

2016 Canandaigua Lake Sampling and Monitoring Program



Report to the Canandaigua Lake
Watershed Council
April 5, 2017



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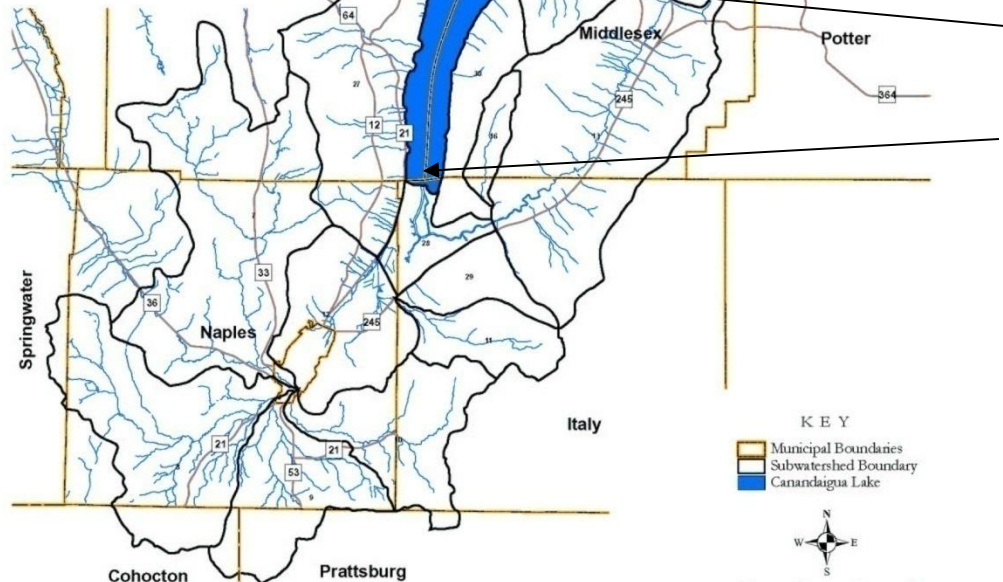
Goals of the Sampling and Monitoring Program

- Take the “pulse” of the lake (thanks CLWC for \$\$ towards our new YSI)
- Healthy attributes that are monitored and compared to previous years
 - Water quality profiles: temperature, dissolved oxygen, pH, conductivity, blue-green algal cell counts
 - Water clarity
 - Lake nutrients
 - Lake algal productivity
- Special projects continued or begun in 2016
 - Invasive species reconnaissance: water chestnut + starry stonewort
 - Macrophyte rake toss survey
 - Population status of Dreissenid mussels
 - active watch for harmful algal blooms (HABs)
- Expert advice to the Watershed Program Manager and Technician

CANANDAIGUA LAKE - SUBWATERSHED & DIRECT DRAINAGE BASINS

Subwatersheds

- 1, Sucker Brook
- 2, Tichenor Gully
- 3, Monteth Gully
- 4, Barnes Gully
- 5, Seneca Point Gully
- 6, Hick's Point
- 7, Grimes Creek
- 8, Eelpot Creek
- 9, Reservoir Creek
- 10, Tannery Creek
- 11, Parrish Gully
- 12, Lower Naples Creek
- 13, Lower West River
- 14, Middle West River
- 15, Upper West River
- 16, Clark Gully
- 17, Vine Valley
- 18, Fisher Gully
- 19, Gage Gully
- 20, Deep Run
- 21, Fall Brook
- 22, Butler Road
- 23, Foster Road
- 24, Deusel Road
- 25, Coy Road
- 26, Stid Hill
- 27, South Bristol
- 28, West River- Naples Creek Junction
- 29, Hi-Tor
- 30, South Hill
- 31, Bare Hill
- 32, Jones Road
- 33, Cottage City
- 34, Lincoln Hill



Fallbrook (FB)

Hope Point (HP)

Deep Run (DR)

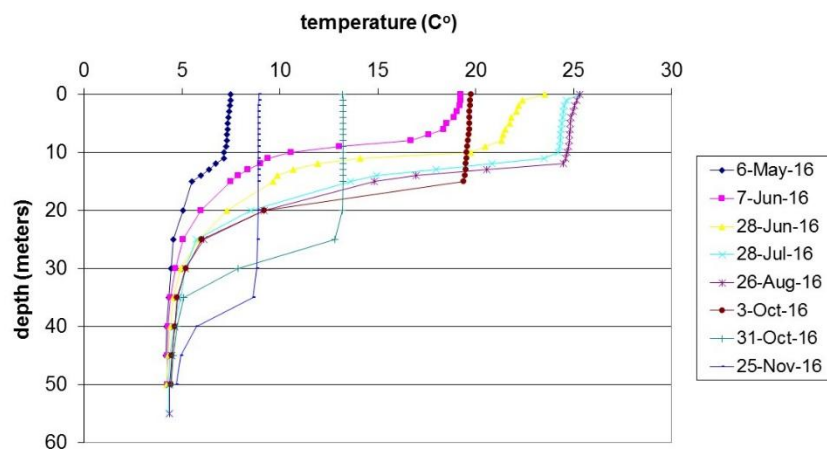
mid-lake locations

Seneca Point (SP)

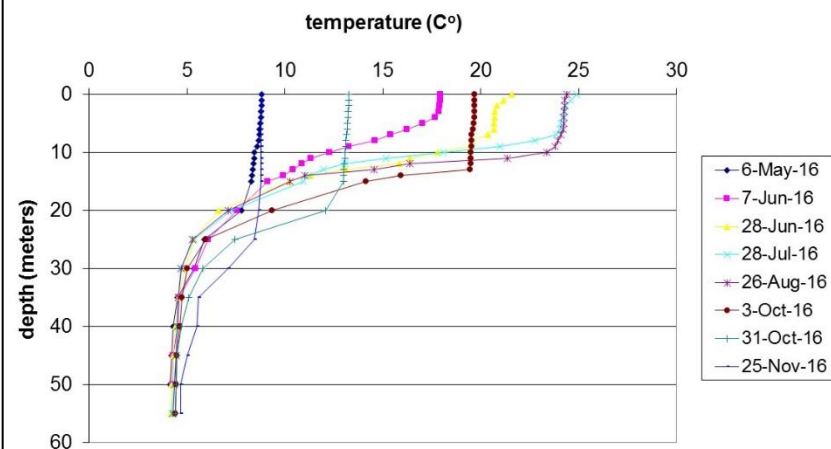
Vine Valley (VV)

West River (WR)

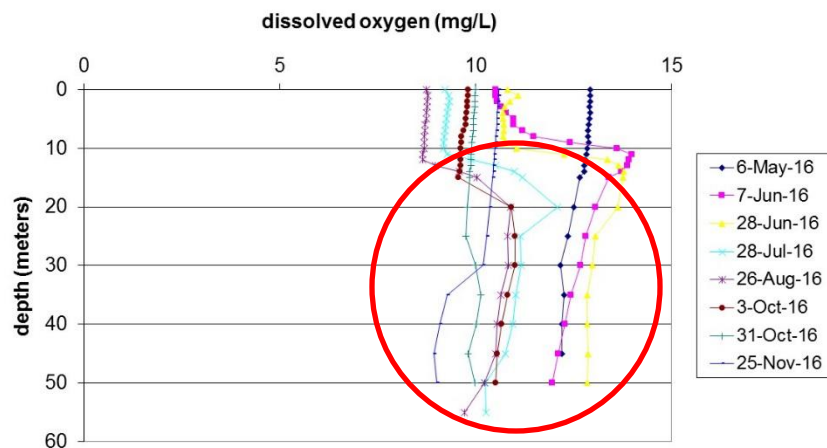
Deep Run Profile



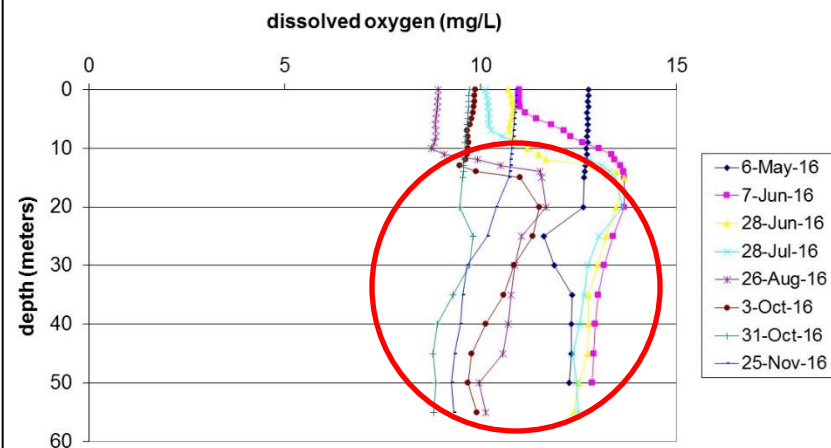
Seneca Point Profile



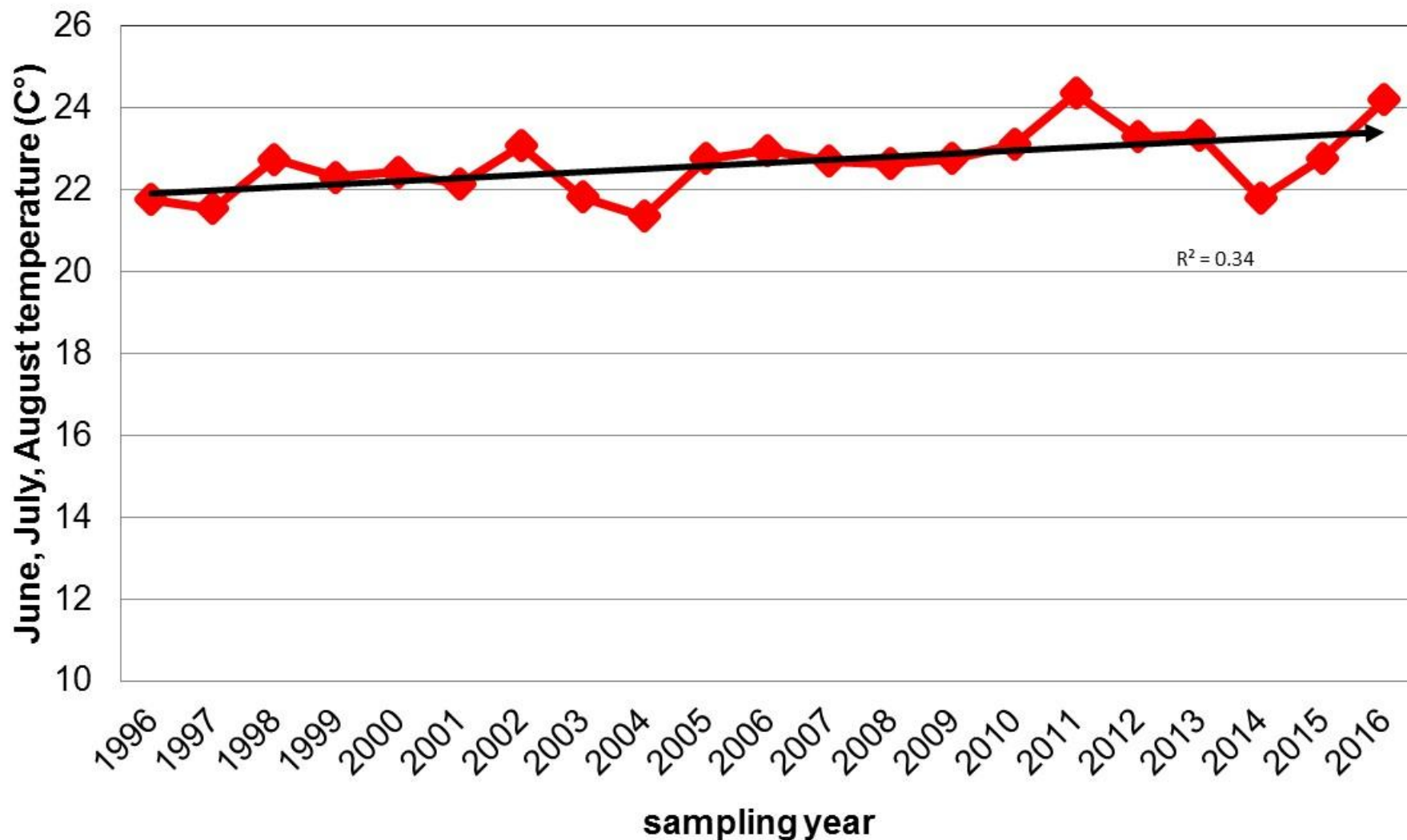
Deep Run Profile



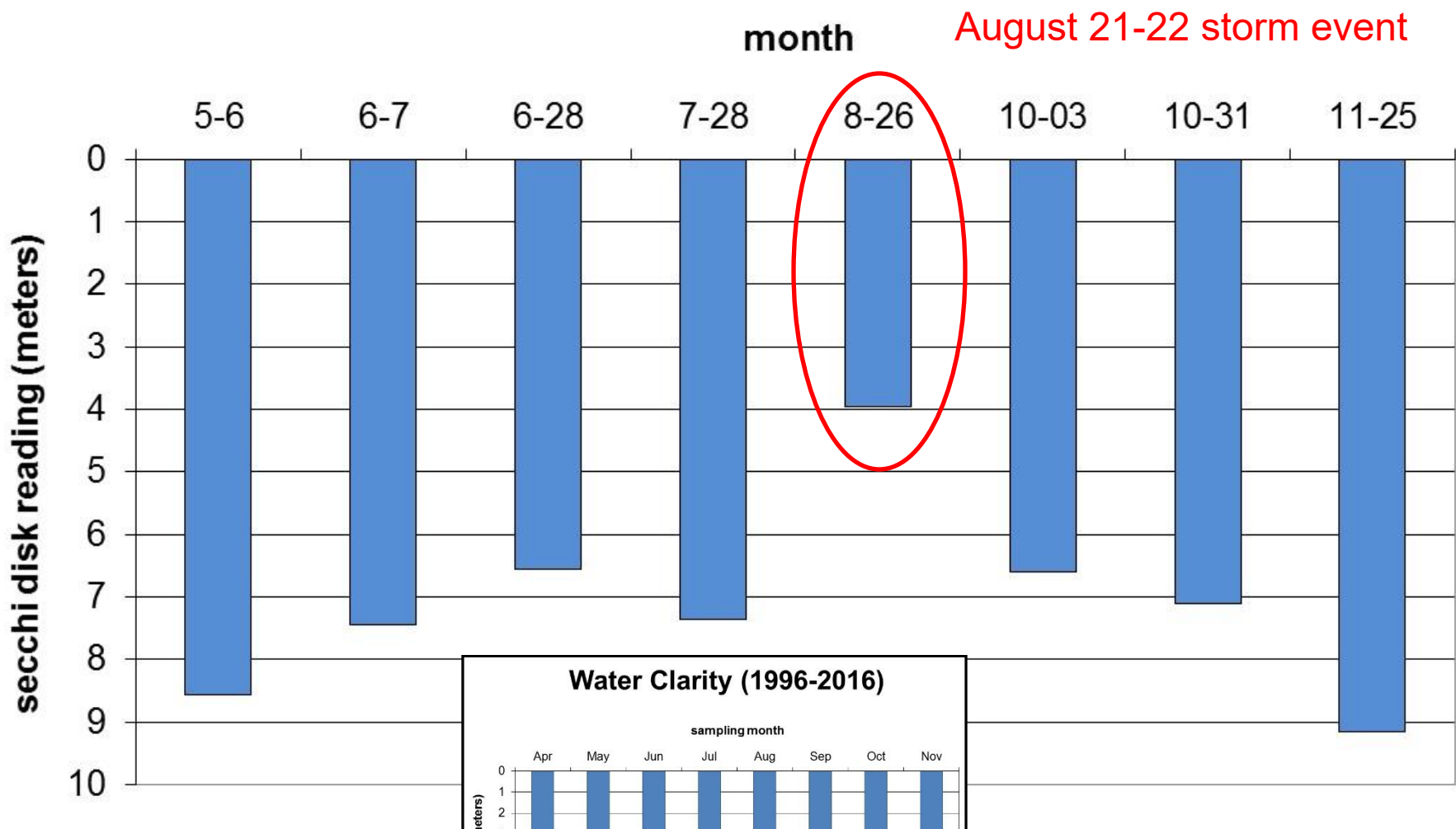
Seneca Point Profile



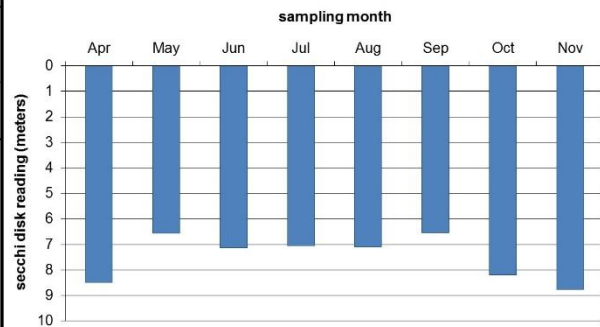
Summer Surface Temperatures (1996-2016)



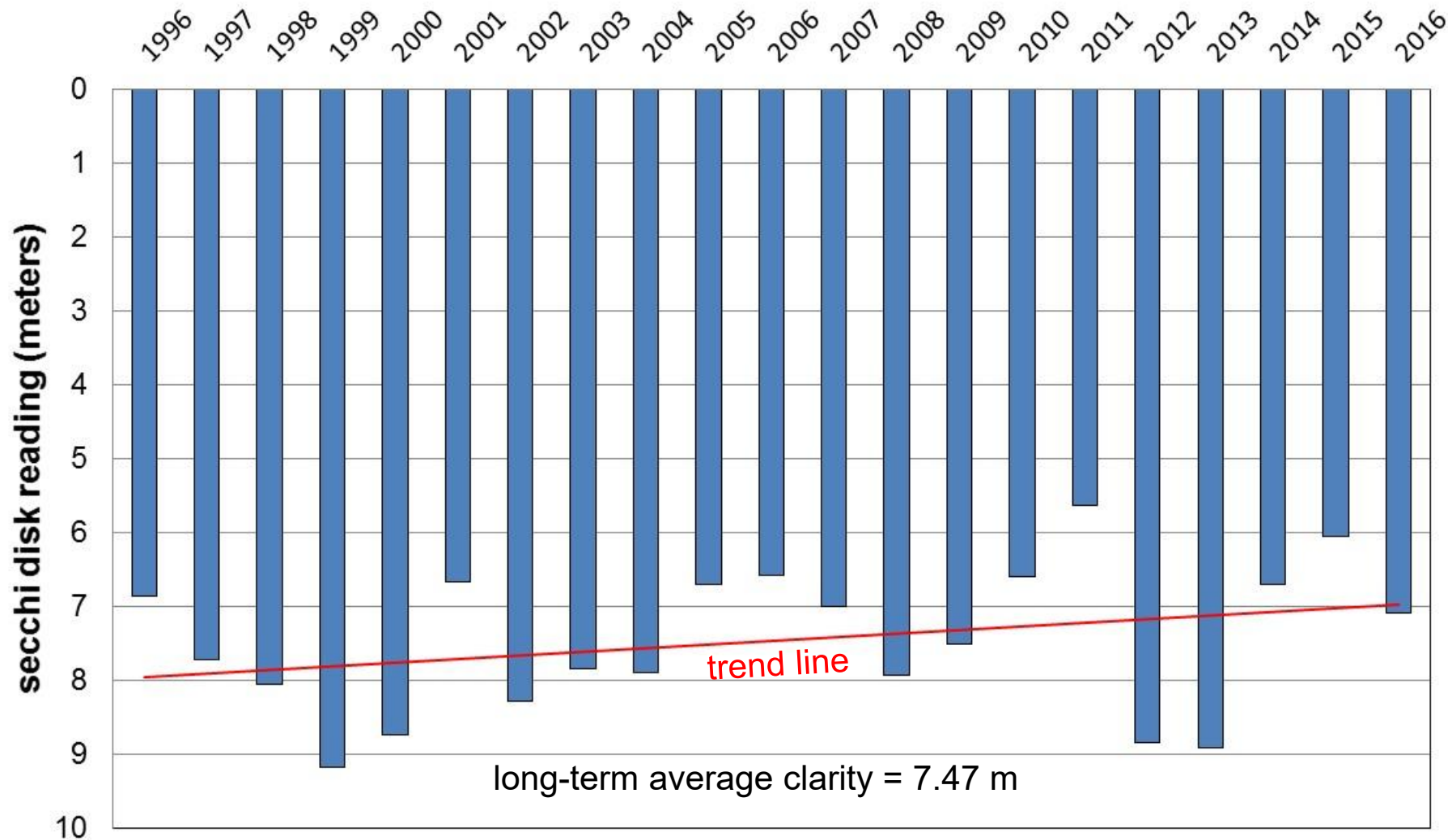
Lake Clarity (2016)



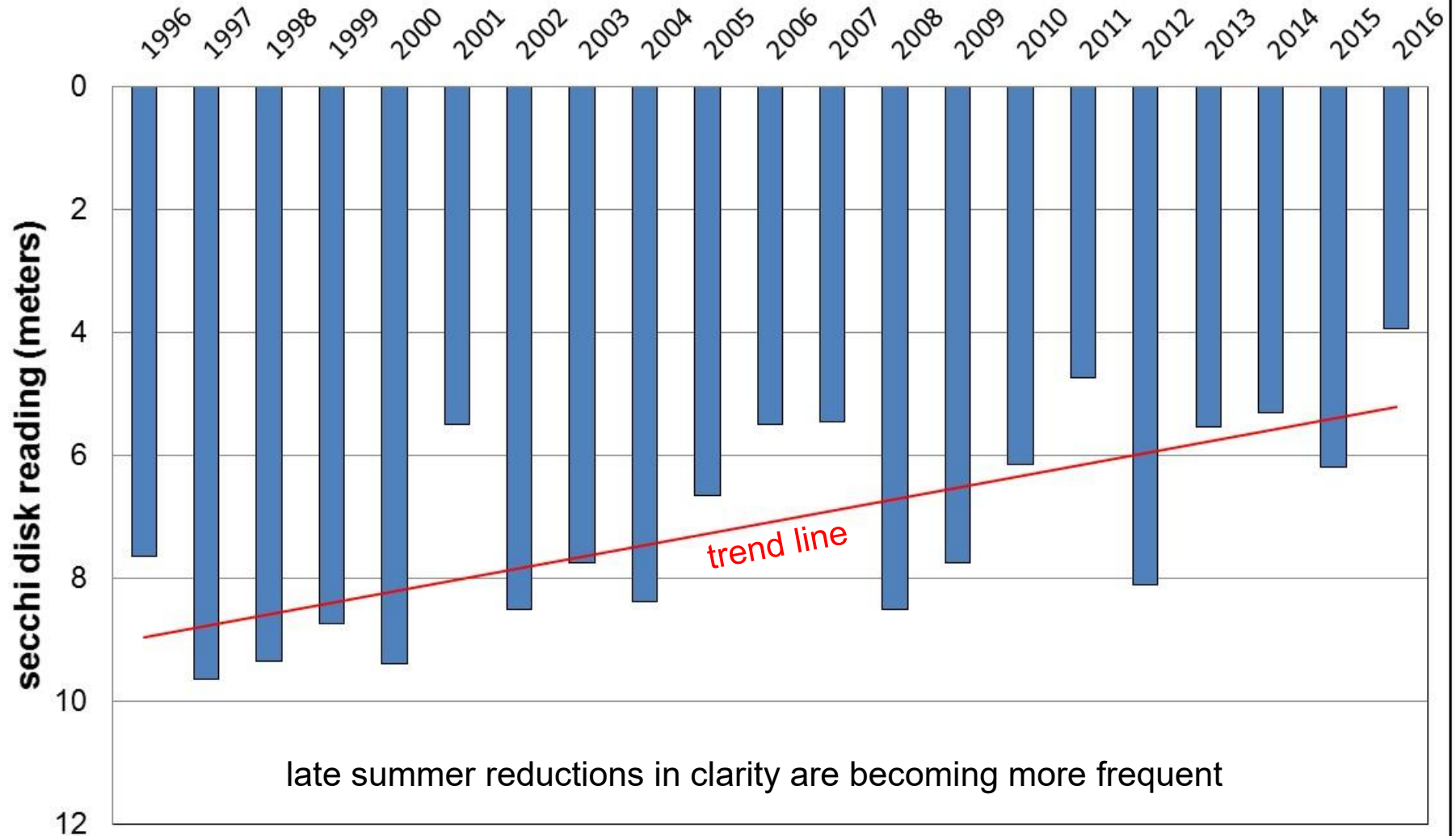
Water Clarity (1996-2016)



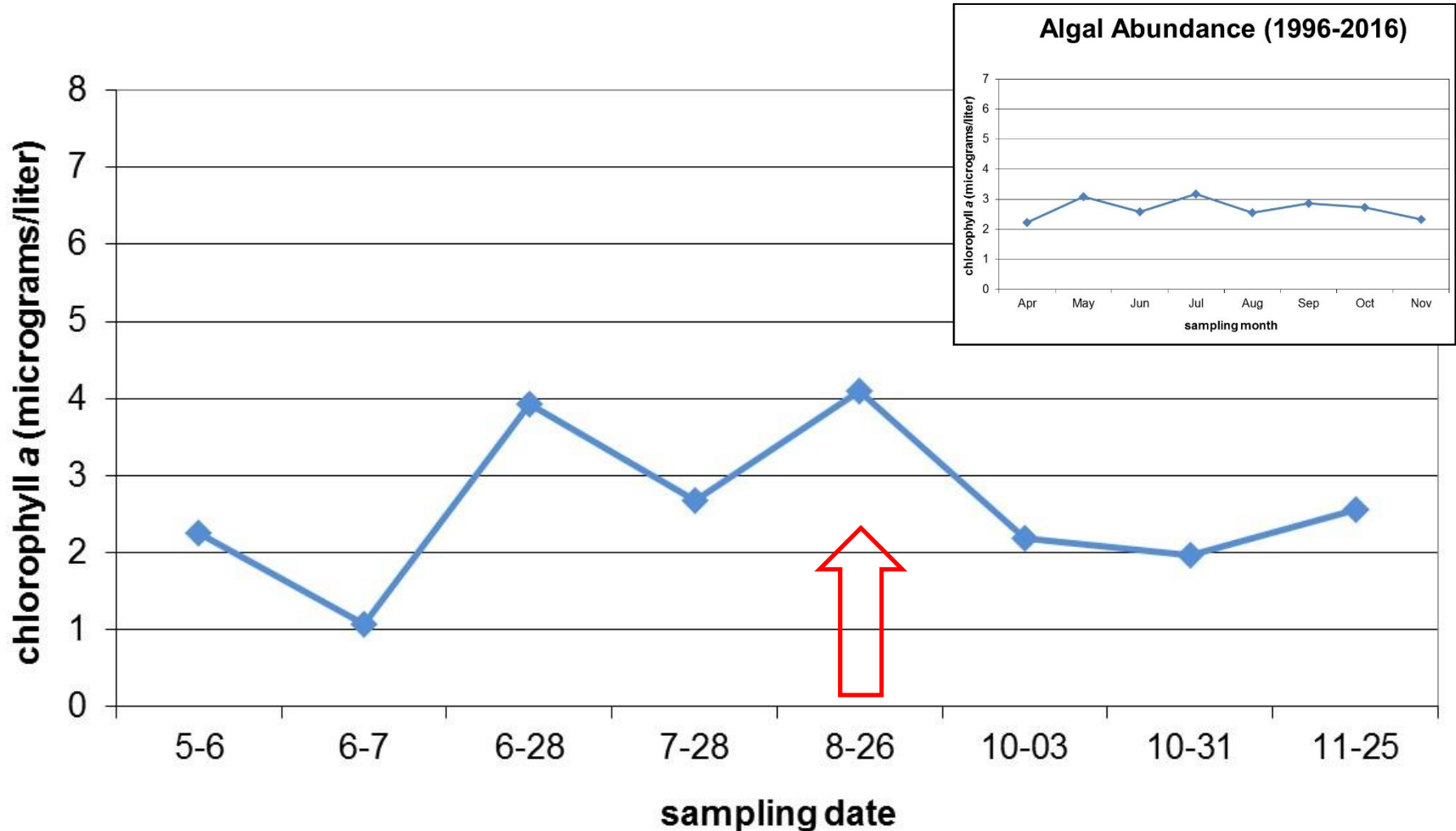
Long-term Mean Annual Water Clarity



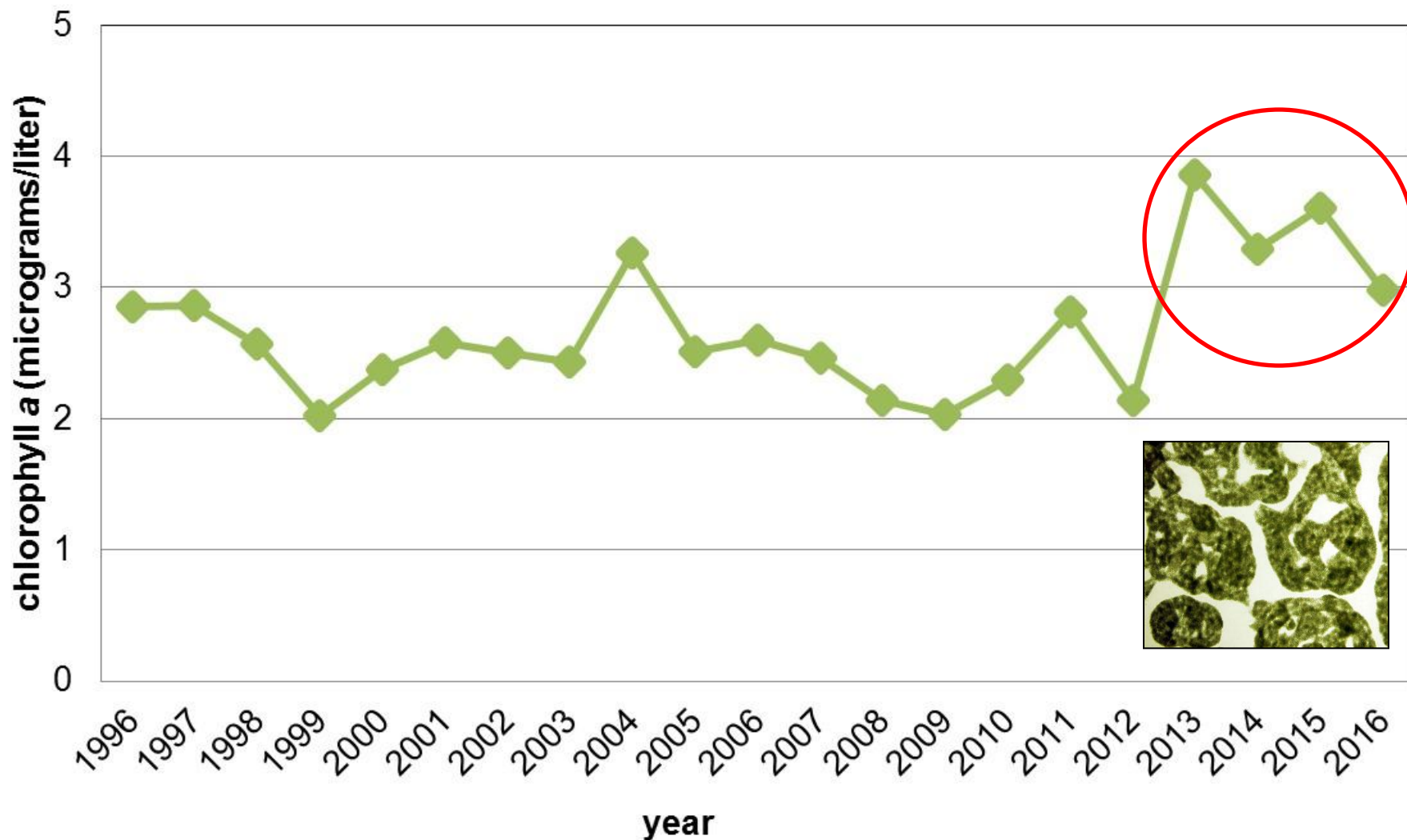
August Mean Annual Water Clarity



Mean Algal Abundance (2016)

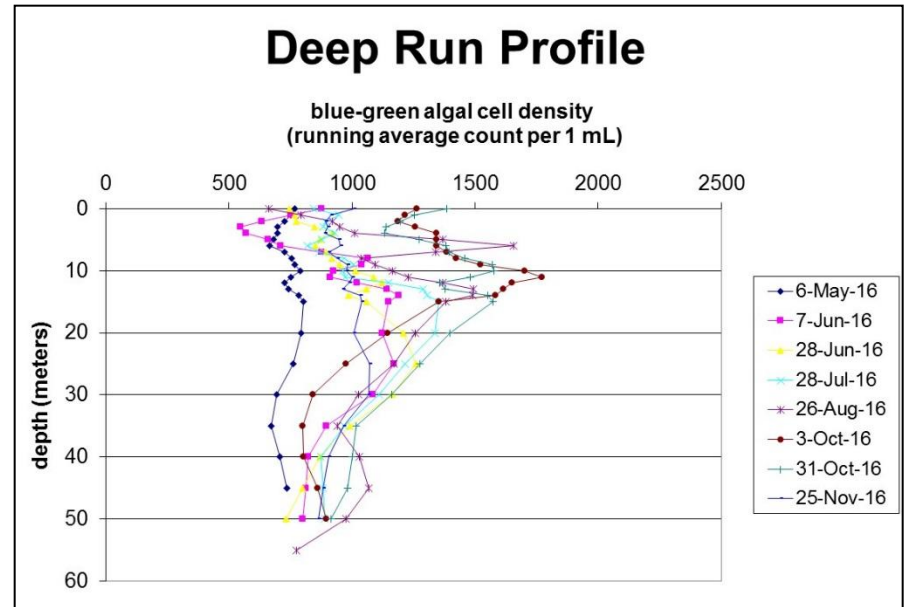
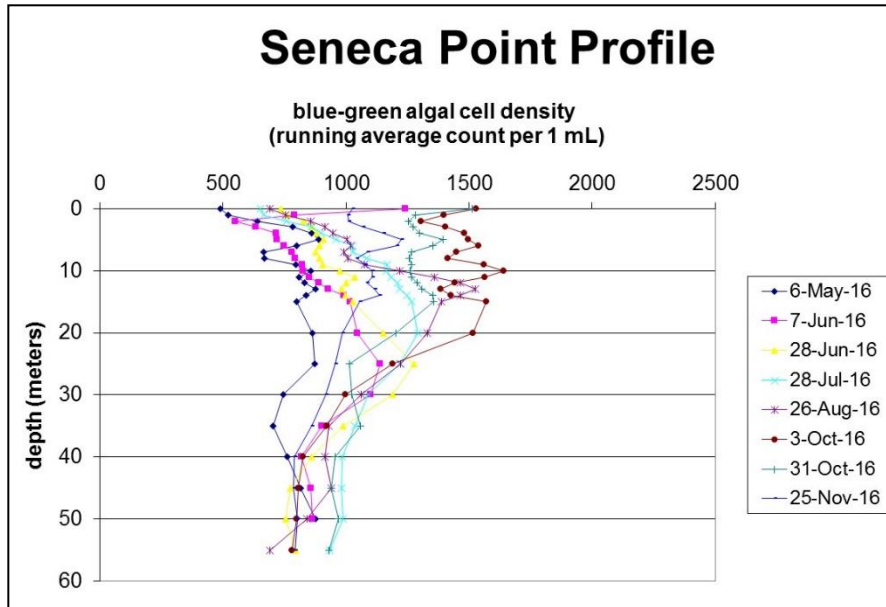


Long-term Mean Annual Algal Abundance (1996-2016)



Blue-green Algal Distribution

WHO lists low probability of health effects <20,000 cells/mL
(or 10 µg/L chlorophyll *a*, or 10 µg/L microcystin-LR)



modifying factors: diurnal movements,
zooplankton herbivory,
surface weather conditions
local sites may be significantly higher

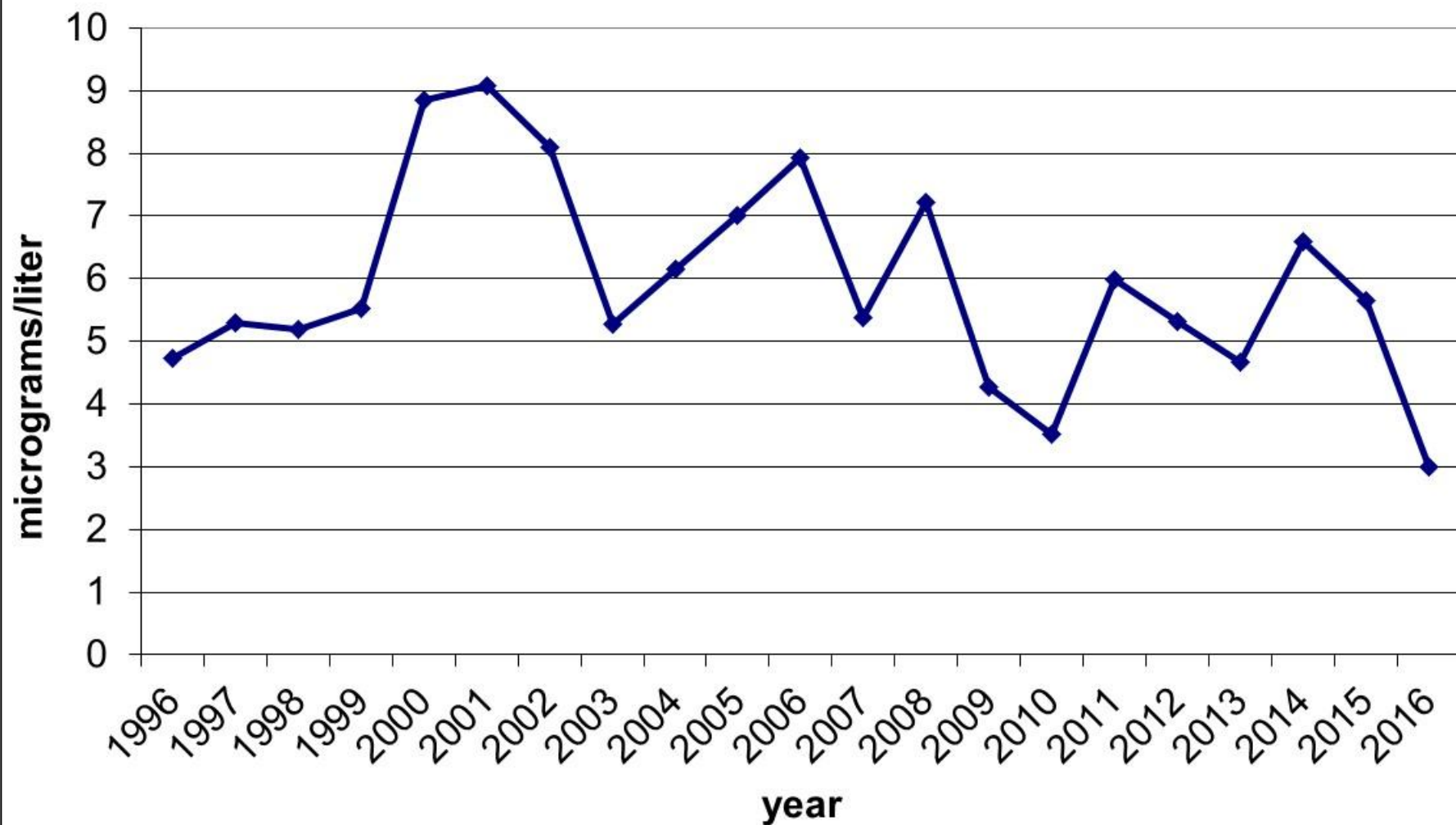
What affects the nutrient budget?

Managing nutrients is complicated – we continue to monitor phosphorus and nitrogen

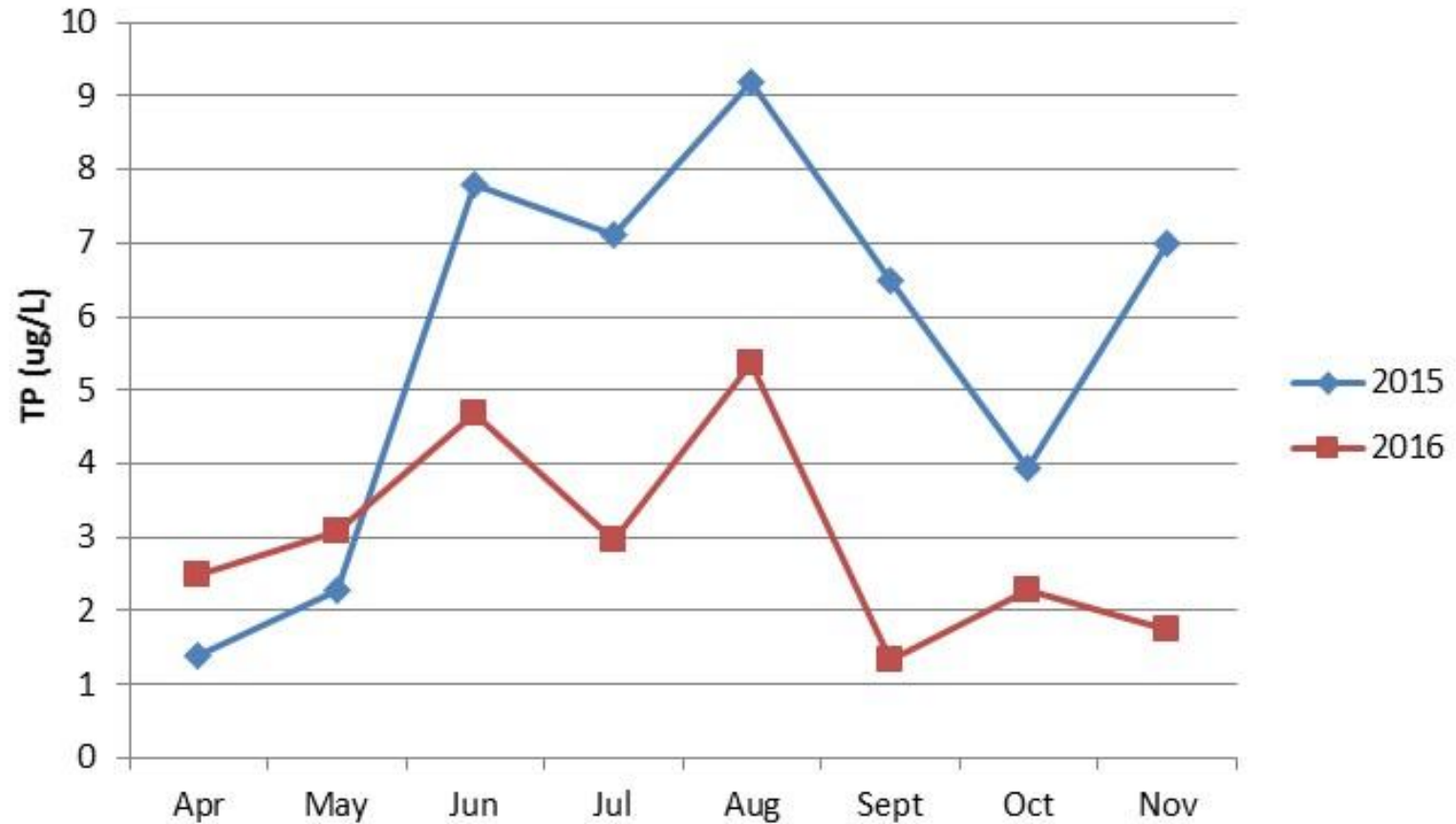
- Some sources of nutrients are “easily managed”
 - Effective watershed protection programs reduce external loading of phosphorus and nitrogen
- Other sources of nutrients “require higher levels of management”
 - Intense storm events produce locally high nutrient runoff, nitrogen may be fixed from the atmosphere by some blue-green algae
- We are beginning to understand how biologically bound phosphorus affects the levels detected in the lake
 - Changing role of invasive quagga and zebra mussels living in the benthic zone of the lake



Mean Total Phosphorus

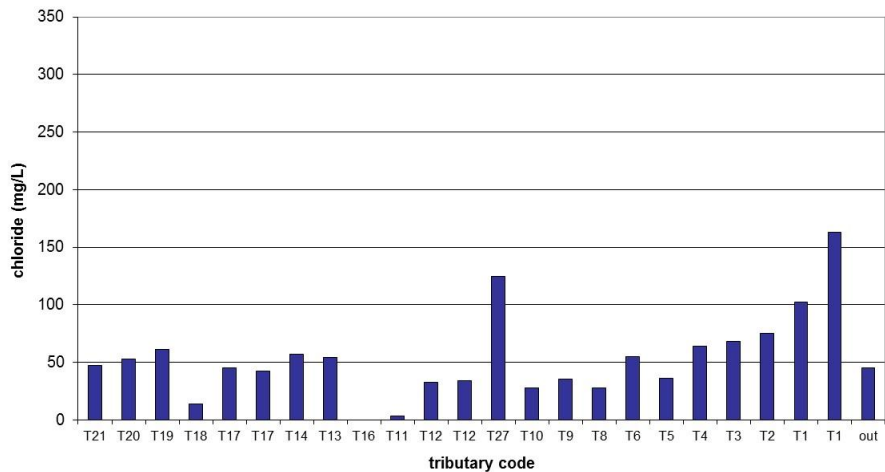


Total Phosphorus Monthly Comparison

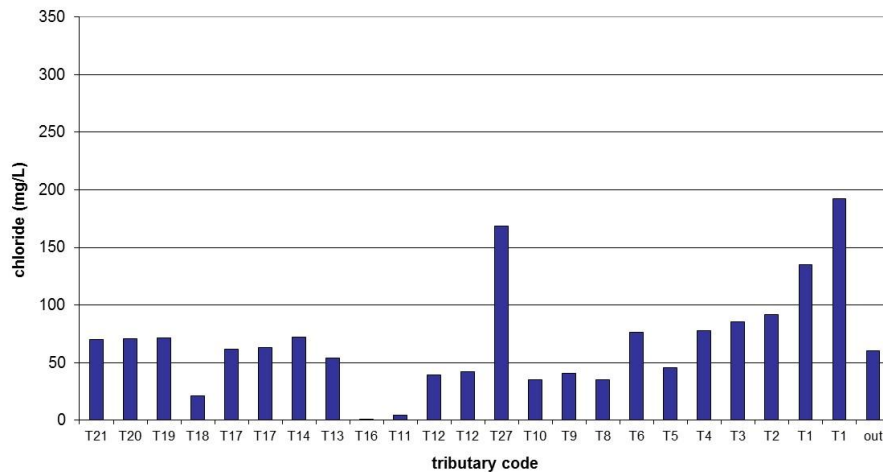


overall perception of growing season,
timing and intensity of storm-related runoff events

Tributary Chloride
Canandaigua Lake, 3-1-2016



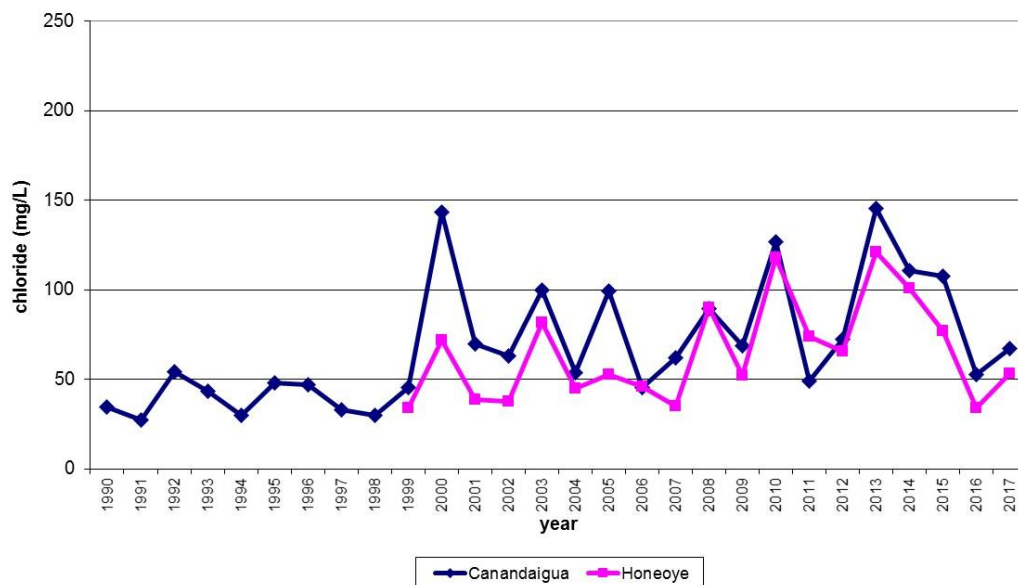
Tributary Chloride
Canandaigua Lake, 2-23-2017



stream patterns reflect road
mileage in sub-watershed

annual patterns reflect
winter severity

Mean Tributary Chloride
Canandaigua Lake and Honeoye Lake (Years of Record)



2016 Macrophyte Rake Survey

A brief presentation at the June 7th meeting

34 sites referenced
with GPS coordinates

258 individual samples
covering multiple depths

Aquatic plant presence
and relative abundance

Phytogeography of
invasive species



An aerial photograph showing a large body of water in the foreground, with a shoreline covered in dense green trees and some buildings in the background.

Thank You!

Any
Questions?