

PROJECT ANNOUNCEMENT

**US Army Corps of Engineers (USACE)
Engineer Research and Development Center (ERDC)**

**Title: Research to Continue Investigation of Hydrometeorological Prediction and the
Application of Using Quantitative Precipitation Forecast Capabilities to Inform
Reservoir Operations**

Announcement Type: Initial Announcement

Funding Opportunity Number: W912HZ-23-SOI-0013

Assistance Listing Number: 12.630

Date Issued: 17MAY2023

Key Dates: Phase III announcement will be open to receive statements of interest continuously until 05:00pm Central Time (CT), 16 JUNE 2023, at which point all statements of interest must be received.

If invited to Phase III, full proposal applications will be due at 05:00pm Central Time (CT), 17 JULY 2023.

Estimated Award Ceiling: \$2.5M

Estimated Total Program Funding: \$52.5M

Agency Contact: Kasey Davis, Kasey.T.Davis@usace.army.mil

I. Program Description

A. Short Description of Funding Opportunity

ERDC seeks applications for: Hydrometeorological Prediction and the Application of Using Quantitative Precipitation Forecast Capabilities

B. Background:

The U.S. Army Corps of Engineers (USACE) has been engaged in a research and development effort called Forecast-Informed Reservoir Operations (FIRO) to conduct research into quantitative precipitation estimation to improve weather forecast skill and to develop a better understanding of the balance between water availability, flood risk management, ecosystem and social benefits at multi-purpose reservoirs. Given reduced supplies, changed hydrologic conditions, and technological advances, some adjustments to the current reservoir operating procedures may be possible to optimize the goals of maintaining flood control while bolstering water availability for downstream users and the environment (e.g., to support recovery of endangered and threatened fish). Modern observation and prediction technology can be used to reduce flood risk by supporting decisions of greater reservoir level drawdown in advance of storms. Such technology can also be used to improve water availability by permitting more storm runoff to be retained for water supply while also enhancing flood risk reduction objectives.

Current scientific research has yielded improvements in understanding the processes which affect the formation, intensification and duration of significant rainfall events in the western U.S., which are predominantly atmospheric river (AR) events. This research includes atmospheric reconnaissance (AR recon) missions using U.S. Air Force Hurricane Hunter aircraft as well as National Oceanic and Atmospheric Administration aviation resources. Data collected from these missions has led to meaningful gains in forecast skill for the global weather modeling community, as well as for specialized models that have been developed for the western U.S. Recent research has demonstrated the value of AR recon not only in the western U.S. but also in the Gulf of Mexico and along the eastern U.S. seaboard.

Since August of 2014, the USACE has actively participated in a multi-agency, multi-discipline research and development effort to investigate how FIRO approaches might be safely and appropriately applied at reservoirs that it manages. In what is now called Phase I of FIRO, this initial effort led to the development of an effective process to determine if weather forecast skill for a reservoir is adequate to safely incorporate forecast information in reservoir operations. This was demonstrated at an initial pilot reservoir, Lake Mendocino, in the Russian River watershed in northern California, a dam that supports a climate-change-vulnerable region, where atmospheric river type storms are the cause of both flooding and provider of water supply. FIRO Phase I consisted of five years of investigation and development of a viability assessment process, concluding with a final viability assessment for Lake Mendocino.

In FIRO Phase II, conducted from 2019 thru 2023, the FIRO viability assessment process

was applied to three additional basins where ongoing FIRO activity is occurring at various stages: 1) in the Santa Ana River basin of southern California, where a FIRO final viability assessment is nearing completion for Prado Dam, and initial investigations into Seven Oaks Dam have begun, 2) in the Yuba-Feather system in the Central Valley of California, where the Oroville and New Bullard's Bar dams, operated in tandem, will have a final viability assessment completed by the end of the year, and 3) at Howard Hanson Dam on the Green River of Washington, where a steering committee is being formed to conduct a FIRO viability assessment there.

Additionally, in FIRO Phase II a screening process was envisioned to assess FIRO suitability at a screening level. This tool was iteratively designed, evaluated, and tested across the 85 dams of the USACE's South Pacific Division (SPD). The FIRO Screening Process is designed to provide a means of assessing FIRO suitability across the entire portfolio of USACE dams nationwide.

C. Program Description/Objective: (brief description of the anticipated work)

At its core, FIRO is a management strategy that uses data from watershed monitoring and modern weather and water forecasting to help water managers selectively retain or release water from reservoirs in a manner that reflects current and forecasted conditions. FIRO's utilization of modern technology can optimize the use of limited resources and represents a viable climate change adaptation strategy.

With the start of FIRO Phase III in 2023, ERDC-CHL now seeks to conduct a five-year effort to:

1. Assess and Improve Forecast Skill for Multiple Flooding Storm Types

FIRO is not viable at reservoirs where forecasts of extreme precipitation and associated floods do not have adequate skill. Although meteorology has largely struggled to improve quantitative precipitation forecasts (QPF), FIRO Phases I and II have found that atmospheric rivers are the key storm type in the west coast flood season (fall/winter). Additionally, FIRO research has found that there is adequate skill to support FIRO operations at all of the tested pilot reservoirs in Phases I and II. Research to improve forecasts have benefitted from focusing on the storms that predominantly produce the precipitation at these reservoirs, i.e., atmospheric rivers. FIRO viability has also been favored by the fact that watersheds along the west coast are relatively short and steep, leading to short travel times for water released from a dam to move beyond flood prone areas. AR forecast skill at lead times of even just a few days is often sufficient for FIRO to be viable at many reservoirs.

FIRO viability in other regions nationally, where other very different storm types dominate flooding, will hinge on the forecast skill for these storms and on the watershed sizes and travel times for water released from dams. Slopes are likely much shallower and thus water travel times longer in places like much of the southeast and Great Plains. Also, convection, a frequent storm type in many parts of the country especially in the summer, is notoriously difficult to predict accurately, while the track and intensity of landfalling tropical storms/hurricanes can also be difficult to predict, including whether or

not they stall (e.g., hurricanes Harvey and Florence). Studies have found that forecast skill for extreme daily precipitation is best in the west (due to ARs) followed by New England, and suggests the need for improvement in QPF for these storm types may be needed for FIRO to be viable.

Precipitation prediction skill is tied to the dynamical processes in the major storm types, and to the models and forecast tools that have been developed to predict them. As with atmospheric rivers in the west, a key to identifying the causes of errors in predictions of extreme precipitation in these storm types is understanding the meteorological attributes of the storms that make them capable of producing the extreme precipitation. This also leads to fruitful research pathways for improving these predictions. By analogy, the hydrology differences in regions affected by these storms need to be considered.

Improved QPF and other meteorological and hydrological forecast data and tools have proven to be immensely valuable to water managers where FIRO has been tested in Phases I and II. Providing water managers, decision makers, senior leaders and the public with information from these improved forecast products has been critical to the successful application of FIRO to date. Research and development of more effective and efficient means of conveying information from these data sources to a variety of audiences through the use of configurable and customizable portals and/or dashboards is an additional area of focus that is requested in this effort.

In order to aid the nationwide screening assessment (see item 6 below), the USACE is interested in assessing basin-scale hydrometeorological predictability (e.g. QPF skill) using a common suite of simplified and practical metrics. Metrics of meteorological predictability will provide necessary information in assessing the practicality of FIRO in watersheds outside of regions where ARs, predictable out to multi-day lead times, are the primary forcers of reservoir inflow.

Finally, a key recommendation from FIRO Phases I and II is that water control manual updates include attributes that allow for expedited increases in reservoir operations flexibility (i.e., the size of the FIRO Buffer Pool) as precipitation (and inflow) forecast skill improves. This is referred to as “FIRO 2.0” and represents a potentially efficient way to enhance reservoir operations over time, while also motivating continuing improvement in forecast skill and use of that skill to deal with increasingly extreme weather and water events anticipated to be characteristic of the future.

2. Completion of Final Viability Assessments at Reservoirs Started in Phase II

Some efforts from Phase II will not be complete at the end of Phase II in FY23 and will therefore need to be carried to completion in Phase III including:

- Final Viability Assessment for New Bullards Bar and Oroville reservoirs to be completed in 2024
- Viability assessment for Howard Hanson Dam. The workplan will be developed in 2023 with the Preliminary Viability Assessment in 2024 and Final Viability Assessment in 2025
- Viability assessment for Lake Sonoma which was added in 2022 as a sibling dam to Lake Mendocino in the Russian River Valley

- Viability assessment for Seven Oaks Dam which was added in 2022 as an upstream dam to Prado Dam.

3. Conduct Full Viability Assessment of System of Dams in the Willamette River Basin

Phase III will assess two major systems of dams (representing at least 8 dams in each system), for which coordination across several dams in an entire larger watershed is required. The first of these will be the Willamette watershed system, with its 14 reservoirs, where atmospheric rivers are the drivers of flood and a leading source of water supply, and where lessons from Phases I and II can efficiently be applied and the skill of atmospheric river prediction can be utilized.

4. Conduct Viability Assessment of System of 8+ Dams in another region nationally

Building on the lessons learned from conducting a FIRO viability assessment in the Willamette Valley, Phase III will explore FIRO in a system in a region where different storm types are key to heavy rain and flooding, and where longer forecast lead times may be required. The second system of at least 8 dams to be examined in Phase III will be located in a region where extreme precipitation is dominated by tropical storms/hurricanes, clusters of long-lived thunderstorms, or Nor'Easters. Atmospheric rivers may also be an important storm type in this region.

5. Conduct Viability Assessments on Two Single Dams in Other Regions Nationally

Two additional non-system FIRO viability assessments are to be conducted in regions of the country where extreme precipitation is dominated by weather systems other than ARs, e.g., tropical storms/hurricanes, large clusters of long-lived thunderstorms, or Nor'Easters. These dams will not be located in the same regions explored in the assessment of system of dams.

6. FIRO Screening-Level Process – Preliminary National Assessment

The FIRO Screening Process was developed from lessons learned by applying FIRO to Lake Mendocino (rural, coastal, flood and supply), Prado Dam (urban, coastal, flood and groundwater recharge), Oroville and New Bullards Bar (rural, Sierra Nevada mountains, flood and major water supply for California), and Howard Hanson (urban, Washington cascade Mountains, flood and water supply, fisheries). The Screening Process was then tested by being applied to all 85 USACE South Pacific Division dams. Additionally, the other aspects of Phase III will explore FIRO in regions characterized by other storm types and reservoir operations strategies, constraints and methods, allowing the systematic growth of the scientific and engineering knowledge base needed to perform well-founded future assessments of FIRO applicability across a much broader range of conditions than has been explored in the first pilot reservoir, Lake Mendocino, and the additional pilots in the West. In Phase III, the FIRO Screening Process will be applied to the nationwide portfolio of USACE dams and reservoirs, the result being an index of FIRO suitability across the portfolio, helping the USACE to prioritize future viability assessments and WCM updates based on FIRO.

7. Phase III Final Report

The full viability assessments for several reservoirs across different regions nationally, as well as results of applying the FIRO screening-level process across all USACE dams will be documented in a concluding report for the FIRO Phase III that will be made available to the public and agencies as a guide for how assessments for FIRO viability can be conducted at reservoirs across the United States and beyond.

ERDC and the USACE have extensive capabilities in meteorological, hydrologic and hydraulic science and modeling that will be necessary to the success of this project. However, the USACE lacks expertise and understanding of the factors affecting successful multi-day prediction of impactful precipitation. Therefore, a collaborative research partner is sought to engage with ERDC and the USACE to conduct this research project. A strong collaboration between ERDC-CHL and the proposers is desired. This collaboration is desired in three main areas: continued research and development in improving understanding of atmospheric processes that impact water management decisions, application of the FIRO screening process nationwide, and conducting viability assessments at single reservoirs and reservoir systems both in and outside of the western weather paradigm which includes incorporation of advanced modeling and observation data together with water management, stakeholder, ecological and social priorities to produce beneficial outcomes.

It is anticipated that this effort will require both basic and applied research in execution. Improving understanding of precipitation types, formation, intensity, duration, and forecasting through the use of field data collection and assimilation of observations into atmospheric modeling and the improvement of hydrologic routing models and atmospheric/hydrologic model coupling all result in fundamental expansion of the knowledge base in these areas. Applied efforts include applying the FIRO screening process to all USACE dams, administering viability assessments to selected demonstration sites, and advancing the coordination of various interests for reservoir operation.

D. Public Benefit

FIRO efforts serve the public of the United States by maximizing the utility of both public infrastructure (i.e., the flood risk management function of reservoir systems) and water resource management. Increased understanding of precipitation skill will allow dam operators to better anticipate future flows to avoid over-releasing water before a drought state or under-releasing in advance of extreme precipitation. This allows more water availability for public use, including consumption, irrigation, recreation, and sustainment of environmental ecosystems. Additionally, increased forecast skill as a result of research done within the FIRO research effort will lead to better weather forecasts available to the general public. This has positive repercussions for public safety and the protection of property.

E. Authorization: 10 USC 4001

F. Legal Requirements

Each Cooperative Agreement awarded under this announcement will be governed by 2 CFR 200, “Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards”, 2 CFR 1100 Subchapter D—Administrative Requirements Terms and Conditions for Cost-Type Grants and Cooperative Agreements to Nonprofit and Governmental Entities and the DoD research general terms and conditions located at <https://www.nre.navy.mil/work-with-us/manage-your-award/manage-grant-award/grants-terms-conditions>.

G. Program-Specific Requirements

The goal of this effort is to develop tools and capabilities to enhance standard flood control guidelines in order to improve water availability, flood risk reduction, environmental and social outcomes without diminishing dam safety, thereby providing significant benefit to the public. It is anticipated that FIRO-developed capabilities that have proven to be of benefit to operations at Lake Mendocino, New Bullards Bar Reservoir, Lake Oroville, and Prado Dam will have transferability potential throughout the U.S. where sufficient hydrometeorological prediction skill and other factors indicate good FIRO suitability. The project has two main objectives:

Improve Water Availability for Downstream Uses - When storms cause moderate-to-high reservoir levels, normal operation is to release water to re-establish flood control space. With FIRO, some of that water could be retained for future supply as long as no major precipitation is predicted for several days and it can be demonstrated that the retained water can be released past downstream flood prone areas before the arrival of the next storm. This strategy will permit earlier supply capture in some years, improving summer season availability for downstream water users and improving the timing and volume of releases to protect water quality, provide flows needed for recovery of fish populations and improve other societal benefits as well.

Enhance Flood Risk Reduction - When a storm is predicted to cause flooding, normal operations call for release of reservoir water and drawdown of water levels. With FIRO, release decisions would consider weather observations and predictions, which, in some cases, would indicate greater drawdown for flood risk reduction so long as there is confidence that the amount of precipitation and runoff will restore reservoir levels for water supply after the storm.

Tasks by Year:

Base Year

- Assist USACE in initiating and conducting viability assessment for the Willamette basin system
 - o Develop work plan
 - o Conduct preliminary and final viability assessments
- Assist USACE in selecting and conducting viability assessment for a single non-western dam

- o Develop work plan
- o Conduct preliminary and final viability assessments
- Assist USACE in beginning the nationwide assessment of USACE dam suitability based on the FIRO screening process
- Conduct research to improve forecasting skill, particularly with regard to atmospheric rivers
- Conduct a nationwide hydrometeorological forecast assessment
- Work collaboratively with USACE in improving hydrologic modeling capability and coupling with atmospheric models and observations to inform water management decisions
- Project planning & coordination

Option Year 1

- Assist USACE in continuing viability assessment for the Willamette basin system
- Assist USACE in selecting and conducting viability assessment for a non-western basin system
 - o Develop work plan
 - o Conduct preliminary and final viability assessments
- Assist USACE in selecting and conducting viability assessment for a second single non-western dam
 - o Develop work plan
 - o Conduct preliminary and final viability assessments
- Continue assisting USACE in nationwide rollout of FIRO screening level assessment
- Continue research to improve forecasting skill
- Continue research to assess nationwide forecast skill
- Continue collaborative efforts with USACE in improving hydrologic modeling capability and coupling with atmospheric models and observations to inform water management decisions
- Project planning & coordination

Option Year 2

- Assist USACE in continuing viability assessment for the Willamette basin system
- Assist USACE in continuing viability assessment for the selected non-western basin system
- Assist USACE in continuing viability assessments for the selected non-western dams
- Assist USACE in continued nationwide rollout of FIRO screening level assessment
- Continue research to improve forecasting skill
- Continue research to assess nationwide forecast skill
- Begin targeted research to increase precipitation forecast skill where precipitation skill assessment reveals there to be low skill
- Continue collaborative efforts with USACE in improving hydrologic modeling capability and coupling with atmospheric models and observations to inform water management decisions
- Project planning & coordination

Option Year 3

- Assist USACE in continuing viability assessment for the Willamette basin system
- Assist USACE in continuing viability assessment for the selected non-western basin system
- Assist USACE in continuing viability assessments for the selected non-western dams
- Assist USACE in continued nationwide rollout of FIRO screening level assessment
- Continue research to improve forecasting skill
- Conclude research to assess nationwide forecast skill
- Continue targeted research to increase precipitation forecast skill where precipitation skill assessment reveals there to be low skill
- Continue collaborative efforts with USACE in improving hydrologic modeling capability and coupling with atmospheric models and observations to inform water management decisions
- Project planning & coordination

Option Year 4

- Assist USACE in concluding viability assessments
- Assist USACE in concluding the application of the screening process
- Continue research to improve forecasting skill
- Develop technical recommendations
 - o Publish findings
 - o Collect stakeholder comment
- Continue collaborative efforts with USACE in improving hydrologic modeling capability and coupling with atmospheric models and observations to inform water management decisions
- Project planning & coordination

Successful applicants should have expert knowledge and experience investigating and predicting sources of impactful precipitation, especially atmospheric rivers and their impact to watersheds along the west coast of the United States. They should also have technical expertise in the fields of water management, hydrologic data collection, data evaluation, QA/QC, statistical analysis, higher order analysis skills, data archiving systems and dissemination of the data to the public in usable form.

Section II: Award Information

Responses to this Request for Statements of Interest will be used to identify potential investigators for a research and development project to be funded by the U.S Army Corps of Engineers (USACE) Engineer and Research and Development Center's Coastal and Hydraulics Laboratory, Vicksburg, MS (ERDC-CHL). This project is expected to last five (5) years. Approximately \$2.5M is expected to be available to support this project in the first year (FY23). Funding for future years (4 option periods) may also be available at an estimated amount of up to \$12.5M/year for an anticipated total of up to \$52.5M, depending on options, for this project including base and option years.

II. Federal Award Information

The following information applies to awards issued under this announcement:

- This is a one-time initiative
- The Government anticipates 1 Federal awards from this announcement, but reserves the right to award more or less
- The total amount of funding expected to be awarded through this announcement is up to \$52.5M
- The expected amount of funding for each award is \$2.5M for Year 1, \$12.5M for Year 2, \$12.5M for Year 3, \$12.5M for Year 4, and \$12.5M for Year 4
- Award(s) from this announcement will be Cooperative Agreement(s)
- The anticipated period of performance is (60 months or 5 years)
- Applications for renewal or supplementation of existing projects are eligible to compete with applications for new Federal awards
- The government reserves the right to accept only portions of an application and to negotiate with potential awardees
- Government's substantial involvement includes:

The USACE will collaborate with the investigator to research the phenomenon of atmospheric rivers and the feasibility of using state-of-the-art forecast information to inform reservoir operations in the USACE. The USACE will also collaborate with the investigator to identify and develop appropriate predictive atmospheric, hydrologic and hydraulic tools required for successful FIRO execution.

III. Eligibility Information

A. Eligible Applicants

This opportunity is restricted to non-federal partners of the Californian Cooperative Ecosystems Studies Unit (CESU).

Disclosures of current and pending support made in this application may render an applicant ineligible for funding. Prior to award and throughout the period of performance, ERDC may continue to request updated continuing and pending support information, which will be reviewed and may result in discontinuation of funding.

Religious organizations are entitled to compete on equal footing with secular organizations for Federal financial assistance as described in E.O. 13798, "Promoting Free Speech and Religious Liberty."

B. Cost Sharing or Matching

This action will be 100% funded by USACE.

C. Conflict of Interest

a) General Requirement for Disclosure

You and your organization must disclose any potential or actual scientific or nonscientific conflict of interest(s) to us. You must also disclose any potential or actual conflict(s) of interest for any identified sub recipient you include in your application. We may have to ask you more questions if we need more information.

At our discretion, we may ask you for a conflict-of-interest mitigation plan after you submit your application. Your plan is subject to our approval.

b) Scientific Conflict of Interest

Scientific collaborations on research and development projects are generally the result of close collaboration prior to the submission of applications for support. Accordingly, these collaborations should be considered when considering potential conflicts of interest. The potential conflict is mitigated by the disclosure of these collaborations, and the list of current and pending support you provide for senior and key researchers. Therefore, you must include in your list of current and pending support all collaborators, even if they did not formally provide support.

D. Other

a) Licensure or Certification

You must include the Acknowledgment of Support and Disclaimer on all materials created or produced under our awards. This language may be found in the Terms and Conditions included in the award documents.

E. Certifications, representations, and assurances

1. To apply for grants and other funding opportunities the applicant entity must have an active registration in the System for Award Management (SAM). Applications will not be accepted through Grants.gov or other methods unless the entity is registered in SAM. Registration in SAM now includes the acceptance of Certifications and Assurances. See <https://www.grants.gov/web/grants/grantors/grantor-standard-language.html> for details on how to register in SAM, and Grants.gov
2. The Federal Assistance Certifications Report is an attestation that the entity will abide by the requirements of the various laws and regulations; therefore, as applicable, you are still required to submit any documentation, including the SF-LLL Disclosure of Lobbying Activities (if award value exceeds \$100,000.00), and, if applicable, informing DoD of unpaid delinquent tax

liability or a felony conviction under any Federal law.

3. Certification Regarding Disclosure of Funding Sources. By checking "I Agree" on the SF 424 (R&R) block 17 you agree to abide by the following statement: "By signing this application, I certify the proposing entity is in compliance with Section 223(a) of the William M. (Mac) Thornberry National Defense Authorization Act for Fiscal Year 2021 which requires that: (a) the PI and other key personnel certify that the current and pending support provided on the proposal is current, accurate and complete; (B) agree to update such disclosure at the request of the agency prior to the award of support and at any subsequent time the agency determines appropriate during the term of the award; and (c) the PI and other key personnel have been made aware of the requirements under Section 223(a)(1) of this Act. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. code, Title 218, Section 1001)."

IV. Application and Submission Information (2 Phase Process)

A. Phase I: Submission of Statement of Interest (SOI)

1. Materials Requested for Statement of Interest/Qualifications:

a. Please provide the following via e-mail attachment to: Kasey Davis, Kasey.T.Davis@usace.army.mil (Maximum length: 2 pages, single-spaced 12 pt. font).

i. Name, Organization and Contact Information

ii. Brief Statement of Qualifications (including):

- Biographical Sketch,
- Relevant past projects and clients with brief descriptions of these projects,
- Staff, faculty or students available to work on this project and their areas of expertise,
- 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.

The administrative point of contact is Kasey Davis, Kasey.T.Davis@usace.army.mil.

2. ERDC will only accept SOIs submitted on or before 16 JUNE 2023, 05:00 Central Time (CT).

Based on a review of the Statements of Interest received, an investigator or investigators will be invited to move to Phase II which is 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.

B. Phase II (if invited): Submission of Full Application Package

1. Address to Request Application Package

The complete funding opportunity announcement, application forms, and instructions are available for download at [Grants.gov](https://www.grants.gov).

The administrative point of contact is Kasey Davis, Kasey.T.Davis@usace.army.mil.

2. Content and Form of Application Submission

All mandatory forms and any applicable optional forms must be completed in accordance with the instructions on the forms and the additional instructions below.

- a. SF 424 R&R - Application for Federal Assistance
- b. Full Technical Proposal – Discussion of the nature and scope of the research and technical approach. Additional information on prior work in this area, descriptions of available equipment, data and facilities, and resumes of personnel who will be participating in this effort should also be included.
- c. Cost Proposal/Budget – Clear, concise, and accurate cost proposals reflect the offeror's financial plan for accomplishing the effort contained in the technical proposal. As part of its cost proposal, the offeror shall submit a full budget in sufficient detail so that a reasonableness determination can be made. A recommended template will be included in the invitation to Phase II. The SF 424 Research & Related Budget Form can be used as a guide but is required if the sub-recipient uses it. The cost breakdown should include the following, if applicable:
 1. Direct Labor: Direct labor should be detailed by level of effort (i.e. numbers of hours, etc.) of each labor category and the applicable labor rate. The source of labor rates shall be identified and verified. If rates are estimated, please provide the historical based used and clearly identify all escalation applied to derive the proposed rates.
 2. Fringe Benefit Rates: The source of fringe benefit rate shall be identified and verified.
 3. Travel: Travel costs must include a purpose and breakdown per trip to include destination, number of travelers, and duration.
 4. Materials/Equipment: List all material/equipment items by type and kind with associated costs and advise if the costs are based on vendor quotes and/or engineering estimates; provide copies of vendor quotes and/or catalog pricing data.
 5. Subrecipient costs: Submit all subrecipient proposals and analyses. Provide the method of selection used to determine the subrecipient.
 6. Tuition: Provide details and verification for any tuition amounts proposed.

7. Indirect Costs: Currently the negotiated indirect rate for awards through the CESU is 17.5%.
8. Any other proposed costs: The source should be identified and verified.

d. R&R Senior/Key Person Profile

1. Biographical Sketch

2. Disclosure of Current and Pending Support:

- i. A list of all current projects the individual is working on, in addition to any future support the individual has applied to receive, regardless of the source.
- ii. Title and objectives of the other research projects.
- iii. The percentage per year to be devoted to the other projects.
- iv. The total amount of support the individual is receiving in connection to each of the other research projects or will receive if other applications are awarded.
- v. Name and address of the agencies and/or other parties supporting the other research projects.
- vi. Period of performance for the other research projects.

e. SF-LLL Disclosure of Lobbying Activities (if award value exceeds \$100,000.00)

f. Data Management Plan:

A data management plan is a document that describes which data generated through the course of the proposed research will be shared and preserved, how it will be done, or explains why data sharing or preservation is not possible or scientifically appropriate, or why the costs of sharing or preservation are incommensurate with the value of doing so. See also: DoD Instruction 3200.12.

<https://www.esd.whs.mil/Directives/issuances/dodi/>

Data management plans are generally 2 pages in length, and must include the following considerations:

- (1) The types of data, software, and other materials to be produced.
- (2) How the data will be acquired.
- (3) Time and location of data acquisition, if scientifically pertinent.
- (4) How the data will be processed.
- (5) The file formats and the naming conventions that will be used.
- (6) A description of the quality assurance and quality control measures during collection, analysis, and processing.
- (7) A description of dataset origin when existing data resources are used.
- (8) A description of the standards to be used for data and metadata format and content.
- (9) Appropriate timeframe for preservation.
- (10) The plan may consider the balance between the relative value of data preservation and other factors such as the associated cost and administrative

burden. The plan will provide a justification for such decisions.

(11) A statement that the data cannot be made available to the public when there are national security or controlled unclassified information concerns (e.g., “This data cannot be cleared for public release in accordance with the requirements in DoD Directive 5230.09.”)

3. ERDC will only accept full application packages submitted on or before 17 JUL 2023, 05:00 Central Time (CT).

4. Submission Instructions

Choose **ONE** of the following submission methods:

a. E-mail:

Format all documents to print on Letter (8 ½ x 11”) paper. E-mail proposal to Kasey Davis, Kasey.T.Davis@usace.army.mil.

b. Grants.gov: <https://www.grants.gov/>:

Applicants are not required to submit proposals through Grants.gov. However, if applications are submitted via the internet, applicants are responsible for ensuring that their Grants.gov proposal submission is received in its entirety.

All applicants choosing to use Grants.gov to submit proposals must be registered and have an account with Grants.gov. It may take up to three weeks to complete Grants.gov registration. For more information on registration, go to <https://www.grants.gov/web/grants/applicants.html>.

Organizations must have a Unique Entity Identifier (UEI) and active System for Award Management (SAM) registration to apply for Federal financial assistance.

C. Application Withdrawal:

An applicant may withdraw an application at any time before award by written notice via email. Notice of withdrawal shall be sent to the agency point of contact identified in this announcement, and are effective upon receipt.

D. Funding Restrictions

Per 2 CFR § 200.216, funds may not be used to procure telecommunications equipment or video surveillance services or equipment produced by

- Huawei Technologies Company,
- ZTE Corporation Hytera Communications Corporation,
- Hangzhou Hikvision Digital Technology Company,
- Dahua Technology Company
- any subsidiary or affiliate of such entities

Funds from an award may not be used to attain fee or profit.

V. Application Review Information

A. Selection Criteria

Applications will be evaluated using the following criteria, listed in descending order of importance:

- Technical merits of the proposed research and development; and
- Potential relationship of the proposed research and development to Department of Defense missions

B. Review and Selection Process:

Each application will be reviewed based on the selection criteria above rather than against other applications submitted under this Announcement.

Based on the Peer or Scientific Review, proposals will be categorized as Selectable or Not Selectable (see definitions below). The selection of the source for award will be based on the Peer or Scientific Review, as well as importance to agency programs and funding availability.

- i. Selectable: Proposals are recommended for acceptance if sufficient funding is available.
- ii. Not Selectable: Even if sufficient funding existed, the proposal should not be funded.

Note: The Government reserves the right to award some, all, or none of proposals. When the Government elects to award only a part of a proposal, the selected part may be categorized as Selectable, though the proposal as a whole may not merit such a categorization.

In addition to the technical/program review, the DoD performs a budget review and a risk review as directed by 2 CFR 200.206, including a review of the Federal Awardee Performance and Integrity Information System (FAPIIS). Applicants may review information in FAPIIS and comment on any information entered into that system. Comments made by applicants will be taken into account in addition to other information in considering applicants' integrity, business ethics, and record of performance.

VI. Federal Award Administration Information

The notification e-mail regarding a selection is not authorization to commit or expend DoD funds. A DoD grants officer is the only person authorized to obligate and approve the use of federal funds. This authorization is in the form of a signed Notice of Award. Applicants whose applications are recommended will be contacted by a DoD grants officer to discuss any additional information required for award. This may include representations and certifications, revised budgets or budget explanations, or other information as applicable to the proposed award. The award start date will be determined at this time.

VII. Reporting Requirements

The terms and conditions of the award will provide the specifics on how to submit the reports and any required sections for those reports.

In accordance with 2 CFR 200.328 (Financial Reporting) and 2 CFR 200.329 (Program Performance)

Report	Requirements/Form	Frequency	Means of Submission
ERDC Progress Report		Upon SF-270 submission	E-mail
Research Performance Progress Reports (Interim and Final)	OMB Control Number: 0704-0527	Annually	E-mail
Financial Report	SF 425	Bi-annually	E-mail
Payment Report	SF 270	Monthly	E-mail
Closeout Report		Once	E-mail

Awardees will need to comply with the reporting requirements in 2 CFR 170: Reporting Subaward and Executive Compensation Information.

The terms and conditions of the award will provide the specifics on how to submit the reports and any required sections for those reports.

VIII. Federal Contacts

Questions should be directed to:

Kasey Davis
 Grants Specialist
 Kasey.T.Davis@usace.army.mil

Tim Black
 Grants Officer
 Timothy.D.Black@usace.army.mil

Questions regarding Grants.gov should be directed to: the toll-free number 1-800-518-4726 and email at support@grants.gov.

IX. Other Information

The Federal government is not obligated to make any Federal award as a result of the announcement. Only grants officers can bind the Federal government to the expenditure of fund.

Applicants are advised to monitor Grants.gov for potential amendments to this Notice of Funding Opportunity. You can also elect to be automatically notified by Grants.gov whenever there is a change to the opportunity.

Applications must not include any information that has been identified as classified national security information under authorities established in Executive Order 12958, Classified National Security Information.