

SOUNDTOXINS

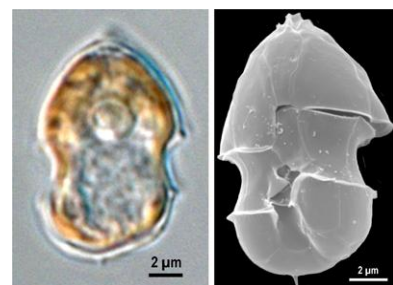
Thanks to all who attended the SoundToxins workshop on April 20 at the NOAA Northwest Fisheries Science Center (NWFSC)! We had a great turnout of new and experienced volunteers and it was a great opportunity to hear about some of the new species of concern in the Puget Sound, get an update on current research in the Puget Sound, spend some time looking under the microscopes and providing some feedback on how the program is going and how to make it better. Below is a summary of what happened at the workshop and some additional information that hopefully will be helpful as the sampling season starts. Once again, we want to thank you for all your work – SoundToxins would not succeed without you!

Be on the lookout! New species of concern

Azadinium spinosum

Professor Urban Tillmann (Alfred Wegener Institute, Germany) and Dr. Mike Twiner (University of Michigan) gave talks on a new HAB species of concern in Puget Sound - *Azadinium spinosum*. *Azadinium spinosum* is a small autotrophic dinoflagellate that produces the azaspiracid (AZA), a toxin responsible for the human illness azaspiracid poisoning (AZP), causing chills, headaches, diarrhea, nausea, vomiting, and stomach cramps. AZP was first reported (1995) from blue mussels originating from Killary Harbour, Ireland and since then, the toxins have also been identified in mussels throughout western Europe, northwestern Africa, and Canada. Recent analyses of samples collected by ORHAB and SoundToxins participants yielded positive results for AZA, suggesting that *A. spinosum* is present on the WA coast and in Puget Sound.

Cells are small (12-16 μm length and 7-11 μm width) with a large nucleus located posteriorly and single chloroplast. Please keep an eye out for *Azadinium* as you are looking at the phytoplankton samples.



Images by Urban Tillmann



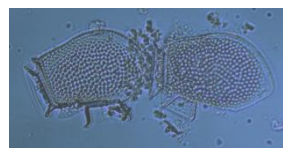
Image by B. Krock

Azadinium spinosum

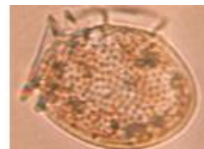
In order to identify if the AZA toxin is present, we will be working with our volunteers at Quartermaster Harbor, Sequim Bay and Fort Warden to put out SPATT bags (small discs with resin that accumulate the toxin) for weekly measurements for AZA. Molecular analysis of water collected at the same time will help confirm the presence of *A. spinosum*. Many thanks to Karlista Rickerson, Lohna O'Rourke, Jean Walat, Stephanie Oliveira, Louise Walczak and Kateri Schmerler for your help on this extra sampling!

Dinophysis

Dinophysis species capable of producing diarrhetic shellfish poisoning (DSP) are present in the Puget Sound, but there is very low awareness about the presence in shellfish. Though the symptoms can be difficult to diagnose since they are common to many gastrointestinal illnesses, there is concern for the long-term impacts of exposure since these toxins are potential tumor promoters. Jerry Borchert (WA Department of Health, DOH) provided some results of sampling for DSP in water and shellfish during the summer 2010. There were a couple hotspots, including Sequim Bay which had a maximum concentration of 250,000 cells/L, but only trace levels of toxin were measured in shellfish. Both the DOH and NWFSC scientists Keri Baugh and Dr. Leslie Moore will be measuring DSP in Puget Sound this year to better understand when and where these toxins are present. The action level for sampling shellfish will be when 7,500 *Dinophysis* cells/L are observed or when in 'common' abundance.



Dinophysis acuta

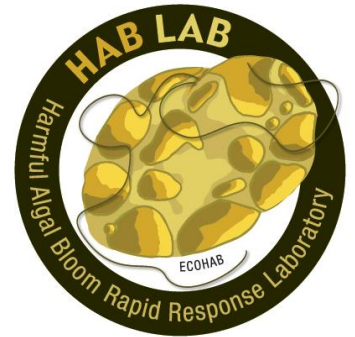


Images by Brian Bill

Current Research

Ecology and Oceanography of Toxigenic *Heterosigma*

Northwest Fisheries Science Center (NWFSC) together with colleagues from U. Maine, Romberg Tiburon Lab (San Francisco State U), and University of Western Ontario, Canada, are conducting a project to determine the cause of fish mortality due to *Heterosigma akashiwo*. We are very interested in knowing when any *Heterosigma* cells are observed anywhere in the Pacific Northwest so that collections can be made. *Heterosigma* blooms may occur in our waters anytime from May through October, usually are associated with calm, warm and sunny weather and sometimes neap tidal series, and can occur and dissipate extremely quickly (a few days) compared to blooms in the Strait of Georgia. SoundToxins partners and the SoundHABs Listserv are important in this project's success and we ask to be notified immediately with even the most minimal indication of cells in the water through the SoundHABs website (more info on next page).



PS-AHAB (Puget Sound Alexandrium Harmful Algal Blooms)

This project, headed by Dr. Stephanie Moore at NWFSC, focuses on modeling favorable habitat areas for the dinoflagellate *Alexandrium catenella* in Puget Sound and evaluating the effects of climate change. *A. catenella* produces a suite of potent neurotoxins, collectively known as paralytic shellfish toxins (PSTs), which accumulate in shellfish and cause severe illness or death if contaminated shellfish are consumed by humans. *Alexandrium catenella* form dormant cysts that overwinter on the seafloor and provide the inoculum for toxic blooms the following summer when conditions become favorable again for growth of the motile cell. A 2005 survey of *A. catenella* cyst distribution in Puget Sound, Washington, identified “seedbeds” with high cyst abundances that correspond to areas where shellfish frequently attain high levels of toxin. However, even at these sites, interannual variability in the magnitude of toxic events is high. In order to provide advanced warning of *A. catenella* blooms, managers need to know how much “seed” is available to initiate blooms, where this seed is located, when/where this seed could germinate and grow, and how these factors could be altered by future climate change. The first cyst survey for this project was completed in January 2011 and a map of the cyst distribution has just been released. SoundToxins data is important to this project for validating the models that will be developed on where and when *A. catenella* is predicted to occur. Check out <http://www.tiny.cc/psahab> for more information.



Data communication

We spent time talking about needs for better data coordination and dissemination of information, facilitated by Andy Gregory, a Masters student at the UW School of Marine and Environmental Affairs. Andy has also talked with many of you individually and we will continue to work with him to implement some of the changes that he has recommended. To start, we will be using the SoundHABs listserv to post information on high cell concentrations of HAB genera of concern. Please post immediately when you see any HABs that meet the guidelines below.

To join the listserv: Email Jack Rensel (jackrensel@att.net) or Zach Siegrist (zcsiegrist@gmail.com), who are responsible to the initial coordination of observations.

How to post: Send an email to SoundHAB@whoi.edu. When posting, put as much information as possible in the Subject Header including:

- Location
- Date/time
- Cell count
- Vertical and horizontal distribution if known.

If there is any doubt and you don't wish to notify everyone via SoundHAB listserv, please send an email with your observations to Jack or Zach (email addresses above) and Vera Trainer (vera.l.trainer@noaa.gov) so sample analysis can be expedited. Also feel free to send questions about species identifications to Brian Bill (brian.d.bill@noaa.gov) or Rita Horner (rita@ocean.washington.edu).

When to post: If you see any of the following genera at the given abundances (or higher), please send an email to the SoundHAB listserv immediately. There are also a couple genera that are critical to WA Department of Health, so if you see these, please also send the email to Jerry Borchert (jerry.borchert@doh.wa.gov) so he can coordinate shellfish sampling.

Genera	Abundance	Who to email
<i>Alexandrium</i>	present	SoundHAB Listserv, Jerry Borchert
<i>Heterosigma</i>	present	SoundHAB Listserv, Vera Trainer
<i>Azadinium</i>	present	SoundHAB Listserv, Vera Trainer
<i>Dinophysis</i>	7500 cells/L or common	SoundHAB Listserv, Jerry Borchert
<i>Pseudo-nitzschia</i> (small forms)	10 ⁶ cells/L or dominant	SoundHAB Listserv
<i>Pseudo-nitzschia</i> (large forms)	2x10 ⁴ cells/L or common	SoundHAB Listserv

