

**New York
Citizens Statewide Lake Assessment
Program (CSLAP) and Buckingham Pond**

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NYS Department of Environmental Conservation

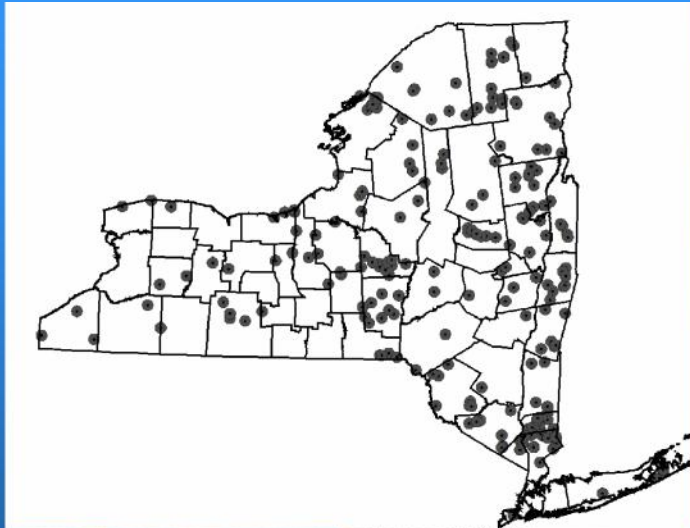


Citizens Statewide Lake Assessment Program (CSLAP)

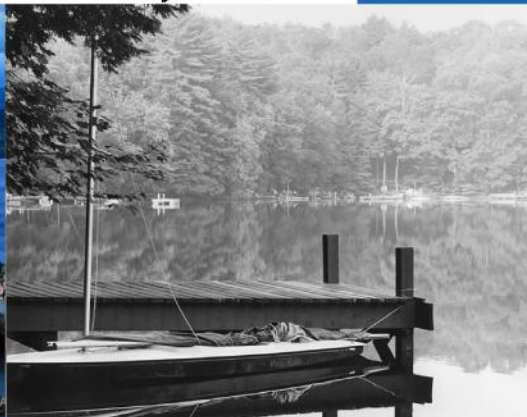
- State volunteer lake monitoring program
- Run jointly with NYS Federation of Lake Associations (statewide not-for-profit coalition of lake associations, environmental groups, fish/game clubs, park districts)
- Initiated 1985 with 25 lakes and 150 volunteers—no lake size limits, public and private lakes included
- ECL 17-0305 (1988) mandates program



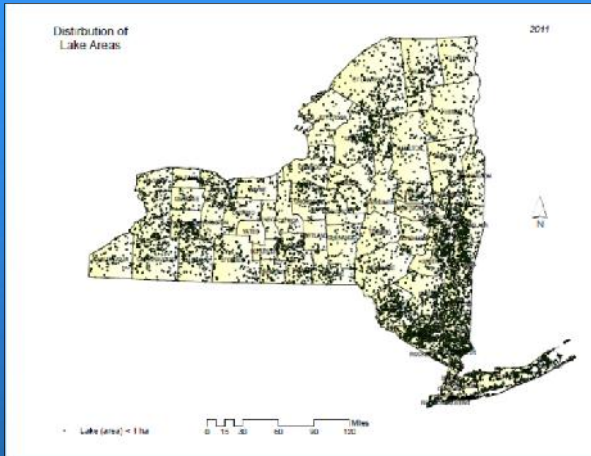
Citizens Statewide Lake Assessment Program (CSLAP)



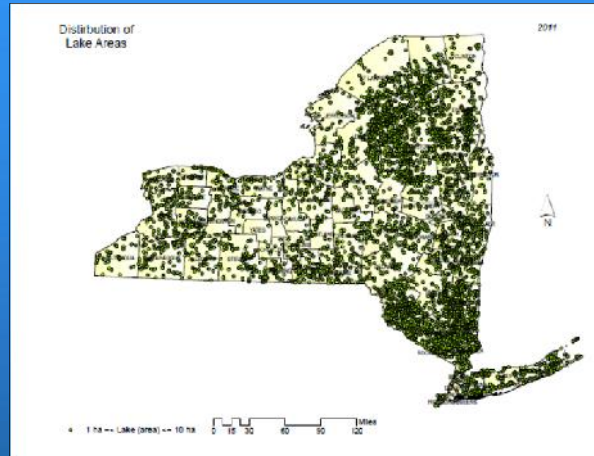
- Program continuous 1986-present
- By 2012: >20,000 samples at 240 lakes over 1-26 years by >1700 volunteers; 2012 – 100 lakes
- Program focus on eutrophication
- Subsidized program:
 - State dedicates >\$100k in analytical services, \$10k contractual services (NYSFOLA for assistant coordinator), \$15k shipping, <\$10k equipment, 0.6 workyears staff time
 - NYSFOLA lake associations contribute appx. \$50k (\$350-450 per lake)



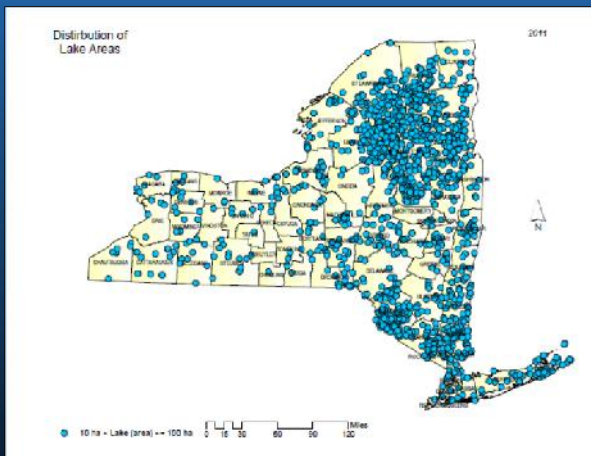
Why we need help



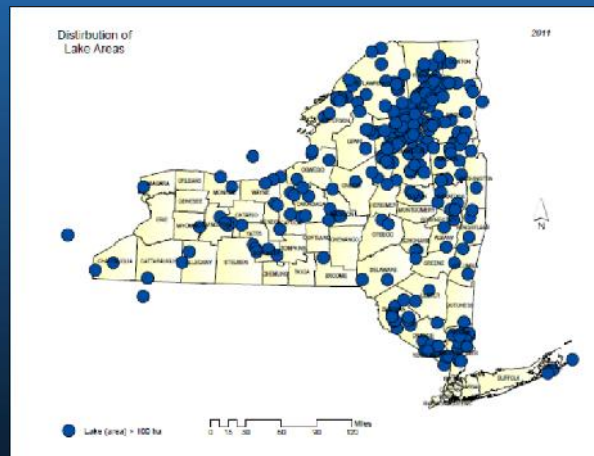
Ponded waters 0.3-3 acres



Ponded waters 3-25 acres



Ponded waters 25-250 acres



Ponded waters >250 acres

NYSDEC responsible for evaluating the state of NY water resources (private and public)

>20,000 lakes, ponds and reservoirs > 0.3 acres

4 NYSDEC DOW statewide monitoring staff- some assistance from regional DOW/DFW staff



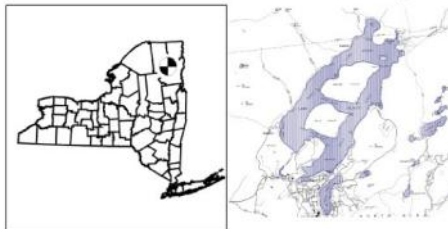
Responsibilities



Division of Water

New York
Citizens Statewide Lake Assessment Program
(CSLAP)
2008 Annual Report- Lake Placid

February, 2009



New York State Department of Environmental Conservation

- NYSDEC:
 - Overall program direction
 - Subsidizes most of program costs
 - Provides program coordinator
 - Develops QAPP, SOPs, sampling protocols, analytical test patterns
 - Coordinates laboratory contracts
 - Conducts volunteer training
 - Identifies macrophyte samples
 - Analyzes data, writes summary reports
 - Communicates results (EPA, agencies, lake associations, municipalities,...)
 - “Portal” to state government
 - ECL 17-0305 (1988) mandates program
- NYS Department of Environmental Conservation



Responsibilities

- NYSFOLA:
 - Day-to-day operation of program
 - Prepares sampling kits
 - Coordinates sample receipt and cooler transmission with laboratory
 - Handles most communication with volunteers
 - “Chooses” candidate lakes
 - Conducts volunteer training
 - Enters field data
 - Provides/maintains newsletter, annual conference, web page for program communication
 - Provides upfront costs and outside push when state budget/red tape delays program



Responsibilities



- Volunteers:
 - Member association of NYSFOLA
 - Participate in group or individual training
 - Follow CSLAP sampling protocol
 - Collect and process water and plant samples
 - Collect field and lake perception measurements
 - Send and receive samples from laboratory
 - Maintain equipment and supplies
 - Communicate results to lake association
 - Provide lake management information to DEC/NYSFOLA
 - Tell DEC and NYSFOLA what we are doing wrong



Citizens Statewide Lake Assessment Program (CSLAP)

- Core program:
 - All lakes sampled 8x per year- biweekly from May/June through September/October
 - Surface samples analyzed for nutrients, algae, color, pH, conductivity, calcium
 - Hypolimnetic samples analyzed for nutrients, iron, manganese, arsenic
 - Field data includes water clarity measurements, standardized lake perception
- Most lakes sampled single site in deepest part of lake-multiple sites established at larger lakes
- Limited plant surveys conducted at some lakes—DOW identifies plants and translates info to maps
- 2009-2013 NYSDOH harmful algal bloom study uses CSLAP volunteer network to evaluate toxic algal blooms
- 2011-2014 SUNY ESF HAB study of screening and algae toxin assessment tools in support of DEC HAB notification network



Buckingham Pond and CSLAP

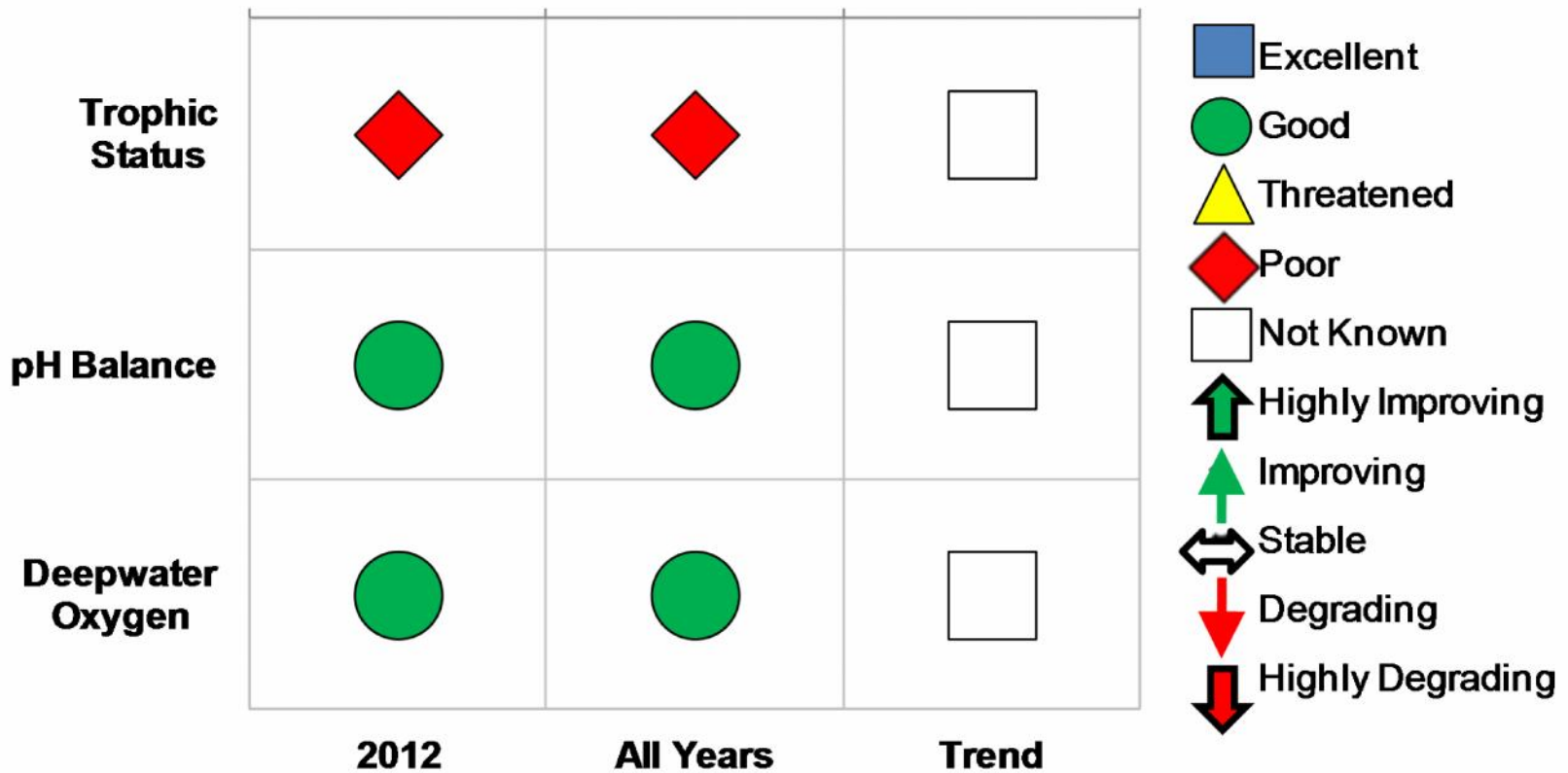
- Buckingham Pond Conservancy joined the NY Federation of Lake Associations in 2010
- Buckingham Pond sampled through CSLAP in 2011-2012
- Annual summary reports available on DEC (2011) and NYSFOLA web pages (all years)



The condition of each lake characteristic is represented by a color scale:



Water Quality



Buckingham Pond vs. Other Lakes and “Standards”

- Buckingham Pond- 1-2 m
- Washington Park Lake- 0.5-1.0m



- Class C Lake- 2-3 m
- Lower Hudson River Basin Lake- 2-3 m
- Typical NYS Lake – 2-3 m
- 25% Buckingham Pond readings below state DOH guidance for swimming beaches (=4 ft)



Total Phosphorus: Buckingham Pond vs. Existing WQ Standards?

- State Guidance Value = 20 $\mu\text{g}/\text{l}$ (= 20 ppb)- this is equivalent to “Highly Productive” (*Eutrophic*) Lakes
 - **All 16 Buckingham Pond Samples > 20 ppb (31-260 ppb)**
 - **Buckingham Pond 2011 = 74 ppb; 2012 = 90 ppb**
 - All 8 Washington Park Lake Samples > 20 ppb (54-97 ppb)
 - Typical Lower Hudson Basin Lake = 21 ppb
- Moderately Productive (*Mesotrophic*) Lakes: 10-20 ppb
 - No Buckingham Pond Samples 10-20 ppb
 - Typical NYS Lake = 15 ppb
 - Typical Class C Lake = 14 ppb
- Unproductive (*Oligotrophic*) Lakes : < 10 ppb
 - No Buckingham Pond Samples < 10 ppb



Algae (Chlorophyll *a*): Buckingham Pond vs. Existing WQ Stds?

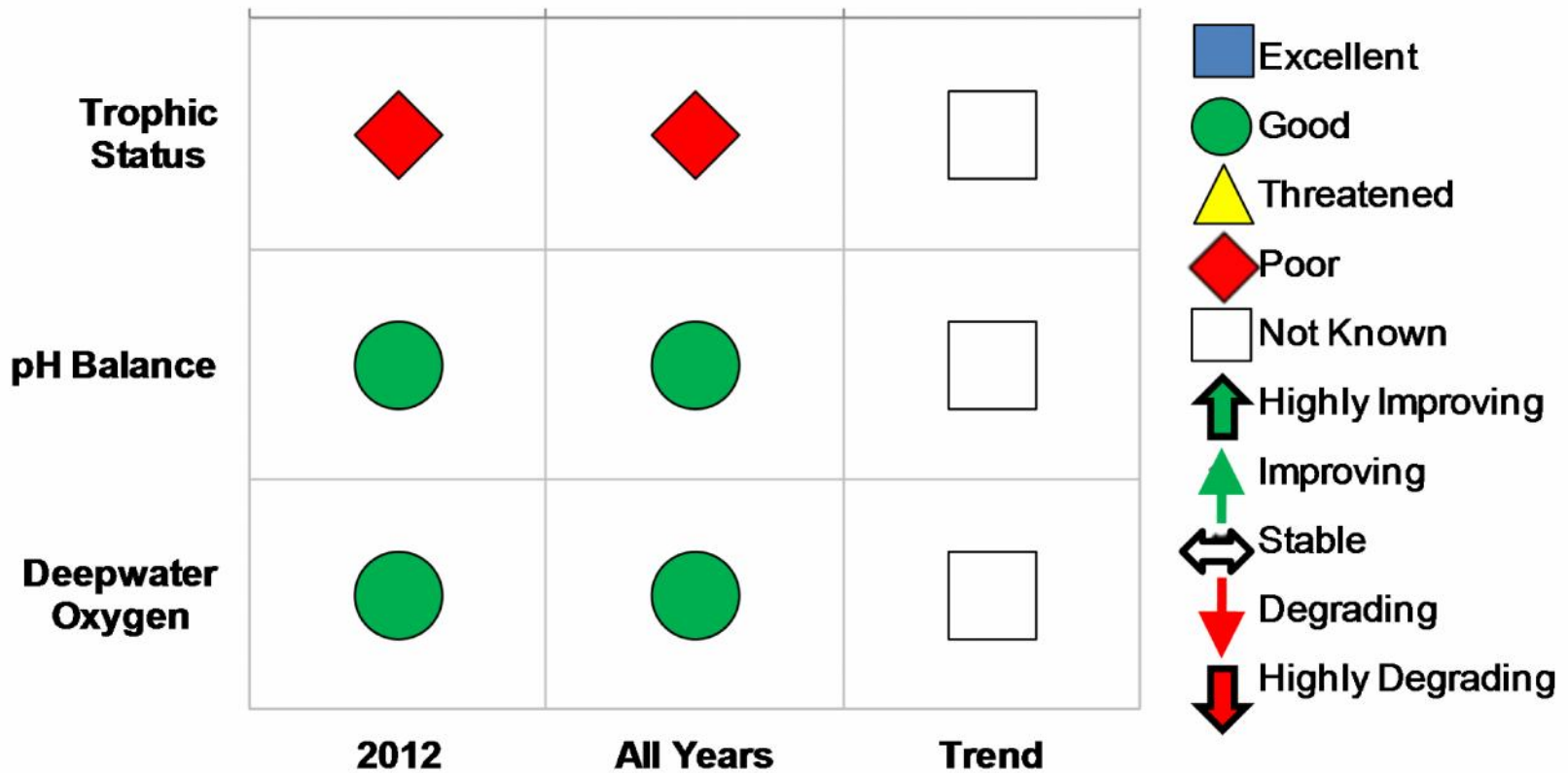
- No State Standards
- “Highly Productive” (*Eutrophic*) Lakes > 8 ppb
 - **63% Buckingham Pond Samples > 8 ppb (10-19 ppb)**
 - **Buckingham Pond 2011 = 7 ppb; 2012 = 16 ppb**
 - 75% Washington Park Lake Samples > 8 ppb (24-80 ppb)
 - Typical Lower Hudson Basin Lake = 10 ppb
- Moderately Productive (*Mesotrophic*) Lakes: 2-8 ppb
 - 24% Buckingham Pond Samples 2-8 ppb
 - Typical NYS Lake = 6 ppb
 - Typical Class C Lake = 5 ppb
- Unproductive (*Oligotrophic*) Lakes : < 2 ppb
 - 13% Buckingham Pond Samples < 2 ppb



The condition of each lake characteristic is represented by a color scale:



Water Quality



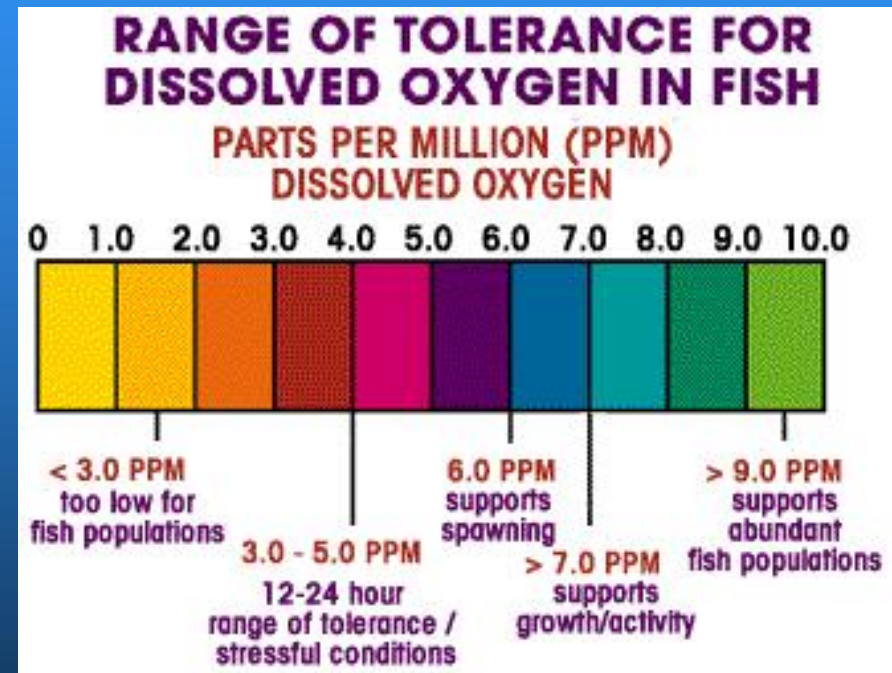
pH: Buckingham Pond vs. Existing WQ Standards?

- State Acceptable Standards pH 6.5 to 8.5
- **No pH readings in Buckingham Pond < 6.5 or > 8.5**
 - **Buckingham Pond 2011 = 7.3; 2012 = 7.4**
- All Buckingham Pond pH samples between 7.1 and 8.0
- Washington Park Lake = 6.7 – 8.1
- Typical NYS Lake = 6.75
- Typical Lower Hudson River Basin Lake = 7.5
- Typical Class C Lake = 6.7

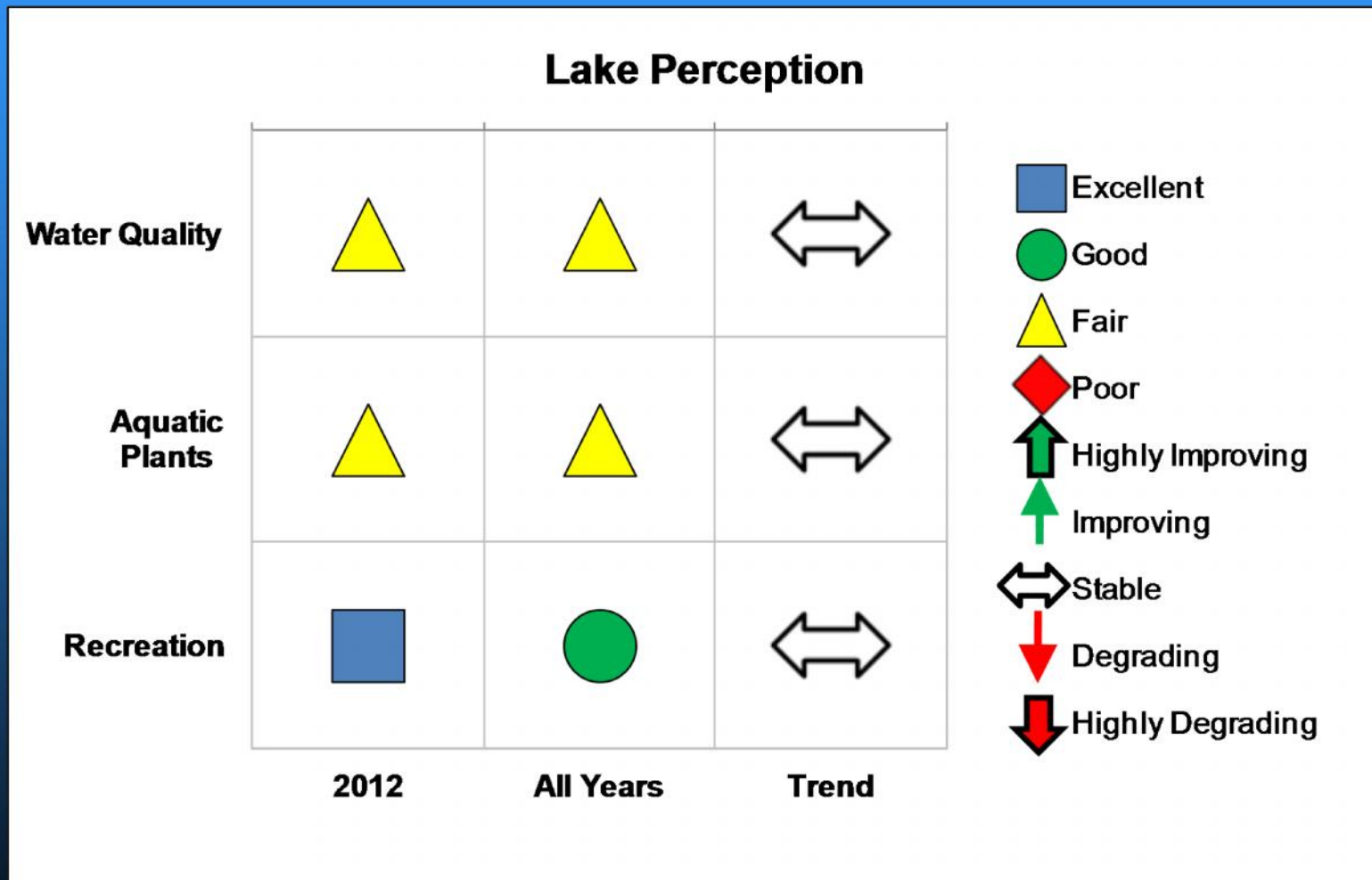


CSLAP Dissolved Oxygen Levels

- Dissolved oxygen not measured directly through CSLAP
- Most shallow, unstratified lakes have sufficiently high oxygen levels throughout lake

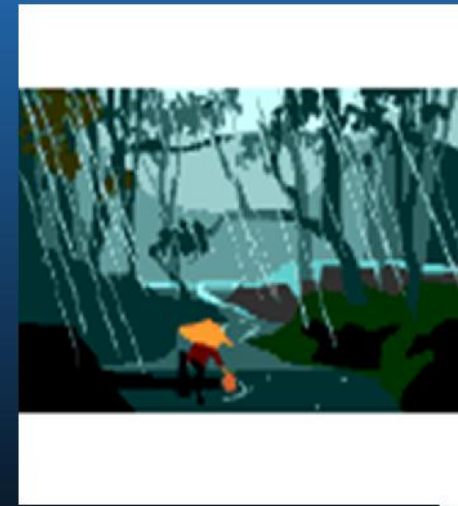


The condition of each lake characteristic is represented by a color scale:



CSLAP Use Survey Questions

- “How Does the Lake Look”- Responses Range from 1 (“Crystal Clear”) to 5 (“Severely High Algae Levels”)
- “Aquatic Plant Coverage”- Responses Range from 1 (“Not Visible from the Surface”) to 5 (“Dense Plant Growth Throughout the Lake”)
- “Recreational Suitability of the Lake”- Responses from 1 (“Could Not Be Nicer”) to 5 (“Recreational Use Impossible”)



What About Water Quality at Buckingham Pond?

- “Crystal Clear”: = 0% samples
- “Not Quite Crystal Clear”: = 40% samples
average clarity = 1.4 meters
average chlorophyll a = 12 ug/l
- “Definite Algal Greenness”: = 54% samples
average clarity = 1.2 meters
average chlorophyll a = 13 ug/l
- “High Algae Levels”: = 6% samples
- “Extremely High Algae Levels”: = 0% samples



What About Plant Coverage at Buckingham Pond?

- “No Plants Visible”: = 93% samples
- “Plants Visible Below the Surface”: = 7% Samples
- “Plants Grow to Lake Surface”: = 0% samples
- “Dense Plant Growth at Surface”: = 0% Samples
- “Plants Completely Cover Lake Surface”: = 0% Samples



What About Recreation at Buckingham Pond?

Not usually assessed by CSLAP volunteers due to little active recreational use

- “Could Not Be Nicer”: = 50% samples
- “Excellent for All Uses”: = 25% samples
- “Slightly Impaired”: = 25% samples
- “Substantially Impaired” = 0% samples
- “Lake Not Usable”: = 0% samples

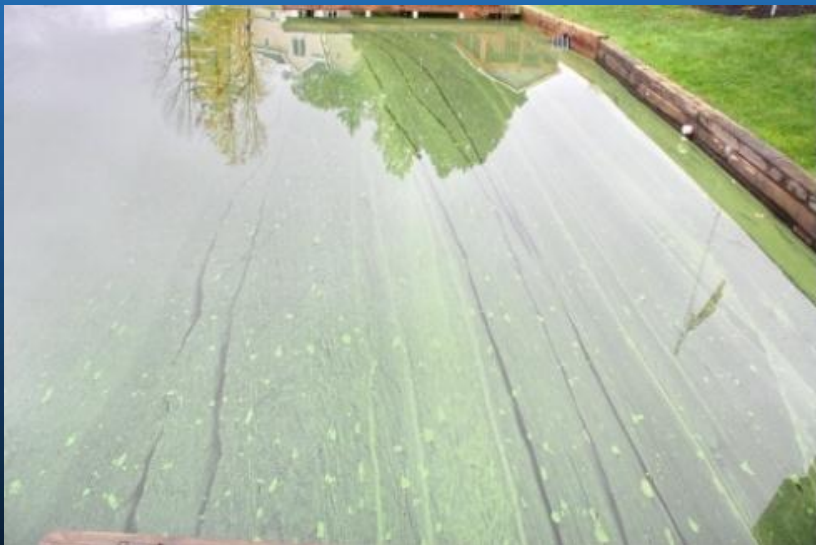


Biological Health Criteria

- 1. Presence of Invasives
 - Animals: None observed at Buckingham Pond
 - Plants: Curly-leaf pondweed
 - Water Chemistry: high susceptibility to zebra mussels
- 2. SUNY ESF Study of HABs
 - High blue green algae levels in some shoreline blooms and some open water samples- most blooms other algae
 - Low but measurable microcystis-LR and other toxin levels
- 3. Plant Diversity
 - Low floristic quality indices (FQIs) from DFWI study
- 4. Fisheries or Benthos Quality
 - No “relative weight” or lake macroinvertebrate data available



Blue green algae blooms



Non-blue green algae blooms



August 25, 2012



- Surface appearance more typical of green algae
- Some blue green algae embedded within bloom
- Low toxicity

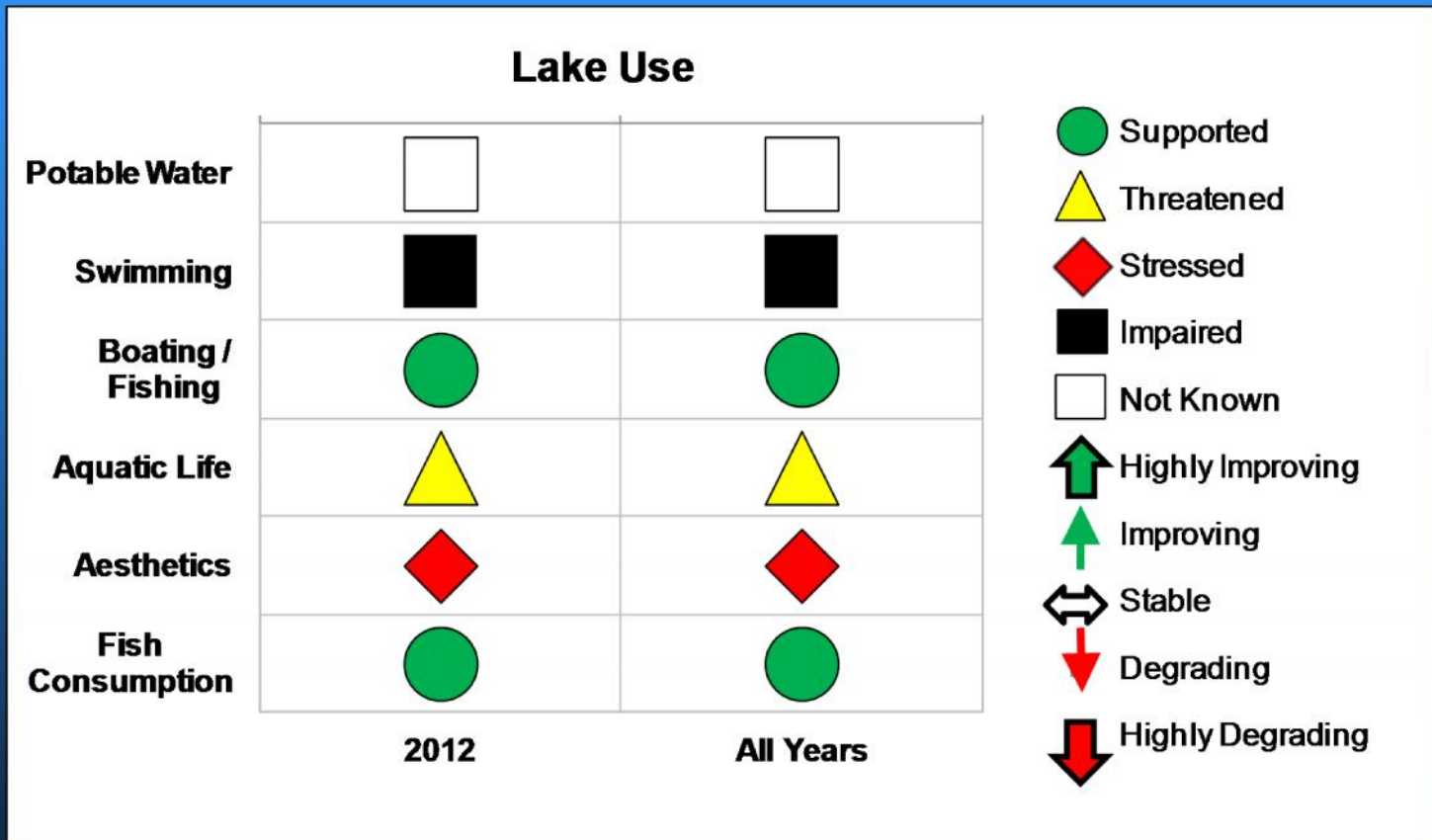


Advice to anyone observing a bloom

- “When in doubt, stay out”
- Keep pets out of discolored water, particularly surface concentrations of algae
- If any health effects in response to exposure (nausea, vomiting, diarrhea, skin or throat irritation, asthma), report to Albany County DOH (518-447-4580)
- Report any suspicious blooms to Conservancy or DEC (518-402-8179)



The condition of each lake characteristic is represented by a color scale:



Lake Use Criteria

- 1. Potable Water
 - Lake Not Classified for this Use
- 2. Contact Recreation
 - Algae levels are moderate to high
 - Blue green algae levels are moderate to high
 - Microcystin (algal toxin) levels are low
 - Water clarity is low
 - Recreational assessments are limited



Lake Use Criteria

- 3. Non-Contact Recreation
 - Aquatic plants usually don't reach lake surface
- 4. Aquatic Life
 - pH levels in acceptable range
 - Dissolved oxygen levels in acceptable range
 - Presence of exotic plants may threaten habitat and aquatic life
- 5. Aesthetics
 - Shoreline blooms may affect aesthetic quality
- 6. Fish consumption
 - No consumption advisories



Does this match what we see?

- No evidence of aquatic life problems or restrictions for passive lake use or non-power boating
- Aesthetics supported when no blooms
- Buckingham Pond suffers algae blooms at times during the summer
 - Phosphorus levels high enough to support persistent algal blooms
 - Not enough information to know why blooms appear to be associated with green algae rather than cyanobacteria (blue-green algae)
 - Bloom lakes generally have less weed growth (due to light limitations) but are susceptible to invasive weeds (since these do well in turbid water)



What can be done about high nutrient levels?

- Several usual sources of elevated nutrients
 - Stormwater runoff
 - Watershed septic leachate
 - Watershed lawn fertilization
 - Waterfowl
- Management actions to control nutrients
 - Maintaining shoreline buffers
 - Discouraging feeding of waterfowl
 - Continue to work with City to manage stormwater

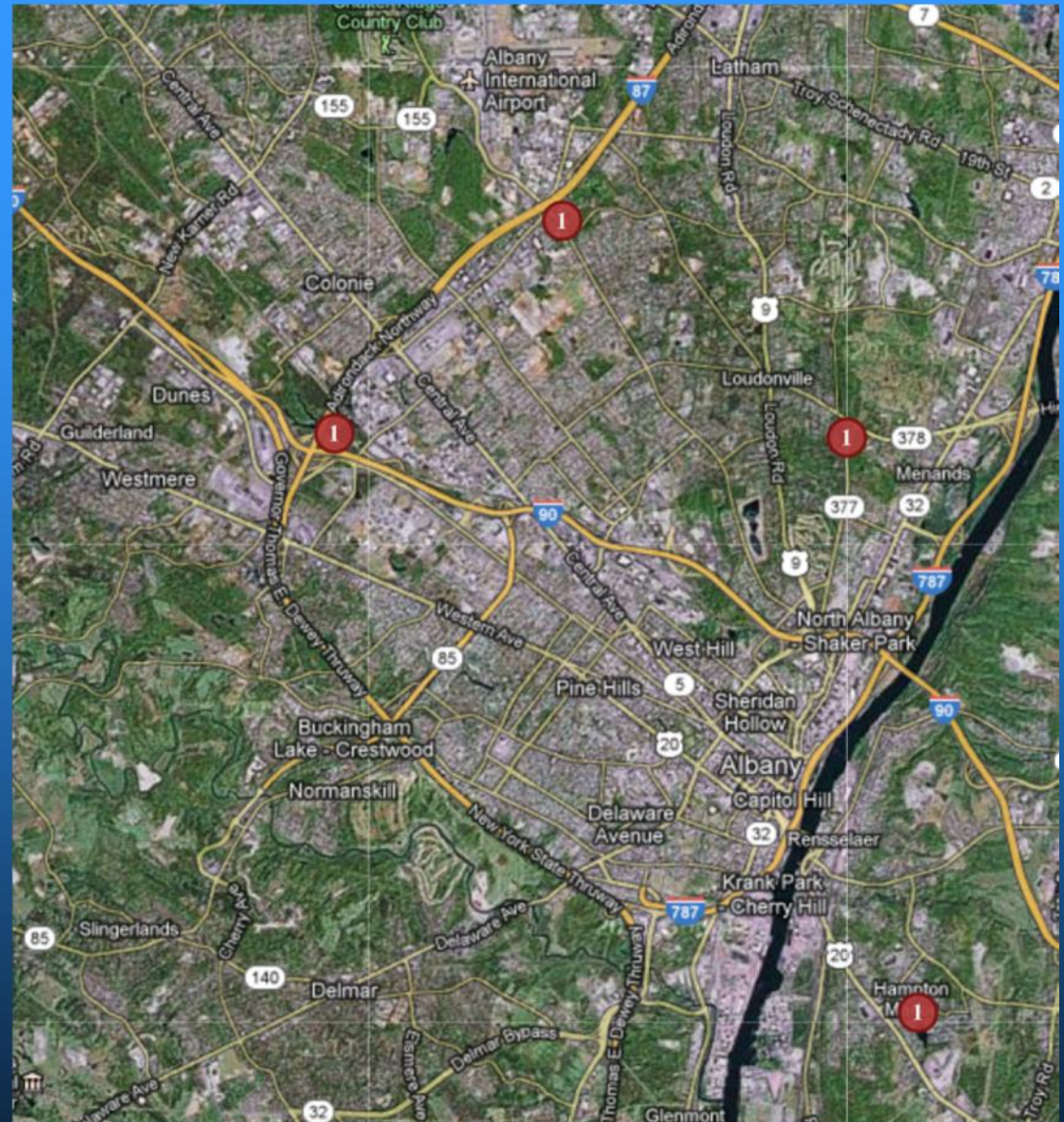


Challenges moving forward

- Numeric Nutrient Criteria
- Harmful algae blooms
 - High blue green algae levels measured in some samples
 - Shoreline blooms lasted during part of the summer
 - Not known why some blooms blue green and some are other algae
 - Low toxicity in blooms
- Invasive Species
 - Lake susceptible to zebra mussels
 - Water chestnut and EWM found in many nearby lakes
 - No boat access greatly minimizes risk to lake



Eurasian watermilfoil



Water chestnut

