Sediment Remediation and Dredging Support

Windward manages sediment assessment, remediation, and monitoring projects. Our years of experience supporting sediment dredging and remediation projects are critical to the successful completion of these projects. Windward's sediment remediation experience includes aquatic site assessments under federal and state cleanup programs; remedial alternatives analysis, permitting, and regulatory support for sediment dredging projects; and habitat restoration design. These projects require an understanding of sediment chemistry, water quality, biological exposure pathways, ecology, and the regulatory framework under which the remediation program is being conducted.

Windward scientists and engineers have been instrumental in developing regional strategies to assess sediment quality (e.g., Washington State Sediment Management Standards) and evaluate dredged material (e.g., Puget Sound's Dredged Disposal Analysis Program). We regularly participate in programs to refine these evaluation standards.

Seattle East Waterway Dredging

At the request of the US Environmental Protection Agency (EPA), the Port of Seattle determined to address sediment contamination in the East Waterway Operable Unit of the Harbor Island Superfund site. The sediment contamination was addressed as required under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Dredged Material Management Program (DMMP).

The Port of Seattle retained Windward to support the dredging program. We conducted dredge material characterization and monitoring during the dredge event, and worked with the Port of Seattle's team to provide a hydroacoustic survey of the turbidity plume caused by the dredging activities throughout a tidal cycle. The data collected supported the water quality monitoring efforts and provided a greater level of understanding of the hydrodynamics and transport of suspended solids in the East Waterway.

The Port of Seattle's goal was to remediate contaminated sediments while dredging to the required navigation depth. Over the course of two dredging seasons, approximately 200,000 yd3 of material were removed, requiring extensive monitoring of water quality and for the presence of juvenile Chinook salmon. Windward provided for the acquisition of monitoring data and distribution to oversight agencies, and coordinated construction responses to water quality issues.

Port of Seattle Terminals 5 & 18 Maintenance Dredging

Windward has supported the Port of Seattle's maintenance dredging program at Terminal 5 and dredging at Terminal 18 since 2008. We have assisted the Port of Seattle in meeting all permitting requirements for both of these programs, which has included the development and implementation of all sediment suitability determination sampling programs and coordination with the DMMP.

For Terminal 18, Windward's permitting support included the completion of a biological assessment, as well as the design and implementation of water quality monitoring during Terminal 18 dredging. This dredging project was completed in 2008.

For Terminal 5, Windward assisted the Port of Seattle in obtaining a programmatic dredging permit from the Army Corps of Engineers to facilitate regular maintenance dredging operations. Maintenance dredging was conducted in 2010/2011 and 2012/2013. The sediment characterization for the 2010/2011 dredging event was one of the first projects in the Puget Sound required to include the analysis of dioxins and furans in the dredged material characterization and anti-degradation analysis. Windward's experience with dioxin and furan analysis, as well as our understanding of the basis for the regulatory limits, was key to the successful completion of the characterization and the subsequent dredging project.

Sediment Remediation

Potentially responsible parties at sites with contaminated sediment are often faced with the prospect of undertaking remedial actions. In addition to conducting remedial investigations to define the nature and extent of contamination and risk-based cleanup goals, Windward engineers and scientists evaluate cleanup alternatives. Our approach to developing sediment remediation alternatives considers not only the application of the most appropriate technologies that will result in cost-effective cleanups, but also takes into account our client's needs, such as future water-based operational requirements or redevelopment goals. Often, sediment contamination is the result of historical releases that are subject to both cleanup liability and natural resource damage (NRD) claims, and cleanup actions provide our clients with the opportunity to discharge both cleanup and NRD liability simultaneously. In such cases, Windward engineers and scientists seek to identify and design habitat restoration elements that could be incorporated into the cleanup action. Once a series of potential restoration alternatives has been identified, Windward uses a Habitat Equivalency Analysis model to optimize the design, maximizing the ecological services provided by the project. Once approved by the natural resource trustees, the restoration elements can be included in the remedial construction plan.