Salt Spring Island Water Preservation Society

JULY 2017 NEWSLETTER

Citizen Science Project Completed: Report Extract and Recommendations

One of the purposes of the SSI Water Preservation Society, as stated in its Constitution, is "to engage in and to otherwise promote the scientific study of and research into water resources"

The WPS's 2½-year **Citizen Science Project 2014–2016** (Stream-Watching and Lake Sampling) is now complete: we have received the final report from limnologists Maggie Squires and Drew Bodaly. WPS has delivered it to the Salt Spring Island Foundation, which generously provided the grant.

On June 1, 2017, Maggie and Drew gave a lively slide presentation about the final report. They presented recommendations, backed these up with findings, and pointed out work left to be done.

On an entirely volunteer basis, these two career scientists did a tremendous amount of high quality work to significantly advance our understanding of the streams and lakes in the Blackburn/Cusheon watershed. They properly planned and competently carried out the project and ensured that conclusions drawn from the data were justified. WPS has been well served.

Extract from the Abstract of the Report:

"Major new findings include the following: groundwater appears to be an underappreciated flow component; septic field failures at the Cedar View Trailer Park may episodically contribute nutrients to Cusheon Lake; net dissolved inorganic P load was substantially lower than the previously modeled estimate of P load (Cusheon Watershed Management Plan 2007) yet provided realistic predictions of lake water P concentration; and, lake waters undergo strong seasonal cycles including NO3-depletion and replenishment, and low-high water clarity.

"Lake water clarity, and the timing and duration of algal blooms that are a concern among those who draw water from Cusheon Lake for domestic purposes were strongly affected by weather, as follows: both lakes were relatively turbid during the winter when flushing with inflow water was frequent, and relatively clear during the spring-summer when inflow and outflow ceased; and, in both lakes, a late summer/early fall algal bloom was triggered by internal mixing (deepening of the epilimnion) and bloom collapse coincided with lake turnover (mixing to the lake bottom). The biomass of algal blooms was greater at Blackburn than at Cusheon Lake and bloom enhancement was due, we think, to internal loading via ebullition and flotation of sediment rafts. Based on summer chlorophyll and TP levels in lake water, both lakes are mesotrophic (intermediate productivity) but Blackburn Lake is between mesotrophy and eutrophy (high productivity) while Cusheon is between oligotrophy (low productivity) and mesotrophy. Both lakes had relatively high mean summer water clarity for their trophic status and likely this was due to zooplankton grazing that kept chlorophyll concentration (algal biomass) lower than expected for late winter/early spring P levels."

(Continued on page 2)

Thank you to those of you have renewed your membership. If your mailing label is highlighted, we have not received your renewal yet. If that is you, please consider renewing.

Citizen science project (continued)

Recommendations for Action (from the Report)**:**

The Blackburn Lake Citizen Science Project provides clear direction for taking action to improve current conditions in Blackburn and Cusheon Lakes.

1) Continuing of community support for re-watering of Blackburn Lake wetlands that were de-watered to create a golf course to re-establish natural wetland hydrology;
2) Monitoring of the holding pond at the garbage transfer station to allow action to be taken, if needed, to lower P and/or N levels in the outflow water;
3) Upkeeping of parking lots and docks at Blackburn Lake, and especially at Cusheon Lake where additional designated public access points remain undeveloped, to raise awareness among users of the need to maintain natural lake features
4) At Cusheon Lake, using diversion (or settling) of north shore runoff to lower sediment input to the lake;
5) Cooperating with the Cedar View Trailer Park in two areas, as follows: a) more regular monitoring of the Park's septic infrastructure; and, b) removing the old pump house, creek side pump, rock dam, and all unnecessary water pipes in the vicinity of Blackburn Lake and Cusheon Creek to improve lake aesthetics and re-establish natural water flows;
6) Cooperating among Cusheon lakeshore residents to regularly monitor the status of septic fields and to replace fields within 100 feet of the shoreline with holding tanks;
7) Leaving beaver dams and log jams in situ at the Cusheon outflow, in light of potential benefits to lake water quality of naturally high summer water levels.

—Usha Rautenbach

Cyanobacteria Blooms: How to Protect Cusheon Lake Water Users

Chris Laughlin, Environmental Health Officer at Island Health, has confirmed that a website has been drafted that will notify the Salt Spring Island public of elevated cyanobacterial levels in island lakes. Although not yet live, the website should be up by the end of the summer, according to Laughlin. He will provide WPS with the URL so that we can publicize it, and it will link to North Salt Spring Waterworks District (NSSWD) and the Capital Regional District (CRD).

This change in public notification came as an indirect result of a letter sent to the Salt Spring Island Water Protection Authority (SSIWPA) in November 2016 from WPS. WPS asked for public notification as soon as there is a bloom of cyanobacteria that is capable of producing toxins.

Specifically, the letter was concerned with the danger of toxin exposure to Cusheon Lake residents who draw their water directly from the lake using home treatment systems and to recreational users of the lake Last August, the lake experienced a cyanobacteria bloom.

Due to these health risks,[1] WPS asked that people using water directly from the lake be informed of toxin producing conditions *before* toxins are present. This is because of the lagtime that exists between when the CRD take raw water samples and when results are available to Island Health—sometimes as many as 5 to 10 days.

(Continued on page 3)

Cyanobacteria blooms (continued)

According to Chris Laughlin,

- CRD tests raw water samples, and when he receives lab results that show cyanobacteria levels over 1.5 microg/L, he notifies Elizabeth Zook, coordinator of the SSI Emergency Program.

According to Zook, however,

- A number of Cusheon Lake residents are not part of the POD team. POD is neighbourhood emergency response program, which sends out emergency notices via people. She's aware of an informal group of Cusheon Lake residents and is making efforts to connect with them.
- The Island Health website will be what she calls a "pull system" rather than a "push system," which means that rather than pushing information out to the public, it will be the onus of lake users to find the website and make sense of the results.
- The SSI Emergency Program operates a new Emergency Notification System. People can voluntarily sign up at www.crd.bc.ca/ens and receive emergency notifications, including notice of cyanobacteria levels.
- The Emergency Program does help Island Health by posting notices at lakes and on neighbourhood mailboxes when cyanobacteria levels are elevated, and she's willing to help in any way she can. Yet, she acknowledges the lagtime between water sampling and public notification.

In an email from Kristi Wilson, Water Quality Officer at CRD, she states,

- "If the raw water tests positive with the cyanotoxin test kit, we will use the test kit on the treated water [in the Beddis Drinking Water System]. If the raw water tests negative, we do nothing more than report the raw water results to Island Health and to the CRD and NSSWD staff that operate the water system."
- "Lake users who are not connected to the Beddis Water System should contact Island Health regarding the cyanotoxin risk level in Cusheon Lake."

WPS approached the SSIWPA and asked the group to work with the proper agencies to achieve earlier and better notification to residents, who are not on the Beddis Water System and who draw their water directly from the lake, and to recreational lake users. "Better" notification wouldn't rely on volunteers or lake water users to seek out is information on their own.

WPS also asked that these users receive accurate information about the limitations of home treatment systems in bloom conditions and the potential dangers of cyanobacteria when and if the bacteria produce toxins.[2]

—*Coreen Boucher*

[1] HealthLinkBC: Blue-green Algae (Cyanobacteria) Blooms https://www.healthlinkbc.ca/healthlinkbc-files/blue-green-algae

[2] Cyanobacterial Toxins: Removal During Drinking Water Treatment, and Human Risk Assessment. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1637783/

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