

## ***Lake Stewardship Program Overview***

The King County Lake Stewardship Program was established in 1994, combining two volunteer-based water quality programs for small lakes that were managed by King County and METRO before the agencies merged. The purpose of the program is to offer training, advice, and technical assistance to help people monitor and manage the County's many lakes and ponds. Monitoring water quality in small lakes can indicate important environmental impacts occurring in local watersheds, along the lake shorelines, or from climate changes. Monitoring with the assistance of volunteers helps the community understand the process behind the changes they see and focuses attention on the importance of our smaller lakes.

Lake Stewardship Program staff train volunteers reliable, consistent, and accurate methods for monitoring the health of their lakes and ponds. The baseline information gathered by monitoring can be used to assess long-term trends and support future actions to protect aquatic resources. Volunteers learn to measure physical and chemical parameters that serve as indicators of lake conditions and health.

Collaboration with trained volunteers has many benefits. Keeping labor costs down makes it possible to monitor many more lakes than could otherwise be afforded, thus getting a regional picture of lake health. Even more important, training residents increases the number of eyes on lakes, and increases the likelihood that significant changes can be detected rapidly. Additionally, working with volunteers allows King County residents to have direct involvement with work done in the Science and Technical Support Section. Volunteers receive information on water quality and watershed management and also serve as stewards in outreach to other interested citizens.

Volunteers have the option of participating in daily, weekly, or summer bi-weekly (May-October) monitoring programs. In addition to water quality monitoring, volunteers keep track of recreational use and track potential nuisances, such as geese. They also report algal accumulations that could signal a health and safety threat, such as a toxic algae bloom.

Water quality data is loaded onto the King County Small Lakes Information and Data webpage (<http://green2.kingcounty.gov/SmallLakes>). This page provides information about the lakes, including maps and physical characteristics, water quality reports, and the option to download or view water quality data.

Why Monitor? Data from the volunteer monitoring program:

- Provides baseline data about physical conditions and water quality conditions.
- Allows us to look for trends over time or changes accompanying development or climate variation.
- Determines if changes in water quality might affect beneficial uses..
- Facilitates evaluation of restoration measures to improve conditions in a lake.
- Helps to identify new concerns early.
- Offers a better understanding of how different land use practices may affect lake ecology and environments.

## ***Monitoring Level Options***

### ***Level 1***

Level 1 monitoring occurs year-round, with some measurements taken daily and others on a weekly basis. Volunteers may choose one or both sets of measurements. The monitoring year follows the water year, running from October 1 through September 30 (e.g., water year 2015= Oct. 2014- Sept. 2015). Level 1 monitors are asked to do the following:

**Daily** at approximately the same time every day:

- Measure and record precipitation in milliliters.
- Measure and record lake level in centimeters.
- Note any unusual or interesting conditions.
- Count geese (optional).

**Weekly** on the same day each week, if possible:

- Anchor boat at predetermined sampling location.
- Measure and record lake temperature at a 1 meter depth.
- Measure and record Secchi depth.
- Record weather and lake use observations.
- Assess and record algae and particle observations.
- Note any unusual or interesting conditions.
- Count geese (optional).

### ***Level 2***

Level 2 monitoring occurs bi-weekly from May through October. On scheduled sampling days volunteers are asked to:

- Anchor boat at predetermined sampling location.
- Measure and record Secchi depth.
- Measure and record temperature at a depth of 1m.
- Record weather and lake use observations.
- Assess and record algae and particle observations.
- Note any unusual or interesting conditions.
- Count geese (optional).
- Scan the lake for cyanobacterial accumulations and if found collect a scum sample for toxicity testing.
- Use the Van Dorn sampler to collect water samples from the lake. Labeled bottles are provided. Most dates involve collecting water at 1 m, but twice during the sample season multiple depths are collected (profiles).
- NEW in 2015, on 4 occasions, routine water samples for cyanobacterial toxin measurements will be collected at a public or community access point along the shoreline.
- Place data sheets and samples in a cooler for pickup.

Level 2 water samples are collected by Lake Stewardship staff and delivered to the King County Environmental Lab for analysis. Parameters measured are:

- Total phosphorus
- Total nitrogen
- Chlorophyll-*a*
- Phytoplankton species present (in the event of high chlorophyll).
- Additional parameters during profile events:
  - Nitrate-nitrite
  - Ammonia
  - Orthophosphorus
  - Alkalinity
  - UV254
- Cyanotoxins measured on 4 occasions:
  - Microcystin
  - Anatoxin-a (on two occasions)