

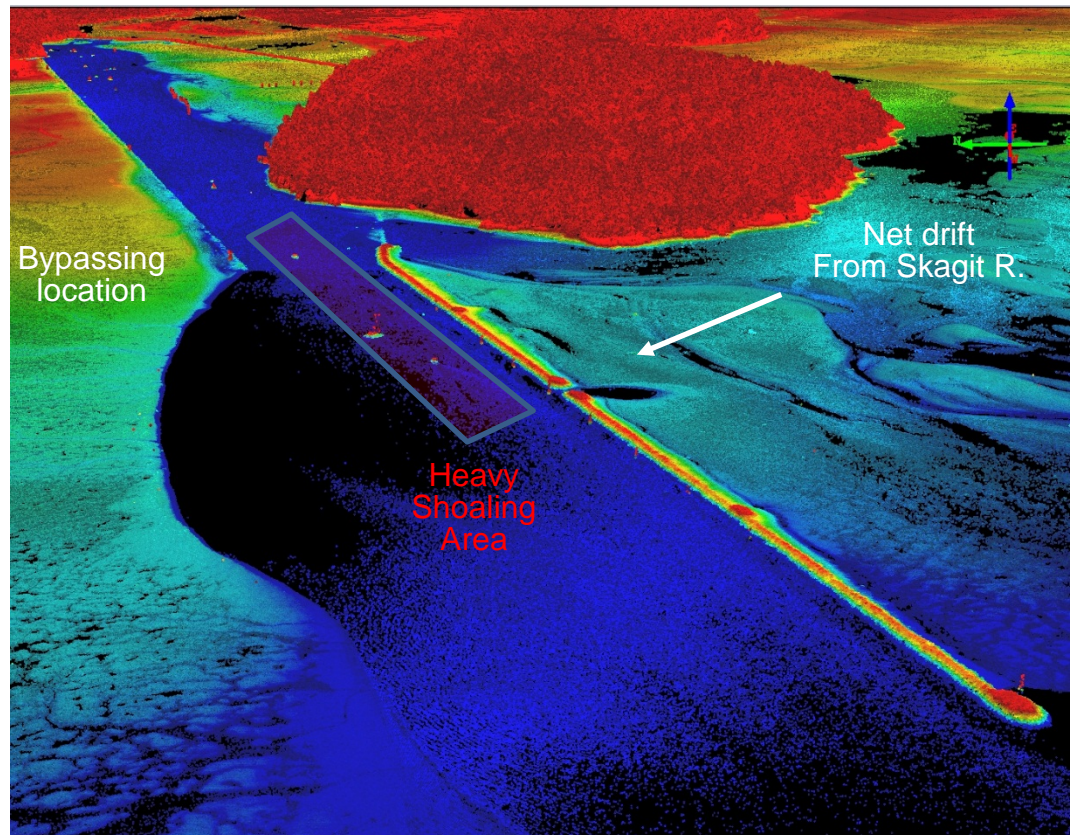


# Regional Sediment Management Program Seattle District (NWS): Feasibility of Nearshore Placement at the Swinomish Navigation Channel



## Description

Seattle District will investigate the feasibility of a sediment bypassing operation at the Swinomish Federal Navigation Project. The goal of the bypassing program is to limit the life-cycle costs associated with the Operations and Maintenance (O&M) dredging project.



## Issue/Challenge To Address

Annually, the Skagit River supplies approximately 2.8 million tons of sediment into Skagit Bay, which is the largest of Puget Sound tributaries (Czuba et al 2013). Shoaling in the Swinomish channel is a significant issue affecting navigation reliability. The functionality of the 12 foot Mean Lower Low Water (MLLW) channel has been directly related to the condition of the coastal navigation structures, which have deteriorated over the past century. Recent condition surveys from June 2014 indicate channel depths are less than 5 feet below MLLW in the channel reach between Skagit Bay and McGlinn Island. The frequency and magnitude of shoaling is adversely impacting navigation traffic through the channel by restricting transits to low tide. Currently dredging is limited to clamshell bucket dredging and requires dredged material to be placed in deep water by a bottom dump scow barge over 20 miles from the dredging site. The Seattle District will investigate alternatives to minimize O&M dredging and placement costs. This would involve nearshore placement of dredge material immediately downdrift of the channel (to the north) by either bottom dump barge or unconfined hydraulic discharge from a submerged pipeline.



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## Successes Lessons Learned

Lessons learned will be compiled during the duration of this study.

## Expected Products

- Description of Alternatives to be Analyzed
- Particle tracking modeling of sediment transport pathways at the proposed placement sites
- Supplemental NEPA/SEPA environmental documents to address changes in operations
- Final Report and Presentation
- Newsletter article to advocacy group

## Stakeholders/Users

Stakeholders include the Port of Skagit and the Swinomish Indian Tribe

## Projected Benefits

Currently all sediment dredged from the Swinomish Navigation Channel is placed in deep water site in Rosario Strait approximately 20 miles away from the navigation channel. Establishing a sediment bypassing program would move sediment more efficiently, be cost effective, and keep valuable sediment in the nearshore system.

## Leveraging Opportunities

The USACE has partnered with the Department of Energy - Pacific Northwest National Laboratory to refine their existing three-dimensional hydrodynamic /sediment transport model of Skagit Bay (Yang and Khangaonkar 2009). The Seattle District has funded the calibration and validation of the finite volume community ocean model (FVCOM) specifically for Swinomish channel which will be completed in early 2016. This effort included recent collection of detailed bathymetric and topographic survey data and hydrodynamic current data. The FVCOM model will be utilized to force the particle tracking model for this study.

## Points of Contact

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## Participating Partners

Pacific Northwest National Laboratory, Port of Skagit