

Developing an Imaging FlowCytoBot (IFCB) monitoring program for HABs in Alaska

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Alaska Ocean Observing System

CyanoSymposium

25 March 2026



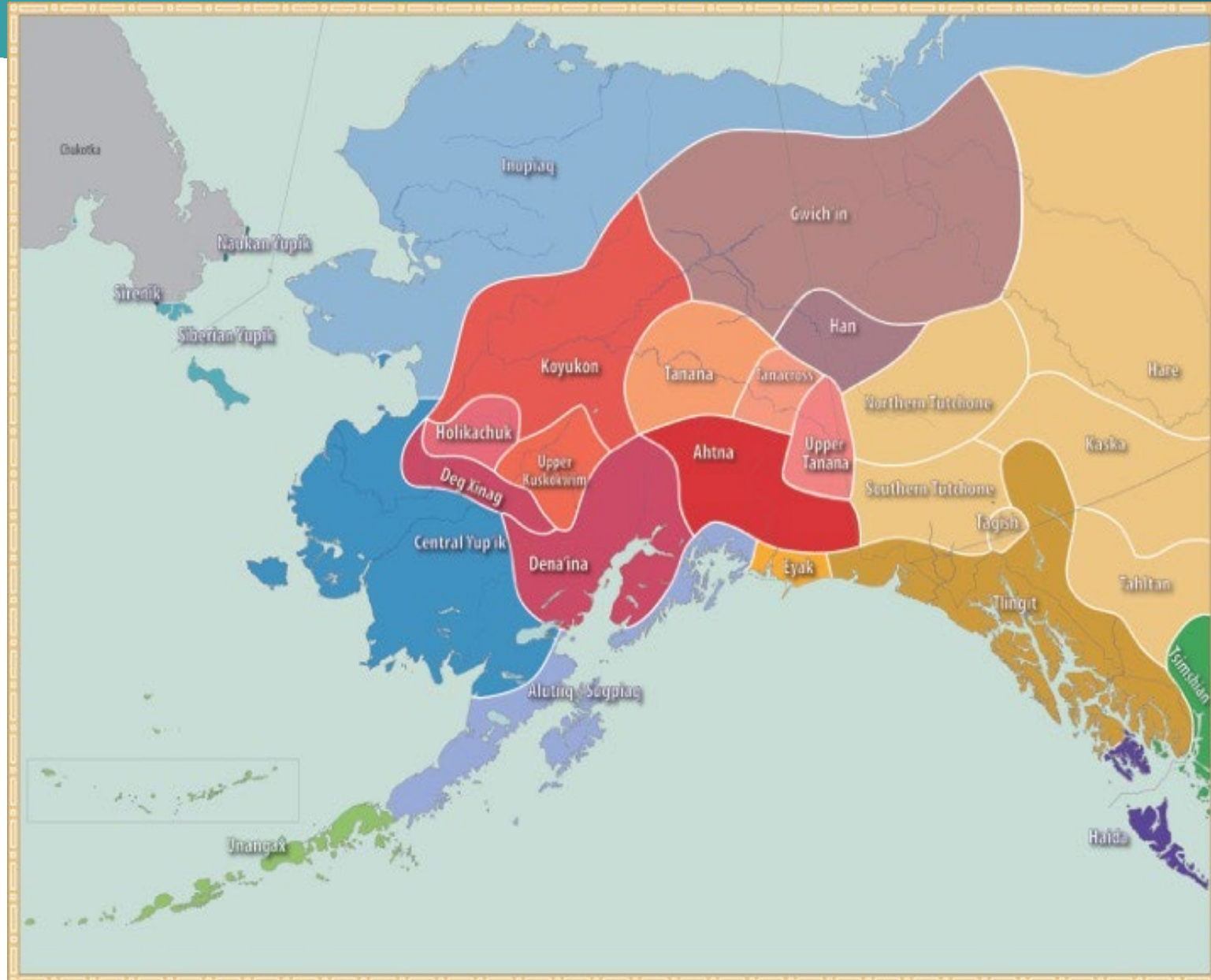
AOOS
Alaska Ocean Observing System

Alaska is Big and Diverse

- 53° to 71° latitude
- Temperate forest to tundra
- Fjords to sea ice
- Steep slopes to shallow seas

- Strong connection to subsistence resources

- Primary concern: toxins

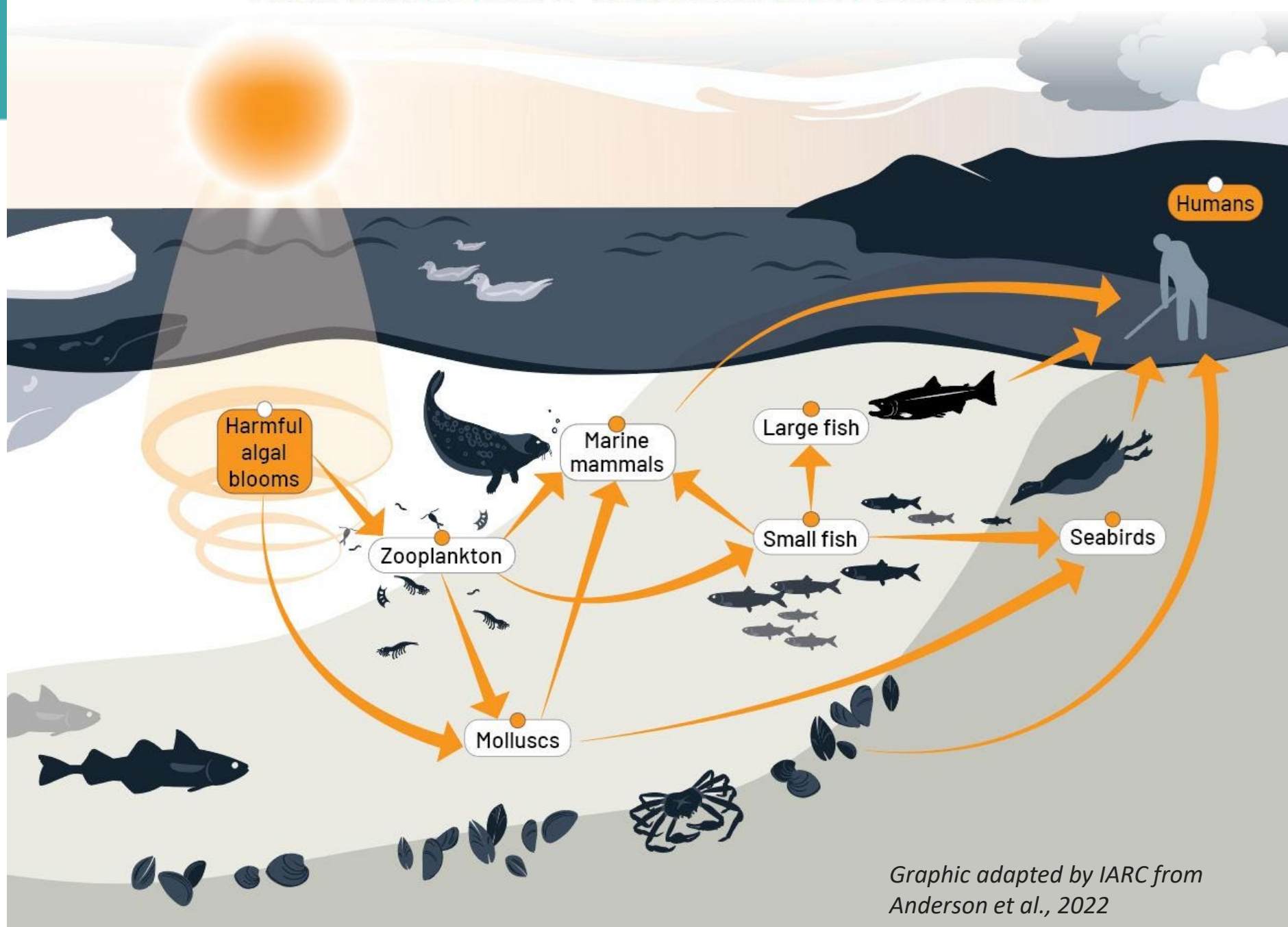


K. Holtermann

From HABs to Humans

- HAB toxins can take several routes to humans
- Impact food safety
- Could impact the health of the animals
- Food security issue!

How HABs MOVE THROUGH THE FOOD WEB



Graphic adapted by IARC from Anderson et al., 2022

Impacts to Wildlife, Subsistence and Commercial resources AOOs

- Toxins found in invertebrates, marine fish, seabirds, and marine mammals
- Still need much more testing of food components
- Food web impacts are not well known, but being researched



HAB Fatality, 2020

- About 200 cases and 5 deaths confirmed in Alaska since 1993
- Potential to get worse with warming temperatures

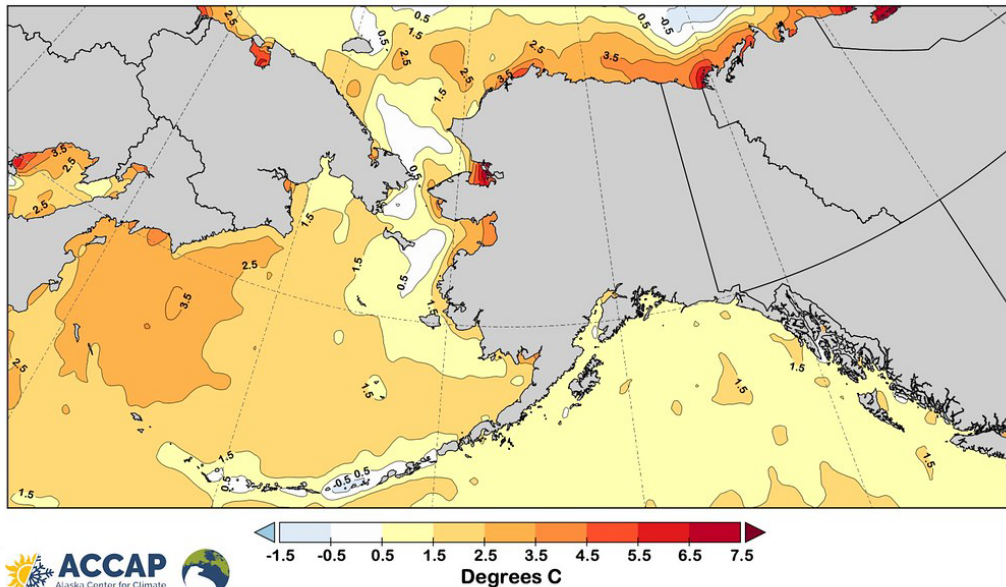
Alaska News

Person dies of paralytic shellfish poisoning after eating snails and mussels from Dutch Harbor beach

✍ Author: [Tess Williams](#) 🕒 Updated: July 16, 2020 📅 Published July 15, 2020



Change in average sea surface temperature
August 1982-2024



OISSTv2.1 courtesy of NOAA/PSL/ESRL



Log floats for oyster cultures



OceansAlaska floating hatchery

- ADEC closely regulates commercial sector
 - testing of product, closing of areas over limits
 - saxitoxin levels need to be below 80 $\mu\text{g}/100\text{g}$
- No reported human cases from commercial product in Alaska
- **BUT there is no state monitoring/regulation of subsistence or recreational harvests!**

Minimizing Risks to Food Safety/Security

Needs 3 approaches used simultaneously

I. Monitoring of algae

- What organisms are in the water?
- Simple, great for understanding bloom dynamics
- Cannot determine safety of food items

II. Toxin testing

- Sample different organisms (food items and other species in ecosystem)
- Requires labs and advanced techniques (PSP)
- Can aid in food safety decision if results are rapid
- Also helpful in HAB research

III. Communication/Outreach

- I. Very important to increase awareness
- II. Can limit impacts of toxins by modifying behavior





Grace Ellwanger, KANA



The Alaska Harmful Algal Bloom Network

Alaska Harmful Algal Bloom Network



AOOS

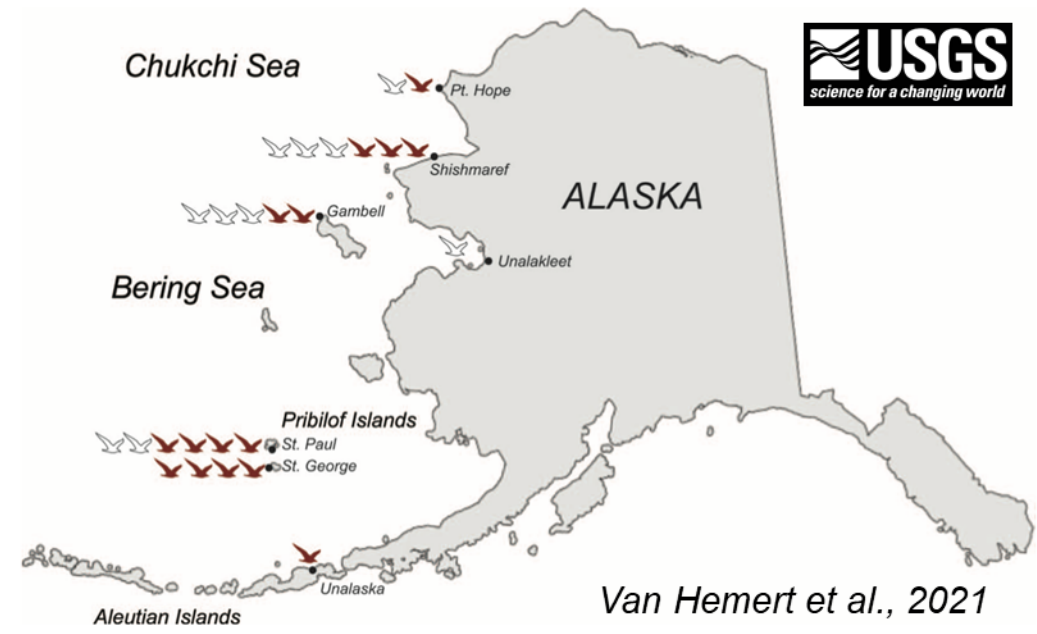
- AHAB Network formed in 2017
- Platform to communicate and support HAB monitoring, research and outreach across Alaska
- Strength of the network comes from our members who contribute to a shared goal



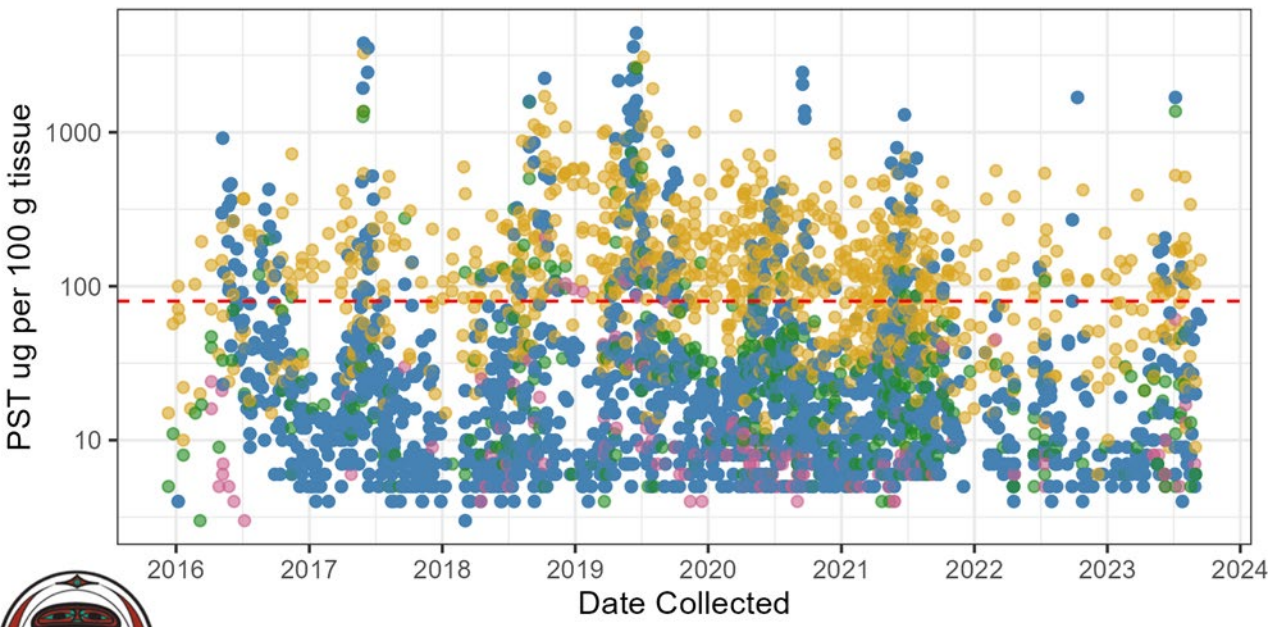
Network Members and HAB Monitors

Sitka Tribe of Alaska/SEATOR	Alaska Dept of Health and Social Services	Aleutian Pribilof Islands Association
KBNERR	Alaska Dept of Environmental Conservation	Chugach Regional Resources Commission
Knik Tribe	Alaska Dept of Fish and Game	Seldovia Village Tribe
Alutiiq Pride Marine Institute	NOAA WARRN-West Lab	Native Village of Port Graham
Kodiak Area Native Association	Alaska Fisheries Science Center	Sun'aq Tribe of Kodiak
Alaska Sea Grant	North Pacific Research Board	Community members of Utqiagvik
Qawalangin Tribe of Unalaska	US Arctic Research Commission	Alaska Conservation Foundation
Aleut Community of St Paul	US Fish and Wildlife Service	Applied Research in Environmental Sciences
Norton Sound Health Corporation	US Forest Service	Center for Alaskan Coastal Studies
Native Village of Kotzebue	Agency for Toxic Substances and Disease Registry	Coastal Observation and Seabird Survey Team
North Slope Borough	Alaska Pacific University	Prince William Sound Stewardship Foundation
USGS Alaska Science Center	Columbia University	Axiom Data Science
NCCOS	University of Alaska Fairbanks	
Alaska Veterinary Pathology Services	University of Alaska Anchorage	
Woods Hole Oceanographic Institute		

Work by AHAB members

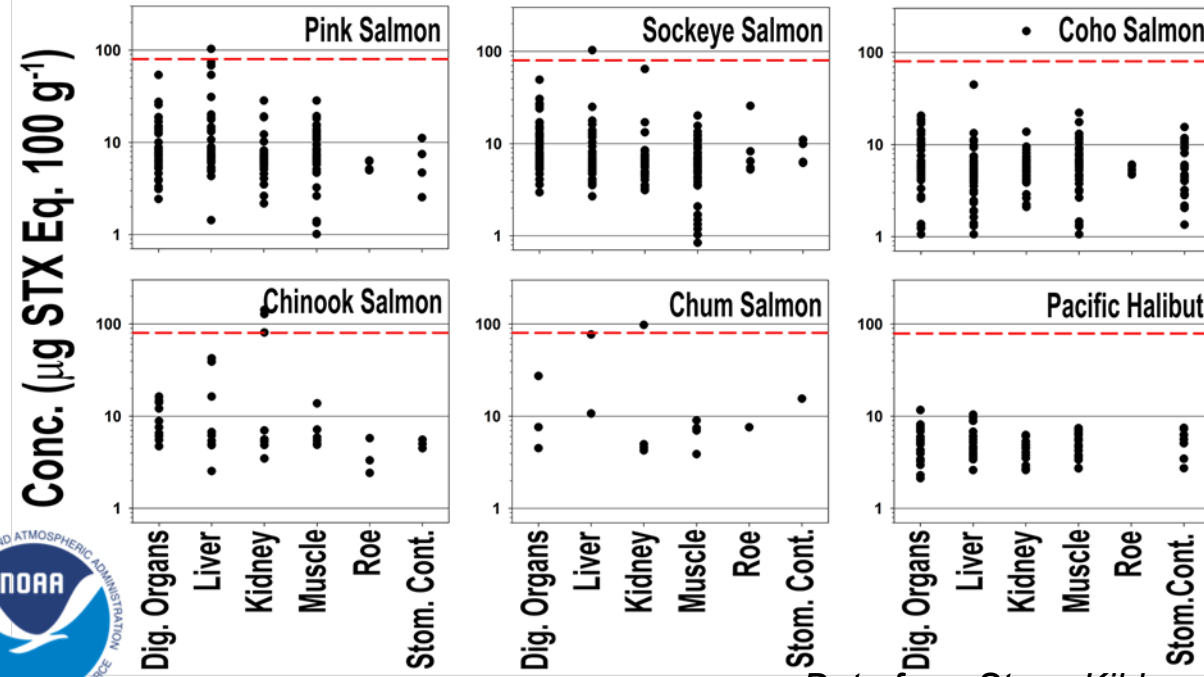


	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Alexandrium												
Dinophysis												
Pseudo-nitzschia												



Blue Mussel Butter Clam Cockle Littleneck Clam

Source: SEATOR Data

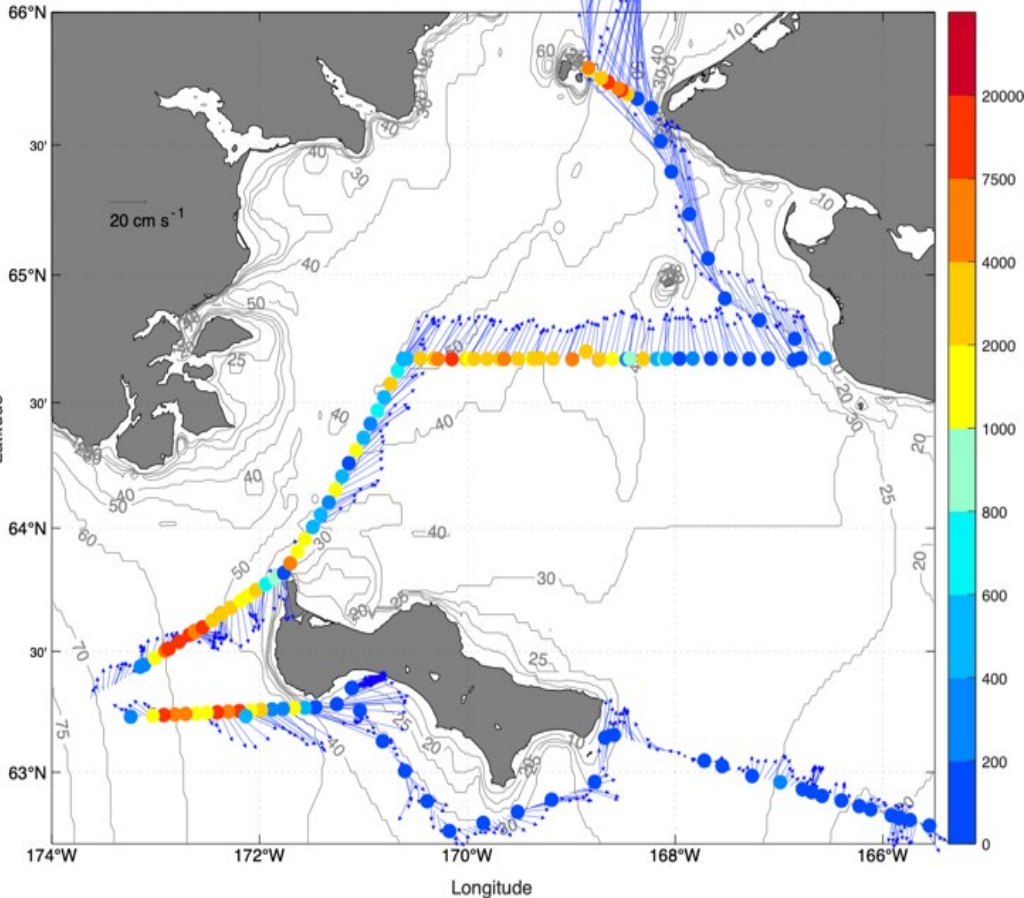


Data from Steve Kibler



Alexandrium bloom in Northern Bering Sea (2022)

Map from Robert Pickart, WHOI



- Regional response/communication network was created through a lot of work and collaboration
- Arctic surf clam sent for testing rather than consumed

The Nome Nugget

Alaska's Oldest Newspaper

• USPS 508-100 • Single Copy Price - 50 Cents in Nome •

Saxitoxin Detected In Regional Clam

THU, 10/06/2022 - 6:50PM admin



Authorities warn subsistence users about potentially harmful algal blooms

By Miriam Trujillo | August 26, 2022



Balancing subsistence and food safety?

- Access to food/water
- Livelihoods
- Social cohesion
- Cultural importance of subsistence foods



- Possibility of sickness or death
- Impact to cultural psyche of having local food/water harm people

- Use of resources, access to alternative sources of food and water, and perceptions of risk vary widely across Alaska – there is not one answer, but first step is gathering information



The Eye on Alaska's Coasts and Oceans



Thank you

AHAB Network Members

Community Monitors

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