



NOTICE OF INTENT TO AWARD

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

ABSTRACT	
Funding Announcement	USGS-19-FA-0177
Project Title	Landsat Radiometric Calibration
Recipient	South Dakota State University
Anticipated Federal Amount	\$654,963.00
Cost Share	\$0
Total Anticipated Award Amount	3,477,286.00
New Award or Continuation?	New
Anticipated Period of Performance	10/01/2019 – 09/31/2024
Award Instrument	Cooperative Agreement
CFDA # and Title	15.808 – Research and Data Collection
USGS Point of Contact	Cody Anderson (chanderson@usgs.gov); Sara Roser (sroser@usgs.gov)

OVERVIEW

South Dakota State University (SDSU) will work collaboratively with the USGS to improve Landsat data quality and user confidence, with specific emphasis on validating surface reflectance products. Landsat is a multispectral imager with reflective and thermal emissive bands. This project will focus on reflective bands and validation to monitor their response. SDSU will perform fieldwork and Pseudo Invariant Calibration Site (PICS) analysis for validation of Landsat Level 1 and Level 2 products. They will also perform research on detector-to-detector response balancing and sensor-to-sensor cross-calibration techniques. This project will improve data quality of both top-of-atmosphere and surface products. Overall, this project will result in Landsat products that are developed with highly-calibrated and validated sensor data.

RECIPIENT INVOLVEMENT

SDSU will:

- Develop, deploy, and update mirror-based targets for surface reflectance derivation at multiple locations across the US;
- Develop software to process mirror responses to correct Landsat imagery to surface reflectance and compare to derived Landsat surface reflectance products;
- Conduct fieldwork with mirror targets and hand-held spectrometers with multiple groups at different locations across the US;
- Enhance PICS methodology for monitoring on-orbit reflective sensor responses;
- Improve relative detector-to-detector response balancing techniques; and
- Analyze Landsat performance and response across multiple missions including the in-development Landsat 9.

USGS INVOLVEMENT

Substantial involvement on the part USGS is anticipated for the successful completion of the objectives to be funded by this award. In particular, USGS, will be responsible for the following:

- Assist with organization and coordination of mirror-based target deployment at multiple locations across the US;
- Assist with analysis of data obtained from mirror targets;
- Participate in fieldwork;
- Assist with review of PICS enhancement and trending results;
- Collaborate with SDSU on potential of incorporating updated calibration parameters into Landsat product production.

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.
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.
- (6) Cooperative Agreements - USGS Unique Authority cited at 43 U.S.C. 36d (Federal, State, and academic partners) or DOI Authority cited at 43 U.S.C. 1457b (not-for-profit organizations).

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

(4) UNIQUE QUALIFICATIONS

(6) COOPERATIVE AGREEMENTS – USGS Unique Authority cited at 43 U.S.C. 36d

Single Source Justification Description:

(4) South Dakota State University (SDSU) has performed Landsat reflective band validation and calibration support for over 30 years. During this time, they have developed and enhanced current state-of-the-art tools for monitoring and assessing surface reflectance measurements with accepted hand-held spectrometers. SDSU has also performed on-orbit image artifact characterization and correction, detector-to-detector response balancing, PICS methods development, and multiple sensor cross-calibrations. Recently, SDSU has also been key in the development of mirror-based targets used for deriving surface reflectance from on-orbit imagery. SDSU also possesses considerable knowledge on radiative transfer and atmospheric correction necessary to connect the top of atmosphere (Level 1) measurements to derived surface (Level 2) products. SDSU’s knowledge and expertise in the area of surface reflectance validation and past experience working on the Landsat reflective bands make it uniquely qualified to conduct this project.

STATUTORY AUTHORITY

USGS Unique Authority cited at 43 U.S.C. 36d (Federal, State and academic partners).

§ 36d. Cooperative agreements: Notwithstanding the provisions of the Federal Grant and Cooperative Agreement Act of 1977 (31 U.S.C. 6301–6308), the United States Geological Survey is authorized to continue existing, and on and after November 10, 2003, to enter into new cooperative agreements directed towards a particular cooperator, in support of joint research and data collection activities with Federal, State, and academic partners funded by appropriations herein, including those that provide for space in cooperator facilities.