



May 14th, 10:00 AM - 2:00 PM

## Organic content and silt to sand ratio in correlation with porewater sulfide concentrations found in eel grass (*Zostera marina*) beds

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## Introduction

Eelgrass meadows are a vital marine habitat for both economically valuable species and nutrient cycling. Due to ecological functions such as these, eelgrass is considered an indicator of Puget Sound health.<sup>1</sup> Goals to increase the distribution of eel grass by 20% in 2020 motivate investigations of conditions that limit eelgrass distribution. Sulfide, a chemical found in the sediment's porewater, could limit eelgrass because it is potentially toxic.<sup>2,3</sup> However, sulfide is difficult to extract and measure in the field. Sulfide forms in organic rich sediment; therefore, sediment characteristics could be used to estimate sulfide concentration. In this study, we asked: **How do sediment characteristics, such as organic matter and grain size, correlate with the amount of porewater sulfide in eelgrass meadows?**

## Methods

### Field Sampling

- August 2014, 4 sites sampled.
- At each site: 8 samples of sediment with corresponding porewater was extracted either by coring or sipping.
- Porewater sulfide concentration was measured.

### Sediment Characteristics

- Organic Matter: Samples were dried, weighed, burned in a muffle furnace at 500°C for 3 hours to remove organic material, and reweighed. % organic content of original weight.

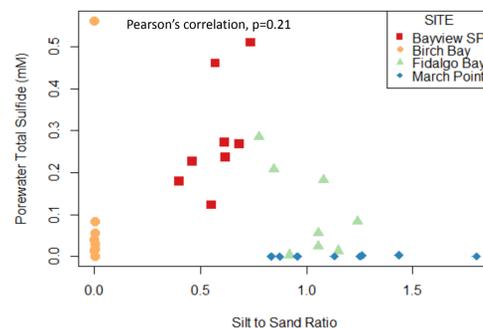
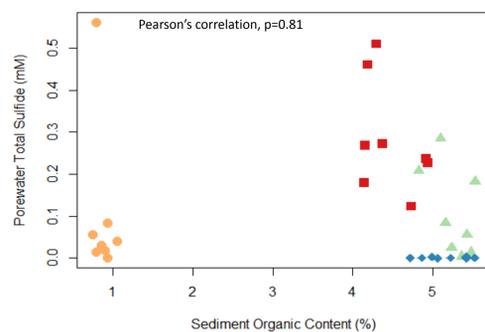


- Grain Size: Samples were wet-sieved. Silt (< 63 μm) and sand (> 63 μm) fractions were dried and weighed. Silt to sand ratio was calculated.

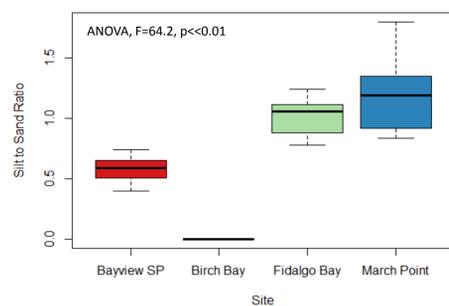
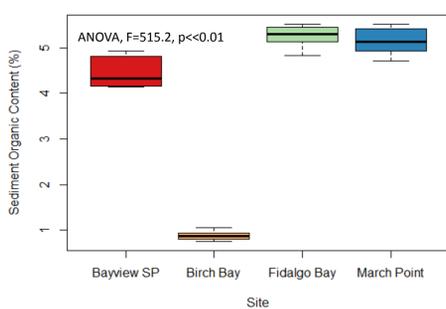


## Results

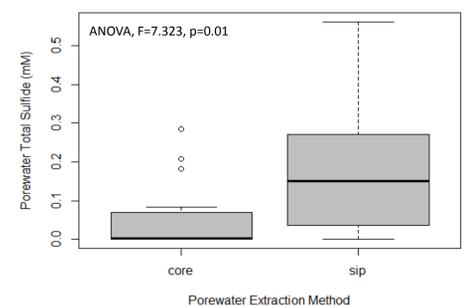
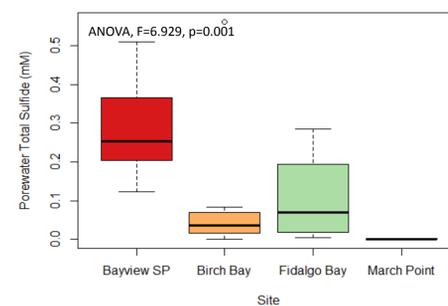
Porewater sulfide concentration did not correlate with organic matter or grain size.



Sediment characteristics differed by site.



Porewater sulfide differed by site and extraction method.



## Conclusions

- Sediment characteristics we measured did not correlate to the amount of porewater sulfide.
- Porewater sulfide did relate to site and extraction method.
- Therefore, % organic content and silt to sand ratio cannot be ruled out as indicators of porewater sulfide.
- Future studies should use the same method to extract porewater sulfide from each site.
- Other sediment characteristics could be indicators, such as carbon to nitrogen ratio and redox.
- Sediment characteristics were site-specific and clustered.
- Site locations should be deliberately chosen to sample the entire range of sediment types.