Statement of Work

Earth Observing System Data and Information System (EOSDIS) Evolution and Development 2 (EED2)

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Section 1 – Introduction

This contract provides for development and sustaining engineering of software and hardware systems that provide science data management for the ESDIS Project. A major activity under this contract will be for evolution and development engineering of several systems that may include:

- EOSDIS Core System (ECS),
- Earth Observing System Clearing House (ECHO),
- EOSDIS User Registration System (URS),
- Coherent Web effort (earthdata.nasa.gov),
- ESDIS Metrics System (EMS),
- ESDIS-managed portions of the S-NPP Science Data Segment (SDS)
- mini-Interface-Data-Processing-Segment (mini-IDPS),

and other EOSDIS elements that provide the common capabilities and infrastructure of EOSDIS.

1.1 Background

The purpose of NASA's Science Missions Directorate Earth science program is to develop a scientific understanding of Earth's system and its response to natural or human-induced changes, and to improve prediction of climate, weather, and natural hazards.

A major component of NASA's Earth Science Division is a coordinated series of satellite and airborne missions for long-term global observations of the land surface, biosphere, solid Earth, atmosphere, and oceans. This coordinated approach enables an improved understanding of the Earth as an integrated system. NASA is completing the development and launch of a set of Foundational missions, new Decadal Survey missions, and Climate Continuity missions. Over the coming decades, NASA and the Agency's research partners will continue to pioneer the use of both spaceborne and aircraft measurements to characterize, understand, and predict variability and trends in Earth's system for both research and applications. The research encompasses:

- the global atmosphere;
- the global oceans including sea ice;
- land surfaces including snow and ice;
- ecosystems; and
- interactions among the atmosphere, oceans, land and ecosystems, including humans.

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NASA's goal is to understand the changing climate, its interaction with life, and how human activities affect the environment. Through partnerships with national and international agencies, NASA enables the application this understanding for the well-being of society.

NASA's Earth Science program was established to use the advanced technology of NASA to understand and protect our home planet by using our view from space to study the Earth system and improve prediction of Earth system change. To meet this challenge, NASA promotes the full and open sharing of all data with the research and applications communities, private industry, academia, and the general public.

NASA was the first agency in the US, and the first space agency in the world, to couple policy and adequate system functionality to provide full and open access in a timely manner – that is, with no period of exclusive access to mission scientists – and at no cost.

NASA made this decision after listening to the user community, and with the background of the then newly-formed US Global Change Research Program, and the International Earth Observing System partnerships. Other US agencies and international space agencies have since adopted similar open-access policies and practices.

Since the adoption of the Earth Science Data Policy adoption in 1991, NASA's Earth Science Division has developed policy implementation, practices, and nomenclature that mission science teams use to comply with policy tenets.

The Earth Observing System Data and Information System is a major core capability within NASA's Earth Science Data Systems Program. EOSDIS ingests, processes, archives and distributes data from a large number of Earth observing satellites. EOSDIS consists of a set of processing facilities and Earth Science Data Centers distributed across the United States and serves hundreds of thousands of users around the world, providing hundreds of millions of data files each year covering many Earth science disciplines.

The Earth Science Data and Information System (ESDIS) Project, Code 423, at the Goddard Space Flight Center (GSFC) manages the EOSDIS on behalf of the SMD.

1.2 Scope

In the performance of this contract, the EED2 contractor is required to coordinate and integrate task related activities with the ESDIS Project, the Distributed Active Archive Centers (DAACs), other Earth science data centers, the science investigator teams, the user community, as well as other EOS contractors. The contractor's overall goal shall be to continuously improve the reliability, availability, functionality, operability, and performance of hardware and software systems within the EOSDIS while reducing operational and maintenance costs.

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The contractor may be tasked to:

- Provide new systems and/or major upgrades to existing systems
- Conduct engineering studies directed by the Government
- Provide corrective engineering of custom and commercial off-the-shelf (COTS) software in a timely manner
- Provide preventive and corrective engineering of hardware components consistent with the operational availability needs of the DAACs and science users
- Provide hardware and software adaptive engineering to sustain the EOSDIS elements Earth science systems
- Provide hardware and software perfective enhancements to implement new requirements
- Provide corrective, adaptive, and perfective engineering to lower the overall cost of maintenance and operations
- Provide system operations support at the ECS DAACs
- Provide user support
- Perform operations for the ECHO system, the URS, Coherent Web, and the EMS

See Section 2.0 for definitions of preventive, corrective, adaptive, and perfective maintenance.

See the ESDIS Project web site for additional information about the Project and the EOSDIS system and components: http://earthdata.nasa.gov/esdis

1.3 Place of Performance

The contractor is responsible for selecting the location(s) to perform the activities required by this statement of work. Generally, the contractor shall be able to support task related meetings at the GSFC within 2 hours of notification.

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The contractor shall host government and government support personnel attending required monthly reviews.

The contractor shall make a minimum of 2 full time offices (no less than 160 square feet total) available for visiting government support personnel, and government assurance representatives upon request.

Section 2.0 Definitions

Corrective Engineering – Changes necessitated by actual design errors and/or design deficiencies. Corrective engineering consists of activities normally considered to be error correction required to keep the system operational. By its nature, corrective engineerng is usually a reactive process. Corrective engineering is related to the system

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not performing as originally intended. The three main causes of corrective engineering are (1) design errors, (2) logic errors, and (3) coding errors.

Adaptive Engineering – Changes initiated as a result of technology upgrades and changes in the environment in which a system must operate. These environmental changes are normally beyond the control of the maintainer and consist primarily of changes to the: (1) rule, laws, and regulations that affect the system: (2) hardware configuration, e.g., new terminals, local printers, etc.: (3) data formats, file structures: and (4) system software, e.g., operating systems, compilers, and utilities.

Perfective Engineering – (Also commonly referred to as enhancements and upgrades) All changes, insertions, deletions, modifications, extensions, and enhancements made to a system to meet the evolving and/or expanding needs of the user. It is generally performed as a result of new or changing requirements, or in an attempt to augment or fine-tune the existing software/ hardware operations/performance. Activities designed to make the code easier to understand and to work with, such as restructuring or documentation updates and optimization of code to make it run faster or use storage more efficiently are also included in the Perfective category.

Preventive Maintenance – As used in this statement of work Preventive Maintenance refers to hardware preemptive activities, such as cleaning filters and installing recommended engineering changes, to avoid future failures. Preventive maintenance activities are expected to be included with a corrective maintenance task.

Section 3.0 Requirements

Within the scope of this contract the contractor shall provide all the necessary capabilities including, but not limited to, trained personnel, tools, materials, documentation, procurement, software and hardware environments, and facilities (except as contractually provided by the government as Government Furnished Property) to perform the following:

3.1 Program Management (WBS 1)

The EED2 contractor shall plan, develop, integrate, and execute the program management activities necessary to successfully execute the requirements of this contract. The contractor shall provide the necessary skills and staffing levels to ensure successful performance on this contract. These activities shall include, but are not limited to, program planning, detailed technical planning; conduct of technical and program reviews; financial and technical progress reporting; financial management; purchasing and procurement of required products, services and resources; subcontract management; configuration management; safety management; security and property management; quality management; risk management; and performance assurance.

3.2 Transition of Engineering Responsibilities (WBS 2)

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The EED2 contractor shall plan for and execute the transfer of hardware and software system responsibilities from the current EED contractor (NNG10HP02C). The EED2 contractor shall also plan and execute the transfer of hardware and software system responsibilities and provide training and consultation services to the responsible contractor in the post-EED2 timeframe. These activities shall include but are not limited to facility planning; transition planning to meet the operational requirements of this contract; goal setting and development of schedules and milestones; coordination of activities; property management; training of personnel necessary for the acceptance, maintenance, development and operation of the software systems under this contract; installation and testing of both hardware and software; and conduct of a Capability Demonstration Test.

3.3 Development Engineering (WBS 3)

The EED2 contractor shall perform design, development, test and implementation activities for Earth science data systems. Development activities shall include, but not be limited to, hardware and/or software requirements analysis, test plan development, test activity planning and coordination, design, interface definition and /or compliance with standards cited within this contract, test and integration, training, quality assurance and documentation development and maintenance.

3.4 Maintenance Engineering (WBS 4)

The EED2 contractor shall perform hardware and software engineering maintenance of Earth science data systems in accordance with authorized tasks. Engineering maintenance shall consist of a large spectrum of activities including, but not limited to, replace, remove and/or upgrade custom software, COTS software, COTS hardware and system media; design; implementation; modification; configuration management; computer resource analysis and utilization planning; training of personnel as necessary; integration; installation; user liaison; help desk; and testing. The contractor shall also plan, document, implement, and maintain the hardware and software maintenance and development processes to be used throughout the life of the EED2 contract, including detailed patch and release documentation.

3.5 System Engineering (WBS 5)

The EED2 contractor shall perform system engineering on Earth science data system hardware and software systems in accordance with authorized tasks. System Engineering activities shall include, but not be limited to, analyses; trade studies; point papers related to recommending enhancements to the EOSDIS system and/or its components for cost saving and/or cost avoidance; capacity growth; performance, reliability, maintainability and/or operational improvements; technology refresh; design improvements; process improvement; and other similar type upgrades.

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3.6 Science Support (WBS 6)

The EED2 contractor shall provide support to the Earth science community in accordance with authorized tasks. Support shall include but not be limited to training in the use of the EOSDIS or other Earth science systems, including instruction on data models, definition of the Earth Science Data Types, development and maintenance of interfaces and related documentation, identification of system modifications required to support science community needs, and training in the analysis of problems.

3.7 Operations Support (WBS 7)

The EED2 contractor shall provide operations support in accordance with authorized tasks. These activities include, but are not limited to, on-site system operations, on site system administration, on-site maintenance, training of operations and related skilled personnel on the maintenance and operation, use of operational and diagnostic tools and procedures, development of procedures to accommodate upgrades or enhancements, on-site engineering support at designated sites, on-site metric collection related to the operational performance, problem diagnoses and solution development, system administration and security planning, system tuning, patch and release planning and coordination , system testing, informational bulletin development; special tools use and development, system impact analyses and problem analyses.

3.8 Studies and Prototyping (WBS 8)

The EED2 contractor shall perform and/or support special studies and prototyping in accordance with authorized tasks.

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