

# 2011 Tuscarora Lake Scorecard

## Citizens Statewide Lake Assessment Program

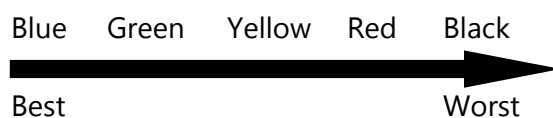
### Introduction

The Citizens Statewide Lake Assessment Program (CSLAP) is a volunteer lake monitoring and education program managed by DEC and the New York State Federation of Lake Associations (NYSFOLA). Lake information from a variety of sources, including CSLAP volunteers, is combined to create a scorecard for each CSLAP lake.

The purpose of the scorecard is to provide a quick and simple summary of sampling results for:

- water quality conditions
- biological health
- lake perception
- lake uses

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



No color indicates the condition is not known due to insufficient data.

### How information is turned into scores

CSLAP volunteers collect valuable lake water quality data using accepted scientific methods to evaluate nutrient enrichment, aquatic weed and algae growth, general lake conditions, and the recreational quality of a lake.

Water quality data is grouped and assigned scores related to the "health" (good or poor) of the lake. The scoring system is based on water quality standards, scientific principles and statistical analysis.

### Tips for interpreting scorecard information

Each section of the scorecard includes a table identifying and describing lake characteristics and generally explains what they tell us about the lake's health. This table can be used to help interpret scorecard results.

### Limitations of the information

Water quality assessments and summaries of lake perception provided in this scorecard are based on information collected by CSLAP, and could be different from assessments and summaries based on information collected by other sources.

Trend information (the positive or negative direction of lake health over time) is not available for every lake characteristic. Many years of data are needed to accurately assess trends. Trends are evaluated using statistical methods that are based on annual measurements. These methods separate short-term changes from long-term patterns, meaning a change from normal conditions in any one year may not represent a trend.

Biological health evaluations come from a variety of sources, including CSLAP. These evaluations will change as CSLAP biological data continues to be evaluated and as additional non-CSLAP information is provided to DEC and incorporated into the database.

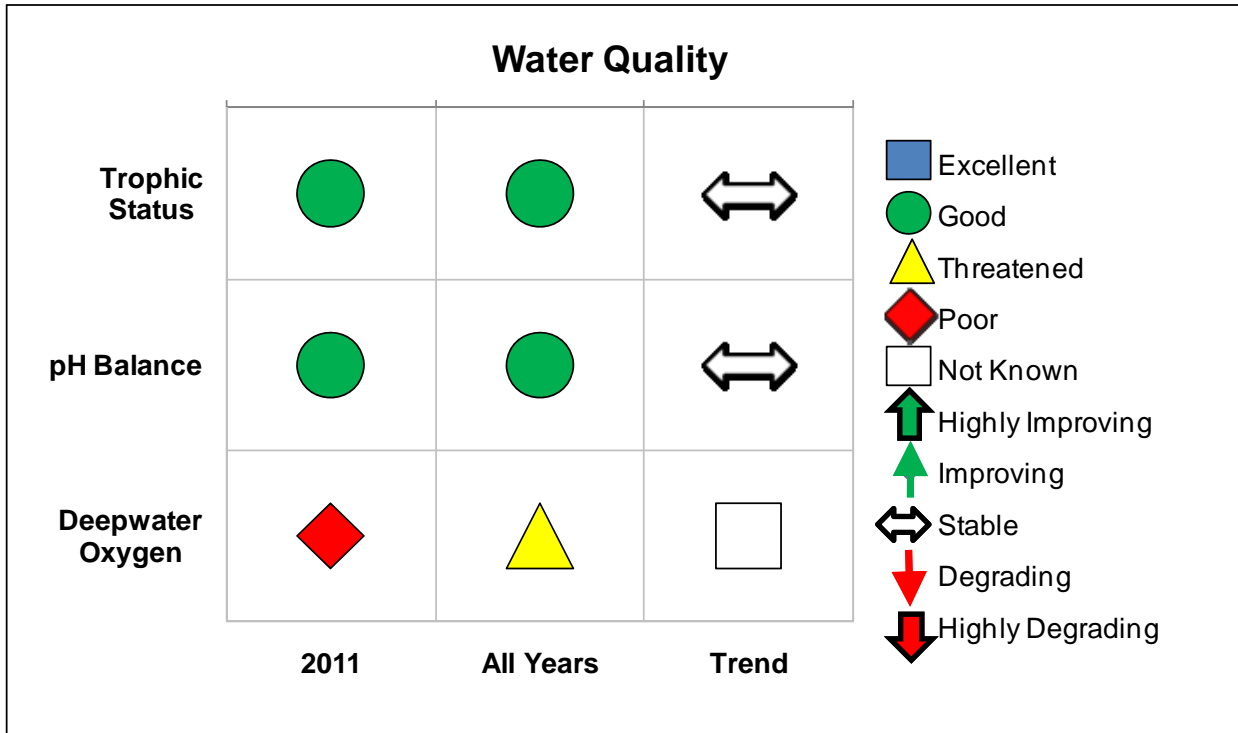
Lake use assessments are made using state water quality standards and guidance values for a variety of water quality and use indicators, not just CSLAP data. Lake use assessments based solely on CSLAP data are incomplete.

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#### Water Quality Assessment

Water quality assessments are based on data collected from the deepest part of the lake every other week, for 15 weeks, from late spring through early fall. The data is used to evaluate a number of lake conditions, including algae growth (productivity or trophic status), pH and deepwater dissolved oxygen levels. There is not enough data to identify a trend in the deepwater oxygen levels for any CSLAP lake.



\*All years of CSLAP data collection for the lake except those for which data was not available.

#### The following data is collected and analyzed to determine the water quality score.

| Water quality characteristic | Measured by  | Description of characteristic   | What it means   |
|------------------------------|--|---|---|
| Trophic Status               | Total Phosphorus (TP)                                      | TP is measured because it is an important nutrient that often controls the growth of algae and rooted plants.   | Too much phosphorus can harm aquatic life, water supplies, and recreational uses by causing excessive algae growth.   |
|                              | Chlorophyll <i>a</i>                                       | Chlorophyll <i>a</i> is measured to estimate the amount of algae in a lake.   | The amount of chlorophyll <i>a</i> is usually closely related to the amount of phosphorus and can affect water clarity.   |
|                              | Secchi Disk  | This is a device to measure how far down into the water you can see.  | Water clarity is a strong indicator of the public's opinion of lake conditions.   |
| pH Balance                   | pH   | Water pH is measured to determine its acidity or alkalinity.  | Values between 6 and 9 support most types of plant and animal life.   |
|                              | Conductivity   | Conductivity is measured to estimate the amount of dissolved and suspended solids in water, including salts and organic material.                         | High conductivity values may be related to geology or land use practices and can indicate susceptibility to changes in pH.  |
| Deepwater Dissolved Oxygen   | Phosphorus, ammonia, nitrite, iron, manganese, and arsenic | Dissolved oxygen (DO) is not measured directly, but can be inferred from the levels of certain chemicals in water samples collected near the lake bottom. | Dissolved oxygen is critical for the ecological balance of lakes. Low DO in bottom waters can affect the survival of fish and lake organisms and cause chemical changes in lakes. |

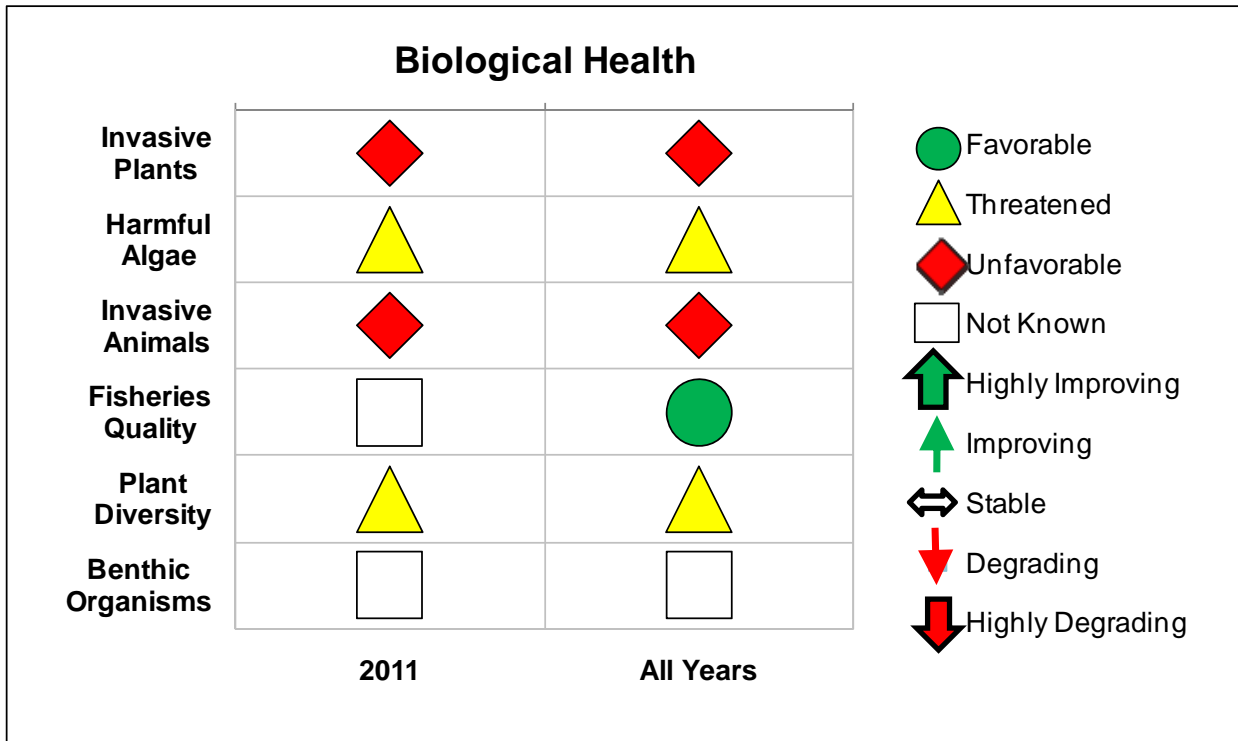
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#### Biological Health

Biological health of lakes can be evaluated in a number of ways. For CSLAP lakes, biological health evaluations are based on the presence of invasive plants, the type and number of blue-green harmful algal blooms, the presence of invasive animals (zebra mussels, spiny waterflea, etc.), the types of fish, aquatic plant diversity, and the number of pollution sensitive aquatic insects.

Biotic indices have been developed to evaluate a few biological health characteristics. Biotic indices are used to compare the biological community of the lake being sampled to the biological community of a known high-quality lake. (Data to support biological health assessments is not available for all CSLAP lakes.)



\* All years of CSLAP data collection for the lake except those for which data was not available.

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The following information is used to determine biological health scores.

| Biological Health Characteristic | Description of characteristic   | What it means  |
|----------------------------------|---|--|
| Invasive Plants                  | CSLAP volunteers survey lakes for nuisance, non-native plants (water chestnut, Eurasian water milfoil, etc.).   | Abundant invasive plants can crowd out native and protected plants, create quality problems, and interfere with recreation. "Unfavorable" means at least one invasive plant species has been found. "Threatened" lakes are geographically close to an "infected" lake, or have water quality conditions that put them at higher risk for species invasion.           |
| Harmful Algae                    | DEC and other biologists screen water samples for blue-green algae cell pigments and also test them for algal toxins.   | Harmful algae can reduce oxygen levels and may cause harm to people recreating on the lake. "Unfavorable" means algal toxin readings are unsafe for water recreation; "threatened" means readings are approaching unsafe for water recreation.   |
| Invasive Animals                 | DEC and other biologists survey lakes for nuisance, non-native animals (zebra mussels, spiny water flea, etc.).   | Abundant invasive animals can harm native plant and animal species, influence the likelihood of algal blooms, and interfere with recreation. "Unfavorable" means at least one invasive animal has been found. "Threatened" lakes are geographically close to an "infected" lake, or have water quality conditions that put them at higher risk for species invasion. |
| Fisheries Quality                | DEC and other fisheries biologists measure the length and weight of various species in a lake's fish community and conduct other measures of the health of the fisheries community. | Better fisheries quality indicates the lake has sufficient food resources and habitat to support its fish community. Several "biotic indices" are used to evaluate fish community quality.   |
| Plant Diversity                  | CSLAP volunteers, academic researchers and consultants survey lakes for the number and types of aquatic plants.   | Higher plant diversity indicates a more natural environment and helps prevent invasive species from taking over a lake. "Floristic quality indices" are used to evaluate plant communities.  |
| Benthic Organisms                | DEC and other biologists count and identify the types of bottom living (benthic) aquatic insects in a lake.   | More pollution sensitive (intolerant) aquatic insects in a lake usually indicate good water quality and suitable habitat. "Biotic indices" are used to evaluate benthic communities.   |

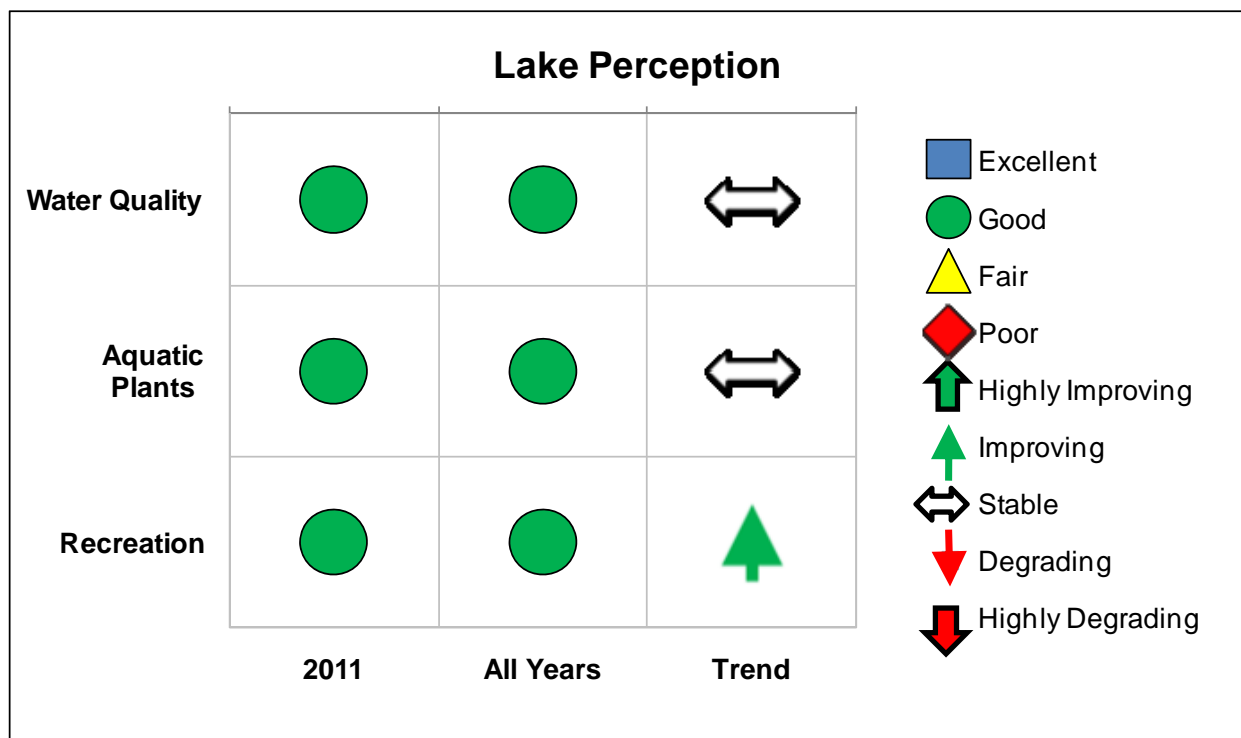
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#### Lake Perception

Lake perception scores are based on the visual observations of CSLAP volunteers who answer questions on the Field Observation Form ([http://www.dec.ny.gov/docs/water\\_pdf/cslapsamobs.pdf](http://www.dec.ny.gov/docs/water_pdf/cslapsamobs.pdf)) completed during sampling. The questions ask the volunteer to determine their perceptions of how clear the water looks, the abundance of aquatic plants, conditions affecting current recreational use, and the overall recreational quality of the lake.

Visual observations are very closely connected to measured water quality conditions. This information is helpful to lake managers in deciding on nutrient criteria, or the amount of nutrients that can flow into a lake without compromising its water quality. For New York State lakes, perception data collected by CSLAP volunteers is critical to the development of nutrient criteria (defining "how much is too much") and has been consistently collected by CSLAP volunteers since 1992.



\* All years of CSLAP data collection for the lake except those for which data was not available.

#### The following information is used to determine the lake perception scores.

| Lake Perception Characteristic | Description of characteristic   | What it means  |
|--------------------------------|---|--|
| Water Quality                  | Asks the user: How clear does the water look today?   | Clearer water usually indicates lower nutrient levels.   |
| Aquatic Plants                 | Asks the user: How abundant are aquatic plants where people are boating and swimming today?                                   | Lower abundances of aquatic plants usually provide proper ecological balance and are less likely to contribute to recreational use problems, although the absence of plants can also lead to lake problems. Lakes with the most favorable assessments have some plants, but not too many plants. |
| Recreation                     | Asks the user: What is your opinion of the recreational quality of the lake? What factors affect your perception of the lake? | Users' perceptions are associated with water quality conditions and aquatic plant coverage. Positive responses usually indicate good water quality and little to no surface plant coverage. Negative responses are usually associated with poor water quality and/or invasive plants.            |

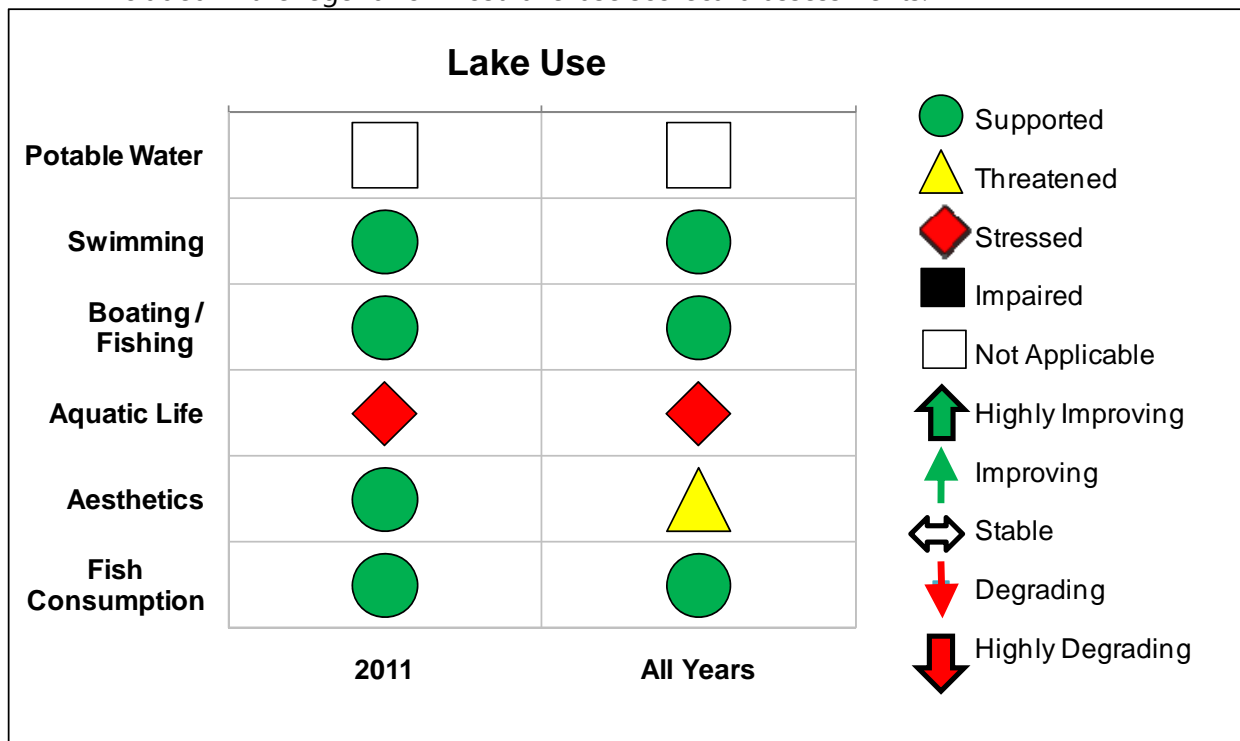
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### Lake Uses

Lake uses are defined as the best uses for a lake (drinking water, swimming, etc.) as determined by several factors. Lake uses are identified using CSLAP water quality, lake perception and biological assessment information to evaluate where a lake fits in the state Water Quality Standards and Classification system (see overview below).

Each lake use is scored based on the following assessment categories, using assessment methodology ([http://www.dec.ny.gov/docs/water\\_pdf/asmtmeth09.pdf](http://www.dec.ny.gov/docs/water_pdf/asmtmeth09.pdf)) established by DEC to evaluate impacts to lake uses:

- **Supported**- no evidence of impacts to lake use;
- **Threatened**- no evidence of impacts to lake use, but some factor threatens this use (for example, changing water quality, conditions that are nearing impact levels, land-use changes, etc.);
- **Stressed**- occasional or slight impacts to lake use;
- **Impaired**- frequent or persistent conditions limit or restrict lake use; and
- **Precluded**- conditions prevent lake use. This category is uncommon in NYS (and CSLAP) lakes and is not included in the legend for most lake-use scorecard assessments.



\* All years of CSLAP data collection for the lake except those for which data was not available.

**Overview of the typical water quality classification and their best uses.** For more information visit [www.dec.ny.gov/regs/4592.html#15990](http://www.dec.ny.gov/regs/4592.html#15990)

| Best use | Other uses  | Water Quality Classification |
|----------|---|------------------------------|
| Drinking | Swimming, fishing, and fish, shellfish and wildlife reproduction and survival | Class AA & A                 |
| Swimming | Fishing, and fish, shellfish and wildlife reproduction and survival           | Class B                      |
| Fishing  | Swimming, and fish, shellfish and wildlife reproduction and survival          | Class C                      |
| Fishing  | Swimming, and fish, shellfish, and wildlife survival                          | Class D                      |

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The following information is used to determine the condition of lake uses.

| Lake Perception Characteristic | Description of characteristic   | How this relates to CSLAP   |
|--------------------------------|---|---|
| Potable Water                  | The lake is used for drinking water. Only Class AA and A lakes have been approved for this use.   | CSLAP data is not intended to assess the condition of potable water. Other state and local monitoring programs better address this use. However, some CSLAP parameters—chlorophyll <i>a</i> , ammonia, arsenic, iron, manganese, algal toxins—indicate potential impacts to potability.   |
| Swimming                       | The lake is used for swimming and contact recreation. Even though some lakes are not classified for this use, all CSLAP lakes should support this use consistent with the federal goal to make all lakes “swimmable.”             | Several CSLAP sampling indicators—water clarity, chlorophyll <i>a</i> , algal toxins, lake perception—can be used to assess swimming conditions.  |
| Boating/Fishing                | The lake is used for boating, fishing and non-contact recreation. Even though some lakes are not classified for this use, all CSLAP lakes should support this use, consistent with the federal goal to make all lakes “fishable.” | Non-contact recreation is evaluated using the lake perception data (visual observations) and aquatic plant surveys.   |
| Aquatic Life                   | The lake is used by aquatic life. This is not an official “use” designated by New York State, but water quality standards and other criteria are adopted to protect aquatic life.   | Aquatic life impacts can be evaluated by a number of CSLAP indicators, including pH, dissolved oxygen, and the presence of invasive species.  |
| Aesthetics                     | The lake is used for visual enjoyment or the visual beauty of the lake. This is not an official “use” designated by New York State, but water quality standards and other criteria are adopted to protect aesthetics.             | Lake aesthetics can be impacted by a number of factors, including algal blooms, nuisance weeds, or simply reports that “the lake looks bad,” all of which are evaluated in CSLAP.   |
| Fish Consumption               | The lake is used for consumption of fish. All lakes are assumed to support this use unless otherwise indicated.   | CSLAP does not collect data or information to evaluate fish consumption. All CSLAP lakes are evaluated against the New York State Department of Health: Health Advice on Eating Fish You Catch ( <a href="http://www.health.ny.gov/environmental/outdoors/fish/health_advisories/">http://www.health.ny.gov/environmental/outdoors/fish/health_advisories/</a> ). |

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### Summary

The information displayed in the scorecard is intended to give a quick and comprehensive overview of the results from CSLAP assessments and lake data collected by DEC, academics and private consultants.

CSLAP scorecards summarize information related to water quality, lake perception, biological condition and lake uses. The data and other information collected through CSLAP, or other sources, contribute to the evaluation of lake uses.

This information is the basis for the water quality assessments conducted as part of DEC's waterbody inventory. More comprehensive summaries of CSLAP data are included in individual lake reports and regional and statewide CSLAP data summaries. To fully understand CSLAP lakes, those interested should review the information found in scorecards, individual lake summaries, and regional and statewide CSLAP reports.

CSLAP individual lake reports can be found on the Water Reports by County page of DEC's website (<http://www.dec.ny.gov/lands/77821.html>). Historical reports and regional lake reports are available on the New York State Federation of Lake Associations website (<http://nysfola.mylaketown.com/>).

### More information about CSLAP and NYS Lakes

Many resources are available to lake associations and citizens interested in lake management and ecology on DEC's website, including:

- Information about CSLAP history, sampling activities, forms, and lake association resources are available on DEC's Citizens Statewide Lake Assessment Program web page (<http://www.dec.ny.gov/chemical/81576.html>).
- Measured water quality variable fact sheets ([http://www.dec.ny.gov/docs/water\\_pdf/cslaplpara.pdf](http://www.dec.ny.gov/docs/water_pdf/cslaplpara.pdf))
- Lake management publication, *Diet for a Small Lake* (<http://www.dec.ny.gov/chemical/82123.html>)
- DEC Google Maps and Earth data, including CSLAP Lakes (<http://www.dec.ny.gov/pubs/42978.html>)
- Boating in NYS (<http://www.dec.ny.gov/outdoor/349.html>)
- Fishing in NYS (<http://www.dec.ny.gov/outdoor/fishing.html>)
- Freshwater Fishes of NY (<http://www.dec.ny.gov/animals/269.html>)
- Lake Contour Maps (<http://www.dec.ny.gov/outdoor/9920.html>)
- NYS Watersheds, Lakes and Rivers (<http://www.dec.ny.gov/lands/26561.html>)
- Fish Health Advisories (<http://www.dec.ny.gov/outdoor/7736.html>)
- Routine Statewide Monitoring Program (water quality monitoring programs) (<http://www.dec.ny.gov/chemical/23848.html>)
- Common Aquatic Invasive Species of NY (<http://www.dec.ny.gov/animals/50272.html>)