

King County's Lake Stewardship Program

By Sally Abella and Rachael Gravon

The largest lakes in King County, including Washington, Sammamish and Union, have been monitored for water quality for many years while our cities have grown tremendously. Their watersheds have been developed and sewage systems installed and updated. However, King County also has many smaller lakes across the landscape – a legacy of the last large glaciation more than 10,000 years ago.

Many lowland lakes have interesting histories as logging mill ponds, summer resorts for city dwellers, and more recently as focal points for residential development on the urban fringes. Quite a few are annually stocked with fish by the Washington Department of Fish and Wildlife (WDFW), and have public boat launches managed by WDFW for public recreational benefit. Some lakes also have parks, trails, and beaches.

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 processes behind the changes they see and focuses attention on the importance of our smaller lakes. The feeling of ownership that comes with involvement can also help mobilize grass-roots efforts for lake protection and restoration.

The King County Lake Stewardship Program began in 1994, combining two volunteer-based water quality programs for small lakes that were managed by King County and METRO before the agencies merged. Over time, 55 lakes were monitored with the help of interested citizens between 1994 and 2004. Budgetary constraints in 2005 resulted in a decrease in monitored lakes, with another reduction in 2009. Twelve urban lake communities have continued sampling since 2009 with the aid of funding from interested cities.

In 2014, restored funding from unincorporated King County Surface Water Management fees

allowed for the addition of 22 rural lakes back into the program, making a total of 34 lakes to be tracked in 2014 (see **Figure 1**).

Choosing which 22 lakes to add back into the monitoring program proved difficult because all of King County's lakes have interesting and unique characteristics. Factors

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FIGURE 1.
 Currently monitored lakes in King County

considered included lake location, a history of changes in algae or nutrients, the importance of the lake for water storage or stormwater pathways, public accessibility, or similarity to other lakes found across the county.

Previous volunteer monitors were contacted to see if they would be interested in resuming the work. The response was immediate and very positive: A roster of more than 100 citizens was compiled in just a few weeks. In April 2014 a volunteer training workshop was held at the Preston Community Center with over 60 attendees. Lake volunteers, friends, and family members received training in water sampling and listened to presentations about water quality, aquatic plant life, and algal blooms.

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 a lake, and significant changes can be detected rapidly. Additionally, working with volunteers allows King County residents to have direct involvement with work done in the Sciences 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 from the summer program is uploaded onto the King County Small Lakes Information and Data Page (link below). This page provides physical information about the lakes, maps, water quality reports, and the option to download or view water quality data. Currently, it is anticipated that an annual summary of the lakes data will be prepared so that interested people can look at the values in a regional context, as well as compare lakes. Trends will also be evaluated for lakes with enough data for statistical significance. See **Table 1**: TSI average for last year of lake monitoring.

To visit the King County Small Lakes Information and Data Page, go to <http://green2.kingcounty.gov/SmallLakes/WQData.aspx>. For more information about the Lake Stewardship Program, please visit www.kingcounty.gov/environment/wlr/sections-programs/science-section/lake-stewardship-program.aspx.

TABLE 1.
TSI average for last date of lake monitoring

Table of Trophic State Index: average for last date of Lake monitoring			
Lake Name	jurisdiction	last year sampled	TSI-average
Alice	King County	2008	44.9
Allen	King County	2008	56.7
Ames	King County	2008	39.9
Angle	SeaTac	2013	34.9
Beaver1	Sammamish	2013	52.7
Beaver2	Sammamish	2013	43.9
Boren	Newcastle	2013	43.6
Cottage	King County	2008	51.6
Desire	King County	2004	50.6
Echo	Shoreline	2013	50.1
Fivemile	King County	2008	51.4
Forbes	Kirkland	2013	44.5
Geneva	King County	2008	39.3
Green	Seattle	2013	43.7
Joy	King County	2008	39.8
Kathleen	King County	2008	39.9
Killarney	King County	2008	47.1
Langlois	King County	2008	37.9
Lucerne	Maple Valley	2013	36.5
Marcel	King County	2008	49.8
Margaret	King County	2008	37.0
McDonald	King County	2008	46.5
Morton	King County	2008	40.6
Neilson (Holm)	King County	2008	48.1
Pine	Sammamish	2013	38.2
Pipe	Maple Valley / Covington	2013	36.7
Retreat	King County	2008	37.3
Sawyer	Black Diamond	2013	40.0
Shadow	King County	2008	45.7
Spring	King County	2008	42.5
Tuck	King County	2008	50.2
Twelve	King County	2004	42.1
Welcome	King County	2008	45.9
Wilderness	Maple valley	2013	41.1

Trophic state index (TSI) values provide a standardized way to rate lakes on a scale of 0 to 100; each major division (10, 20, 30, etc.) correlates with a doubling of algal biovolume. The indices are based on the summer mean values (May through October) of three commonly measured lake parameters: Secchi depth, total phosphorus, and chlorophyll a. Below 40 is considered low and above 50 is considered high in productivity

Contributors to King County's SciFYI

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Rachael Gravon

Rachael Gravon joined the Science and Technical Support Section in 2014 as a water quality planner and limnologist. She recently relocated to Seattle from Bellingham, where she received her MS in Environmental Science from Western Washington University. Rachael participates in numerous projects involving lake water quality and watershed management.



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