

**STATEMENTS OF INTEREST
GREAT LAKES NORTHERN FOREST CESU
NUMBER W912HZ-19-SOI-0002
PROJECT TO BE INITIATED IN 2019**

**Project Title: Algorithm for Inventory and Spatial Analysis in Natural Resources
Management, Institute for Water Resources**

Responses to this Request for Statements of Interest will be used to identify potential investigators for a project to be funded by the U.S. Army Corps of Engineers (USACE) Institute for Water Resources (IWR). Approximately \$150,000 is expected to be available to support this project for one (1) year. Additional funding maybe available at a rate of \$100K/yr for up to 4 additional option years based on future R&D needs for a total of \$550K for the full project.

Background:

The US Army Corps of Engineers is the steward of about 12 million acres of public lands and waters with natural resource management missions at 430 water resources projects located in 43 states. The Corps' natural resources program consists of hundreds of lakes and reservoirs, thousands of miles of rivers and streams, 40,000 archeological sites, 5,000 historic sites, and more than 5,000 developed areas for recreation use. The goals of USACE's NRM program are to help maintain healthy ecosystems and to ensure the availability of these natural resources for future generations. In addition, these lands and waters are comprised of various types of habitat that support a variety of fish and wildlife, while provide recreational use which also supports local economies.

For general public to benefit from these lands and waters now and into the future, it's critical to manage our natural resources wisely. The Corps' NRM program has co-existed with other missions such as flood risk management, hydropower, navigation, and water supply in many of the Corps' multi-purpose water projects. It also contributes to the variety and abundance of our fish and wildlife, and to the attractiveness of our lands and waters, as well as, protect our cultural heritage and providing public outdoor recreational opportunities.

(<https://corpslakes.ercd.dren.mil/employees/envsteward/envsteward.cfm>).

USACE-IWR is seeking a partner/cooperator to support our research on Natural Resources Management, including Shoreline Management, Boundary Management, Management of Special Status Species, and Management of Recreation Resources, by providing research opportunity to explore better options to develop data inventories and methods for decision-making supports for the NRM program.

Brief Description of Anticipated Work:

We are aiming to work on

- **Shoreline Management and Boundary Management**

Working closely with Corps staff to develop methods to (1) collect longitudinal information related to the land-use and social-demographic information along the Corps managed shoreline and other properties; (2) monitor the land-use changes and population changes and examine the environmental impacts on the Corps properties; (3) develop method to measure the land use and population changes on environmental impacts; (4) to develop a condition-consequence index and an online simulation tool to support Corps boundary management activities based on the above work (1, 2, and 3) and Corps boundary management data.

- **Management of Invasive Species**

We are seeking solutions to (1) build an inventory of the invasive species on Corps property and areas with Corps' activities from various resources (e.g., EDDMapS, invasive species lists from federal, state and local agencies); (2) develop a method to visualize the distribution of the invasive species and prioritize the risks; and (3) estimate the impacts of invasive species on Corps land and activities.

- **Natural Resources Management and Management of Recreation Resources**

Collaborate the recreation resources/visitations data to support the shoreline management activities, including assisting in maintaining and updating Corps spatial data inventory for recreation facilities. Integrate recreation visits data in support of shoreline management research and invasive species research.

Public Benefit:

The research and output of this project will benefit the public in various ways. The deliverables generated from this effort will be shared with public agencies, businesses, local communities, non-profit organizations, and individuals near USACE lakes and rivers for the purposes of policy making and regulatory compliance, planning and community development, shoreline management, natural resources management, recreation management, environmental awareness, and education. These research efforts are vital to understanding the environmental, economic, and social conditions of Corps project areas and their surrounding communities, and their connection to the broader region in which they are located.

Benefits associated with this research include:

- A focus on Quality of Life elements and improved public health through environmental stewardship, such as efficient use of natural resources, reducing waste and consumption, and protecting our environment to ensure more healthy, active lifestyles.
- Reducing the negative economic impacts to industries such as commercial fishing, agriculture, recreation, and tourism that are caused by invasive species, coastal erosion and accretion, encroachment on public land, pollution, and other environmental issues that create unique problems for these communities.

- Minimizing the potential consequences to the natural environment and to the communities facing these threats, whether it involves invasive species harming native plant communities or impacting croplands, the dispersion and establishment of noxious weeds, erosion depleting beachfront and recreation areas, or diminished wetlands not being able to provide the protection from storm surges to coastal communities that they once did.
- Maintaining the integrity of navigation structures and water channels to ensure the timely transport of goods and services that communities depend upon for their way of life, and avoid delays or closures of channels and ports which can impact shipping schedules and deliveries for the region, as well as disrupt recreation and tourism opportunities for nearby communities.

Objectives:

The objectives of the proposed effort include:

Objective One:

Explore methods to quantify land use/land cover spatiotemporal landscape pattern and population/housing changes along the Corps managed shoreline and its properties.

Objective Two:

Develop a condition-consequence index to examine the Corps Civil Works on boundary management based on Objective One and other boundary management activity data.

Objective Three:

Develop a method to compile, integrate and visualize invasive species on Corps lands/water from various sources (e.g., EDDMapS, invasive species inventories from federal, state and local agencies), prioritize the risks, and estimate the impacts of invasive species on Corps land and activities.

Objective Four:

Develop algorithm to help maintaining and updating the data inventory for recreation resources and visits, and in further in support of environmental stewardship research for Objective One, Two and Three.

Site Location:

The US Army Corps of Engineers is the steward of about 12 million acres of public lands and waters with natural resource management missions at 430 water resources projects located in 43 states. The location of these lands and waters include a mix of urban and rural environments,

with many projects located in or near metropolitan statistical areas. There is a high degree of variation in the size of these projects, as well as locations in which projects cross state lines or span multiple watersheds.

Vendor Requirements:

Vendor must be a non-federal partner of the Great Lakes-Northern Forest Cooperative Ecosystem Studies Unit (GLNF-CESU) willing to accept the negotiated CESU indirect cost rate of 17.5%. Successful applicants should have expert knowledge and work experience in analysis of remotely sensed geospatial data, land use change analysis, and the dynamics between communities and adjacent multipurpose public lands and waters. The candidates should have prior experience with natural resource management; environmental and recreation management; geospatial analysis and visualization; statistics and quantitative modeling; simulation tool development on web/mobile devices, etc. The candidates will also be required to submit one (1) mid-year status reports and one (1) annual report each year of the cooperative agreement to provide updates on the implementation of the project.

Government Participation:

The Government will work cooperatively with the investigator to identify issues the protocol must address, develop field and training materials, and assist the awardee with field activities. The Government may also assist in data analysis review and provide workspace and equipment as necessary.

Materials Requested for Statement of Interest/Qualifications:

Please provide the following via e-mail attachment to: Deberay.R.Carmichael@usace.army.mil
Maximum length: 2 pages, single-spaced 12 pt. font).

1. Name, Organization and Contact Information

2. Brief Statement of Qualifications (including):
 - a. Biographical Sketch,
 - b. Relevant past projects and clients with brief descriptions of these projects,
 - c. Staff, faculty or students available to work on this project and their areas of expertise,
 - d. Any brief description of capabilities to successfully complete the project you may wish to add (e.g. equipment, laboratory facilities, greenhouse facilities, field facilities, etc.).

Note: A proposed budget is NOT requested at this time.

Review of Statements Received: Based on a review of the Statements of Interest received, an investigator or investigators will be invited to prepare a full study proposal. Statements will be evaluated based on the investigator's specific experience and capabilities in areas related to the study requirements. Additionally, the evaluation method and selection criteria for research and development awards must be: (1) The Technical merits of the proposed research and development; and (2) Potential relationship of the proposed research and development to the Department of Defense missions.

Please send responses or direct questions to:

Deberay R. Carmichael

U.S. Army Engineer Research and Development Center (ERDC)

ERDC Contracting Office (ECO)

3909 Halls Ferry Road

Vicksburg, MS 39180

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Timeline for Review of Statements of Interest: Review of Statements of Interest will begin after the SOI has been posted on the CESU website for 10 working days.