

1. Scope of Program

1.1 Introduction

NASA's Earth-Sun System Division (ESSD) is responsible for a wide range of investigations that cover numerous scientific disciplines comprising the Earth and Sun and their connections. One of the principles of the ESSD is that larger environmental processes involving multiple established disciplines can be organized into logical groupings of Science Focus Areas (SFAs), and that the observation data of many spaceflight missions can be likewise organized into geophysical measurement suites.

The objective of this solicitation is to further enhance, and in some instances develop, the means for improving the connections of existing conventional pieces of the science data and information infrastructure that support ESSD science communities and their attendant applications and educational users. The Advancing Collaborative Connections for Earth-Sun System Science (ACCESS) program seeks to expand and strengthen the interconnectedness and reuse of key information technologies and services across the broad spectrum of Earth-Sun system science investigations and those within ESSD's applied science applications.

Proposals selected from the ACCESS solicitation are expected to rapidly bridge specific gaps in existing information systems and services that support NASA Earth-Sun system science investigations and applications (view NASA's Earth science research strategy at <http://science.hq.nasa.gov/earth-sun/science> and the applied sciences strategy at <http://science.hq.nasa.gov/earth-sun/applications>). Within the scope of this solicitation, NASA ESSD seeks proposals that address particular known challenges in the development of Earth science data system infrastructure, tools and services that are enumerated here. Proposals that are able to link key needs of the science or application communities with innovative mechanisms for achieving greater data access, use and analysis are of particular value.

This ACCESS solicitation is not a duplicative call for activities described in other ROSES-2005 solicitations, including Earth and solar science research (Appendices A.2 through A.23 of this NRA), science data product generation or related education activities under the REASoN solicitation (Appendix A.27 of this NRA), integrated system solutions and solution network characterization through the Applied Sciences Decision Support through Earth-Sun Science Research Results solicitation (Appendix A.24 of this NRA), or integrated data services and prototyping offered through the Virtual Observatories for Solar and Space Physics solicitation (Appendix A.22 of this NRA).

1.2 Data Systems and Services for Earth-Sun and Applied Sciences

NASA seeks to support the deployment of data and information systems and services that enable the freer movement of Earth science data and information within a distributed environment of providers and users, and the exploitation of needed tools and services to aid in scientific inquiry and applications of national importance. Other NASA solicitations deal with the development of needed technologies (see the Earth Science Technology Office at <http://esto.gsfc.nasa.gov>), the ACCESS solicitation differs from these in its goal to use existing higher TRL (technology readiness level 6 and above) technologies to support science and applications communities. NASA ESSD has been actively promoting a more distributed and heterogeneous data and information system architecture to support Earth-Sun system science. ACCESS provides significant resources to develop and coordinate these distributed systems based on existing structured research disciplines and application communities. The two-targeted categories discussed in the following sections serve to inform prospective proposers of the information technology and data services sought in this solicitation and illustrate the type of proposals that are deemed responsive to NASA's Earth-Sun Science and Applied Sciences goals and priorities.

1.2.1 Support for Evolution to Science Measurement Processing Systems

NASA's ESSD is actively moving forward with the creation of science measurement processing and analysis systems (ComPS) that will serve specific science communities data product and service needs. The development of ComPS to support NASA Earth-Sun System research and applied sciences represents an evolutionary step forward in the function and structure of NASA data and information systems. A science measurement system brings together expertise in multiple instrument characterization, data processing, science-based product generation and distribution, and interactive relationships with the broader science community. The ComPS affords science communities greater control over the type of data and information products needed to answer key science questions and related application activities.

The Ocean Color Processing System (OCPS) at GSFC demonstrates an early instantiation of NASA's move from mission-oriented data and information processing to systems that are measurement focused (see <http://oceancolor.gsfc.nasa.gov/>). The OCPS, as a processing system, is able to ingest data streams from multiple instruments and platforms and generate and distribute higher-level science products. The ocean color community has derived direct benefits for science inquiry using a science-based processing system that embodies many innovative functions including community ftp where data and results can be shared, flexible processing systems that can incorporate user algorithms for quick testing and comparison, and community-based tool kits for users to process and use ocean color data on their desktop environments.

The prototype ComPS for the ocean color community, and the Precipitation Processing System (PPS) for the precipitation community, are first steps in NASA's move from

mission-oriented data systems (single instrument data) to a measurement-based data systems (multiple instrument and satellite data). It is widely recognized from past practices that a single, "one size fits all" science data and information system rarely can satisfy all the broad requirements of the land, oceans and atmosphere research communities.

This first component of the ACCESS solicitation seeks proposals that will further enable the rapid development of community-based science processing systems by leveraging current or proven emergent data and information technologies and services. Given that the needs and specific requirements of science and application communities will vary, NASA anticipates that a variety of existing solutions may be applicable to advancing the development of our supporting science measurement processing systems and science teams.

Several current information technology and web service developments lend themselves to supporting and bolstering the evolution to science measurement processing systems. These are mentioned here in order to focus proposals on achievable, near-term activities for further development of science measurement systems rather than experimental, proof of concept technology exercises. In this first round of ACCESS solicitations, we are requesting proposals that: 1) enable greater interoperability and/or data flow between distributed data sources, data processing assets, and data distribution portals, 2) use intelligent web-enabled services for handling routine data access, processing or exchange tasks by science or applications (DSS) users, and 3) incorporate needed data reduction tools into data delivery systems that allow users to obtain only the data that is required for science of application purposes.

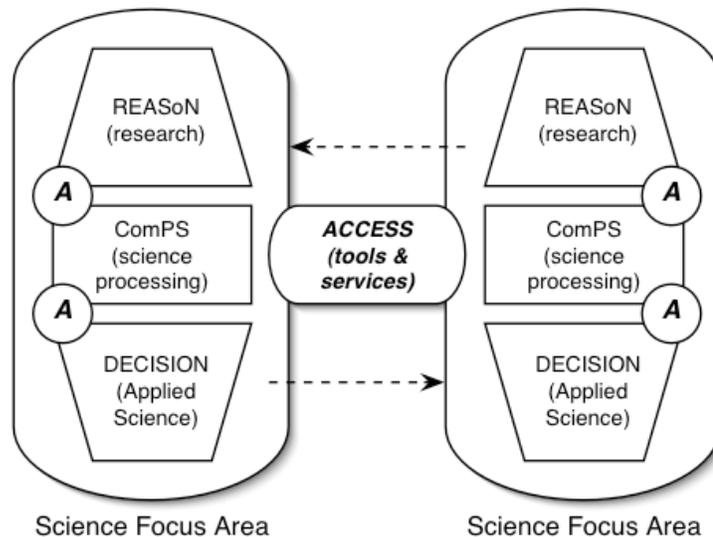
The evaluation criteria for final selection will be based on the efficacy of the proposal plan in helping to improve an existing measurement system or help to build capabilities needed for multiple measurement systems.

1.2.2 Data and Information Systems Support for Science Focus Areas and Applications

The ComPS activities focus on well-defined science and application requirements for specific science communities (e.g., ocean color, precipitation), another important activity under the second portion of the ACCESS solicitation is support for the seven Earth-Sun SFAs (<http://science.hq.nasa.gov/earth-sun/science>), and the 12 Applied Sciences application areas (<http://science.hq.nasa.gov/earth-sun/applications>). The science goals of the science and applications communities are broad given the diverse set of observations and the objectives of the research questions sought and decision support systems used. This solicitation seeks proposals to improve the information technology services and tools available to the science and user communities through demonstrated improvements to data access and distribution, data preparation, and other beneficial services. The outcome of these proposals will be to provide and strengthen conduits that connect scientists to data and services that further research goals for the SFAs as well as

facilitate the continued development of decision support system support for Applied Sciences.

Similar to Section 1.2.1 of this solicitation, proposals for support of the science focus areas and applications are targeted to a prescribed range of information technology tools and service capabilities of interest to the agency. For this initial ACCESS solicitation, we are seeking proposals that will assist SFA research and Applied Sciences communities in making progress along their associated roadmap activities (see <http://science.hq.nasa.gov/strategy/roadmaps/>). The following figure illustrates how ACCESS proposals will strengthen the linkages between existing research and application program elements.



ACCESS proposals should address the linkages and interfaces that connect the research, data processing and application elements of NASA's SFAs as illustrated here.

To swiftly implement solutions within and between the SFA elements, proposals should consider methods for streamlining the flow of data and information between science and application elements (including external science communities) such as data volume reduction methods, automated data reformatting for seamless use in models, data assimilation activities and applications (e.g. HDF-EOS to geo-tiff, HDF to GIS, etc.), search, query and subscription tools that foster easier access and delivery of specific data products and services, and modification of existing tools and capabilities for use by other science and application communities.

In addition, the recent launch of the EOS Aura satellite presents the atmospheric science communities with unprecedented opportunities to greatly expand our collective knowledge of the Earth's atmosphere and the relationships between various atmospheric components (see <http://eos-chem.gsfc.nasa.gov/>). Those working within the atmospheric SFA communities may wish to explore initiatives for accelerating the use and validation

of these data for science and applications. Specifically some noted areas of need include the creation of tools and services for preparing atmospheric data suites of new observations along with complementary existing data sets, creation of virtual "one-stop-shops" for data validation tools and services, and tools to enable the correlation of atmospheric measurements that are currently not available to the atmospheric science community.

2. Programmatic Information

The contract vehicle for this solicitation will be a Cooperative Agreement (CA) only. Proposers should be aware of the differences between a CA and other contract vehicles such as NASA Research Announcements (NRA), Grants, and others, see *NASA Grants and Cooperative Agreement Handbook* (<http://ec.msfc.nasa.gov/hq/grcover.htm>) for guidance; also see Section F.22 in the *Guidebook for Proposers* (see further below).

2.1 Funding

This solicitation provides approximately \$3M per year over a two-year cooperative agreement period with an option for a third year extension. Proposals that plan on seeking a third year's funding must submit a project plan mid-way through year two. Proposal budgets for ACCESS are expected to vary commensurate with the scale and scope of the activities proposed. The maximum yearly award will not exceed \$500K, and the majority awarded will be within a \$100- \$300K/year range. Only the most critical projects with broad scope (addressing both Sections 1.2.1 and 1.2.2) should propose budgets at the maximum funding level.

2.2 Proposal Preparation and Submission

Those responding to this announcement must position their proposal to address recognized information technology and interoperability challenges to NASA's Earth-Sun System research science and applied sciences application communities (see <http://science.hq.nasa.gov/earth-sun/>). It is critical that technology and service solutions be well suited to the communities that can benefit directly in the near-term. It is strongly encourage that those proposing should work closely with or be exceedingly familiar with the needs of the research science and/or applied sciences communities, especially those in alignment with the SFA identified in NASA Earth-Sun System science strategic plans and roadmaps (see <http://science.hq.nasa.gov/strategy/>).

Proposals will be evaluated by peer review that may include mail review, a panel review, or both. NASA will conduct the coordination of the ACCESS peer review process. This peer review will be followed by a programmatic review in which NASA managers will assess program balance across the competitive range of proposals, evaluate any logistical, implementation, cost, and/or management concerns.

2.3 Participation in Data System Working Groups

Those proposals selected for ACCESS will be asked to have representation on one or more Earth Science Data System Working Groups (DSWG). All ACCESS proposals should include which DSWG(s) they wish to have representation and should also budget 0.25 FTE for these activities (see <http://lennier.gsfc.nasa.gov/seeds/> for additional information).

2.4 Demonstration of Relevance to NASA's Objectives

Proposals for all of NASA sponsored research programs are judged on three criteria: Scientific and technical merit of the proposed work, cost realism and reasonableness, and relevance of the proposed work to NASA missions and science goals (see also Appendix C of the *Guidebook for Proposers Responding to NASA Research Announcement – 2005* at <http://www.hq.nasa.gov/office/procurement/nraguidebook/>). To enable the NASA Science Mission Directorate to properly evaluate the relevance of proposals submitted to its programs, as well as track its progress toward achieving its goals as mandated by the Government Performance Review Act (GPRA), it is mandatory that all research supported by NASA's programs demonstrate its relationship to NASA strategic goals and/or science objectives as stated in the latest version of its Strategic Plan; see the discussion in Section I(a) of the *Summary of Solicitation* of this NRA. Therefore, in addition to addressing the specific goals of this program, all proposers must provide as expository text in the main body of their proposal a statement of the relevance of their proposed work to NASA's *Strategic Objective* given in Table 1 in the *Summary of Solicitation* of this NRA. This discussion need not exceed the order of a quarter page of text and is to be included in the introduction to the Science-Technical-Management section of proposal.

Note that this NRA references NASA's 2005 strategic objectives (see Section I(a) and Table 1 for references).

2.5 Summary of Key Information

Expected total program budget for new awards	~ \$3M
Number of new awards pending adequate proposals of merit	~ 12-22
Maximum duration of awards	2 years, with an option for a third year extension
Page length for the central Science-Technical-Management section of proposal	15 pp; see also Chapter 2 of <i>Guidebook for Proposers Responding to NASA Research Announcement – 2005</i>
Submission medium and number of copies	Hard copy only (15 copies plus signed original); see also Chapter 3 of <i>Guidebook for Proposers Responding to NASA Research Announcement – 2005</i>

NASA Strategic Objectives to which proposals to this program <u>must</u> state and demonstrate relevance	See Table 1 in the <i>Summary of Solicitation</i> of this NRA.
General information and overview of this solicitation	See <i>Summary of Solicitation</i> of this NRA.
Detailed instructions for the preparation and submission of proposals	<i>Guidebook for Proposers Responding to NASA Research Announcement – 2005</i> at http://www.hq.nasa.gov/office/procurement/nraguidebook/ .
Web site for submission of proposal Cover Page:	URL: http://nspires.nasaprs.com (help desk available at nspires-help@nasaprs.com or (202) 479-9376)
Due Date for Notice of Intent to Propose	See Tables 2 or 3 in <i>Summary of Solicitation</i> of this NRA.
Due Date for delivery of proposals	See Tables 2 or 3 in <i>Summary of Solicitation</i> of this NRA.
Address for the delivery of proposals	<u>ACCESS</u> ROSES-2005 NRA Science Mission Directorate NASA Peer Review Services Suite 200 500 E Street, SW Washington, DC 20024 Telephone: (202) 479-9030
Point of contact concerning this program	Ms. Martha Maiden Earth-Sun System Division Science Mission Directorate NASA Headquarters Washington, DC 20546-0001 Telephone: (202) 358-1078 Facsimile: (202) 358-2769 E-mail: Martha.E.Maiden@nasa.gov Amended February 25, 2005 Inserted: Mr. Francis Lindsay Mission and Systems Management Division Science Mission Directorate NASA Headquarters Washington, DC 20546-0001 Telephone: (202) 358-1757 Facsimile: (202) 358-2769 E-mail: Francis.Lindsay-1@nasa.gov