Alutiiq Pride Marine Institute's

Water Sampler Workshop

Join us virtually on May 7th, 2025!

This workshop will give an overview of harmful algal blooms and ocean acidification and how they impact our marine resources. We will also review sampling protocols and best practices.

General Agenda

Sampling Overview

Phytoplankton

Ocean Acidification

Environmental DNA (how we can target one species of interest)

Community & sampler needs

How can we help support samplers

Discussion on community needs

Updated agenda to come!

To register reach out to

Allison Carl

acarl@crrcalaska.org

Biology Lab Manager

Chugach Regional Resources Commission — Alutiiq Pride

CHUGACH REGIONAL RESOURCES COMMISSION

Alutiiq Pride

Chugach Regional Ocean Monitoring (CROM) Program's

Water Sampler Workshop, Wednesday May 7th, 2025

Virtual Zoom Meeting 9:30 am – 4:00 pm

Zoom: https://us02web.zoom.us/j/81934972001

WELCOME:

9:30 am	Welcome & introductions
10:00 am	CRRC and APMI introduction & overview
10:15 am	APMI programs overview
10:45 am	CROM Program introduction
11:00 am	**Break**
11:15 am	Ocean acidification – why it is important & how it works
11:30 am	Harmful algal blooms – what they are & how we find them
11:45 pm	Next steps in environmental monitoring (eDNA)
12:00 pm	**Lunch Break**
1:00 pm	Ocean acidification: sample demo & laboratory tour
1:30 pm	Shellfish toxins: sample demo & laboratory tour
2:00 pm	eDNA sample demo & lab tour
2:30 pm	**Break**
2:45 pm	Ocean acidification trends in the Chugach Region
3:00 pm	Harmful algae near communities
3:15 pm	eDNA – what we have found so far
3:30 pm	Group discussion - sampler & community needs

Quyana!

P.O. Box 111686

Anchorage, Alaska 99511-1686

(907) 224-5181

www.crrcalaska.org

Follow up information

We know the sampling workshop is a long day with a lot of information. If you have questions on anything you learned during the workshop, please feel free to reach out to us!

Contacts:

Chemistry Lab:

Burke-O-Lator, ocean chemistry and nutrients

Sierra Lloyd, Chemistry Lab Manager

sierra@alutiiqprideak.org

Biology Lab:

Harmful algal blooms, paralytic shellfish toxin, and general lab questions

Allison Carl, Biology Laboratory Manager

acarl@crrcalaska.org

Jana Wheat, Biology Laboratory Technician

jana@alutiiqprideak.org

Molecular monitoring and eDNA

Dustin Carl, Tribal Wildlife Biologist

dustin@crrcalaska.org

To see staff in all CRRC departments, please visit our website at

https://crrcalaska.org/our-team/

You can also send a message to our general email to get in contact with other CRRC staff and programs

admin@crrcalaska.org

Allison Carl is inviting you to a scheduled Zoom meeting.

Topic: My Meeting
Time: May 7, 2025 09:30 AM Alaska
Join Zoom Meeting
https://us02web.zoom.us/j/81934972001

Meeting ID: 819 3497 2001

One tap mobile
+12532158782,,81934972001# US (Tacoma)
+13462487799,,81934972001# US (Houston)

Dial by your location
• +1 253 215 8782 US (Tacoma)
• +1 346 248 7799 US (Houston)
• +1 669 444 9171 US
• +1 669 900 9128 US (San Jose)
• +1 719 359 4580 US
• +1 253 205 0468 US
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• +1 646 931 3860 US
• +1 689 278 1000 US
• +1 301 715 8592 US (Washington DC)
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• +1 360 209 5623 US
• +1 386 347 5053 US
• +1 507 473 4847 US
• +1 564 217 2000 US

Meeting ID: 819 3497 2001

Find your local number: https://us02web.zoom.us/u/kcYxceFI4t

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Chugach Regional Resources Commission
Alutiiq Pride Marine Institute
Annual Water Sampler Work Shop
Sign in Sheet

Name		Affiliation
1.	Naomi McMullen	Port Graham – IGAP/Sampler
2.	Tyson Breedlove	Port Graham
3.	Severan Demas	Nanwalek - Sampler
4.	Alana Shaw	Kenaitze Indian Tribe
5.	Andrew Sheriff	Malahat
6.	Beks Rumley	CRRC
7.	Carol Hatch	Qutekcak (sampler)
8.	Celeste	KANA
9.	Kasey Jo Wright	KANA
10.	Isaiah	KANA
11.	Charla Hughes	PWSSF
12.	Chris Beaudet	CRRC/APMI
13.	Nick Jordan	CRRC/APMI
14.	Dustin Carl	CRRC
15.	Jana Wheat	CRRC/APMI
16.	Katrina Hecks	Seldovia Village Tribe
17.	Madeline Lee	CRRC
18.	Robin McKnight	CRRC
19	Sean Den Adel	CRRC/APMI
20	Sierra Lloyd	CRRC/APMI
21	Veronica Paudula	Aleut Community of St. Paul
22.	Dallas	Aluet Community of St. Paul
23.	Briana Murphey	CRRC/APMI
24.	Annette Jarosz	CRRC/APMI
25.	Allison Carl	CRRC/APMI
26.	Maddy Lee	CRRC

Chugach Regional Resources Commission

&

The Alutiiq Pride Marine Institute

CHUGACH
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RESOURCES
COMMISSION








CHUGACH REGIONAL RESOURCES COMMISSION

Alutiiq Pride

The CRRC is founded as a community-based, Alaska Native, natural resource management organization.

Community resiliency and self-determination are central threads interwoven throughout all our activities.

Executive Director
Willow Hetrick-Price

MISSION

To protect, rebuild, and conserve the Chugach environment and natural resources while promoting Tribal sovereignty and the protection of a subsistence lifestyle. We strive to assure bio-cultural restoration and conservation, sound economic development, and stewardship of the natural resources in the traditional use areas of the Chugach region while bringing Tribal voices to the forefront of natural resource management processes.

VISION

We envision a resilient future for the Sugpiaq (Alutiiq) and dAXunhyuu (Eyak) peoples, where the Chugach region leads in Tribal sovereignty, bio-cultural stewardship, and regenerative economic development. The future we envision is one in which:

- Chugach communities **THRIVE** through the integration of traditional ecological knowledge and contemporary science.
- Chugach communities **REACH** food security and sovereignty.
- Chugach communities **ADAPT** to impacts of climate change, build resiliency, and capitalize on opportunities.
- Chugach lands and waters remain **VIBRANT**, ensuring the survival and prosperity of the people for generations to come.

ALASKA

VALDEZ

TATITLEK
(TAATIILAAQ)

CORDOVA/EYAK
(IIYAAGDAAD)

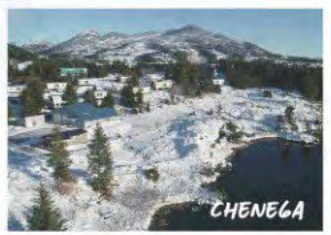
SEWARD
(QUTALLEQ)

CHENEGA
(CANIQAQ)

PORT GRAHAM
(PALUWIK)

NANWALEK

GULF OF ALASKA



CRRC History

CRRC was created by the Tribes to provide Chugach communities a more active role in the management decision-making process of natural resources.

1984

1994

Qutekcak Native Tribe established The Qutekcak Tribal Shellfish Hatchery in Seward, now known as the Alutiiq Pride Marine Institute (APMI).

CRRC took over hatchery operations full time.

2004

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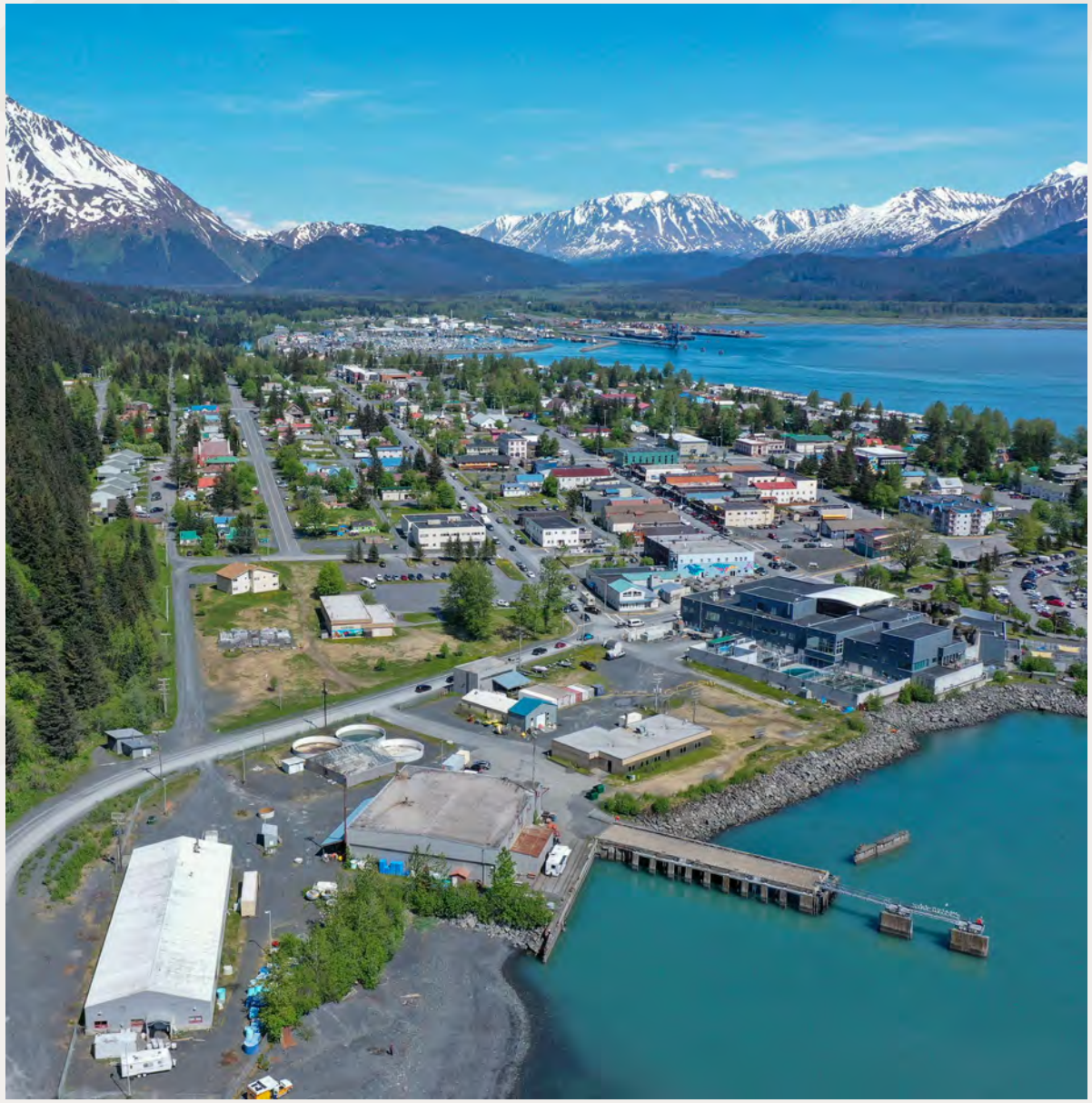
Alutiiq Pride Marine Institute



ALUTIIQ
PRIDE
MARINE
INSTITUTE

MARICULTURE:

The focus is developing projects that enhance economic and subsistence opportunities for local communities, Tribal or otherwise, and diversifying mariculture development opportunities in the Chugach. The Alutiiq Pride Marine Institute is tasked with raising subsistence and commercial species while using the facility to expand research and development to several new species for potential mainstream mariculture applications.


BASKET COCKLE


BIDARKI


BLUE KING CRAB


BULL KELP


BUTTER CLAM


CALIFORNIA SEA CUCUMBER


GEODUCK CLAMS


HALIBUT


HERRING


LITTLENECK CLAM


PACIFIC OYSTER


PACIFIC RAZOR CLAM


PINK SALMON


PINTO ABALONE

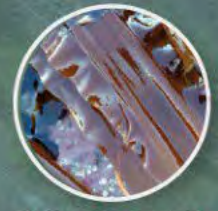

PURPLE HINGE ROCK SCALLOP


RED KING CRAB


RIBBON KELP


SOFT-SHELL CLAMS


SUGAR KELP


THREE-RIBBED KELP

APMI Departments

Jeff Hetrick
Jeff@crrcalaska.org

General CRRC Info
admin@crrcalaska.org

Crrcalaska.org
www.alutiiqprideak.org

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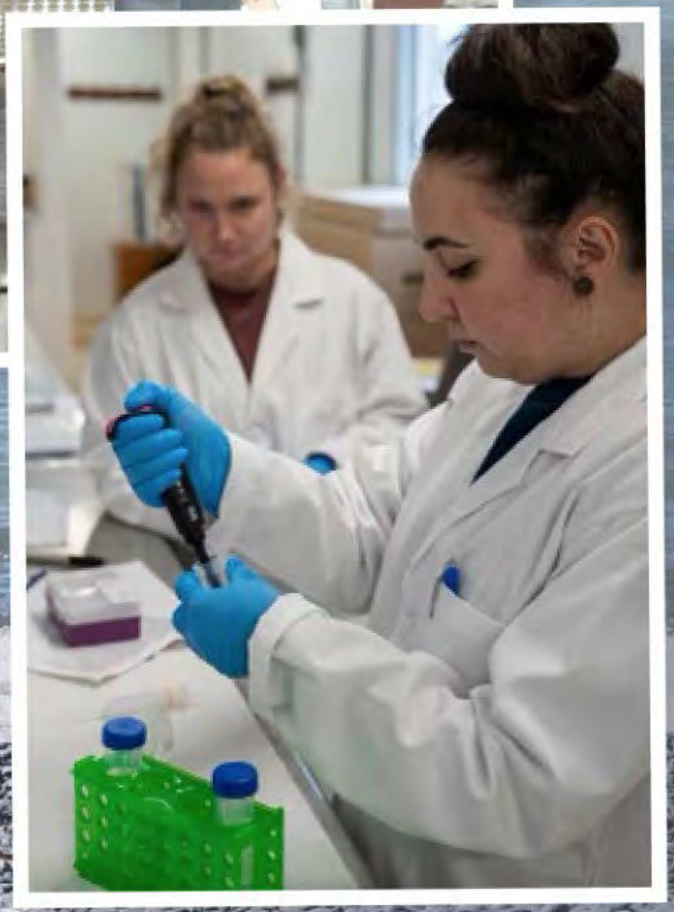
Chugach Regional Ocean Monitoring (CROM) Program

Allison Carl & Sierra Lloyd
Laboratory Mangers
Alutiiq Pride Marine Institute



CHUGACH REGIONAL OCEAN MONITORING PROGRAM

The focus is to fill in gaps in understanding of nearshore ocean health in Chugach communities through examining ocean chemistry, harmful algae, and shellfish biotoxin levels. The program relies on citizen science from our partners in Tribal communities throughout the region. With regional Tribal capacity, CRRC can further support safe and sustainable harvest opportunities for both local communities and the shellfish industry in Southcentral Alaska.

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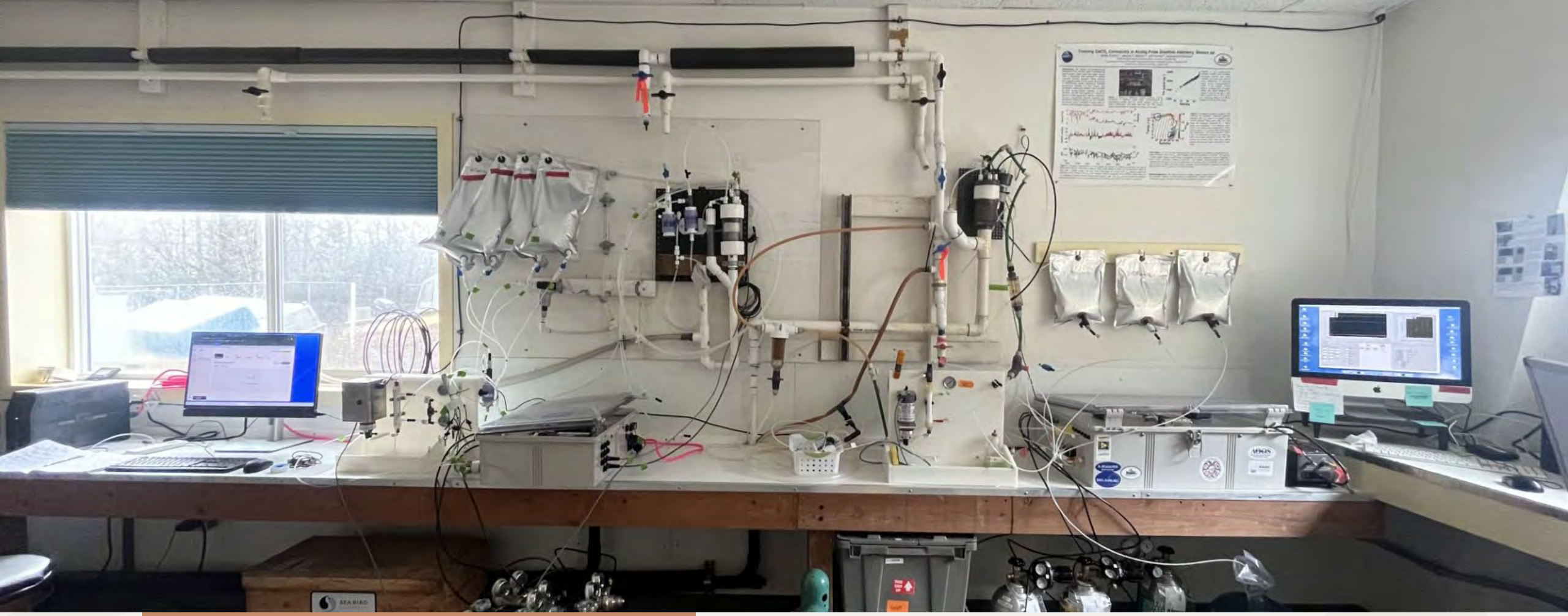
Alutiiq Pride

CROM Program

What are we monitoring for?

- ❑ Coastal ocean chemistry and ocean acidification (OA) signatures
- ❑ Presence of algae with the potential to form harmful algal blooms (HABs)
- ❑ Presence of biotoxins associated with those HABs (e.g. paralytic shellfish poison (PSP))
- ❑ General environmental conditions and how they related to HAB presence



CROM Chemistry Lab

CHUGACH REGIONAL RESOURCES COMMISSION

Alutiiq Pride

CROM Biology Lab

Alutiiq Pride MARINE INSTITUTE

CHUGACH REGIONAL OCEAN MONITORING
COMMUNITY SAMPLING

One Community Member at Each of the Seven Villages Works with APMI as a Field Sampler. Samples are Collected on a Weekly Basis.

CHENEGA • CORDOVA • NANWALEK • PORT GRAHAM • SEWARD • TATITLEK • VALDEZ

ANALYSES CONDUCTED BY APMI

The focus is to fill in gaps in understanding of nearshore ocean health in Chugach communities through examining ocean chemistry, harmful algae, and shellfish biotoxin levels. The program relies on citizen science from our partners in Tribal communities throughout the region. With regional Tribal capacity, CRRC can further support safe and sustainable harvest opportunities for both local communities and the shellfish industry in Southcentral Alaska.

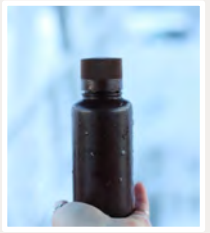
Regional CROM samplers

Tasks:

- ❑ Attend trainings & meetings
- ❑ Take weekly water samples and phytoplankton tows
- ❑ Record environmental data

Samplers work to Support:

- ❑ Long-term environmental monitoring
- ❑ Documenting coastal environmental conditions
- ❑ Informed subsistence harvests



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Information Sharing

With Tribes:

- ❑ Monthly sampler meetings and trainings
- ❑ Facebook updates
- ❑ Quarterly (or as needed) digital newsletters
- ❑ Community visit

With the public:

- ❑ Facebook updates
- ❑ Presentations
- ❑ Website

With the scientific community:

- ❑ Conferences
- ❑ Presentations
- ❑ Posters
- ❑ Publications

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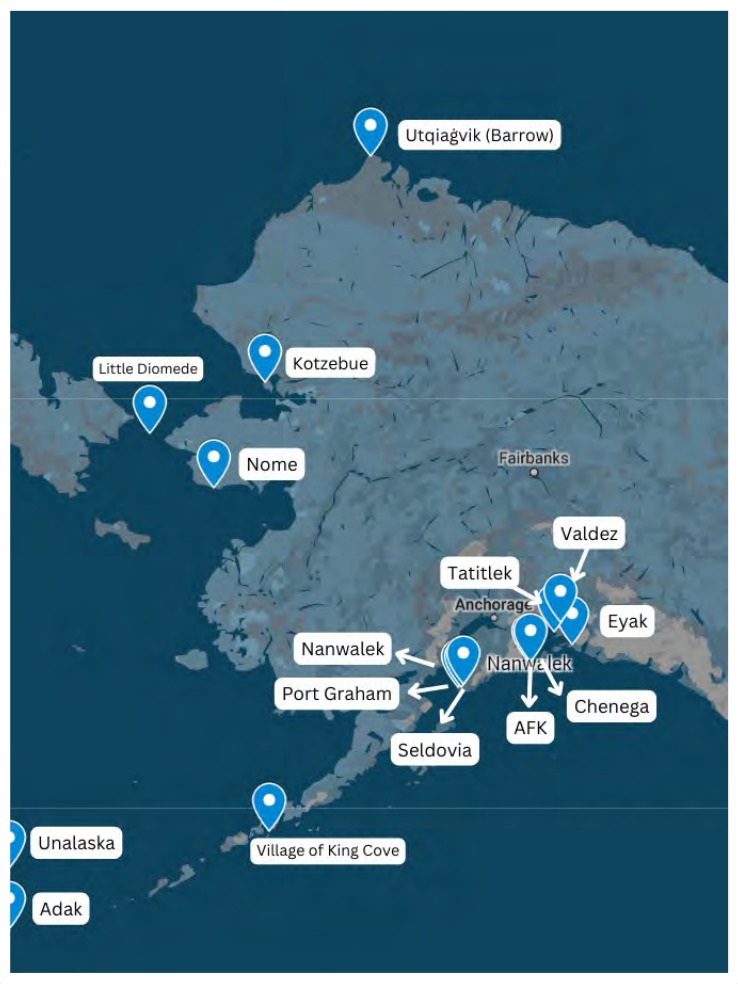
Building Partnerships



Expansion to monitoring Utqiagvik, Kotzebue, Nome, Unalaska, Kodiak, and some research cruises.

Longest running ocean chemistry sampling program in Alaska!

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Objectives

- ❑ Foster Tribally-led research
- ❑ Support informed shellfish harvests for all stakeholders (Tribal, mariculture, and recreational users)
- ❑ Document coastal marine conditions in the Chugach Region
- ❑ Connect with Tribal members
- ❑ Develop tool for HAB and OA predictions

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Outcomes

Long-term data, mitigate potential toxin exposure, food safety and security




Ocean Acidification: What Is It and How Do We Measure It?

Sierra Lloyd
Chemistry Laboratory Manager

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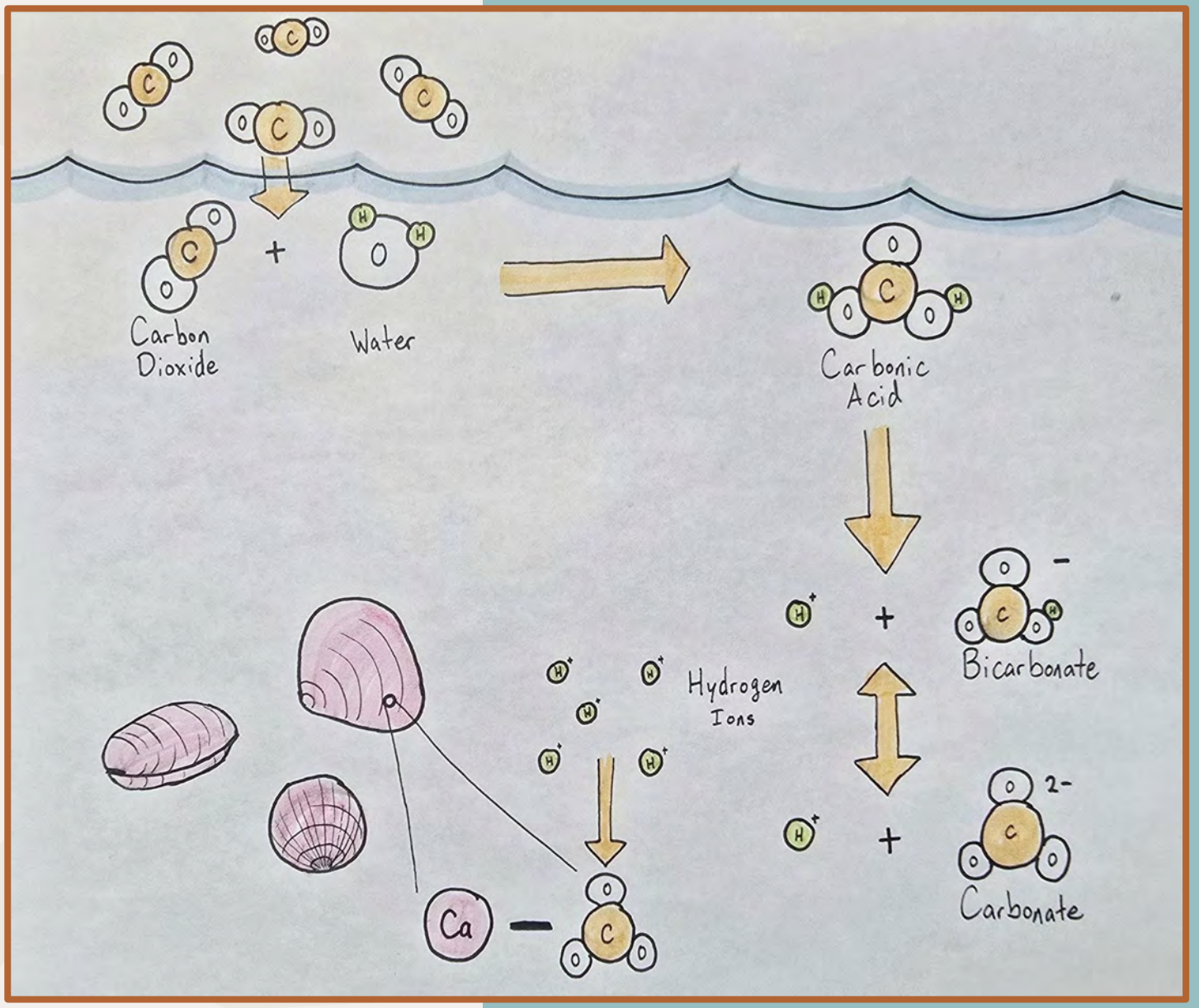
What is Ocean Acidification (OA)?

- CO_2 reacts with water
- Decrease in pH (aka increase in H^+)
- Seawater becomes corrosive
- Threats to marine life
  - Aragonite = the form of calcium carbonate that shellfish create



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How Does OA Affect Subsistence?

Fish	Shellfish	Other animals
• Halibut • Pollock • Salmon • Herring	• Clams • Crab • Limpets • Snails	• Sea otters • Seabirds

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How do we monitor OA?

Continuous Monitoring in Resurrection Bay

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How do we monitor OA?

Community Samplers

CROM Program

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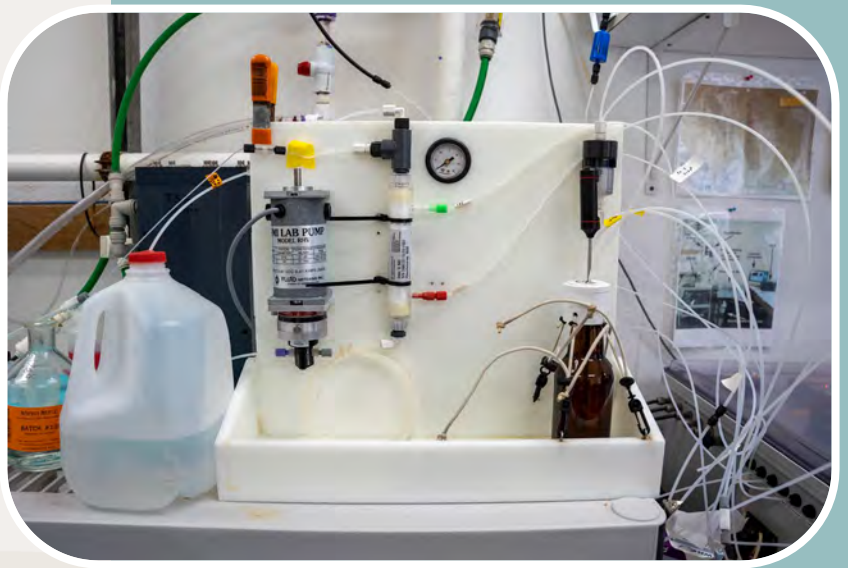
How do we monitor OA?

Community Samplers

Burke-o-Lator

- pCO_2
- TCO_2



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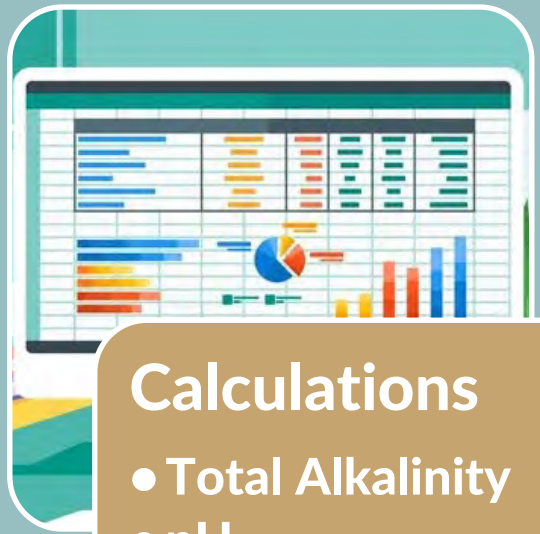
How do we monitor OA?

Community Samplers

Burke-o-Lator

- pCO_2
- TCO_2



Calculations

- Total Alkalinity
- pH
- Ω Aragonite

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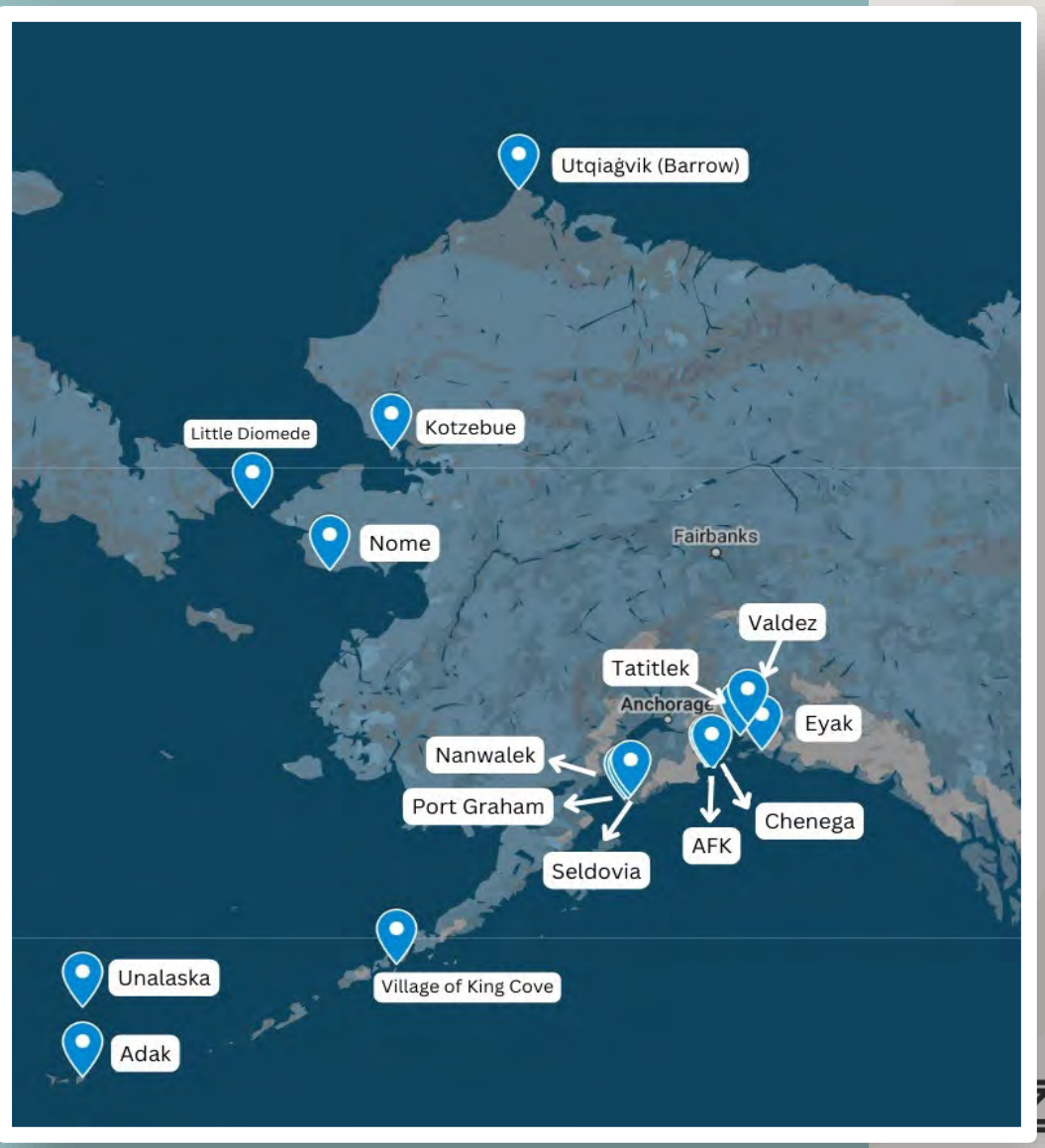
Where Are We Sampling?



Chugach Region Communities

- ❑ Nanwalek
- ❑ Port Graham
- ❑ Chenega
- ❑ Tatitlek
- ❑ Eyak
- ❑ Qutekcak
- ❑ Valdez

Plus partner communities!

Chenega (Caniqaq) - Cordova (IiyaaGdaad) - Nanwalek - Port Graham (Paluwik) - Seward (Qutalleq) - Tatitlek (Taatiilaaq) - Valdez

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CROM: Harmful Algal Blooms
What they are and how we find them

Allison Carl
Biology Lab Manager

Harmful Algae

We focus on algae that produce toxins

We record other species that are present

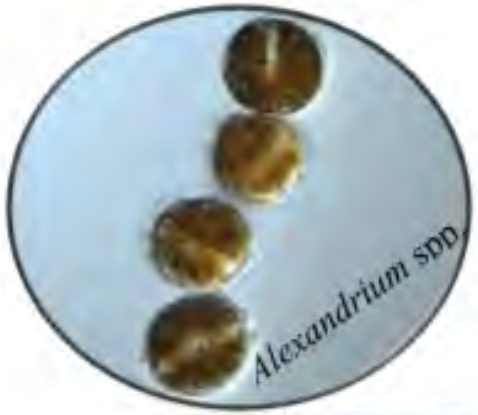
Toxic

- Biotoxins (PSP)
- Food chain

Non-toxic

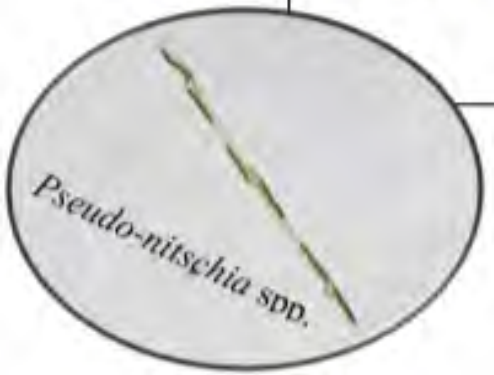
- Use up nutrients
- Block sunlight
- Clog gills/kills marine plants

What are we looking for?

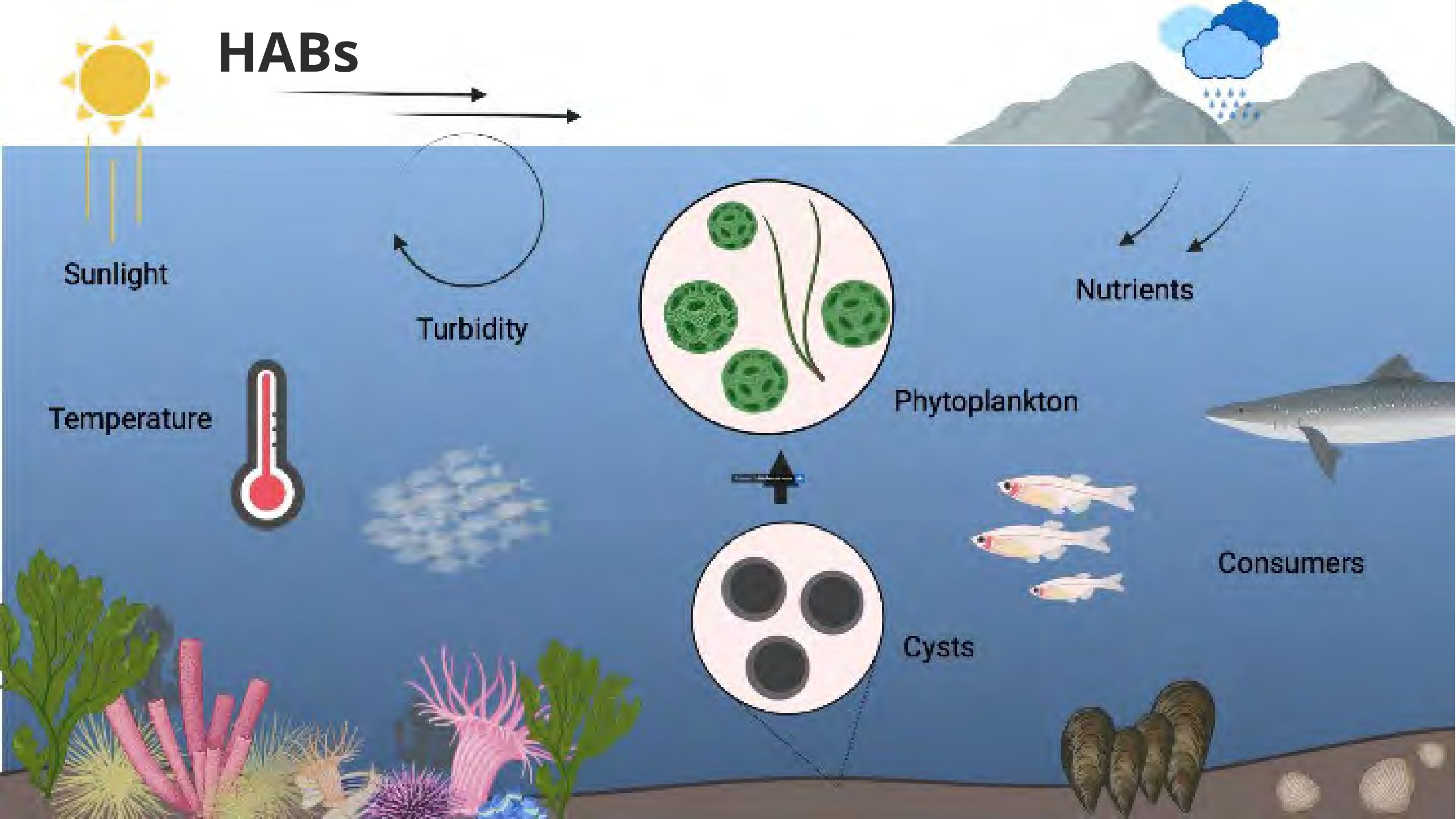


What algae species are we looking for?

Species	Toxin compound	Symptom	Human health effect
Alexandrium spp.	Saxitoxin	Respiratory paralysis	Paralytic shellfish poisoning (PSP)
Dinophysis spp.	Okadaic acid	Gastrointestinal distress	Diarrhetic shellfish poisoning (DSP)
Pseudo-nitzschia spp.	Domoic acid	Gastrointestinal and central nervous system effects	amnesic shellfish poisoning (ASP)



HABs


Sunlight
Turbidity
Nutrients
Temperature
Phytoplankton
Consumers
Cysts

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Federal Regulatory Limits

CRRC does not regulate shellfish harvest – We only inform of the limits and what we find

Saxitoxin

Algae: *Alexandrium* Species

Paralytic Shellfish Toxin/Poison (PST/PSP)

Federal limit: 80ug/100g

Domoic Acid

Algae: *Psuedo-nitzchia* species

Amnesic Shellfish Poison (ASP)

Federal Limit: 20 ppm

The allowable amount determined by the federal government

All commercial shellfish are required to be tested

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CROM Biology Lab

Identify Algae

Microscopy for phytoplankton identification

qPCR detection of *Alexandrium* spp. (eDNA)

Identify toxin levels

RBA for total Saxitoxin concentration

ELISA for domoic acid concentration

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Long-term Toxin Monitoring

To inform subsistence use of marine resources

Monitor for Harmful Algal Blooms (HABs) - neurotoxins they can produce

Microscopes to look for HABs

Run tests on blue mussels for Toxins (can test subsistence species!)

Next Steps

Environmental DNA

- **Small pieces of DNA found in the environment**
- **Allows us to accurately identify different animals and algae**

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Next Steps:

Molecular Monitoring

Dustin Carl
Tribal Wildlife Biologist

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What is eDNA?

- ❑All living things are made up of DNA
- ❑Shedding, bleeding, eating etc.
- ❑Tiny pieces of DNA left in the environment

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Environmental DNA

Next steps in monitoring..

- ❑Small pieces of DNA found in the environment
- ❑Identify one – two species of interest
  - ➢ Or look for many species at once
- ❑Effective monitoring method for species Identification
- ❑Buildout of molecular lab

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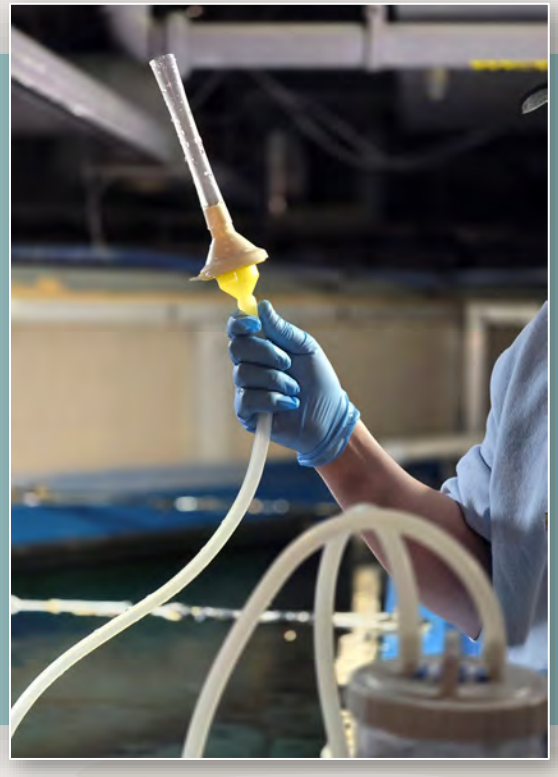
Environmental DNA

Procedure: Sample Collection



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eDNA Projects at APMI

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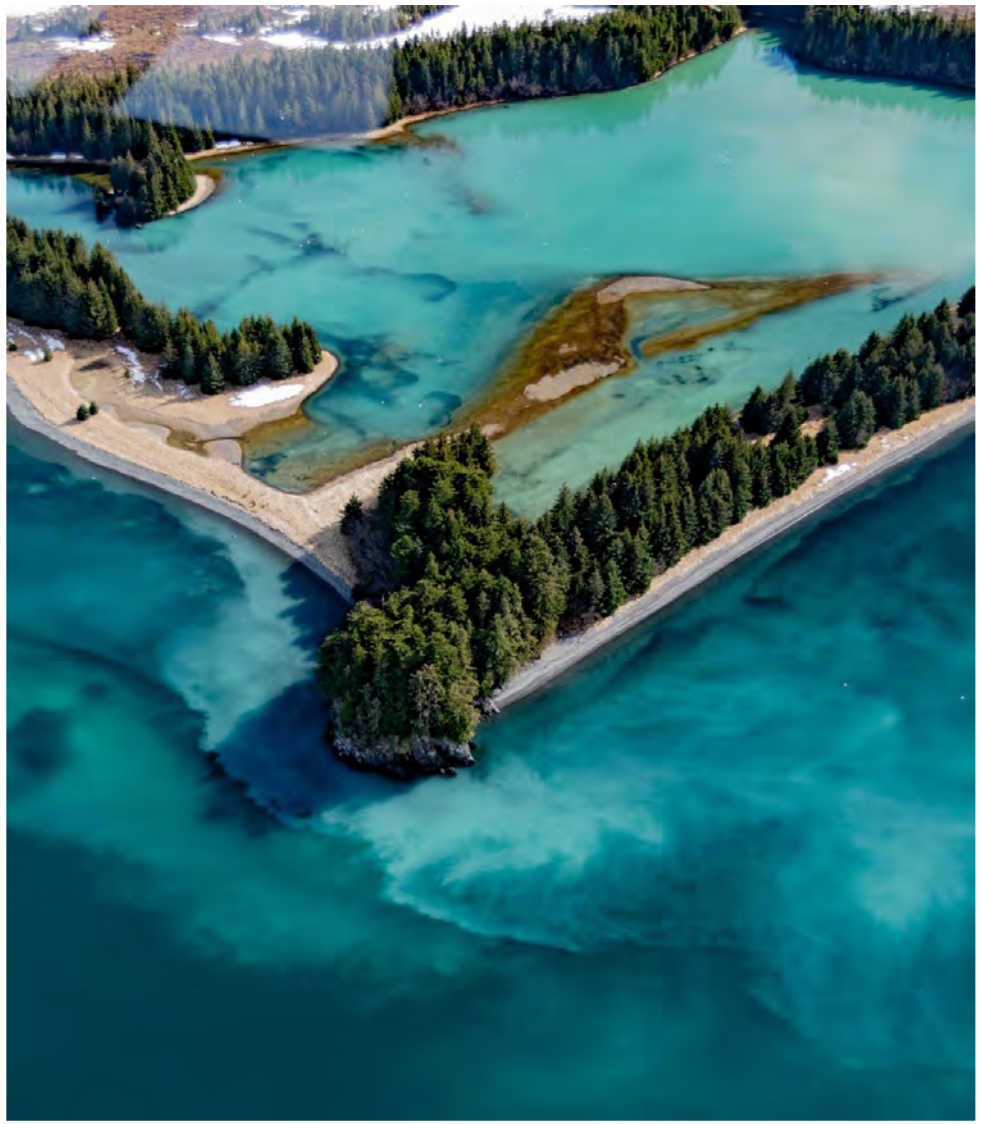

Pacific Herring

The Prince William Sound

- Once a robust commercial and subsistence fishery
- Commercial Fishery closed in 1994
- Biomass decreased from 65,000 tons to 10,000 tons

HERRING SPAWN OBSERVED DURING ADF&G AERIAL SURVEY AT CEDAR BAY. PHOTO TAKEN BY BIOLOGIST SHANE SHEPHERD.

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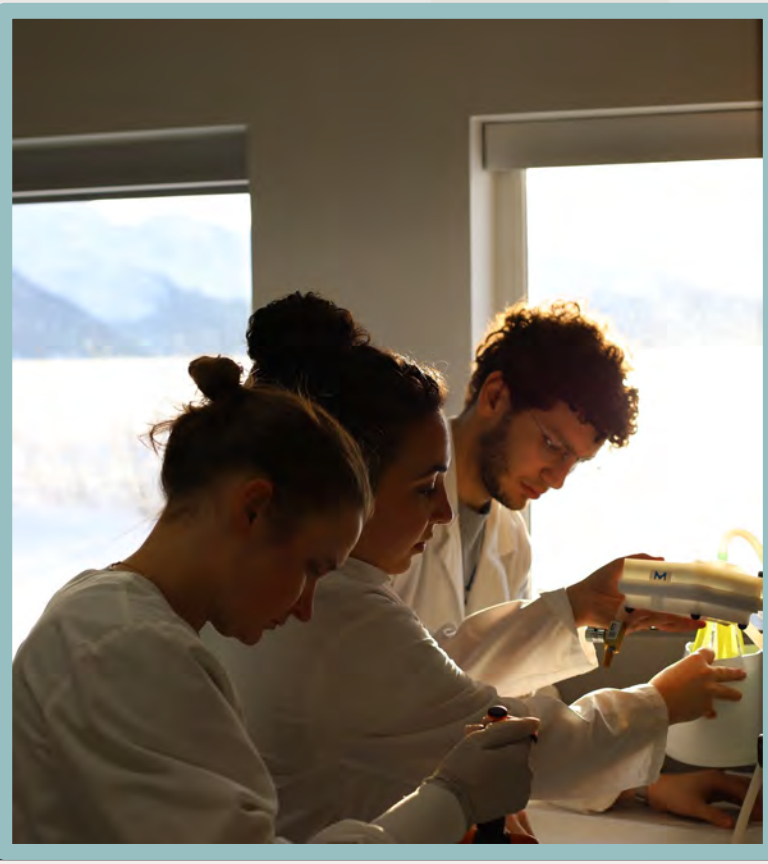
CRRC eDNA Project

Transferring Environmental DNA methods to the Alutiiq Pride Marine Institute (APMI) Laboratory to support the Chugach Regional Ocean Monitoring Program (CROM) with determining the spatial distribution of Pacific Herring (*Clupea pallasi*)

Funded by ANA

Process and analyze eDNA samples

Sample collection started in 2024



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Questions?

Chenega (Caniqaq) - Cordova (IiyaaGdaad) - Nanwalek - Port Graham (Paluwik) - Seward (Qutalleq) - Tatitlek (Taatiilaaq) - Valdez

Ocean Acidification Sampling Methods and Lab Tour

Sierra Lloyd
Chemistry Laboratory Manager

Alutiiq Pride

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What do we measure?

- TCO_2
- Total Alkalinity
- pCO_2
- Omega Aragonite
- pH

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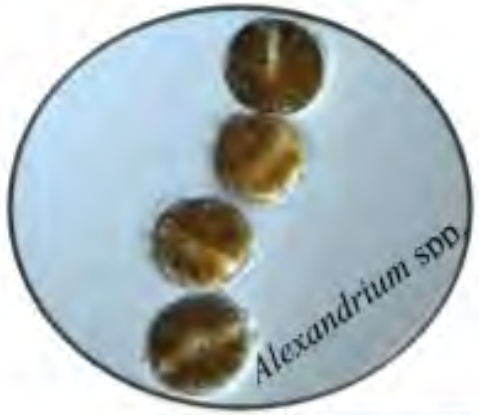
Harmful Algae Bloom: field methods and lab tour

Allison Carl
Biology Lab Manager
&
Jana Wheat
Laboratory Technician

What are we looking for?



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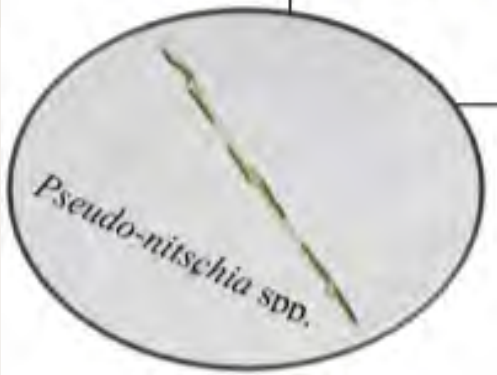

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What we collect

Phytoplankton tow → Blue mussel sample → Environmental data

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Sampling supplies

- ❑ Phytoplankton net and rope
- ❑ Catch bottle
- ❑ Sample bottles
- ❑ Lugol's Iodine

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Sampling supplies

- ❑ Mussel holding net
- ❑ Ziplocks
- ❑ Rope

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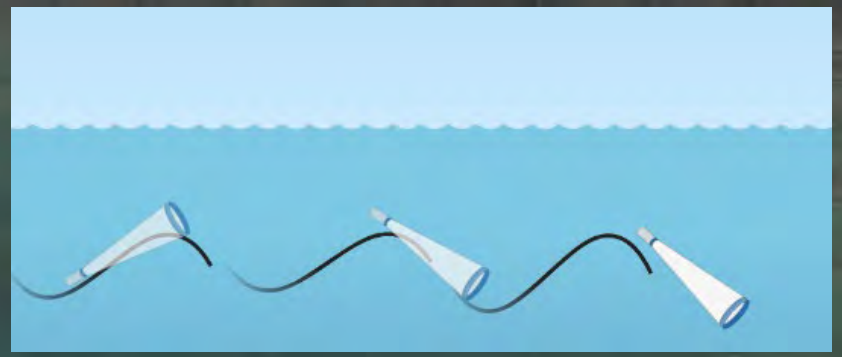
Sampling supplies

- ❑ Data Sheet!
- ❑ Thermometer
- ❑ Refractometer
- ❑ Zip ties for return shipping

Phytoplankton tow – 3 minutes



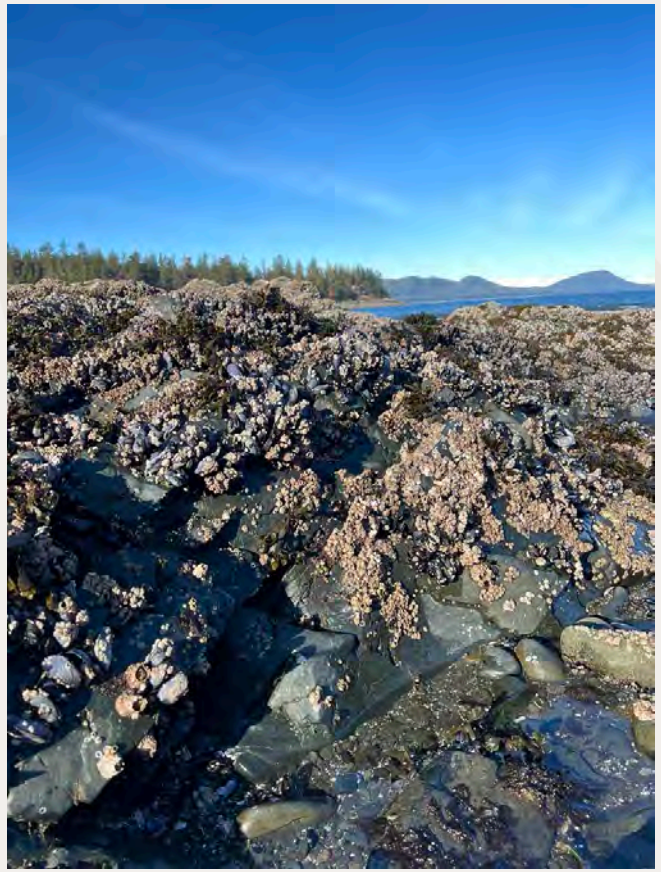
Add Lugol's iodine

- clear add 3-5 drops
- green/brown add 10-12 drops

Blue mussel sampling methods

Tasks:

- ❑ Collect mussels (150 – 200)
- ❑ Hang mussels in holding net at sampling location
- ❑ If these are the only samples being taken also include water temperature and salinity
- ❑ Place the Ziploc bag in a freezer and coordinate with CRRC staff.

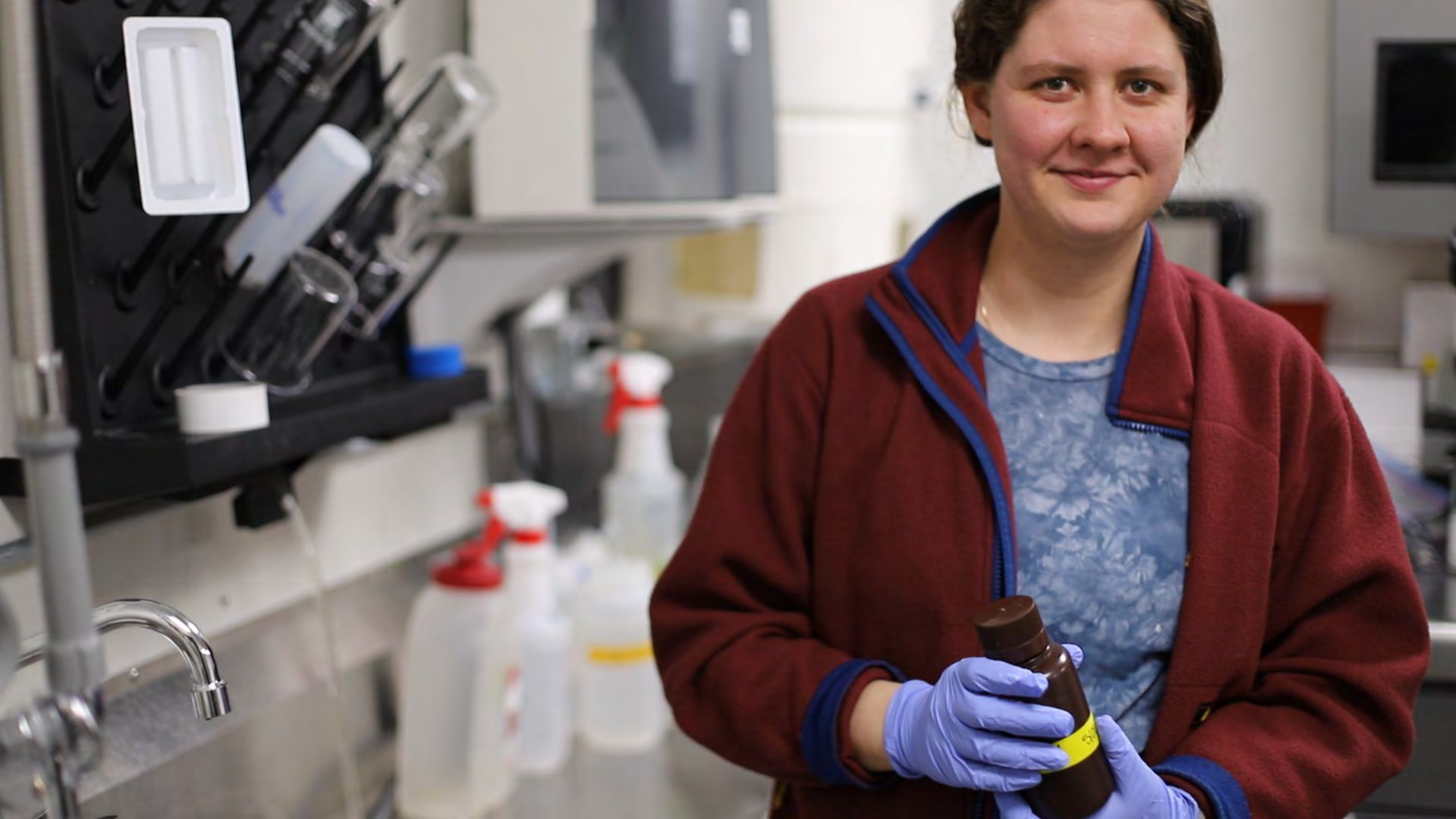


Collect 10 - 20 mussels

Environmental Data

	Latitude Longitude Location	SAMPLERS LOG					PROPERTY OF ALUTIIQ PRIDE MARINE INSTITUE (907)224-5181 101 RAILWAY AVE SEWARD AK				
Glass Bottle #	Location	Date	Sample Time (24 HR)	% Cloud	Wind Direction	Wind Speed	Tide (low/ incoming/ high/outgoing)	Precipitation	Water Temp (C)	Air Temp (C)	Salinity	Sampler Name
	Seward	5/15/2024	18:00	0	N	5	Incoming	0	9.3	21	22	CM
	Seward	5/22/2024	10:23	100	W	3	Incoming	0	7	7	27	CM/JC/JK
	Seward	5/29/2024	10:33	100	SE	2	Outgoing	0	5.1	7.9	26	JC
	Seward	6/5/2024	10:43	100	SE	4	Incoming	Rain	6	9	24	CM/JC
	Seward	6/12/2024	10:04	10	N	2	Outgoing	0	6	12.5	22	CM/JC
	Seward	6/21/2024	13:34	0				0	10.6	18.7	15	AC/JC
	Seward	6/26/2024	10:56	100	N	3	Low	0	7.3	11	14	JC/CM
	Seward	7/2/2024	12:15	10	N	4	Outgoing	0	12.6	11.6	12	JC/CM
	Seward	7/10/2024	12:07	70			Low	0	11.7	8	17	JC/CM
	Seward	7/17/2024	10:20	40	S	3	Incoming	0	11.3	9	15	JC
	Seward	7/25/2024	12:47	100	N	4	Incoming	0	12	12.8		JC/CM
	Seward	8/1/2024	13:32	50	N	4	Outgoing	25	13.3	15.2	23	JC/CM/JK
	Seward	8/8/2024	11:40	100	NW	4	Outgoing	20	8.1	11.3	8	JK
	Seward	8/15/2024	12:05	95	S	7	Incoming	20	10.8	11.7	24	JK
	Seward	8/20/2024	12:25	0	SSE	11	Incoming	0	11.8	18.4	25	JK
	Seward	8/29/2024	11:35	20	WNW	9	High	15	10.2	12.5	23	JK
	Seward	9/5/2024	11:00	100	NW	8	Incoming	100	10.6	10.1	24	jk
	Seward	9/12/2024	9:30	100	n	7	High	0	9.9	10.3	21	AJ/M
	Seward	9/26/2024	10:30	75	S	2	High	0	9.9	7.3	27	jk
	Seward	10/10/2024	12:08	70	SW	2	low	None	6.7	6.5	26	mb
1	Seward	11/20/2024	9:56	0	N	22	Incoming	None	3.5	6.6	20	Alli/Carol H/Lilly

How we can relate lab results to what is happening in the water



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Lab Analysis – HABs & Toxins

Phytoplankton samples

Blue mussel samples

Chenega (Caniqaq) - Cordova (IiyaaGdaad) - Nanwalek - Port Graham (Paluwik) - Seward (Qutalleq) - Tatitlek (Taatiilaaq) - Valdez

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eDNA field methods and lab tour

Dustin Carl
Tribal Wildlife Biologist

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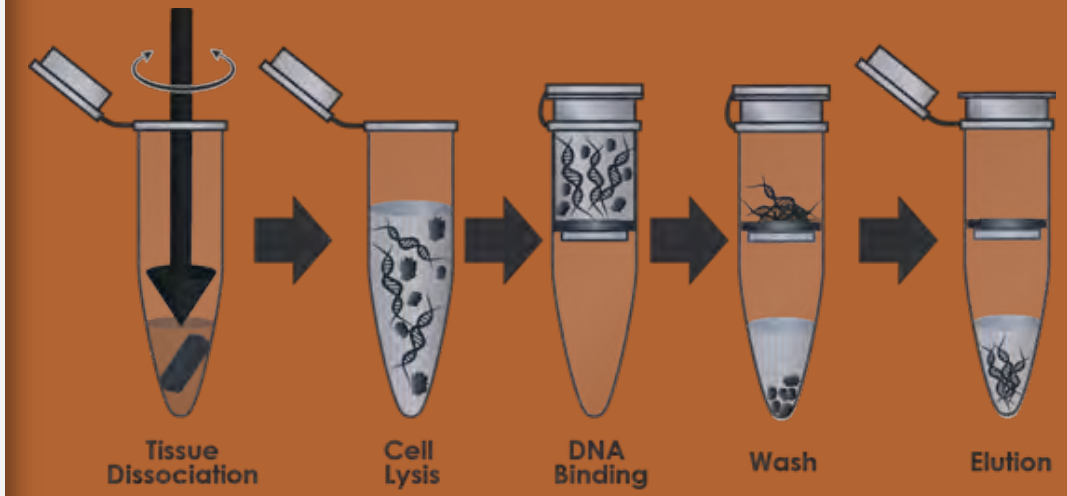
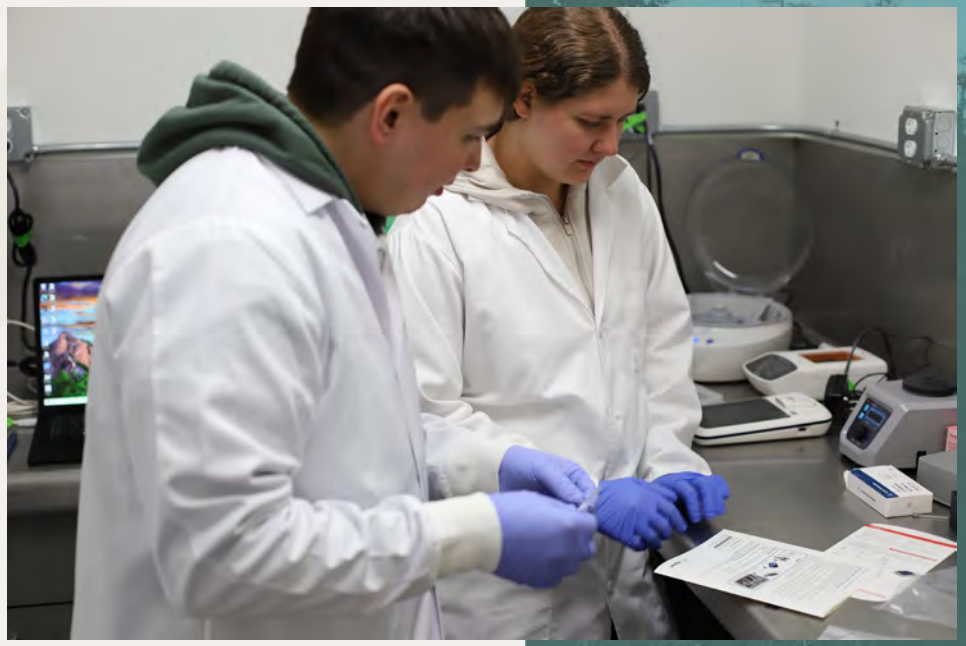
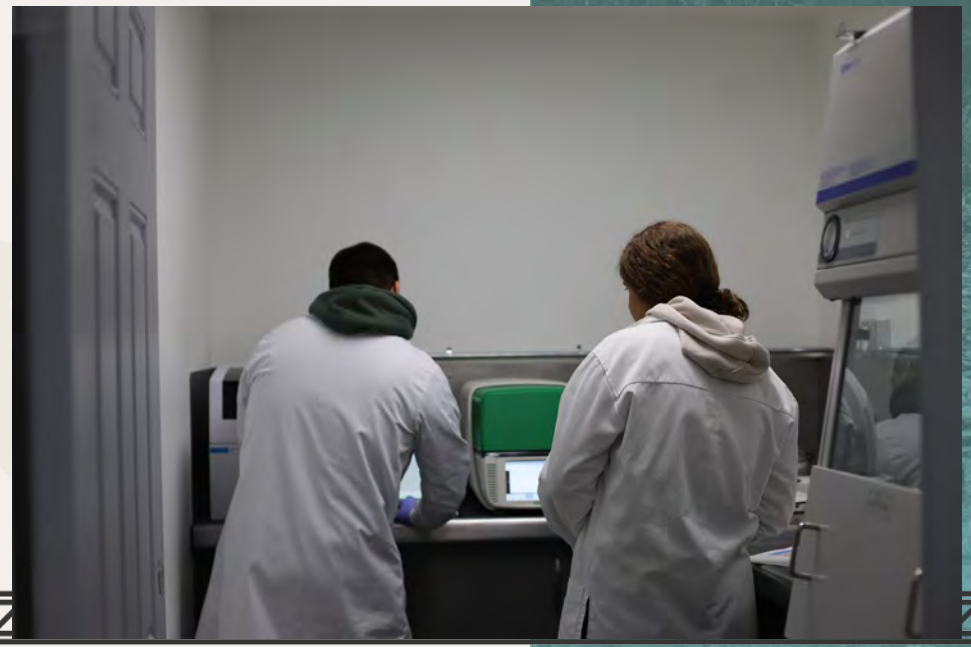
How we extract DNA

Extract DNA







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Questions?

Ocean Acidification Trends in the Chugach Region

Sierra Lloyd
Chemistry Laboratory Manager

Alutiiq Pride

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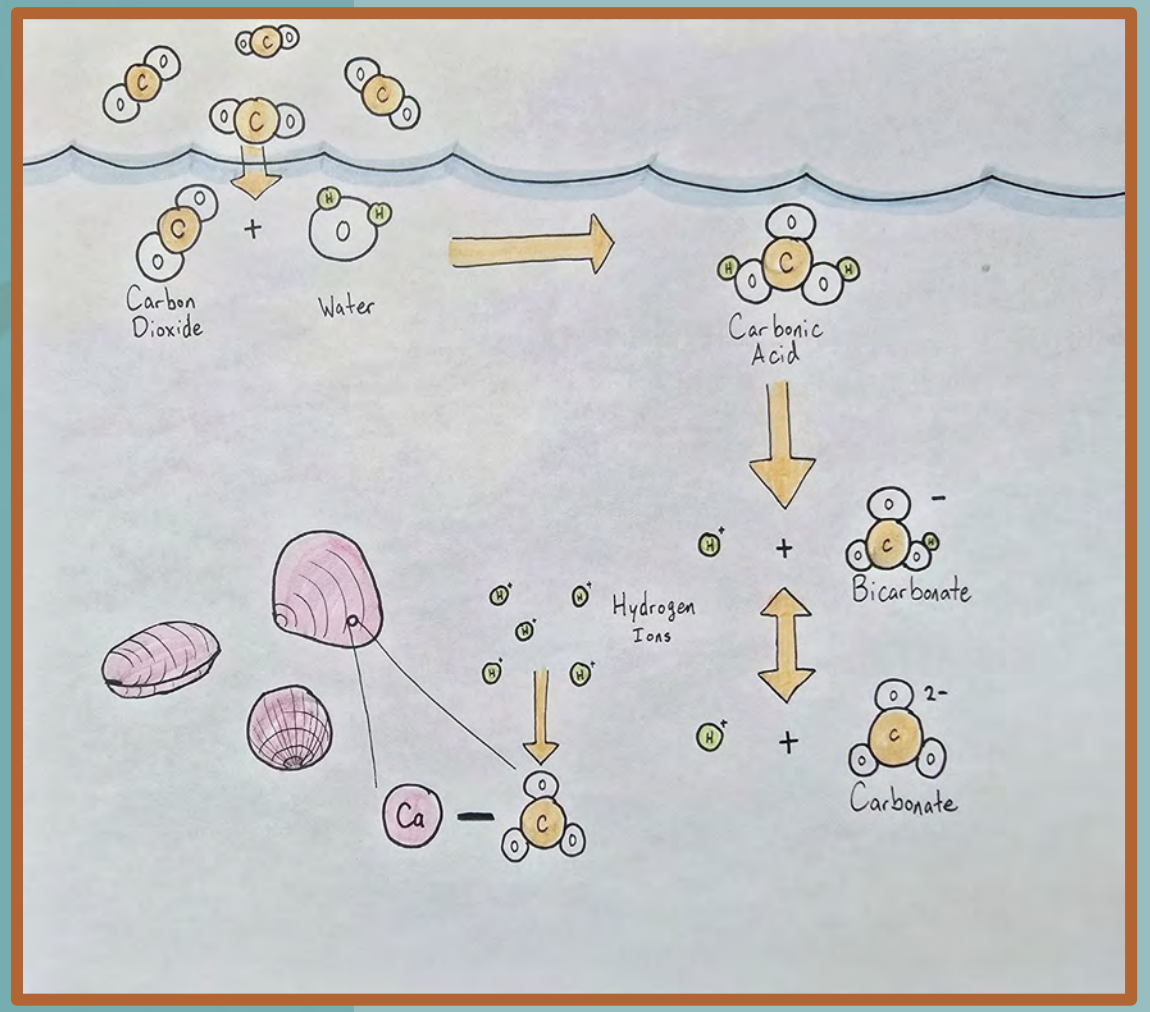
OA Review

- Carbon dioxide reacts with seawater to reduce carbonate concentrations in seawater
- Decreased carbonate in water means that seawater will “steal” carbonate from shells

So, what do we measure to determine the health of our waters?



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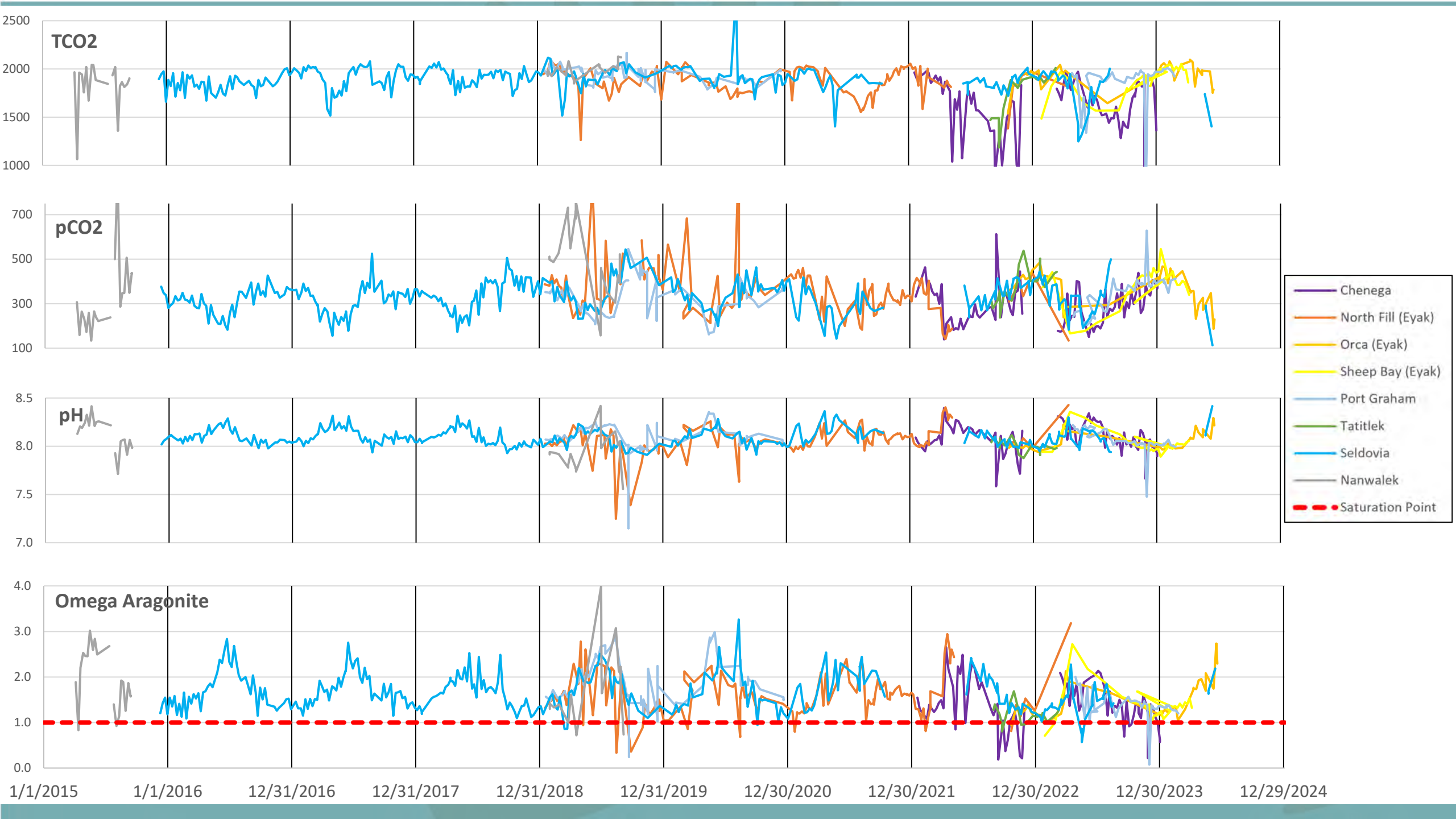
Previously…

- TCO_2
- Total Alkalinity
- pCO_2
- Omega Aragonite
- pH

Important to build baseline knowledge so that we can prepare for future conditions


TCO2
2500
2000
1500
1000
pCO2
700
500
300
100
pH
8.5
8.0
7.5
7.0
Omega Aragonite
4.0
3.0
2.0
1.0
0.0
1/1/2015
1/1/2016
12/31/2016
12/31/2017
12/31/2018
12/31/2019
12/30/2020
12/30/2021
12/30/2022
12/30/2023
12/29/2024
Chenega
North Fill (Eyak)
Orca (Eyak)
Sheep Bay (Eyak)
Port Graham
Tatitlek
Seldovia
Nanwalek
Saturation Point

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What does this mean for our subsistence species?

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Species Responses to OA

* denotes species with very few studies

Shellfish

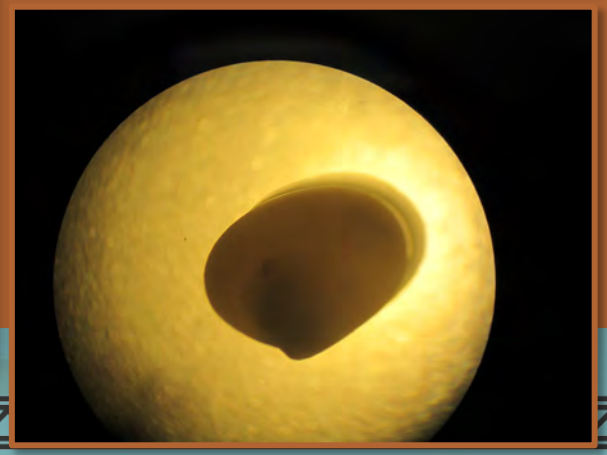
Geoducks*
Razor clams*
Cockles*
Butter clams*
Oysters
Dungeness Crab*
Sea urchins
Limpit*

Fish

Pinks
Coho*
Pollock/Cod
Herring (eggs)*

Unstudied Species

Littleneck Clams
Chinook
Chum
Sockeye/Reds
Halibut
Bidarki
Snails



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What species are top priorities?

sierra@alutiiqprideak.org

HABs Results

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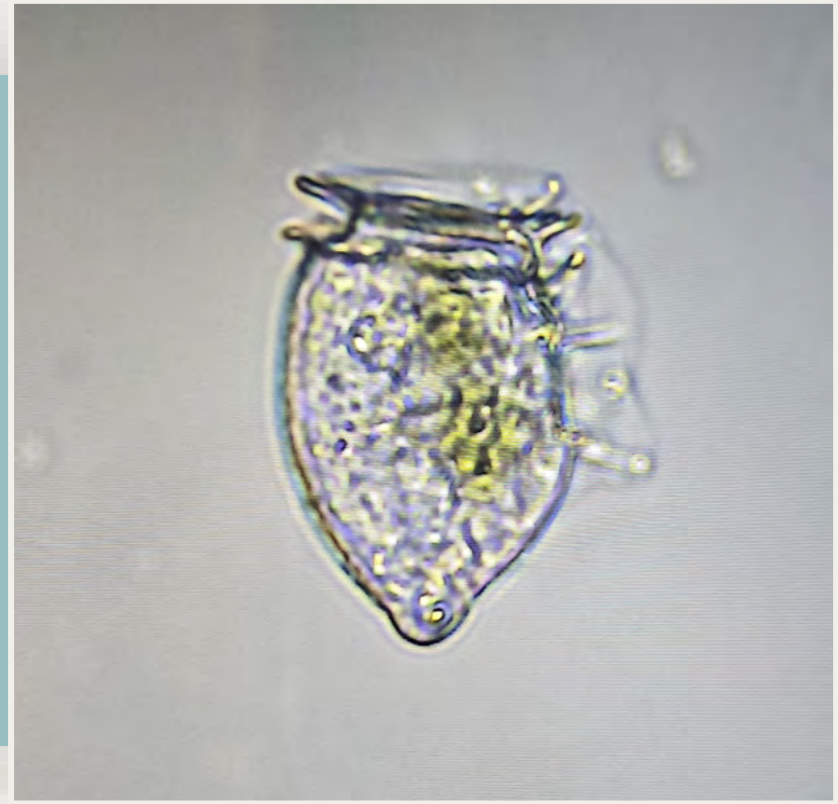
Phytoplankton recap

Net tow → Microscopy



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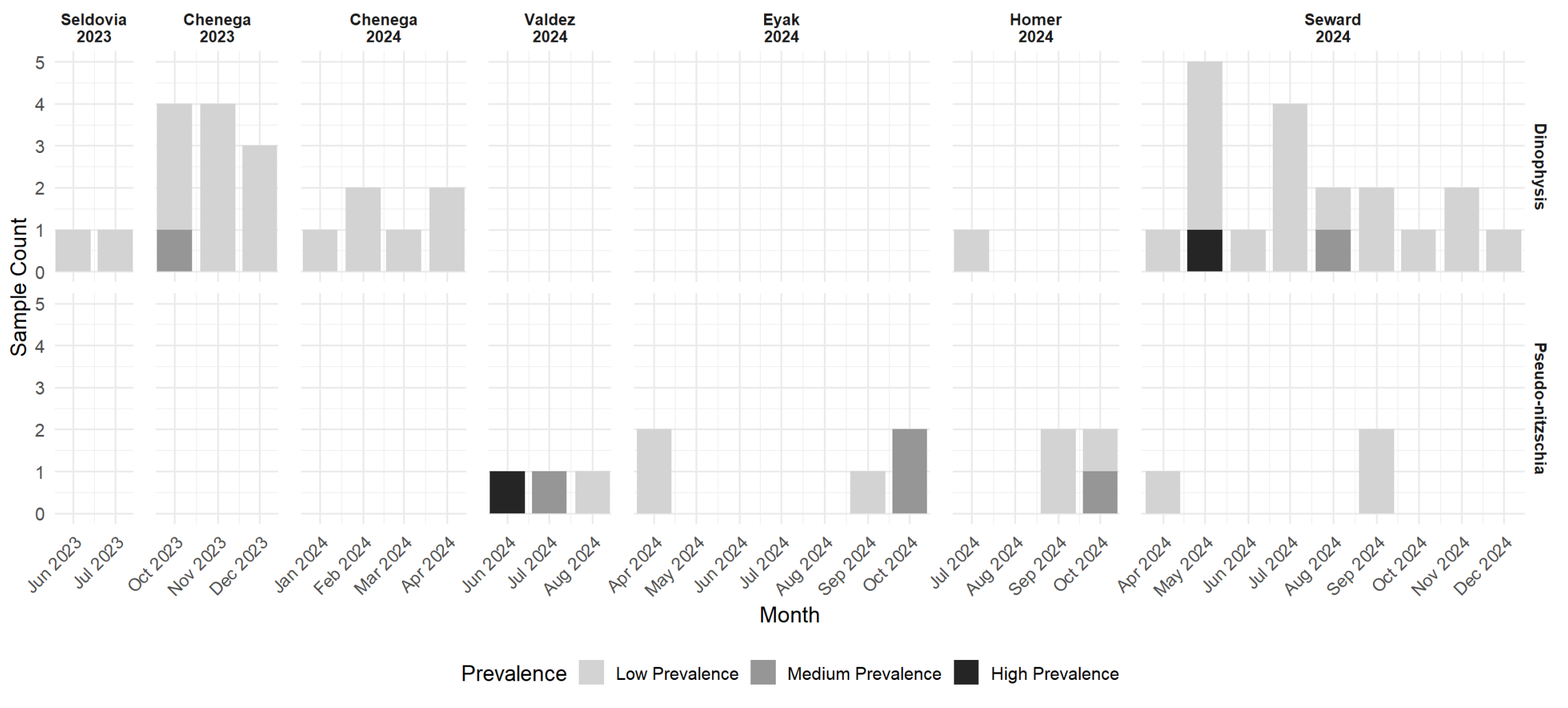
Results 2023-2024



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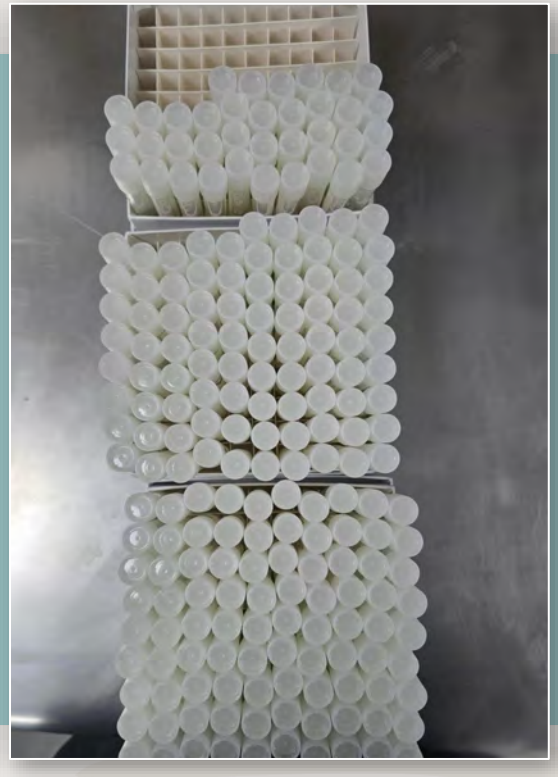
Toxin Testing Recap

Clam samples → blended → extract toxins → test extractions for toxins



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Federal Regulatory Limits

CRRC does not regulate shellfish harvest – We only inform of the limits and what we find

Saxitoxin

Algae: *Alexandrium* Species

Paralytic Shellfish Toxin/Poison (PST/PSP)

Federal limit: 80ug/100g

Domoic Acid

Algae: *Psuedo-nitzchia* species

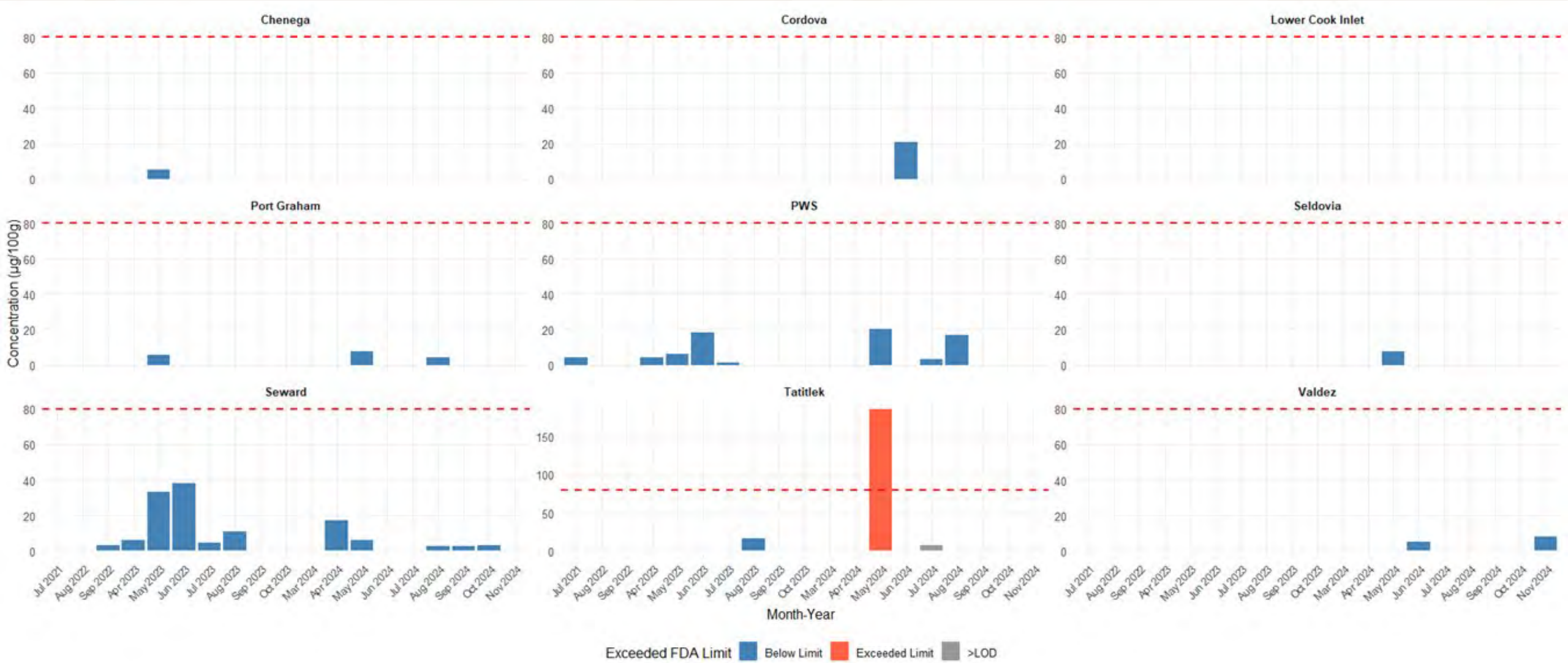
Amnesic Shellfish Poison (ASP)

Federal Limit: 20 ppm

The allowable amount determined by the federal government

All commercial shellfish are required to be tested

Saxitoxin (PSP) Results



Public Service Announcement

Date

Paralytic Shellfish Toxin Advisory

The following advisories are for Chugach Regional Resources Commission (CRRC) sites with shellfish that have Paralytic Shellfish Toxins (PST) levels above the FDA regulatory limit of 80 µg/100 g. In high concentrations, PSTs cause Paralytic Shellfish Poisoning (PSP). Consuming wild shellfish from these sites may result in an increased risk of PSP.

New Advisories

CRRC sites with shellfish PST levels above the regulatory limit. CRRC is not a regulatory agency and the consumption of wild shellfish in Alaska is up to consumer discretion.

Community	Beach	Species Affected	Date Collected
-	-	-	-

Recent PSPresults

Community	Location	Species	PST Results (µg/100g)	Date Collected
-	-	-	-	-

DISCLAIMER: There is always risk when consuming wild shellfish. Toxins cannot be cooked, cleaned, or frozen out of shellfish. Toxins can vary between regions, beaches, and shellfish species. Clean crab thoroughly and discard the gut contents since crab viscera and guts (butter) can contain high levels of toxins. Commercially available shellfish have been tested for PSTs and are considered safe for consumption.

<LOD = below limit of detection for the receptor binding assay. Red coloring indicates PST levels are above the FDA limit of 80 µg/100 g.

PSP Information

PSP is caused by an increase in concentration of a PST producing marine algae triggered by warm temperatures and currents. PSP symptoms include tingling in the lips and fingertips, numbing of the arms and legs, nausea, difficulty breathing, and even death. Anyone with these symptoms should seek immediate medical care or call 9-1-1. To report PSP cases, contact the Alaska Department of Health and Social Services, Section of Epidemiology at (907) 269-8000, or (800) 478-0084 after hours.

CRRC Information

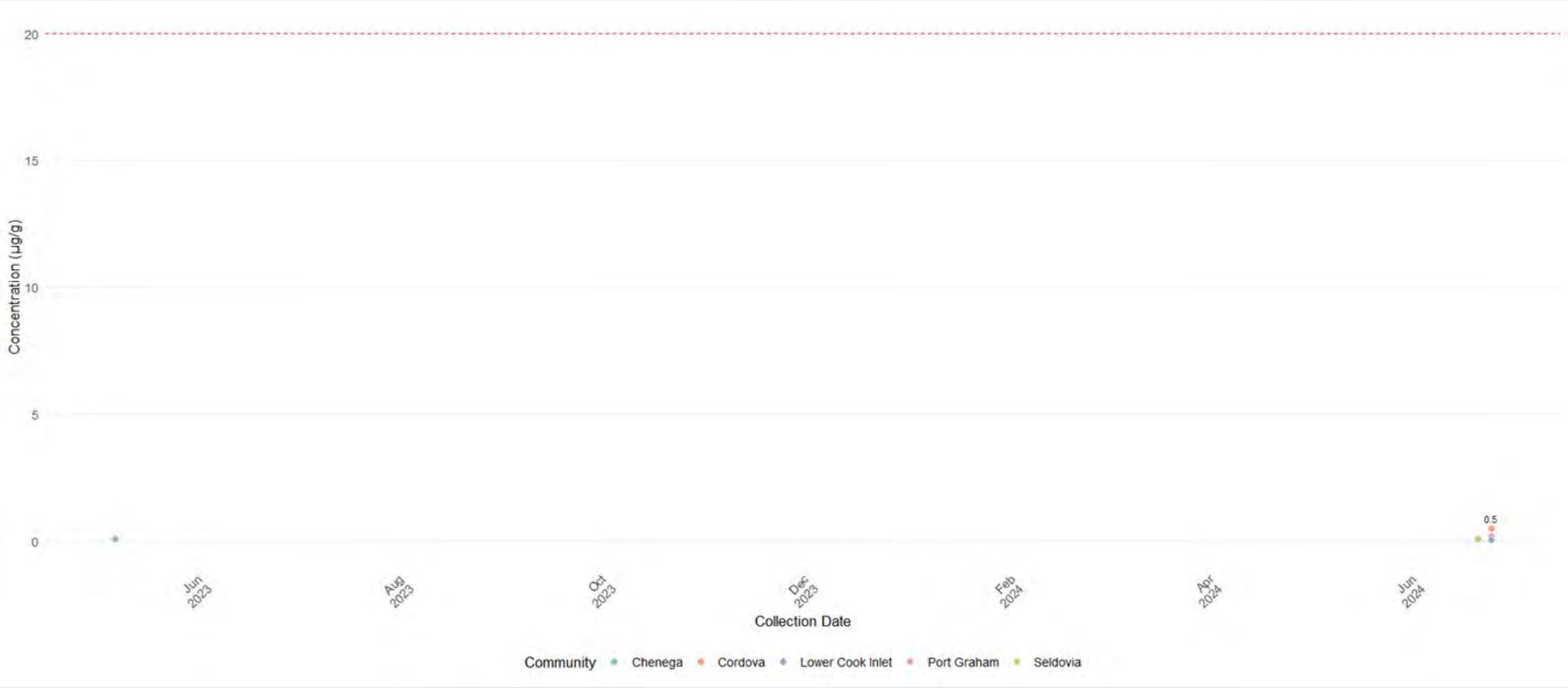
CRRC is a Tribal organization within the meaning of the Indian Self Determination and Education Assistance Act of 1991, and an Alaska Native Organization (ANO) as defined in federal policies. We are authorized by our seven member Tribes in Alaska's Chugach region to provide essential governmental services to Tribal citizens. We provide support for natural resource management, subsistence activities, climate change adaptation and environmental concerns, food security, and access to healthy traditional foods and clean water.

How to Get Shellfish Tested

If you are interested in getting harvested shellfish tested or have any questions about paralytic shellfish poisoning, please contact Allison Carl at acarl@crrcalaska.org or Annette Jarosz at annette@alutiiqprideak.org.

DISCLAIMER: There is always risk when consuming wild shellfish. Toxins cannot be cooked, cleaned, or frozen out of shellfish. Toxins can vary between regions, beaches, and shellfish species. Clean crab thoroughly and discard the gut contents since crab viscera and guts (butter) can contain high levels of toxins. Commercially available shellfish have been tested for PSTs and are considered safe for consumption.

Domoic Acid Results



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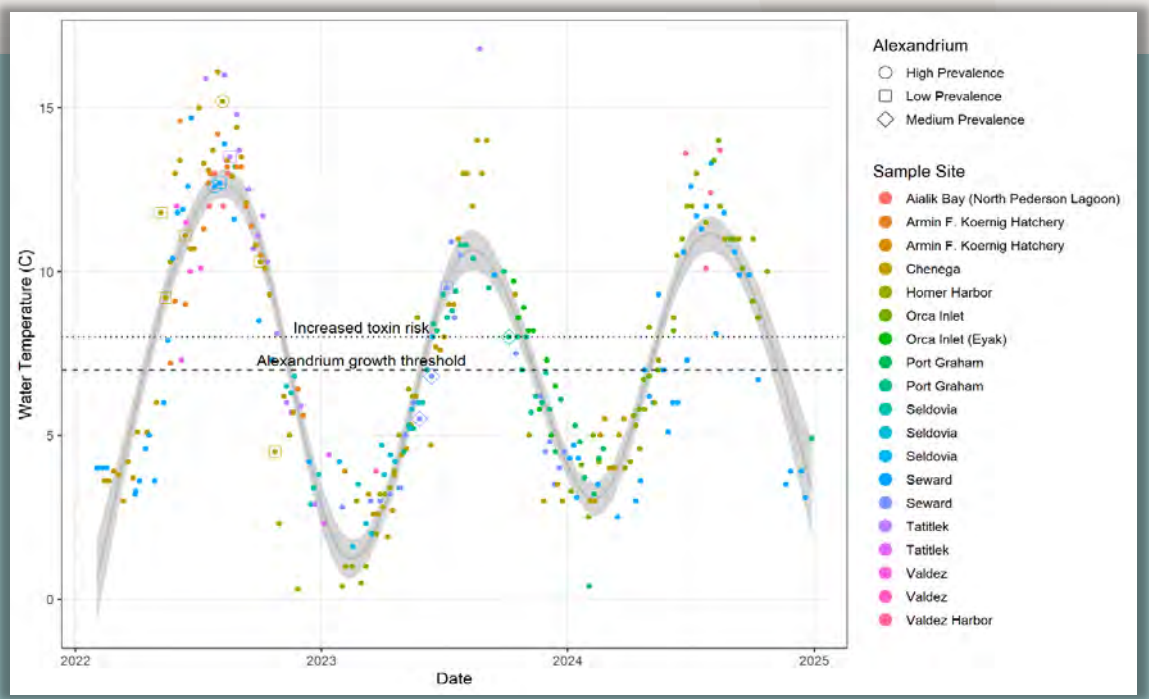
Next steps in data management and analysis

Preliminary data → Reports → Comprehensive analysis

ID	Collection Date	Sample Type	Community	Sample Lo	Collector	RBA completed
27	7/3/2021	Blue mussel	PWS	Pigot Bay (	PWSSF	<LOD
28	7/18/2021	Blue mussel	PWS	Fox Farm E	PWSSF	12
29	7/27/2021	Blue mussel	PWS	Pigot Bay (	PWSSF	<LOD
30	8/5/2022	Blue mussel	PWS	Pigot Bay	PWSSF	<LOD
31	8/26/2022	Blue mussel	PWS	Derickson	PWSSF	<LOD
.19	9/30/2022	Blue mussel	Seward	4th of July	CRRC	3
1	4/11/2023	Blue mussel	PWS	Pigot Bay	PWSSF	4
2	4/23/2023	Blue mussel	Seward	4th of July	CRRC	6
3	4/26/2023	Blue mussel	Port Graham		CRRC	<LOD
4	5/3/2023	Blue mussel	Port Graham		CRRC	<LOD
5	5/5/2023	Blue mussel	Seward	4th of July	CRRC	<LOD
6	5/7/2023	Blue mussel	Chenega	Airport Be	CRRC	22
7	5/8/2023	Littleneck clam	Chenega	Airport Be	CRRC	<LOD
8	5/10/2023	Blue mussel	Port Graham		CRRC	<LOD
33	5/14/2023	Blue mussel	PWS	Pigot Bay	PWSSF	6
9	5/17/2023	Blue mussel	Port Graham		CRRC	4
10	5/24/2023	Blue mussel	Port Graham		CRRC	18
11	5/26/2023	Blue mussel	Seward	4th of July	CRRC	66
34	6/11/2023	Blue mussel	PWS	Derickson	PWSSF	25
11	6/16/2023	Blue mussel	Seward	4th of July	CRRC	22
12	6/21/2023	Blue mussel	Seward	4th of July	CRRC	54
35	6/27/2023	Blue mussel	PWS	Eleanor Isl	PWSSF	12
36	7/6/2023	Blue mussel	PWS	Derickson	PWSSF	<LOD
37	7/17/2023	Blue mussel	PWS	Fox Farm	PWSSF	4
13	7/17/2023	Blue mussel	Seward	4th of July	CRRC	5
14	7/20/2023	Blue mussel	Seward	4th of July	CRRC	4
15	7/22/2023	Blue mussel	Seldovia	Seldovia H	SVT	<LOD
38	7/25/2023	Blue mussel	PWS	60.932940	PWSSF	<LOD
16	7/26/2023	Blue mussel	Port Graham		CRRC	<LOD
17	7/26/2023	Blue mussel	Seward	4th of July	CRRC	5
20	7/26/2023	Blue mussel	Seward		CRRC	4
59	7/27/2023	Blue mussel	Seldovia	Seldovia H	SVT	<LOD
18	8/3/2023	Blue mussel	Seward	4th of July	CRRC	11
19	8/3/2023	Blue mussel	Port Graham		CRRC	<LOD
60	8/11/2023	Blue mussel	Seldovia	Seldovia H	SVT	<LOD
20	8/14/2023	Blue mussel	Port Graham		CRRC	<LOD
61	8/16/2023	Blue mussel	Seldovia	Seldovia H	SVT	<LOD
62	8/22/2023	Blue mussel	Seldovia	Seldovia H	SVT	<LOD
21	8/29/2023	Cockle	Tatitlek			15

Sample Type	Community	Sample Date	RBA completed (ug/100g)
Blue mussel	Seward	2022-07-18	<LOD
Softshell clam	Seward	2022-07-18	<LOD
Blue mussel	Seward	2022-07-27	<LOD
Cockle	Seward	2022-07-27	<LOD
Blue mussel	Seward	2022-08-09	<LOD
Blue mussel	Seward	2022-08-11	<LOD
Softshell clam	Seward	2022-08-11	<LOD
Cockle	Seward	2022-08-11	<LOD
Blue mussel	Seward	2022-08-24	<LOD
Blue mussel	Seward	2022-09-27	<LOD
Blue mussel	Seward	2022-09-30	3
Blue mussel	Seward	2023-07-26	4
Softshell clam	Seward	2024-03-06	<LOD
Softshell clam	Seward	2024-04-10	<LOD
Blue mussel	Seward	2024-04-30	34
Mya truncata	Port Graham	2024-05-06	26
Macoma	Port Graham	2024-05-06	<LOD
Butter clam	Port Graham	2024-05-06	<LOD
Blue mussel	Port Graham	2024-05-07	4
Macoma	Seldovia	2024-05-09	23
Cockle	Seldovia	2024-05-09	<LOD
Butter clam	Seldovia	2024-05-09	<LOD
Softshell clam	Seward	2024-05-09	30
Butter clam	Tatitlek	2024-05-13	390
Butter clam	Tatitlek	2024-05-13	298
Cockle	Tatitlek	2024-05-13	48
Littleneck clam	Tatitlek	2024-05-13	8
Littleneck clam	PWS	2024-05-14	4
Butter clam	PWS	2024-05-14	45



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Are there traditional areas you think we should monitor?

Chenega (Caniqaq) - Cordova (IiyaaGdaad) - Nanwalek - Port Graham (Paluwik) - Seward (Qutalleq) - Tatitlek (Taatiilaaq) - Valdez

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Early eDNA results

Learning experiences and what we have seen so far!

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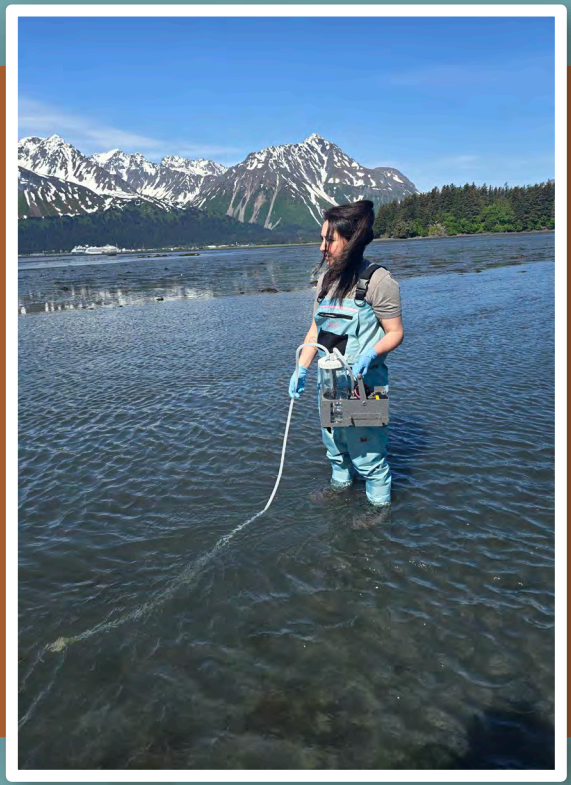
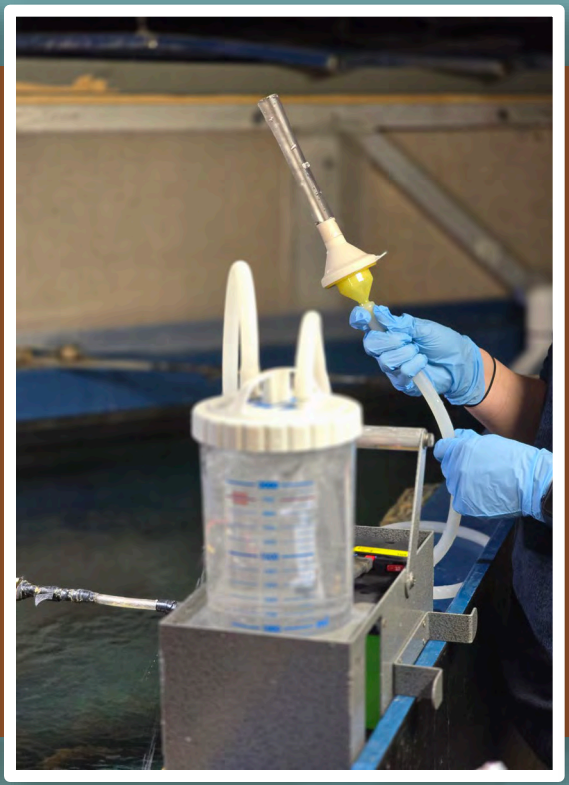
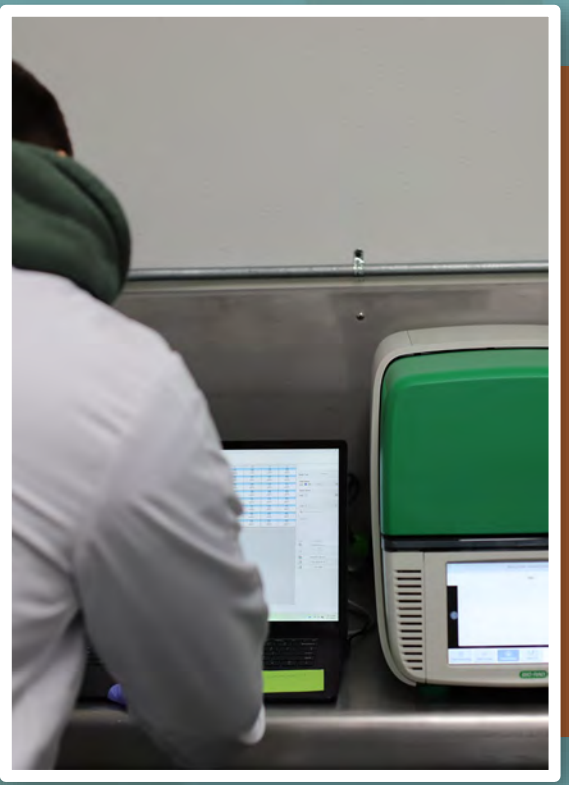
eDNA recap

Collect sample → take out DNA → look for Herring/HABs → calculate how much DNA in sample







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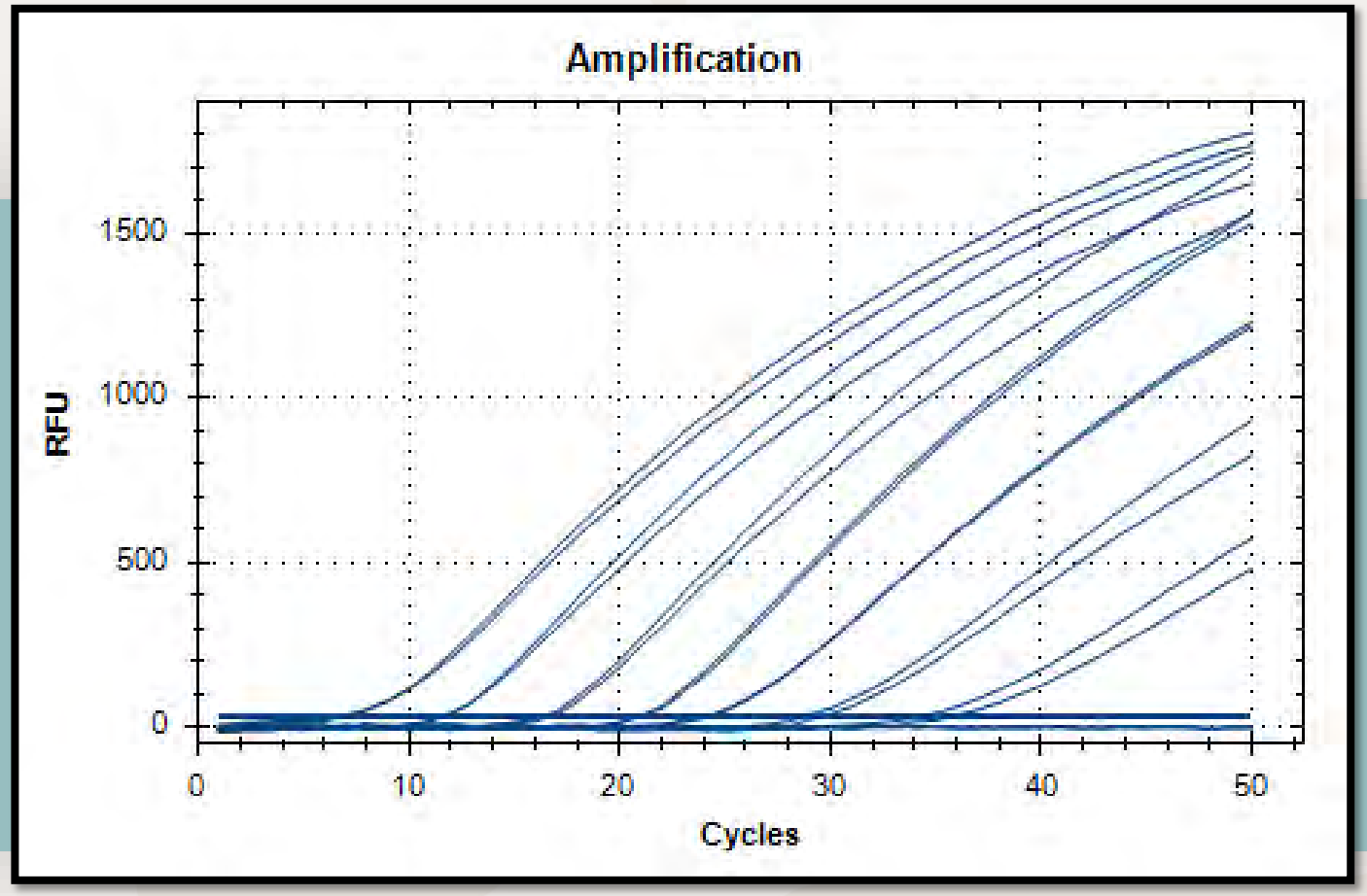
Environmental DNA



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Other Project

eDNA Projects in Alaska

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What should we look for?
Specific species?
Animal diet?
Invasive species?

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CROM Recap

Long-term monitoring to build baseline marine data inform subsistence harvests

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Recap Questions

OA – HABs – eDNA

- What species are top priority when monitoring ocean chemistry?
- Are there traditional areas near communities we should be monitoring?
- Are there species of concern – population, movement/migration, health, contamination

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Feedback

How can we better support samplers?

Additional community needs?

Final Thoughts

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QUYANA