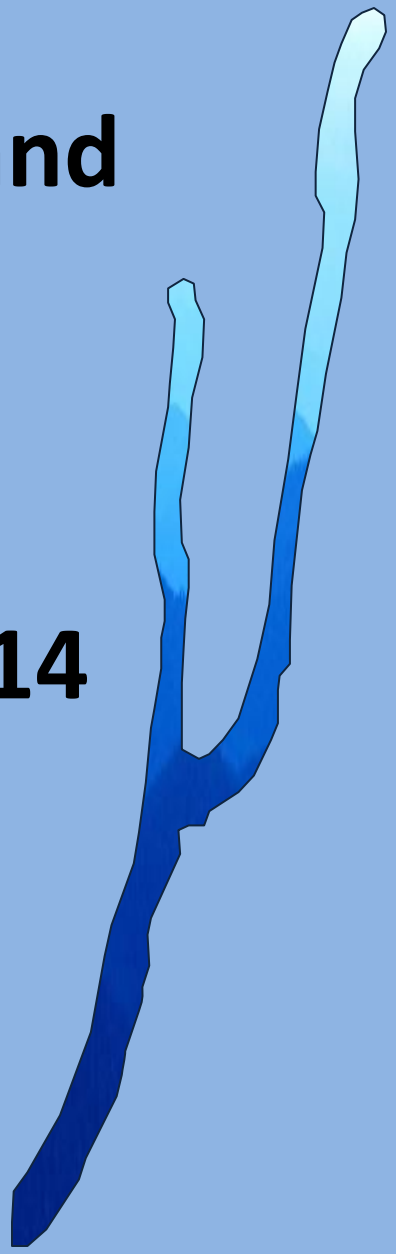
Keuka Lake Looking Back and Looking Ahead

State of the Lake **2013**
Mid-season update for **2014**

Tim Sellers, PhD



Keuka Lake Association
protecting the quality of the lake

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 Environmental Science

Associate Vice President, Academic Programs

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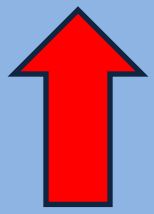
Talk Outline

- State of the lake 2013
  - Updates with long term history
- Submersible Probe
  - Variation under the waves
  - Blue-green algae
- May 2014 storms
  - Data from the storm
  - Predictions for future

2013 State of Keuka Lake

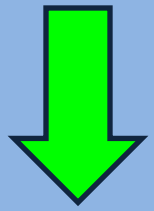


*Nutrient levels (**Phosphorus**)*

- *Averaged 6.5 ppb, **up** 1.1 ppb from 2012,*
- *Below long-term average of 7.28 ppb*

Water clarity

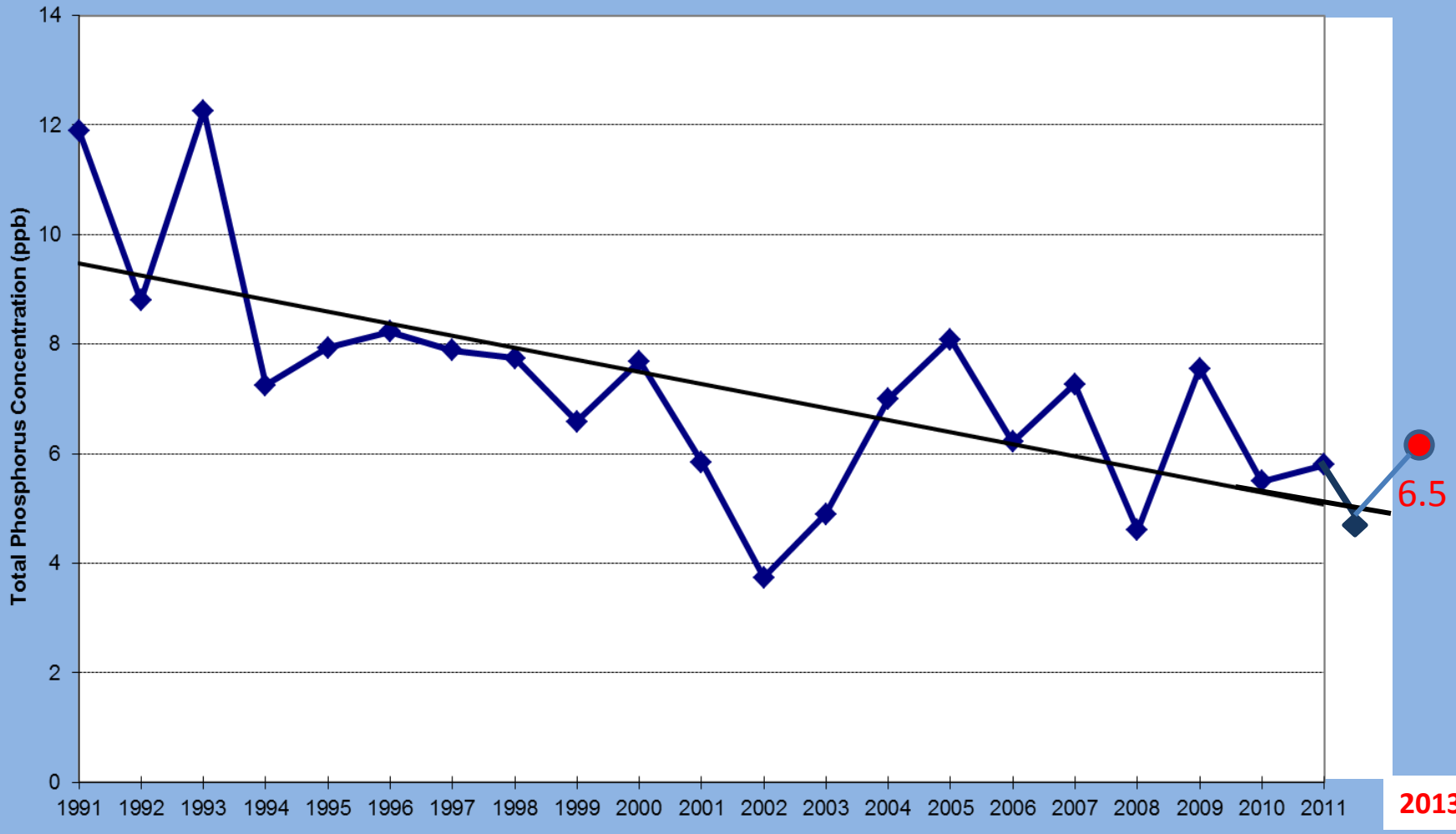
- *Averaged 7.9 m, similar to 2012 levels*
- *1.8 m above the long-term average of 6.1 meters*

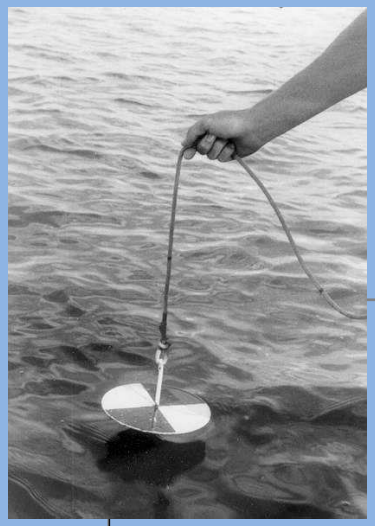


Algae levels

- *averaged **0.67** ppb, down from 2012*
- *well below the long-term average of 2.6 ppb*

Keuka Lake Phosphorus Trends

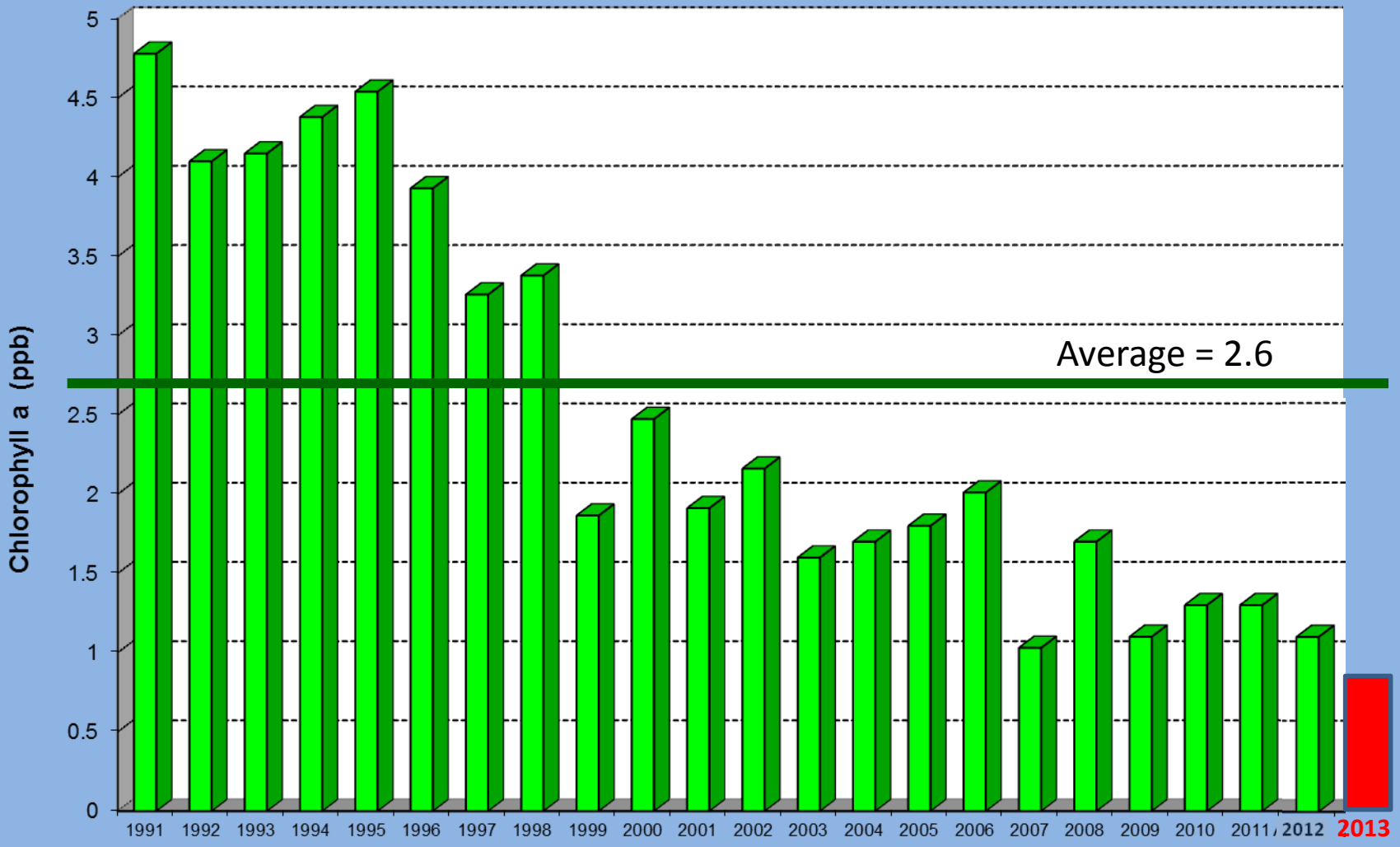




Keuka Lake Secchi Disk Data

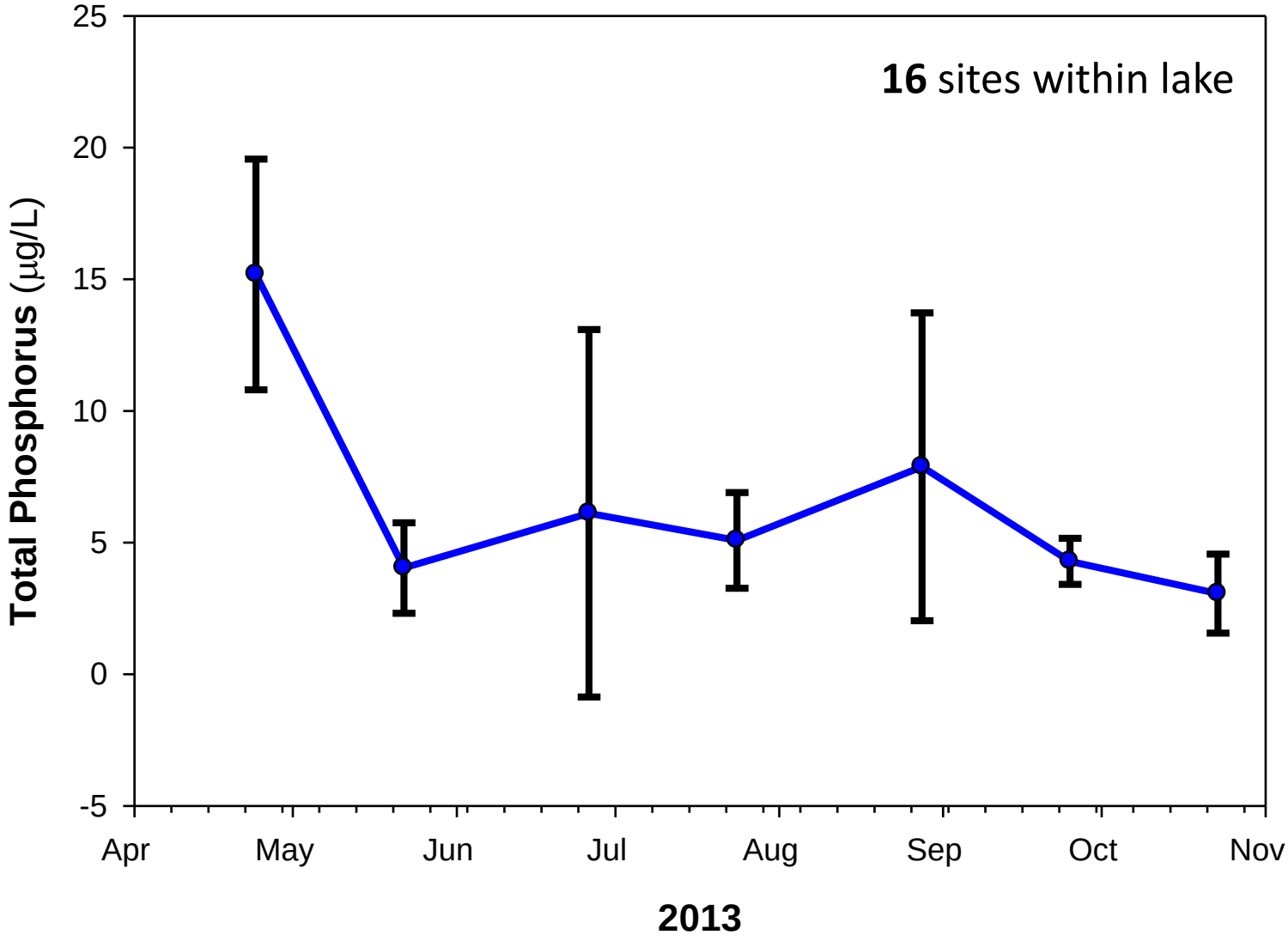
SD
Trendline
$R^2 = 0.3117$
Depth in Meters
Date
7.9
2013

Keuka Lake Chlorophyll *a* (= algae)



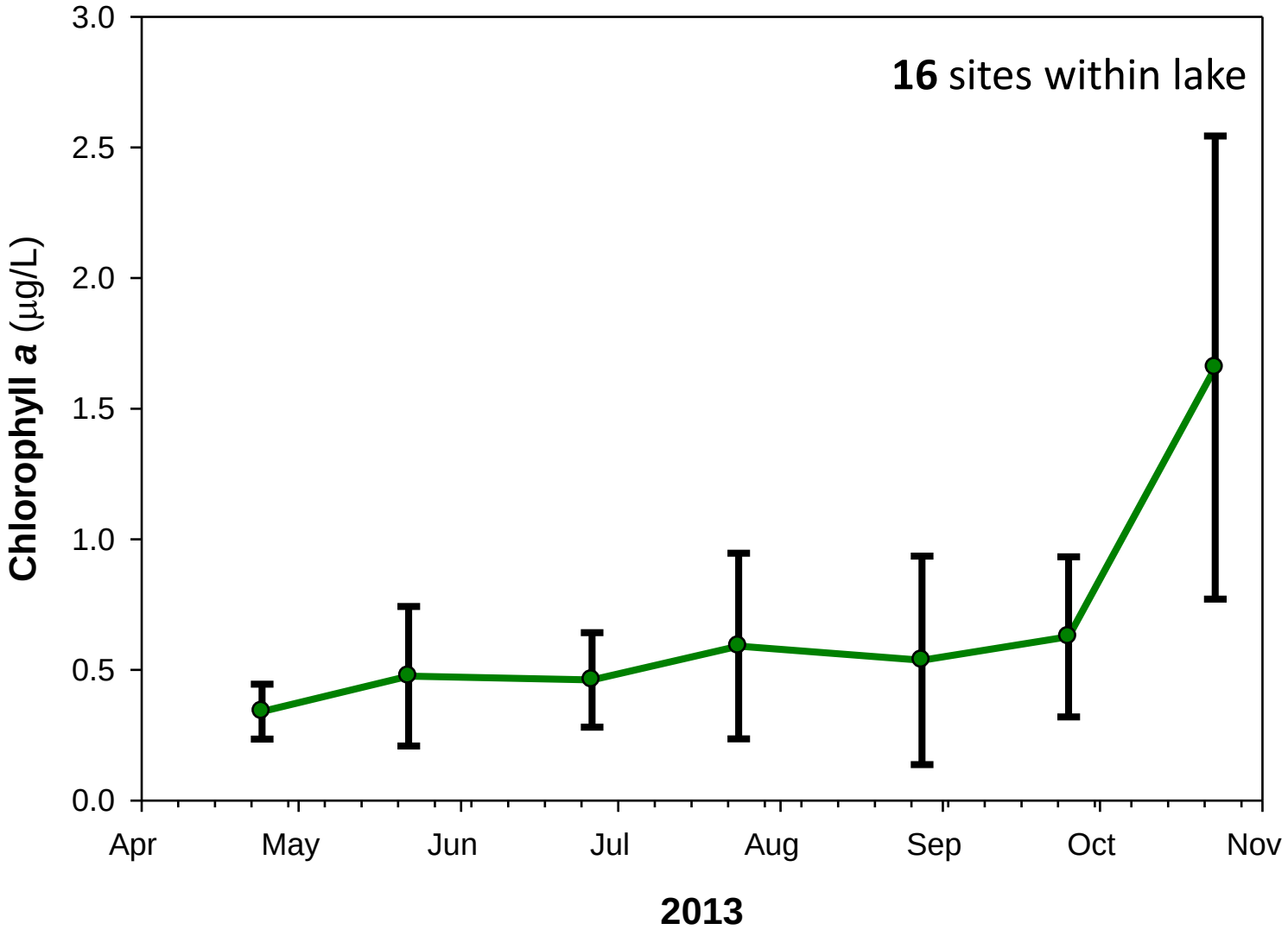
Keuka Lake

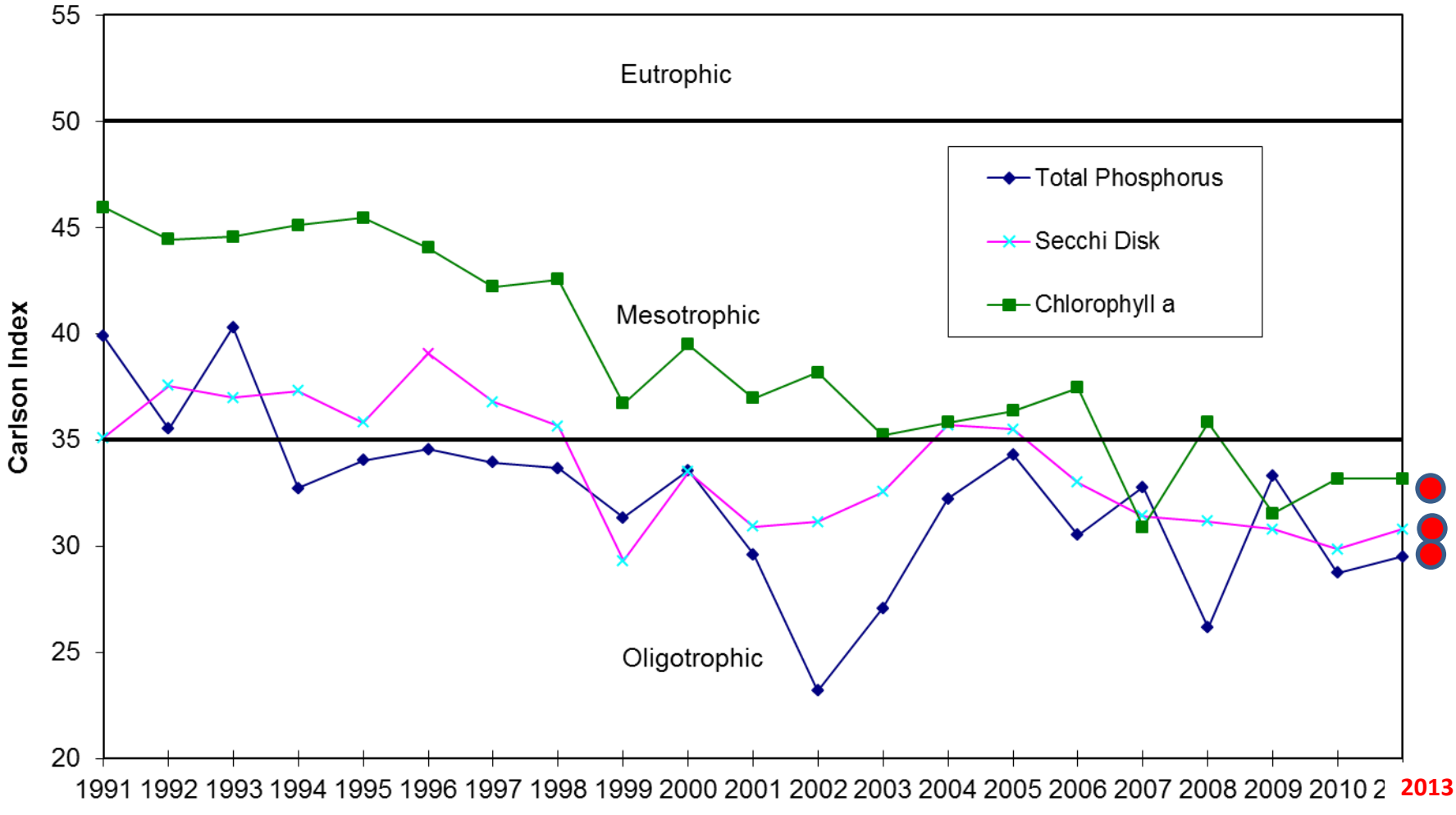
Total Phosphorus



Keuka Lake

Chlorophyll *a*




Keuka Lake Trophic Status
Carlson Index
55
50
45
40
35
30
25
20
Eutrophic
Mesotrophic
Oligotrophic
Total Phosphorus
Secchi Disk
Chlorophyll a
1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2
2013

Submersible Water Quality Probe

Depth
Temperature
Chlorophyll *a* (= algae)
Cyanobacteria (= blue green algae)
pH
Conductivity (= salts)

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Keuka Lake

Where is the algae/phytoplankton?

Low surface

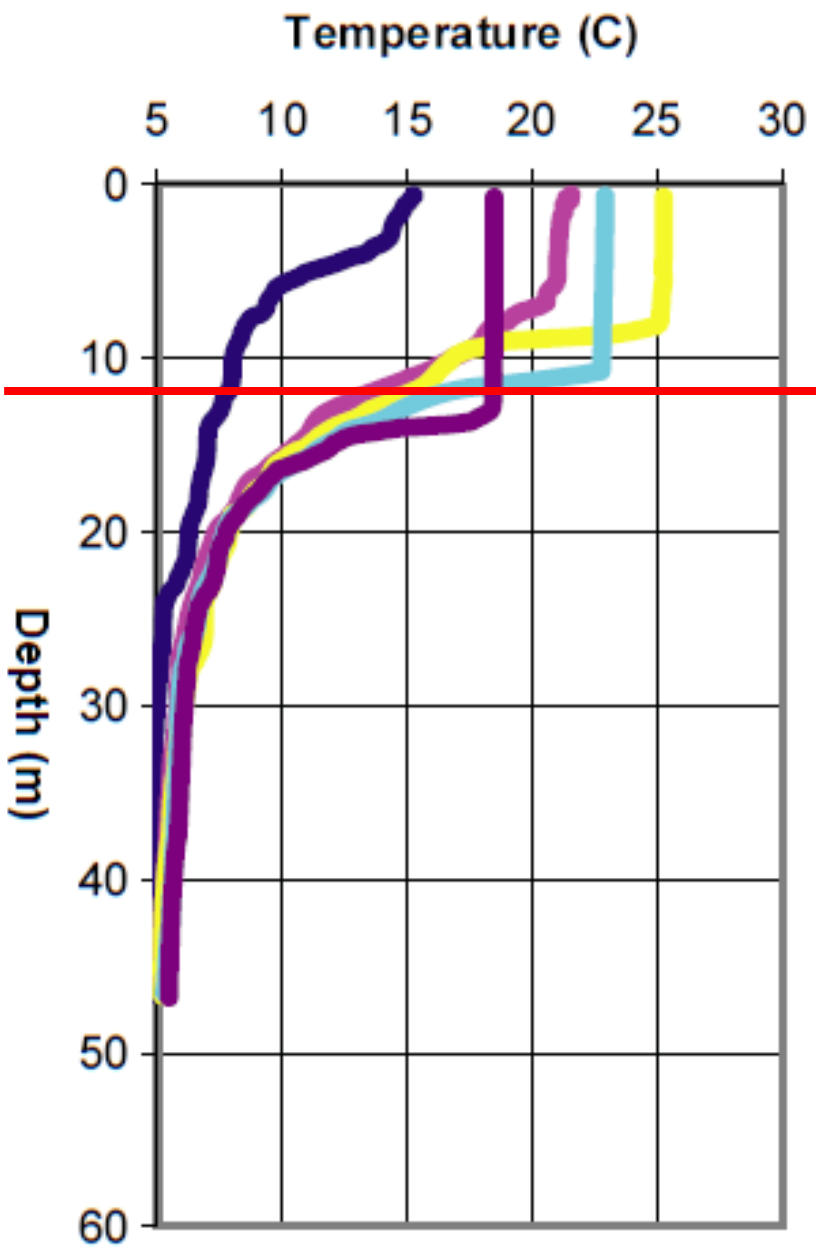
High Middle

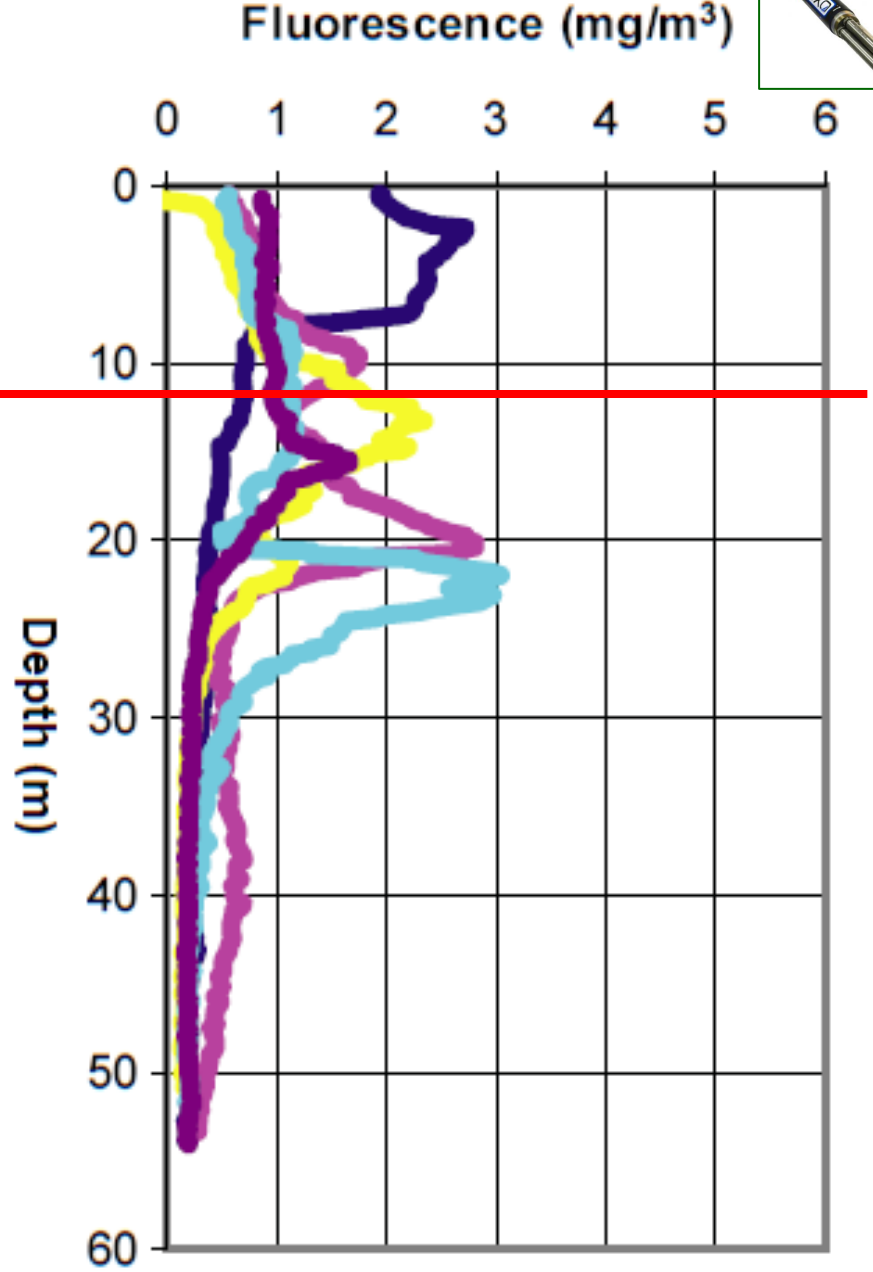
Low bottom

Site 1
Site 2
Temperature

Depth (m)

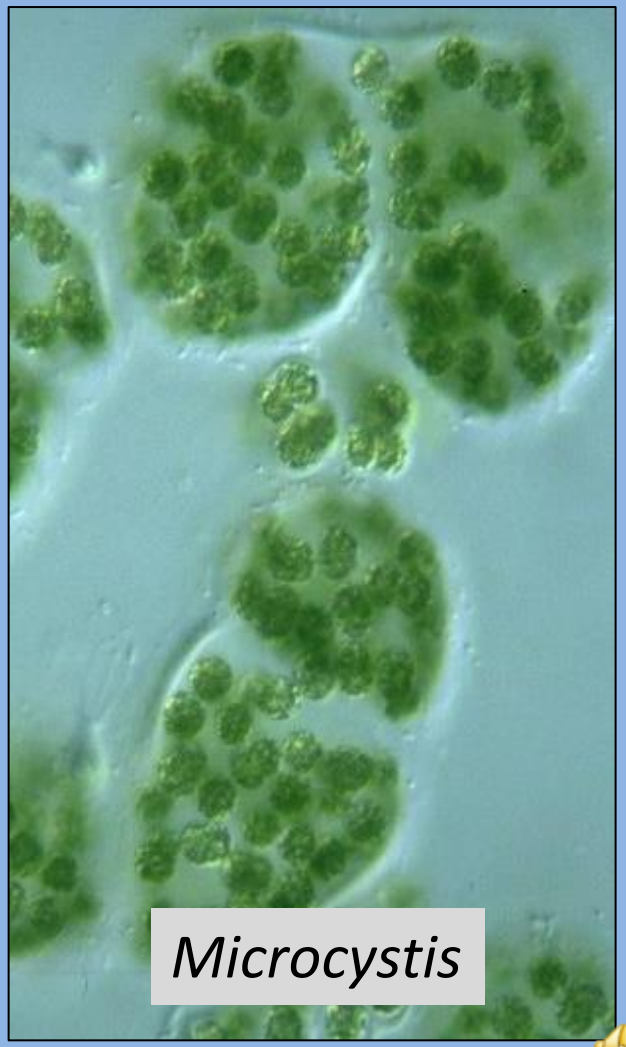
Chlorophyll *a* (µg/L)

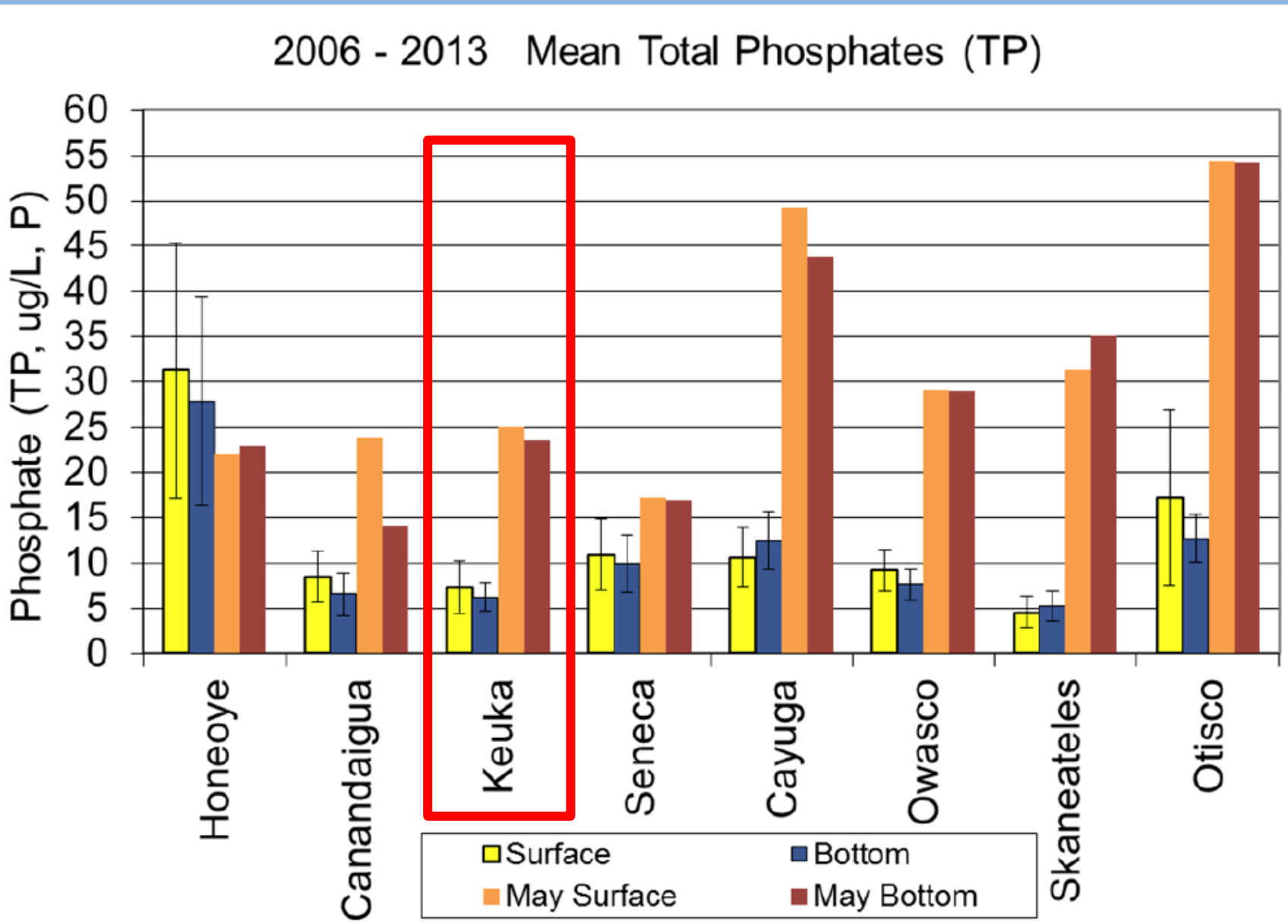

Temperature (C)
5
10
15
20
25
30
0
10
20
30
40
50
60
Depth (m)


Fluorescence (mg/m³)
0
1
2
3
4
5
6
0
10
20
30
40
50
60
Depth (m)

Cyanobacteria (= Blue green algae)

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





Data from **Dr. John Halfman**, Hobart and William Smith Colleges

State of the Lake

- 2013 data show the lake is in generally **good health**
- **Improving trends** in many important parameters (*algae*, *phosphorus*)
- Cyanobacteria levels continue to be **low** (but present!)
- Submersible probe yielding great results so far
- May 2014 storm dumped a lot of phosphorus in lake → could be a major issue later this summer, following years.
  - More macrophytes (seaweed)
  - More cyanobacteria

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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:

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