

SITE STATUS SUMMARY OF CONDITIONS

3.4  WATER CLARITY

TROPHIC STATE **MESOTROPHIC**

14.9  TOTAL PHOSPHORUS

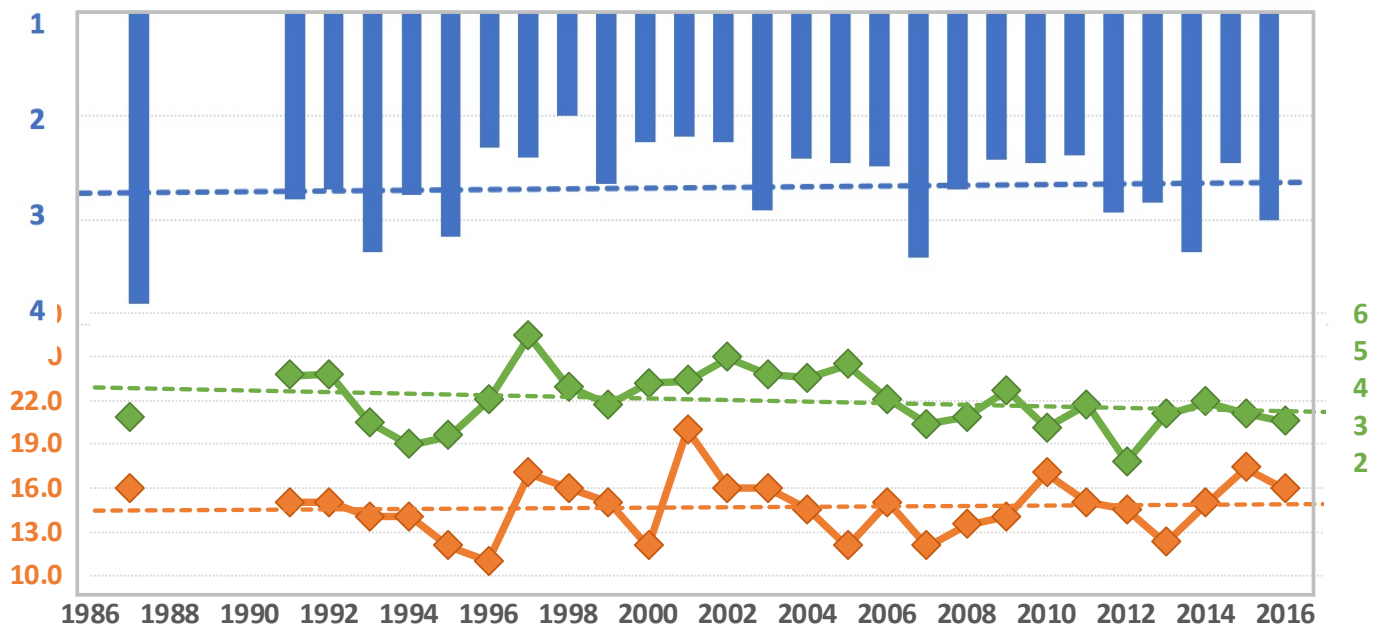
At site 1 Deep, water quality is moderate and mixed. Phosphorus values are high and relatively steady. Chlorophyll is slightly improving and is nearly oligotrophic, but water clarity is holding steady.

3.6  CHLOROPHYLL A

 DISSOLVED OXYGEN

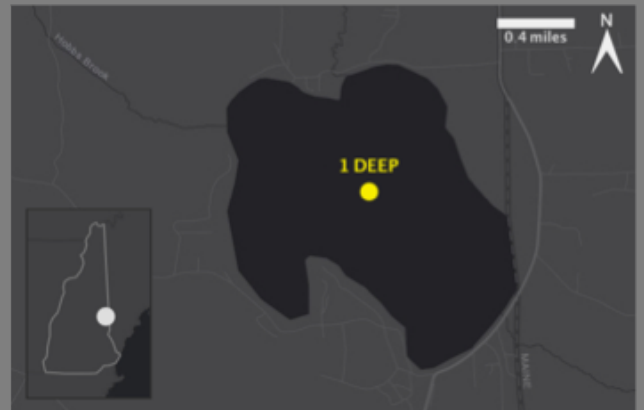
TREND  degrading  improving  flat  too few data CURRENT  poor  good  excellent  no data

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** 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.

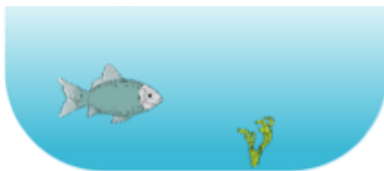
CHLOROPHYLL A A green pigment found in plants and algae, it is used to estimate algal biomass. Algal growth is promoted by phosphorus, increasing chlorophyll.

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

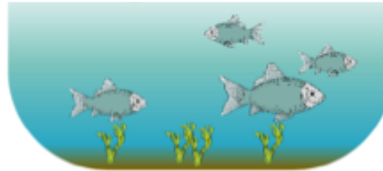
LOW

LOW

HIGH THROUGHOUT
WATER COLUMN

MINIMAL PLANTS

MESOTROPHIC



REDUCED

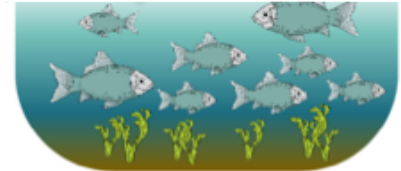
MODERATE

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.

