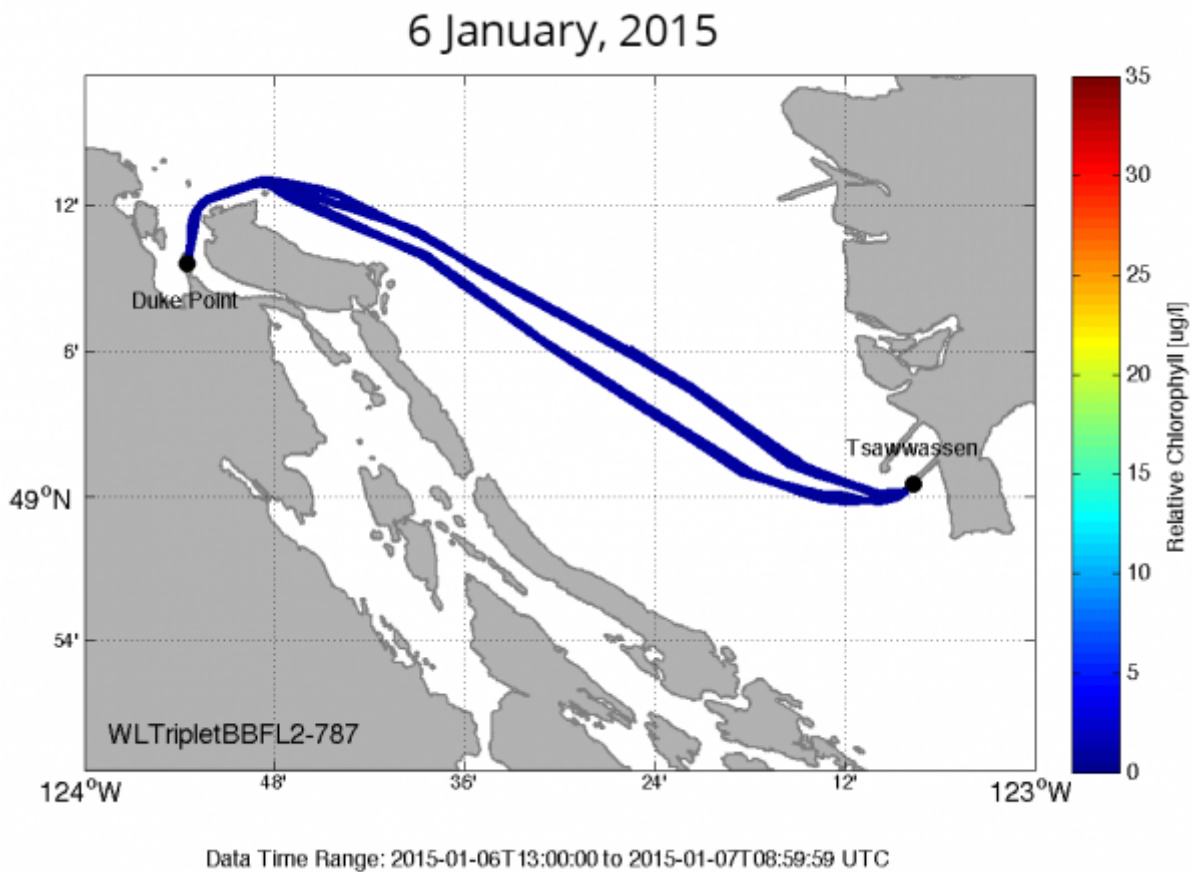


Spring bloom arrives early this year

Submitted by Virginia Keast Mon, 2015-05-11 09:02

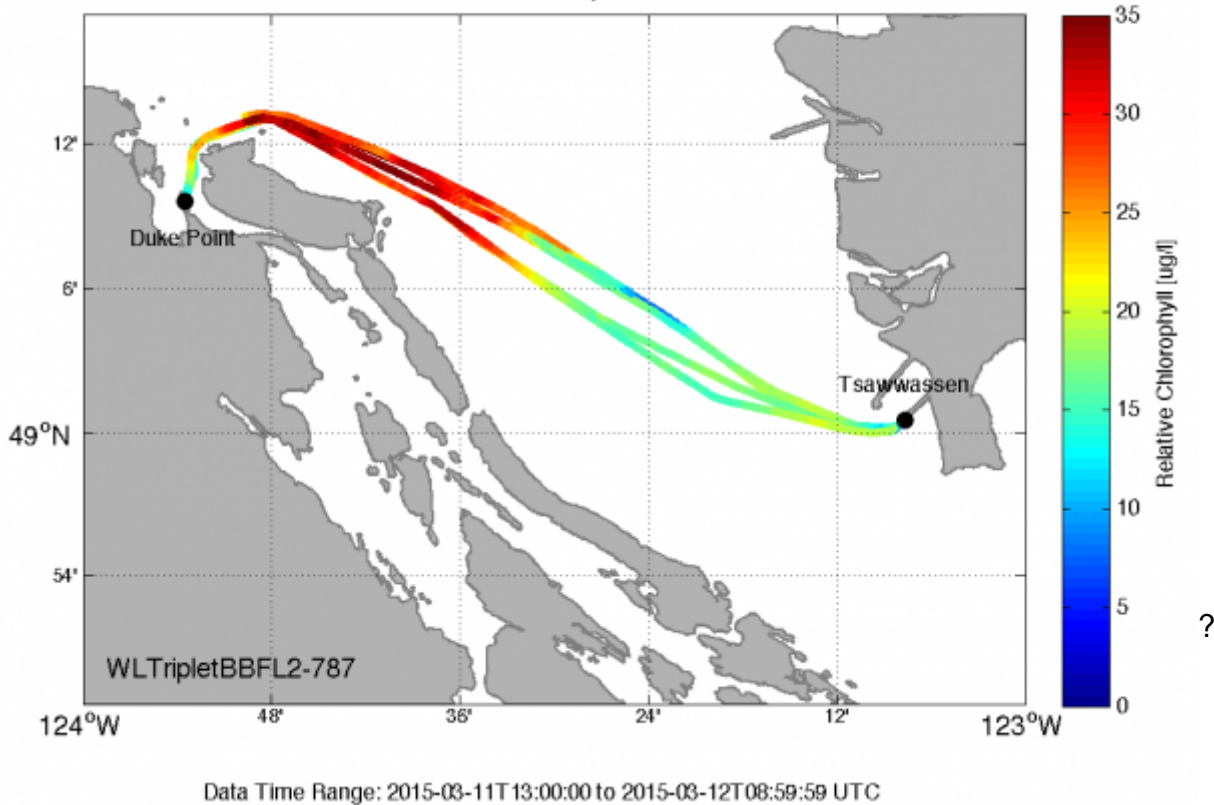
Every spring, plant-like cells known as phytoplankton will grow in number so rapidly and to such an extent that in many coastal areas such as British Columbia's Strait of Georgia, the water colour will become visibly green. This annual burst in productivity is referred to as the spring phytoplankton bloom. And this year, the bloom was the earliest we've had since 2005¹.

Ocean Networks Canada maintains a mobile observatory system on two BC Ferries vessels that transit the Strait of Georgia up to eight times daily between Vancouver Island and the lower mainland. Instruments on board measure water properties and the amount of plankton (biomass) at the surface every 10 seconds, making these data ideal for characterizing conditions that determine where and when the bloom starts.



(Fig.1) Comparing plankton biomass along the BC Ferries *M/V Queen of Alberni* route between Duke Point and Tsawwassen terminals on 6 January (above) and 11 March (below) 2015. Plankton measured on 6 January, 2015 depicts typical winter or pre-bloom conditions, characterized by low plankton biomass. Measurements on 11 March, 2015 show near peak plankton biomass during the spring bloom. High plankton biomass values are represented by warm/hot colours (yellow-red).

11 March, 2015



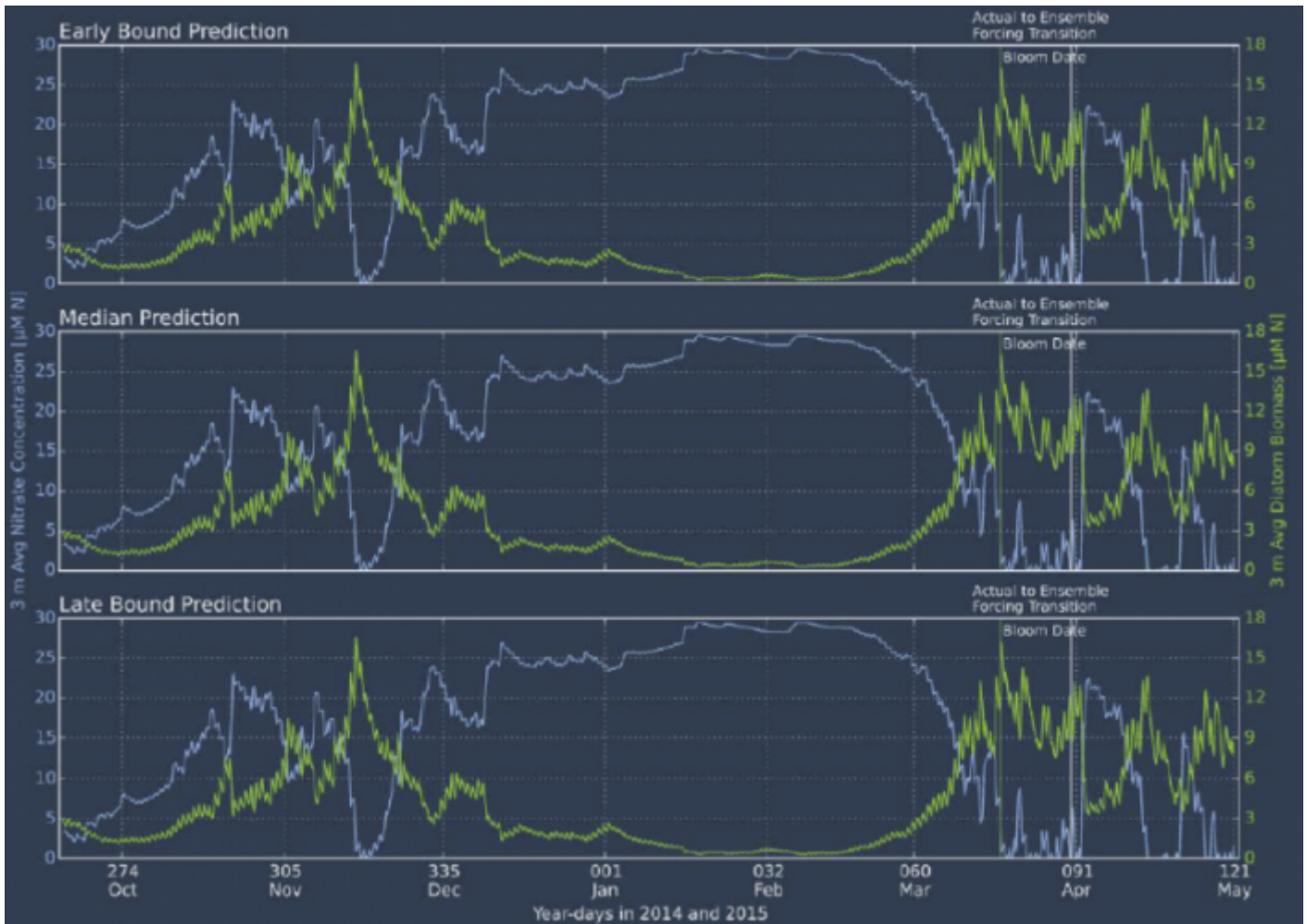
Scientists are particularly interested in this spring phytoplankton bloom because it fuels the growth of zooplankton, mostly tiny crustaceans, that then serve as food for small fish, salmon smolts and reproducing seabirds. The timing of the bloom is important because an early or late bloom can lead to potential mismatches that affect the growth and survival of these animals further up the food chain.

Computer model predicts the spring bloom

On average, the spring bloom peaks in late March. However, the timing can vary by up to seven weeks, with blooms as early as late-February or as late as mid-April.

Predictions of the timing of the bloom are made every year based on a numerical model produced by Dr. Susan Allen and her colleagues at the University of British Columbia. Dr. Allen uses the ONC data to evaluate the accuracy of her models, both the spring bloom model and the three-dimensional Salish Sea model her group is currently configuring.

?High frequency data like these provided by ONC are rare,? says Dr. Allen, ?and very valuable to evaluate models considering variations on the order of days.?

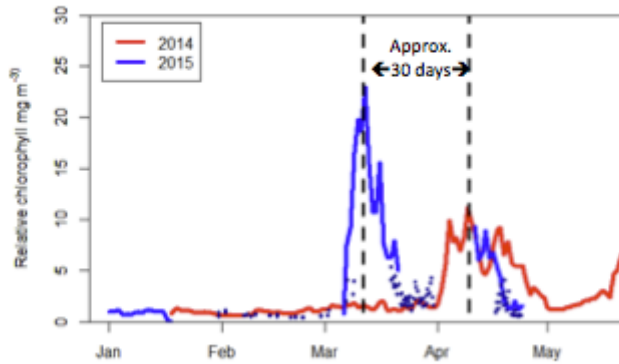


(Fig.2) Forecasts for the timing of the spring phytoplankton bloom for 2015 derived from model outputs. (See pdf from S.Allen)

Comparing the timing of the bloom from year to year

Gaining insight into what conditions promote an early, typical, or late bloom is therefore very important and demands the collection of continuous measurements over time and throughout the Strait of Georgia.

For instance, underway measurements from the *M/V Queen of Alberni*, crossing between Duke Point and Tsawwassen, made it possible to capture the start of the 2014 bloom on April 3-4. Whereas this year, the ferry instruments registered the start of the 2015 bloom during the first few days of March (Fig.3). According to Dr. Allen, this marks a return to typical bloom timing after nine years of consistently late blooms².



(Fig.3) Comparing 2014 (red) and 2015 (blue) spring phytoplankton blooms in the Strait of Georgia. Inter-annual variation in the timing of the spring phytoplankton bloom as measured by ONC mobile observatories aboard BC Ferries vessels M/V Queen of Alberni (solid lines) and M/V Spirit of Vancouver Island (dots).

If you are interested in learning more about the ferry program or joining the Ferry Working Group of scientists, please contact ONC Staff Scientist, [Akash Sastri](#).

¹Allen and Wolfe 2013

²Allen et al. 2014

Related papers:

- [Hindcast of the Timing of the Spring Phytoplankton Bloom in the Strait of Georgia, 1968-2010](#). (Allen, S.E. and Wolfe, M.A, 2013)

Related story:

- [Spring Plankton bloom in the North Atlantic](#) from Science 2.0 (April 2, 2015)

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