



Regional Sediment Management Program Seattle District (NWS): Ediz Hook post-dam removal shoreline change analysis



Description

The Ediz Hook beach erosion control project is located in Port Angeles, Washington situated on the Strait of Juan de Fuca. The spit protects Port Angeles Harbor from northwesterly wave attack which is the only U.S. deep-draft harbor located on the Strait of Juan de Fuca. The sediments which formed Ediz Hook originated from the Elwha River and the coastal bluffs east of the river delta. The historic supply of sediment supply was reduced to 10% of the historic rate following construction of Elwha Dam in 1914, Glines Canyon Dam in 1927, and a bulkhead protecting the City of Port Angeles water supply line along the adjacent coastal bluffs. Over time this has led to a coarsening and steepening of the beaches east of the river delta. In 1978, the Corps of Engineers initiated a cobble and gravel beach nourishment program to minimize coastal storm damage to Ediz Hook.



Figure 1: Elwha River Littoral Drift Cell Area

Issue/Challenge To Address

Over 2 million cubic yards of sediment have been deposited in the nearshore region in the 2 years following dam removal. Routine monitoring of the river delta and adjacent bluffs is currently being performed by number of state and federal agencies. However, the magnitude and time scale of sediment delivery from the delta to Ediz Hook approximately 5 miles downdrift is relatively unknown.

Successes Lessons Learned

Beach profile monitoring data will allow for calibration and validation of a GENCADE shoreline change model. A working model is essential for predicting nourishment demands at Ediz Hook as well as local shoreline management within the Elwha Littoral Cell. Progress on this goal will be documented throughout the duration of the study



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Expected Products

- Biannual beach profile surveys
- Biannual grain size distribution data
- Working GENCADE model of the Elwha littoral cell
- Future shoreline change simulations
- Technical Note

Stakeholders/Users

Stakeholders include the City of Port Angeles, Coastal Watershed Institute, Washington State Department of Natural Resources, Washington State Department of Ecology, U.S. Geological Survey, U.S. Coast Guard, and Nippon Industries, Inc.

Projected Benefits

The GENCADE model will compute longshore transport rates for the Elwha littoral cell and simulate shoreline change over time. This will help determine the temporal scale for sediment delivery to Ediz Hook. The model will also help guide beach restoration alternatives for a Section 206 (Aquatic Ecosystem Restoration Project – CAP authority) project with the City of Port Angeles. These alternatives will seek to optimize sediment delivered from the Elwha River to produce regional benefits to nearshore habitat and mitigate coastal storm damages.

Leveraging Opportunities

This study will provide a better understanding of sediment transport rates over the entire Elwha Littoral Cell. This work will leverage on-going survey work at the river delta and coastal bluffs being conducted by the USGS and the State of Washington.

Points of Contact

David Michalsen
H&H Branch, Coastal Engineer
206-764-3705
david.r.michalsen@usace.army.mil

Participating Partners

City of Port Angeles