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West Whidbey Island nearshore bathymetry and coastal topography survey reveals diversity of sediment, morphology, and habitat

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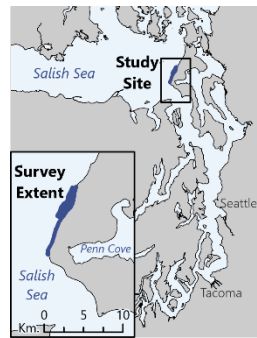
Stokes, Delaney, "West Whidbey Island nearshore bathymetry and coastal topography survey reveals diversity of sediment, morphology, and habitat" (2022). *Salish Sea Ecosystem Conference*. 351. <https://cedar.wwu.edu/ssec/2022ssec/allsessions/351>

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INTRODUCTION

In May 2018, The Washington State Department of Ecology Coastal Monitoring & Analysis Program performed a topo-bathymetric survey along a 4-km reach of west Whidbey Island.

The survey revealed a complexity of morphology and sediment type with varying levels of vegetation, highlighting the importance that the nearshore plays in habitat and ecosystem service functions.



West Whidbey Island topo-bathymetric survey reveals diversity of nearshore sediment, morphology, and habitat

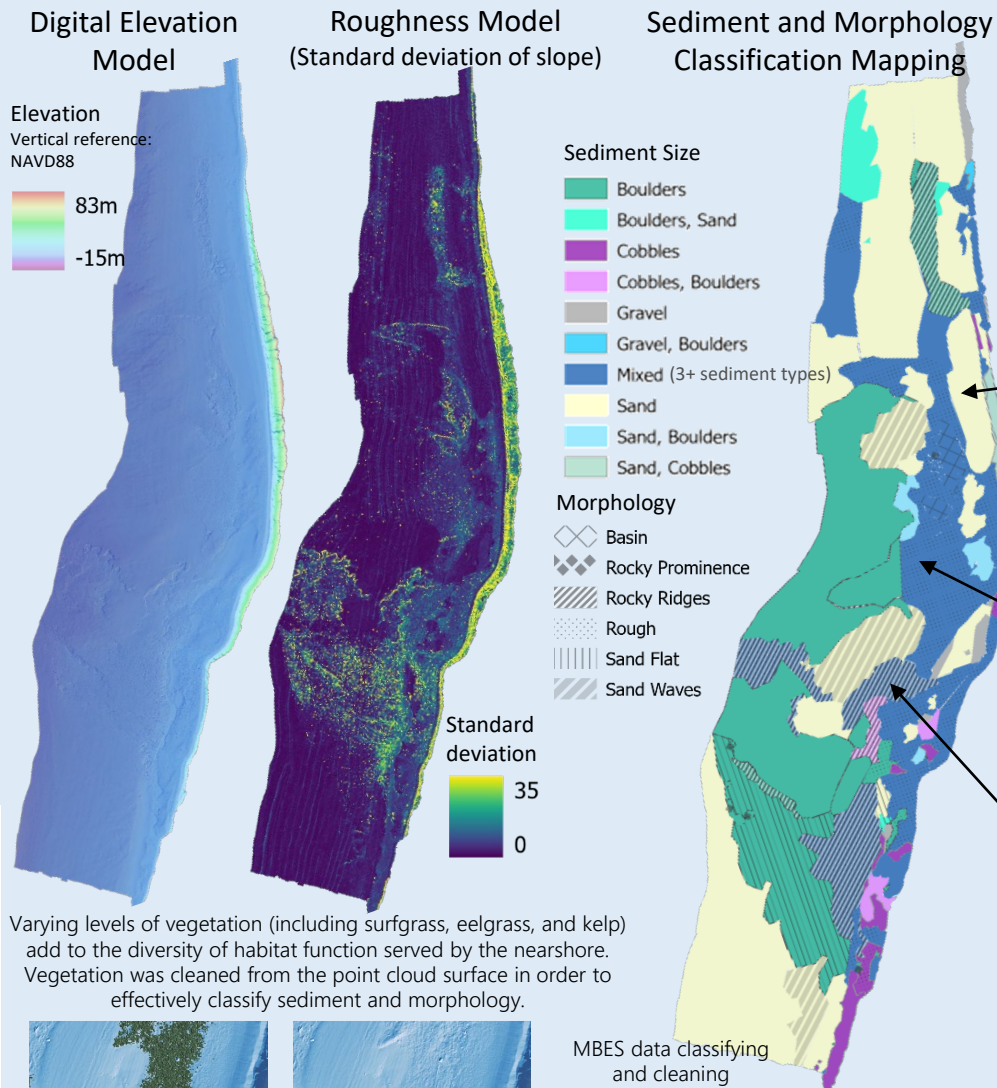
Authors: Delaney Stokes, Amanda Hacking, George Kaminsky, Hannah Drummond

DISCUSSION

- Morphological and sediment size complexity contributes to habitat diversity, providing important spawning grounds and protection for forage fish species.
- As shown, complexity at our survey site is greater closer to shore.
- Coastal survey data of the Puget Sound nearshore environment have rarely been collected due to difficulties using traditional survey methods, but these data are critical in informing management and conservation.

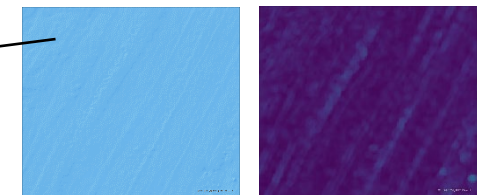
METHODS

- High-resolution bathymetric data were collected using dual-head multibeam sonars aboard the R/V George Davidson.
- A roughness model was created by taking the standard deviation of slope within the DEM, highlighting size differences in substrate.
- Classification polygons were delineated using the roughness model for sediment type differentiation, and the DEM for morphology classification.
- Percent of total area was calculated for each distinct combination of sediment and morphology type.

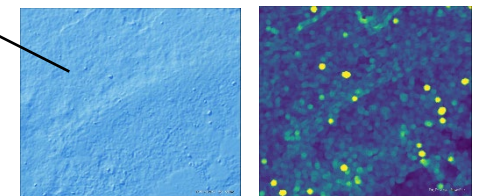


INTERPRETATION EXAMPLES

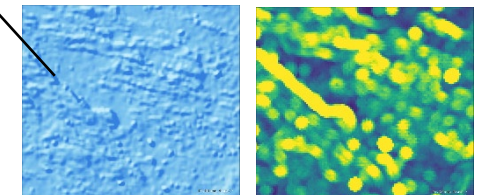
Morphology: Unclassified. Sediment: Sand.



Morphology: Rough. Sediment: Mixed.

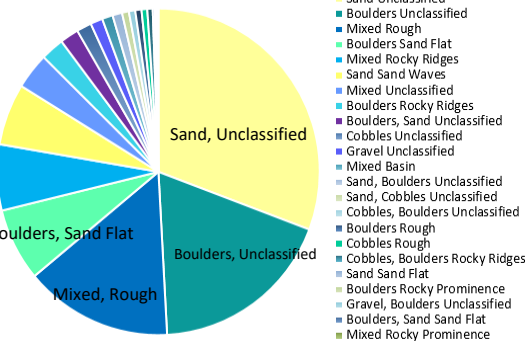


Morphology: Rocky ridges. Sediment: Mixed.

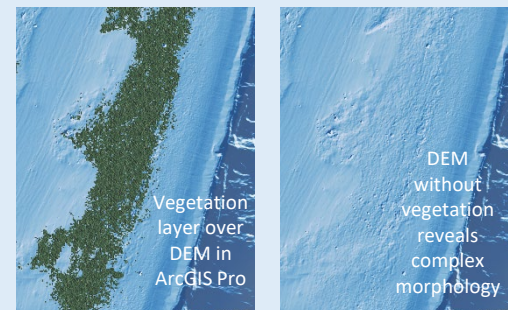


RESULTS

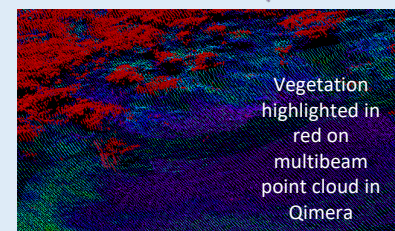
Combined Sediment and Morphology type by Percent



Varying levels of vegetation (including surfgrass, eelgrass, and kelp) add to the diversity of habitat function served by the nearshore. Vegetation was cleaned from the point cloud surface in order to effectively classify sediment and morphology.



MBES data classifying and cleaning



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