

Recent Advances in Management of Contaminated Sediments and Stormwater

December 4, 2019

SERDP & ESTCP Symposium



Contaminated Sediments - Status

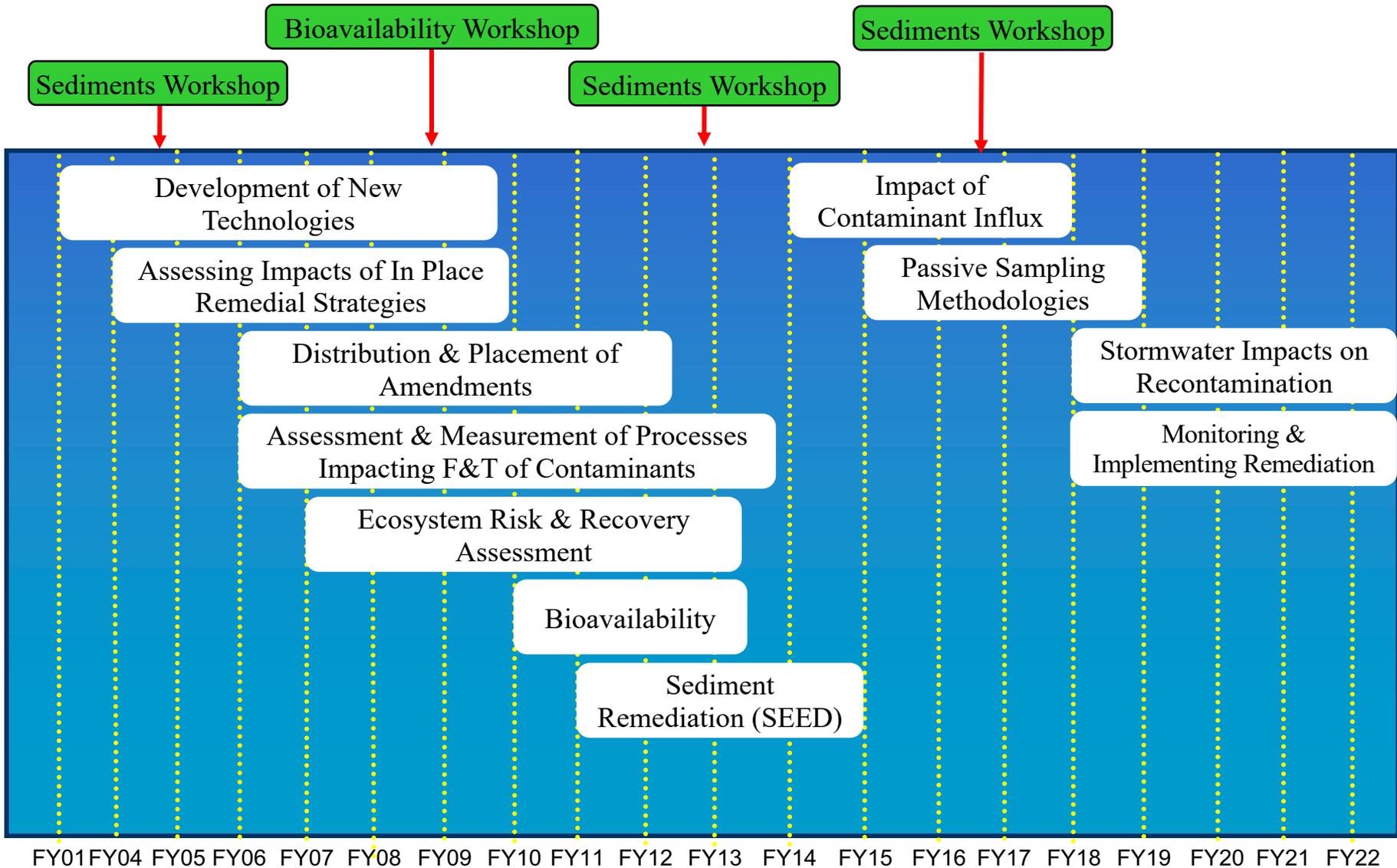
In August 2016, SERDP and ESTCP sponsored a workshop on Research and Development Needs for Long-Term Management of Contaminated Sediments.

Background

- Sediment contamination: estimated liability for DOD >\$2 billion
- PCBs, PAHs, Metals, metalloids, PFASs and munitions constituents
- SERDP & ESTCP: Support of projects since 1996
- Problems with contaminated sediments remain

Contaminated Sediments Research in SERDP

Statements of Need



FY01 FY04 FY05 FY06 FY07 FY08 FY09 FY10 FY11 FY12 FY13 FY14 FY15 FY16 FY17 FY18 FY19 FY20 FY21 FY22

Contaminated Sediments Workshop

Approximately 60 experts participated

Objectives

- Summarize the state of work by SERDP & ESTCP
- Review DOD facility implementation
- Identify data gaps
- Prioritize research, demonstration and tech transfer

Identify future research, demonstration and technology transfer needs to support DoD sediment management and restoration goals.

Workshop Focus Areas

- Reducing the impact of stormwater discharge on sediment recontamination
- Cleanup actions and navigation dredging
- Emerging contaminants of concern in sediments
- Increasing confidence in sediment cleanup levels
- Monitoring remedy effectiveness

34 Research, Demonstration and
Technology Transfer Needs Identified

Environmental Restoration FY18 SONS

- Improved Understanding of Per- and Polyfluoroalkyl Substance Source Zones
- In Situ and Ex Situ Remediation of Per- and Polyfluoroalkyl Substance Contaminated Groundwater
- Improved Understanding of Stormwater Impacts and Control on Sediment Recontamination and Recovery
- Innovative Approaches for Monitoring and Implementing In Situ Remediation of Contaminated Aquatic Sediments

SON: Improved Understanding of Stormwater Impacts & Control on Sediment Recontamination and Recovery

- Objective: Improve our management of stormwater, both through an improved understanding of the impact of stormwater to sediment recontamination and recovery as well as through improved stormwater control to prevent recontamination.
 - ◆ Improve understanding of source & rate of change in chemical concentrations on remediated sediment surfaces and approaches to quantify such changes.
 - ◆ Improve understanding of relationships between stormwater-associated sediment load, dissolved-phase contaminant concentrations, contaminant-induced benthic impairment, and sediment recontamination or recovery.
 - ◆ Develop innovative stormwater control & treatment technologies that improve stormwater management, prevent sediment recontamination, and add to existing water supply.
 - ◆ Develop watershed modeling of new stormwater control processes that focus on sediment-related contaminants to provide information on efficiency needed & number of systems deployed to prevent sediment recontamination & increase stormwater harvesting.

Current SERDP Stormwater Projects

- **ER18-1145:** Prevention of Sediment Recontamination by Improved BMPs to Remove Organic and Metal Contaminants from Stormwater Runoff, Richard Luthy, Stanford University
- **ER18-1181:** Proof-of-Concept for the in situ Toxicity Identification Evaluation (iTIE) Technology for Assessing Contaminated Sediments, Remediation Success, Recontamination and Source Identification, Allen Burton, University of Michigan
- **ER18-1230:** Development, Evaluation, and Technology Transfer of BMPs for Optimizing Removal of PAHs, PCBs, PFASs, and Metals from Stormwater at DoD Sites, Staci Simonich, Oregon State University
- **ER18-1303:** Treatment Media for Control of Persistent Organic Pollutants and Metals in Stormwater, Birthe Kjellerup, University of Maryland
- **ER18-1371:** Development of Tools to Inform the Selection of Stormwater Controls at DoD Bases to Limit Potential Sediment Recontamination, Danny Reible, Texas Tech University

Current SERDP Stormwater Projects

Overview of research performed in current stormwater project cohort

Project #	Contaminants	Approach
18-1145	PAHs, PCBs, PFASs, metals	Lab scale
18-1181	In situ contaminants in sediment	In situ
18-1230	PAHs, PCBs, PFASs, Cu, Zn	Test field
18-1303	PAHs, PCBs, Cu, (Zn)	Lab scale
18-1371	Particulate matter, contaminant mass	In situ/Model