

## A.19 ADVANCING COLLABORATIVE CONNECTIONS FOR EARTH SYSTEM SCIENCE

**Amended February 24, 2006**

**This final version of Appendix A.19: Advancing Collaborative Connections for Earth System Science (ACCESS) replaces in its entirety the preliminary version that was released with the ROSES-2006 NASA Research Announcement.**

### 1. Scope of the ACCESS Program

#### 1.1 Programmatic Description

The objective of the ACCESS (Advancing Collaborative Connections for Earth System Science) program is to enhance and improve existing components of the data and information systems infrastructure that support NASA's Earth science research communities. ACCESS projects help to strengthen the interconnectedness of NASA's heterogeneous data system components by leveraging proven information technologies, protocols, and practices.

This solicitation seeks proposals to develop web-based, science-user clients that utilize NASA's EOS Clearing House (ECHO) middleware technologies. These clients are intended to exploit the underlying capabilities of ECHO and serve as functional prototypes demonstrating the ease of development and reuse of ECHO clients by science and technology professionals.

#### 1.2 Solicitation Goals

The intent of this solicited activity is to provide users of NASA Earth science data innovative ECHO-based client portals to discover, transform, or deliver these data using the metadata inventoried in ECHO. ECHO is a NASA-supported middleware development effort that provides client developers a means to interface with NASA's EOS data archives.

The outcome of this ACCESS solicitation will result in the creation of new user clients that leverage the powerful middleware features of ECHO. These new clients will demonstrate the underlying utility of ECHO by providing a known community of science users a client that facilitates the access to and the discovery of NASA data and services. The following sections provide the information needed to respond to this solicitation.

##### 1.2.1 ECHO Technical Overview

ECHO is a clearinghouse of spatial and temporal metadata, inclusive of NASA's Distributed Active Archive Center (DAAC) data holdings, that enables the science community to more easily exchange NASA data and information. Currently ECHO holds the metadata descriptors for over 2,129 data collections comprising 54 million individual data granules and 13 million browse images. The majority of ECHO's

holdings come directly from data held in the NASA DAACs; more information on the NASA DAACs may be found at <http://nasadaacs.eos.nasa.gov/>. The science disciplines and domains represented in ECHO are diverse and include metadata for all of NASA's Science Focus Area data:

- Climate Variability and Change
- Carbon Cycle and Ecosystems
- Earth Surface and Interior
- Atmospheric Composition
- Weather
- Water and Energy Cycle

As middleware for a service-oriented enterprise, ECHO offers entrée to its capabilities through a set of publicly available Application Program Interfaces (APIs) (see Figure 1). These ECHO APIs are based on industry standards for performing web-based computing, specifically web services profile. These service interfaces are defined in the Web Services Definition Language (WSDL) and are accessible through Simple Object Access Protocol (SOAP).

Using these standards, clients written in most contemporary programming languages are isolated from the underlying technologies that support the distributed communication and functionality. These clients may call the ECHO web services much like a local function call. Most current developer tools support these standard technologies (e.g. WSDL, SOAP) natively. More information about ECHO, including a user's guide and the API specification is available at <http://eos.nasa.gov/echo>.

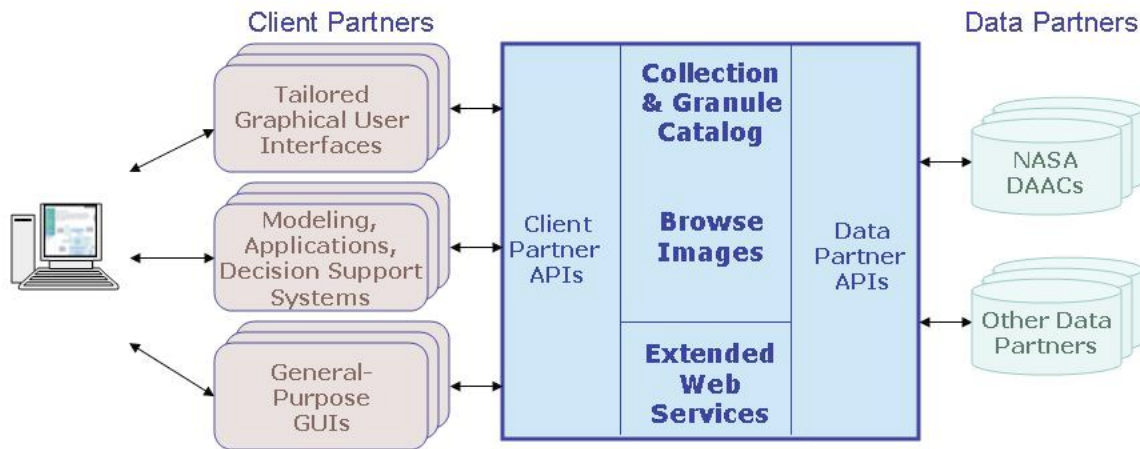


Figure 1: The relationship of ECHO (middle box) to data sources and user clients.

### 1.2.2 ECHO Resources for Proposers

The ECHO website (<http://eos.nasa.gov/echo>) offers extensive information on how to get started developing an ECHO client. Proposers unfamiliar with ECHO will find numerous resources that provide extensive information on the specific technical aspects of ECHO. Client-developer resources at the ECHO web site include:

- ECHO User's Guide
- API Specification
- System Access Information
- Reuse Page - The ECHO Client Reuse page is a resource to enable the sharing of source code between ECHO client developers.
- Reference Client - The ECHO Reference Client is a working Java-based Web application that interacts with ECHO to demonstrate an implementation of basic client operations. The application is distributed with the source code and is intended to be used as a learning resource by anyone developing software clients for ECHO.

The ECHO Operations Team (ECHO Ops) is also a resource for ECHO client developers. ECHO Ops is the point of contact for direct interaction between NASA's ECHO project, its technology partners, and end users. The ECHO Ops team will meet with the client-developers before client development begins. Team members will be available to answer questions and track problems to resolution throughout the client-development process. In addition, the ECHO project has a well-established user community that meets weekly for technical discussions. We encourage proposers to participate in these discussions.

### 1.2.3 ECHO Clients Sought

The clients developed in response to this ACCESS solicitation are intended to be functioning ECHO-enabled clients. The rapid deployment of these clients may mean that some client functions are more operable than others by the end of the contract. The demonstration of the functioning client at the end of the period of performance is a key requirement and deliverable of each selected proposal. It is strongly encouraged that proposers to this solicitation work closely with, or be exceedingly familiar with, the needs of one or more Earth science research community. Clients that readily address a known need of the affiliated NASA science investigators and user communities are strongly encouraged. All clients developed under this program should remain available to the user community following the end of the development effort. The clients developed will also be used as client examples by the ECHO Ops Team.

The ECHO client developed for this effort can be either a GUI-based interactive system (invoked via a web page) or a machine-to-machine interface where ECHO services are provided to users in an automated or routine fashion (such as a data subscription).

## 2. Programmatic Information

### 2.1 Funding and Number of Funded Efforts

This solicitation expects to provide approximately \$200K for approximately two proposed efforts. It is expected that approximately \$75,000 - \$125,000 will be provided for each ECHO client-development effort. Proposers are encouraged to propose development efforts that can be realized within this funding range.

### 2.2. Period of Performance

All work funded under this solicitation must be completed in one year from the start date. The goal of this solicitation is to rapidly develop ECHO clients. It is anticipated that robust user clients can be developed within this period.

### 2.3 Prior Work

Past work or use of ECHO is not a requirement for selection under this solicitation.

### 2.4 Award Type

The funding vehicle for any award under this solicitation will be a Cooperative Agreement (CA) only. Proposers should be aware of the differences between a CA and a grant. For additional information proposers should review the NASA Grant and Cooperative Agreement Handbook (<http://ec.msfc.nasa.gov/hq/grcover.htm>).

### 3. Summary of Key Information

Expected total program budget for new awards	~ \$200K
Number of new awards pending adequate proposals of merit	~2
Maximum duration of awards	1 year
Due date for Notice of Intent to propose (NOI)	3/31/06
Due date for proposals	6/14/06
NASA strategic objective(s) which proposals must state and demonstrate relevance to	Every proposal must address one or more strategic goal or strategic outcome from Table 1. See also Sections I(a) and IV(e) in the <i>Summary of Solicitation</i> of this NRA.
General information and overview of this solicitation	See the <i>Summary of Solicitation</i> of this NRA.
Detailed instructions for the preparation and submission of proposals	See the <i>NASA Guidebook for Proposers Responding to a NASA Research Announcement – 2006</i> at <a href="http://www.hq.nasa.gov/office/procurement/nraguidebook/">http://www.hq.nasa.gov/office/procurement/nraguidebook/</a> .
Page length for the central Science-Technical-Management section of proposal	15 pp; see also Chapter 2 of the <i>Guidebook for Proposers</i>
Submission medium	Electronic proposal submission is required; no hard copy is required. See also Section IV in the <i>Summary of Solicitation</i> of this NRA and Chapter 3 of the <i>NASA Guidebook for Proposers</i> .
Web site for submission of proposal via NSPIRES	<a href="http://nspires.nasaprs.com/">http://nspires.nasaprs.com/</a> (help desk available at <a href="mailto:nspires-help@nasaprs.com">nspires-help@nasaprs.com</a> or (202) 479-9376)
Web site for submission of proposal via Grants.gov	<a href="http://grants.gov">http://grants.gov</a> (help desk available at <a href="mailto:support@grants.gov">support@grants.gov</a> or (800) 518-4726)
Funding opportunity number for downloading an application package from Grants.gov	NNH06ZDA001N-ACCESS
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