



US Army Corps
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Engineer Research and
Development Center

National Regional Sediment Management Program Kansas City District (NWK):



The Downstream Channel as a Beneficial Use for Reservoir Sediment

Description (NWK will continue efforts to further reservoir sediment management in the Corps of Engineers by: (1) collaborating with the Environmental Advisory Board in exploring the downstream channel as a beneficial use of sediment, (2) documenting case studies that pass sediment to the downstream channel, and (3) quantifying the effects of passing sediment from the Missouri River dams to the downstream Missouri River.



Figure 1. Millsite Lake—An Example of a Reservoir that Passes Dredged Sediment to the Downstream Channel

Issue/Challenge To Address

Sediment accumulation in federal reservoirs is a widespread problem in the Corps of Engineers. Unless something is done, the future for all 400 Corps reservoirs includes dramatically increased O&M costs coupled with decreasing reservoir benefits.

Traditional dredging with disposal of the sediments to a confined disposal facility (CDF) has been cost prohibitive for most Corps projects and stakeholders. In addition, such actions remove the sediment from the fluvial system.

Less expensive sediment removal methods exist which pass the sediment through or over the dam to the downstream channel. In many cases, restoring sediment continuity to the system would be a restorative activity to the ecology, as well as the most cost-effective option to satisfy infrastructure needs. A straightforward set of criteria is needed that districts can use to make the determination that restoring the sediment load to the downstream channel is a beneficial use of the sediment.

Successes Lessons Learned

Lessons learned from multiple reservoir projects will be compiled during the duration of this study.

Estimated Benefits & Cost Savings

- Projects that pass sediment to the downstream channel can maintain reservoir storage for Flood Risk Management, Navigation, Recreation, Water Supply, Hydropower, and Water Quality authorized purposes as well as provide a downstream environmental benefit.

Expected Products



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- Draft white paper with criteria for the downstream channel as a beneficial use of sediment
- Journal article documenting case studies with successfully passing sediment to the downstream channel
- White paper on the physical effects of passing sediment to the lower Missouri River
- Presentation at SEDHYD and at the RSM IPR

Stakeholders/Users

Stakeholders include the Kansas Water Office and the Kansas Department of Health and Environment.

Projected Benefits Value Added

Both the Kansas City District and the Tulsa District have specific studies to look at sediment management options for reservoirs. Other districts have similarly expressed interest. This project will help districts around the Corps secure funding and receive permits for these types of cost effective sediment management options.

Leveraging Opportunities

SWG has identified opportunities to perform this RSM study in conjunction with the Galveston Park Board of Trustees Sand Management Plan, FY15 Galveston Entrance Channel RSM Study, Galveston Bay Sediment Budget, and potentially ERDC-developed modeling of the Galveston Bay system and DMMP tools currently being developed for GIWW and HSC projects. The Sand Management Plan will create a long term plan for maintaining sand on Galveston beaches, including the popular East Beach and Stewart Beach, and will identify sand sources to help sustain the beaches along the island. The Galveston Entrance Channel RSM study and Galveston Bay Sediment Budget, would work to identify sources of sand that contribute to shoaling in the vicinity of the Bolivar Flare. Collaboration between these studies is anticipated to help better manage the GIWW, HSC and GC projects the adjacent beaches as a system.

Points of Contact

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Participating Partners

Dr. Rollin Hotchkiss (Brigham Young Univeristy) nationally-known reservoir expert and chair of the Corps Environmental Advisory Board will be actively participating as will Corps sediment experts Paul Boyd (NWO) and Stanford Gibson (IWR-HEC).