

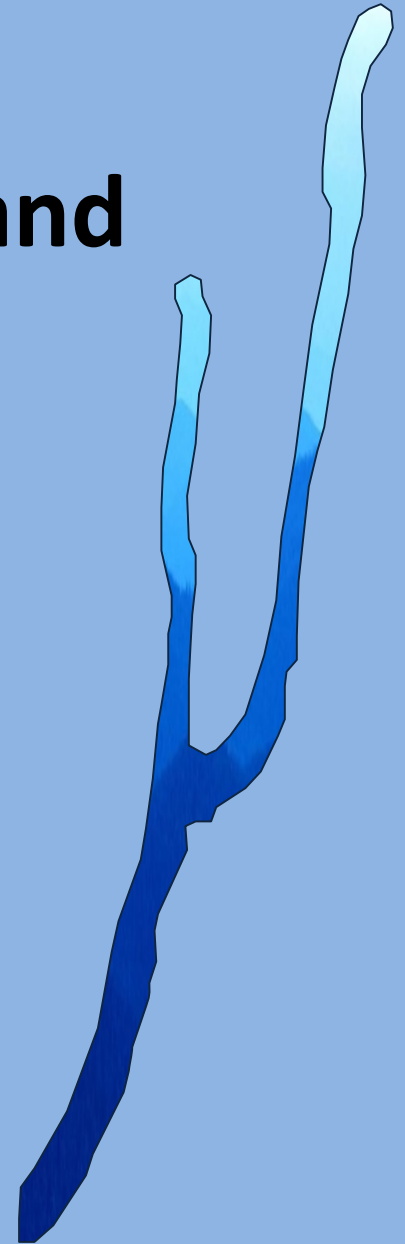
Keuka Lake Looking Back and Looking Ahead

State of the Lake **2016**

Tim Sellers, PhD



July 8, 2017



Tim Sellers, PhD

KLA Science/Water Quality Advisor


Training

Limnologist / Aquatic Biologist
Research lakes, rivers, oceans

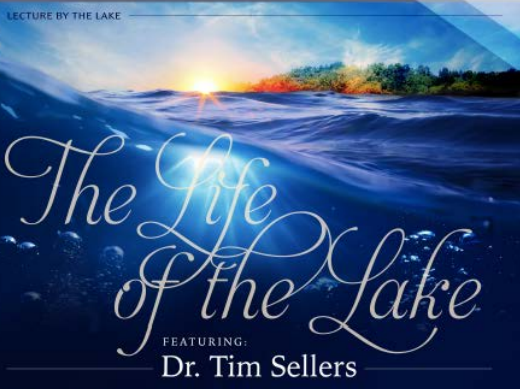
Keuka College

Director, Center for Aquatic Research
Professor of Biology and Env. Sci.

Associate Provost for Academic Innovation



LECTURE BY THE LAKE




The Life of the Lake
FEATURING:
Dr. Tim Sellers

*Take a look below the surface of Keuka Lake.
Explore how it lives and breathes, the secrets it harbors, and its future.*

FRIDAY, AUGUST 19, 2016
3-5 p.m., Geiser Dining Commons,
Dahlstrom Student Center

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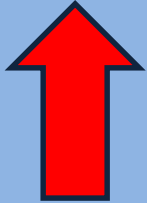
Dr. Tim Sellers is an aquatic biologist who serves as professor of biology and environmental science, director of the Center for Aquatic Research, and associate provost for academic innovation at Keuka College. He holds a Ph.D. from the University of Louisville.

Talk Outline

- State of the lake 2016
 - Updates with long term history
- Fish, Complexity, and “Too clean”?
- New & Continued Partnerships
- Conclusions

2016 State of Keuka Lake

Nutrient levels (**Phosphorus**)



- Averaged 5.2 ppb, **up** 0.6 ppb from 2015,
- Well below long-term average of 7.3 ppb

Water clarity



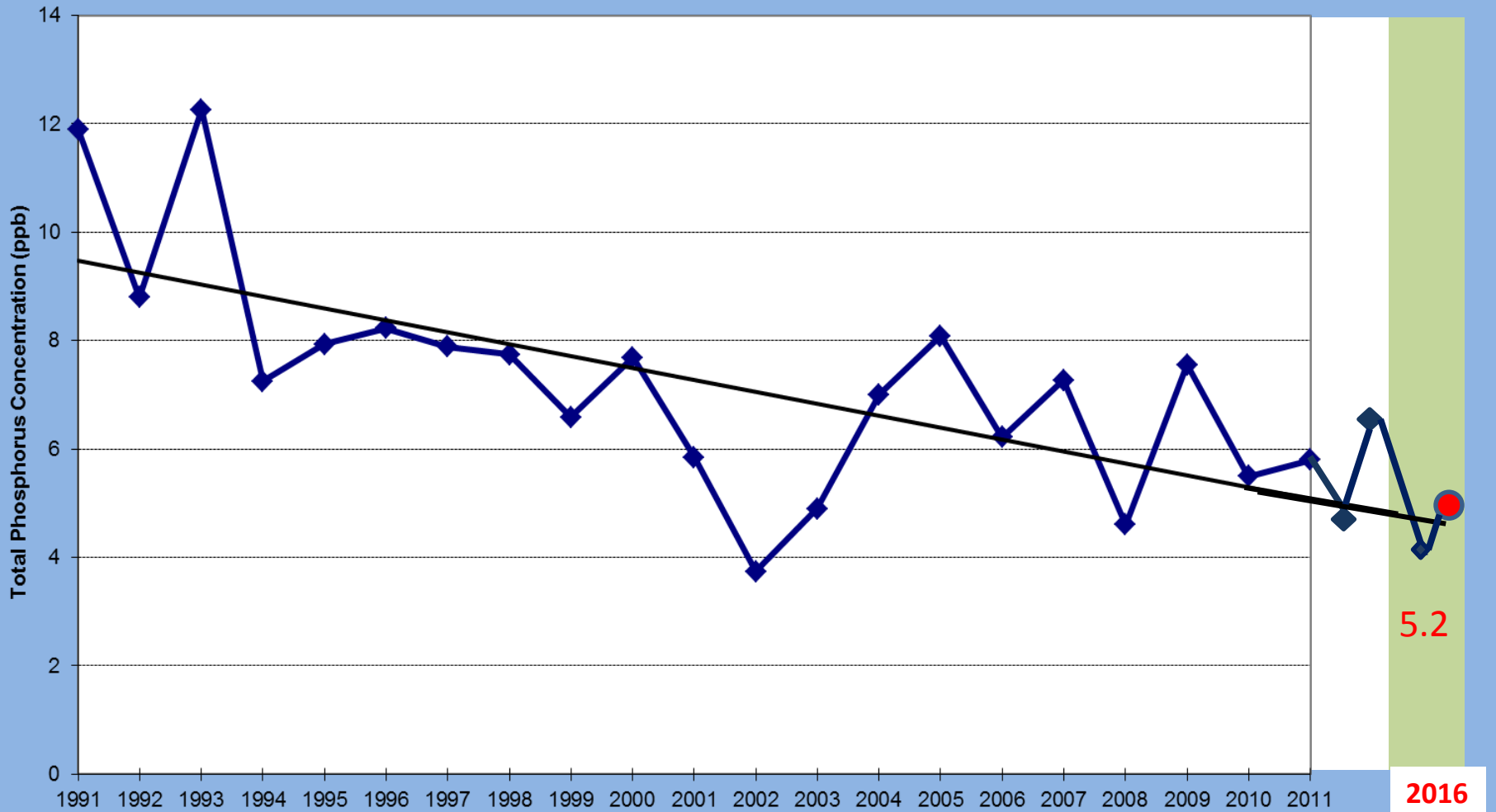
- Averaged 9.3 m, higher than 2015 levels
- Well above the long-term average of 6.1 meters

Algae levels (**Chl a**)

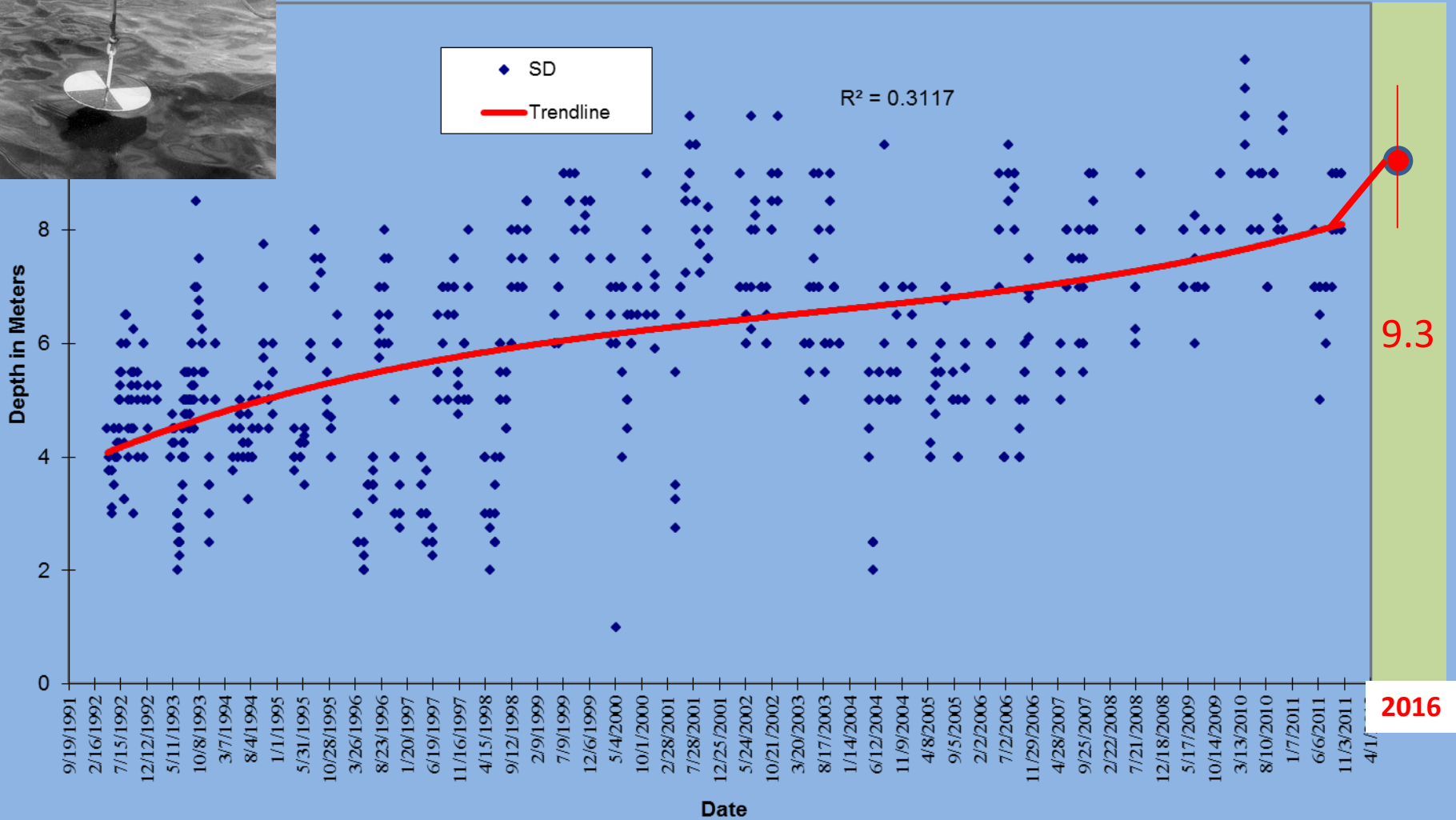
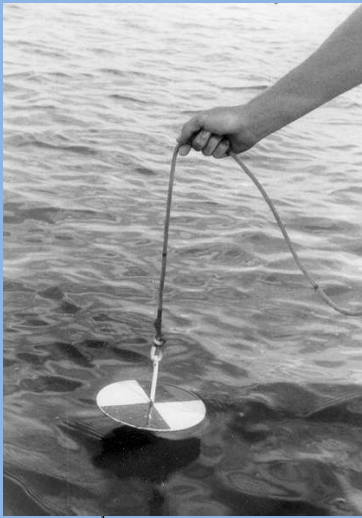


- Averaged **1.42** ppb, **up** 0.1 from 2015
- Well below the long-term average of 2.6 ppb

Keuka Lake Phosphorus Trends

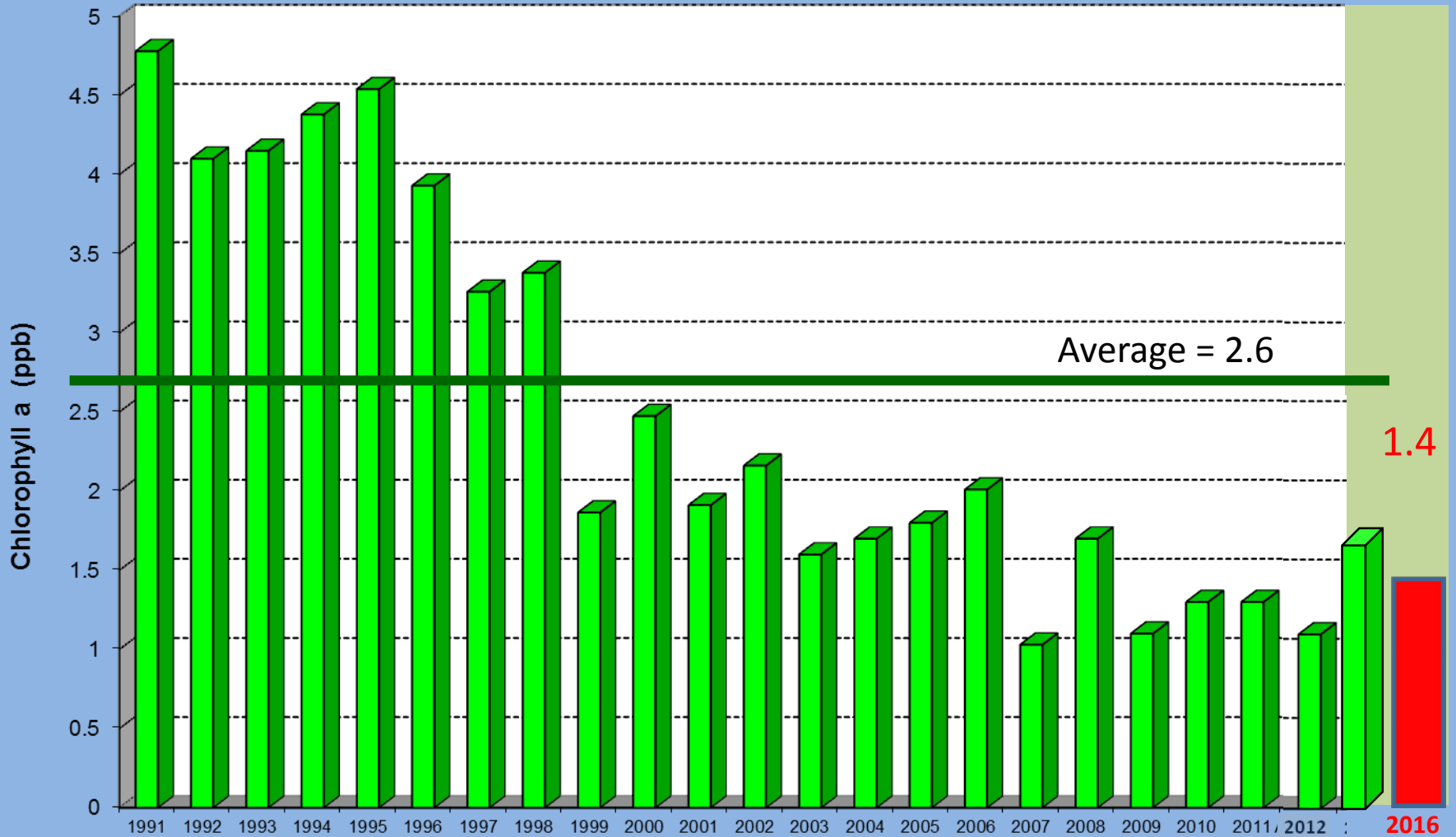


Keuka Lake Secchi Disk Data



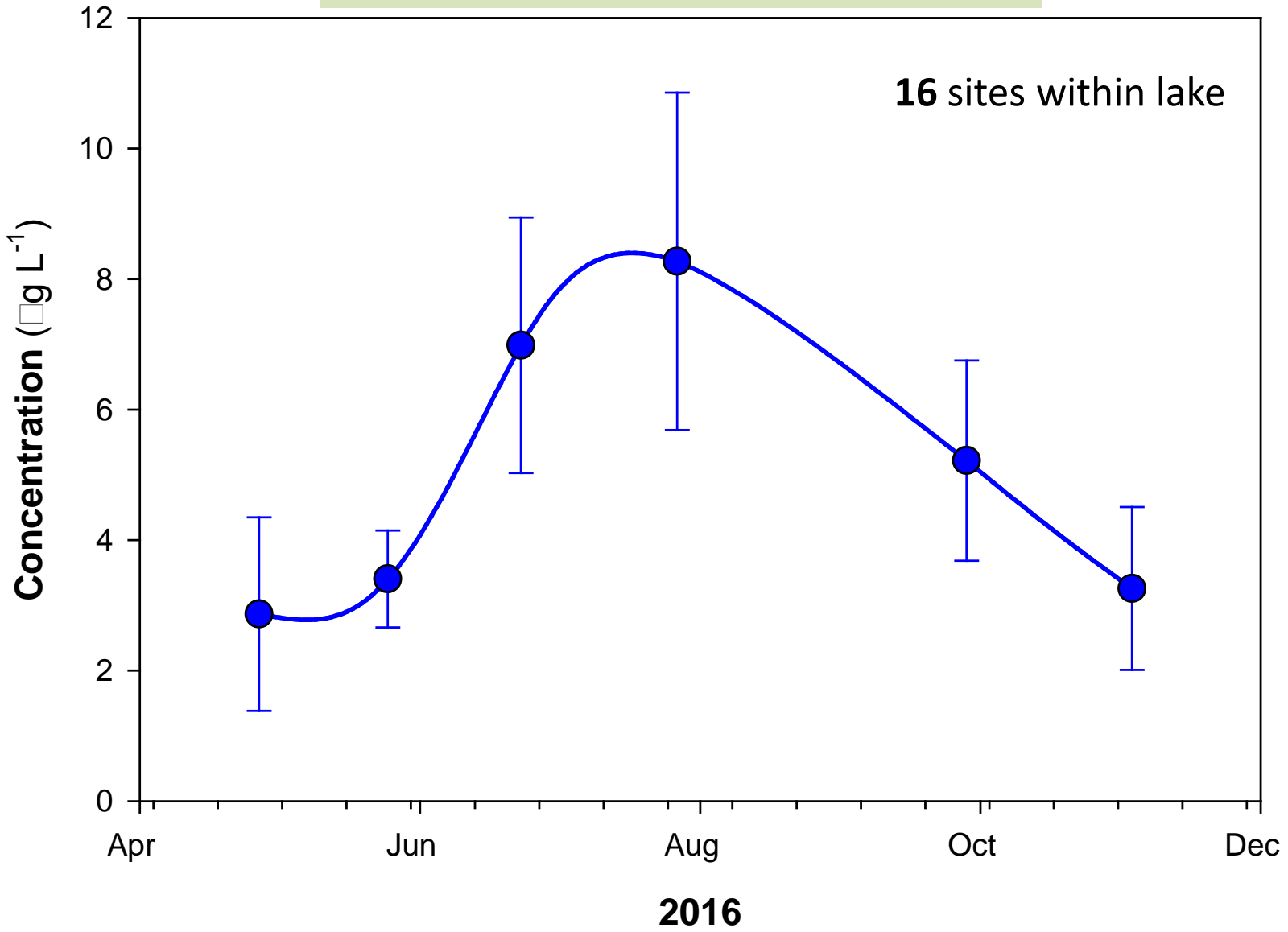


Keuka Lake Chlorophyll a (= algae)



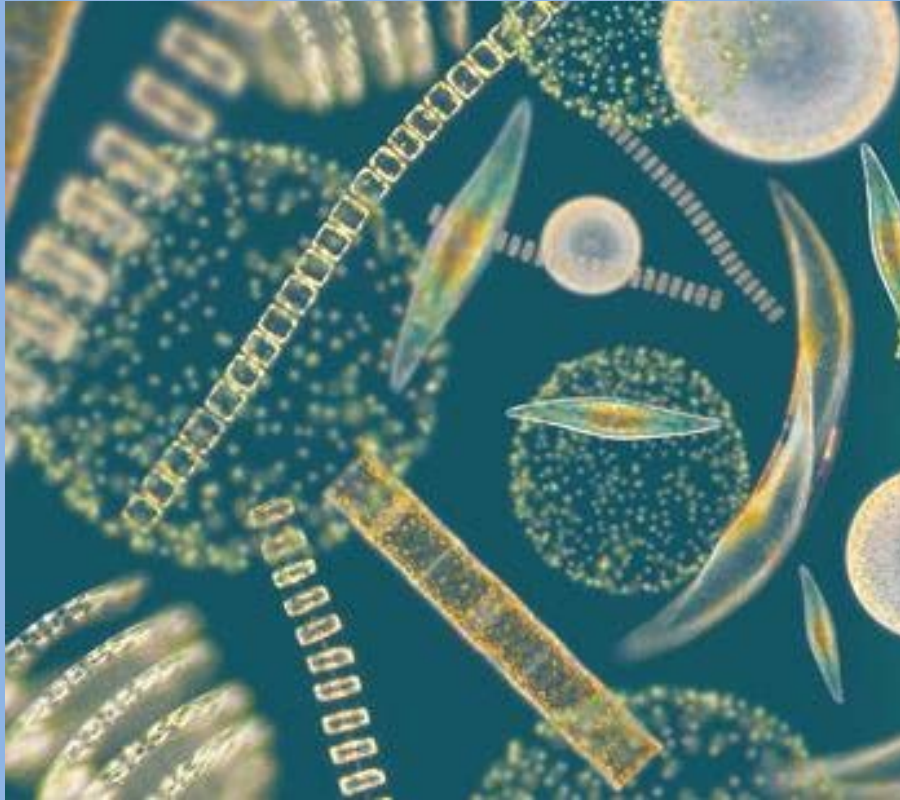
Total Phosphorus

“Fertilizes” algae – good *and* bad



“Algae”

Phytoplankton



Microscopic, floating **in** and **on** water.
Colors the water.
Many, many **species**: most good, some bad.
Base of food web. (**Easy** to eat)

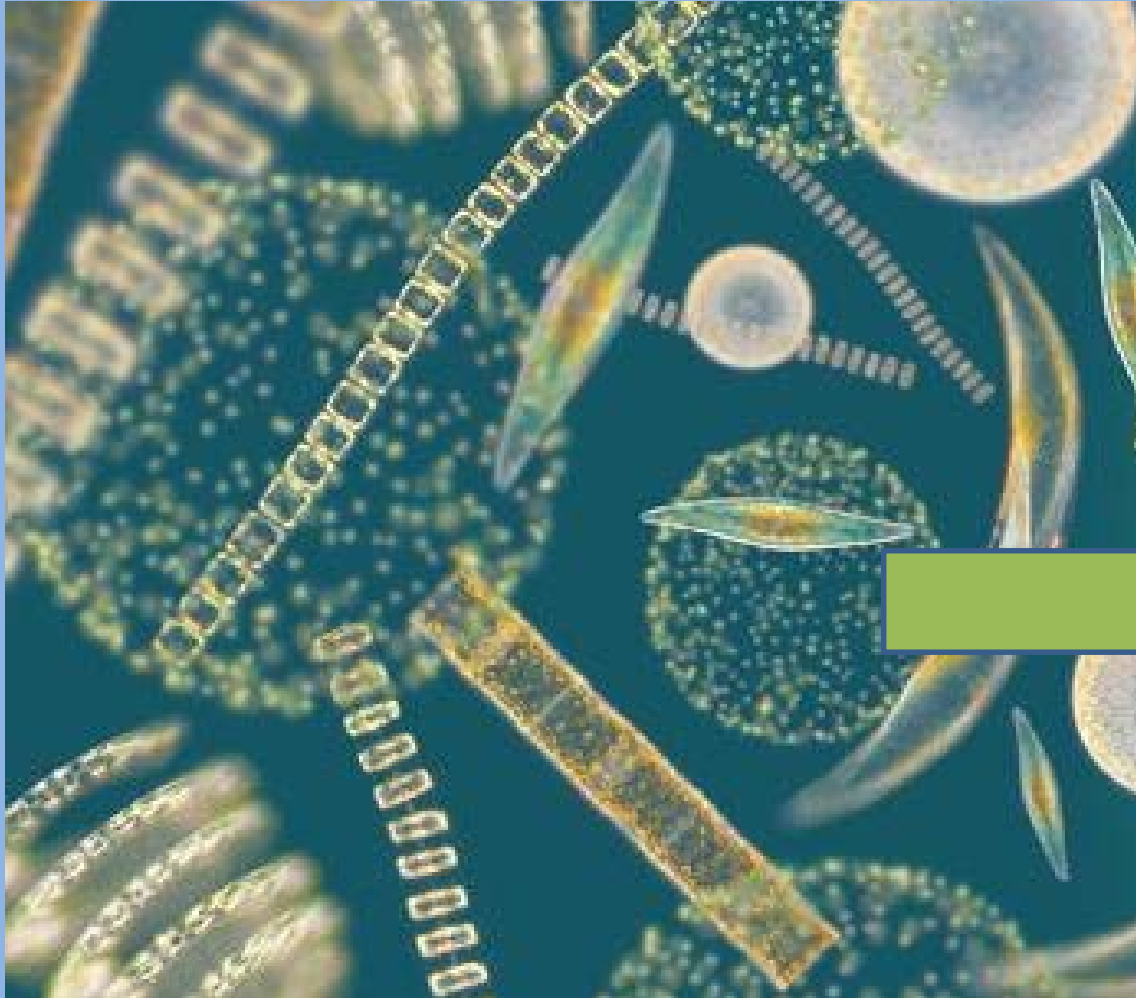
Benthic Algae



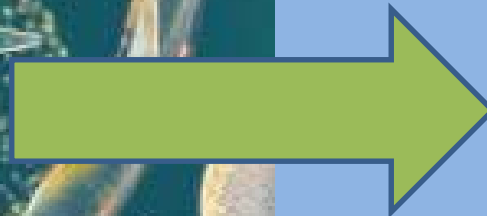
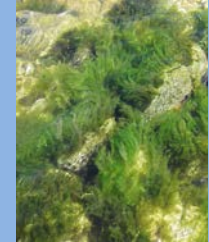
Stringy stuff, stuck to bottom.
Around shallow **margins** of lake.
Many, many **species**: most good, some bad.
Base of food web. (**Difficult** to eat)

“Algae”

Phytoplankton



Benthic Algae



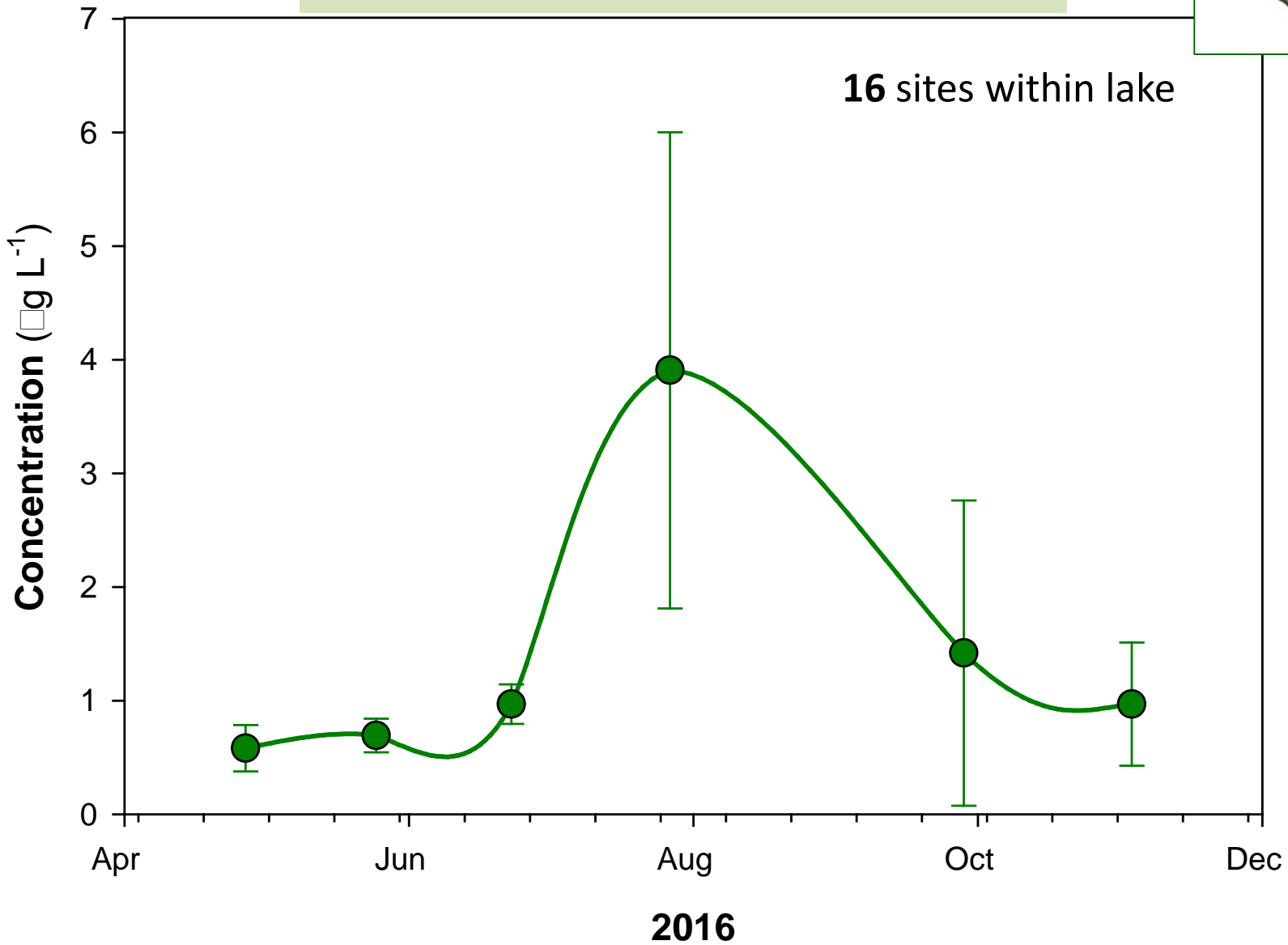
Chlorophyll *a*

How much? -- **Chl a**

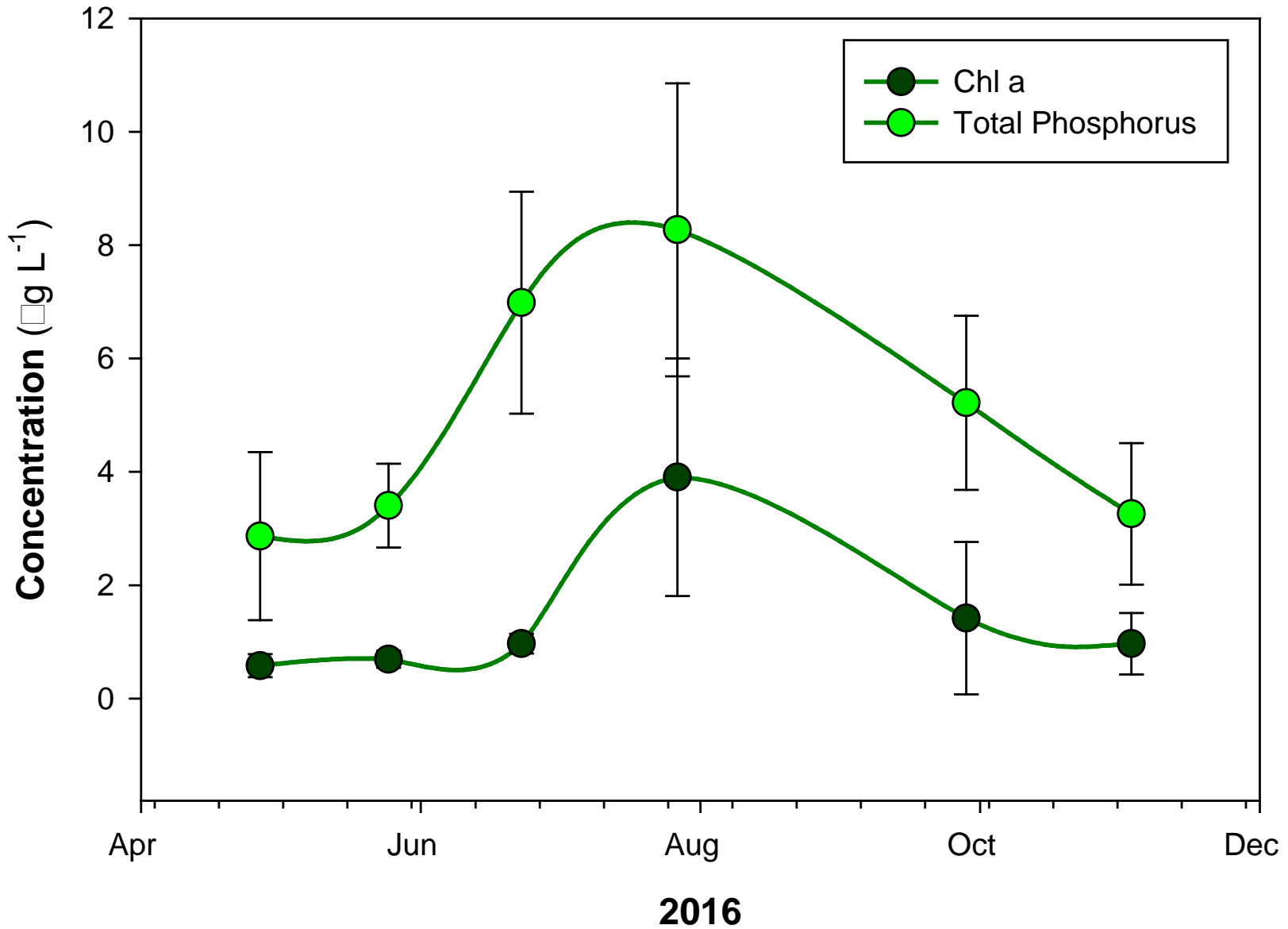
What kind? – Other tests

Chlorophyll *a*

All algae – both good *and* bad

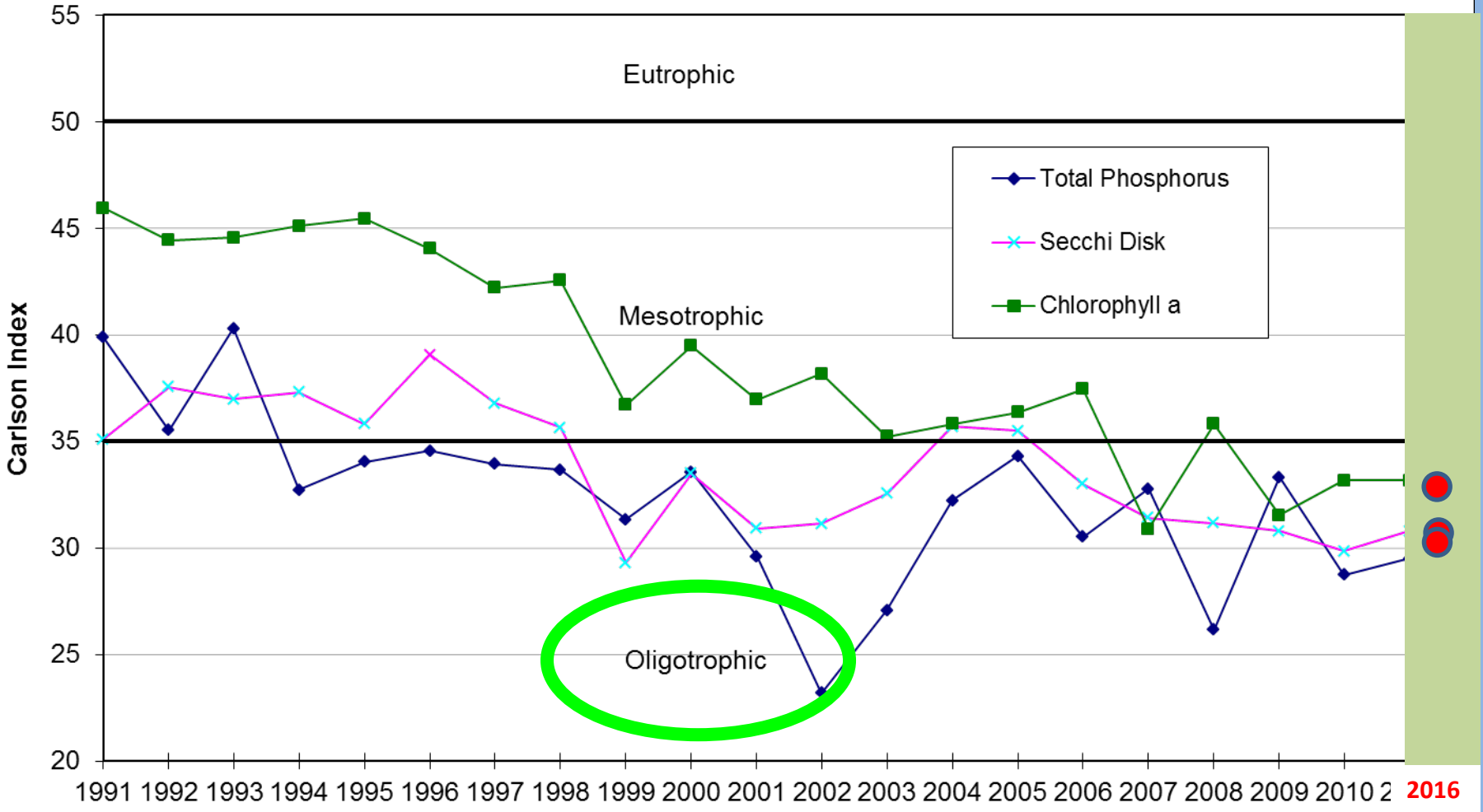


Phosphorus and Chl *a*





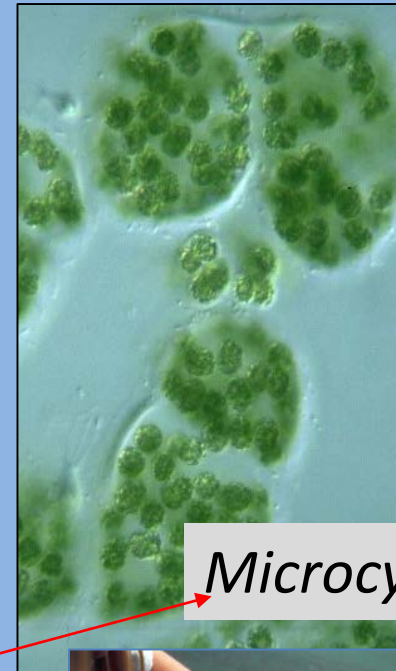
Keuka Lake Trophic Status





Cyanobacteria (= Blue green algae)

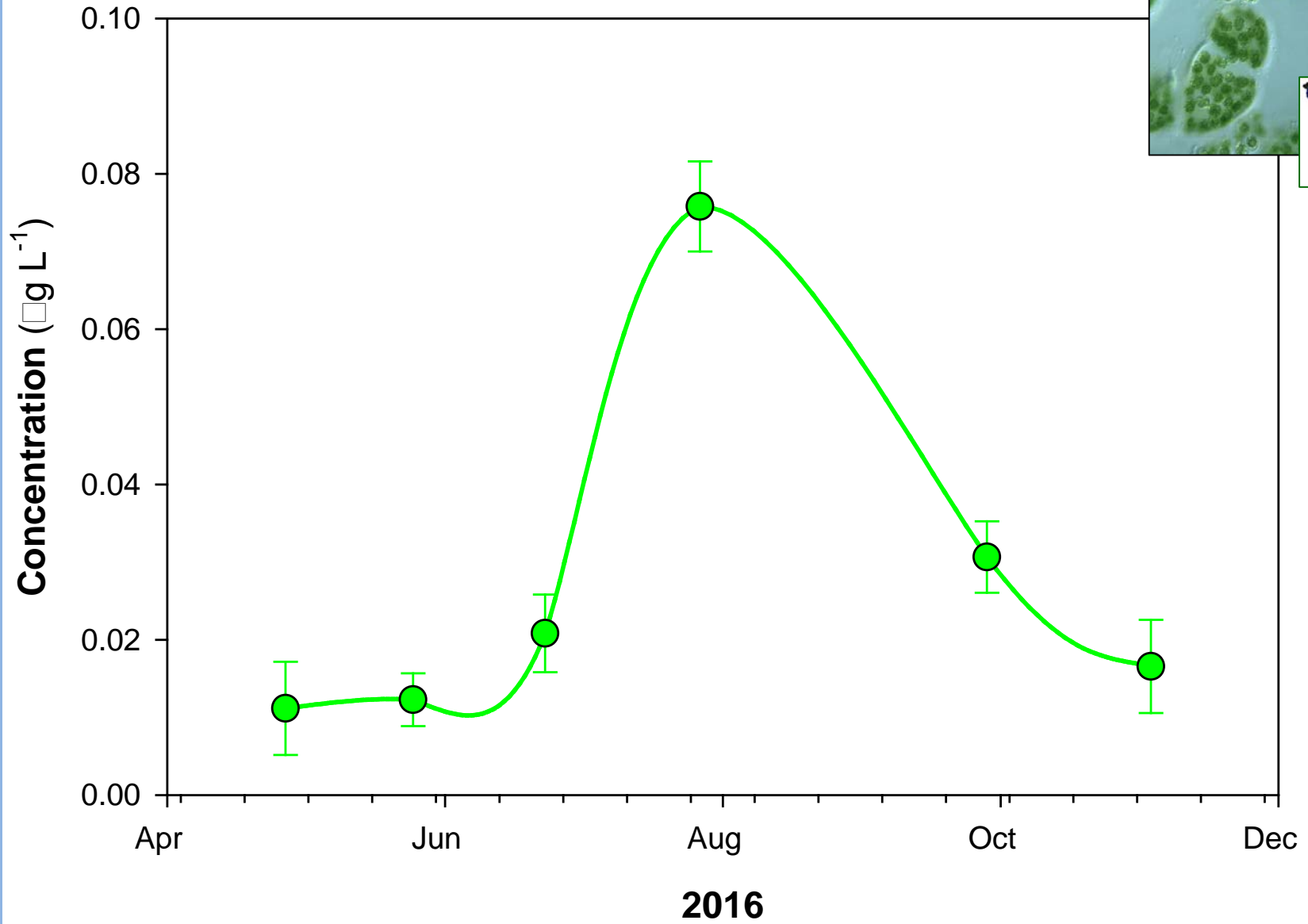
- Type of phytoplankton / algae
- Generally **surface** (not deep)
 - Reduces **light** in lake:
 - Bad for “good algae” (DCL)
- Many species
 - Most **harmless**
 - Some* produce **toxic chemicals**
- **Very LOW levels in Keuka!**
 - Probe allows instant sample



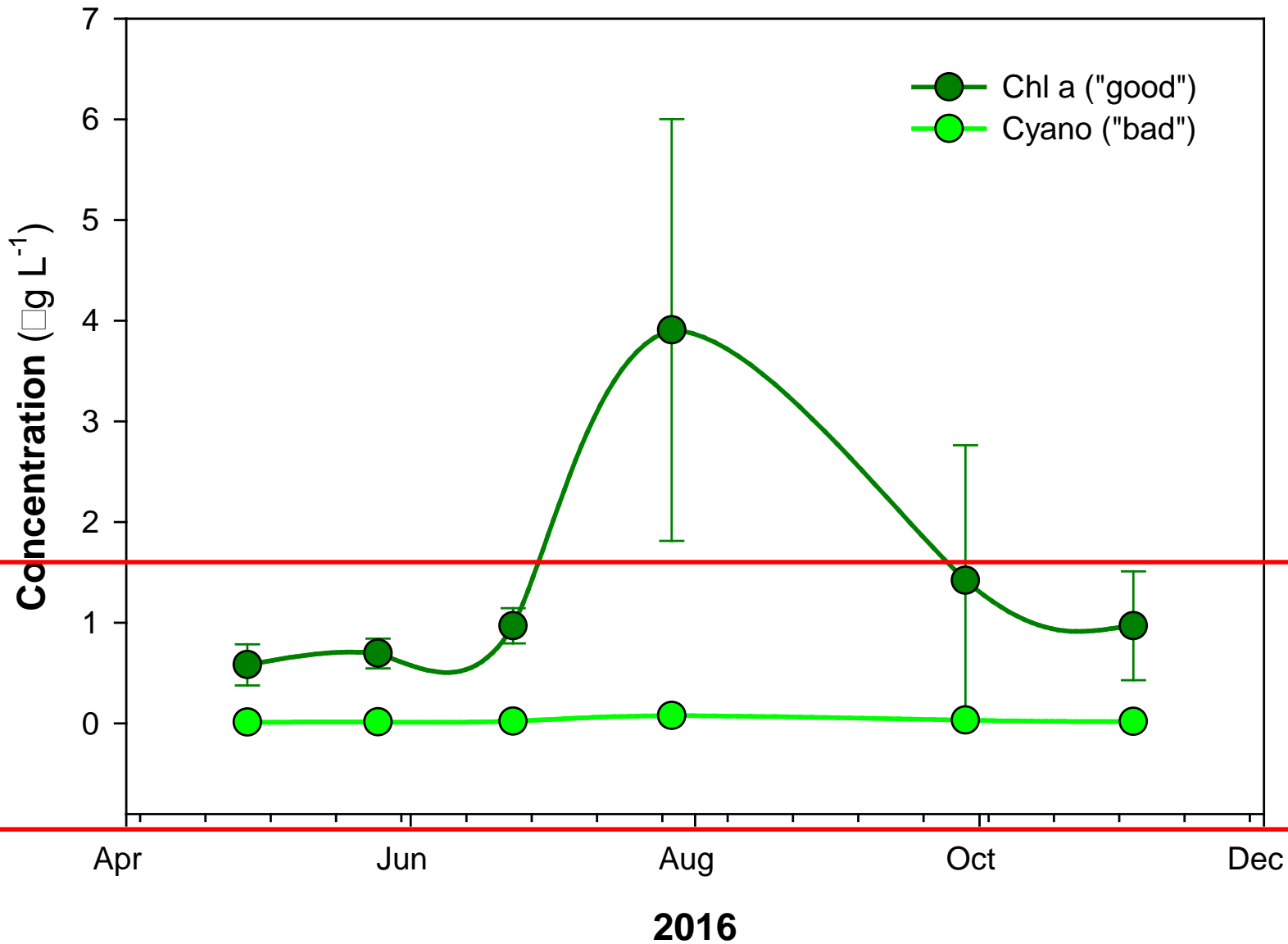
Microcystis



Cyanobacteria ("Blue-green Algae")



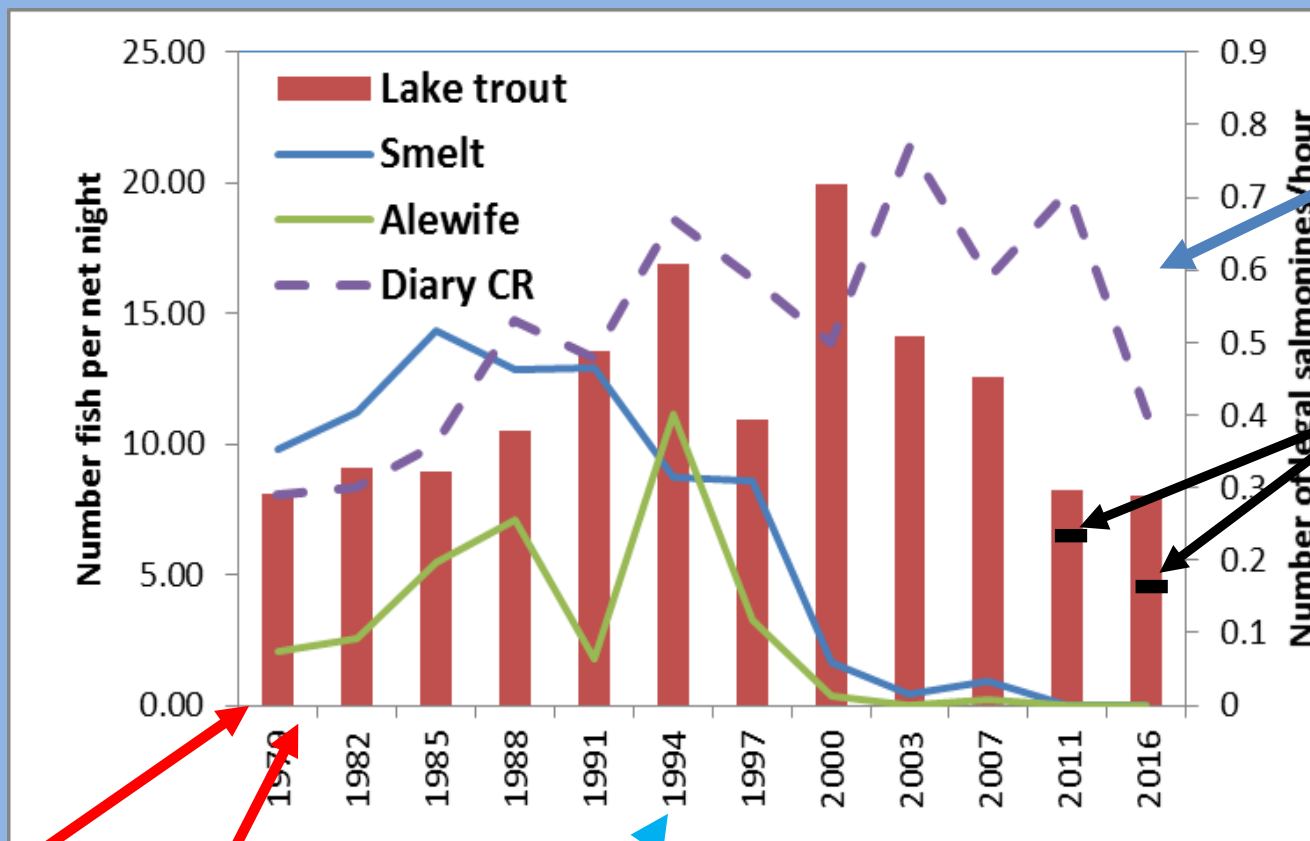
"Good" versus "Bad" Algae



Fish, Complexity,
and “Too clean”?

New York DEC

Keuka Lake



Diary CR
0.63 2014

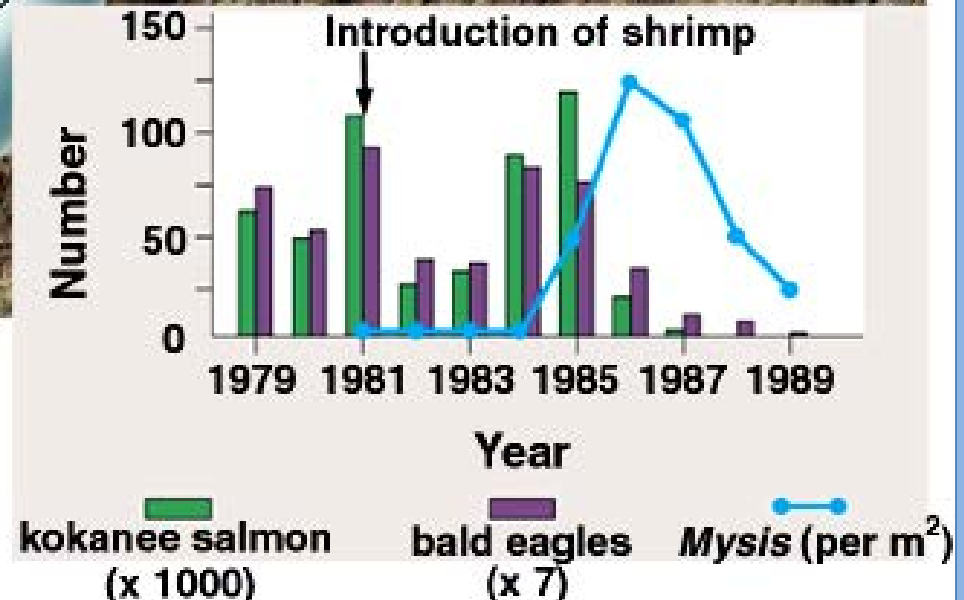
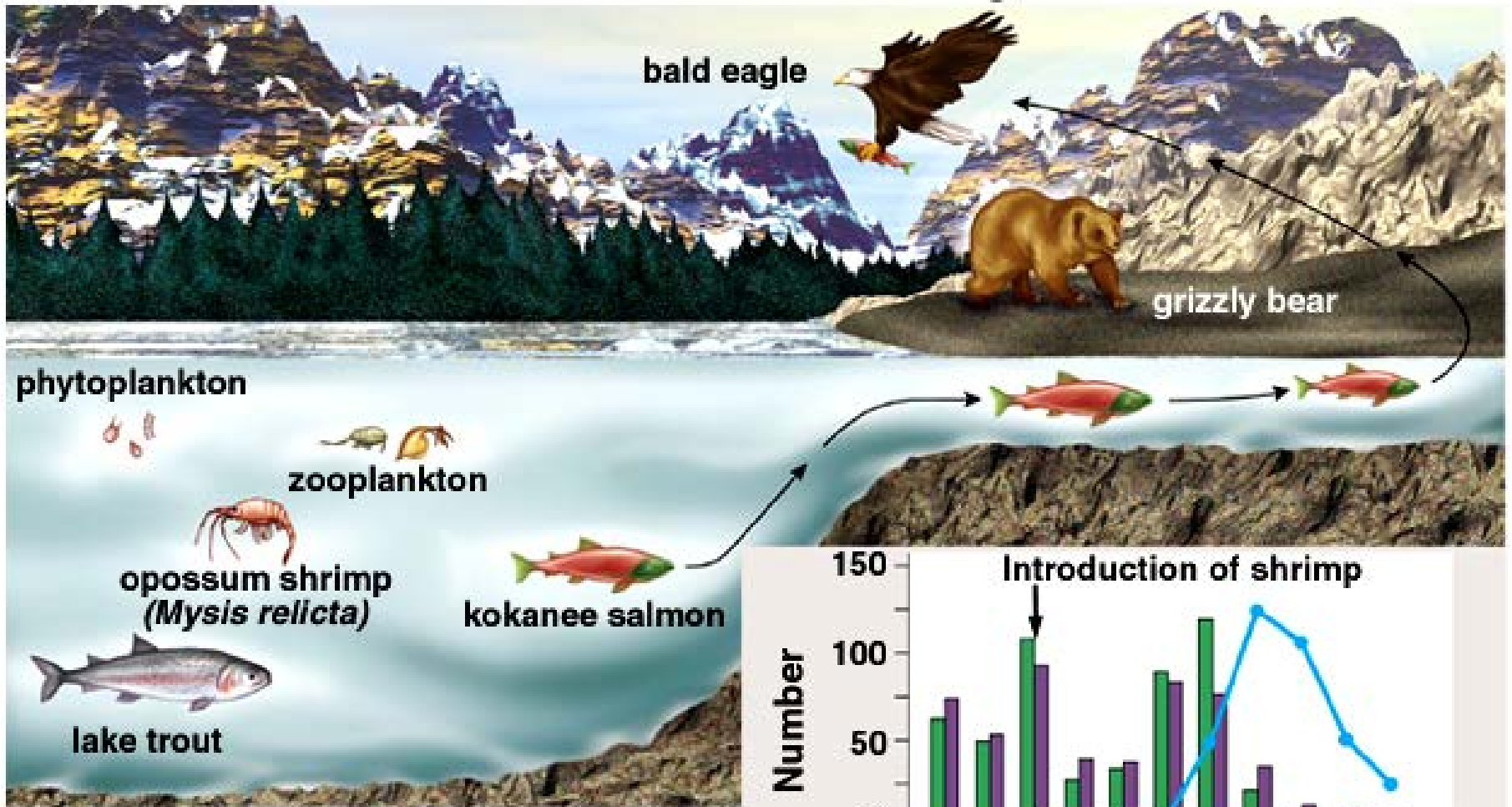
Mono net
Correction
factor

Atlantic salmon - 1978

Brown trout- 1980

Zebra mussels

Flathead lake community in Montana



New & Continued Partnerships

- KLA has long history of **collaborating** with other research, monitoring, and conservation groups
 - Keuka College, Cornell Cooperative Extension, HWS, Penn Yan Water Treatment, DEC, et al.
- **2016: DEC Fish study**
 - June presentation: **DEC**, KLA, and Keuka College
 - Slides available on KLA website
 - Video of talk soon available (YouTube)
- **2017 DEC**
 - DEC fisheries data/knowledge partnerships
 - Finger Lakes Watershed Hub: Tony Prestigiacomo

State of the Lake

- 2016 data show the lake is in generally **good health**
- **Improving trends** in many important parameters (*water clarity, algae*)
- Cyanobacteria levels continue to be **low** (but present!)
- Aquatic invasive species (AIS) concerns...
- Changes in some fish populations may correlate with water quality parameters... but we must be careful
- New studies (DEC, et al.) help to look at lake health in new ways.

Thank you for your dedication to protecting Keuka Lake

- Continue to the “Listen to the Lake”
- “If not now, *when?* If not us, *who?*”
- Contact me:
Tim Sellers
tsellers@keuka.edu
(315) 279-5685