

STATEMENT OF OBJECTIVES

Water Resources Review and Research, Hydrology and Hydraulic Studies

W9126G-20-2-SOI-4993

27 July 2020

1.0 PURPOSE

The purpose of this Cooperative Agreement is to allow the U.S. Army Corps of Engineers Fort Worth District, and specifically the Water Resources Branch of the Fort Worth District availability to the academic resources of multiple Universities within the state of Texas, under the Interagency Flood Risk Management (InFRM) Council Group.

1.2 In agreement with the above stated purpose, the recipient/cooperator agrees to provide the necessary personnel, research, and data required to produce and complete all tasks in this Cooperative Agreement.

2.0 AUTHORITY

2.1 In accordance with section 6305 – *Using cooperative agreements* of the *Federal Grant and Cooperative Agreements Act of 1977* (31 U.S.C. § 6301 et seq.), all projects must carry out a public purpose of support or stimulation, instead of acquiring goods or services for the exclusive direct benefit of the United States Government. Examples of carrying out a public purpose may include, but are not limited to, the following:

A) Hydrology and hydraulic studies are of importance to the public as well as engineers and scientists involved in designing and operating infrastructure such as:

- Bridges and culverts for transportation of public and private infrastructure
- Flood plain mapping including base flood elevations (BFE)
- Reservoirs (Flood risk management, recreation, and more)
- Hydropower facilities (electricity for public use on grid)
- Water supply infrastructure for municipalities (public water sources)
- Any other infrastructure or human habitations located along rivers and creeks

2.2 In accordance with section 6305 – *Using cooperative agreements* of the *Federal Grant and Cooperative Agreements Act of 1977* (31 U.S.C. § 6301 et seq.), substantial involvement is expected between the Department of Defense and the recipient when carrying out the activity contemplated by the cooperative agreement.

The Federal Government further agrees to provide substantial involvement to include, but are not limited to, the following:

A) The USACE Fort Worth District Water Resources Branch will serve in a management and technical role by working with the partner to identify the

most qualified academic personnel to work on the various engineering and scientific objectives outlined under section 3.0. USACE will also perform quality assurance reviews of annual reports developed for the Cooperative agreement.

3.0 DESCRIPTION OF OBJECTIVES

3.1 **Base Task 1:** Daily Reservoir Evaporation Loss Study (Analysis) = approximate budget \$50,000.

The main objective of this project is to develop a 4 km spatial resolution daily gridded reservoir evaporation database which can be freely accessed and visualized by stakeholders in Texas. The database will contain two layers: a daily gridded Penman evaporation product, and a set of daily estimates for each of the major reservoirs. Improve the algorithm for calculating the gridded daily evaporation rate. Generate the fetch length parameter files for all of the reservoirs. Develop the historical reservoir evaporation dataset (e.g. 1979-2019) and comparing the dataset with estimates from TWDB. Migrate the evaporation software to the Google Earth Engine for Operational Application.

3.2 **Optional Task 2:** Daily Reservoir Evaporation Loss Study (Software API focus) = approximate budget \$50,000.

The main objective of this task will build on Task 1 and focus on developing the Application Programming Interface (API) for visualizing and downloading reservoir evaporation data. Develop the geodatabase and operational software architecture to integrate gridded weather data and simulate evaporation. Build and document the API to allow for machine-to-machine queries via HTML or command line requests. Provide a technical report to explain the algorithm, the inputs/outputs, the API, the database, and the evaluation results.

4.0 QUALIFICATIONS

Work on the reviews and studies will require comprehensive knowledge of hydrology, hydraulic engineering, meteorology, and hydrometeorology of extreme storms. All team members are required at a minimum to have a degree in meteorology, hydrology, engineering, or a related science field. The team must be qualified to review engineering and scientific reports. The team also must be able to prepare cartographic maps for a number of the proposed studies.

5.0 OPTIONS

One (1) optional task is anticipated within this agreement, and is subject to the availability of funds. Each optional tasks may be exercised at any time during the 12 months of the base period time frame.

6.0 PERIOD OF PERFORMANCE (PoP)

6.1 Base Period:

Base Task 1 = 12 months from date of award.

6.2 Optional Tasks:

Optional Task 2 = 12 months from date exercised.

*Optional task(s) are subject to the availability of funds.

7.0 COORDINATION

7.1 Project Management:

USACE – Fort Worth District Water Resources Branch

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7.2 Location:

The physical location of the university is requested (but not mandatory) to be close to downtown Fort Worth, TX and specifically the USACE Fort Worth District Office (819 Taylor Street, Fort Worth, TX 76102) OR WITHIN the State of Texas. So that either party may drive to the other party's office for an in person day meeting.

8.0 DELIVERABLES

8.1 Annual Report – Once work begins, reports need to be provided to USACE once a year detailing progress of the base task based on the assumption that the base period and all option periods are awarded. However, if any of the option periods are not exercised, all models, reports, and all accompanying data that had been completed up

to the end of the base period or the last executed option period will be sent to the Fort Worth District.

The Fort Worth District Water Resources Branch Chief will coordinate the submittal date of the Final Report and all deliverables to the Fort Worth District.

One (1) copy of all reports will be sent electronically to the Fort Worth District.

All reports shall be submitted to the person identified as the Fort Worth District Water Resources Branch Chief in section 7.1 of this document.

9.0 Any resulting cooperative agreement will be subject to and recipient/cooperator shall comply with 32 CFR subpart 32.36 “Intangible Property” which includes use of research data.

[End of SOO]