Ross Island Sediment Transport Modeling

Ross Island Sand & Gravel has mined gravel from the Ross Island Area for over 75 years. The mining effort has created a large lagoon that provides habitat for various aquatic life forms and the island provides habitat for various birds and animals including eagles and herons. Active mining in the lagoon has been recently phased out and the reclamation plan adopted in 1978 is being revised to provide for enhanced environmental benefits. WEST was tasked to model sediment transport into the lagoon from the Willamette River during flood flows and to evaluate options for increasing natural sedimentation in the lagoon. WEST performed the modeling effort for Ross Island's environmental contractor, Landau Associates.

In order to evaluate sediment transport into the lagoon WEST developed a two-dimensional hydraulic and sediment transport model of the Willamette River from mile 11.8 (Broadway Bridge) to mile 18 (about a mile downstream from Elk Rock Island). The model covers the river and associated side channels, Ross Island, Hardtack Island, the Ross Island Lagoon, and other islands and floodplains in the reach. WEST used the Corps of Engineers RMA-2 and SED2D models for the hydraulics and sediment transport respectively. The SMS interface was utilized to create the models, view model output and compare results between the various options evaluated.

The RMA-2 and SED2D models were used to estimate sediment delivery to the lagoon for flows corresponding to the 5, 10 and 100 year floods as well as the 1996 flood. The 1996 flood is the flood of record on the Willamette River and peaked at approximately 460,000 cfs. Various alternatives for increasing flow through and sedimentation in the lagoon were investigated in order to reduce required fill volumes.

The project involved the analysis of sediment samples, generation of sediment discharge rating curves and the analysis of numerous reports on bed materials and sediment trends in the reach.

Project Owner:
Landau Associates
Kruse Woods 1
7800 SW Durham Road, Suite 500
Tigard, OR 97224
Contact: *Dr. Julie Wilson*
(503) 443-6010