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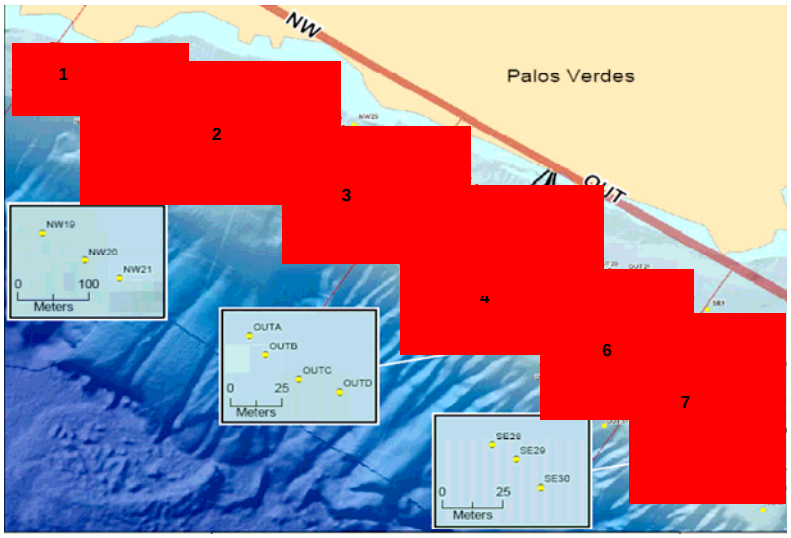
Engineer Research and Development Center

Palos Verdes Shelf: Erosion Study to Support Remediation Option Assessment

Description

CHL, in support of the U.S. Army Engineer District, Los Angeles (SPL) and the U.S Environmental Protection Agency, Region 9, performed SEDflume field studies to quantify critical shear stress for initiation of motion and erosion rates for contaminated storm sewer effluent offshore of Palos Verdes, CA. The effluent affected (EA) sediment deposit is an EPA Superfund site. Quantifying erosion is only one part of a larger study to understand sediment processes and develop predictive capabilities to assess remediation options.

Issue



The Palos Verdes Shelf sediment bed includes a contaminated layer of fine-grained storm - sewer effluent that covers 20 km^2 and is up to 1 m thick. Water depths at the site are 30-90 m. EPA is considering several remediation options, including natural attenuation and capping. Understanding of conditions for contaminated material migration is required to appropriately assess remediation options.

Products

Algorithms to predict erosion as a function of depth from the initial sediment surface and applied shear stress.

Supporting Technology

SEDflume is a mobile laboratory for testing 60-100 cm deep sediment samples extracted from a site to quantify cohesive sediment erosion rate and critical shear stress for initiation of erosion. SEDflume also quantifies the variation of these processes with depth below the sediment/water interface, which is typical for cohesive sediments due to consolidation and other processes.

Benefits

SEDflume-based algorithms predict site-specific stability and erosion processes for cohesive sediments. These algorithms are required for predictive modeling of the fate of contaminated sediments and the success of proposed remediation alternatives. For this study, it is expected that remediation option assessment will take several years. SEDflume-based stability and erosion algorithms are a vital component of this assessment.

Sponsors U.S. Army Engineer District, Los Angeles (SPL); U.S. Environmental Protection Agency (Region 9).

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