



Exploring the Applicability of Novel Source to Sink Methodologies to Reduce Shoaling in Harbors, POH

ERDC Dredging Operations Technical Support Program (DOTS)

U.S. ARMY CORPS OF ENGINEERS

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Response Summary:

POH requested technical assistance by ERDC CHL & EL to identify sediment mitigation strategies for harbors and federal navigation channels throughout POH. Shoaling of these harbors is a critical concern for POH, and could be reduced in the harbors via improved sediment mitigation efforts, reducing lifecycle costs. POH lacks critical regional sediment budget information on the source(s) of sediment being transported into the harbors and the transport mechanism(s) themselves. POH requested DOTS support for ERDC researchers to present emerging methodologies (e.g. geochemical fingerprinting of sediment, chirp sub-bottom imagery, Radar Inlet Observation System) to the POH navigation project delivery team and other stakeholders, as well as a site visit to Honolulu Harbor. ERDC Researchers Heidi Wadman, Jesse McNinch, and Brooke Stevens responded to the DOTS request via a combined seminar and site visit.

Period of Performance:

February 28, 2018 – March 1, 2018

Benefits of the Response to the USACE Dredging/Navigation Program:

Incorporating emerging technologies into ongoing dredging projects has the potential to reduce lifecycle costs by better quantifying the various sources of shoaling sediment, as well as the transport pathways and mechanisms by which sediment is transported in a system. These data are required in order to more effectively manage sediment to reduce transport from the newly identified sources into the sink (e.g. navigation harbor).

Deliverable:

The response consisted of two components: (1) a seminar by CHL & EL for POH, followed by an open discussion with POH; and (2) a site visit to Honolulu Harbor, one of the primary harbors of concern for POH. With respect to the seminar, Wadman, McNinch, and Stevens presented recent developments by ERDC utilizing chirp sub-bottom imaging and sedimentary geochemical fingerprinting to identify the sources and transport pathways of infilling sediment, and the use of RIOS (Remote Inlet Observing System) for real-time, long-term monitoring of sediment transport and shoaling. The team then traveled to various points along Honolulu Harbor, the state's primary port of entry, to assess potential sources and pathways of sediment, and determine if there were optimal locations for the long-term deployment of RIOS. Concurrently, POH and ERDC are collaborating on a small pilot study, funded by the Regional Sediment Management (RSM) program, to explore the application of one of the methodologies noted above (geochemical fingerprinting) to sediment sourcing issues in Kahului Harbor, Maui. It was agreed that POH and ERDC would wait to see what the results were at Kahului before deciding how best to move forward, and what potential funding sources are the most relevant. Once the RSM project is completed (end of FY18), POH & ERDC will follow up with a webinar to discuss the results and relative success of the pilot study, identify if any potential additional research is still needed at Kahului, and identify additional harbors in POH that would benefit from some/all of these methodologies.

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Providing environmental and engineering technical support to the U.S. Army Corps of Engineers
Operations and Maintenance navigation and dredging missions

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