**Kachemak Bay Research Reserve Phytoplankton Update**
**November 2019 – April 17th, 2020**
Harmful Algal Bloom Program
Rosie Robinson 907-235-1598 rmmasui@alaska.edu

Hello Everyone!

After a snowy winter, spring is here and time to share our first phytoplankton update of 2020! We collected weekly samples from the Homer Harbor on the weeks the harbor wasn't frozen over, and what a sight that was! Throughout the winter months Homer Harbor had low numbers of phytoplankton, with a small increase in diatoms taking advantage of the longer days the past few weeks.

Coming up on Tuesday April 28th, we will be sharing our prerecorded community monitor training on our website. Presentations by KBNERR, ADFG, and NOAA will be posted for monitors to access on HABs in 2019, water quality monitoring, razor clam abundances, and ongoing HAB research. KBNERR will also be posting a guide for community monitors walking through the plans for sampling and monitor support for this upcoming summer. On Thursday April 30th, Rosie will be hosting virtual "office hours" to answer any questions and to schedule equipment pick up times for community monitors.

At this time **all** KBNERR field work, including phytoplankton and wild shellfish collection, has been suspended. This is in accordance with the State of Alaska "shelter in place" order and UAA policy COVID-19 response. Recently the University has announced the potential for some research projects to receive exemptions to be able to complete some field work. We will keep everyone posted on how this will impact our HAB monitoring in summer 2020.

The next Kachemak Bay phytoplankton update will be sent out the first week of May.

As always please reach out with any questions. Note that all KBNERR staff are working remotely, email is the best method to reach us with your questions.

From all of us in the Harmful Species Program we are sending well wishes and thank you for all you contribute to keeping our Kachemak Bay communities safe and informed.

Jasmine and Rosie

Kachemak Bay Research Reserve Phytoplankton Update
Qualitative Analysis Phytoplankton Data

## INNER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 3/23/2020 | Peterson Bay | 3.2 | | *Thalassiosira* sp. | Present | None | None |
| 3/23/2020 | Gull Island | 3.2 | | Sparse Sample | None | None | None |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 3/23/2020 | Glacier Spit | 2.7 | | Mixed Diatoms | None | None | None |
| 3/23/2020 | Halibut Cove | 5 | | Sparse Sample | None | None | None |
| 3/28/2020 | Homer Harbor | 2.7 | 30.4 | Sparse Sample | None | None | None |

*Samples received after last weekly update

## OUTER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 3/20/2020 | Tutka Bay | 2.8 | 30.27 | *Thalassiosira* Bloom | None | Present | None |
| 4/2/2020 | Tutka Bay | 3.0 | 30.8 | Mixed Diatoms Bloom | Present | Present | None |

**Kachemak Bay Research Reserve Phytoplankton Update**
**April 23rd – May 7th, 2020**

Harmful Algal Bloom Program
Rosie Masui 907-235-1598 rmmasui@alaska.edu
Jasmine Maurer 907-235-4799 jrmaurer@alaska.edu

Hello Everyone!

May is here and the phytoplankton have been abundant in many sub-bays over the past several weeks. During the first few days of May the phytoplankton in Homer Harbor were abundant with *Thalassiosira* sp. at bloom levels. Samples have also had many larvae from marine invertebrates including this larval form of a Polychaete species (segmented marine worm).

Image from http://invert-embryo.blogspot.com

We are excited to share that KBNERR's Harmful Species Program got the go ahead from UAA to carry out summer sampling! We will be modifying our sampling procedures, and locations to stay within all State mandates with the highest priority put on protecting community and staff health.

Resources for Monitors are available on our website by clicking here. Thank you to all our monitors for your commitment and flexibility during this unusual spring.

As always please reach out with any questions. Note that all KBNERR staff are working remotely, email is the best method to reach us with your questions.

Jasmine and Rosie

Kachemak Bay Research Reserve Phytoplankton Update
Qualitative Analysis Phytoplankton Data

## INNER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 4/24/2020 | Homer Harbor | 5.9 | 28.6 | *Thalassiosira* Bloom | None | None | None |
| 4/24/2020 | Glacier Spit | 5.5 | 32 | Mixed Diatoms | None | Present | None |
| 4/30/2020 | Halibut Cove | 7 | 28 | *Chaetoceros* &*Thalassiosira* Bloom | None | None | None |
| 5/2/2020 | Homer Harbor | 6 | 29.7 | *Thalassiosira* Bloom | None | Present | None |
| 5/6/2020 | Homer Harbor | 7.5 | 28.5 | Sparse Sample | None | Present | None |
| 5/6/2020 | Halibut Cove | 6 | 27 | Thalassiosira sp. | None | None | None |

*Samples received after last weekly update

## OUTER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 4/24/2020 | Green Can | | 30 | *Thalassiosira* Bloom | None | Present | None |

## Reserrection BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 4/26/2020 | SMIC Dock | | 30.5 | *Chaetoceros* sp. | None | None | None |

**Kachemak Bay Research Reserve Phytoplankton Update**
**May 8th – May 21st, 2020**

Harmful Algal Bloom Program
Rosie Masui 907-235-1598 rmmasui@alaska.edu
Jasmine Maurer 907-235-4799 jrmaurer@alaska.edu

Hello Everyone!

The phytoplankton in Kachemak Bay continue to be abundant in many areas over the past two weeks. In the Inner Bay there was an abundance of mixed diatoms, while the Outer Bay had *Chaetoceros* spp. dominating consistently over the past two weeks (*Chaetoceros* spp. also are diatoms).

As summer gets kicked off this weekend we want to take a moment to highlight the main goal of the program, which is to look for groups of phytoplankton that are known to carry toxins that can result in shellfish poisoning in humans and other animals. Most species of phytoplankton do not cause harm to humans or other animals, in fact the abundant phytoplankton of Kachemak Bay are the base of our productive food web that supports the marine mammals, sea birds, and healthy fish populations. By monitoring for phytoplankton that produce toxins we can provide valuable information to shellfish harvesters of all types and public health officials to protect human health in our communities. Monitoring phytoplankton also provides us with valuable baseline information on the bloom cycles in Kachemak Bay.

There are three types of phytoplankton in Kachemak Bay that can cause harmful algal blooms (HABS), they are *Alexandrium* sp., *Pseudo-nitzschia* sp., and *Dinophysis* sp.. These three species are listed in the table below to document if they were present or not in the sample. None of these species have produced a "red tide" when they have been present or blooming in Alaska, the only way to know if they are present is to analyze a water sample. *Alexandrium* sp. produces saxitoxin, the toxin responsible for paralytic shellfish poisoning (PSP) when humans consume shellfish that have accumulated saxitoxin in their tissues. *Pseudo-nitzschia* sp. produce domoic acid, this toxin acts as a neurotoxin and can lead to amnesic shellfish poisoning (ASP) in humans, birds, and marine mammals when toxic shellfish are consumed. *Dinophysis* sp. produce okadaic acid which can lead to diarrhetic shellfish poisoning (DSP) after consumption of contaminated shellfish. For more information on these species and symptoms associated with each please check out the resources on our website by clicking here or send us an email.

All commercially harvested shellfish are regulated by the DEC and considered safe for consumption.

As always please reach out with any questions. Note that all KBNERR staff are working remotely, email is the best method to reach us with your questions.

Thank you to all our monitors and partners. Wishing everyone a safe and healthy Memorial Day Weekend!

Jasmine and Rosie
jrmaurer@alaska.edu
rmmasui@alaska.edu

Kachemak Bay Research Reserve Phytoplankton Update
Qualitative Analysis Phytoplankton Data

## INNER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 5/9/2020 | China Poot | | 32 | Mixed Diatoms | None | None | None |
| 5/13/2020 | Homer Harbor | 7.8 | 30.6 | Mixed Diatoms | None | None | None |
| 5/17/2020 | Peterson Bay | 7.2 | 30 | *Chaetoceros* spp. | None | Present | None |
| 5/19/2020 | Halibut Cove | 7 | 28 | Sparse Sample | None | None | None |
| 5/20/2020 | Homer Harbor | 8.5 | 29.4 | Mixed Diatoms | None | Present | None |

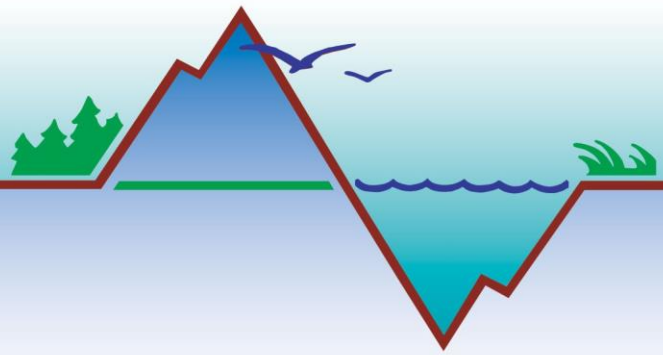
*Samples received after last weekly update

## OUTER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 5/10/2020 | Tutka Lagoon | 7.4 | 27.5 | Sparse Sample | None | Present | None |
| 5/13/2020 | Jakolof | 6.7 | 24.7 | *Chaetoceros socialis* | None | None | Present |
| 5/13/2020 | Kasitsna | 6.6 | 31.3 | *Chaetoceros* spp. | None | None | Present |
| 5/13/2020 | Eldridge | 7.4 | 28.8 | *Chaetoceros* spp. | None | Present | None |
| 5/13/2020 | Sadie Powerline | 7.1 | 30 | *Chaetoceros* bloom | None | Present | None |
| 5/13/2020 | Sadie Elbow | 6.9 | 30.5 | *Chaetoceros* spp. | Present | None | None |
| 5/13/2020 | Tutka Bay | 7.7 | 24.3 | *Chaetoceros* bloom | None | None | None |

**Kachemak Bay Research Reserve Phytoplankton Update**
**May 22– June 4th, 2020**

Harmful Algal Bloom Program
Rosie Masui 907-235-1598 rmmasui@alaska.edu
Jasmine Maurer 907-235-4799 jrmaurer@alaska.edu



Hello Everyone,

We have results back from our first round of wild shellfish toxin testing this summer. Toxin levels were below the regulatory limit considered safe for consumption for both samples we submitted for testing.

| Date | Shellfish Type | Location | Toxin Tested For | Toxin Testing Result |
|---|---|---|---|---|
| 6/1/2020 | Blue mussels | Homer Harbor | Saxitoxins-PSP | Below regulatory limit. |
| 6/1/2020 | Blue mussels | Kasitsna Bay | Saxitoxins-PSP | Below regulatory limit. |

Commercially harvested shellfish are regulated by DEC and considered safe for consumption.

Phytoplankton samples throughout Kachemak Bay over the past two weeks have been dominated by *Chaetoceros* sp. In Outer Kachemak Bay several of the sub-bays are experiencing *Chaetoceros* sp. blooms this week. *Chaetoceros* sp. do not produce toxins, however, they do have long spines on each cell and form straight or curly chains. The spines on *Chaetoceros* cells can get caught in fish gills and cause irritation. This can be fatal if fish aren't able to swim away from areas with high densities of *Chaetoceros* sp., such as when fish are held in net pens. For this reason, phytoplankton monitoring is one tool used by hatcheries to optimize smolt health and inform the timing of release for stocked runs.

Currently the KBNERR webpage server is not functioning properly, as a result our website updates and resources are offline. Please reach out to Rosie or Jasmine to receive any support materials or past updates as needed. We apologize for any inconvenience this may cause. Our IT staff are working on it and we hope to have the website up and running again soon.

Thanks to all our monitors and partners for the phytoplankton samples!
Rosie Masui & Jasmine Maurer

Kachemak Bay Research Reserve Phytoplankton Update
Qualitative Analysis Phytoplankton Data

## INNER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 5/24/2020 | Peterson Bay | | 30 | Mixed Diatoms | None | None | None |
| 5/25/2020 | China Poot | | 36 | Mixed Diatoms | None | Present | None |
| 5/28/2020 | Homer Harbor | 8.7 | 29.7 | Sparse | None | Present | Present |
| 5/31/2020 | Peterson Bay | 8.3 | 30 | Mixed Diatoms | None | None | None |
| 6/2/2020 | Halibut Cove | 7.0 | 28 | Sparse | None | None | None |
| 6/3/2020 | China Poot | 8.7 | 29.4 | *Chaetoceros* sp. | None | Present | None |
| 6/3/2020 | Homer Harbor | 11.1 | 28.2 | *Chaetoceros & Fragilariopsis* | Present | None | None |
| 6/3/2020 | Peterson Bay | 9.8 | 29.0 | *Chaetoceros* sp. | None | Present | None |
| 6/3/2020 | Aurora Lagoon | | 25.9 | *Chaetoceros* sp. | Present | Present | None |
| 6/3/2020 | Bear Cove | 9.9 | 28.1 | *Chaetoceros* sp. | Present | Present | None |

*Samples received after last weekly update

## OUTER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 5/24/2020 | Tutka Lagoon | 7.5 | 25.9 | Sparse | None | Present | None |
| 6/2/2020 | Jakolof | 8.0 | | *Chaetoceros debilis* bloom | None | Present | None |
| 6/3/2020 | Kasitsna | 8.3 | 30.7 | *Chaetoceros debilis* bloom | None | Present | Present |
| 6/3/2020 | Jakolof | 9.0 | 30.7 | *Chaetoceros* sp. bloom | None | Present | Present |
| 6/3/2020 | Sadie Cove | 8.2 | 29.4 | *Chaetoceros* sp. bloom | None | Present | None |
| 6/3/2020 | Tutka Bay | 7.5 | 29.3 | *Chaetoceros debilis* bloom | None | Present | Present |

*Samples received after last weekly update

## Prince William Sound

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 4/23/2020* | MBH Dock | 6.3 | 31.3 | No cells | None | None | None |
| 4/30/2020 | MBH Dock | 6.8 | 27.6 | Sparse | None | None | None |
| 5/9/2020* | MBH Dock | 7.1 | 27.4 | Sparse | None | None | None |

*Samples received after last weekly update

Kachemak Bay National Estuarine Research Reserve
Alaska Center for Conservation Science
University of Alaska Anchorage

**Kachemak Bay Research Reserve Phytoplankton Update**
**June 5th to June 11 th, 2020**

Harmful Algal Bloom Program
Rosie Masui 907-235-1598 rmmasui@alaska.edu
Jasmine Maurer 907-235-4799 jrmaurer@alaska.edu

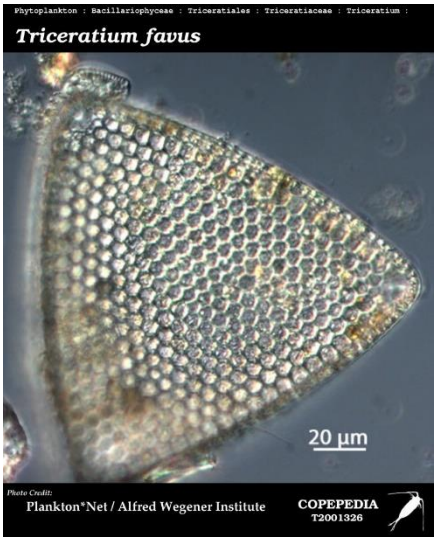
Hello Everyone,

We have wild shellfish toxin testing results to report again this week. Toxin levels were below the regulatory limit considered safe for consumption in the blue mussels from Homer Harbor we submitted for testing.

| Date | Shellfish Type | Location | Toxin Tested For | Toxin Testing Result |
|---|---|---|---|---|
| 6/8/2020 | Blue mussels | Homer Harbor | Saxitoxins-PSP | Below regulatory limit. |

Commercially harvested shellfish are regulated by DEC and considered safe for consumption.

KBNERR website is up and running again, with resources covering HAB species in detail, past weekly updates and links to the KBNERR YouTube channel which has additional resources for monitors.




This week in the Inner and Outer Bay *Chaetoceros* sp. continue to dominate reaching bloom levels in many areas.

One species stands out this week from the Sadie Cove sample, it was a three-pointed *Triceratium* sp.. Members of this genus of diatoms can have seven to three points and aren't commonly seen in our samples. The first time a species of this genus was identified in a KBNERR phytoplankton sample was in November 2014 and had five points like a star.

Thanks to all our monitors and partners for the phytoplankton samples!
Rosie Masui & Jasmine Maurer

Kachemak Bay Research Reserve Phytoplankton Update
Qualitative Analysis Phytoplankton Data

## INNER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 6/1/2020* | Bear Cove | 10 | 30 | Sparse Sample | Present | Present | None |
| 6/5/2020 | Peterson Bay | 8.3 | 30 | *Chaetoceros* sp. | None | None | None |
| 6/6/2020 | Jakolof | 12 | 37 | *Chaetoceros* bloom | None | Present | None |
| 6/10/20 | Eldridge | 9.1 | 29.4 | *Chaetoceros* bloom | None | Present | None |
| 6/10/2020 | Sadie Cove | 13 | 30.3 | *Chaetoceros* bloom | None | None | Present |
| 6/10/2020 | Homer Harbor | 11.3 | 29.3 | *Chaetoceros* sp. | None | Present | Present |

*Samples received after last weekly update

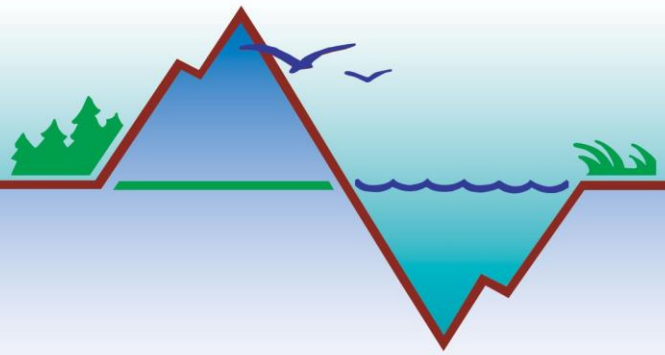
## OUTER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 6/10/2020 | Seldovia Harbor | 9.7 | 29.8 | Mixed Diatoms | Present | Present | None |
| 6/10/2020 | Kasitsna Bay | 8.9 | 31.2 | *Chaetoceros debilis* bloom | None | Present | None |
| 6/10/2020 | Tutka Bay | 10.2 | 27.5 | *Chaetoceros* sp. bloom | None | None | None |

*Samples received after last weekly update

Kachemak Bay National Estuarine Research Reserve
Alaska Center for Conservation Science
University of Alaska Anchorage

**Kachemak Bay Research Reserve Phytoplankton Update**
**June 12th to June 18th, 2020**
Harmful Algal Bloom Program
Rosie Masui 907-235-1598 rmmasui@alaska.edu
Jasmine Maurer 907-235-4799 jrmaurer@alaska.edu



Hello Everyone,

This week we have wild razor clam toxin testing results to report. Toxin levels were below the regulatory limit considered safe for consumption.

| Date | Shellfish Type | Location | Toxin Tested For | Toxin Testing Result |
|---|---|---|---|---|
| 6/9/2020 | Razor Clams | Set Net Site Cook Inlet | Saxitoxins-PSP | Below regulatory limit. |
| 6/9/2020 | Razor Clams | Clam Gulch South | Saxitoxins-PSP | Below regulatory limit. |

Commercially harvested shellfish are regulated by DEC and considered safe for consumption.

This week *Chaetoceros* sp. dominated in the Inner and Outer Bay. The Inner Bay phytoplankton samples in the years 2009-2013 also had *Chaetoceros* sp. dominating for many weeks during this same time period May – June. In the Outer Bay the same seasonal trend of *Chaetoceros* sp. dominating among the phytoplankton was seen in the years 2014, 2017, & 2018.

Thanks to all our monitors and partners for the phytoplankton and razor clam samples!
Rosie Masui & Jasmine Maurer

Kachemak Bay Research Reserve Phytoplankton Update
Qualitative Analysis Phytoplankton Data

## INNER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 6/8/2020* | China Poot | - | - | Mixed Diatoms | None | None | None |
| 6/13/2020 | Peterson Bay | 12.2 | 30 | Mixed Diatoms | None | Present | None |
| 6/16/2020 | Peterson Bay | 12.2 | 28.4 | *Chaetoceros* sp. bloom | None | Present | None |
| 6/16/2020 | China Poot | 12 | 28.4 | *Chaetoceros laciniosus* | None | Present | Present |
| 6/16/2020 | Halibut Cove | 8 | 30 | *Chaetoceros* sp. | None | None | None |
| 6/16/2020 | Homer | 11.5 | 29.7 | Mixed Diatoms | Present | Present | None |

| | Harbor | | | | | | |
|---|---|---|---|---|---|---|---|
| **DATE** | **Bay** | **Water Temp** | **Salinity** | **Dominant species** | **Dinophysis** | **Pseudo-nitzschia** | **Alexandrium** |
| 6/16/2020 | Aurora Lagoon | 11.7 | 28.8 | *Chaetoceros* sp. bloom | None | None | None |
| 6/16/2020 | Bear Cove | 12.7 | 27.3 | *C. laciniosus* | None | Present | None |

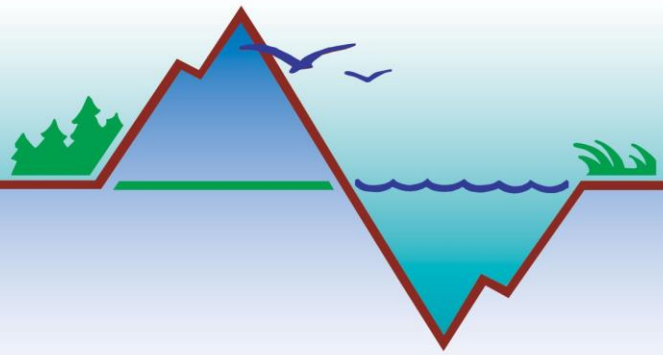
*Samples received after last weekly update

## OUTER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 6/16/2020 | Kasitsna Bay | 12.4 | 30.9 | *Chaetoceros* sp. bloom | None | Present | None |
| 6/16/2020 | Tutka Bay | 12.5 | 26.2 | *Chaetoceros* sp. bloom | None | None | None |
| 6/16/2020 | Sadie Cove | 12.1 | 29.2 | *C. laciniosus* | None | None | None |
| 6/16/2020 | Eldred Passage | 11.6 | 29.9 | *Chaetoceros* sp. bloom | Present | None | None |

*Samples received after last weekly update

**Kachemak Bay Research Reserve Phytoplankton Update**
**June 19th to June 25th, 2020**
Harmful Algal Bloom Program
Rosie Masui 907-235-1598 rmmasui@alaska.edu
Jasmine Maurer 907-235-4799 jrmaurer@alaska.edu



Hello Everyone,

We have results from toxin testing of wild blue mussels harvested from the Homer Harbor this week. PSP levels were below the regulatory limit considered safe for consumption.

| Date | Shellfish Type | Location | Toxin Tested For | Toxin Testing Result |
|---|---|---|---|---|
| 6/21/2020 | Blue Mussels | Homer Harbor | Saxitoxins-PSP | Below regulatory limit. |

Commercially harvested shellfish are regulated by DEC and considered safe for consumption.

On July 1st we will start the new fiscal year for our Harmful Species Program. You will notice a few changes in the program operations as a result of some budget cuts. We will be prioritizing sampling sites and testing of wild shellfish to maximize the program funds with quality information you have come to count on. We are so thankful to all community monitors that continue to participate in this program providing samples and coverage we couldn't achieve on our own.
Weekly updates will still be provided; however we anticipate reducing staff phytoplankton sampling to a bi-weekly schedule. Please reach out if you have any questions about our plans moving forward.

Thanks to all our monitors and partners for the phytoplankton samples!
Rosie Masui & Jasmine Maurer

Kachemak Bay Research Reserve Phytoplankton Update
Qualitative Analysis Phytoplankton Data

## INNER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 6/20/2020 | Peterson Bay | 9.4 | 30.0 | Sparse Sample | None | Present | None |
| 6/21/2020 | China Poot | 9 | 34 | Sparse Sample | None | Present | None |
| 6/24/2020 | Homer Harbor | 11.6 | 25.8 | *Chaetoceros* sp. | None | None | None |

*Samples received after last weekly update

## OUTER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 6/11/2020* | Jakolof | 11 | 37 | *Chaetoceros* sp. bloom | None | Present | None |
| 6/11/2020* | Seldovia | 10 | 32 | Sparse Sample | None | None | None |
| 6/14/2020* | Jakolof | 10 | 38 | *Chaetoceros* sp. | None | Present | Present |
| 6/19/2020 | Seldovia | 10 | 32 | Mixed Diatoms | None | None | Present |

*Samples received after last weekly update

## RESSURECTION BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 6/15/2020* | Seward Small Boat Dock | 13.8 | 23.6 | *Chaetoceros* sp. | None | None | None |

Kachemak Bay National Estuarine Research Reserve
Alaska Center for Conservation Science
University of Alaska Anchorage

**Kachemak Bay Research Reserve Phytoplankton Update**
**June 26th to July 3rd, 2020**
Harmful Algal Bloom Program
Rosie Masui 907-235-1598 rmmasui@alaska.edu
Jasmine Maurer 907-235-4799 jrmaurer@alaska.edu

Hello Everyone,

Happy Fourth of July! And what a positive weather forecast we have for the long weekend ahead of us. This week we are seeing a decline in the number of *Chaetoceros* sp. in the samples although *Chaetoceros* sp. remain the most dominant phytoplankton in many areas. This is a common occurrence as we enter July, and as always we are curious to see which species dominate in the weeks ahead. You may also notice the that many of our samples have species of concern, *Dinophysis*, *Pseudo-nitzschia*, or *Alexandrium,* "present". Present means we saw at least one cell of a species of concern in the sample. We keep close track of the species of concern and will include additional information in our updates should we observe concentrations of a species of concern that reach abundant or bloom levels.

Wild shellfish in the state of Alaska are considered dig at your own risk.
All commercially harvested shellfish are regulated by the DEC and considered safe for consumption.

Wishing everyone a safe and healthy summer holiday. Please reach out with any questions.

Thanks to all our monitors and partners for the phytoplankton samples!
Rosie Masui & Jasmine Maurer

Kachemak Bay Research Reserve Phytoplankton Update
Qualitative Analysis Phytoplankton Data

## INNER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 6/26/2020 | Peterson Bay | 10 | 30 | *Heterocapsa* sp. | Present | Present | Present |
| 6/28/20 | Halibut Cove | 11 | 20 | Sparse Sample | None | None | None |
| 6/29/20 | China Poot | 9 | 31 | *Chaetoceros* sp. | Present | Present | Present |
| 6/30/2020 | Homer Harbor | 11.2 | 29 | Mixed Diatoms | Present | Present | None |

*Samples received after last weekly update

## OUTER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 6/18/20 | Tutka Lagoon | 9.8 | 26.1 | Sparse Sample | None | None | None |
| 6/22/20 | Tutka Bay | 9.9 | 28.1 | *Chaetoceros* sp | None | None | None |
| 6/27/20 | Sadie Cove | 10.5 | 29 | *Chaetoceros* sp. | None | None | None |
| 6/30/20 | Sadie Cove | 13 | 33 | *Chaetoceros* sp. | None | Present | None |

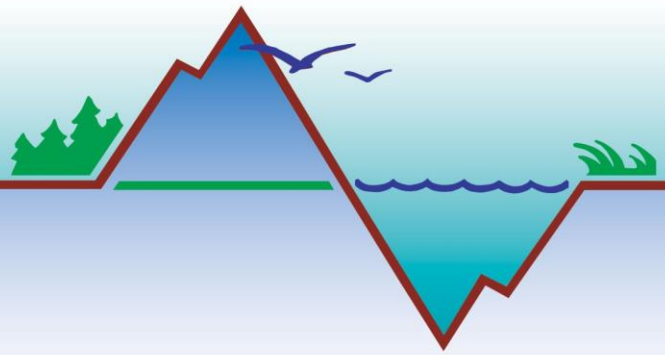
*Samples received after last weekly update

## RESSURECTION BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 6/29/2020 | Seward Small Boat Dock | 13 | 26.2 | *Chaetoceros* sp. | None | None | None |

Kachemak Bay National Estuarine Research Reserve
Alaska Center for Conservation Science
University of Alaska Anchorage

**Kachemak Bay Research Reserve Phytoplankton Update**
**July 3rd to July 9th, 2020**
Harmful Algal Bloom Program
Rosie Masui 907-235-1598 rmmasui@alaska.edu
Jasmine Maurer 907-235-4799 jrmaurer@alaska.edu



Hello Everyone,

This week we started seeing a relative increase in the number of dinoflagellates in the samples. Dinoflagellates are a group of phytoplankton that use flagella, long whip like structures, to move around. *Alexandrium* sp. and *Dinophysis* sp. are both dinoflagellates. *Chaetoceros* sp. are at bloom levels again in Eldred Passage and Tutka Bay. Overall, the samples this week have abundant phytoplankton from a diverse number of species.
This week we also saw *Pseudo-nitzschia* sp. density increase to abundant levels in Jakolof and Kasitsna Bay. Eldred Passage sample also had many *Pseudo-nitzschia* present, although not quite enough to meet the criteria of "abundant". *Pseudo-nitzschia* sp. can produce domoic acid and cause amnesiac shellfish poisoning when toxic shellfish are consumed. Cell counts for all three species of concern are used to determine abundance classification.

Commercially harvested shellfish are monitored by DEC and considered safe for consumption.

Please reach out with any questions.
Thanks to all our monitors and partners for the phytoplankton samples!
Rosie Masui & Jasmine Maurer

Kachemak Bay Research Reserve Phytoplankton Update
Qualitative Analysis Phytoplankton Data

## INNER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 7/4/2020 | Peterson Bay | 11.6 | 30 | *Chaetoceros* sp. | Present | Present | None |
| 7/7/2020 | Halibut Cove | 14 | 26 | *Chaetoceros* sp. | Present | None | None |
| 7/9/2020 | Homer Harbor | 11.5 | 29.4 | Mixed Diatoms | Present | Present | Present |

*Samples received after last weekly update

## OUTER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 7/7/2020 | Kasitsna Bay | 11.1 | 31.3 | Mixed Diatoms | None | Present | Present |
| 7/7/2020 | Jakolof | 11 | 38 | Mixed Diatoms | Present | Present | Present |
| 7/7/2020 | Eldred Passage | 11.1 | 30.4 | *Chaetoceros* sp. bloom | Present | Present | Present |
| 7/7/2020 | Tutka Bay | 12.5 | 27.5 | *Chaetoceros* sp. bloom | Present | Present | Present |
| 7/8/2020 | Sadie Cove | 13.5 | 30 | Sparse Sample | Present | Present | None |

*Samples received after last weekly update

Kachemak Bay National Estuarine Research Reserve
Alaska Center for Conservation Science
University of Alaska Anchorage

**Kachemak Bay Research Reserve Phytoplankton Update**
**July 10th to July 16th, 2020**
Harmful Algal Bloom Program
Rosie Masui 907-235-1598 rmmasui@alaska.edu
Jasmine Maurer 907-235-4799 jrmaurer@alaska.edu

Hello Everyone,

We have a lot to report out on this week.
We are saddened to share that the Alaska Department of Health and Social Science (DHSS) has issued a Public Service Announcement due to a recent death in Alaska from Paralytic Shellfish Poisoning. The full announcement is attached to the weekly email. Please take a few minutes to read this announcement, it includes important information from DHSS and resources regarding the harvest of wild shellfish in Alaska. As always you can contact us with questions as well, and Rosie has set up **virtual** office hours this Friday, July 17th, 9 to noon to take questions over the phone. KBNERR's office is still not open for in person visitors, so please reach out via phone: **907-235-1598** or email: jrmaurer@alaska.edu or rmmasui@alaska.edu

We also have results to share from our wild shellfish toxin testing program. The wild blue mussels came in well below the regulatory limit; however, the toxin level in the butter clams was near the limit considered safe for consumption. We will continue to monitor wild shellfish and report out results as they become available to us.

| Date | Shellfish Type | Location | Toxin Tested For | Toxin Testing Result |
|---|---|---|---|---|
| 6/23/2020 | Blue mussels | China Poot | Saxitoxins-PSP | Below regulatory limit. |
| 6/23/2020 | Butter Clams | China Poot | Saxitoxins-PSP | Below regulatory limit. |

Commercially harvested shellfish are monitored by DEC and considered safe for consumption.

Throughout Kachemak Bay phytoplankton are numerous this week and we are seeing an increase in diversity; in other words, more species present in each sample. This week all our samples had species of concern present, and we saw abundant levels of *Pseudo-nitzschia* sp. in several sub-bays. *Pseudo-nitzschia* sp. can produce domoic acid, which can lead to Amnesic shellfish poisoning when toxic shellfish are consumed. Science is still researching what triggers *Pseudo-nitzschia* sp. to begin producing domoic acid, at this time testing shellfish is the best way to know if toxins are being accumulated.

Rosie will be hosting **virtual** office hours on Friday, July 17th, from 9am - 12pm to answer any questions via phone at **907 - 235 – 1598.**

Thanks to all our monitors and partners for the phytoplankton samples!
Rosie Masui & Jasmine Maurer

Kachemak Bay Research Reserve Phytoplankton Update
Qualitative Analysis Phytoplankton Data

## INNER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 7/9/2020* | China Poot | 10 | 32 | Mixed Diatoms & Dinoflagellates | Present | Present | Present |
| 7/9/2020* | Bear Cove | 12.5 | - | Tintinnids | Present | Present | None |
| 7/12/2020 | Peterson Bay | 11.1 | 30 | *Pseudo-nitzschia* | Present | Present | Present |
| 7/14/2020 | Halibut Cove | 15 | 25 | *Chaetoceros* sp. | Present | Present | None |
| 7/15/2020 | Homer Harbor | 13.9 | 25.8 | Sparse Sample | Present | Present | None |

*Samples received after last weekly update

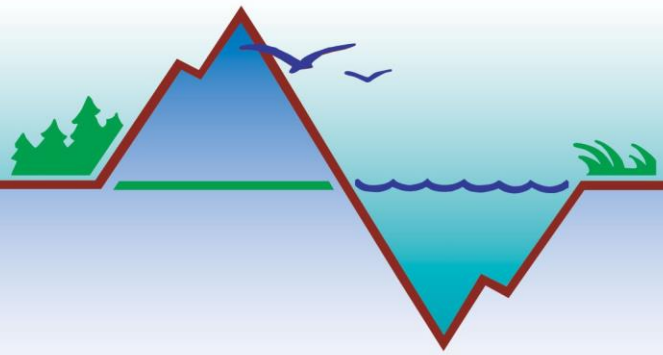
## OUTER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 7/15/2020 | Kasitsna Bay | 12.7 | 30.5 | Mixed Diatoms | Present | Present | None |
| 7/15/2020 | Jakolof | 12.5 | 30.7 | Mixed Diatoms | Present | Present | None |
| 7/15/2020 | Tutka Bay | 12.4 | 28.7 | Mixed Diatoms | Present | Present | Present |
| 7/15/2020 | Sadie Cove | 12.9 | 29.3 | Mixed Diatoms | None | Present | Present |
| 7/15/2020 | Eldred Passage | 12.9 | 28.3 | *Chaetoceros* sp. | Present | Present | None |
| 7/15/2020 | NW Yukon Island | 12.3 | 29.3 | *Chaetoceros* sp. | Present | Present | Present |

*Samples received after last weekly update

Kachemak Bay National Estuarine Research Reserve
Alaska Center for Conservation Science
University of Alaska Anchorage

**Kachemak Bay Research Reserve Phytoplankton Update**
**July 17th to July 23rd, 2020**
Harmful Algal Bloom Program
Rosie Masui 907-235-1598 rmmasui@alaska.edu
Jasmine Maurer 907-235-4799 jrmaurer@alaska.edu



Hello Everyone,

A relatively quiet week to report out on the phytoplankton in Kachemak Bay. This week we continue to see dinoflagellates be the most numerous group of phytoplankton in the samples. Peterson Bay sample is dominated by *Protoperidinium* sp., a dinoflagellate, while other samples didn't have a single dominant dinoflagellate species this week.

Please reach out with any questions.
Thanks to all our monitors and partners for the phytoplankton samples!
Rosie Masui & Jasmine Maurer

Kachemak Bay Research Reserve Phytoplankton Update
Qualitative Analysis Phytoplankton Data

## INNER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 7/18/2020 | China Poot | 12 | 28 | Mixed Dinoflagellates and Diatoms | Present | Present | None |
| 7/19/2020 | Peterson | 12.2 | 30 | *Protoperidinium* sp. | None | Present | Present |
| 7/20/2020 | Sadie Cove | 10.5 | 28 | Mixed Diatoms | Present | Present | None |
| 7/21/2020 | Halibut Cove | 15 | 23 | *Chaetoceros* sp. | Present | None | None |
| 7/21/2020 | Homer Harbor | 13.1 | 27.3 | Mixed Dinoflagellates | Present | Present | None |

*Samples received after last weekly update

## OUTER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 7/12/2020* | Tutka Lagoon | - | - | Sparse Sample | None | Present | None |
| 7/16/2020* | Tutka Lagoon | 13.2 | 28.2 | Sparse Sample | None | Present | None |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 7/19/2020 | Tutka Lagoon | 13.3 | 27.3 | Sparse Sample | Present | Present | Present |

*Samples received after last weekly update

## RESURRECTION BAY

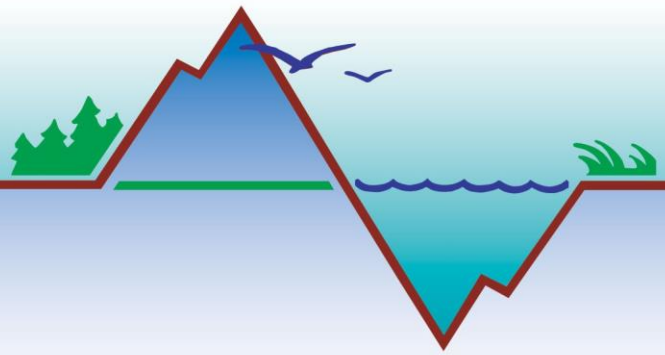
| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 7/6/2020* | Seward Small Boat Harbor | 14 | 13.1 | Sparse Sample | None | Present | None |

*Samples received after last weekly update

Kachemak Bay National Estuarine Research Reserve
Alaska Center for Conservation Science
University of Alaska Anchorage

**Kachemak Bay Research Reserve Phytoplankton Update**
**July 24th to July 30th, 2020**

Harmful Algal Bloom Program
Rosie Masui 907-235-1598 rmmasui@alaska.edu
Jasmine Maurer 907-235-4799 jrmaurer@alaska.edu



Hello Everyone,

As July ends and we welcome August we are in the time of year that we have typically seen more toxin producing phytoplankton in Kachemak Bay. There are three species of concern in Kachemak Bay that can produce toxins and lead to shellfish poisoning when shellfish accumulate these species, they are *Alexandrium*, *Dinophysis* and *Pseudo-nitzschia*.

In Alaska the presence of these species has not yet been associated with any change in the color of the water. A few factors that can influence the color of our coastal waters are run-off, spruce pollen or other pollens, and tidal changes. To date harmful algal blooms in Kachemak Bay have not been associated with changes in water color.

Toxins produced by harmful algal blooms are accumulated and flushed from shellfish tissue at different rates depending on the shellfish species. Mussels for example tend to accumulate toxins relatively rapidly and flush them over several days. This contrasts with the **butter clam** that can accumulate toxins and **remain toxic for up to 2 years**. Washing, cooking and freezing do not break down the toxins in shellfish tissue.

This week the phytoplankton in Kachemak Bay overall were less abundant than the previous weeks. However, a diversity of species was present in all the samples this week. We hope to have results to share next week from our wild-shellfish toxin testing program.

For more information on toxin producing phytoplankton, harmful algal blooms, or our monitoring program please reach out via email with your questions or concerns. Or visit our website by clicking here to access detailed handouts covering the species of concern in Kachemak Bay and other relevant topics. To access our past Weekly Phytoplankton Updates click here.

Please reach out with any questions. Rosie will be out of the office until August 6th, so please email Jasmine or Steve for a timelier response.

Thanks to all our monitors and partners for the phytoplankton samples!

Rosie Masui, Jasmine Maurer & Steve Baird: sjbaird@alaska.edu

Kachemak Bay Research Reserve Phytoplankton Update
Qualitative Analysis Phytoplankton Data

## INNER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 7/23/2020 | Bear Cove | 17.5 | 25 | Mixed Diatoms | Present | Present | Present |
| 7/25/2020 | Peterson | 12.2 | 30 | *Chaetoceros* sp. | Present | None | Present |
| 7/29/2020 | Halibut Cove | 13 | 27 | Sparse sample | None | None | None |
| 7/30/2020 | Homer Harbor | 13.5 | 26.3 | Sparse sample | Present | None | None |

*Samples received after last weekly update

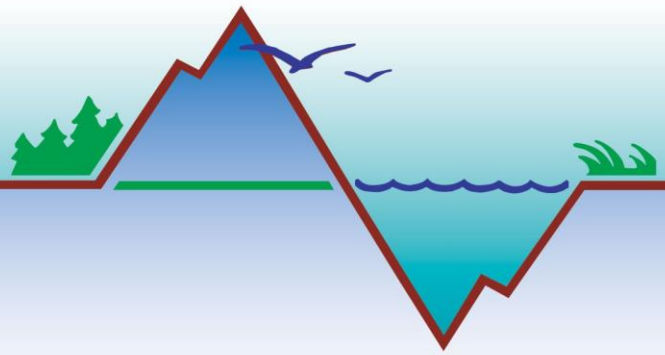
## OUTER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 7/3/2020* | Seldovia Harbor | 12 | 31 | Sparse Sample | None | Present | Present |
| 7/23/2020 | Jakolof | 13 | 38 | *Chaetoceros* sp. | Present | None | None |
| 7/24/2020 | Seldovia Harbor | 11 | 31 | Sparse Sample | None | None | None |
| 7/29/20 | Jakolof | 11 | 47 | *Chaetoceros* sp. | None | None | None |

*Samples received after last weekly update

Kachemak Bay National Estuarine Research Reserve
Alaska Center for Conservation Science
University of Alaska Anchorage

**Kachemak Bay Research Reserve Phytoplankton Update**
**July 31st to August 6th, 2020**
Harmful Algal Bloom Program
Rosie Masui 907-235-1598 rmmasui@alaska.edu
Jasmine Maurer 907-235-4799 jrmaurer@alaska.edu



Hello Everyone,

This week we have results to share from our wild shellfish toxin testing program. Blue mussels collected from China Poot on July 16th were below the regulatory limit for saxitoxins, the toxin that can lead to Paralytic Shellfish Poisoning (PSP).

| Date Collected | Shellfish Type | Location | Toxin Tested For | Toxin Testing Result |
|---|---|---|---|---|
| 7/16/2020 | Blue mussels | China Poot | Saxitoxins-PSP | Below regulatory limit. |

Commercially harvested shellfish are monitored by DEC and considered safe for consumption.

This week the inner bay had sparse phytoplankton at all the sampling sites. This contrasts with the outer bay samples that had numerous phytoplankton from a variety of different species at all sample locations.

Thanks to all our monitors and partners for the phytoplankton samples!
Rosie Masui, and Jasmine Maurer

Kachemak Bay Research Reserve Phytoplankton Update
Qualitative Analysis Phytoplankton Data

## INNER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 7/31/2020 | Peterson Bay | 14.5 | 30 | Sparse Sample | None | None | None |
| 8/1/2020 | Peterson Bay | 12.2 | - | Sparse Sample | Present | None | None |
| 8/4/2020 | Homer Harbor | 13.5 | 25.8 | Sparse sample | Present | None | None |
| 8/4/2020 | China Poot Entrance | 13.5 | 23.8 | Sparse Sample | None | None | None |
| 8/4/2020 | Halibut Cove | 13 | 27 | Sparse sample | Present | None | None |
| 8/4/2020 | Bear Cove | - | 20 | Sparse Sample | None | None | Present |

*Samples received after last weekly update

## OUTER BAY

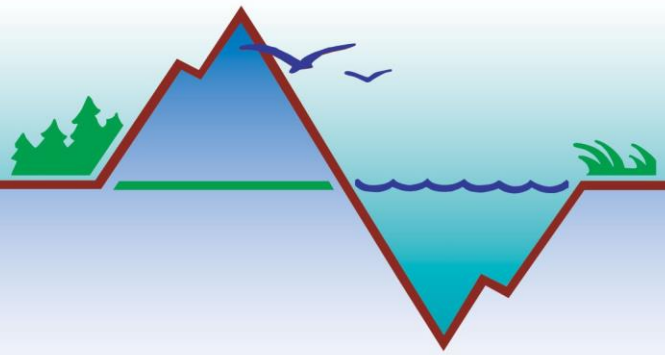
| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 7/30/2020* | Tutka Lagoon | 13.7 | 26.8 | Mixed Diatoms | Present | Present | None |
| 8/2/2020 | Tutka Bay | 11.2 | 29.3 | Sparse Sample | Present | None | Present |
| 8/4/2020 | Kasitsna Bay | 10.9 | 30.6 | Mixed Diatoms & Dinoflagellates | Present | Present | None |
| 8/4/2020 | Sadie Cove | 13.6 | 12.7 | *Chaetoceros* sp. | Present | Present | Present |
| 8/4/2020 | Eldred Passage | 11.9 | 29.8 | *Chaetoceros* sp. | Present | Present | None |

*Samples received after last weekly update

Kachemak Bay National Estuarine Research Reserve
Alaska Center for Conservation Science
University of Alaska Anchorage

**Kachemak Bay Research Reserve Phytoplankton Update**
**August 6th to August 13th, 2020**

Harmful Algal Bloom Program
Rosie Masui 907-235-1598 rmmasui@alaska.edu
Jasmine Maurer 907-235-4799 jrmaurer@alaska.edu



Hello Everyone,

This week in the inner bay phytoplankton continues to be sparse. During August of 2018 and 2019 the inner bay experienced a similar decrease in phytoplankton abundances. The outer bay samples were also predominantly sparse this week, except for Tutka Bay and Sadie Cove which had more numerous phytoplankton although no single species dominated in either bay. We will continue with weekly phytoplankton monitoring into September.

Please reach out to us with any questions.

Thanks to all our monitors and partners for the phytoplankton samples!
Rosie Masui, and Jasmine Maurer

Kachemak Bay Research Reserve Phytoplankton Update
Qualitative Analysis Phytoplankton Data

## INNER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 8/5/2020* | China Poot | 11.5 | 34 | Sparse Sample | None | None | None |
| 8/8/2020 | Peterson Bay | 14 | 27 | Sparse Sample | Present | None | None |
| 8/9/2020 | Peterson Bay | 12.2 | - | Sparse Sample | Present | None | Present |
| 8/11/2020 | Homer Harbor | 13.5 | 25.8 | Sparse sample | Present | None | None |
| 8/11/2020 | Halibut Cove | 13 | 26 | Sparse sample | Present | None | None |

*Samples received after last weekly update

## OUTER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 8/11/2020 | Kasitsna Bay | 11.9 | 30.6 | Sparse Sample | Present | None | None |
| 8/11/2020 | Jakolof | 12.4 | 30.3 | Sparse Sample | Present | None | None |

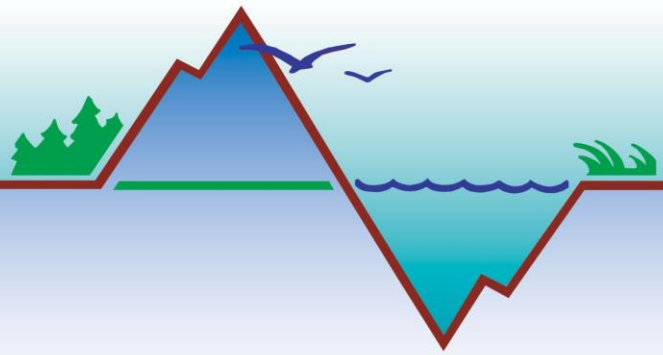
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 8/11/2020 | Tutka Bay | 12.2 | 29.2 | Mixed Dinoflagellates | Present | None | None |
| 8/11/2020 | Sadie Cove | 13.2 | 28.5 | Mixed Diatoms | Present | Present | Present |
| 8/11/2020 | Eldred Passage | 12.8 | 28.2 | Sparse Sample | Present | None | None |

*Samples received after last weekly update

Kachemak Bay National Estuarine Research Reserve
Alaska Center for Conservation Science
University of Alaska Anchorage

**Kachemak Bay Research Reserve Phytoplankton Update**
**August 14th to August 20th, 2020**

Harmful Algal Bloom Program
Rosie Masui 907-235-1598 rmmasui@alaska.edu
Jasmine Maurer 907-235-4799 jrmaurer@alaska.edu



Hello Everyone,

This week we have results to share from our wild shellfish toxin testing program. Blue mussels collected from Homer Harbor on 8/10/2020 were below the regulatory limit for saxitoxins, the toxin that can lead to Paralytic Shellfish Poisoning (PSP).

| Date Collected | Shellfish Type | Location | Toxin Tested For | Toxin Testing Result |
|---|---|---|---|---|
| 8/10/2020 | Blue mussels | Homer Harbor | Saxitoxins-PSP | Below regulatory limit. |

Commercially harvested shellfish are regulated by Alaska DEC and considered safe for consumption.

Phytoplankton samples from throughout Kachemak Bay continue to be sparse this week. For the inner bay this is not unusual. Since 2011, when we began weekly monitoring of the inner bay during the summer months, we have frequently observed phytoplankton abundances decrease in inner Kachemak Bay for some part of August. However, the decrease in phytoplankton abundances in the outer bay these past two weeks had not be observed since we started weekly sampling of the outer bay in 2016.

Reach out with any questions.
Thanks to all our monitors and partners for the phytoplankton samples!
Rosie Masui, and Jasmine Maurer

Kachemak Bay Research Reserve Phytoplankton Update
Qualitative Analysis Phytoplankton Data

## INNER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 8/15/2020 | Peterson Bay | 13.3 | 29 | Sparse Sample | None | None | None |
| 8/19/2020 | Homer Harbor | 14 | 26.3 | Sparse Sample | None | None | None |
| 8/19/2020 | Halibut Cove | 13 | 26 | Sparse Sample | Present | None | None |

*Samples received after last weekly update

## OUTER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 8/8/2020* | Seldovia Harbor | 12 | 30 | Sparse Sample | None | None | None |
| 8/13/2020* | Seldovia Harbor | 13 | 31 | *Chaetoceros* sp. | None | None | None |
| 8/15/2020 | Jakolof | 12 | - | Sparse Sample | Present | None | None |
| 8/17/2020 | Sadie Cove | 17 | - | Sparse Sample | Present | None | None |

*Samples received after last weekly update

## RESURRECTION BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 8/17/2020 | SMIC floating dock | 15.1 | 25.7 | Sparse Sample | None | None | None |

*Samples received after last weekly update

Kachemak Bay National Estuarine Research Reserve
Alaska Center for Conservation Science
University of Alaska Anchorage

**Kachemak Bay Research Reserve Phytoplankton Update**
**August 21st to August 27th, 2020**
Harmful Algal Bloom Program
Rosie Masui 907-235-1598 rmmasui@alaska.edu
Jasmine Maurer 907-235-4799 jrmaurer@alaska.edu

Hello Everyone,

This week in Halibut Cove a *Dinophysis* bloom was observed. *Dinophysis* spp. are species of concern that can produce okadaic acid which can lead to diarrhetic shellfish poisoning (DSP) when toxic shellfish are consumed. Diarrhetic shellfish poisoning is a gastrointestinal illness with symptoms similar to food poisoning such as: diarrhea, nausea, vomiting, and abdominal pain. Symptoms can occur within 30 minutes to a few hours after consuming toxic shellfish. There have been no fatal cases of DSP.

KBNERR along with our local and state partners are working closely together to monitor the *Dinophysis* spp. abundances in Kachemak Bay. Additional information on *Dinophysis* spp. and DSP can be found in the second attachment, NOAA PMN Factsheet Dinophysis spp, on this week's email update.

Please reach out with any additional questions.

Overall phytoplankton were more abundant throughout Kachemak Bay this week, ending the sparse samples we have been seeing the last couple of weeks. The dominant species at Peterson Bay, Gull Island and throughout outer Kachemak Bay this week is *Bacteriastrum* sp.. This is a diatom with long spines like *Chaetoceros* spp. The difference between these two groups is the forked ends of the spines visible in *Bacteriastrum* species as shown in the illustration by Conrad Field.

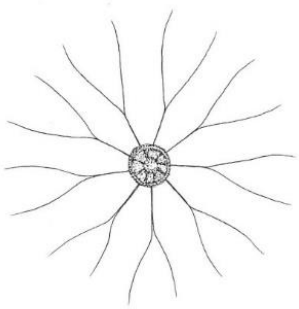


Illustration of *Bacteriastrum* sp. by Conrad Field

Reach out with any questions.
Thanks to all our monitors and partners for the phytoplankton samples!
Rosie Masui, and Jasmine Maurer

Kachemak Bay Research Reserve Phytoplankton Update
Qualitative Analysis Phytoplankton Data

## INNER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 8/17/2020* | China Poot | 13 | 32 | Sparse Sample | None | None | None |
| 8/19/2020* | Peterson bay | 15 | 28 | Mixed Dinoflagellates | Present | None | None |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 8/22/2020 | China Poot | 13 | 30 | Mixed Dinoflagellates | Present | None | None |
| 8/23/2020 | Peterson Bay | 12.7 | 29 | *Bacteriastrum* | Present | None | Present |
| 8/25/2020 | Halibut Cove | 13 | 26 | *Dinophysis* bloom | Bloom | None | None |
| 8/25/2020 | Homer Harbor | 13.8 | 27.5 | Sparse Sample | Present | None | None |
| 8/27/2020 | Gull Island | 13.2 | 28.2 | *Bacteriastrum* bloom | Present | None | None |

*Samples received after last weekly update

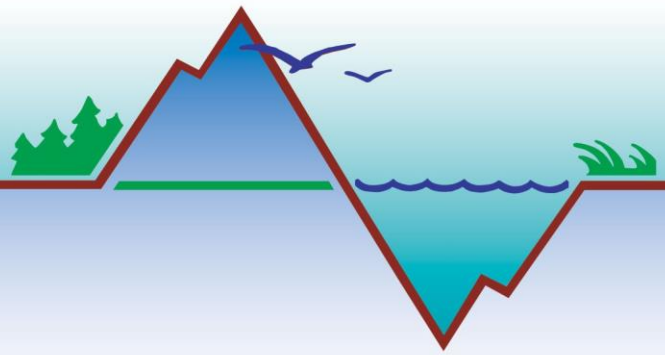
## OUTER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 8/20/2020* | Seldovia Harbor | 13 | 30 | Sparse Sample | None | None | None |
| 8/25/2020 | Kasitsna | 12.4 | 30.4 | *Bacteriastrum* | Present | None | None |
| 8/25/2020 | Jakolof | 12.4 | 30.2 | *Bacteriastrum* | Present | None | None |
| 8/25/2020 | Tutka Bay | 14.4 | 28.9 | *Bacteriastrum* | Present | None | None |
| 8/25/2020 | Sadie Cove | 14.3 | 29.4 | *Bacteriastrum* | Present | None | None |
| 8/25/2020 | Eldred | 13.1 | 29.3 | *Bacteriastrum* | Present | None | None |

*Samples received after last weekly update

**Kachemak Bay Research Reserve Phytoplankton Update**
**August 28th to September 3rd, 2020**

Harmful Algal Bloom Program
Rosie Masui 907-235-1598 rmmasui@alaska.edu
Jasmine Maurer 907-235-4799 jrmaurer@alaska.edu



Hello Everyone,

This week Kachemak Bay phytoplankton were sparse at almost all sampled locations. In 2018 & 2019 we saw a similar abundance fluctuation during the same time period in the inner bay, one week of abundant phytoplankton in late August preceded and followed by several weeks of sparse phytoplankton. We shall see what next week looks like.
Although *Dinophysis* is present at most sample sites this week it was far below bloom levels at all sample locations.
Reach out with any questions.

Thanks to all our monitors and partners for the phytoplankton samples!
Rosie Masui, and Jasmine Maurer

Kachemak Bay Research Reserve Phytoplankton Update
Qualitative Analysis Phytoplankton Data

## INNER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 8/28/2020 | Bear Cove | 12 | 28 | Sparse Sample | None | None | None |
| 8/29/2020 | China Poot | 11 | 34 | Sparse Sample | Present | None | None |
| 9/3/2020 | Homer Harbor | 12.1 | 26.7 | Sparse Sample | Present | None | None |

*Samples received after last weekly update

## OUTER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 8/27/2020* | Seldovia | 11 | 30 | Sparse Sample | Present | None | None |
| 8/27/2020* | Bootlegger Cove | 13.8 | 31 | Mixed Diatoms & Dinoflagellate | Present | None | None |
| 8/29/2020 | Jakolof | 11 | | Sparse Sample | Present | Present | None |

*Samples received after last weekly update

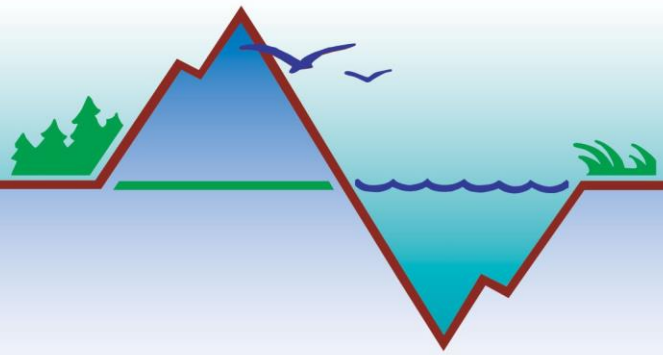
## RESURRECTION BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 8/29/2020 | SMIC Dock | 14 | 25.9 | *Ceratium furca* morphotype | None | None | None |

Kachemak Bay National Estuarine Research Reserve
Alaska Center for Conservation Science
University of Alaska Anchorage

**Kachemak Bay Research Reserve Phytoplankton Update**
**September 4th to September 10th, 2020**

Harmful Algal Bloom Program
Rosie Masui 907-235-1598 rmmasui@alaska.edu
Jasmine Maurer 907-235-4799 jrmaurer@alaska.edu



Hello Everyone,

This week, apart from Jakolof, Kachemak Bay phytoplankton were sparse at all locations sampled. As mentioned last week low phytoplankton abundances during this time of year is a pattern we have observed in past years. We will continue to collect weekly phytoplankton samples but are switching to bi-weekly email updates for the remainder of the season, which means the next update will be emailed out on September 24th.
As always, reach out with any questions.

Thanks to all our monitors and partners for the phytoplankton samples!
Rosie Masui, and Jasmine Maurer

Kachemak Bay Research Reserve Phytoplankton Update
Qualitative Analysis Phytoplankton Data

## INNER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 9/5/2020 | Peterson | 13.3 | 29 | Sparse Sample | Present | None | None |
| 9/5/2020 | Bear Cove | 12 | - | Sparse Sample | Present | None | None |
| 9/7/2020 | Peterson Bay CACS | 13 | 32 | Sparse Sample | Present | None | None |
| 9/7/2020 | Halibut Cove | 13 | 26 | Sparse Sample | Present | None | None |
| 9/9/2020 | Homer Harbor | 11.8 | 27.9 | Sparse Sample | Present | None | None |

*Samples received after last weekly update

## OUTER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 9/3/2020* | Seldovia | 11.5 | 27.5 | Sparse Sample | None | None | None |
| 9/5/2020 | Sadie Cove | 12 | 30 | Sparse Sample | Present | None | None |
| 9/8/2020 | Jakolof | 12 | - | Mixed Diatoms | Present | Present | None |

*Samples received after last weekly update

Kachemak Bay National Estuarine Research Reserve
Alaska Center for Conservation Science
UNIVERSITY of ALASKA ANCHORAGE

**Kachemak Bay Research Reserve Phytoplankton Update**
**September 11th to September 24th, 2020**

Harmful Algal Bloom Program
Rosie Masui 907-235-1598 rmmasui@alaska.edu
Jasmine Maurer 907-235-4799 jrmaurer@alaska.edu

Hello Everyone,

Over the past two weeks phytoplankton in Kachemak Bay have been abundant at all the sites sampled. There are many different species of phytoplankton present without a single group dominating the samples. Some of the species have auxospores present, see image on the right, which are special cells used to restore cell size after many cell divisions leave cells smaller, they also are usually associated with sexual reproduction.

Above in the center of the image is a chain of phytoplankton called *Lauderia*. The two rounded cells are auxospores, which are present at key life stages for some species of phytoplankton.

The next KBNERR phytoplankton update will be sent out on October 8th. As always, reach out with any questions.

Thanks to all our monitors and partners for the phytoplankton samples!
Rosie Masui, and Jasmine Maurer

Kachemak Bay Research Reserve Phytoplankton Update
Qualitative Analysis Phytoplankton Data

## INNER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 9/13/2020 | Halibut Cove | 11 | 26 | Sparse Sample | Present | None | None |
| 9/21/2020 | Peterson Bay | 10 | 31 | Mixed Diatoms | Present | Present | None |

*Samples received after last weekly update

## OUTER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 9/16/2020 | Tutka Bay | 10.5 | 29.7 | Mixed Diatoms | Present | Present | None |
| 9/16/2020 | Kasitsna Bay | 11.5 | 29.9 | Mixed Diatoms | Present | Present | None |
| 9/16/2020 | Sadie Cove | 11.5 | 29.9 | Mixed Diatoms | None | Present | None |
| 9/16/2020 | Eldred | 11.5 | 29.9 | Mixed Diatoms | Present | Present | None |
| 9/20/2020 | Jakolof | 11 | - | Mixed Diatoms | Present | Present | None |

*Samples received after last weekly update

Kachemak Bay National Estuarine Research Reserve
Alaska Center for Conservation Science
University of Alaska Anchorage

**Kachemak Bay Research Reserve Phytoplankton Update**
**September 25th to October 8th, 2020**

Harmful Algal Bloom Program
Rosie Masui 907-235-1598 rmmasui@alaska.edu
Jasmine Maurer 907-235-4799 jrmaurer@alaska.edu

Hello Everyone,

During the past two weeks we have continued to see a variety of phytoplankton species present in Kachemak Bay. Although Seldovia and Homer Harbors have had few phytoplankton other sampling sites continue the trend from late September with abundant phytoplankton samples composed of a wide variety of species. We will continue to monitor phytoplankton in Kachemak Bay so long as weather conditions allow us to collect them safely.

Rosie and Jasmine will be participating in this year's virtual Rotary Health Fair's Facebook live event the first week of November, exact day and time to be determined. We will be sharing information on Harmful Algal Blooms (HABs) risks to human health, KBNERR's phytoplankton monitoring program, and answering questions on these topics to increase community awareness of HABs. We are excited for this opportunity to participate in the 2020 Rotary Health Fair.

The next KBNERR phytoplankton update will be sent out on October 22nd.
As always, reach out with any questions.

Thanks to all our monitors and partners for the phytoplankton samples!
Rosie Masui, and Jasmine Maurer

Kachemak Bay Research Reserve Phytoplankton Update
Qualitative Analysis Phytoplankton Data

## INNER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 9/24/2020 | Homer Harbor | 11.2 | 28 | Sparse Sample | None | Present | None |
| 9/29/2020 | Homer Harbor | 9.3 | 25.1 | *Skeletonema* sp. | None | Present | None |
| 10/1/2020 | Peterson Bay | 10.1 | 31 | *Thalassiosira* sp. | None | Present | None |

*Samples received after last weekly update

## OUTER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 9/10/2020* | Seldovia Harbor | 9.5 | 28 | Sparse Sample | Present | Present | None |
| 9/24/2020* | Kasitsna Bay | 10.9 | 30.4 | Mixed Diatoms | Present | Present | None |
| 9/24/2020* | Tutka Bay | 11.3 | 27.8 | *Chaetoceros* sp. and *Thalassiosira* sp. | Present | Present | None |
| 9/24/2020* | Sadie Cove | 11.3 | 30.1 | Mixed Diatoms | Present | Present | None |
| 9/24/2020* | Eldred | 11.1 | 29.6 | Mixed Diatoms | Present | Present | None |
| 9/25/2020 | Seldovia Harbor | 10.8 | 30 | Sparse Sample | Present | None | None |
| 10/2/2020 | Seldovia Harbor | 9.3 | 24 | Sparse Sample | None | Present | None |
| 10/6/2020 | Seldovia Harbor | 9.3 | 22.9 | Sparse Sample | None | Present | None |
| 10/6/2020 | Kasitsna Bay | 10.5 | 29.4 | Thalassiosira | Present | Present | None |
| 10/6/2020 | Tutka Bay | 7.8 | - | Sparse Sample | Present | Present | None |
| 10/6/2020 | Sadie Cove | 9.0 | 22.2 | Mixed Diatoms | Present | Present | None |
| 10/6/2020 | Eldred | 9.8 | 27.2 | Mixed Diatoms | Present | Present | None |

*Samples received after last weekly update

**Kachemak Bay Research Reserve Phytoplankton Update**
**October 9th to October 22nd, 2020**

Harmful Algal Bloom Program
Rosie Masui 907-235-1598 rmmasui@alaska.edu
Jasmine Maurer 907-235-4799 jrmaurer@alaska.edu

Hello Everyone,

Phytoplankton samples from the past two weeks have mostly been sparse. However, Peterson Bay, Bear Cove and Sadie's Cove had moderate abundances of a variety of species present this week. We have also received this summers phytoplankton samples from our partners in Prince William Sound and are analyzing those. Information from Prince William Sound samples will be included in our annual report, however, please reach out if you are interested in knowing more about these phytoplankton samples.

Rosie and Jasmine will be participating in this year's virtual Rotary Health Fair's Facebook live event on November 10th at 7pm. We will be sharing information on Harmful Algal Blooms (HABs) risks to human health, KBNERR's phytoplankton monitoring program, and answering questions on these topics to increase community awareness of HABs.

This is the last phytoplankton update of 2020. We will continue to collect weekly samples from Homer Harbor while there is open water to do so and analyze any samples from our partners that continue to collect them. Weekly updates will begin again in April of 2021. We will be composing our Annual Phytoplankton Report and sharing that with you all in December.
As always, reach out with any questions.

Thanks to all our monitors and partners for the phytoplankton samples!
Rosie Masui, and Jasmine Maurer

Kachemak Bay Research Reserve Phytoplankton Update
Qualitative Analysis Phytoplankton Data

## INNER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 10/20/2020 | Homer Harbor | 8.7 | 28.7 | Sparse Sample | None | Present | None |
| 10/20/2020 | Peterson Bay | 9.8 | 29.5 | Mixed Diatoms | Present | Present | None |
| 10/20/2020 | Halibut Cove | 9.6 | 29.4 | Sparse Sample | Present | Present | None |
| 10/20/2020 | Bear Cove | 8.7 | 28.2 | Mixed Diatoms | Present | Present | None |

*Samples received after last weekly update

## OUTER BAY

| DATE | Bay | Water Temp | Salinity | Dominant species | Dinophysis | Pseudo-nitzschia | Alexandrium |
|---|---|---|---|---|---|---|---|
| 9/26/2020* | Tutka Bay | 11.5 | 27.0 | Mixed Diatoms | Present | Present | None |
| 10/4/2020* | Tutka Bay | 10.2 | 26.5 | Sparse Sample | None | None | None |
| 10/8/2020* | Seldovia Harbor | 9.6 | 28 | Sparse Sample | None | Present | None |
| 10/16/2020 | Seldovia Harbor | 9.0 | 30 | Sparse Sample | None | None | None |
| 10/17/2020 | Sadie Cove | 9.5 | 27 | *Ditylum* & *Eucampia* | Present | Present | None |

*Samples received after last weekly update

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