

SITE STATUS SUMMARY OF CONDITIONS



WATER CLARITY



TOTAL PHOSPHORUS



CHLOROPHYLL A



DISSOLVED OXYGEN

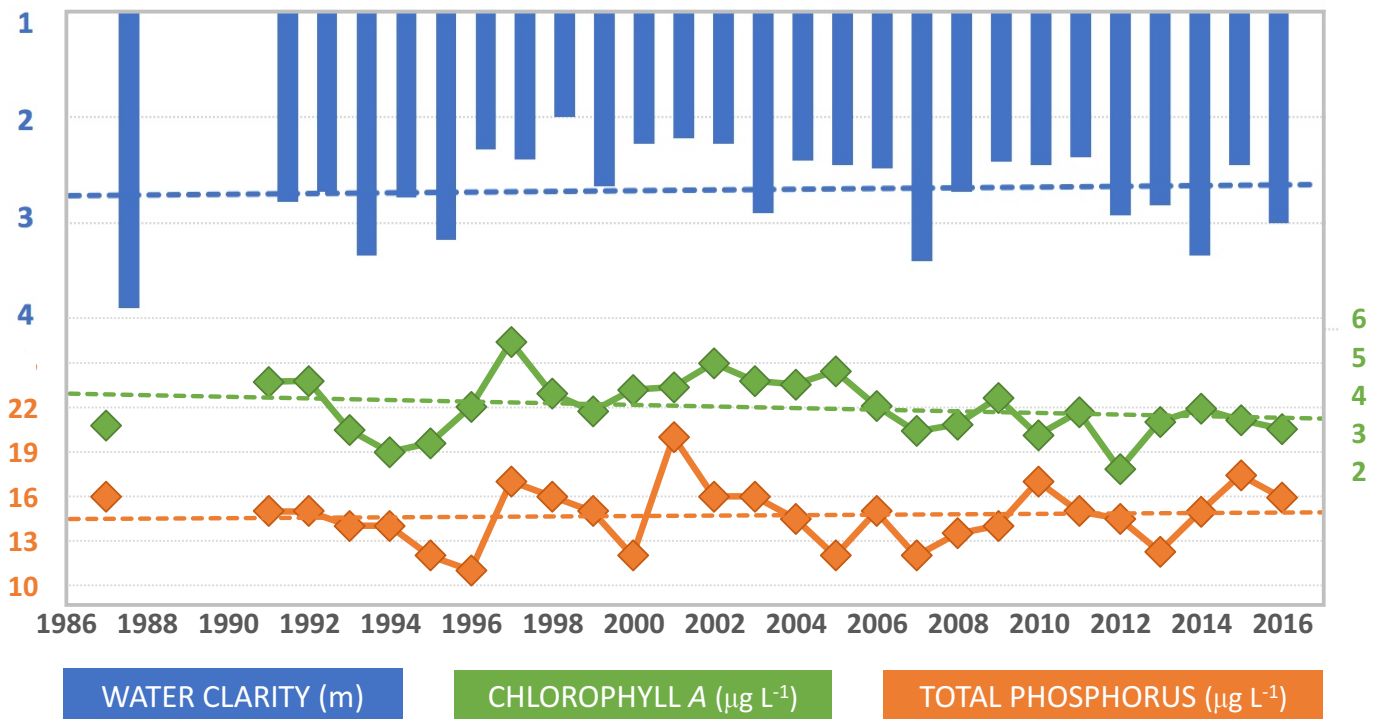
TROPHIC STATE

MESOTROPHIC

At site 1 Deep, water quality is moderate and mixed. Phosphorus values are high and relatively steady. Chlorophyll is slightly improving and is nearly oligotrophic, but water clarity is holding steady.

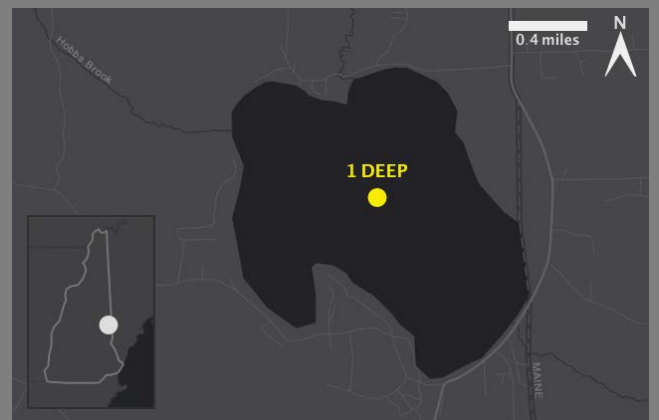
TREND degrading improving flat too few data CURRENT poor good excellent no data

SITE RESULTS ANNUAL WATER QUALITY PATTERNS



LAKE BASICS BACKGROUND INFO

Site Depth	1 Deep – 16 feet
Lake Max/Mean Depth	16 feet / 9 feet
Location	Wakefield & Effingham, NH Parsonsfield, ME
Watershed Area	6.1 square miles
Lake Area	968 acres
Shore Length	5.3 miles
Lake Volume	11.3 million cubic meters
Flushing Rate	1.0 times per year
Lake Elevation	480 feet



Province Lake is currently **MESOTROPHIC**, but is teetering on the edge of becoming **EUTROPHIC**.

The lake is often subject to wind-induced mixing, which results in the breakdown of thermal stratification, leading to resuspension of sediments and phosphorus.

Blooms of **CYANOBACTERIA** have occurred periodically in recent years.

**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.

Province Lake has its own Watershed **MANAGEMENT PLAN**

## 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.

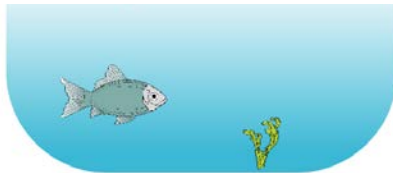
**CHLOROPHYLL A** A green pigment found in plants and algae, it is used to estimate algal biomass. Algal growth is promoted by phosphorus, increasing chlorophyll.

**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

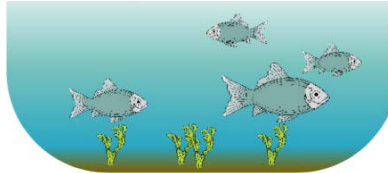
LOW

LOW

HIGH THROUGHOUT  
WATER COLUMN

MINIMAL PLANTS

### MESOTROPHIC



REDUCED

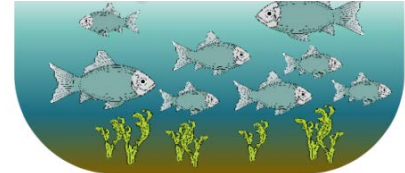
MODERATE

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.

