

AHAB Monthly Call – November 10th, 2022

Participants: Thomas Farrugia (AOOS), Gay Sheffield (UAF/AK Sea Grant), Tod Leighfield (NCCOS), Bruce Wright (Knik Tribe), Bill Carter (USFWS), Amy Holman (NOAA), Dom Hondolero (NCCOS), Dean Stockwell (UAF), Hanna Hellen (Aleut Community of St Paul), Carol Brady (ADEC), Jeanette Gann (NOAA), Kathleen Easley (DOH EPI), Sarah Schoen (USGS), Juliana Cornett (NOAA Fisheries), Charla Hughes (PWSSF), Evie Fachon (WHOI), Shannon Cellan (Sitka Tribe), Naomi Bargmann (USGS), John Harley (UAS), Lori Verbrugge (DHHS/CDC), Sarah Pease (Murkowski), Danielle Gerik (USGS), Megan Onders (AOOS), Matt Smith (USGS), Anne Garland (ARIES), Bridget Ferriss (NOAA Fisheries), Grace Ellwanger (KANA), Josianne Haag (UAF), Jesse Endert (Seldovia), Natalie Rouse (AVPS), Stephen Payton (Seldovia), Karen Pletnikoff (APIA), Maile Branson (APMI), Annette Jarosz (APMI).

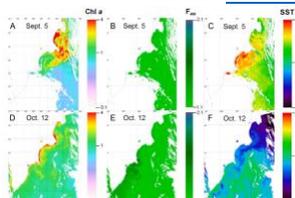
Thomas' updates (more details on AHAB website: ahab.aaos.org)

HAB Science

- Follow-up from fall 2020 *Karenia* bloom in Russia

A massive bloom of *Karenia* species (Dinophyceae) off the Kamchatka coast, Russia, in the fall of 2020

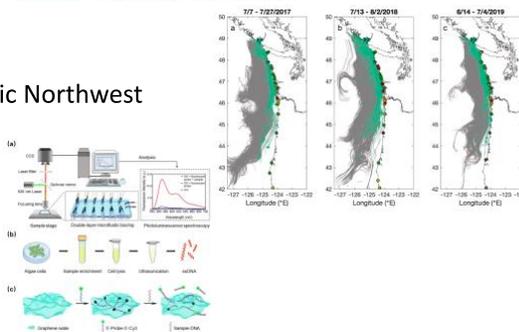
Tatiana V. Orlova^{1,2}, Anatoly I. Alkhazin^{1,2}, Ekaterina V. Lepkova¹, Rimsha V. Ekhova¹, Marina S. Selina¹, Tatiana V. Morozova¹, Irina V. Bostik¹, Vasily A. Kachur^{1,2}, Alexander A. Karpenko¹, Kirill A. Yimikov¹, Andrey V. Adriaens¹, Mikonami Inasaki^{1,2}



- HAB transport model in the Pacific Northwest

Assessing a model of Pacific Northwest harmful algal bloom transport as a decision-support tool

Hally B. Stone^{1,2,3}, Neil S. Banas⁴, Parker MacCready⁵, Vera L. Trainer⁶, Daniel L. Ayres⁷, Matthew V. Hunter⁸



- Development of a biochip to detect HABs

A Sensitive and Portable Double-Layer Microfluidic Biochip for Harmful Algae Detection

Feng Li^{1,2}, Le Qiang^{1,2,3}, Wenguan Han¹, Yujin Chen¹, Jinyan Qiu¹, Fangfang Song¹, Min Wang¹, Qiang He¹, Yanning Zhang¹, Shiqiang Sun¹, Cuiwen Li¹, Shuang Song¹, Yun Liu¹, Liu Han^{1,2,3} and Yu Zhang^{1,2}

Bruce: When the *Karenia* bloom first hit the news media, the Western news media blamed it on Russian military sites contaminating the area along Kamchatka and so I contacted Orlova, the lead author there, because we'd had a *Karenia* bloom in Kachemak Bay years past. And she said that they were really concerned about how the Western media was depicting this. And so Pat Tester and I asked them to share their phenomenal data. And we asked them to publish and we went through several iterations and I'm really excited that it got published. But what's interesting is the *Karenia* usually does not exist up in this area, just like it doesn't occur normally in Kachemak Bay in Alaska, but the conditions during the summertime can promote the organism, it just needs to be brought into the area at the right time. And we think in both cases, both Kachemak Bay, and here along the Kamchatka coast that it was probably brought in, in the bilge of a vessel and inoculated when the water temperature and in the ocean conditions were good for *Karenia*. So we're really excited about this now. Now during this whole thing, the Russian Academy of Sciences put together an international seminar to discuss this topic, and several of us were able to present at that seminar. This is a pretty big deal that the science that went into this on the Russian side was phenomenal. I mean, they did all the genetics I mean they were looking at everything was very impressive work.

HAB News

- MERHAB/PCMHAB letters of intent submitted – responses in late Nov
 - Invited full proposals due Jan 31, 2023
- New NCCOS project to support a climate-ready Dungeness crab fishery in the Northern California current
 - Funded through the multi-stressor RFP from 2022
- NOAA awards \$18.9 million for HAB research and monitoring
 - \$16.1 million from through NCCOS grants
 - \$2.8 million for NHABON pilot projects

Alaska HAB Updates

- Alaska Marine Science Symposium 2023
 - Jan 23-27, 2023 (Anchorage)
 - Planning to host a HAB research workshop
- One Health, One Future Conference
 - Feb 28 – Mar 3, 2023 (Fairbanks)
 - *Voices of One Health: Embracing Change & Transformation (Innovation & Creativity leading to Change, Reengagement, and Resilience)*
- March AHAB workshop – community monitoring needs
 - Info and hold-the-dates later this month

Round Robin Updates (going by region of work)

ARCTIC

Evie Fachon

So we have a lab member who's on the Arctic cruise right now and is collecting sediment and invertebrate samples to kind of follow up on the big bloom we saw in the Bering Strait region this summer and see what kind of Alexandrium cysts deposition might have happened or what kind of toxins are still present in some of the invertebrates in the region. We did have an IFCB onboard that vessel, but it had a failure a couple days into the cruise. Unfortunately, we don't have imagery from this cruise, we do have water samples. And since it's so late in the year, we're probably not going to see much in the way of Alexandrium, although there might be some Pseudo-nitzschia still there. Other than that, we're just really busy going through all the samples that we collected this past summer. So we'll hopefully have some updates on those things in the coming months and data products to share. Don and I will be at AMSS and presenting on this, and Kathi and Patrick are also planning on being there.

Bill Carter

I've kind of been missing in action for these calls for last couple of months because I've been working on other things. So I think Ajit gave a update on getting the mooring out and maybe some of the stuff that they found from that data. And we're just starting to work on gearing up for next year. We may be partnering with the Coast Guard to do some water samples.

Anne Garland

Hi all, I'm calling in from Utqiagvik, actually up here for a month. First week we were up here with my colleague who's at the Army Corps of Engineers doing survey transects with new thermal sensors that we installed along the bluff. And then the rest of the time I'm here doing recruitment with my team both for erosion monitoring and HABs, and as well as doing some risk assessment workshops for the month. And I wanted to report that we've got a March workshop planned for HABs. I've already had one recruitment meeting and interview with somebody from the schools. She's a counselor at the middle school. And so she's going to be spreading the word. The other important info I need to pass on is because we're working through the Emergency Management Office, I've had meetings with the three folks and told them about HABs. And they're new to their positions. So it was all news to them. And they actually are considering possibly getting permission from the administration to include it in their new hazard mitigation plan. If that happens, that's a huge step. I don't know if that will actually take place because they all agree it's a very anxious thing. And it may or may not get approved by the administration. But if anybody can help, I referred them to Don. I sent them the report, that 35-page report that came out. I sent the NSB Emergency Management Office to this network for them to educate themselves. I will certainly continue to encourage them to pursue this as a policy issue, rather than just outreach and engagement. So if anybody has any suggestions I can try and set up a meeting with Don and them. You guys tell me what you want me to do. You can do that offline, but I'm trying to get something progressive up here while I'm here. Their hazard mitigation plan is renewed every five years and they're in non-compliance right now because they had a vacated position for a while. So they want to get it done by March and they want me to talk to the state person that's supposed to be writing it up. I also met with our team to talk about other things that we're doing that they want to include in the revised plan. But this is a big one they had never even thought of, and I didn't bring that up Scott Barr did, he is the new emergency manager. He used to teach emergency services at the college.

Evie: Anne, I'll be sure to pass your update info on to Don!

Anne: Thanks Evie and let me know if he wants to arrange a meeting for details of the results with the EMO, Scott Barr. He is welcome to send an email to Scott to keep this dialogue continuing. We are now educating a key department of the NSB for local policies to be considered eventually. Scott.Barr@north-slope.org

NORTHERN BERING SEA

Gay Sheffield

Emma Pate is not in today so that's why she's not on the call. Updates are we have had sea ice actually coming down into the Strait around the fourth of this month and that was kind of

exciting. But it's been beaten back with the storm we just had which was relatively strong and warm. So we had quite a bit of snow followed by quite a bit of rain and now we're just sitting right around the 32 degree Fahrenheit mark. So we're kind of into fall. We've got Sikuliaq out here, I heard Evie talking about things we're going to be pretty stratified. Well, there's a pretty good storm coming their way, I think up in the Chukchi next week. And that'll be really interesting to see if that pans out. What's that going to do to the ice, it's going to come in pretty hard out of the west southwest, I think, and what it's going to do in the shallow water regarding sort of lifting up and moving stuff around. There was a trip that Emma and I just got back from, we went out to Savoonga much delayed and wonderful to see everybody in person and get the training that needed to get done. And to sort of get sampling started for both the EcoHAB and the Norton Sound Health Corporation water monitoring project. So we had a great visit and that's underway. And that, I think, is all the news from here. The rest of it, everybody, I'm sure is busy getting into their late fall winter time mode.

ALEUTIAN AND PRIBILOF ISLANDS

Hanna Hellen

No updates from us this month!

Karen Pletnikoff

We're partnering with Norton Sound Health Corporation, and AHAB on a letter of intent for the MERHAB proposal. It would be to allow for sampling across western Alaska, specifically for food safety, for large collections of either beach washed or planned harvest. We want to help our community to harvest safely, and get finances to do the analysis and support the shipping services. If any of you are interested in providing input into that, and then thoughts on logistics or raise our proposal to be strengthened feel free to reach out. Thanks.

KODIAK

Grace Ellwanger

Hi, everybody. We just got to take a look at the award summary that the BIA posted. And we received two categories of funding from the BIA. One is relevant to HAB monitoring and is going to allow for us to set up a better standardized system for the island as a whole, and really encourage communication between organizations on Harmful Algal Bloom monitoring, ocean acidification monitoring, fresh water quality monitoring, so all things water quality monitoring, hopefully create one big system. So that's really exciting. I'll definitely update you guys on more of that. But we just got that news last week. We're waiting for more funding, I know Andy had mentioned the congressionally directed funding that we got from Murkowski last year, we're still waiting for that to come through. But that will hopefully allow for us to, again, keep doing some Harmful Algal Bloom monitoring again on the island more regularly, and actually allow for us to hire some staff members to do that, which is really exciting, because it's just something Andy and I have been doing whenever we get a moment to do it. So things are looking up here in Kodiak, I guess you could say, and lots of positive news and lots of other work going on. And thank you to those who helped with that proposal. I think Andy mentioned it last time, too, we just submitted an NIH grant with the Sitka Tribe of Alaska, which, if received, would allow us to

continue Harmful Algal Bloom monitoring for five years. So fingers crossed on that one. That's the big one. And yeah, again, thanks to everyone who, who helped with some of those projects.

SOUTHCENTRAL

Bruce Wright

Since 2006, either through Aleutian Pribilof islands association or through Knik tribe, we've been sampling from northern British Columbia to the Commander islands and up to Norton Sound. These last couple of years, we've been looking specifically at salmon because we're detecting PSP levels in salmon. And some of the hits we had two years ago when we had a reasonable PSP bloom during the summer, is we had salmon from the Yukon River livers were above 100 micrograms. And I was surprised to learn during that whole exercise that people along the Yukon River savor eating king salmon livers. So that's a risk factor. We had hits in all five species and at least detectable levels in all five species but several of the species (silvers, reds, and kings) all had levels above the FDA limit, and it's mostly been in their digestive tract. The muscle tissue and eggs have been low or non detect. So if you don't eat the liver, the risk factor for eating salmon is probably zero. So this year, the funding was directed at looking at salmon and I was able to get about 1000 liver samples from as far south as Sitka and Juneau and then along the Alaska peninsula and in lower Cook Inlet, and the full length of the Yukon, Tanana rivers. And those were mostly collected by Fish and Wildlife Service and Alaska Department of Fish and Game. I only had enough money to analyze about 420 samples, I did some composite samples and then there's still a bunch in the freezer. There's about 200 in the queue right now being analyzed using HPLC at the DEC lab. In addition to doing the salmon liver work, I also set up monitoring stations to determine what the bloom was like. We had weekly monitoring at a Juneau site, Chignik lagoon, Sand point, and the PSP event was not real high in any of those locations this last summer. The highest was Chignik lagoon, and we had some clams that came in. These were subsistence harvested clams and they came in at a little over 400 micrograms, both razor clams and butter clams. And so they were advised to not eat clams. So the bloom wasn't that big this year. The only places so far that we had detectable levels of PSP and salmon livers has been Sitka king salmon, and Kachemak Bay red salmon. And I probably got 400 liver samples, various species, but including red, chum, and king salmon in lower Cook Inlet. And so we had hits there at detectable level. So I just went ahead and analyzed most of the samples that came in from lower Cook Inlet, those are in the in the lab right now. So that's kind of a wrap for this year until I get the rest of the rest of the data. And then by March, I'll have an annual report. And I'll send it out to you guys. So you'll know what we found this year. We just received word that the BIA funded our Knik Tribe's PSP monitoring project for four years. That's at \$1.8 million, which means that I'll have three times more funding than I usually do per year for the four years. I just hired a project coordinator and that's Andrea James, she has a master's working in Harmful Algal Blooms. I think she'll be a great candidate and she'll be really easy to work with all of you guys. The project is designed to analyze subsistence harvests, we'll be using mouse bio assay, we'll support research projects, instead of the 400 samples that I usually analyze every year, we'll have we have funding to analyze 1500 samples. And we'll use probably mostly mouse bio assays so we can get rapid results back to people. But we'll try to follow some of those up with HPLC. And we can also analyze 20 samples of domoic acid per year. So if you have a research project, or like Karen, you

mentioned that you want to do sampling for food safety, we have funding to help do the analysis, we can pay for your shipping and analysis. Of course, you'll get all the data. And we'll have a website so that we'll have real time. As soon as we get the data, we'll put it up on our website so everybody can see. So unlike other projects, where I waited until the end of the year to post a final report, which will provide data as soon as we get it on our website so people will see what's going on. We will also have five mussel monitoring stations. So to get a sense of distribution, severity and timing of the PSP event in Alaska. I'm open for suggestions, but we'll probably have weekly monitoring in point Louisa in Juneau, several people have gotten sick from meeting the mussels there, one person died from eating cockles, Chignik, Kodiak would be nice so we'll be working with them to figure out how to get that done. Probably not Kodiak proper, but maybe Port Lions someplace like that. See, Sand Point would be nice and Akutan would be nice if we could get technicians. In the budget, I have \$5,000 to fund the technician in each of those five locations. So that should be a pretty good incentive. And then sampling for the mussels, the weekly mussel samples will probably be April through August. So with this funding, we're here to serve the community now, like I told Thomas before, when I mentioned that we were going after this funding that it's to serve research projects, and to serve people that want to find out what their subsistence bivalves or crab for that matter, some people like the hepatopancreas of crab. Andrea James will be the coordinator of the project. Her contact information is still Chickaloon right now. She'll start in December. But you guys can contact me if I want to get things rolling. And I'd like to get things rolling on establishing the five mussel monitoring sites because I know Thomas has some funding. And he'd like to do something along those lines too. And so it'd be nice if we could coordinate that. And Karen maybe you can help me get some solid technicians from Akutan. I know we've talked about this for more than a decade. It's hard to get data from there, but I think it's a pretty important data location. And, then maybe Sand Point.

Dom Hondolero

We've been able to get out of weather days and boat days lined up recently. We don't have any updates. Right now. We're gonna be trying to get out next week. Yeah, weather hasn't been real great here. But yeah, hopefully, it'll calm down and we can get out next week.

Annette Jarosz and Emily Mailman

Hi, everyone. We just have one update this month. Our ELISA testing is now up and online. So we ran a big batch of saxitoxin and a smaller batch of domoic acid. All of the samples came back well below the regulatory limit. So that's good to see. And we're planning on doing another batch of saxitoxin testing before Thanksgiving. So we should have another round of results up on our websites. And that's it. I think we talked about this last month, but we sent some Pseudo-nitzschia samples that we got from Chenega to NOAA and those came back that it was Pseudo-nitzschia pungens I believe. So they said it's a species that is known to produce domoic acid, but not in large quantities or concentrations. So we did some testing on blue mussels that we got during that bloom. And the results were well below the regulatory limits. So that's good to see.

Stephen Payton and Jesse Endert

No big updates, got some sampling equipment from the Marine Institute. We'll do some more sampling for them. And I think that's pretty much it. Jesse's been going out collecting.

Carol Brady

Good morning, everyone. I don't have anything that's necessarily HAB related but something that may be interesting is that back in the middle of October there was a voluntary recall of oysters from a harvester/dealer in Kachemak Bay. The dealer had gotten some reports of people getting ill after eating raw oysters. So she initiated a voluntary recall. At this time, we don't know what the illness is, none of the illnesses have been confirmed. So at this point, the dealer/harvester did a voluntary closure on her own harvest. And she is back to harvesting and following the protocols as necessary. She believes it may have been DSP, but again, we don't have a confirmed illness. I know that she has some frozen samples available so if anyone would like to reach out with me to coordinate with this dealer, I would be happy to work with anyone on that.

Thomas: Good on them for doing a voluntary recall. Is that something that maybe DOH would be interested in?

Carol: So actually Kathleen Easley with DOH is on. So we coordinated with them. And they've done the reports on people who are willing to reach out to them. And at this point, and I'll let Kathleen jump in in a moment, there's just no one submitting stool samples. So that's why none of the have been confirmed. And it looks the oysters were harvested on October 17.

Kathleen: Thanks Carole, great rundown of that. We had public health nurses interview, I believe 11 people that had reported illness. Nobody sought medical care. Nobody was ill longer than a few days, I think, three days. And that was kind of part of the problem, right? People were feeling better by the time we were reaching out. So we didn't collect any stool samples or, you know, were able to confirm exactly what it was. But the shared illness and symptoms were all pretty similar, you know, nausea and diarrhea, anywhere from four to 12 hours after eating oysters. So yeah, it was interesting. The lady was really great to work with and super forward with all of her information and helped our public health nurses reaching out to those folks. And so it was within a couple of days everybody was relieved the illness was resolved. Yeah, it was an interesting scenario. And I didn't really reach out and tell you about Thomas because it was not really certain that's what it came from that.

Thomas: Thanks Kathleen. If the dealer has frozen samples, perhaps we can get them to a lab to test for okadaic acid. And if I remember correctly last month, there were some observations of Dinophysis right? Annette, I think maybe APMI reported some in the water?

Annette: I think we saw some in August, along with a Pseudo-nitzschia bloom. That must have been the Chenga sample too, because we sent that to NOAA also, and they were able to tell us what species we saw. But I don't remember, I can look it up and send you an email.

Thomas: Carol, if you want to follow up with the operator and see if she's willing to send in some samples, maybe we can get some of them tested for okadaic acid. And we could pay for that testing, if need be.

Jeanette: Not quite the same area, but we noted quite a few Dinophysis in the IFCB along track during our S. Bering Sea survey in Aug/Sept.

Kathleen Easley

No other updates, Carol covered it well, that's all the excitement we've had, thank goodness.

Sarah Schoen

I don't have any updates right now. Naomi's plugging through analyzing a bunch of our samples. So we should have a big update soon. But nothing is ready yet. Thanks.

Danielle Gerik

I'm back from maternity leave. So I'm ready to start putting samples again.

Matt Smith

Nothing huge from us. We did get some samples from the state vet lab to run but otherwise we don't have that many, we caught up on all the samples in the last few years finally, so don't have that many to run. And I'm working on putting together results from the murre study that I'll hopefully present AMSS.

Natalie Rouse

Just a small update that I'm kind of wrangling samples from last year and mostly the summer. We have about 40 that are in the queue get gathered and they should go down to WARREN-West lab in the next month or two. So not a lot. We usually have quite a bit more but at least there'll be some results from marine mammals, mostly in south central but we have a few from other parts of the state too. So I'll report on those in a couple months.

Megan Onders

Hi, good morning. Thanks, Thomas. We have a Oceanology Radio Show coming up on November 18, which airs on KNOM in western Alaska. And one, I guess question for Sarah Pease in Senator Murkowski's office with the Working Waterfront legislation is if you guys might be willing to do a Tribal call or a call that would walk through provisions of the legislation and give people an idea what the context is the goals are and then and that would really I think, generate some feedback and as of course, just being a former staffer, and knowing how much our Tribes in our Tribal organizations play a critical role in all this water quality monitoring across the state, just making sure that Tribes and Tribal organizations are there along with states and for funding eligibility.

Sarah: I think that's a great idea. I would love to get the ball rolling on that, too. So if you want to send me an email, Meghan, that would be great.

SOUTHEAST

Shannon Cellan

Not too much that I really have to update I've kind of been out of the office of feels like for nearly a month. Because I got to meet a lot of wonderful folks, including many of you at the conference in Albany. And then we had our activities for WhaleFest here in Sitka last week. So that was kind of an all hands on deck thing. But we are still testing, we're cranking out a lot more of these okadaic samples. So hopefully, when I get back in, we can start to look at what these trends are looking like a little bit more. Because we haven't really analyzed that it's just been more so generating the data. So it's going to be exciting to go back and look and see what's present. I feel like we don't see Dinophysis too much. But we have been seeing numbers in our returns. They're not above the regulatory limit, but it's interesting to see that. We're continuing to test shellfish. Shellfish submissions are down significantly. They've been all year even once we inform partners that we are back up and running. So again, please, your communities are very welcome to send us shellfish even though our suppliers not consistent. We still want to be testing what we can in the meantime, and we're setting up that HPLC so that should we not be able to run RBA while we wait for new radiated saxitoxin vendor we can still be generating results for partner communities. Other than that, we're still just cranking through testing. All of our lab folks have been doing amazing live been not present. So they're not on this call, but I feel like they should get a little a little recognition and praise. Yeah.

Thomas: Two quick things, Sharon, it's a few weeks old but didn't you have like a really high value for a mussel or something?

Shannon: Yes, that was in Klawok, both of their locations were high. Big salt was at 80. So we still really see advisory for all shellfish because it was right at that limit. But you know, it's blue mussels. The boat launch was I think 1600 or something crazy high. So of course we were in touch with our partners there to communicate directly with them. And, you know, advisories are still in place for those locations, but it dropped back down below the regulatory limit already. I think it was 2 weeks later it was back down. So we haven't been able to get a full spread of the beach. We did ask them if they'd like to include anything else. Usually they tend to just send us blue mussels. I would like to see what's happening with the cockles. Usually those are so low, but we have seen them go up. And with numbers like 1600, I think it might be interesting, but it wasn't a sustained bloom. So I don't I don't know enough about the ecology to say if the sustained is more what gets those shellfish higher or just larger bloom. But yeah, so that was a very big bloom, but we didn't see really anything else anywhere else from folks who are shipping to us. And again, it was it was a super quick blip.

Thomas: Thanks, and then the other thing is would you would be available for testing for okadaic acid if person in Kachemak Bay wanted to get those oysters tested for that?

Shannon: I think that's totally doable. Please feel free to contact us at our email (seator@sitkatriben-sns.gov), or me personally. That's definitely something we can work out. I think that would be a great connection.

John Harley

Hi everyone. I just want to also throw in some praise for Sitka Tribe and KANA, we submitted that NIH grant, which was a monster and ended up being over 100 pages of text. And I just really want to thank those groups for their efforts. I think it turned out really well. The Klawok case of a blue mussel going hot this time of year is really interesting. But it's even more interesting when you consider that this is now the third time that we've seen a blue mussel over the regulatory limit in Klawok in October across all of the years that SEATOR has been monitoring, we don't really see that in other communities. So it's kind of an interesting case down there.

Michelle Morris

Hey, I just want to say it's coming up to the end of the year. So if you had any permits during the year, start thinking about getting your data together for collection reports. And also, I'm already getting applications for 2023. So anybody who already knows they've got project proposals that they're going for next year, you can go ahead and submit your applications.

OUTSIDE ALASKA

Sarah Pease

I will re-pitch again. We are still soliciting feedback on Senator Murkowski's Working Waterfront legislative framework. And a couple of you I've received feedback from thank you so much. I'll post again in the chat, the link, and we're looking for feedback by December 2, and then we're going to start working on some legislative language for that. And then the other thing I wanted to mention was that HABHRCA is up for reauthorization next year. So that's the main federal legislation that presents the PCMHAB, ECOHAB, MERHAB funding. So, I am in talks with another staffer who's involved in that reauthorization. So if that's something that you want to discuss more, feel free to reach out to me. I'll put my email in the chat too. And that's it for me. Thanks.

<https://www.murkowski.senate.gov/press/release/murkowski-unveils-working-waterfronts-framework> Send feedback to: Working_Waterfronts@Murkowski.Senate.Gov by December 2. Sarah_Pease@murkowski.senate.gov

**NEXT AHAB MONTHLY CALL WILL BE: THURSDAY January 12TH, 2022 AT 9:30AM AK
(The meeting schedule for 2023 will remain the 2nd Thursday of every month)**