

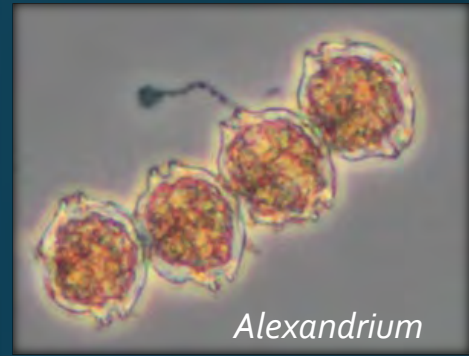


Alaska PSP Monitoring and Risk Assessment Project 2023 Update

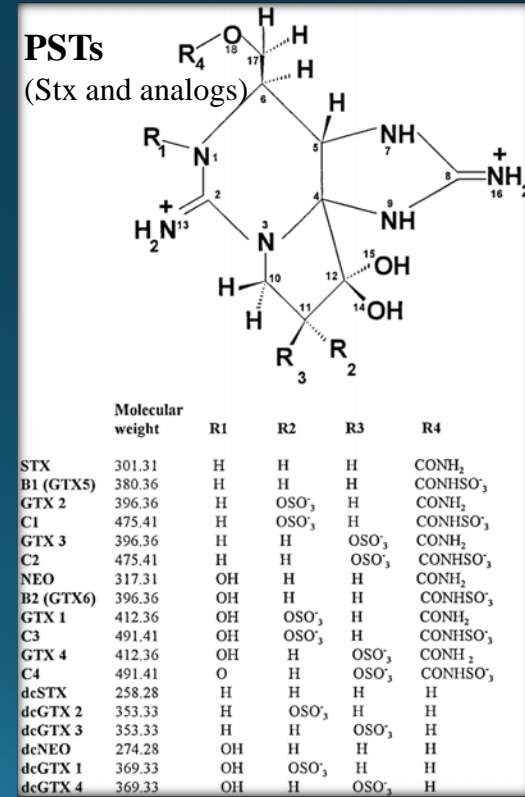
Bruce Wright, Knik Tribe

Steve Kibler, NOAA

PSP Background

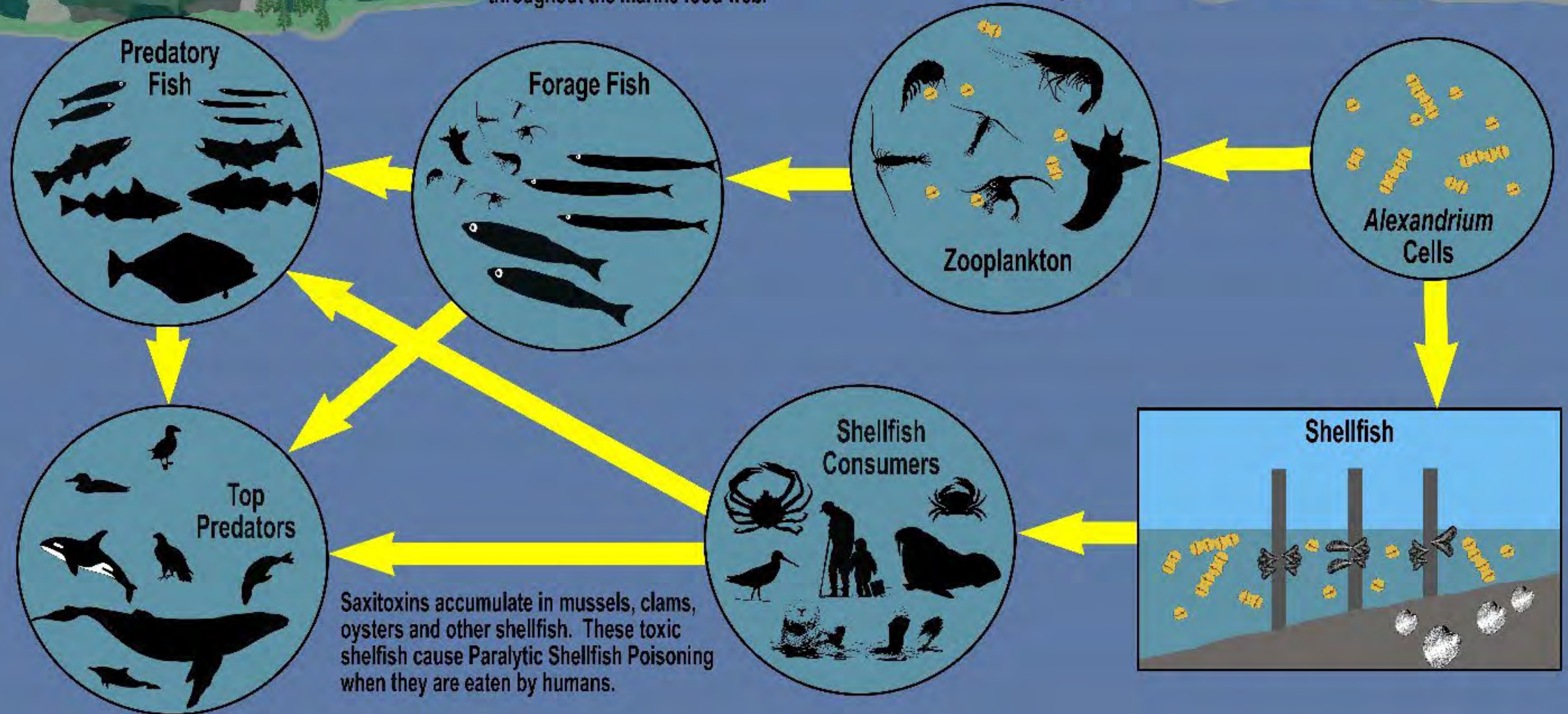


- *Alexandrium* (microalgae) produces paralytic shellfish toxins (PSTs)
- PSTs contaminate seafood → paralytic shellfish poisoning (PSP)
- HABs Misnomers
 - Not red tide (likely nontoxic *Noctiluca*)
 - Toxins cannot be removed
- PSP is an increasing issue
 - Climate change



Alexandrium Blooms & Saxitoxins in the Marine Food Web of Alaska

Alexandrium catenella blooms annually in Alaskan coastal waters. The cells produce, Saxitoxins, (STXs), potent neurotoxins that are transferred to many organisms throughout the marine food web.



Current Knik Tribe PSP Project

Blue mussel and water temp. collections from 7 main locations:

- Akutan, Chignik Lagoon, Juneau, King Cove, Old Harbor (Kodiak), Sand Point, Unalaska
- Opportunistic samples from other locations
- Year-round for 4 years

Main objectives: track PSP timing, location, duration, and severity

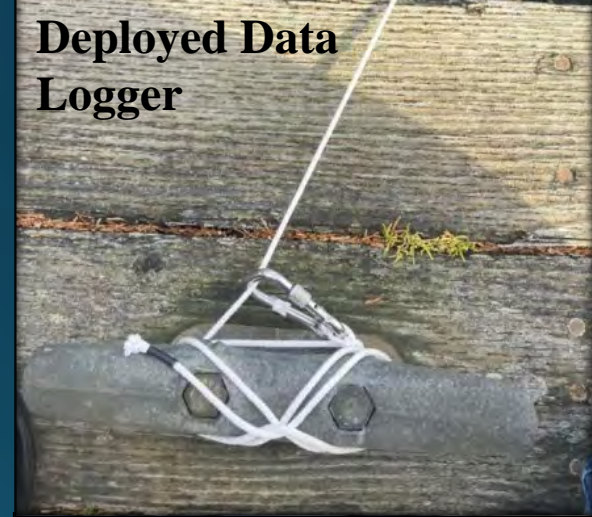
- Blue mussels as bioindicators
- Testing other shellfish, invertebrates, and fish to understand trophic transfer of toxins to higher levels
- Test subsistence shellfish

Samples analyzed at Alaska Department of Environmental Conservation (ADEC) Environmental Health Laboratory

Data Logger



Deployed Data Logger



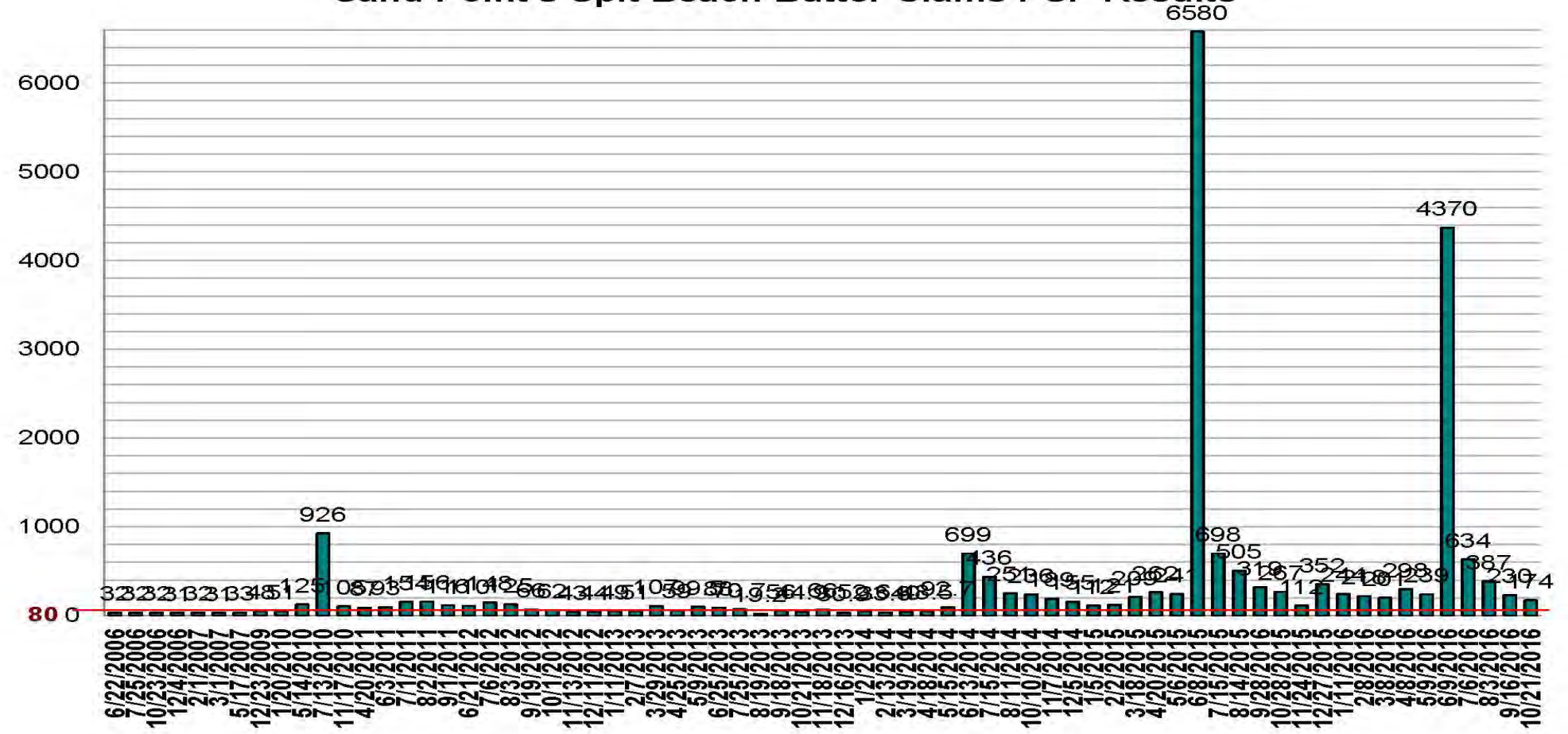


 Weekly Blue Mussel Sites

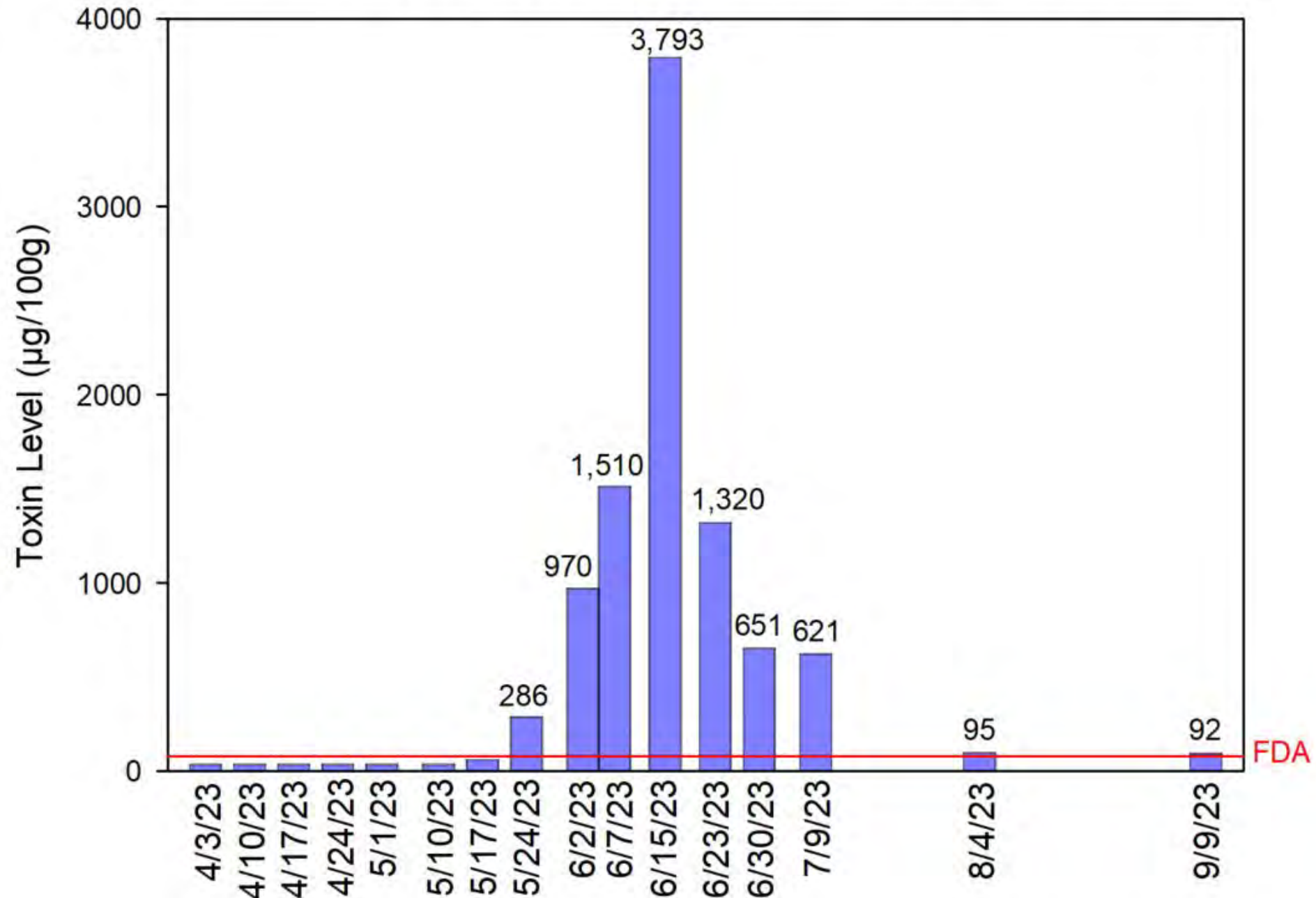
- Akutan
- Chignik Lagoon
- Juneau
- King Cove
- Old Harbor, Kodiak
- Sand Point
- Unalaska

 Opportunistic Sample Sites

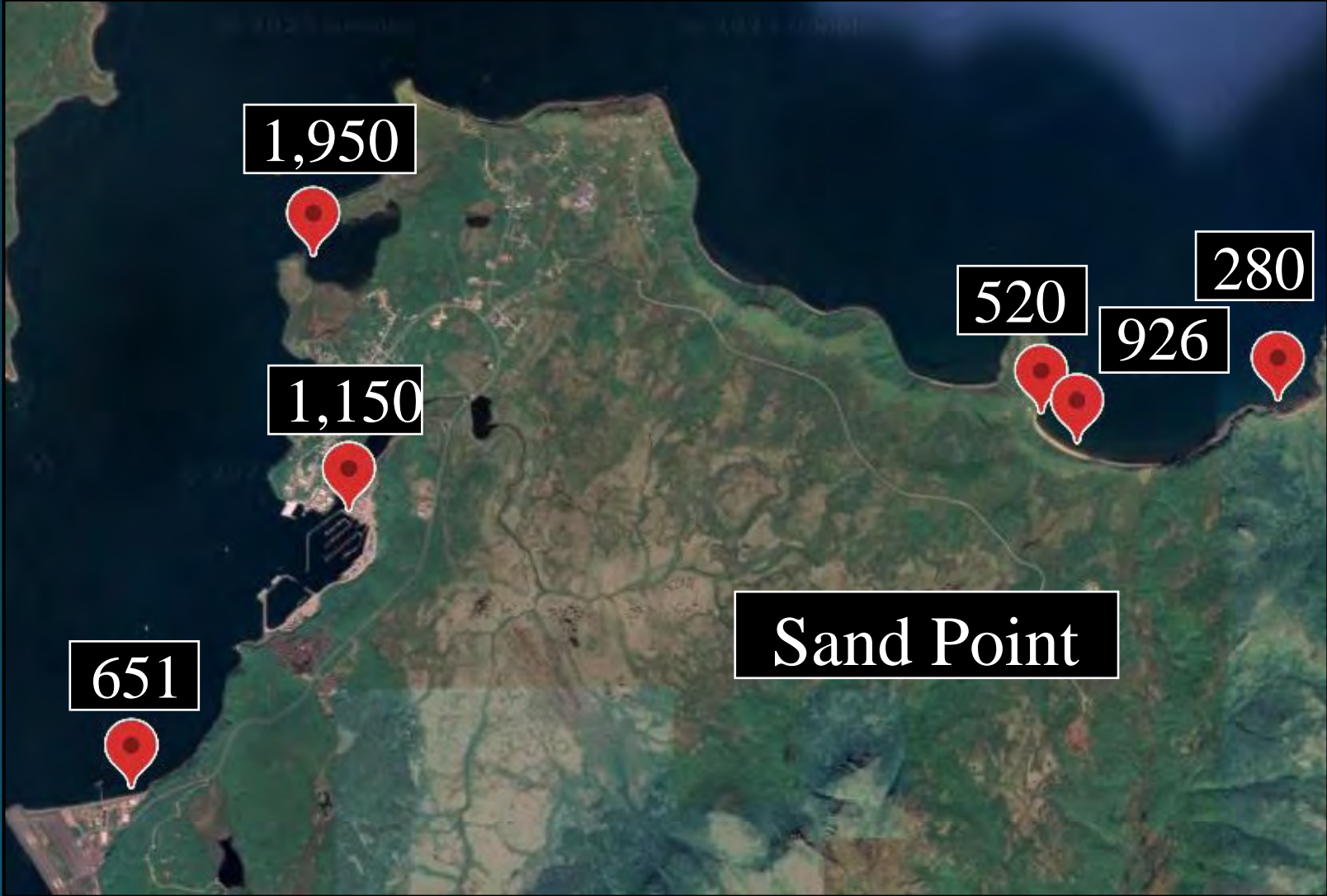
Sand Point's Spit Beach Butter Clams PSP Results



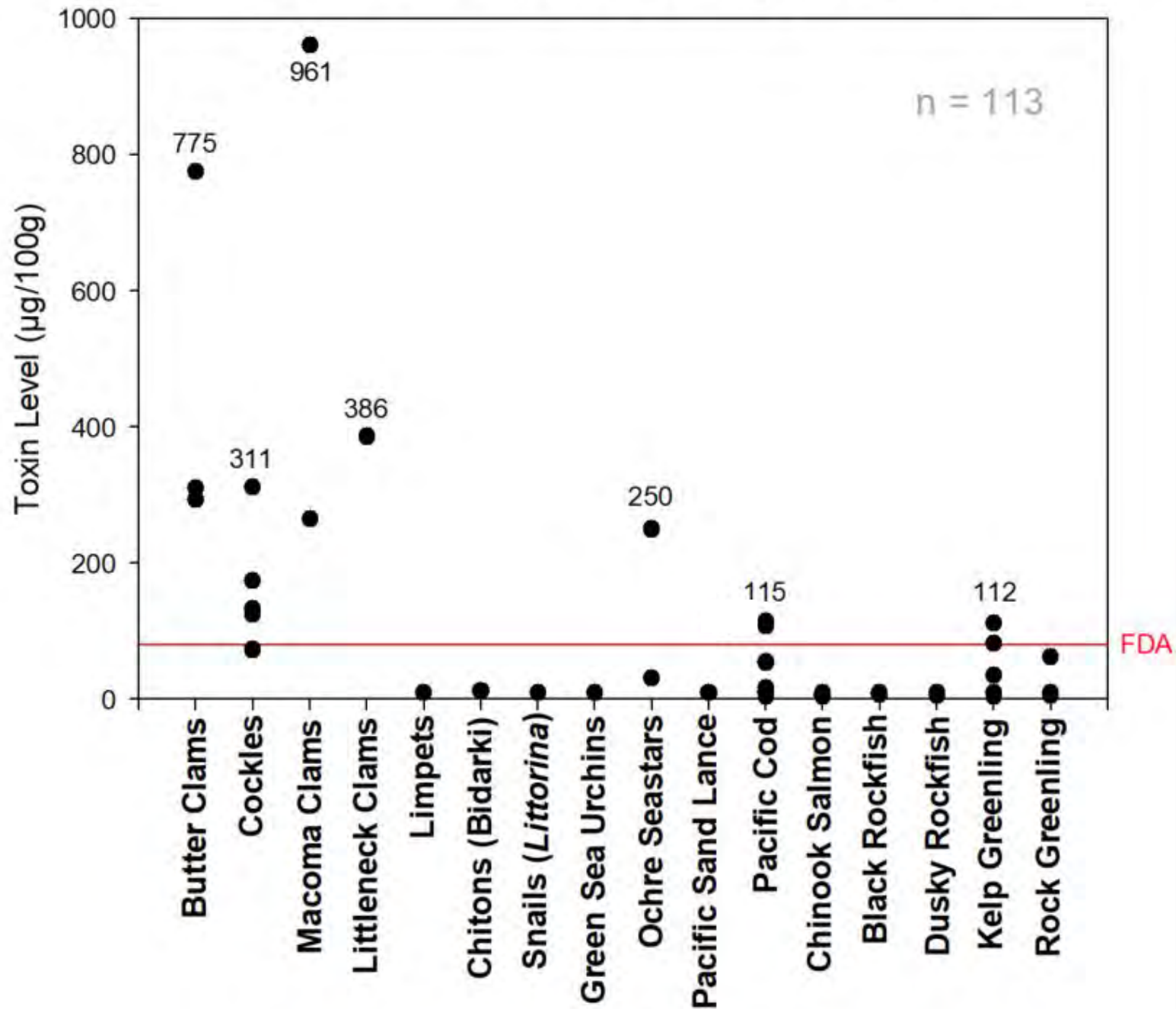
2023 PSP Toxin Levels in Blue Mussels: Airport Beach, Sand Point



Spatial Variation of PST Levels: 6/30 - 7/2/23



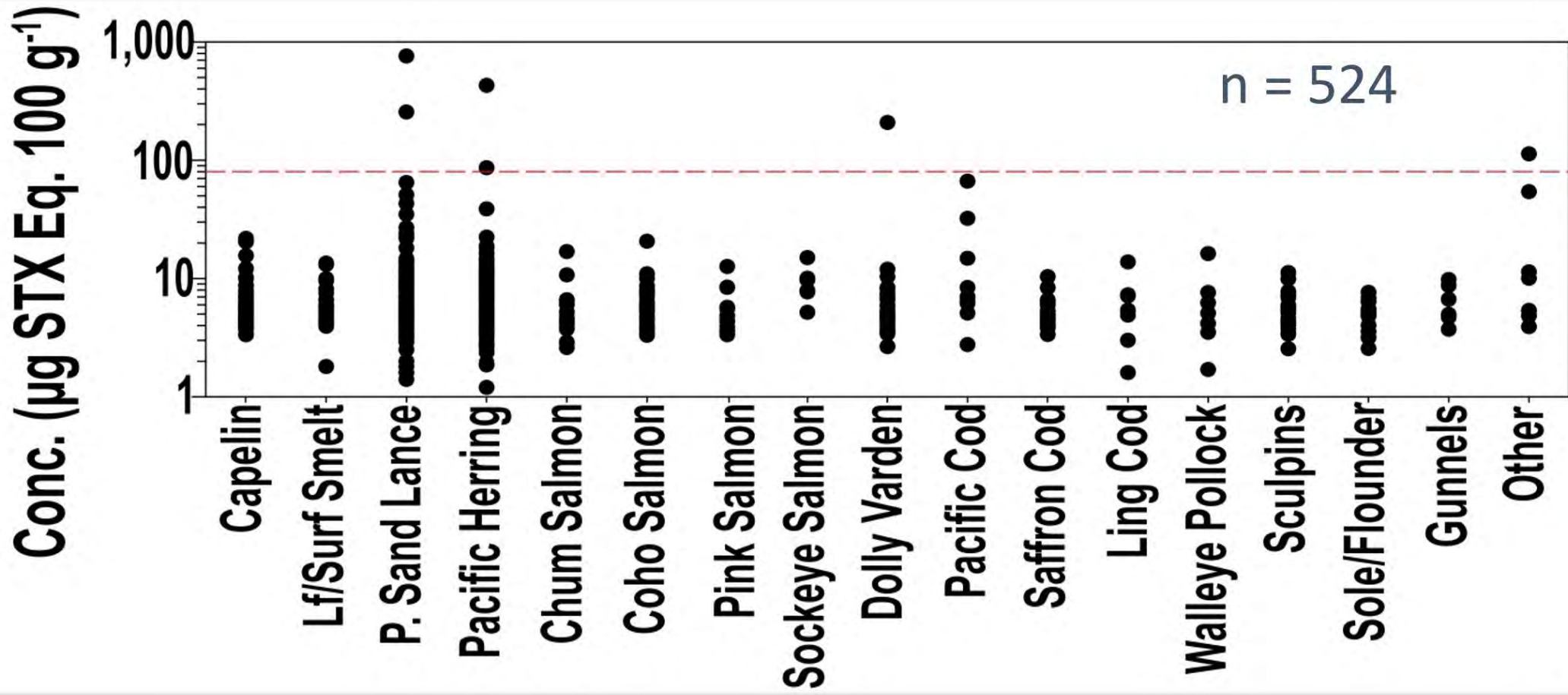
2023 Sand Point June and July PSP Levels



Site Results

- **Akutan: mussels = 41.5 ug/100g (4/14/23)**
- **Chignik Lagoon: Razor clams = 311 ug/100g (6/2/23)**
- **Juneau: Blue mussels = 490 ug/100g (7/2/23)**
- **King Cove: mussels = 93.2 ug/100g (6/3/23)**
- **Kodiak City: Blue mussels = 134 (6/27/23)**
- **Old Harbor, Kodiak: Butter clams = 175 ug/100g (5/1/23)**
- **Sand Point: mussels = 3,793 ug/100g (6/15/23)**
- **Unalaska: mussels = 54 ug/100g (8/16/23)**





← Advisory limit



Starry Flounder



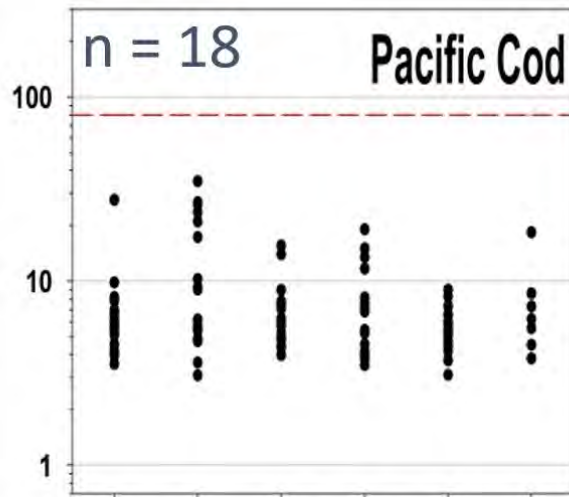
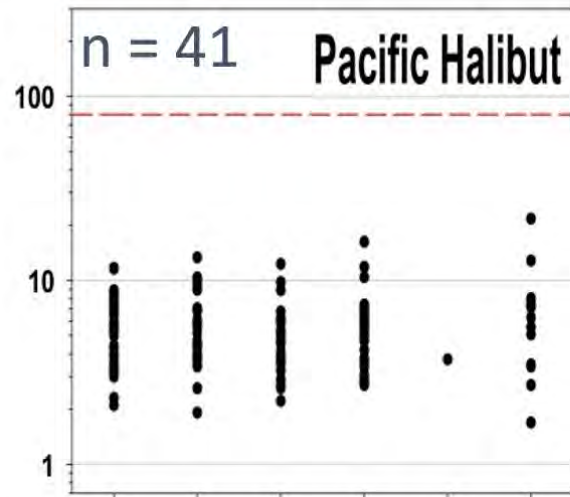
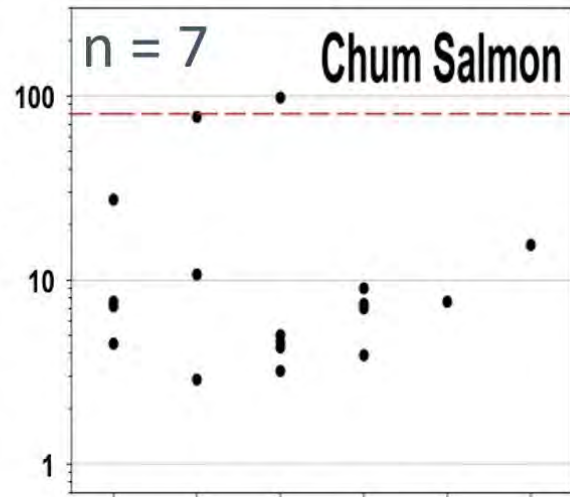
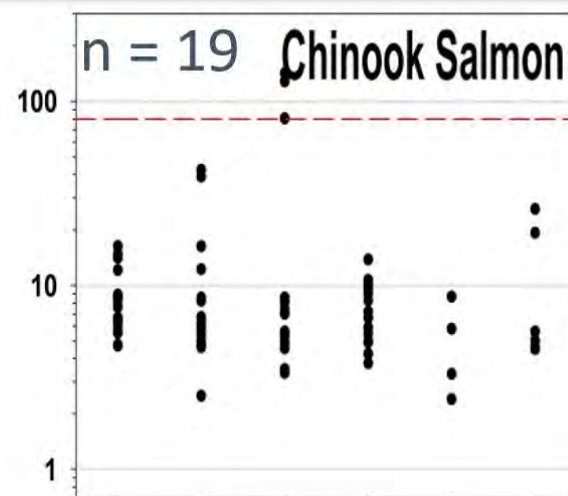
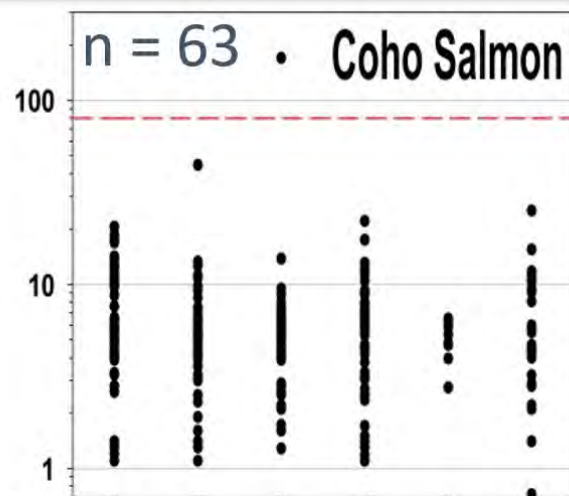
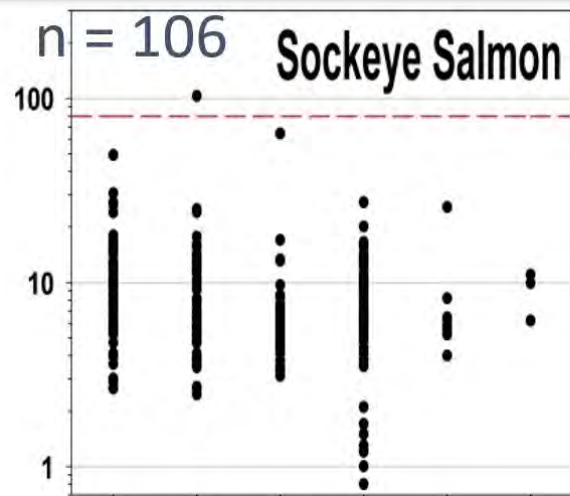
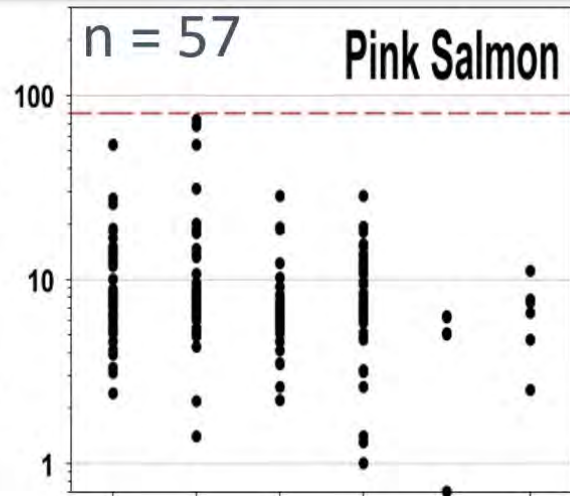
Staghorn Sculpin



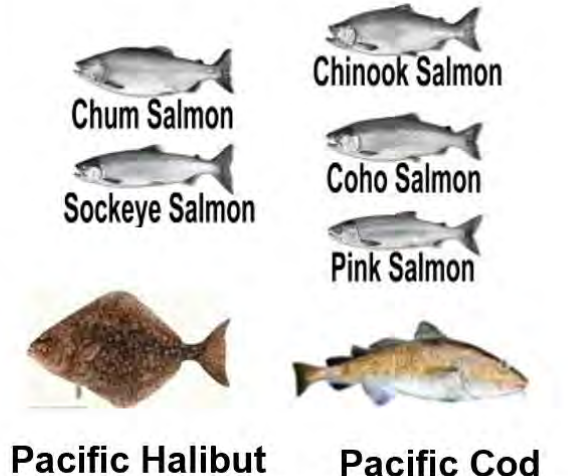
Crescent Gunnel



Conc. ($\mu\text{g STX Eq. } 100 \text{ g}^{-1}$)



Dig. Organs
Liver
Kidney
Muscle
Gonads
Stom. Cont.



PSTs in Alaska Salmonids

2019	Pink Salmon Liver	King Cove	73.6 (µg/100g)
	Sockeye Salmon Kidney	King Cove	64.3 (µg/100g)
	King Salmon Kidney	Juneau	128 (µg/100g)
	Chum Salmon Liver	Sand Point	76.8 (µg/100g)
2020	Pink Salmon Liver	Kodiak	53.8(µg/100g)
2021	Pink Salmon Liver	King Cove	58.2 (µg/100g)
2022	King Salmon Liver	Sitka	78.5 (µg/100g)
2023	King Salmon Liver	Yukon River	79.5 (µg/100g)
	King Salmon Liver	Yukon River	99.8 (µg/100g)
	Sockeye Salmon Liver	Seldovia	107 (µg/100g)
	Silver Salmon Liver	Upper Cook Inlet	73.0 (µg/100g)
	Silver Salmon Liver	Upper Cook Inlet	80.3 (µg/100g)
	Sockeye Salmon Guts	Lake Iliamna	11.3 (µg/100g)
	Rainbow Trout Liver	Lake Iliamna	17.5 (µg/100g)

Continuing & Future Work

- Sampling year-round
- Awaiting DEC HPLC test results
- Collaborations:
 - PSTs in wolves,
 - PSTs in NPS survey species,
 - PSTs in salmon: Yukon River, Lake Iliamna, other,
 - PSTs in subsistence shellfish: Nome area crab.....
 - Offshore salmon survey samples
 - Pacific cod samples





Questions?

Contact:

Jackie McConnell
Project Coordinator
jmccconnell@kniktribe.org

Bruce Wright
bwright@kniktribe.org



Alaska PSP Monitoring and Risk Assessment Project : Sampling Protocol and data interpretation

Jackie McConnell, Knik Tribe

Field Sampling



Collect

Bivalves,
fish,
crab,
invertebrates



Prepare

Clean the
sample



Freeze

One specie
per bag /
sampling
event



Ship

Chain of
Custody

Field Sampling

Collect the sample

- Largest available bivalves
- Collect at least 10 g (a cup)
- Samples must be collected from the same beach



Field Sampling

Get the sample ready!

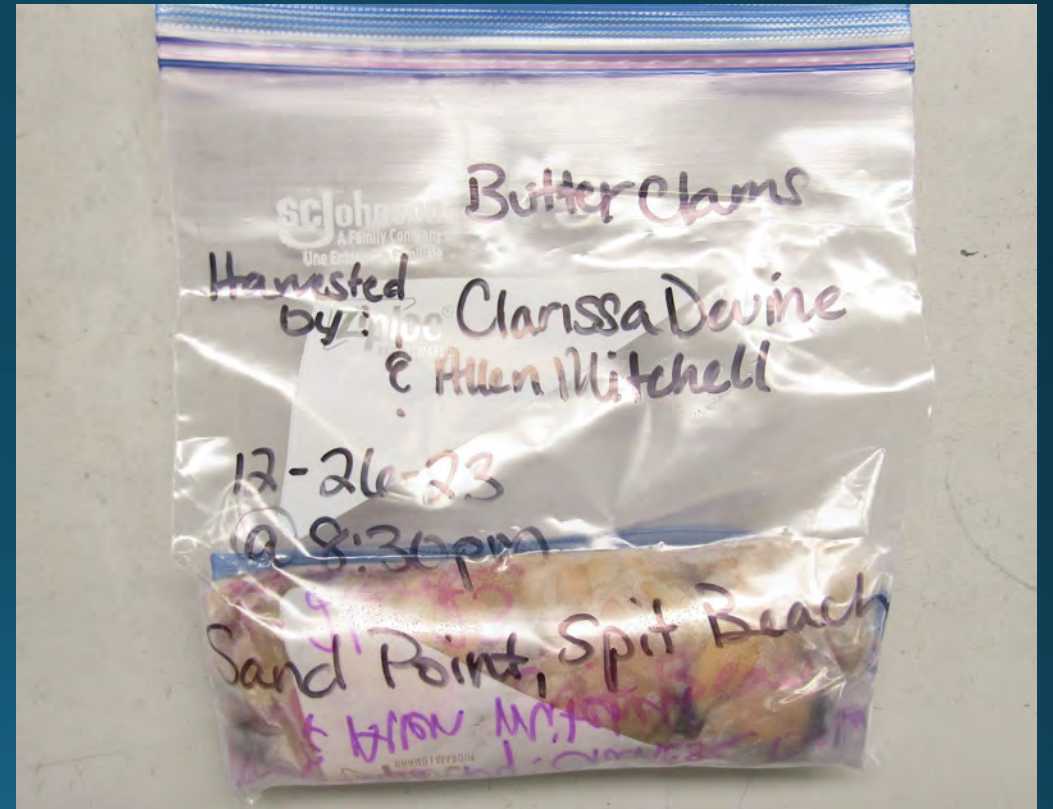
- Bivalves: Shuck and drain
- Dissect large fish: muscle, gonads, digestive tract, liver, kidneys, and heart
- Whole small fish: sand lance



Field Sampling

Freeze

- Label each plastic bag: date, species, location
- One species per bag / sampling event



Field Sampling



Ship it!

- Fill the Chain of Custody
- Samples must be in a sealable box or other container for shipping.
- “Keep Frozen”.



Questions?

Contact:

Jackie McConnell
Project Coordinator
jmccconnell@kniktribe.org

Bruce Wright
bwright@kniktribe.org