2022 King County *Alexandrium* Cyst Concentrations in Bed Sediments

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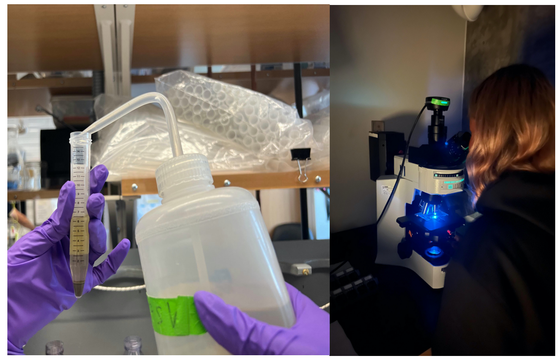
Introduction

Alexandrium catenella blooms produce a toxin that accumulates in shellfish, potentially producing paralytic shellfish poisoning (Greengrove et al. 2012). Monitoring the concentration and distribution of the dormant cysts to assure public health. The purpose of this project is to continue the monitoring work done by King County to establish long-term trends.

Methods

- Bed sediment was collected by King County's Marine Monitoring Program from various locations in the Puget Sound around King County.
- Samples were processed using the modified Yamaguchi et al. 1995 method.
- **Diluting:** 5ml of sediment to 1:5 with filtered sea water (FSW)
- **Sonicating:** removes excess sediment
- **Sieving:** 90 µm – 20 µm sieves
- **Preserving:** preserved using formalin
- **Etching:** etched with methanol
- **Staining:** stained using primulin
- **Microscopy:** epifluorescence compound microscope



Left: Filtered sea water (FSW) was added to a 15mL centrifuge tube sample. Right: The processed sample was analyzed under an epifluorescence microscope.

Results

- *Alexandrium* cysts only found at Central Quartermaster Harbor and Inner Quartermaster Harbor.
- No *Alexandrium* cysts were found at other stations.

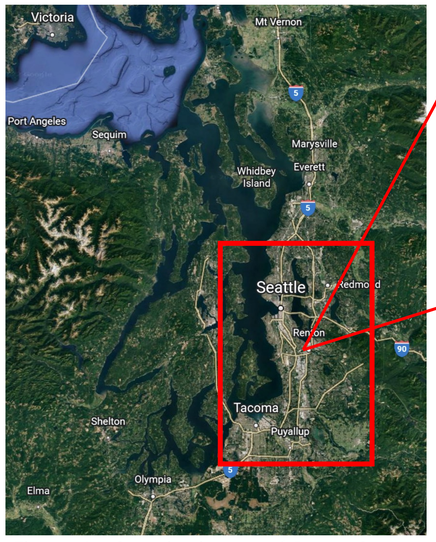


Figure 1 : Satellite image of Puget Sound captured using Google Earth.

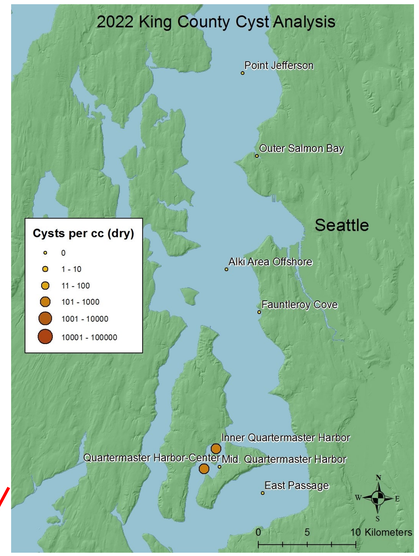


Figure 2: Cyst abundances in King County region (dry sediment). The dry measurement describes the number of cysts in the solids, omitting water fraction.

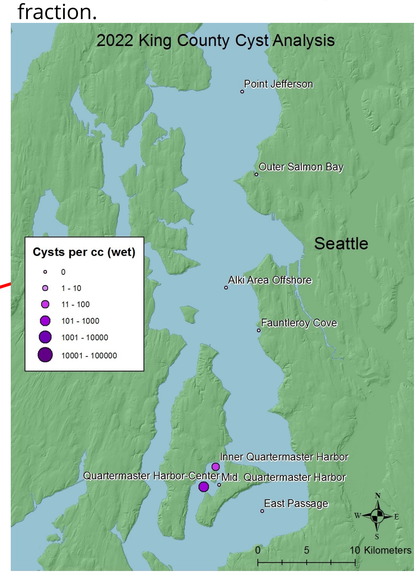
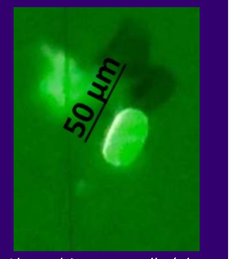


Figure 3: Cyst abundances in King County region (wet sediment). The wet measurement describes the spatial distribution of the cysts.

QUICK FACTS

- *Alexandrium catenella* is a dinoflagellate with two life phases – a dormant stage in bed sediment and a vegetative swimming stage.
- *Alexandrium* can produce toxins that cause paralytic shellfish toxins (PSTs) – which has potential to harm humans when consuming.
- Resting cysts are mapped to determine next season's potential for harmful algae bloom occurrence.
- Quartermaster Harbor is the only location with *Alexandrium* cysts for this study.



Alexandrium catenella (photo by Caitlyn McFarland)

Discussion

- Figures 2 and 3 show that the cyst abundances in Central Quartermaster Harbor and Inner Quartermaster were high compared to other stations.
- This is in line with the data from previous research (Masura et al. 2021; Greengrove et al. 2012).
- Possible errors that could affect cyst counts.
  - Samples were collected during Spring/Summer.
  - High temperatures and increased nutrient availability can cause excystment into vegetative cells

Conclusion

- The presence of *Alexandrium* implies Quartermaster Harbor should continue to be monitored.
- Monitoring *Alexandrium* is important for officials to inform the public of potential environmental threats.

References