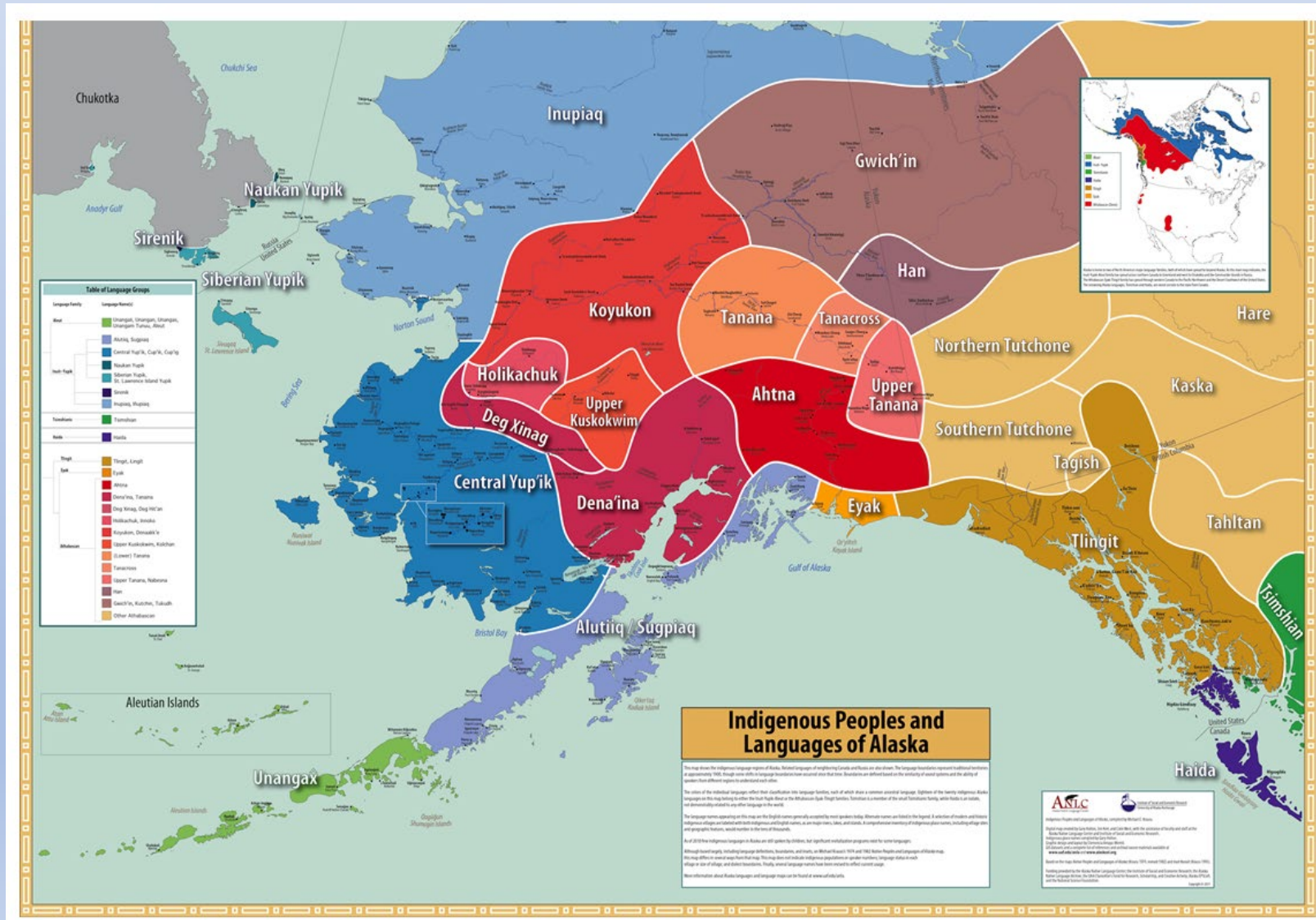


Harmful Algal Blooms in Southeast Alaska

Matthew Gribble, UCSF



Acknowledgement of Peoples and Lands



Paralytic Shellfish Poisoning: A Major Health Disparity

- Butter clams are a staple of Alaska Native diets
- Saxitoxin was named after its occurrence in butter clams' tissues (*Saxidomus gigantea*)
- Alaska Natives had a prevalence ratio of 11.6 (vs. whites) for paralytic shellfish poisoning (PSP) caused by saxitoxin and related toxins in a household community survey

Gessner BD, Schloss M. A population-based study of paralytic shell fish poisoning in Alaska. *Alaska Medicine*.1996;38:54-8, 68.

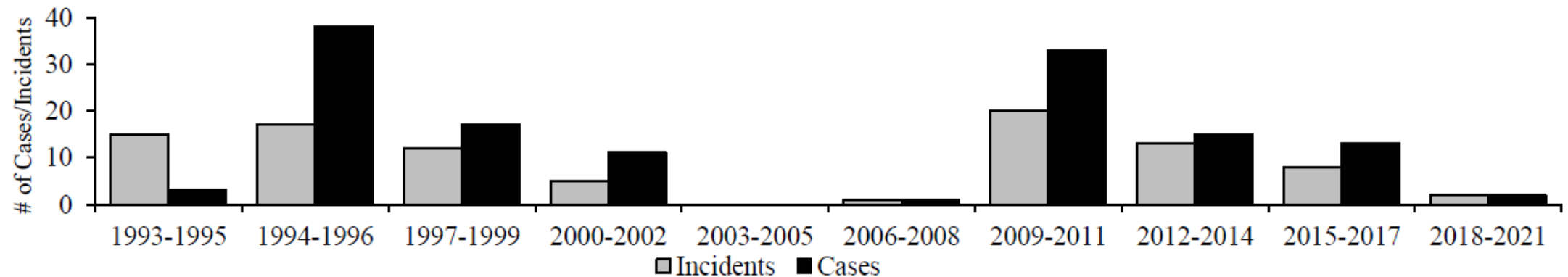


Photo Credit: Florence Welsh (Sitkavores blog)

Epidemiology of PSP Reported to Alaska Section of Epidemiology, 1993-2021

- There were 132 reported PSP cases in 79 incidents (1-7 cases per incident)
- 55% of reported PSP incidents occurred during April-July
- Among the 85 reported cases for whom race was recorded, 53% were Alaska Native, 26% were Asian, 21% were white.

Figure 1. Reported PSP Cases (N=132) and Incidents (N=79) — Alaska, 1993–2021



Newell, Katherine G. Paralytic Shellfish Poisoning Update – Alaska, 1993-2021. *State of Alaska Epidemiology Bulletin*. 5. April 21, 2022

Southeast Alaska Tribal Ocean Research (SEATOR) Consortium

[Home](#)[New!](#)[Basic Info](#)[STAERL](#)[Data](#)[Ocean Acidification](#)[Clean Water](#)[Links List >](#)

Shellfish Data

Weekly phytoplankton data is collected at each SEATT site and uploaded to the SoundToxins database. Once the Tribes begin sampling shellfish for toxins ...

[Data >](#)

Shellfish Testing

Learn more about PSP, shellfish identification, regulatory standards, and how other Monitoring groups are using weekly phytoplankton data to enhance state regulatory authority.

[Toxin Information >](#)

Ocean Acidification

With the changes in ocean chemistry due to climate change, Southeast Alaska has been deemed one of the "high risk" ...

[Ocean Acidification >](#)

Partners

Partners for projects include the Southeast Alaska tribal environmental programs, federal agencies, universities, and private industry. All partners share a common goal ...

[Partners >](#)

SEATT

The Southeast Alaska Tribal Toxins (SEATT) partnership was formed in September 2013 to unify southeast Alaska Tribes in monitoring ...

[SEATT >](#)

Job Opening

There are no current job openings. Please check again in the future. Thank you.

[Application >](#)

Highlighted SEATOR Partners

Central Council of the Tlingit and Haida Indian Tribes of Alaska

Chilkoot Indian Association

Craig Tribal Association

Kodiak Area Native Association

Hoonah Indian Association

Hydaburg Cooperative Association

Ketchikan Indian Community

Klawock Cooperative Association

Metlakatla Indian Community

Organized Village of Kake

Organized Village of Kasaan

Petersburg Indian Association

Skagway Traditional Council

Sitka Tribe of Alaska

Sun'aq Tribe of Kodiak

Wrangell Cooperative Association

Yakutat Tlingit Tribe



Tracking toxins and warning the public



Southeast Alaska Tribal Toxins

Shellfish Advisory

This map shows both shellfish biotoxin data and current phytoplankton observations. Phytoplankton data is not shown in the default view. Shellfish biotoxin data is provided by the [Sitka Tribe of Alaska](#). SEATOR and reflects levels of Paralytic Shellfish Toxins unless otherwise indicated. data is time sensitive and location-specific. Contact seator@sitkatriben-sn.gov with questions.

Shellfish ID info Regulatory limits

Current Biotoxin Advisory Level

- Incomplete baseline data
- No recent data
- No advisory
- Advisory for some species
- Advisory for all species

Current Phytoplankton Abundances

- No recent data
- Absent
- Present
- Common
- Bloom

Data type

All

Location

All

Shellfish biotoxins

All

Phytoplankton species of concern

All

Phytoplankton species

All



Total points: 73 On screen: 39

Seasonality of Toxigenic Algae in Southeast Alaska

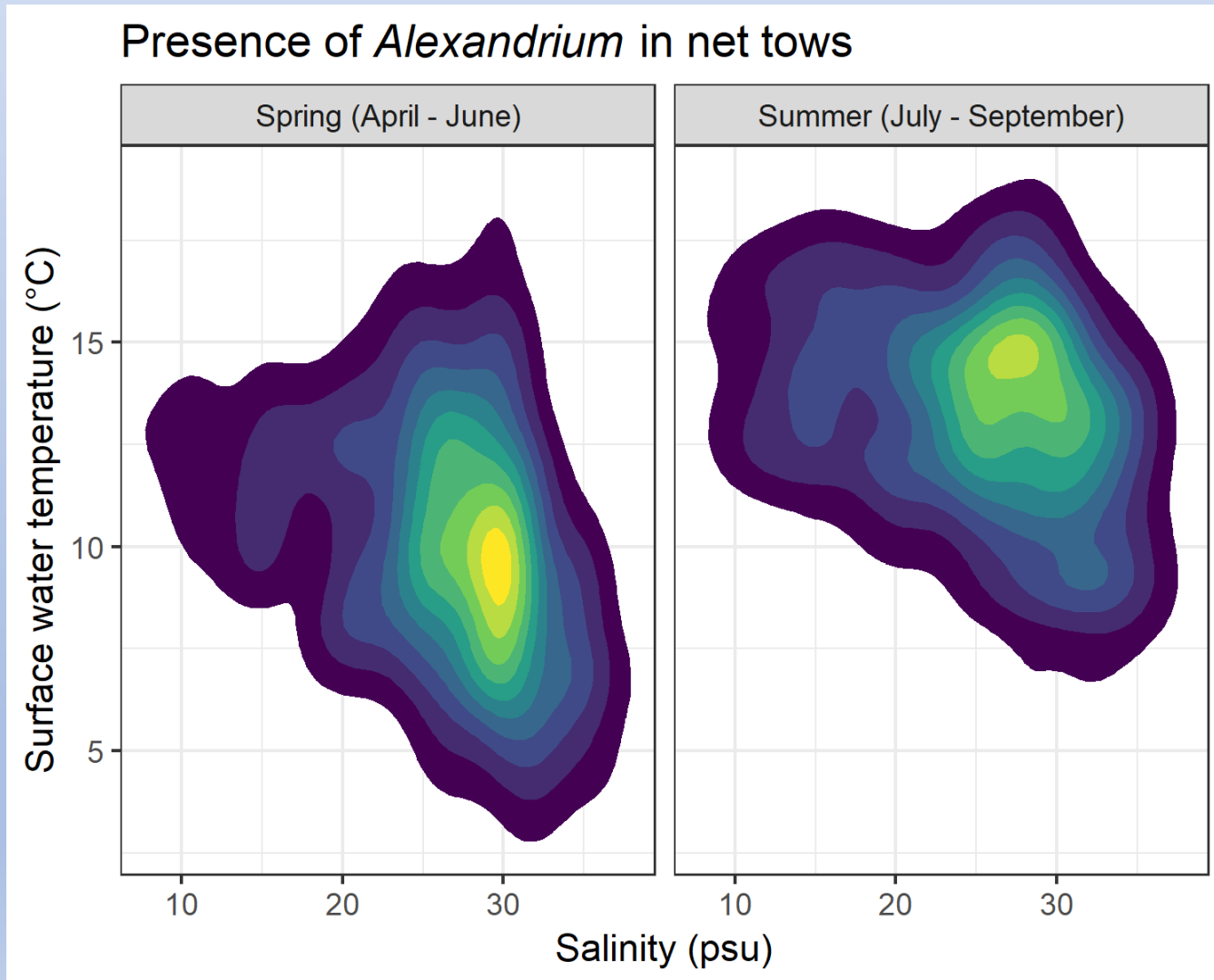
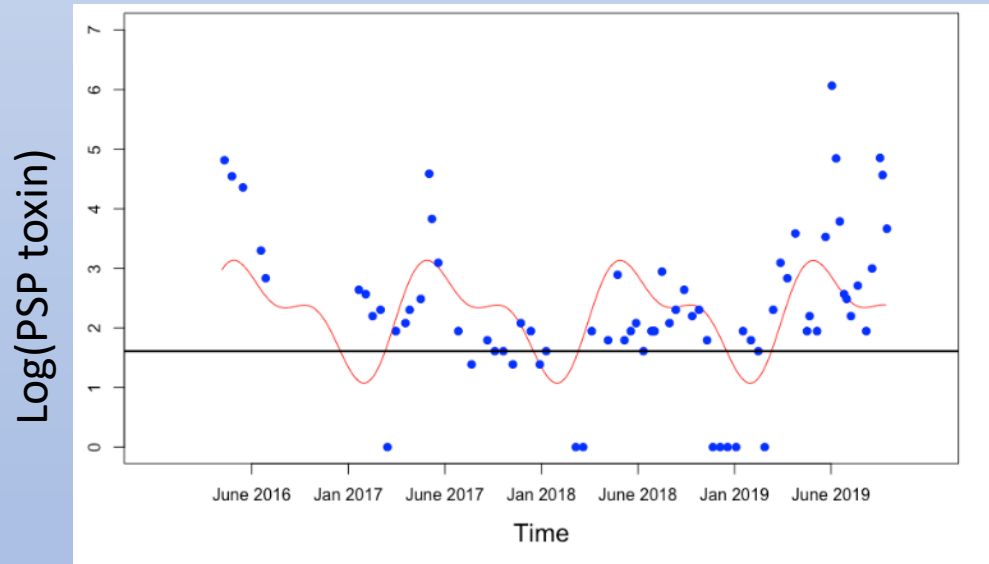
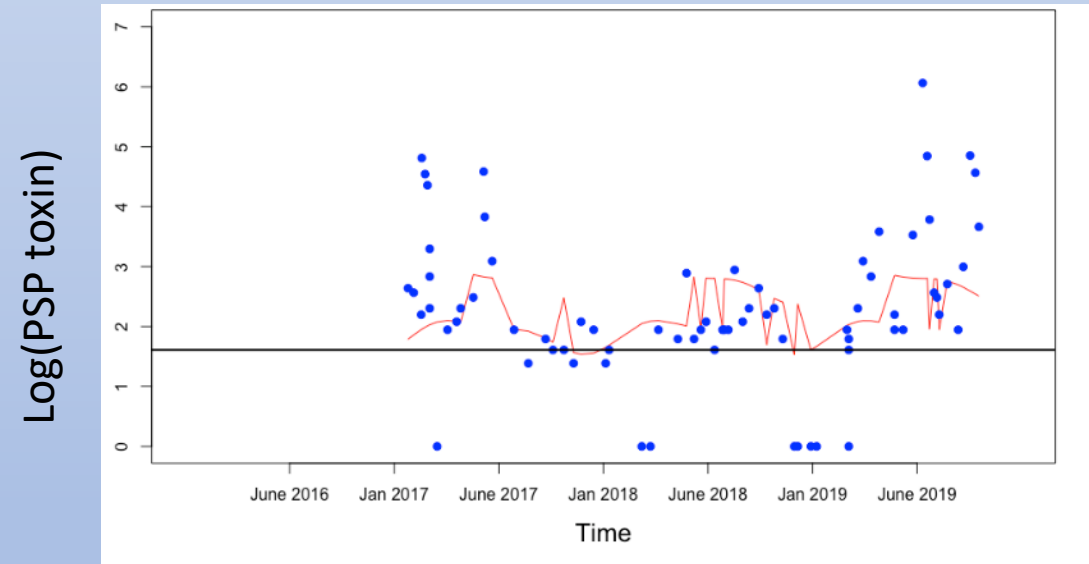


Figure 5 – 2-dimensional kernel density estimation of *Alexandrium* presence in phytoplankton net tows in relationship to measured salinity and SST. Color gradient represents density of *Alexandrium* observations (low=blue, yellow=high) during spring (April-June) and summer (July-September). Plotted here are 1,176 observations of *Alexandrium* identified using microscopy by SEATOR partners. The color of each polygon corresponds to the density of observations within that kernel (level).


Results for a single sampling location (research in progress)



Site seasonal pattern based only on toxin data
(k=2 harmonics)



Model predictions conditional on measured predictor variables
(X_{ij} = Temperature & Salinity in acceptable range for *Alexandrium*)

Blue Mussels		<p>Size: Up to 3 inches</p> <p>Shape: Oblong</p> <p>External: Blue-black or brown shell</p>	<p>Depth: n/a</p> <p>Substrate: Rocks, pilings, boats, gravel, and other hard surfaces</p> <p>Zone: Intertidal</p>
Butter Clams		<p>Size: Up to 5 inches; heavy for size</p> <p>Shape: Oval to square</p> <p>External: Prominent concentric rings on a cream or gray shell. No external siphon or mantel.</p>	<p>Depth: 12-18 inches</p> <p>Zone: Lower intertidal or shallow subtidal (up to 120 feet)</p> <p>Substrate: Sand, gravel</p>
Pacific Littlenecks		<p>Size: Up to 2 ½ inches</p> <p>Shape: Oval to round</p> <p>External: Concentric rings with radiating ridges forms a lattice pattern. Cream/gray color, but sometimes mottled with brown. White interior of shell.</p>	<p>Depth: 4-6 inches</p> <p>Substrate: Gravel, mud</p> <p>Zone: Normally mid-tide level to lower intertidal, sometimes subtidal</p>
Cockles		<p>Size: Up to 6 inches</p> <p>Shape: Round (somewhat triangular)</p> <p>External: Prominent, evenly spaced ribs radiate from the hinge and extend to the shell margin. Typically, light brown color, but sometimes with lighter colored ribs or with concentric dark bands.</p>	<p>Depth: 1-2 inches</p> <p>Zone: Intertidal or subtidal (up to 90 feet)</p>



Name _____

Butter Clam Risk Mitigation Dissection

Label the selected Butter Clam organs and describe any processing techniques that harvesters use to decrease their risk of toxin consumption. Not all organs have processing methods that decrease toxin risk.

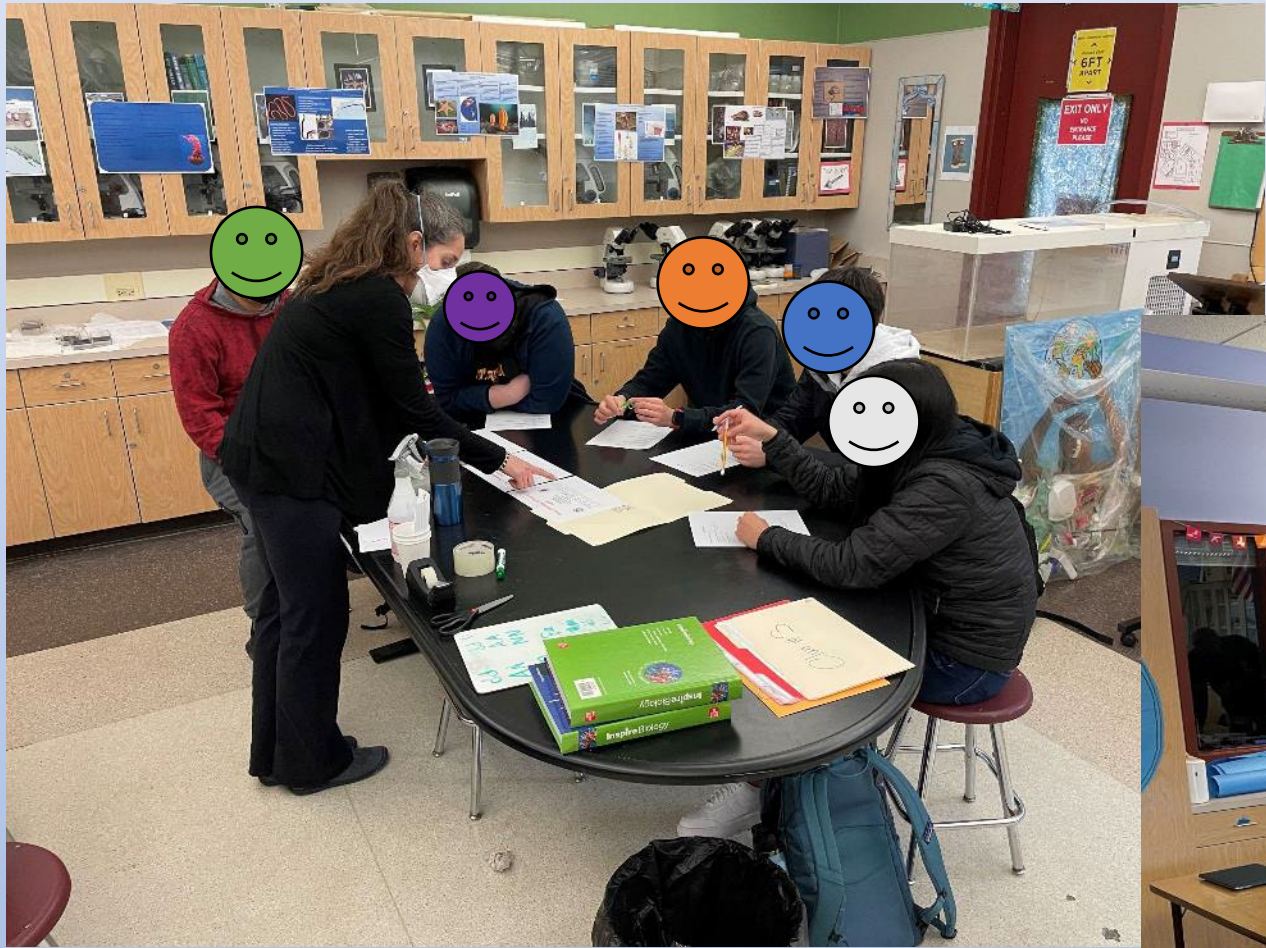
Remember, there is always a risk when eating wild clams!



Sitka Tribe of Alaska Environmental Research Lab
Butter Clam Risk Mitigation Dissection



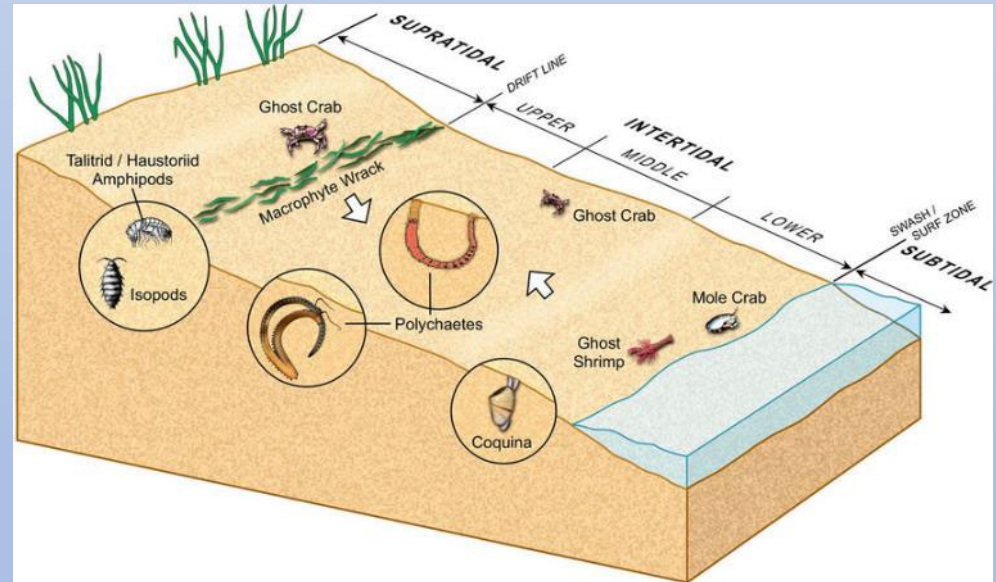




Tide Pool - léin héeni



Beach Zone - léin wooch t'agakóot





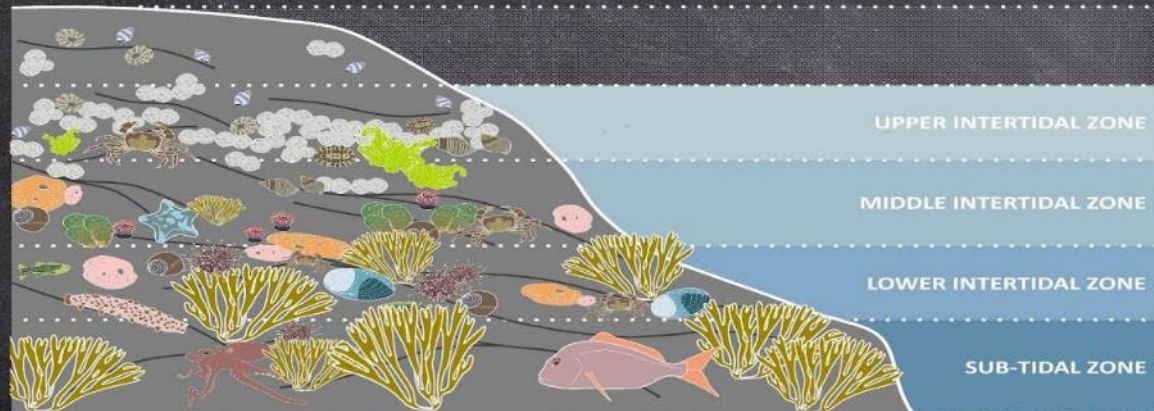
Splash Zone - téet x'atú

Upper Intertidal Zone - léin tléin

Mid Intertidal Zone - héen kwéiyi

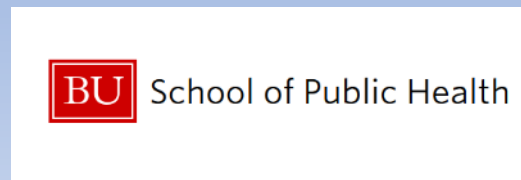
Lower Intertidal Zone - léin wán

ROCKY INTERTIDAL ZONATION



Tribally Led Oceans and Human Health Center

- Knowledge Warding Against Toxin Levels (P01ES035551)



Acknowledgements

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