

SITE STATUS SUMMARY OF CONDITIONS

7.1  **WATER CLARITY**

6.4  **TOTAL PHOSPHORUS**

2.5  **CHLOROPHYLL A**

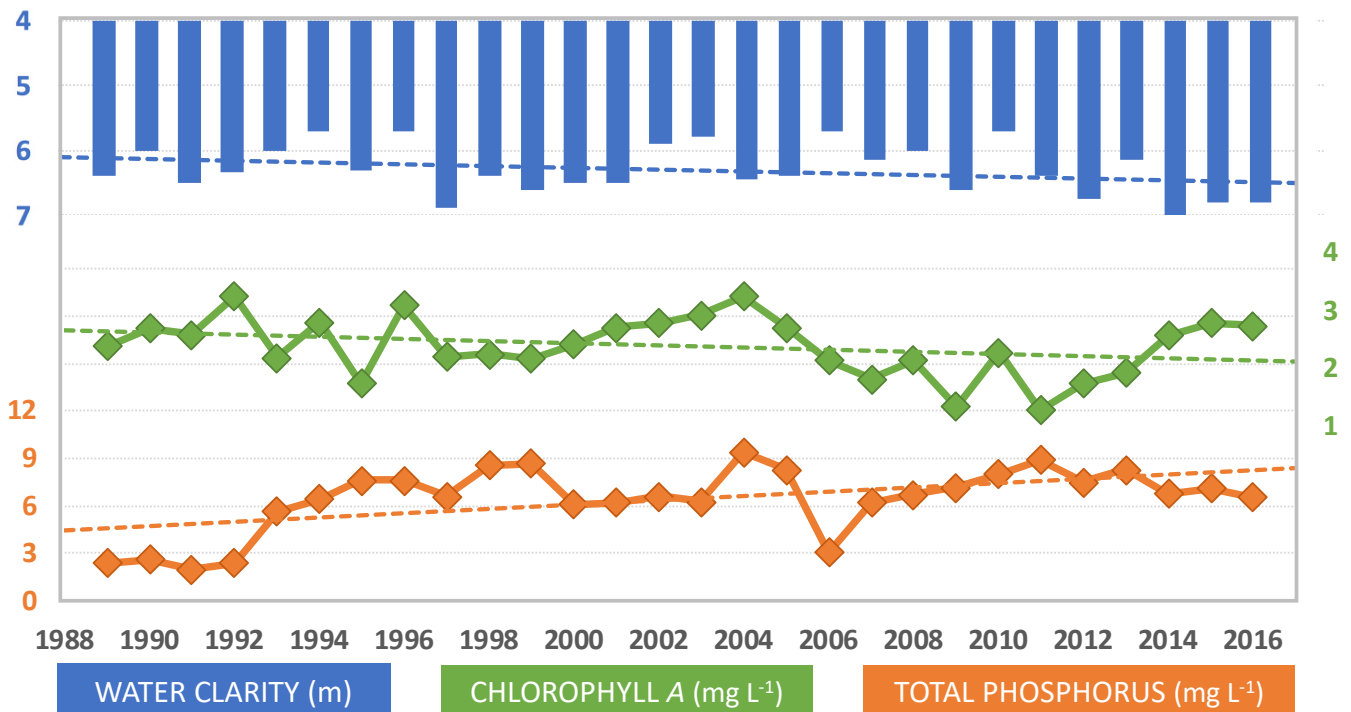
 **DISSOLVED OXYGEN**

**TROPHIC STATE** **OLIGOTROPHIC**

At site 1 North, water quality is generally excellent. Increasing water clarity and decreasing chlorophyll concentrations show improving water quality. However, increasing phosphorus indicates the danger of decreasing water quality, potentially leading to more plant growth and algal blooms.

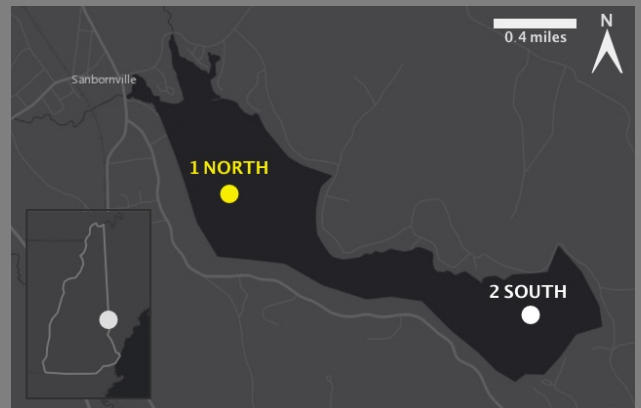
**TREND**  degrading  improving  flat  too few data **CURRENT**  poor  good  excellent  no data

SITE RESULTS ANNUAL WATER QUALITY PATTERNS



LAKE BASICS BACKGROUND INFO

Site Depth **1 North – 24 feet**  
 Lake Max/Mean Depth 41 feet / 13 feet  
 Location Wakefield, NH (Carroll Co.)  
 Watershed Area 4.8 square miles  
 Lake Area 538 acres  
 Shore Length 6.6 miles  
 Lake Volume 8.6 million cubic meters  
 Flushing Rate 0.7 times per year  
 Lake Elevation 572 feet



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SITE STATUS SUMMARY OF CONDITIONS

7.5  **WATER CLARITY**

6.5  **TOTAL PHOSPHORUS**

2.8  **CHLOROPHYLL A**

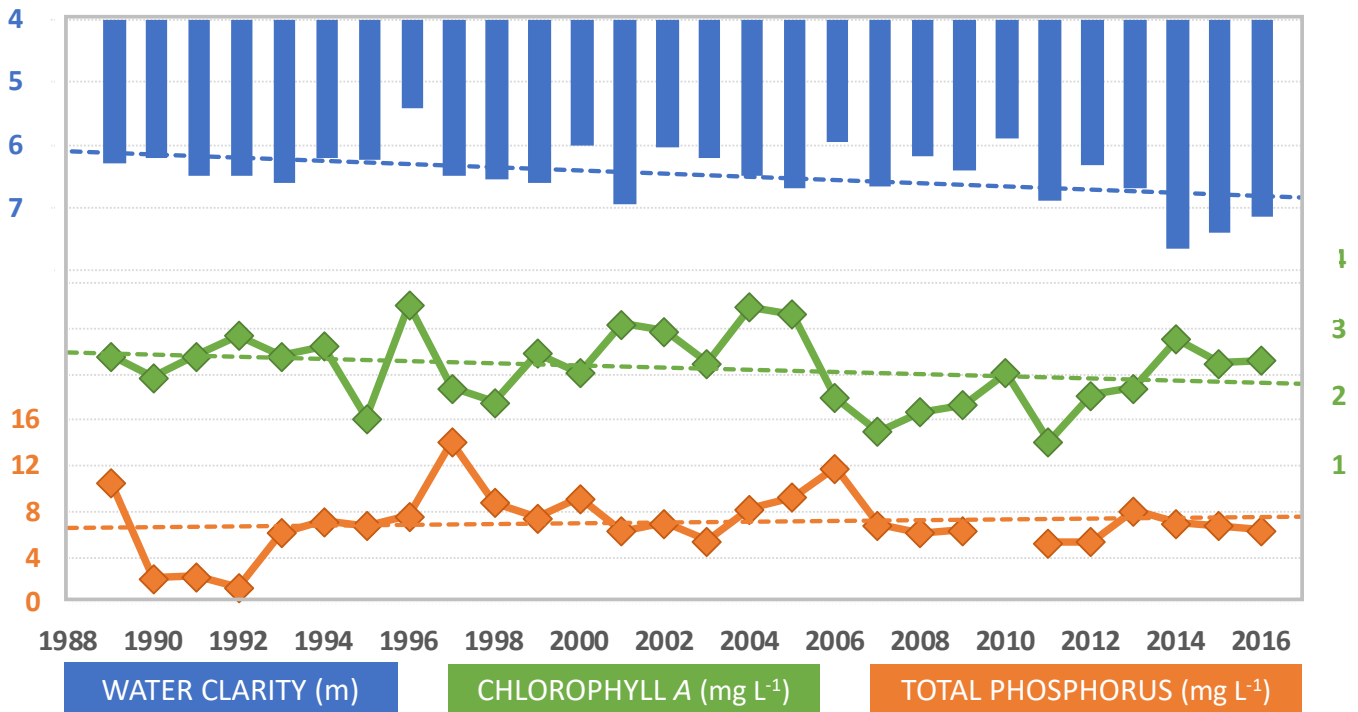
1.7  **DISSOLVED OXYGEN**

**TROPHIC STATE** **OLIGOTROPHIC**

At site 2 South, water quality is generally excellent. Increasing water clarity and decreasing chlorophyll concentrations show improving water quality. However, increasing phosphorus indicates decreasing water quality, potentially leading to more plant growth and algal blooms. This trend could be amplified by low dissolved oxygen, which could lead to internal loading.

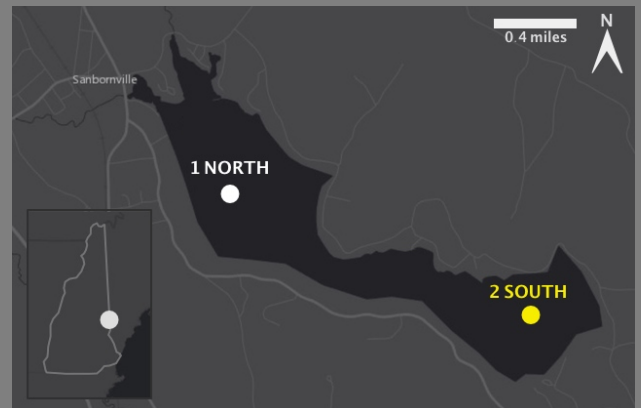
**TREND**  degrading  improving  flat  too few data **CURRENT**  poor  good  excellent  no data

SITE RESULTS ANNUAL WATER QUALITY PATTERNS



LAKE BASICS BACKGROUND INFO

Site Depth **2 South – 41 feet**  
 Lake Max/Mean Depth 41 feet / 13 feet  
 Location Wakefield, NH (Carroll Co.)  
 Watershed Area 4.8 square miles  
 Lake Area 538 acres  
 Shore Length 6.6 miles  
 Lake Volume 8.6 million cubic meters  
 Flushing Rate 0.7 times per year  
 Lake Elevation 572 feet



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**LOW DISSOLVED OXYGEN** at 2 South indicates susceptibility to internal phosphorus loading, which could increase the amount of phosphorus available to stimulate plant and algal growth.

**WATER CLARITY** and **CHLOROPHYLL A** long-term trends are improving in spite of increasing **PHOSPHORUS**. Why? Water quality can also vary due to rainfall, temperature, lake color, fish, etc.

**INVASIVES** are not currently present. Lake Host program inspects boats to prevent introduction.

**WATERSHED RESTORATION EFFORTS** by the Acton Wakefield Watersheds Alliance began in 2008 to help improve water quality. Work will be ongoing to achieve water quality goals.

## WATER QUALITY REVIEW

## LEARN MORE ABOUT LAKE HEALTH

**LAKE PRODUCTIVITY** is determined by multiple factors, including

**WATER CLARITY** Water clarity is used as an indirect measure of algal productivity, but is also influenced by suspended sediments and dissolved color.

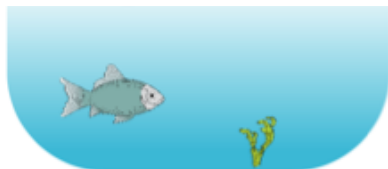
**CHLOROPHYLL A** A green pigment found in plants and algae, it is used to estimate algal biomass. Algal growth is promoted by phosphorus, increasing chlorophyll.

**PHOSPHORUS** A key nutrient that stimulates algal blooms and excessive plant growth, particularly for invasive species.

**DISSOLVED OXYGEN** Low dissolved oxygen can kill or stress organisms and release phosphorus from sediments, further degrading water quality.

**LAKE TROPHIC STATE** is generally broken into three categories

### OLIGOTROPHIC



DEEP
LOW
LOW
HIGH THROUGHOUT WATER COLUMN
MINIMAL PLANTS

### MESOTROPHIC



REDUCED
MODERATE
MODERATE
OCCASIONALLY LOW IN BOTTOM WATERS
MODERATE PLANTS

### EUTROPHIC



SHALLOW
HIGH
HIGH
FREQUENTLY LOW IN BOTTOM WATERS
ABUNDANT PLANTS

**LAKE AGING** is both natural and accelerated by human activities

Lakes **NATURALLY** age or become more productive over thousands of years. In recent geologic time, humans have enhanced the rate of nutrient enrichment and lake productivity, speeding up this natural process to tens or hundreds of years.

**HUMANS** introduce excess phosphorus enters the lake in eroding sediment, groundwater (e.g. aging septic systems), or stormwater runoff, which contains fertilizers, detergents, or other phosphorus-based products. Algal blooms and uncontrolled sediment erosion along the shoreline can decrease water clarity, which can reduce shoreline property values.



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