Monitoring of harmful algal blooms in the Strait of Georgia by a Citizen Science program

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Citizen Scientist Program 2015 - 2017

- Citizen science is defined as "scientific work undertaken by members of the general public, often in collaboration with or under the direction of professional scientists and scientific institutions”

Pacific Salmon Foundation + Ocean Networks Canada + Department of Fisheries and Oceans Canada

unique data on entire Strait of Georgia
Sampling

- Properties/samples that are measured/collection are: conductivity, temperature, depth, dissolved nutrients, fluorescence, oxygen, zooplankton, phytoplankton, turbidity.
- The majority of collected data could be found on the Ocean Networks Canada website.
- ~ 80 locations are sampled
- sampling every ~2 weeks
- From February to October

- Phytoplankton samples:
- ~1300 samples in 2015
- ~2000 samples in 2016
Phytoplankton sampling

• Most of the station sampling at the surface, 1 station at 0, 5, 10, 20 m
• Samples preserved with Lugol’s Iodine, processed under light microscope
• Biomass and constituent groups are estimated, dominant species and known harmful to fish species (includes *Alexandrium* spp.) are enumerated

Observing non skeletal Dictyocha in the field Cowichan Bay, summer 2016
Results 2015

- 2015: the spring bloom was recorded extremely early (early March) with the dominant species being a diatom - *Skeletonema costatum*

- The majority of the phytoplankton biomass throughout the sampling season was comprised of diatoms, while the dinoflagellate contribution was unusually low and silicoflagellates and raphidophytes were almost absent

- Elevated levels of *Alexandrium* spp. were observed in Cowichan Bay and Ladysmith

*Alexandrium* spp. at the Ladysmith sites.

*Alexandrium* spp. at the Cowichan Bay sites.
Summary grid with the average biomass per area for the year 2015.

<table>
<thead>
<tr>
<th>Date</th>
<th>Victoria</th>
<th>Cowichan</th>
<th>Nanaimo</th>
<th>Baynes</th>
<th>Campbell</th>
<th>Lund</th>
<th>Powell</th>
<th>Irvine's</th>
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Results 2016

• The spring bloom was recorded several weeks later than in 2015 (late March, early April); there were a mixture of *Thalassiosira* spp., *Skeletonema costatum*, *Chaetoceros* spp. and its abundance in samples were often comparable

• Dinoflagellates started to appear in samples early; silicoflagellates blooms (non skeletal *Dictyocha*) in June, July

• Early *Alexandrium* spp. presence (March), not high concentrations but persistent (months) in some areas

• Blooms of *Rhizosolenia setigera*, *Ditylum brightwellii*, coccolithophores in summer
Examples of data applications

- Some areas are more likely to have certain species present (e.g. *Alexanrium* spp. is more common and abundant in Cowichan Bay and rare in Baynes Sound)

- It is possible to extract information from our data on local “windows of opportunity” for certain species

- Early warning system

Map of the Citizen Science sampling areas
Stay in touch

• Facebook page “Phytoplankton - Citizen Science Program” was created for informal communication between citizen scientists on the topics concerning phytoplankton in the Strait of Georgia
Thank you

• Environmental data – Ocean Networks Canada http://www.oceannetworks.ca/

• Phytoplankton data – Strait of Georgia data Center http://sogdatacentre.ca/

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