

**Strategic Environmental Research and Development Program
(SERDP)**

FY 2014 STATEMENT OF NEED

Environmental Restoration (ER) Focus Area

**IMPROVED UNDERSTANDING OF THE IMPACT
OF ONGOING, LOW LEVEL CONTAMINANT INFLUX
TO AQUATIC SEDIMENT SITE RESTORATION**

1. Objective of Proposed Work

The objective of this Statement of Need (SON) is to seek fundamental through applied research to improve our understanding of the impact of ongoing, low level contaminant influx to aquatic sediment sites that are either undergoing restoration or are in the long-term monitoring phase, and to develop tools to assess and manage such impacts. Proposed efforts should focus on the following objectives:

- Develop methodologies or modeling tools to understand and quantify the relationship between the influx of low level contaminants, and sediment contaminant concentrations and biological receptors in the area of concern.
- Determine how potential ongoing low level contaminant influx can be accounted for appropriately in remedy selection, design, implementation, and monitoring.
- Evaluate the ability of in situ restoration technologies (including enhanced monitored natural recovery, amendments, and amended caps) to be effective in the face of continued low level contaminant influx and determine their assimilation capacity.

In most urban and industrial harbors and rivers, it is unlikely that all contaminant sources will be completely eliminated. Aquatic sediments will be exposed to continued input from such sources as permitted discharges, transport from upstream contaminated sites, or from stormwater discharge. Recontamination from such sources can slow or even reverse recovery and methodologies are needed to manage for ongoing contaminant influx.

The focus of this SON is contaminated aquatic sediments, either marine, estuarine, brackish, or freshwater. Research proposals can involve laboratory-, bench-, and field-scale studies, as well as computer modeling to support such efforts. Proposers may address one or multiple objectives listed above. Proposers should clearly show how the proposed research effort builds on past efforts.

The Strategic Environmental Research and Development Program (SERDP) co-sponsored a Workshop on Research and Development Needs for Long-Term Management of Contaminated Sediments in July 2012 that identified high priority research topics in this area. A more detailed description of these issues can be found in the workshop report (<http://www.serdp->

estcp.org/content/download/16022/182923/version/2/file/Sediment+Workshop+Report_October+2012.pdf). We strongly encourage proposers to review the workshop report for additional detail.

2. Expected Benefits of Proposed Work

Improving our understanding of the impact of low level, off-site contaminant loading to sites that are undergoing or have completed restoration will improve the ability of site managers to manage contaminated sediment sites and ensure protection of human health and the environment. Low level, off-site contaminant loading is unavoidable and measures to account for such influx will improve contaminated sediment site management.

3. Background

Aquatic sediments are often the ultimate receptors of contaminants. Sediment contamination is particularly difficult to manage due to the tendency for contaminants to be retained within sediments for long periods of time. According to an estimate by the U.S. Environmental Protection Agency (U.S. EPA), approximately 10% or 1.2 billion cubic yards of the sediment underlying the country's surface water is sufficiently contaminated with toxic pollutants to pose potential risks to fish and to humans and wildlife that eat fish (U.S. EPA, 1998). This represents the upper 5 centimeters of sediment where many bottom-dwelling organisms live, and where the primary exchange processes between the sediment and overlying surface water occur. Contaminated sediments can pose a threat to human health when pollutants in sediments accumulate in edible aquatic organisms (U.S. EPA 1998 and references therein).

While the DoD maintains a policy that sources must be identified and controlled prior to implementing cleanup, federal and/or state orders often require cleanup before sources have been or can be controlled. Remedial Project Managers (RPMs) at the Workshop expressed concern that these restored sites may likely become recontaminated by continued input from off-site sources including permitted discharges, transport from upstream un-remediated contaminated sites, or from stormwater discharge.

Recontamination from off-site sources can slow or even reverse recovery. In most urban and industrial harbors and rivers, because it is unlikely that sources will be completely controlled, a fundamental technical challenge is assessing "How controlled is controlled?" This requires better scientific and technical capabilities to understand releases from these sources and how these source levels relate to potential recontamination of the sediment bed. This also drives a more rigorous approach to remedy selection and risk management that incorporates the resilience of remedies in the face of ongoing contaminant influx into the criteria for remedy selection (within the existing context of long-term effectiveness). These challenges manifest in the context of both Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) sediment cleanup actions, and Clean Water Act (CWA)-related Total Maximum Daily Loads (TMDL) actions.

Critical research needs identified by Workshop participants were specifically relevant to the assessment of incoming off-site contaminant loads and methods to quantify how those loads might directly change the surface sediment concentrations on a remediated sediment surface. For example, at some sites, the Navy is being required to implement sediment cleanup, but source

control has not been achieved and several of the permitted discharges have contaminant particulate loadings that are above sediment cleanup levels. There is a need to be able to establish the linkage between loading and surface sediments recontamination.

4. Cost and Duration of Proposed Work

The cost and time to meet the requirements of this SON are at the discretion of the proposer. Two options are available:

Standard Proposals: These proposals describe a complete research effort. The proposer should incorporate the appropriate time, schedule, and cost requirements to accomplish the scope of work proposed. SERDP projects normally run from two to five years in length and vary considerably in cost consistent with the scope of the effort. It is expected that most proposals will fall into this category.

Limited Scope Proposals: Proposers with innovative approaches to the SON that entail high technical risk or have minimal supporting data may submit a Limited Scope Proposal for funding up to \$150,000 and approximately one year in duration. Such proposals may be eligible for follow-on funding if they result in a successful initial project. The objective of these proposals should be to acquire the data necessary to demonstrate proof-of-concept or reduction of risk that will lead to development of a future Standard Proposal. Proposers should submit Limited Scope Proposals in accordance with the SERDP Core Solicitation instructions and deadlines.

5. Point of Contact

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For Core proposal submission due dates, instructions, and additional solicitation information, visit the SERDP web site at www.serdp-estcp.org/Funding-Opportunities/SERDP-Solicitations.