

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

**FY 2023 STATEMENT OF NEED**

**Resource Conservation and Resiliency (RC) Program Area**

**INNOVATIVE APPROACHES TO RESOLVING  
SEA-LEVEL RELATED DATA AND DATUM GAPS WORLDWIDE**

**1. Objective of Proposed Work.**

The objective of this Statement of Need (SON) is research that will enhance the Defense Regional Sea Level (DRSL) Database at Department of Defense (DoD) coastal and tidally influenced sites. The envisioned enhancements would result from the development of innovative approaches to provide relationships between authoritative geodetic datums and mean sea levels, and tidal and non-tidal residual data for sites lacking comprehensive data. As part of addressing this objective, research is also sought that can assist in determining appropriate methods for data acquisition, the identification of minimum standards of data availability, and the qualification of datum and data records with acceptable bounds of uncertainty commensurate with DRSL application.

Research efforts are sought that specifically provide innovative, robust, and technical defensible approaches to the following:

- More efficient or effective data collection methods or model simulations that establish robust estimates of mean sea level for DoD sites worldwide currently lacking such estimates as a result of data sparsity.
- More efficient or effective data collection methods or model simulations that can reference robust estimates of mean sea level for DoD sites worldwide to authoritative geodetic vertical datums currently used at DoD sites, including providing the ability to shift to active geodetic datums in locations covered by the National Geodetic Survey or localized or worldwide geoid models as appropriate and available.
- Spatially extending the applicability of the above research efforts to distances outside the data collection or model simulation centroid, including establishing confidence bounds for the information as a function of distance from the centroid.
- For sites possessing complex coastal geomorphology, such as embayment and estuaries, the development of rigorous approaches for estimating mean high water (MHW) or mean higher high water (MHHW) in a spatially explicit manner; and
- For sites lacking tide gauge information, quantification method development to estimate an extreme water level local index (average annual maximum nontidal residual).

In addressing the specific interests above, preference will be shown to proposals that address potential screening and inventory approaches for examining and characterizing relevant data and datum gaps at DoD and other locations worldwide. Proposals based foundationally on proprietary

products are of less interest since the logic used in their development is often opaque and unavailable for peer review. The ultimate intent is that the resulting research and advanced technology development, if successful, would translate into improvements to the DRSL.

## **2. Expected Benefit of the Proposed Work.**

The DoD has a large number of high-value coastal installations worldwide that would benefit from the development of innovative approaches to providing relationships between water level data and authoritative geodetic datums, mean sea levels, and tidal and non-tidal residual data for sites lacking comprehensive data. The research and analysis resulting from this work will be used to inform screening-level exposure assessments and possibly more detailed assessments of exposure, sensitivity, and adaptive capacity to coastal extremes and sea level change.

## **3. Background.**

The DoD relies on a large number of installations with extensive supporting infrastructure to prepare for and execute missions to defend U.S. national security interests. The DoD's DRSL database is a key tool used in DoD infrastructure planning and engineering. The DRSL depends on the capability to anchor its data to a reference elevation that is static over typical infrastructure planning periods and consistent across the spatial domain of the project area. Moreover, to understand and manage for the potential impacts of future sea-level change, critical prerequisites applicable to any particular location are required that include not only an authoritative geodetic (vertical reference) datum, but also a robust estimate of mean sea level that itself can be aligned to the geodetic datum.

The availability and quality of the preceding information is highly variable across the globe. For a globally dispersed entity such as DoD, such variation hampers planning for and responses to impacts on its coastal and tidally influenced assets. Authoritative geodetic datums generally are available for DoD sites within the continental United States (CONUS); however, significant data gaps and data-datum relationship gaps exist outside CONUS and even for some CONUS sites. Generating data-datum relationships and water level information for sites lacking such information on a site-by-site basis is resource-intensive. More efficient and spatially dispersed approaches covering multiple sites at a time that take advantage of new and emerging data sets and technology or methodologies are needed to address the existing information gaps.

## **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. The proposals must describe a complete research effort. It is anticipated that the scope of this SON is such that a multi-disciplinary team will be required to execute a successful effort. Nonetheless, single investigator efforts may compete successfully. The proposer should incorporate the appropriate time, schedule, and cost requirements to accomplish the scope of work proposed. Two proposal 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 four years in length and vary considerably in cost consistent with the scope of the effort but must not exceed \$900,000 per year. Preference will

be given to proposals that efficiently address and integrate specific research objectives. Project budgets vary but must remain consistent with the scope of the effort.

**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 \$250,000 and approximately two 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 website](#).