Crooked Lake Homeowners Association

Efforts to Maintain and Improve Crooked Lake

5/27/14

Crooked Lake Homeowners Board

Officers

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Crooked Lake Homeowners Association

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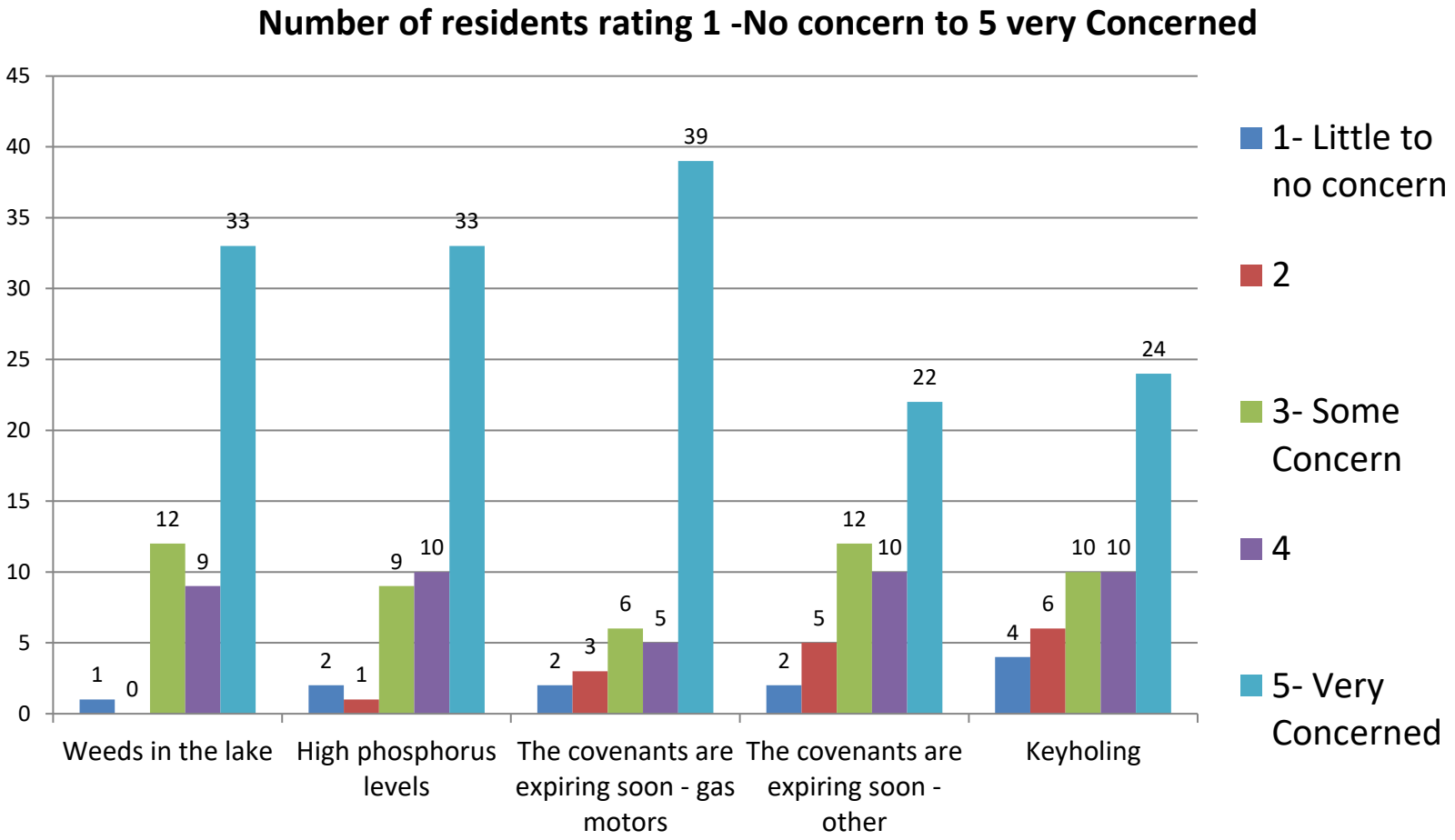
2012
Survey Results

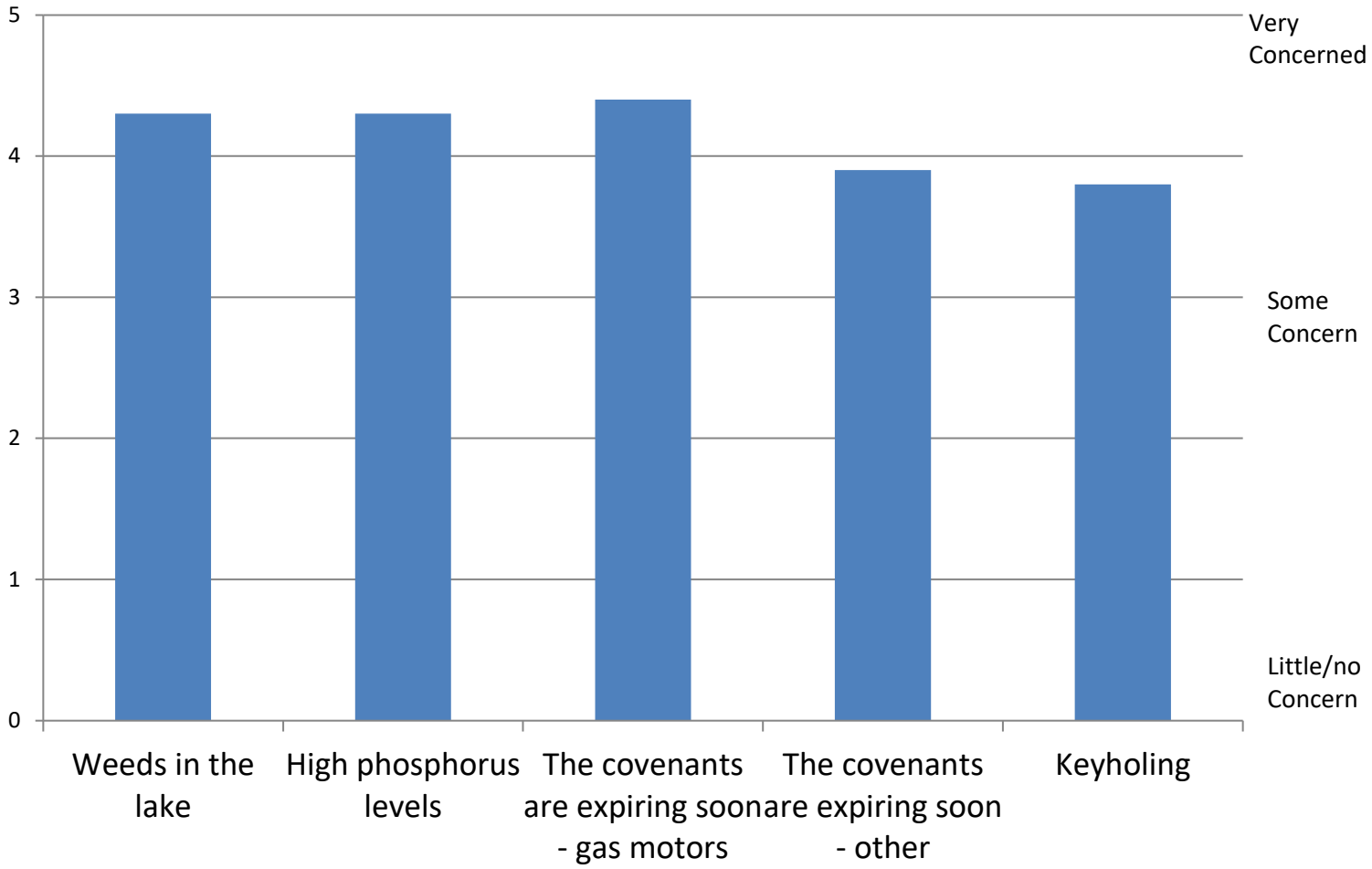
In the Fall of 2012, 55 of 62 households on Crooked Lake responded to a survey about lake concerns



The great majority of residents are **concerned or very concerned** about

- **Weed growth** (42)
- **High phosphorus** levels in the lake (43)
- **Expiring covenants** in general – (32)
- **Expiring covenants concerning gas motors** (43),
- **Keyholing** - The ability of one property to allow multiple other properties onto the lake (34)

Average Ratings on 2012 Crooked Lake Survey
55 of 62 Households on Crooked Lake



Crooked Lake Homeowners Association

How's the water??

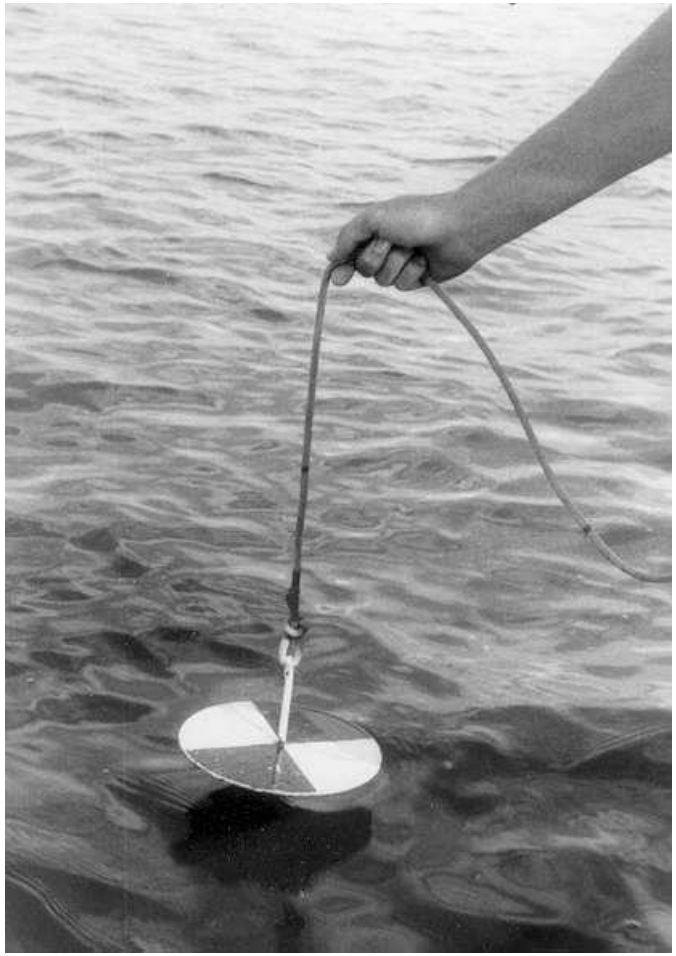
Results of Water Quality Testing

(1986 to 1990, 1993 to 1998, and 2009 to 2013)

How is data collected?

Water clarity is measured using a Secchi Disk.

The depth at which the disk disappears from sight when lowered into the water is a measure of water clarity.



How is data collected?

What water 'qualities' are measured?

- Phosphorus,
- Conductivity
- pH
- Color (true)
- Nitrogen (nitrate, ammonia)
- Chlorophyll a
- Calcium

Samples are taken every two weeks over the Summer for 8 total samples per year.

Collect water samples at 1.5 and 21 (bottom of lake) meters using this contraption called a Kemmerer Bottle

What is measured? (from www.dec.ny.gov/

Parameter	Importance
Water temperature (°C)	Water temperature affects the growth of plants and animals and the amount of oxygen in the water. It also affects the length of the water recreation season.
Water clarity (m)	Water clarity is measured with a secchi disk to measure how far down into the water column you can see.
Conductivity (µmho/cm)	Conductivity measures the amount of dissolved and suspended materials in the water, including salts and organic material. The amount of particles in the water may be related to geology or land use practices.
pH	pH measures water acidity. A pH value between 6 and 9 supports most types of plant and animal life.
Color (true) (platinum color units)	Water color is affected by organic matter (decaying plants). The color of water can affect water clarity and influence plant growth by limiting the amount of sunlight that can pass through the water.
Phosphorus (total, mg/l)	Phosphorus is an important nutrient for the growth of aquatic plants and animals in lakes. Too much phosphorus can harm aquatic life, water supplies, and recreational uses.
Nitrogen (nitrate, ammonia, and total dissolved, mg/l)	Nitrogen is also an important nutrient for the growth of aquatic plants and animals in lakes. Too much nitrogen can harm aquatic life, water supplies and recreational uses.
Chlorophyll a (µg/l)	Chlorophyll a is the primary pigment in green plants and estimates the amount of algae in a lake. The amount of chlorophyll a may be influenced by the amount of phosphorus and can affect the water clarity.
Calcium (mg/l)	Calcium is an important nutrient for most aquatic organisms and is required for mussel shell growth. Calcium enters lakes through natural limestone deposits. Calcium concentration is related to lake conductivity and improves the lake's buffering capacity to acid rain.
Use Impairment Surveys	Four question survey on the Field Observation Form that capture the user's observations of the quality of the lake for recreational use. This information is then linked to the water quality data.

What have we found?

The Bottom Line

- Clarity - Lower… The lake is less clear (But may be improving based on summer 2013 data)
- Phosphorus – Higher (But may be improving)
- Algae levels - Higher (But not in range that we would tend to see a lot of harmful algae blooms or HABs. No HABs have been detected in Crooked Lake but without intervention we are at risk.)
- Plant growth is quite bad in some areas
  Affecting lake use for many who live on the lake

At the bottom of the lake (about 70 feet) Phosphorus and Ammonia levels in recent years have been high and oxygen is very low.

Bottom Line

Crooked Lake is a great lake for swimming, boating and fishing (as well as to look at) but we see some threats to its health and our enjoyment:

- Excessive weed growth
- Increasing Phosphorus
- Less water clarity

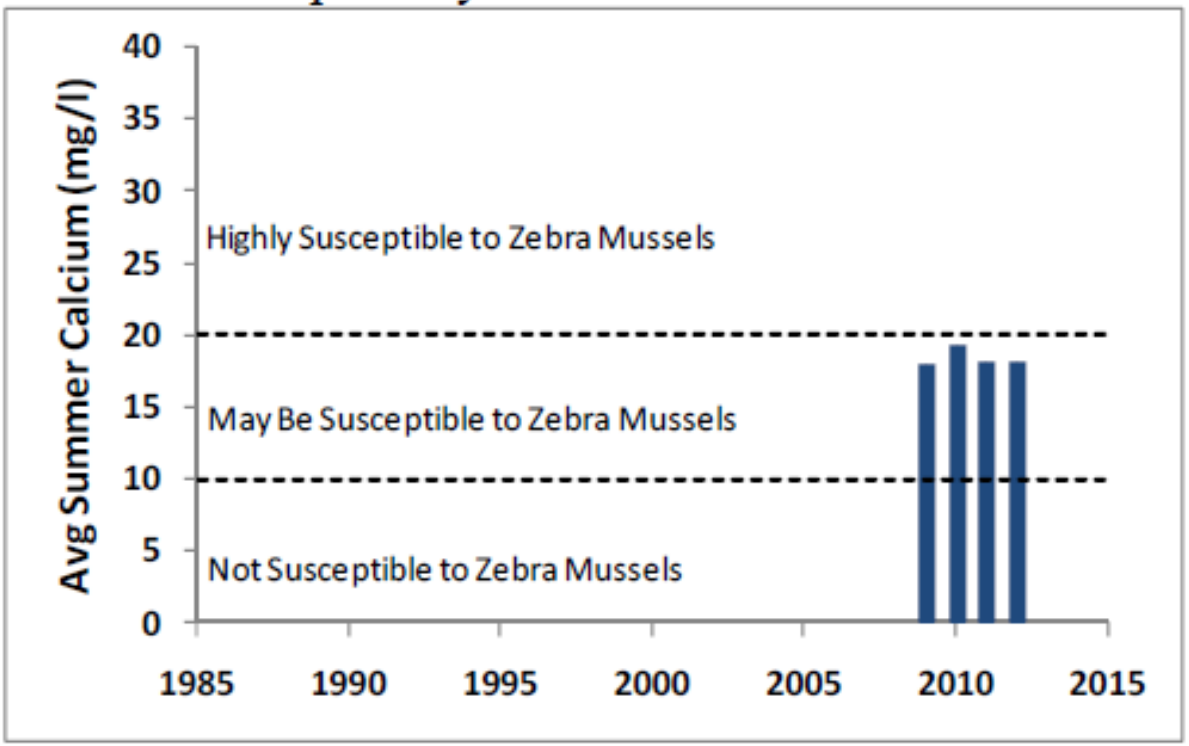
Calcium

Crooked Lake Long Term Trends

From 2012 CSLAP Lake Water Quality Summary (Scott Kishbaugh DEC)

Long Term Trends: Calcium

- No trends (yet) apparent
- Most readings indicate moderate susceptibility to zebra mussels



Crooked Lake has less calcium than some other lakes in the area making it **less susceptible to Zebra Mussels**.

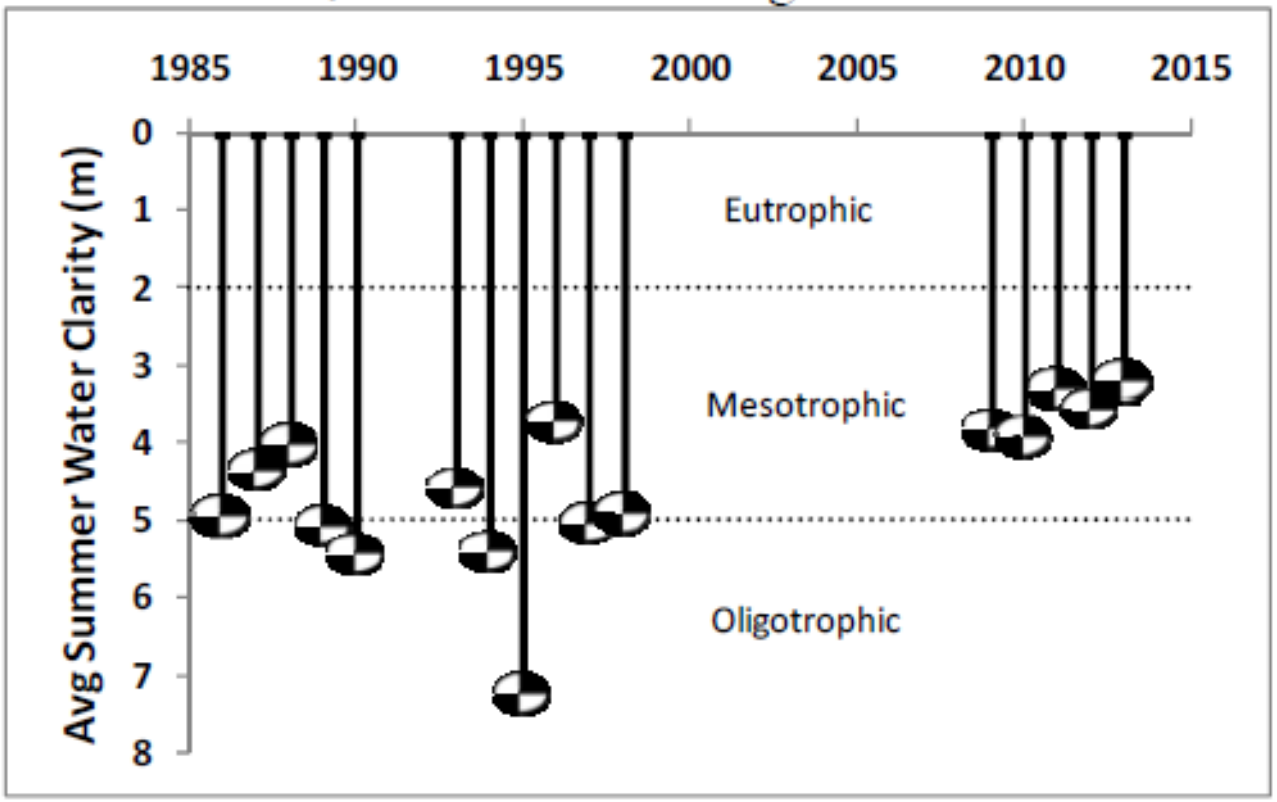
We still need to take precautions such as washing boats before they come into Crooked Lake from another lake.

Water Clarity

Crooked Lake Long Term Trends from 2012 CSLAP Lake Water Quality Summary (Scott Kishbaugh DEC)

Long Term Trends: Water Clarity

- Lower clarity last 4yrs, but no clear trend
- Most readings now typical of *mesotrophic* lakes, consistent with algae and TP levels

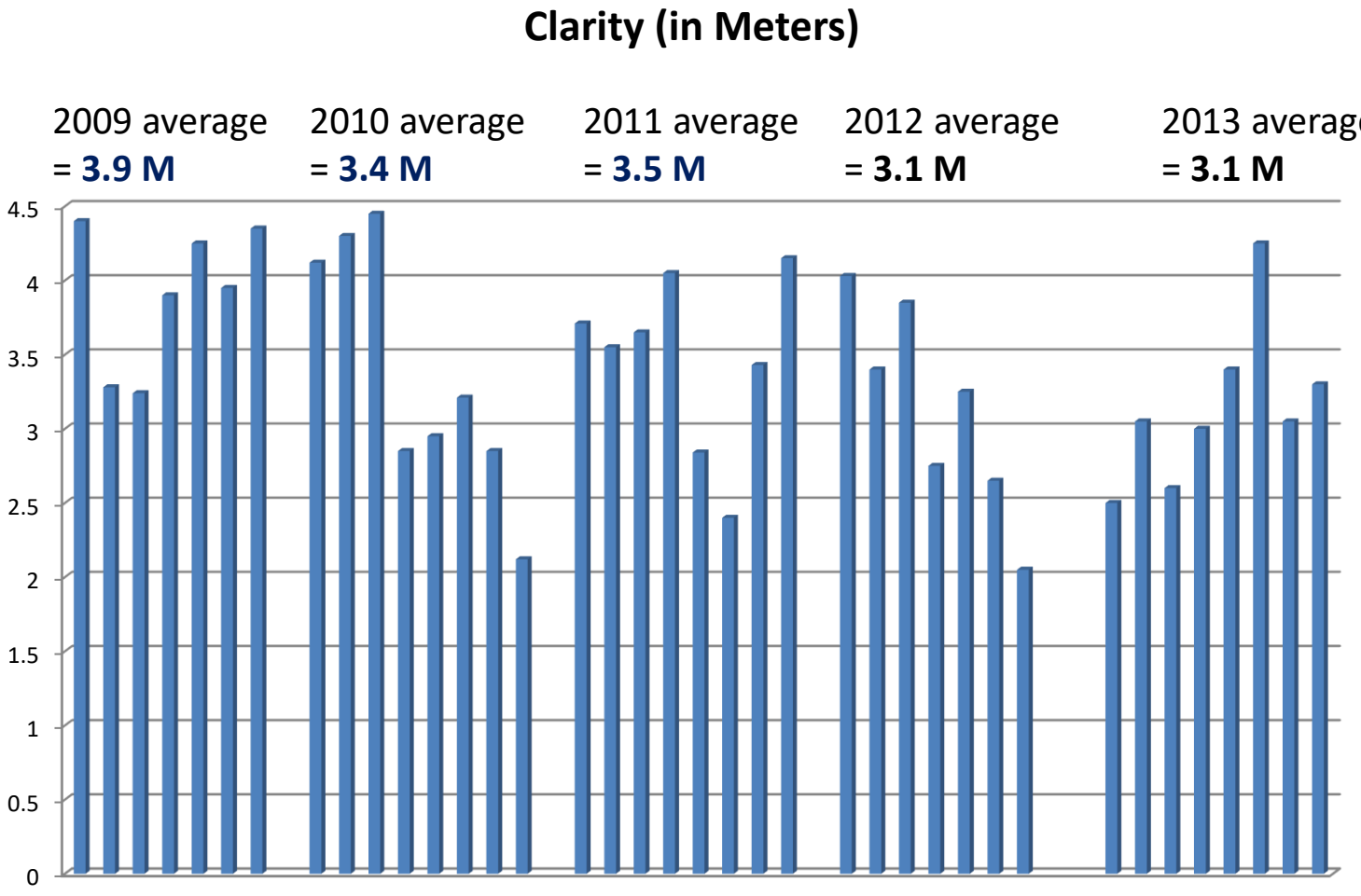


Water clarity between 1985 and 1998 was generally between 4 and 5 Meters

From 2009 – 2013 water clarity has averaged between 3.1 and 3.9 Meters

Trend???

Trends from 2009 – 2012 Water Clarity
(How far down into the water can you see?)



Water clarity between 2009 and 2012 has deteriorated by about .8 Meters.

Average clarity 2013= 3.1 M

Average clarity Between 1986 and 2013 was 4.2 Meters

How can phosphorus effect a lake?

Crooked Lake

Oligotrophic
Really really clear

Mesotrophic - Us!
Clear with some and in some areas excessive plant growth

Eutrophic
High phosphorus, rampant plant/algae growth – not good.

***This is what we are working to avoid*.**

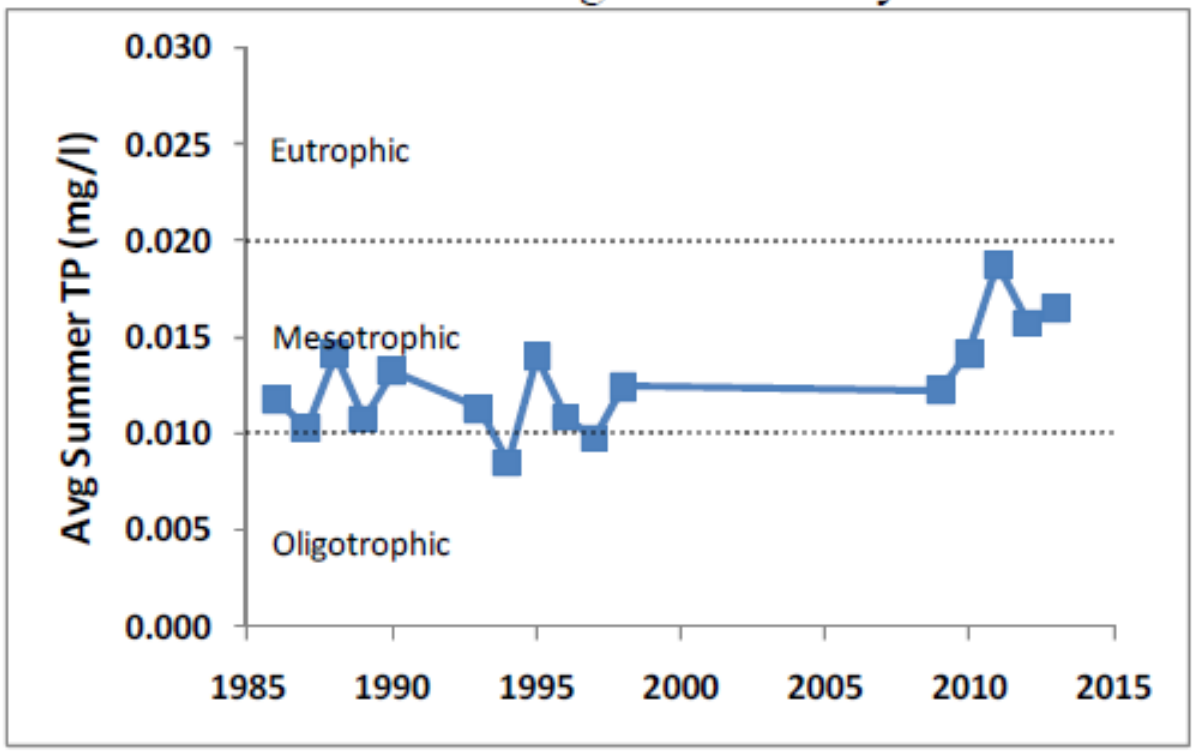
Phosphorus

Crooked Lake Long Term Trends

From 2012 CSLAP Lake Water Quality Summary (Scott Kishbaugh DEC)

Long Term Trends: Phosphorus

- Increase may not be statistically significant
- Most readings typical of *mesotrophic* lakes, consistent with algae and clarity



Phosphorus levels have increased since 1985. Phosphorus contributes to weed growth as well as algae.

2011 phosphorus levels were especially high. We approached Eutrophic status

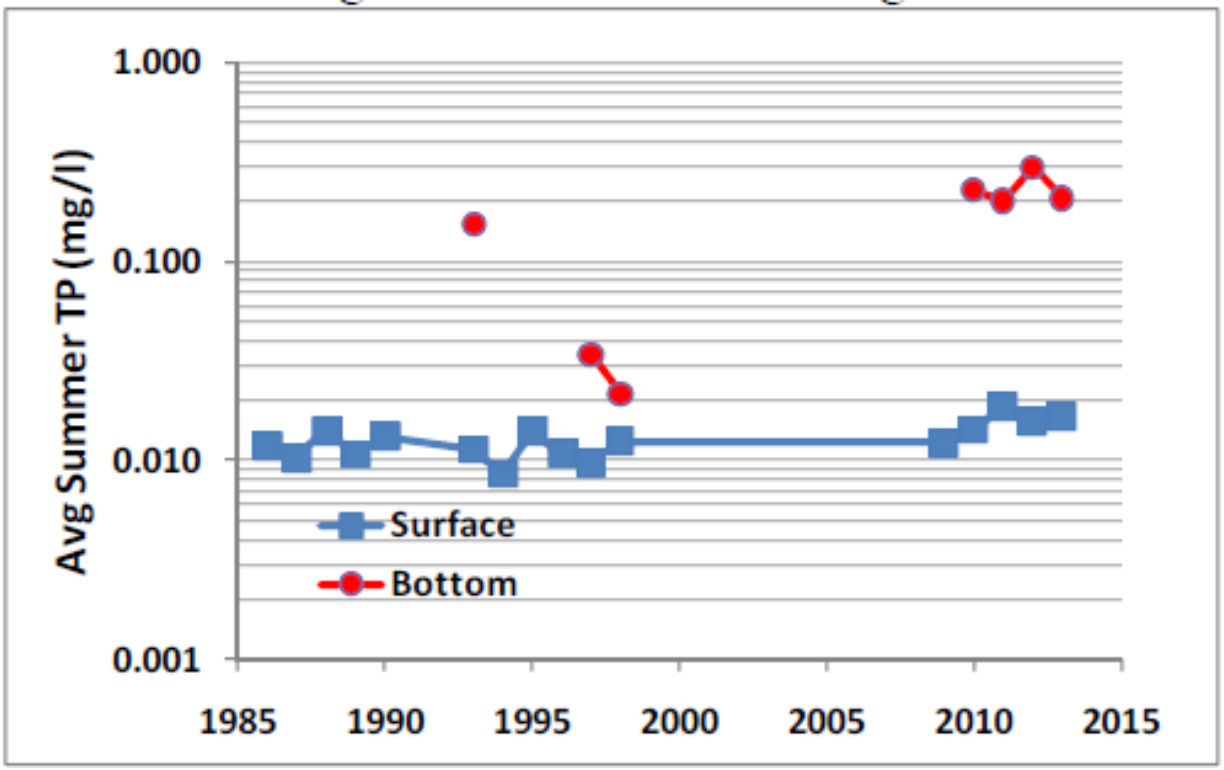
Phosphorus

Crooked Lake Long Term Trends

From 2012 CSLAP Lake Water Quality Summary (Scott Kishbaugh DEC)

Long Term Trends: Bottom Phosphorus

- At times significantly higher bottom TP
- Bottom TP may indicate some nutrient loading to surface levels during late summer



Phosphorus levels at the bottom of the lake (about 70 feet) are high and have increased.

Phosphorus at bottom 'mixes' with surface level in late summer/fall.

Phosphorus – Potential Sources

Farm Run off ?? (Has there really been an increase in this over the past 30 years?)

Residential Septic ?? - Crooked Lake consists of relatively new homes with modern septic on 1+ acre lots. Detergents are now phosphate free.

Lawn fertilizer?? (If you have to please keep it minimal and use lower phosphate blends)

Song Mountain Resort?? Tributary running past Song Mountain feeds into Crooked Lake. Their septic is 'self monitored'.

Streams flowing into Crooked Lake - Tested in 2011 had minimal phosphorus levels with one tributary showing .010 in 2012.

Geese?? Some studies indicate that fall gathering can be a major contributor of phosphorus.

So, What are we doing about it??

What are we doing about it??

Phosphorus (and thus clarity)

- Geese dispersion techniques
- Ongoing monitoring of Crooked Lake water though CSLAP testing as well as additional testing

Weeds

- Efforts to decrease phosphorus (cut food supply)
- Added grass carp Spring 2013 and Spring 2014 (Thanks to our neighbors on the North Cove!)
- Weed survey (ESF)?

Geese

There has been a significant increase in the resident goose population over the past several years.

Increase in lake phosphorus levels (especially at the lake floor) has been associated with geese.

1 goose lets loose up to 1.5 pounds of manure per day

In the fall of 2010 it was estimated that there were about 1000 ‘resident geese’ on Crooked Lake on a given day.

Geese - In the fall of 2011 it was estimated that there were about 1000 ‘resident geese’ on Crooked Lake on a given day.

In late December 2011, surface and deep water samples were collected. (This was an independent effort by Crooked Lake Assoc. apart from CSLAP.)

Phosphorus levels in December 2011 were very high at surface and deep water (by December the bottom waters had mixed with surface waters).

Winter 2011 Deep Water = .019 mg/l

Winter 2011 Surface Water = .021 mg/l

1986 – 2012 Summer Average = .013 mg/l

Summer Average 2012 = .016 mg/l

Summer average 2013 = .017 mg/l

Geese - In the fall of 2011 it was estimated that there were about 1000 ‘resident geese’ on Crooked Lake on a given day.

In the fall of 2012 bird whistlers were used to chase the geese off of the lake. About 5-6 residents participated in this effort to disperse the geese. There was also limited hunting of geese allowed on the Crooked Lake.

There were far fewer geese on the lake in the fall of 2012 and fall of 2013.

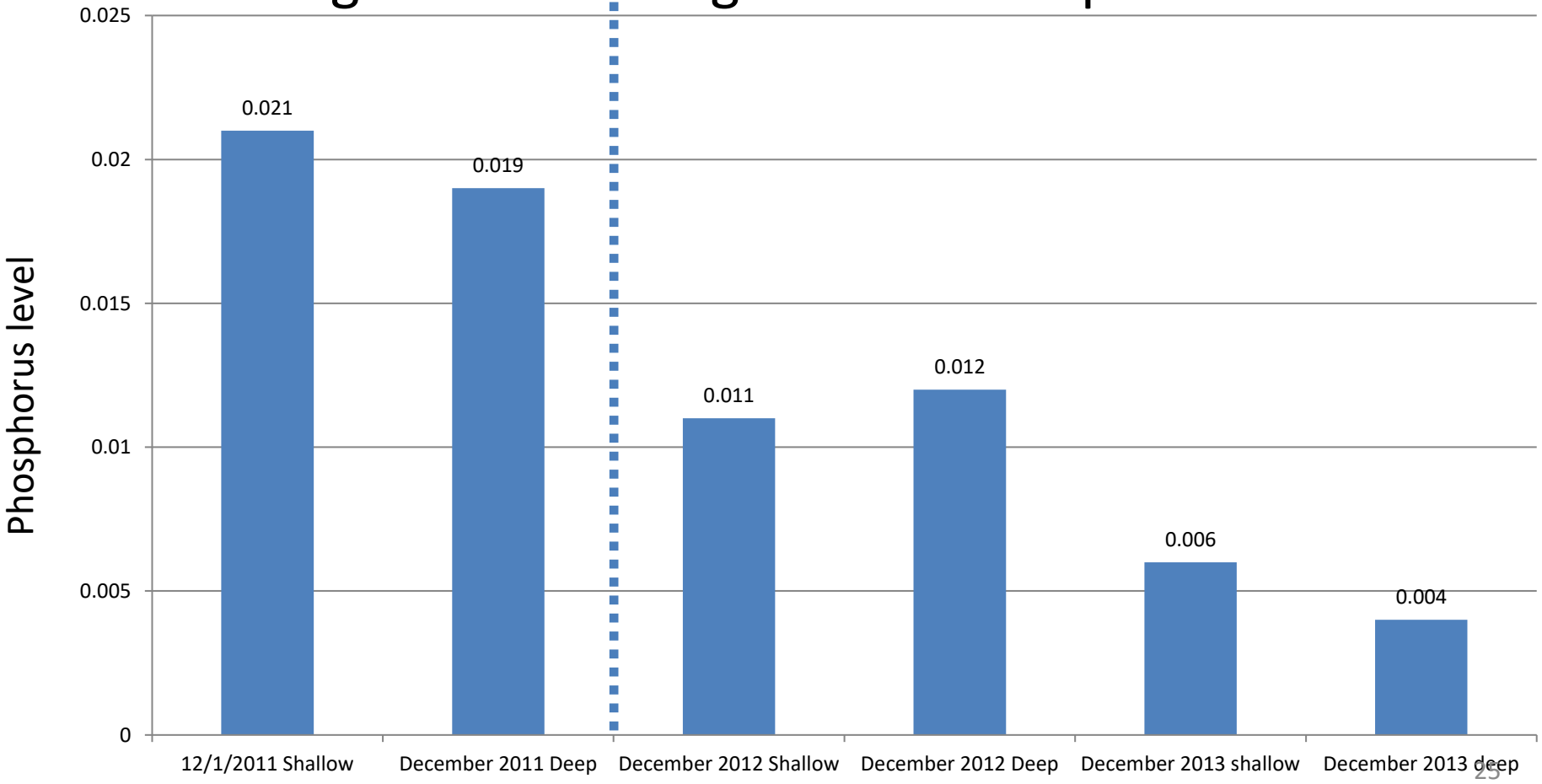
Data was collected again in December 2012 and December 2013.

Winter Phosphorus levels before and after geese

Phosphorus levels in December 2012 were almost ½ of what they were in 2011 and ¼ of 2011 levels in 2013!!!

Winter 2011 – With 1000 geese

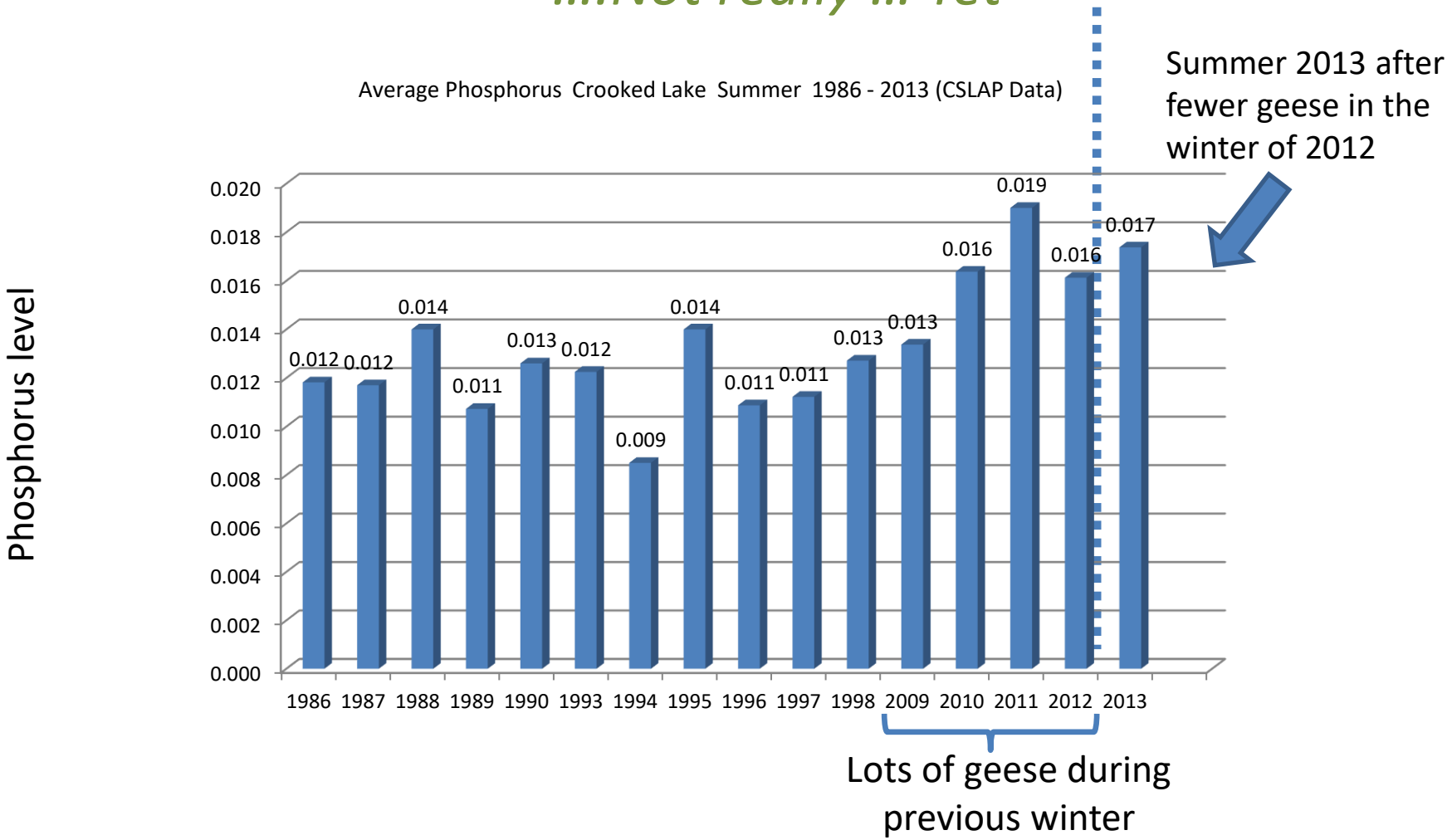
Winter 2012 and 2013 - Fewer geese after dispersion efforts



Phosphorus levels before and after geese

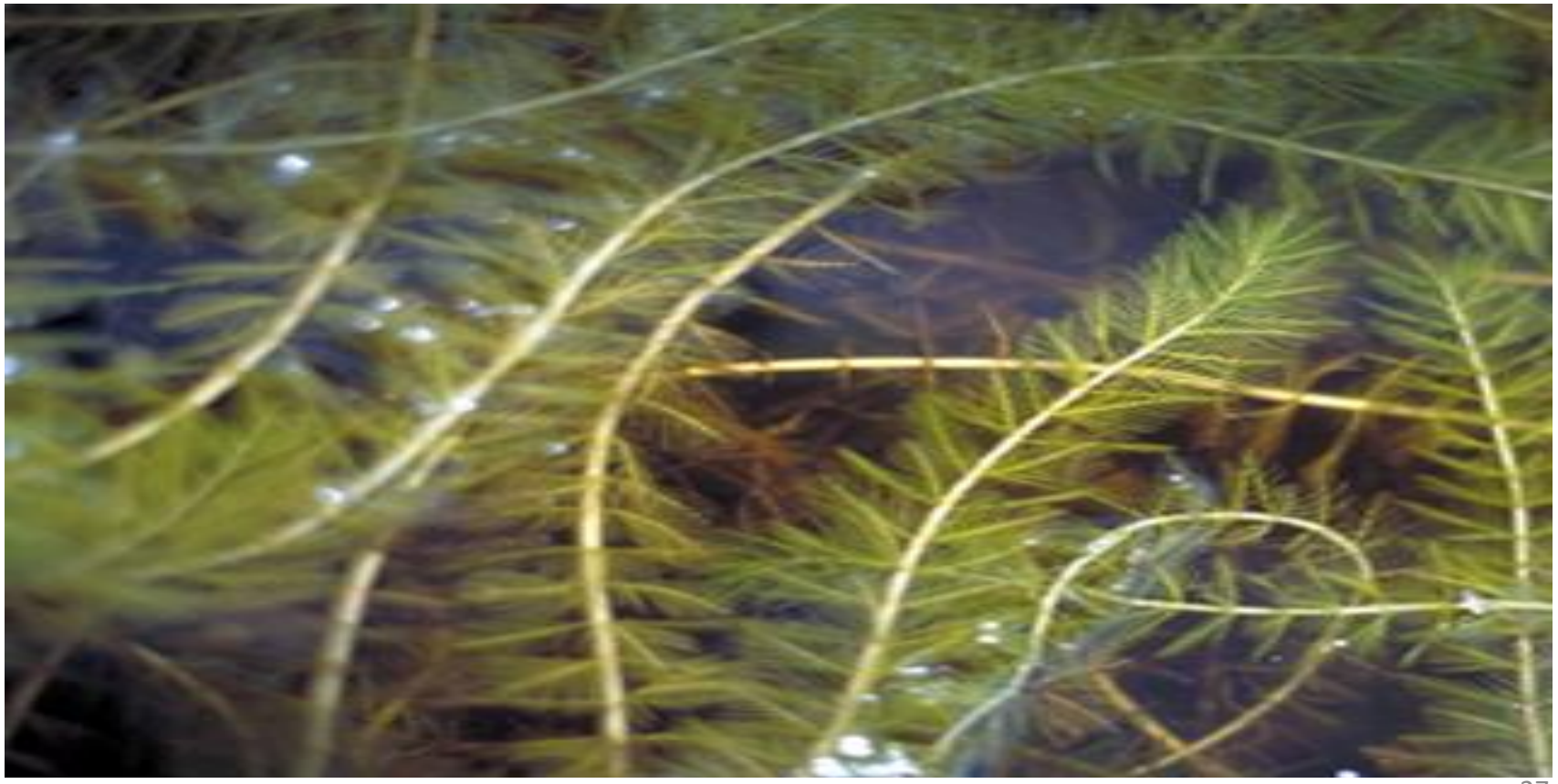
*Did decreased **winter** phosphorus levels in 2012 lead to decreased **summer** phosphorus levels in 2013?*

….Not really … Yet



Efforts to reduce weeds in the lake

(Note: this is Eurasian Milfoil. We also have a similar type of milfoil that is native to freshwater lakes in Central NY



Weeds

It is hoped that decreasing phosphorus will help to slow weed growth as phosphorus is the gatekeeper nutrient source for aquatic plants and algae.

Eurasian Milfoil

Hydrilla

We want to make special efforts to identify and protect against these two invasive species of weeds.

In the summer of 2011 four households on the north cove of Crooked Lake used their own funds to harvest weeds in their section of the lake with little success (the weeds came back).

Spadderdock

Water lily

In 2013 four household on the north cove of Crooked Lake obtained a 3 year DEC permit for **600 grass carp and stocked 200 in the spring of 2013, and 200 in the spring of 2014** with their own funds.

Results are yet to be determined as it may take several years to see benefits as the fish grow.

Other efforts to maintain our lake water quality

Crooked Lake supports Cortland Onondaga Federation of Kettle Lakes (COFOKLA). This groups works to increase understanding of lakes in our area through:

- Presentations by experts in lake ecology
- Provide awareness of various threats to local lakes (from zebra muscles to harmful algae blooms to fracking)

Please consider coming to these meetings!

Other efforts to maintain our lake quality

We are currently working on **extending the protections** afforded by our soon to expire protective covenants.

We need input from all lake residents so that we can work together to maintain our beautiful lake.

Extending the protections provided by expiring covenants

Before

After

Expiring Covenants

• Covenants sunset 40 years after it's lot was sold with the first group set to expire 2014.

• Most provisions related to lot development and use are now addressed by Town Zoning and Ordinances

• Residents are concerned about motor boats, keyhole development and water quality.

The board has consulted attorney Tom Blair concerning possible options

Protections not covered in Town Ordinance/Zoning

Covenants had kept gas powered craft off of the lake preserving its esthetic beauty

Banning gas powered vehicles from the lake also decreases the likelihood of introduction of invasive species such as zebra muscles and hydrilla

Protections not covered in Town Ordinance/Zoning

Keyholing allows one property owner to grant lake access to several other properties (e.g., a development across the road from a lake). This could cause overcrowding and have a significant negative impact on Crooked Lake.

'No keyholing' would be a new protection

Protections not covered in Town Ordinance/Zoning

It has been suggested that Crooked Lake could be used for mining operations (as it had been used for Allied ’s brine operations in the distant past)

A provision against use of lake resources (land, water, minerals) for commercial ventures would be an additional protection the HOA Board is proposing.

Protections not covered in Town Ordinance/Zoning

Finally, the new proposed Bylaws and DCCR would help to **ensure best practices are employed to preserve water quality and prevent invasive species colonization (zebra mussels etc.)**

Homeowners are asked to disinfect boats that have been in other lakes prior to bringing them into Crooked lake.

Continuing Covenant Protections and including additional ones

Recommendation 1: Including 'Rules of Conduct' in Crooked Lake updated HOA Bylaws

ARTICLE IX - MEMBER RULES OF CONDUCT

- **No member shall operate, endorse, permit or allow the operation of any motorized watercraft on Crooked Lake** other than watercraft powered by muscle, wind or battery driven electric motors. Motorized commercial watercraft engaged in Board sanctioned lake maintenance are permitted only for the duration of such maintenance activities. **(No gas powered vehicles on Lake)**
- No member shall **permit or offer for sale any property directly abutting or with deeded access to the lake that results in access to Crooked Lake** for more than one single family home constructed upon such property. **(No Keyholing)**
- No member shall permit, lease or sell any Crooked Lake natural resource (land, water, minerals) for use by any commercial venture.

  (No use of lake waters for fracking activities)
- Ensure best practices are employed to **preserve water quality and prevent invasive species colonization** (zebra mussels etc.)

Continuing Covenant Protections and including additional ones

Recommendation 2: Declaration of Codes Covenants and Restrictions (DCCR)

A DCCR would be prepared by Crooked Lake HOA with the assistance of an attorney. Once a property owner signs a DCCR, it is attached to the deed. The DCCR would enforce the following protections for Crooked Lake:

- **Prohibit motorized watercraft** or other vehicles on the lake
- **Protect against "keyholing"**
- **Prohibit any commercial natural resource extraction**
- Ensure best practices are employed to **preserve water quality and prevent invasive species colonization** (zebra mussels etc.)

Continuing Covenant Protections and including additional ones

The aforementioned updated Bylaws and DCCRs are ***proposals.***

We need input, support and accord among homeowners to accept bylaws and attach DCCR to deeds.

We will provide information at our June 8 party (2:00 – 6:00 with presentation at 3:00) 316 Long Road.

We will be voting on proposals at our September 7 annual meeting.

What you can do to help

- **Participate: Please come to the June 8 informational party and September 7 Annual Meeting**
- **Stay informed**
- **Provide input to the Crooked lake HOA Board**
- **Pay your dues**
- **Support covenant protection efforts**
- **Enjoy the lake!**