

AHAB Monthly Call – February 11th, 2021

Participants: Thomas Farrugia (AOOS), Kathi Lefebvre (NOAA NWFSC), Adam Ruka (CEMML), Andie Wall (KANA), Anne Garland (ARIES), Bailey Richards (ANTHC), Bill Carter (USFWS), Brock Taylor (DEC), Brian Korth (Seldovia Village Tribe), Carol Brady (DEC), Chandra Poe (Qawalangin), Chelsea Campbell (CRRC), Caroline Cummings (USFWS), Grace Ellwanger (KANA), Chris Guo (KBNERR), Courtney Hart (UAF), Caroline van Hemert (USGS Alaska Science Center), Danielle Gerik (USGS Alaska Science Center), Darcy Dugan (AOOS), Dean Stockwell (UAF), Eric Wyatt (ASGA), Gay Sheffield (AK Sea Grant), Jacqueline Ramsay (Alutiiq Pride), Jasmine Maurer (KBNERR), Jill Prewitt (AOOS), Jeff Hetrick (Alutiiq Pride), John Harley (UAS/ACRC), Karen Pletnikoff (APIA), Kari Lanphier (SEATOR), Karie Holterman (City of Unalaska), Katie Gavenus (CACS), Kevin Heller (ANTHC), Kimberlee Beckmen (ADFG), Maile Branson (Alutiiq Pride), Michael Opheim (Seldovia Village Tribe), Michelle Morris (ADFG), Matt Smith (USGS Alaska Science Center), Molly McCammon (AOOS), Muriel Dittrich (UAF), Naomi Bargmann (Sitka Tribe), Natalie Monacci (OARC), Patryce McKinney (DEC), Sarah Schoen (USGS Alaska Science Center), Stephen Payton (Seldovia Village Tribe), Steve Kibler (NOAA Beaufort Lab), Tim and Barbara Lydon (PWS Stewardship Foundation), Varis Ransi (NOAA), Xiuning Du (Hatfield Marine Science Center), Kathy Burek Huntington (Alaska Veterinary Pathology Services), Lori Verbrugge (CDC), Julie Matweyou (AK Sea Grant)

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

HAB News – Sea Ice

- Mineral dust -> larger algal blooms -> darker ice -> faster ice melt in Greenland

Mineral phosphorus drives glacier algal blooms on the Greenland Ice Sheet

Jennie McCutcheon^{1,2}, Barbara Lutz, Christopher Williamson, Joseph M. Cole, Andrew J. Tallante, Audrey Vandorsten, Bethan A. Wilson, Anthony Strickland, Shana Bornemann, Alexander M. Anas, Karan U. Yeh, James B. McClain, Marjyn Tranter & Lane O. Björnsen

Nature Communications | 12, Article number: 570 (2021) | [Cite this article](#)



- Red and green snow algae in Antarctica

Spectral characterization, radiative forcing and pigment content of coastal Antarctic snow algae: approaches to spectrally discriminate red and green communities and their impact on snowmelt

Khan, A. L., Dierssen, H. M., Scambos, T. A., Höfer, J., and Cordero, R. R. The Cryosphere, 15, 133–148, <https://doi.org/10.5194/tc-15-133-2021>, 2021



- Melting ice could mean more toxic algae in Arctic

An under-ice bloom of mixotrophic haptophytes in low nutrient and freshwater-influenced Arctic waters

Ortiz U. Saggard^{1,2}, Brian K. Sorrel, Mikael K. Jørg, Per Andersen, Børn Ruggaard, Per Just Hansen, Annette Bratås, Signe Lantto & Lars Christian Lund-Hansen

Scientific Reports | 11, Article number: 2919 (2021) | [Cite this article](#)

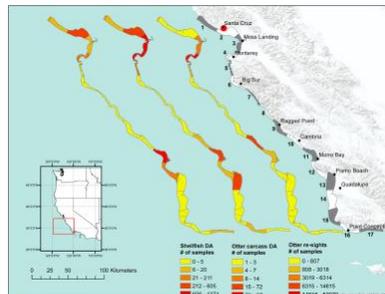
HAB News – Domoic Acid in Sea Otters

- Sea otters exposed to domoic acid are 2.5x more likely to die of heart disease
- DA from consuming crabs and clams



Exposure to domoic acid is an ecological driver of cardiac disease in southern sea otters^{3*}

Megan E. Morley^{1,2,3,4,5,6}, M. Tim Tinker^{1,2,3,4,5,6}, Melissa A. Miller^{1,2,3,4,5,6}, Joseph A. Tomkowiak^{1,2,3,4,5,6}, Michelle M. Standler^{1,2,3,4,5,6}, Jessica A. Fujii^{1,2,3,4,5,6}, Francesca I. Bacc^{1,2,3,4,5,6}, Eric M. Dodd^{1,2,3,4,5,6}, Raphael M. Kudrinski^{1,2,3,4,5,6}, Vanessa Zubikowsky-White^{1,2,3,4,5,6}, Christine K. Johnson^{1,2,3,4,5,6} & R. B.



HAB News – DA Still Closing Razor Clam Digs

- WA state beach continue to show increased levels of DA
- Testing done every 2 weeks for DA and PST
- No clam digs allowed until DA levels drop below reg levels
- <https://wdfw.wa.gov/fishing/basics/domoic-acid/levels>



Upcoming Events

- Kachemak Bay Science Conference
 - March 15-18, 2021
 - Special HAB session
 - <https://www.kachemakbayscience.org/>
- Managing Harmful Algal Blooms in Tribal Waters Webinar Series
 - March 10, 16 and 18, 2021
 - <https://region10rtoc.net/managing-harmful-algal-blooms-in-tribal-waters-webinar/>

Network Update – HAB Proposals

- Role of AHAB – coordinate efforts and encourage collaboration
- Alaska Sea Grant 2022-2024 RFP
 - <https://alaskaseagrant.org/research/funding/>
 - Preliminary Proposals: March 1, 2021
- Aquatic Research Equipment & Travel Grant programs for graduate students and undergraduate faculty (from FlowCam): <https://info.fluidimaging.com/flowcam-student-grant-2021>
- Alaska Conservation Foundation Youth Mini Grants: <https://alaskaconservation.org/wp-content/uploads/2021/01/Youth-Mini-Grant-Guidelines.pdf>

For HAB funding proposals, the role of the AHAB network should be to help coordinate proposals as much as possible. Thomas will post HAB-related funding opportunities on the AHAB website. Please let Thomas know if you know of any funding opportunities that apply to HABs, or if you need help or are looking for partners. Ideally, we would avoid competing for the same pot of money as much as possible (although sometimes that will be inevitable).

Overall announcements

Chandra Poe – This is the time of year when outreach materials need to be put together and sent out, both outreach and awareness (presence of PSP, awareness of PSP, etc.). In Unalaska, there are metal signs posted in certain beaches:

DANGEROUS PSP LEVELS

Extremely high paralytic shellfish poisoning (PSP) levels have been found this year in shellfish (mussels, bivalve mollusks, clams, oysters, cockles, snails and scallops) in the region.

IT IS NOT POSSIBLE TO SEE, SMELL, OR TASTE IF SHELLFISH ARE CONTAMINATED!

Freezing and cooking the shellfish



DOES NOT remove the toxins!

Commercial products purchased at the store



have been tested and are safe for consumption.

Toxic algal blooms are invisible and can vary from one beach to another. It does not have to be red tide. Shellfish may have completely different toxin levels depending on the site. Regardless, PSP levels in the region are far above the FDA limit for safe consumption.

PSP Poisoning Symptoms:

- Tingling and numbness that spreads from the lips and mouth to extremities
- Shortness of breath
- Confused/slurred speech
- Weakness in legs & arms
- Dizziness
- Headache
- Nausea
- Sense of floating
- Vomiting
- Paralysis
- Death

Anyone with these symptoms should seek immediate medical care or call 911.

This notice was made by the Qawalangin Tribe of Unalaska in partnership with Alaska Sea Grant. If you have any questions, please contact Melissa Good at (907) 581-1876 or melissa.good@alaska.edu.

Not aware of a central place where outreach resources have been shared before, could we start a place to send links or a google folder?

Thomas: if people send in the outreach materials they have, Thomas can consolidate and post them somewhere (on the AHAB website, or in a shared google folder).

Jasmine: KBNERR has lots of flyers they can contribute.

Gay: Alaska Sea Grant book store has materials too.

Katie over chat: In addition to physical products (like fliers) it would be good to compile things like radio announcements/pieces if anyone has done those.

Gay: the AHAB website says we deal with response. Do we actually do this? AHAB isn't the response agency. Should be modified.

Round Robin Updates

Bruce Wright (through Thomas) – Knik tribe will be monitoring PSP in 2021 from BC into the Bering Sea. Mussel samples will be collected and tested from 12 locations from April to August 2021. Knik tribe will be fully funding the supplies, shipping and analyses and providing a stipend to participants.

Dean: would like to see a map of the sites and who the co-investigators are for Alaska.

Karen Pletnikoff: also interested in map of where sampling is taking place around the state (historic sampling or current)

Thomas: I can work on a map of sampling locations – will probably need to be added to over time but can start with the available datasets.

Naomi Bargmann – Sunny in Sitka! But pretty cold for here. PST levels have been uninteresting. A couple locations where butter clams are over the limit (120, 150) but Ketchikan butter clam was 480 but very variable site. They typically have the highest butter clam samples and are the first site to go over the limit in April every year. Ketchikan is definitely on the southern border of Alaska and it shows. Everyone is back in the office; working with a full crew since last week.

Kari Lanphier – just gearing up for bloom season!

John Harley – Put in a proposal to Climate Adaptation Science Center. Got funded to look at local ecological knowledge of linkage between herring spawn timing and HABs in Southeast. Hoping to start in the summer. Try to get more data to play with. If anyone is interested, he's looking for undergrad or graduate students to help.

Dean: wondering if there is any indication of a PSP load in herring in Southeast.

John: doesn't know. Did some sampling with Bruce Wright with sand lance and other forage fish. Sent them to USGS and found detectable concentrations. Caroline is looking for linkage to that with sea bird die-offs in 2019.

Kathi: they do have herring samples but have been out of the lab since March. She can send numbers from a few herring samples from the Gulf.

Dean: what about up in Bering?

Kathi: has lots of cruise samples and have map of fish samples from 2019 Chukchi/Bering. She can send an email.

Steve Kibler: We have some toxin data in a variety of forage fish, including herring

Sarah Schoen: We also have a few herring with detectable levels of STX from Prince William Sound and Cook Inlet.

Courtney Hart: graduate student in Eckert lab, wrapping up cyst sampling of the past year. Has 300 samples of sediments from geoduck harvest areas in SE Alaska, will share that soon. Muriel Dittrich, undergrad at UAS, starting to measure HABs at oyster farm in town. Will collect basic set of info as well as oyster tissue toxicity. Will collect OA during the bloom too with Natalie Monacci. Will continue throughout the summer and into the fall.

Michelle Morris – getting more aquatic resource permit applications for 2021 season. People are hoping to do more sampling this year compared to last year. Reminder that if you're looking to collect anything, talk to Michelle.

Eric Wyatt – located on the outside coast of Prince of Wales. Thanks Courtney for presentation at Alaska Shellfish Growers Association conference. ASGA is also interested in map of sampling locations. Quiet time of year from them.

Michael Opheim – Environmental coordinator for Seldovia Village Tribe. Work with Alutiiq Pride and KBNERR. Collect samples for Burke-o-lator. And have also collected samples for Bruce Wright. Gearing up for summer; herring project and salmon project. Have had herring die offs in spring and early summer. Thought it was due to low DO but it might be interesting to sample for toxins.

Kathi: would love to contact Michael about sampling to look for toxins in herring.

Katie Gavenus – soon they'll have people at field station across the bay from Homer and in inner bay. If anyone thinks of any opportunity sampling they need, let them know. Send samples to Jasmine and Rosie, but if need more, always willing.

Maile Branson – Exciting news is also received USGS Climate Adaptation funding to expand community based shellfish sampling. Have 7 communities in PWS and lower Cook that will be sending shellfish samples.

Jacqueline Ramsay – Kind of new to the group, my role is in the OA lab (can hear the Burke-o-lator going).

Tim and Barbara Lydon – Chugach National Forest and PWS Stewardship foundation, here to listen and learn and support the work.

Jasmine Maurer – KBNERR continues to do biweekly sampling and receive samples from one other monitor. So far this winter phytoplankton continue to be sparse. And as Thomas mentioned the KBay Sci Conference will be happening virtually in March.

Chris Guo – On the horizon we are moving forward with some forage fish experiments (aquaculturing herring and sand lance). Will be doing some dosing with saxitoxin this summer. Reach out if you want info or to collaborate.

Varis Ransi – works with Kris Holderied at Kasitsna Bay Lab but located in Silver Spring, MD. Looking at satellites for HAB and vibrio forecasting. Looking for feedback from Kris and stakeholders in Alaska.

Caroline van Hemert – follow up from previous conversation about forage fish samples John Harley mentioned. Put that together with tern die off results from 2019 that the USFS and others collected. Hope to have that info and a publication out before too long. Captive study on saxitoxin and common murre moving forward.

Matt Smith – almost cut up on samples of saxitoxin. Met yesterday with ASLC partners for captive study. Pilot studies were done last summer even though fieldwork shut down. Dean: are you focusing on particular organs in the birds. If the bird gets sick, its emaciated by the time a carcass is found. Hoping there would be some type of metabolite in an organ, brain tissue, heart tissue, lung tissue, some kind of indicator for a PSP or domoic acid event. One time

an eyeball was harvested from a minke whale that came up hot with DA. Haven't heard of anything like that from birds. Hoping they are looking for some kind of indicator in organs. Matt: when they started testing sea birds, would test 12 different tissues. Narrowed it down with beachcast samples and dosing study on mallards to liver, upper and lower intestine. But any kind of fecal or cloacal samples can help as well. Now they start out running liver, upper GI and lower GI samples. If they detect toxin, they test the rest of the organs sent in.

Dean: Are there any breakdown components of the PSP toxin that could be detectable?

Matt: We're just using ELISA that detect STX mostly and to a lower extent a couple congeners, and if the sample is above threshold, they send to HPLC to detect the different congeners. It can get pretty complicated on the different congeners. DA is a bit simpler.

Caroline: The captive work that's plan, we are trying to evaluate physiological parameters and behavioral response to STX, and then a subset of the birds will be used to look at tissue routing. From HPLC results, in most cases it seems to be primarily saxitoxin itself that is showing up in bird tissues.

Dean: hoping they're looking at sublethal doses to see accumulation in the birds

Caroline: yes, that's the plan.

Sarah: Caroline was lead author on 2020 paper that looked at presumably healthy birds from colonies in Cook Inlet. And saw detectable levels of saxitoxin in muscle and liver as well as feces. That's a paper with published results.

Carol Brady – Scallop sample at Sitka Sound south that had a PST level of 104, so that area is closed for harvest. They will have to go reopening criteria: 3 samples collected over 2 weeks, currently in the process of that.

Bailey Richards – Working internally to see if there are other ANTHC programs that would be good contributors to the group. Might be more ANTHC folks joining the call in the future.

Lori Verbrugge – No updates, just really appreciate all the great work everybody is doing.

Natalie Monacci – OARC is accepting project ideas from UAF students to monitor OA. If you know a student who is interested in co-monitoring HABs and OA, please share the flyer. <https://www.uaf.edu/cfos/files/research/oarc/oarc-graduate-research-sampling-flyer-2021.pdf>

Andie Wall – gearing up for 3rd annual marine water quality workshop next week. First day on OA, second day HABs. Bringing together tribal leaders and samplers from across the Island to one virtual platform. Looking forward to having HABs outreach and education material combined.

They had the first oyster samples come out of Larsen bay, one of the tribal communities. Eric O'Brien is running that oyster farm.

Kathy Burek Huntington – Just submitted a small proposal to the Florida Institute of Technology to run samples for okadaic acid. No cost to us, and some people have found Dionysin and some of the plankton tows, so just wanted to see. Also, sea otter paper on

mortality coming out in Frontiers in Marine Science. Includes possibility of mortality and sea otters due to HABs.

Julie Matweyou – Some of my goals this summer will be to set up the lab and run samples on the SeaTox ELISA that was developed from our NPRB project, working with Steve Kibler. Been working with Steve on whole water samples to run on qPCR and how we can enhance sampling in the future. I think Steve is hoping to come up in June.

Caroline: can you share info on the SeaTox ELISA?

Julie: I'll send the link to the website (<https://www.seatoxresearch.com/products/paralytic-shellfish-poisoning-test-kit/>)

Karen Pletnikoff – Continues to partner with Qawalangin Tribe of Unalaska whose taking the lead in sampling in our region right now. Also partner with Knik Tribe. Primary interest is keeping information flowing about current state of PSP and other HABs to prevent any additional fatalities. APIA program started over a decade ago, up until the recent fatality, there had been no fatalities and that was a success. Also interested in long term goal of finding ways to safely consume subsistence foods but right now the only safe way is to collect a harvest subsample, send it in for mouse bioassay, and wait for results.

Chandra Poe – Does anyone have experience with mussel cages for a sampling source?

They're focusing on outreach, including getting materials translated. Samples from Sand Point will start getting collected this month. Reached out to Gay and Racheal about the work they've done in doing a workshop with clinic staff and life med staff. Updated website for sampling data: <https://www.qawalangin.com/psp>

Andie: KANA does mussel cages for sampling in Kodiak as well.

Michelle: Julie does mussel cages in Kodiak as well. Aquatic resources permit is required with ADFG. http://www.adfg.alaska.gov/index.cfm?adfg=otherlicense.aquatic_resource

Kimberlee Beckmen – On behalf of Gretchen Roffler who is studying the wolves in southeast and Glacier bay that have prey shifted to mussels, sea otters and sea birds. I've been necropsying and collecting more wolf tissues and she has lots of scat samples that she would like to analyze for DA other HABs and PFAS/PFOA. Anyone that can assist her in finding labs and collaborators please contact her at Gretchen.Roffler@alaska.gov

Caroline: We've been working with Gretchen on the wolf samples. Kimberlee, we'll be in touch about specifics.

Bill Carter – Lots of ice and -35 in Kotzebue. Nothing to report.

Kathi Lefebvre – Update on the large-scale ECOHAB project, how toxins move up the food web. Full set of cruises in 2019. 2020 canceled. This year: spring mooring cruise in May in Bering, DBO in Chukchi and Bering in August, north Bering sea survey in August. 3 other cruise doing sampling for shellfish in EBS, GOA and North Bering, all collaboration through NOAA AFSC. On fall mooring DBO cruise, will get whole suite of toxins and oceanography and phytoplankton sampling at every station so we can quantify Alexandrium and Pseudo-nitzschia. We're gonna

get zooplankton (individual copepods and krill) as well. Will get sediment for cyst counts, and benthic clams and worms and fish species. We will quantify toxins in all these levels to generate this model. Second year of comprehensive samples in different conditions than 2019 when it was really really warm.

Starting to reach out to communities in Chukchi/Bering regions for community sampling of water samples for presence/absence of cells. This would not be human health but for seasonality to inform the model. Anderson lab has put together training video showing field technique.

Kathi can contribute to the statewide map showing where samples are going to be taken and times of year.

Jacqueline Ramsay: do you have a link to the Anderson lab training video?

[Thomas will include the link to this training video on the AHAB website once it is made public]

Caroline Cummings – first time attending, broad interest in HABs. Hope to bring it in more in the marine mammals management program. Trying to get a better handle on where blooms might happen and how they might affect FWS trust resources.

Karie Holtermann – No updates, but excited to be on the committee for qPCR methods.

Xiuning Du – From Newport OR lab. Currently working on PST in marine food web in PWS and KBay. They did in 2019 a full year sampling in both locations. Zooplankton, phytoplankton and fish. Last year also did some sampling. A bit behind in testing samples in the lab because of COVID. Hopefully later this year will have more info on PST and marine food web. If anyone has questions about detail on their research, please reach out to her.

NEXT AHAB MONTHLY CALL WILL BE: THURSDAY MARCH 11TH, 2021 AT 9:30AM AK
(The next call will be scheduled for 1.5 hours to make sure there's time for everybody)