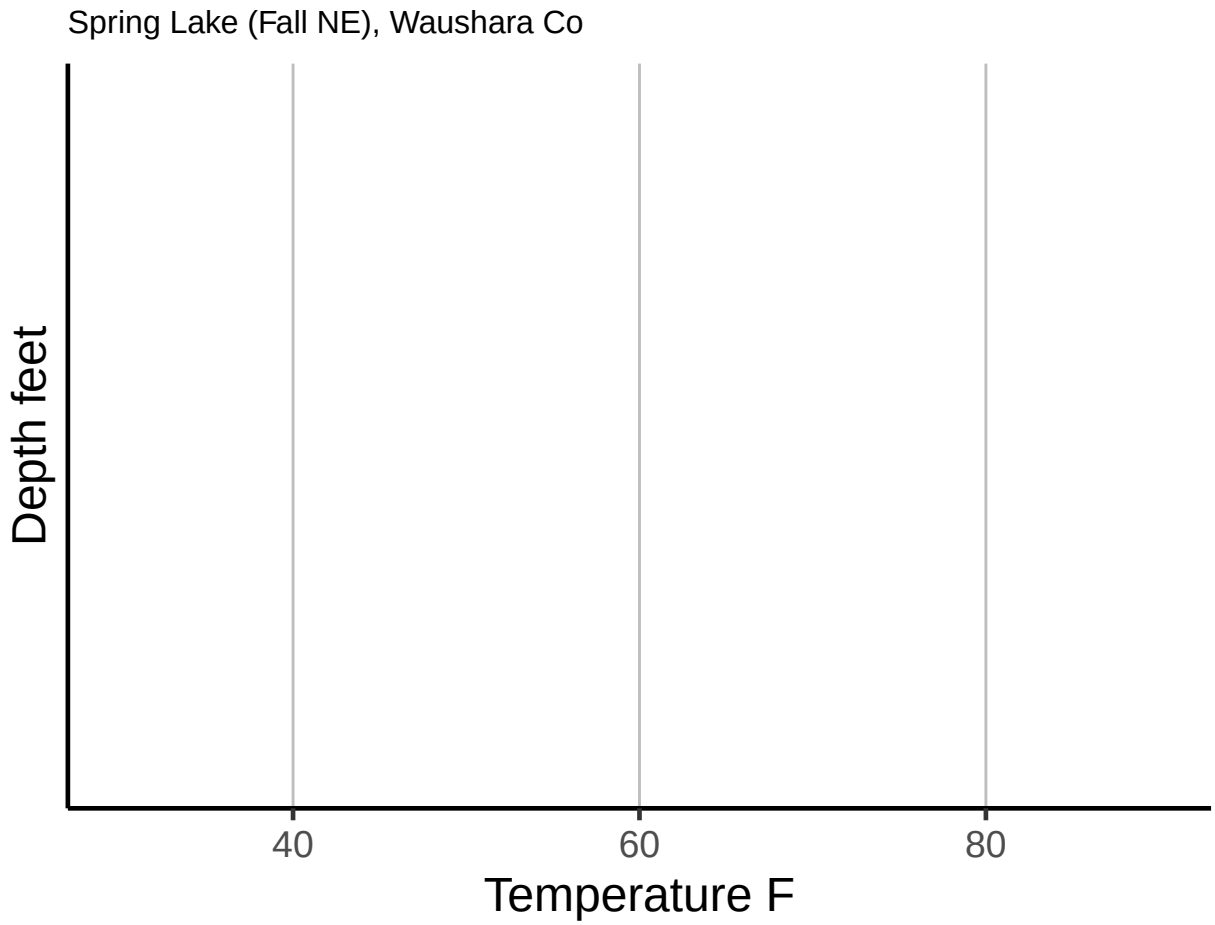



Plot below shows this during the year (prior to the last ten years shown):



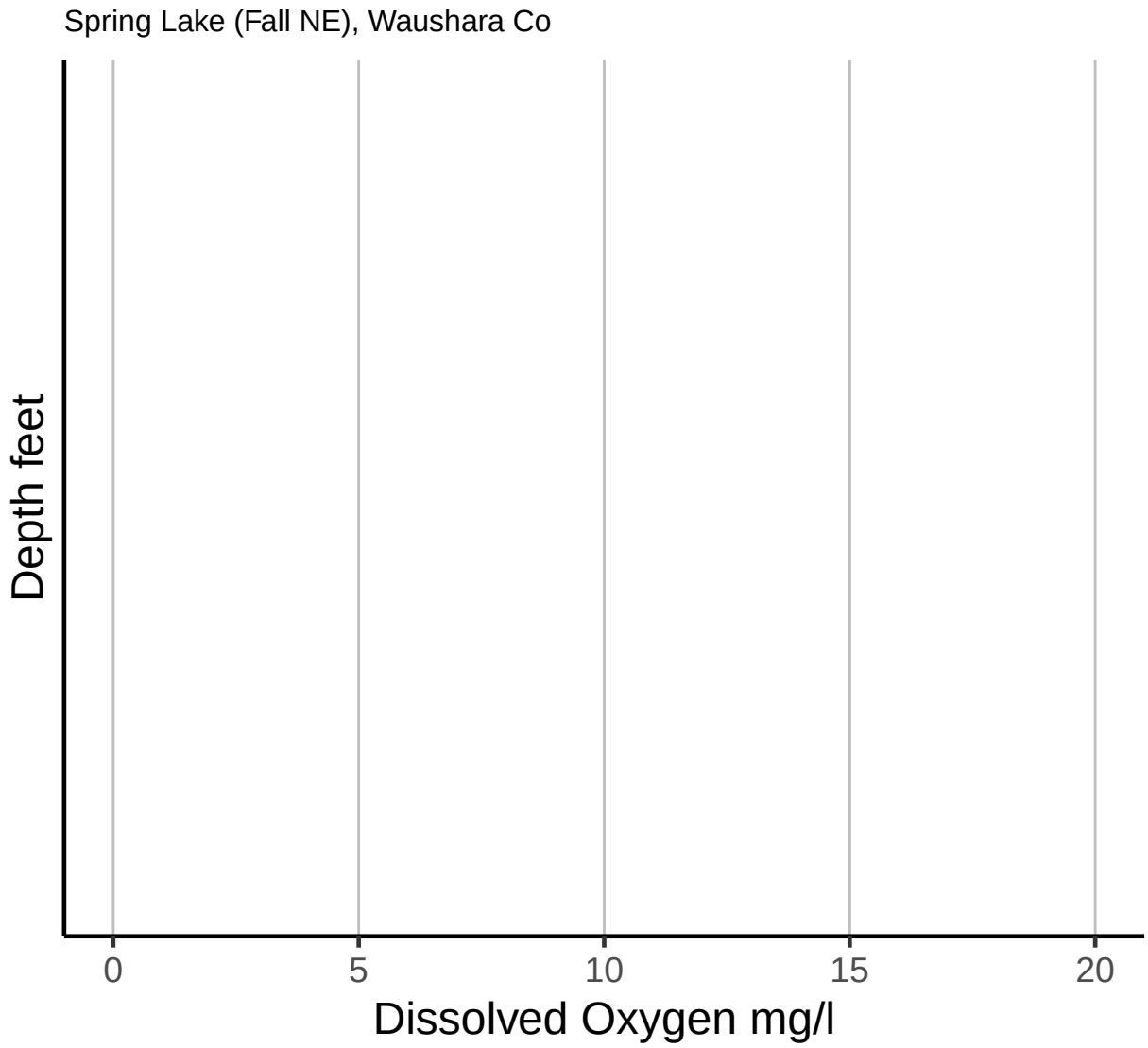

*Total phosphorus concentrations can vary during the year due to settling, release and runoff.*

## Temperature profiles during the year



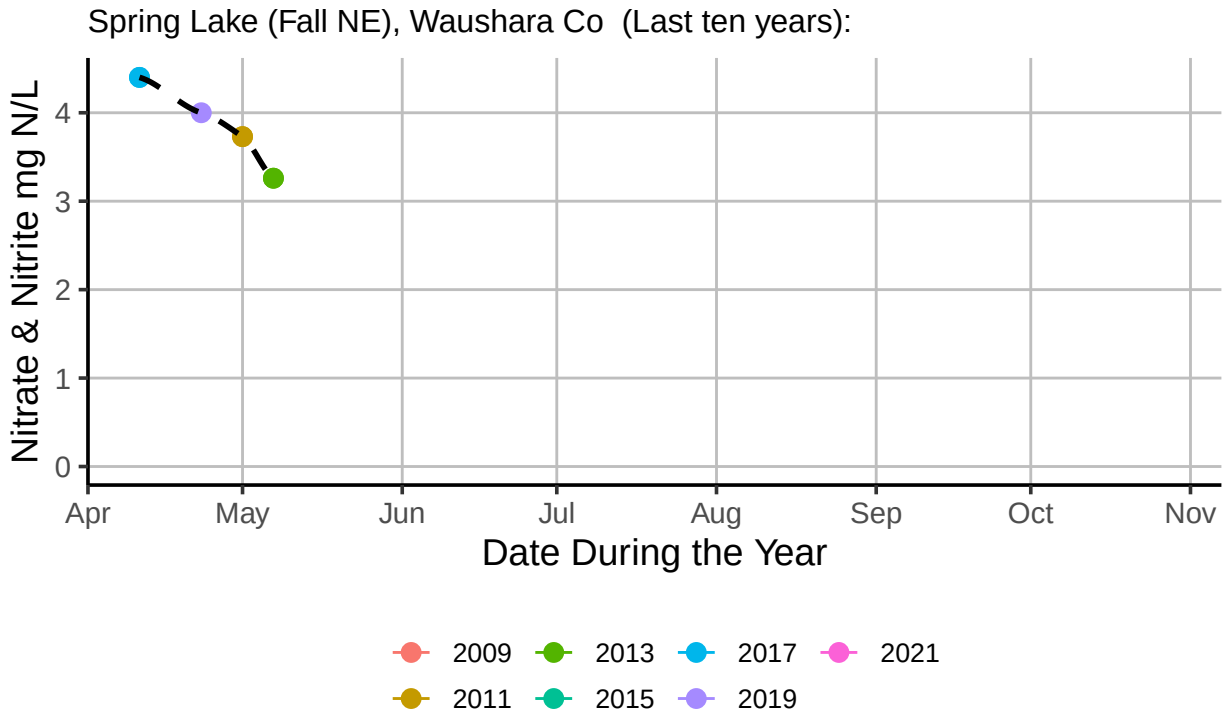

*Temperature profiles show the extent to which the lake stratifies as the lake warms in the summer and mixes as it cools in the fall. If you do not see data plotted above, this means that no temperature data has been collected, or the data has not been entered into the WDNR SWIMS database.*

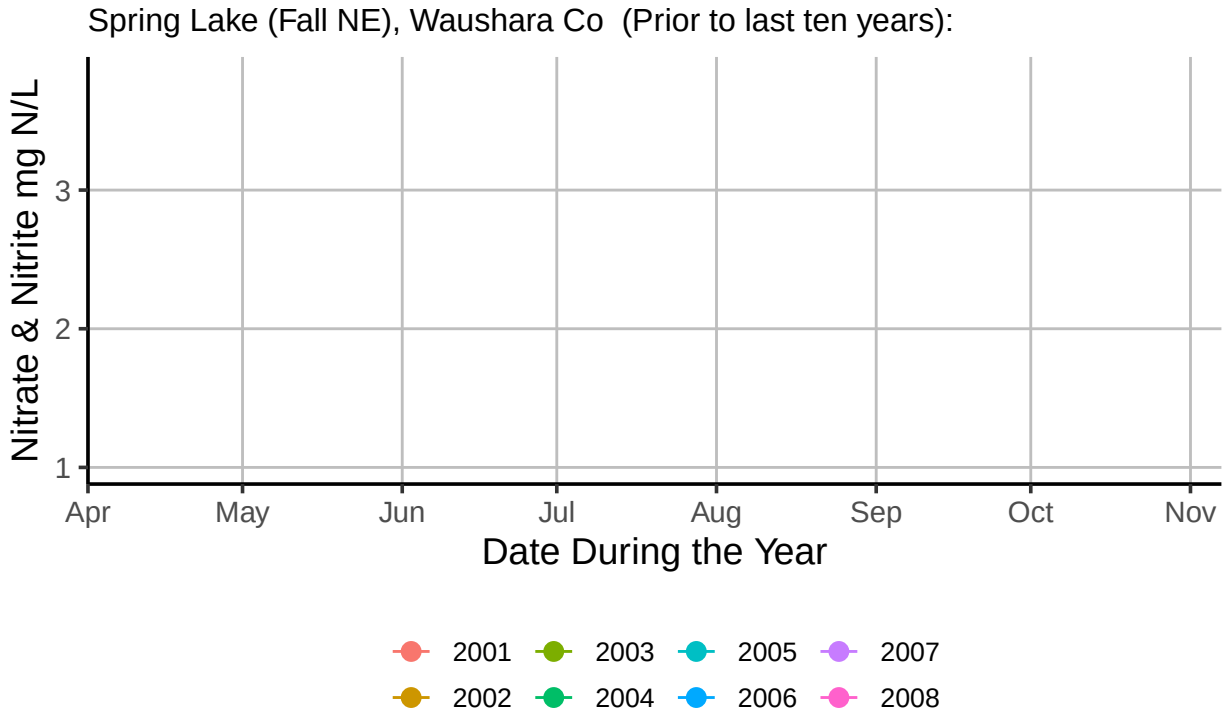
## Dissolved oxygen profiles during the year




*Dissolved oxygen profiles show how and where oxygen is consumed in the lake by microbial respiration and added to the lake by mixing with the atmosphere and photosynthesis at different depths. If you do not see data plotted above, this means that no dissolved oxygen data has been collected, or the data has not been entered into the WDNR SWIMS database.*

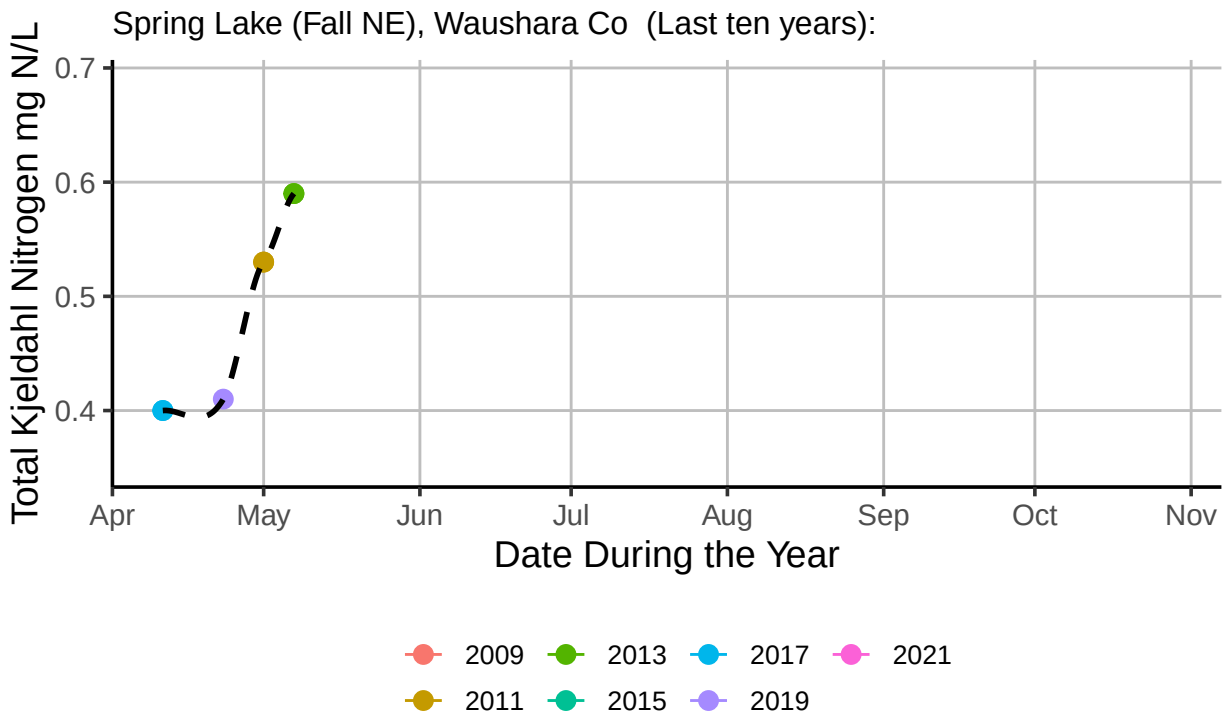
## Nitrate & Nitrite over time and during the growing season

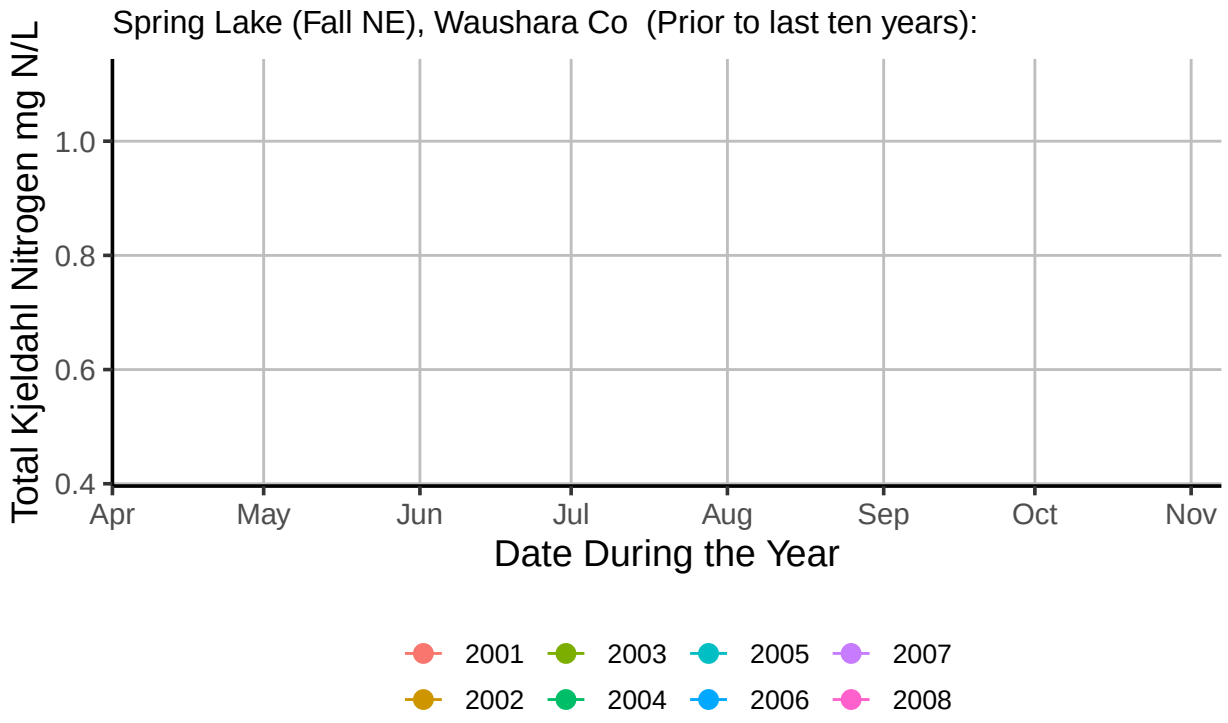



*Concentration of Nitrate + Nitrite varies during the year due to uptake by plants and algae and denitrification.*

## Total Kjeldahl Nitrogen over time and during the growing season




*Total Kjeldahl Nitrogen concentration in the lake varies during the year due to growth of algae, release from aquatic plant and sediment decomposition, and settling.*