PST Results and Risk Assessment and Prediction

Grade Level: 6th-12th grade

Subject: Biology, Marine Science

Recommended length of time for unit: 20 minutes

Overview: This activity will be taking place on the second day of Clam Camp. Review previous shellfish collection with students. Discuss how the paralytic shellfish toxins (PSTs) results are determined in the lab. Review PST Report for shellfish collected by the students. Discuss the risk associated with this specific result. Discuss broader information obtained through the results.

Objectives/Goals:

- Students should understand how to read a PST Marine Biotoxin Report.
- Students should understand general trends on PSTs in Southeast Alaska
- Students should be able to make general predictions about future PSTs based on the time of year.
- Maintain COVID safety procedures and social distancing while conducting outdoor, hands-on science education activities.

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Materials: PST Report with collected data, previous PST reports that show seasonality, printed figures of blue mussels, cockles and littlenecks and butter clams from all SEATOR sites

COVID safety: As possible, each student should have their own field kit so they can maintain social-distancing and avoid touching the same surfaces (especially items that touch the face like the refractometer). If there are not enough resources for individual kits, student groups should take turns sampling to provide ample time between the groups for washing and disinfecting the equipment. Gloves and clear adhesive stickers (to put over on the eyepieces and change out between students) are additional recommended safety precautions.

RBA lab process discussion: Instructors will describe the laboratory analysis used to determine the final PST values that are published on the PST Marine Biotoxin Report.

PST report discussion: Students will be asked to recall what species they collected during the previous session and to make predictions about what the PST levels for each species will be. Students will review the PST marine biotoxin report with the data from their collected species. Students and instructors will discuss if they match or are different from the predictions. Students will be asked to evaluate the current risk of those samples.

Seasonal PST reports: Students will receive 4 PST marine biotoxin reports from a SEATOR site. Reports will be from April, June, October and January. There will be 3 different report packages that show different PST trends. Students will need to group up according to their package, discuss the results and present to the whole group their findings.

1) Ketchikan- Early PST increase, low levels in late summer, high levels in butter clams year-round.
2) Petersburg- Hardly any PSTs year-round in all shellfish species.
3) Klawock- Low levels of PSTs in early spring, typical fall bloom, butter clams usually depurate toxins in winter.

Long term monitoring discussion: Students will have figures that display the entire SEATOR data set for blue mussels, littlenecks, cockles and butter clams. Students and instructors will discuss the trends that the long-term data set illuminates.

Predictions and data access: Students and instructors will discuss possible PST scenarios and make predictions on the associated risk. Students and instructors will discuss the use of SEATOR.org/data for finding the PST levels for regularly monitored sites.