

RECLAMATION

Managing Water in the West

U.S. Department of the Interior
Bureau of Reclamation

NOTICE OF INTENT TO AWARD

This Funding Announcement is not a request for applications. This announcement is to provide public notice of the Bureau of Reclamation's intention to fund the following project activities without full and open competition.

ABSTRACT	
Funding Announcement	BOR-MP-18-N011
Project Title	Intermediate-range Climate Forecasting to Support Snowpack Modeling in the Sierra Nevada
Recipient	Boise State University (BSU)
Principal Investigator / Program Manager	Alejandro Flores
Anticipated Federal Amount	\$161,044
Anticipated Non-Federal Amount	\$0
New Award or Continuation?	New
Anticipated Period of Performance	Approximately 3 years
Award Instrument	Cooperative
Statutory Authority	Omnibus Public Land Management Act of 2009 (Public Law 111-11), Title IX-Bureau of Reclamation Authorizations, Subtitle F-Secure Water, Sec. 9509 Research Agreement Authority
CFDA # and Title	15.555
Single Source Justification Criteria Cited	Unique Qualification
Reclamation Point of Contact	Chadwick Moore

OVERVIEW

As the demands upon surface water supplies grow increasingly complex, the need for early and accurate runoff forecasting becomes more critical. In watersheds of California's Sierra Nevada, balancing agricultural water needs, municipal water needs, and environmental river flows is hampered by current runoff forecasting methods. Much of the rain and snow sensor network omits high elevation terrain and large wilderness areas, and the technology used for measurement is generally decades old. Existing runoff forecasting methods rely upon historic analogs and are

prone to increasing inaccuracy the face of shifting climate and related factors such as tree mortality or large wildfires.

A key component of modeling runoff is forward-looking forecasts to enable modeling to anticipate precipitation and snow melt events. Existing forecast products are typically too coarse in spatial resolution to adequately drive snowpack models, such as ISNOBAL which characterizes the snowpack at a fine scale. A suitable forecast to drive ISNOBAL is possible using the Weather Research Forecasting (WRF) model. By downscaling atmospheric model data at finer scales across a 7-10 day time horizon, existing ISNOBAL models for the Sierra Nevada can forecast the timing of snowmelt and subsequent runoff, not just the total volume of runoff over a season.

The objective of this Agreement is to utilize the expertise and computational hardware of the Boise State University Lab for Ecohydrology and Alternative Futuring (LEAF) to produce timely mesoscale forecasts at high resolution in order to enhance the capability of ISNOBAL models currently in development by Agricultural Research Service (ARS), evaluate the most efficient method for producing and integrating such forecasts, evaluate WRF forecast accuracy through reforecasting and verification, and partner with the Bureau of Reclamation and Reclamation partners in advancing 21st Century runoff forecasting.

RECIPIENT INVOLVEMENT

Boise State University shall:

- Maintain responsibility for provisioning adequate computing resources to perform forecasting and other modeling activities identified within the Statement of Work;
- Be responsible for provisioning adequate data storage capacity for project data during the lifetime of the agreement;
- Attend coordination meetings between ARS modeling team, and product users;
- Maintain responsibility for ensuring the accessibility of model outputs for ARS modeling and other project personnel;
- Respond to requests for information about model data output products from ARS modeling team and other project personnel;
- Collaborate with ARS and Mid-Pacific personnel to evaluate how forecast products might be integrated into existing streamflow forecasting workflows.

RECLAMATION INVOLVEMENT

Substantial involvement by Reclamation is anticipated during the performance of activities funded under this cooperative agreement. In support of this Agreement, Reclamation will be responsible for the following:

- Initiate Kick-off meetings to optimize work products for the Bureau of Reclamation operations staff, and guiding the modeling domains and desired model products;

- Hold regular coordination meetings between ARS modeling team, Recipient, and product users;
- Promote integration of data products (both qualitatively and using the products in operations) into Millerton Lake Reservoir operations and San Joaquin River Restoration Program operations;
- Provide technical review of work products to optimize for application in operations;
- Work with Recipient to evaluate how WRF-derived forecast products could be used to enhance streamflow forecasting in support of real-time operations, including identifying partners to integrate WRF-derived forecasts products into ongoing runoff models.

SINGLE-SOURCE JUSTIFICATION

DEPARTMENT OF THE INTERIOR SINGLE SOURCE POLICY REQUIREMENTS

Department of the Interior Policy (505 DM 2) requires a written justification which explains why competition is not practicable for each single-source award. The justification must address one or more of the following criteria as well as discussion of the program legislative history, unique capabilities of the proposed recipient, and cost-sharing contribution offered by the proposed recipient, as applicable.

In order for an assistance award to be made without competition, the award must satisfy one or more of the following criteria:

- (1) Unsolicited Proposal – The proposed award is the result of an unsolicited assistance application which represents a unique or innovative idea, method, or approach which is not the subject of a current or planned contract or assistance award, but which is deemed advantageous to the program objectives;
- (2) Continuation – The activity to be funded is necessary to the satisfactory completion of, or is a continuation of an activity presently being funded, and for which competition would have a significant adverse effect on the continuity or completion of the activity;
- (3) Legislative intent – The language in the applicable authorizing legislation or legislative history clearly indicates Congress' intent to restrict the award to a particular recipient of purpose;
- (4) Unique Qualifications – The applicant is uniquely qualified to perform the activity based upon a variety of demonstrable factors such as location, property ownership, voluntary support capacity, cost-sharing ability if applicable, technical expertise, or other such unique qualifications;
- (5) Emergencies – Program/award where there is insufficient time available (due to a compelling and unusual urgency, or substantial danger to health or safety) for adequate competitive procedures to be followed.

Reclamation did not solicit full and open competition for this award based the following criteria:

(4) UNIQUE QUALIFICATIONS

Single Source Justification Description:

BSU has a successful record providing intermediate-range high resolution forecasts for snowpack and runoff modeling and working under cooperative agreements with Reclamation. BSU's Lab for Ecohydrology and Alternative Futuring (LEAF) has developed a WRF modeling process and has the computer hardware resources for the intensive forecasting necessary for this task. BSU has a unique working relationship with Reclamation its cooperative partners in the development of better runoff forecasting. The LEAF lab brings together researchers from multiple universities across the country focused on several research themes related to snow hydrology, streamflow, remote sensing, soil moisture, and vegetation. No other entity could achieve a similar level of familiarity and expertise without first engaging in the lengthy process of studying and analyzing the data acquired thus far.

STATUTORY AUTHORITY

SEC. 9509. RESEARCH AGREEMENT AUTHORITY.

The Secretary may enter into contracts, grants, or cooperative agreements, for periods not to exceed 5 years, to carry out research within the Bureau of Reclamation.

Research can be defined as the careful or diligent search, studious inquiry, or examination (especially investigation or experimentation) aimed at the discovery and interpretation of facts, or the collecting of information about a particular subject. The objective of this research project is to assess the capabilities of using mesoscale weather predictions model(s) to provide hydroclimate forecasts data at improved accuracy and spatiotemporal coverage relative to currently available products. The outputs of the WRF model, combined with other modeling efforts, will potentially improve streamflow prediction. Better streamflow volume and timing prediction would enable a more efficient use of water storage and conveyance facilities.