

## AHAB Monthly Call – July 8<sup>th</sup>, 2021

**Participants:** Thomas Farrugia (AOOS), Michelle Morris (ADFG), Bill Carter (USFWS), Gay Sheffield (AK Sea Grant), Karen Pletnikoff (APIA), Chandra Poe (Qawalangin Tribe), Grace Ellwanger (KANA), Michael Opheim (Seldovia Village Tribe), Dom Holdero (NOAA Kasitsna Bay), Kris Holderied (NOAA Kasitsna Bay), Jeff Hetrick (APMI), Maile Branson (APMI), Annette Jarosz (APMI), Patryce McKinney (DEC), Carol Brady (DEC), Sarah Schoen (USGS), Matt Smith (USGS), Caroline van Hemert (USGS), Naomi Bargmann (USGS), Sarah Yoder (DHSS), Kate Helfrich (DHSS), Robb Kaler (USFWS), Courtney Hart (UAF), Susana Gonzalez (Tufts University), Muriel Dittrich (UAF), Anne Garland (ARIES), Chelsea Campbell (CRRC), Stephen Payton (Seldovia Village), Steve Kibler (NOAA NCCOS), Alex Sabo (NOAA NCCOS), Julie Matweyou (AK Sea Grant), Jasmine Maurer (KBNERR), Dom Hondolero (NOAA Kasitsna Bay), Danielle Gerik (USGS), Sijo Smith (ACF)

**Thomas' updates** (more details on AHAB website: <https://aoot.org/alaska-hab-network/>)

### HABs in the News

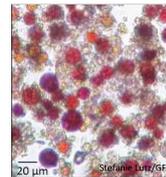
- Algal blooms in snow as it melts, seen all around the world, including Arctic

<https://www.nytimes.com/2016/06/23/science/watermelon-snow-global-warming.html>



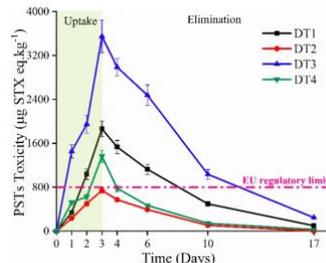
- Article puts global HAB trends in context of Alaska

<https://insideclimatenews.org/news/16062021/algal-blooms-global-regional-trends/>



### HAB Science

- Review of the impacts of STX and DA on seabirds – has good explanations of the effects of toxins on seabirds, analytical methods for detecting toxins, and vectors of intoxication in seabirds
- Study on the combined effect of SST and *Alexandrium* abundance on the uptake and depuration of STX in mussels. Also discusses toxin distribution in tissues.



**Figure 2.** PSTs ( $\mu\text{g STX eq. kg}^{-1}$ , mean  $\pm$  SD) detected in mussels during the experiment under four environmental conditions (DT1: 25 °C and  $C_{A. catenella}$   $5.6 \times 10^6$  cells  $\text{L}^{-1}$ ; DT2: 30 °C and  $C_{A. catenella}$   $5.6 \times 10^6$  cells  $\text{L}^{-1}$ ; DT3: 25 °C and  $C_{A. catenella}$   $1.0 \times 10^7$  cells  $\text{L}^{-1}$ ; DT4: 30 °C and  $C_{A. catenella}$   $1.0 \times 10^7$  cells  $\text{L}^{-1}$ ).

## Work Updates

- 2020 HABs Summary – up on website
- AHAB Action Plan – formatting and finalizing
  
- On your radar
  - Toxin levels increased last month across the Gulf
  - Karen Pinchin (journalist) writing an article on HABs in Alaska for Scientific American - <https://www.karenpinchin.com/>
  - Recording of HAB identification workshop on the AHAB Youtube channel

### Round Robin Updates (going by region of work)

#### SOUTHEAST

##### **Courtney Hart, Susanna Gonzalez, Muriel Dittrich**

We're doing a lot of sampling around Juneau. Not many Alexandrium in the water right now, but we are seeing Pseudo-nitzschia, so we could use some help regarding DA testing if anybody can assist with that. We are also seeing a lot of phytoplankton and chlorophyll so trying to sample those if anybody has any techniques to share to sample those.

Kris: You can check with SEATOR, they do ELISA for DA I believe.

Julie: Courtney, I will send you chapter 5 of my thesis (2003) which describes the chlorophyll and nutrient methods I used

##### **Michelle Morris**

We are having more aquaculture farms asking for permits, and you can see the locations of currently permitted aquatic farms. Updates are live as permits get issued:

<https://adfg.maps.arcgis.com/apps/webappviewer/index.html?id=f3ca95493c1042b39e42a3ecb5dcad6a& ga=2.235200327.773326172.1625689351-1207690787.1556725022>

Also, if you want to collect samples for testing, the Aquatic Resource Permit application for collection or holding of species can be found here:

[http://www.adfg.alaska.gov/index.cfm?adfg=otherlicense.aquatic\\_resource](http://www.adfg.alaska.gov/index.cfm?adfg=otherlicense.aquatic_resource)

##### **Jeanette Gann** (update over email)

However, I thought I'd let you know that last week's samples just outside of Auke bay in Stephens passage, revealed a few chains of pseudo-nitzschia with an apparent second large phytoplankton bloom this summer. Not sure of cell density yet since I just read the samples yesterday and haven't yet quantified. I also forgot to mention I did see one small chain of Alexandrium as well.

**Annette Jarosz**

At the beginning of the month we weren't finding much at the entrance of Seward Harbor and not finding much. We're now sampling at the entrance of 4<sup>th</sup> of July Harbor which is deeper with a lot less traffic, and we've been finding a lot more diversity in algae. But we haven't found any Alexandrium, and no Pseudo-nitzschia. We also have hanging blue mussels there that we also sample and freeze. We've also been going to Afognak beach and sampling blue mussels there plus cockles. Once we get the ELISA up and running (we are doing training for that next week), we'll be able to do domoic acid and saxitoxin testing on all the backlogged samples from both sites.

**Grace Ellwanger**

Seeing a pretty slow increase in phytoplankton activity, we're seeing pseudo-nitzschia pretty regularly, and Alexandrium in a few locations, not really in any big quantities lately. But our PSP results are definitely coming back hotter in blue mussel samples. We have another collection coming up this week. There was a big increase 2 months ago, and then it died down a bit after that and it's been consistent since then. Not as active compared to this time last year.

**Steve Kibler**

Project with Julie Matweyou and Chris Guo looking at toxins in the lower food web (part of NPRB funded project). Did beach seining for forage fish, also got some in a fyke net. Also sampled intertidal invertebrates, zooplankton and phytoplankton. We also did some scoping for a future fish toxicity project with Chris. In August, planning a trip to Kachemak Bay to do the last of the sampling for fish with the Reserve's help. And continuing to run toxicity analyses.

**Alex Sabo**

Just started working with Steve in Beaufort, NC two weeks ago. Looking forward to working with everybody!

**Julie Matweyou**

With was a pleasure to work with Steve, he gave a good overview of the projects going on here. In addition, I've been working with our interns on monitoring for Alexandrium, collecting whole water samples and concentrating that through a net. These samples will be analyzed by qPCR in Beaufort. We've been monitoring that twice a week, and will continue that throughout the summer. It'll be good to compare that to the work that SEATOR is doing, since we are sampling in the same location (Trident Basin). We can compare our qPCR samples to the mussel toxin data they are gathering. Hopefully, we'll see connections between the two.

**Jasmine Maurer**

We have seen an interesting summer – this is my 3<sup>rd</sup> summer doing phytoplankton and we are starting to see a consistent phytoplankton abundance in Kachemak Bay at most of our sites. Since mid-May and for most of June, it was very spotty. We're seeing a lot of small Pseudo-nitzschia but we haven't really seen Alexandrium, and Dinophysis in pockets. For our program as a whole, since the covid summer our community of monitors has shrunk a little bit. So we'll

be doing some more work this winter and spring to re-inject some enthusiasm. We weren't sure what to expect going into this summer...

### **Kris Holderied**

We're looking forward to having Steve come up. Also coming with Steve is the HAB forecasting branch chief for NCCOS, so maybe looking to set up meetings with other folks – opportunity to meet with Kaytee Boyd. We're moving forward with the SST project, that's very exciting. We had a fisherman come to us saying that he's seeing a super dense layer at the bottom on the depth sounder for miles. So he borrowed a zooplankton net and sampled through it, and it looks like it was mostly euphausiids. Could be other stuff in there too. But it would be great to pull together everybody's observations about the timing of everything this year, cause it seems like an unusual year, at least in our area.

### **Dom Hondolero**

We're continuing to do our regular monitoring, this month we'll be doing the quarterly CTD transect. For that we'll be going to the Cook Inlet entrance, so it'll be interesting to see what's going on out there, and compare that to what we're seeing in the bay. We're continuing the port sampling for predator fish (toxins in the food web project), as well as collecting forage fish from beach seines (last field season for that project). We'll be summarizing that project after this season, so we look forward to sharing those results with everybody.

### **Patryce McKinney**

Thank you to everybody for being patient with our little scare regarding the shutdown, and then we had another scare of not being able to get mice – interesting side effect of climate change. We're back up and operational!

### **Carol Brady**

No updates for commercial shellfish, there have not been any PST events that have shut down any growing areas.

### **Kate Helfrich**

I have been MIA for Covid, and I have been trying to get back into all the things, so I appreciate getting the invite for this call. I'm hoping that we can get more involved, but we will be a bit sporadic at first. One thing we'd like to get a sense on is that last year we weren't able to do a lot of messaging related to things outside of Covid. But now our public information officers are hoping to put out some PSP notices on our facebook and tweets like we have historically done. So I wanted to share a couple options and see if anybody had any feelings about one over the other. Since levels are increasing, we were thinking some time in July would be great to post. Below are some options for messaging, let Kate know if you have any inputs.

- Anyone consuming non-commercial shellfish does so at his or her own risk. You may have heard of paralytic shellfish poisoning (PSP), but do you know the symptoms?
- Early symptoms include tingling of the lips and tongue, which may begin within minutes of eating toxic shellfish or may take an hour or two to develop. Symptoms may progress to tingling of fingers and toes and then the loss of muscle control in the arms and legs,

followed by difficulty breathing. Some people experience a sense of floating or nausea. Muscles of the chest and abdomen may become paralyzed; if this happens, death can occur in a matter of hours.

- Treatment is supportive care, which may require mechanical ventilation; there is no antitoxin. If you think you have PSP symptoms, call 911 and seek immediate medical attention.
- Attention health care providers: Please report suspected cases of paralytic shellfish poisoning (PSP) as soon as possible to the State of Alaska Section of Epidemiology at 907-269-8000 or after hours at 1-800-478-0084. Public health officials will investigate and help prevent additional cases from occurring.
- Shellfish toxin levels have been high in some areas of Alaska recently. Anyone consuming non-commercial shellfish does so at his or her own risk.
- For more information on shellfish harvesting and PSP:  
<http://dhss.alaska.gov/dph/Epi/id/Pages/dod/psp/default.aspx>  
<https://dec.alaska.gov/eh/fss/shellfish/paralytic-shellfish-poisoning/>

Our DHSS state website is still down and we do not have an estimated time of when that will be back up. So we are referring folks to DEC website for PSP materials.

### **Sarah Schoen**

I've been talking to Chandra Poe in Unalaska about some higher levels they've been seeing in blue mussels and I'm hoping to fly out there as soon as the winds come down and do some food web sampling, from plankton to seabirds.

### **Robb Kaler**

As of July, only 2 reports of sea bird deaths: In Nome 2 murre carcasses were found at the end of May, we don't have them in possession so can't assume they died from exposure from HABS. The other report was from Susan Oehlers at USFS in Yakutat of a tern chick (presumably arctic tern). It had something in its mouth, and she did collect the carcass. Once we get that here in Anchorage, we'll ship it down to the USGS NWHC as exposure to HAB toxins might have been involved. The chick was not acting normal, but it was a hot day, so that might have been the cause as well. Other than that, so far nothing else to report on the seabird die-off front, so that's good news.

### **Bruce Wright**

I got some results from Chignik, and it tells a bit of a story. A man dug butter clams from a 1m diameter hole, just last week. He sent samples in and also left some in a 5 gallon bucket in 8-10 ft of water off the dock to let it clean out. Then he sent those in as well. I told him that the clams in the bucket are still in the ocean and still feeding so still possibly exposed. The clams soaked in the bucket for 2 days, then he cleaned all the clams, sent in another sample and froze the rest.

Also from that same hole, he pulled out 20 of what he called 'steamers'. Usually when people say 'steamer', they're littleneck clams and most know that they usually don't obtain the high

toxicity levels like butter clams or cockles, and in fact sometimes can transfer saxitoxin into less toxic compounds. But in this case, these were actually small butter clams, so there's risk associated there.

Test results: all of the butter clams taken out of same small excavation.

Large butter clams from initial harvest: 536 ug/100g.

Clams that stayed in the water at 8-10ft for 2 days: 320 ug/100g. So they were at a lower level but still not, not quite sure what that means yet.

"Steamers" (but actually small 2-in across, 6 yr old butter clams): 231 ug/100g.

The person that harvested was pretty excited about harvesting butter clams, dropping them 10-20m off buoy to see if they deplete. So we're going to do that experiment. Right now I'm telling him not to eat any of these clams.

One of the most interesting things is the misidentification of clam species. It's easy for people to mis identify butter clams and little necks, but it increases the risk.

The difference between big and small clams is also interesting. I did sampling of small/medium/large mussels off the same rock, and the large mussels were as much as 10x lower in PSP as the small mussels. Lots of anecdotal results that go along with that. Some oyster farmers are seeing the opposite in oysters: larger oysters collected more toxin (as much as 2x). This is the first time I've seen possible difference between small and large butter clams. Ray Ralonde speculated that small mussels were more active so higher concentrations of PSP.

Note: experienced people don't always identify species right! Ray was good at going to communities and talking about the different species.

Make sure you know the different species and the communities you're working with know the different species.

Butter clams act much differently with respect to PSP than cockles and razor clams.

Julie: I talked to experienced harvesters in Kodiak. They treat any 2 inch clam as a steamer, regardless of the species. They can recognize the species, but they process them differently so they just treat anything small as a steamer. Also, I wanted to comment on the idea of lowering the bucket of clams to deplete the toxicity. I don't know how much work has been done in the state on the depth distribution of Alexandrium, but when I did my graduate work, I sampled at 1,3, 5, 10 and 17 m and plotted a depth contour. Alexandrium can be found throughout that water column. I didn't publish but I could share the graph so we can let people know Alexandrium can be found throughout the water column. And Bruce, Steve and I have done studies on clams from the same hole, and there's a lot of variability in the butter clams.

Michael Opheim: I have seen people who I think should know the difference in steamers and butters put other species in the buckets because they were the size of a steamer.

Kris Holderied: Bruce - this is fascinating. Were the "steamer" small butter clams from the beach or the bucket?

Kimberly Stryker (AK Food Safety & Sanitation): Bruce, do you think that the sample from the beach was representative of the total population at the beach? Is it possible there was variation among clams in the population?

Steve Kibler: That kind of depuration study has been done before. Butter calms are a bad risk.

Kimberly Stryker (AK Food Safety & Sanitation): Because butter clams hang onto PSTs for a long time, is it possible the smaller (younger) ones haven't been exposed to as many toxic events and that could explain their lower toxicity?

Steve Kibler: Possible Kim. We also found huge variation in individual clam toxicity from the same hole. Several hundred %

Kimberly Stryker (AK Food Safety & Sanitation): Butters and geoducks are interesting creatures! One day, we'll crack the code!! ;)

Julie Matweyou: Steve and Bruce - we need to publish the butter clam variability work

Bruce Wright: Within beach variability could explain the differences in the PSP levels in small and large butter clams from the same excavation. To control from this variability would likely require a sample size in the hundreds.

Chandra Poe: What is everyone's favorite online resource to share with people for proper shellfish identification of AK species?

Bruce: Ray Ralonde produced one.

Julie: It's on the AK Sea Grant website, there's a poster and the Ralonde publication that has an insert in the middle. It might be worthwhile to update that, because the poster was drawings and it would be nice to have photographs.

Kimberly Stryker (AK Food Safety & Sanitation): <http://dec.alaska.gov/eh/fss/shellfish/alaska/>

Naomi Bargmann: I have found this guide to be super helpful identifying unknown shellfish, esp if you can cut them open. <https://apps-afsc.fisheries.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-341.pdf>

Julie Matweyou: Nice guide Naomi. Thanks for sharing.

Jasmine: SEATOR also has a good guide for clams that has photographs and brief descriptions.

### **Chandra Poe**

Nothing terribly new, all of our results are coming in high for our blue mussels. I am keeping website updated if people want to check in there periodically. It'll be good to get Sarah out there.

### **Karie Holtermann**

I started doing some net tows, and will do them weekly here. Alexandrium is coming up a little bit. I'm using NOAA quantitative net tow method and getting some environmental parameters at the same time. We're going to have a museum day with kids, I bought some little microscopes, and I'll show them about HABs and phytoplankton. And hopefully I can get with Steve to get those standards for the qPCR.

### **Gay Sheffield**

Not much to report in the way of news. The weather has been chilly, with temps in the high 40's, moist chilly conditions. The AFSC down in Seattle is doing a bottom trawls Bering Sea Survey right now. They are posting the bottom temps as they go. The grid is 20 nautical miles; usually take a station in the middle. Boats will come to Nome soon and start the northern portion of the bottom trawl survey. They're trying to understand what's going on with the ecosystem. Salmon seem to be having trouble showing up. Way below average for chum; waiting on that.

NOAA Bering Sea Bottom Trawl Survey - Bottom temps (in near real time):

[https://www.fisheries.noaa.gov/alaska/science-data/near-real-time-temperatures-bering-sea-bottom-trawl-survey?fbclid=IwAR2d2\\_zjKlAuB7z\\_qWgf8fzf1-jCLWqHvESO8QnjEbgGZjhyhiiBWzbu4po](https://www.fisheries.noaa.gov/alaska/science-data/near-real-time-temperatures-bering-sea-bottom-trawl-survey?fbclid=IwAR2d2_zjKlAuB7z_qWgf8fzf1-jCLWqHvESO8QnjEbgGZjhyhiiBWzbu4po)

### **Emma Pate** (from email update)

I collected several samples from 4 different sites and will narrow it down to 2 sites weekly and 1 site monthly. The 1 site monthly will be coordinated with the Harbormaster to bring me offshore within a 2 mile radius. The best locations for samples are offshore and in a lagoon 20 miles East of Nome. It will be a developmental process as it will take time and practice to fine tune these areas for a Quality Assurance Project Plan. Once the basis within our department is established with a few partners, we can branch out to the region for those Tribal Environmental Programs that have a focus on establishing a baseline phytoplankton database for a 5 year period to monitor activity in water quality as it pertains to harmful algal blooms. I also have an intern for the short summer period that will assist in development and distribution of a survey for our region.

### **Bill in Kotzebue**

Everything is on hold here; instruments have been pushed back, but should arrive in another 2 weeks. It's been cold and rainy except for 2 days at the end of June.

Conditions haven't been optimal for seeing the blooms we've seen in the past few years when it's been warm. This year, it's been stormy, 1.5 inches of rain in 24 hours this past weekend.

### **Evie Fachon** (update over email)

No big updates from our group besides preparing for cruising in August-September.

### **Anne Garland**

There's still ice on the north slope so they haven't been taking samples yet. It's unusual because the ice typically moves out at the end of June. We're trying to have a virtual "risky business" camp and the kids we're organizing it with want to focus on HABs. I might be checking with you Thomas cause we need something really simple. It'll be middle school and 4<sup>th</sup> and 5<sup>th</sup> grade.

Darcy Dugan: Katie Gavenus at the Center for Alaska Coastal Studies has a lot of great curricula for kids and might be a good resource.

### **Lisa Eisner**

Followin on with what Gay said, there's gonna be a NOAA survey in northern Bering Sea where they do pelagic fish and salmon and forage fish. And they also include zoo plankton, phytoplankton, and will do HABs for Kathi Lefebvre to analyze. That's Aug/Sept. Then also the survey from Bering to Chukchi in late Aug/Sept. I'll be on that survey also collecting phytoplankton images.

Gay: Thanks Lisa, and also the entire Bering Sea survey and other surveys are collecting for Kathi for ECOHAB project. There's a whole swath of people and cruises that are working on that, so thank you all.

**Jasmine Maurer**

Just wanted to let everybody know about the 2-week course from Bigelow that includes lab and monitoring techniques. The application for the course is every march and the course is in the fall: <https://ncma.bigelow.org/training-courses>

**NEXT AHAB MONTHLY CALL WILL BE: THURSDAY August 19<sup>TH</sup>, 2021 AT 9:30AM AK**