

2025 Analysis of Particle Size and Total Organic Content of Bed Sediments in Elliott Bay, Puget Sound, WA

During June 2025, surface sediments (upper 2–3 cm) were collected with a Van Veen grab at 10 fixed sites in Elliott Bay to evaluate potential spatial and recent temporal changes in Total Organic Carbon (TOC) and Particle-Size distributions and to identify contamination hotspots and biological risks relevant to Elliott Bay, for the Puget Sound Ecosystem Monitoring Program (PSEMP). One sample was collected per site and each sample was analyzed twice ($n = 20$ analytical runs). TOC was determined by combustion and reported on both wet and dry weight, and particle-size distributions were measured on an LS13-320 laser diffractometer with obscuration targeted at 8-12%, with the runs averaged. Most samples were dominated by silt with median grain size ranged from 15 to 290 μm (mean $\approx 80 \mu\text{m}$). TOC (wet) ranged 1.05–4.61% and TOC (dry) ranged 1.34–10.19%. Median grain size versus TOC showed moderate correlations: $R^2 = 0.5133$ for TOC (wet) and $R^2 = 0.5486$ for TOC (dry). Nearshore urban sites and depositional basin exhibited distinct sediment characteristics. The depositional basin had elevated TOC that correlated with finer particle fractions, and particle-size distributions followed the expected nearshore-to-offshore gradient. These findings identify localized anthropogenic inputs and depositional hotspots in Elliott Bay and support PSEMP-targeted follow-up monitoring and comparison with historical sediment records to inform mitigation and habitat-protection decisions.