

Season in Review

An End of Season Summary

The 2022, 55 lakes monitoring programs were conducted under the BC Lake Stewardship and Monitoring Programs, which aims for the collection of 12 samples or data points per site per year.

The sampling season began in April with an online training and several in-person training sessions around the province.

The season included monitoring of 38 Level 1 programs, managed by the [BC Lake Stewardship Society](#). Additionally, nine Level 2 and eight Level 3 monitoring programs were managed by the Ministry.

Unfortunately, a late melt and a cool spring led to a shortened season for many lakes. Some data is still incoming but the BCLSS and the Ministry were able to audit 28 (51%) of the 55 active lake monitoring programs in 2022. This included audits of 15 Level 1 programs, eight Level 2 programs and five Level 3 programs.

The BCLSMP relies on audits of volunteer samplers to ensure the best possible data collection. The Ministry and BCLSS would like to thank all our 2022 volunteers for all their hard work in delivering these programs successfully.



Volunteer on White Lake, Sorrento.
Photo credit: Marge Signey



Tabor Lake, Prince George, October 2008. Photo Credit: Kirsten McNeill

Wrapping Up

Next steps for volunteers to complete 2022 programs

As the cooler weather moves in and you gear up for winter, there are still some steps that need to be completed to wrap up the 2022 monitoring programs.

If you have a few more sampling events planned, that's ok. Program end dates vary across the province due to weather conditions, Volunteer availability can also vary because of work or school schedules and getting back into the autumn groove.

Once you have completed all sampling events for the year, please make sure the following tasks are also completed:

- 1) Please make sure to send in all data. The data needs to be sent electronically using either the online field data submission [tool](#), or the excel field data [sheets](#) and email to volunteerlakes@gov.bc.ca.

- 2) For Level 2 and 3 programs please return all sampling equipment, including any unused sampling kits or paperwork, to the Ministry for winter storage and maintenance. Please use Purolator to ship and email volunteerlakes@gov.bc.ca for an account number to charge shipping costs. Unless otherwise indicated, please ship to:

Ministry of Environment & Climate Change Strategy
1011-4th Ave, Suite 325
Prince George, BC V2L 3H9
Attn: Kim Klaczek

The Ministry and BCLSS will be sending out year-end surveys soon, so keep an eye on your email inboxes. These surveys help to gauge the success of program delivery and identify areas for improvement, so your feedback is incredibly valuable.

We hope to work with you again in 2023!

Meet the BCLSMP Team

Lucie Thomson Unit Head Vernon	Kirsten McNeill Aquatic Stewardship Coordinator Prince George	Mike Sokal Water Quality Limnologist Penticton	Jolene Raggett Aquatic Resource Biologist Nelson
Kristy Rasmus Water Quality Monitoring Specialist Smithers	Kim Klaczek Water Quality Monitoring Specialist Prince George	Dan St. Hilaire Water Quality Monitoring Specialist Penticton	Dean Peard Water Quality Monitoring Specialist Victoria

Behind the Scenes

What the Ministry is working on

Each year the Ministry performs a program review and identifies areas where improvement or optimization can occur. The BCLSMP team has been working to find and implement strategies to accomplish our program improvement goals.

A change that was made early in the year was moving from the previous program name (the Volunteer Lake Monitoring Program) to the current BC Lake Stewardship and Monitoring Program. The change was made to better represent all the works done under the program and to better align with the program name used by BCLSS.

Additionally, early in the year Ministry staff spent considerable time updating and revising the program website to ensure all the content was current and more easily accessible to volunteers and visitors.

In January the Ministry sent out a year end survey to all 2021 volunteers and stewardship groups. The results of that survey identified four areas of concern: additional training materials, the need for updated field sheets, better organized sampling bottle kits, and more efficient communications.

The Ministry has added several training tools to the website including presentations, a video training library, and is working on a BCLSMP Field Manual.

Field sheets were also updated early in the year and current versions are available on the website for each program level. Additionally, the sampling bottle kits were restructured to require fewer bottles, and reorganized for easier sampling by volunteers.

“The Lake Sampler” bulletin, which includes updates and information for volunteers will be sent out in spring, summer, fall and winter.

Additionally, several other strategies are planned for 2022. These include revising the BCLSMP interactive mapping portal to have data summaries, graphs and georeferenced lake maps, and improving our internal data analysis and verification methods.



Restructured and reorganized sample bottle kit.



2022 Favourite Lake Photo submission “Hunting in the Reeds”. Photo credit: Neil Bousquet

In the Know

Items volunteers and stewardship groups need to know

- 2022 was the first year for widespread use of our online field data submission tool. Based on feedback from the 2022 year end survey (which will be sent out soon) there may be changes to the form for the 2023 season
- In 2022 the Ministry began a policy where all new lake groups or volunteers will start at a Level 1 before they can be upgraded to a Level 2 or 3 program
- Once the BCLSMP Field Manual is finalized it will be emailed out to all current volunteers, and will be available on the website
- The Ambient Surface Water Quality Monitoring team has added two additional staff members this fall who will be helping to support the BCLSMP in their local regions
- For any questions or concerns email volunteerlakes@gov.bc.ca

Team Tell-All

Spotlight on a Team Member

Kirsten McNeill is the Aquatic Stewardship Coordinator for the Province and is part of the Ministry’s Ambient Surface Water Quality Monitoring team. In addition to the job duties outlined in the “Meet the Ministry” segment on Page 1, Kirsten also participates in lake monitoring as part of the [BC Lake Monitoring Network](#) and stream and invertebrate monitoring as part of the Province’s [Canadian Aquatic Biomonitoring Network \(CABIN\)](#) work.

Kirsten grew up in Burns Lake before going to university in Kelowna. Her career with the Ministry began as a co-op student working out of Williams Lake. Kirsten also spent some time working out of Kamloops with the Ministry before landing in Prince George. Kirsten has been working with the BCLSMP since she started with the Ministry 16 years ago.

Kirsten lives along the Nechako River with her husband and two daughters.



Kirsten McNeill, Aquatic Stewardship Coordinator.

Stewardship in Action

Highlighting volunteers and stewardship groups



Osoyoos Lake Water Quality Society logo.

The Osoyoos Lake Water Quality Society (OLWQS) is a non-profit stewardship group founded in 1991 by local residents. The group formed in response to research conducted by the Okanagan University College (now UBC Okanagan) that indicated the lake had elevated nutrient concentrations.

The OLWQS participates in the BCLSMP doing a Level 2 program. They

collect bi-weekly secchi depth, surface temperature and dissolved oxygen/temperature profiles from four sites.

In addition to the BCLSMP work, the OLWQS also engages in public education and engagement initiatives such as painting yellow fish, using non-toxic paint, next to storm drains throughout the community of Osoyoos. The purpose of the yellow fish is to remind people of what they put into storm drains as it can affect fish and the aquatic ecosystem.

The OLWQS has also worked with school classrooms to raise salmon from eggs to fry and then release them to the Okanagan River.

Additionally, the group did considerable funding to purchase their own pontoon boat. This boat allows the OLWQS to continue the BCLSMP work as well as other studies they conduct such as monitoring for invasive zebra and quagga mussels.

In late October 2022, the OLWQS was a supporter of the Osoyoos Lake Water Science Forum in Osoyoos, BC. For more information visit www.osoyooslake.ca.

Animalia

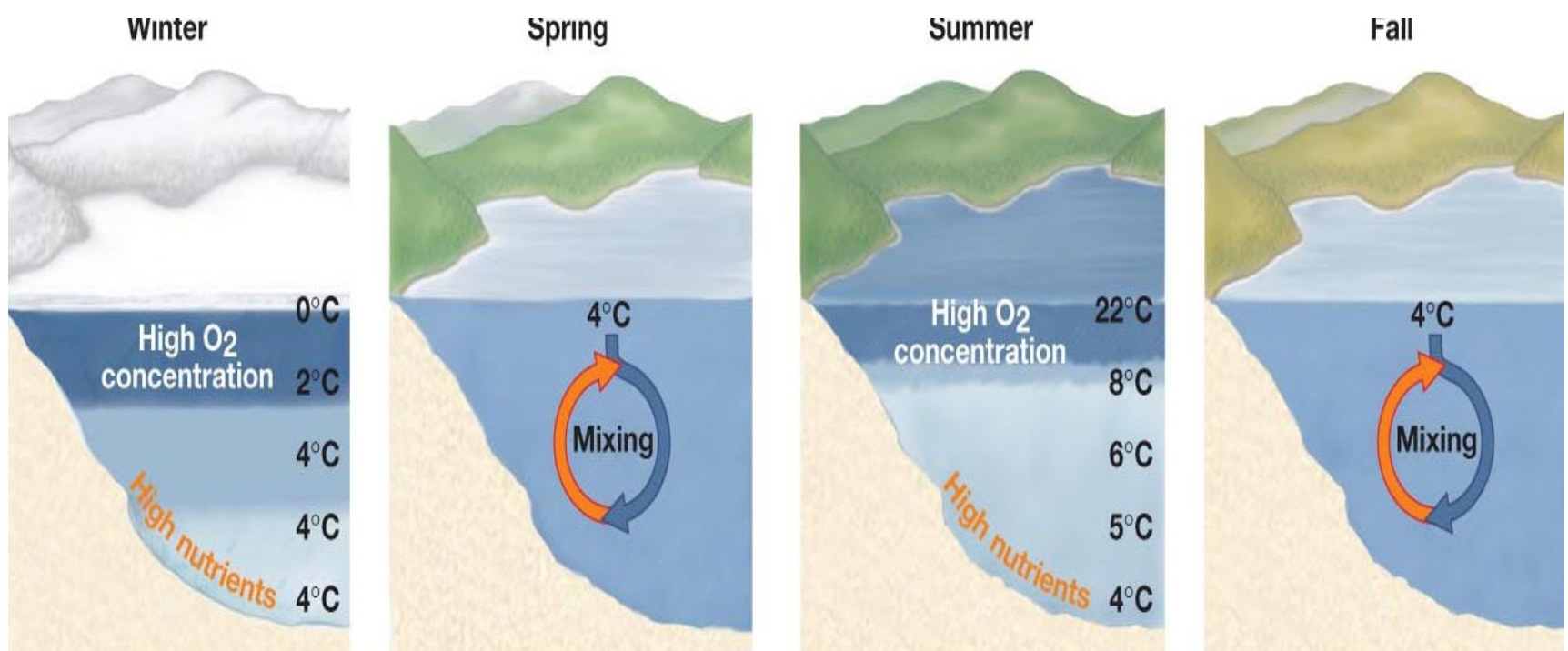
Understanding aquatic animals and insects

Water striders (*Gerridae*) are a family of insects that can walk on water due to the hydrophobic hairs covering their legs. They also use their long legs to distribute their weight on the water surface. Most water striders (90%) are found in calm freshwater systems, but there are some oceanic species.

They are predators that feed on spiders and other insects that fall onto the water surface, and are mainly preyed upon by birds. Water striders are harmless to humans.



Four Water Striders on a waterbody.



Lake Turnover diagram courtesy of University of Illinois at Chicago.

Terminology Tutorial

Demystifying common lake monitoring terms

Lake **turnover** is the mixing of a lake where the water from the bottom of the lake rises to the top and water from the top of the lake sinks to the bottom. This is a natural phenomenon that can occur in any lake during rapid changes in weather temperature.

Most lakes are dimictic, meaning that they mix twice per year. **Dimictic** lakes typically experience a turnover event in the fall after ice-off occurs. The cooler waters at the top of the lake are more dense (water is most dense at 4°C) so they sink pushing the warmer, less dense bottom water to the top. Then in the fall as the warm surface waters begin to cool and become more

dense they sink, forcing the bottom waters up to the top.

Some lakes, typically shallow lakes that are prone to high wind activity, can experience multiple mixing events each year. These lakes are called **polymictic**. There are also **monomictic** lakes that only experience a single mixing event each year. Lakes that mix at least once a year are all categorized as **holomictic** lakes.

Some deep water lakes can be classified as **meromictic**. This is where only the top portion of the lake experiences mixing, while the bottom portion does not.