



National Aeronautics and
Space Administration

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Science Mission Directorate

NN-H-04-Z-YO-010-C

COOPERATIVE AGREEMENT NOTICE

Decision Support through Earth Science Results

- A. Integrated System Solutions for Applications of National Priority
&
B. Performance Networks for Earth Science Solutions

** This is the initial announcement of this funding opportunity. **

National Aeronautics and Space Administration (NASA)
Science Mission Directorate
300 E Street, SW • Washington, DC • 20546

Step 1 Proposals Due October 22, 2004

Step 2 Proposals Due December 17, 2004

OMB Approval No. 2700 (-0087)
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EXECUTIVE SUMMARY

NASA (with partnering federal agencies) is soliciting proposals for projects to begin in FY05 to support the goal “*to extend the societal and economic benefits of NASA research in Earth science, information, and technology.*”

NASA partners with national organizations and federal agencies to evaluate, verify and validate, and then benchmark solutions that integrate Earth science observations and predictions resulting from NASA research into decision support tools of partnering organizations to benefit U.S. and global citizens. This solicitation seeks proposals to integrate NASA Earth science results into applications of national priority and to improve networks of Earth science organizations to sustain solutions for applications of national priority. Projects will aid the nation by harnessing Earth science results for improved decision support pertaining to national issues, including water and energy management, public health, air quality, and ecosystem stewardship (Appendix B has a complete list of application topics).

This announcement solicits proposals that contribute to two major components of the NASA Science Mission Directorate Applied Science Program: integrating systems and benchmarking solutions (referenced herein as **Integrated System Solutions**) and optimizing the performance of networks for Earth science solutions (referenced herein as **Solutions Networks**).

- The **Integrated System Solutions** component focuses on extending NASA Earth science results to decision support tools in twelve applications of national priority. The direction of each of the twelve applications is captured in roadmaps and integrated system solutions configurations that are described in the NASA Earth Science Applications Plan, accessible at <http://www.earth.nasa.gov/visions>. The roadmaps and configuration diagrams are accessible at <http://www.earth.nasa.gov/roadmaps>. Projects should develop prototype solutions, demonstrate them in an operational environment, and characterize system performance.
- The **Solutions Networks** component focuses on improving the collective ability of Earth science organizations to interact and harness the results of Earth science research. Successful projects will characterize the existing organizational networks, add organizations and develop new connections, and mine the Earth science results that may address some or all of the twelve applications of national priority. A document listing representative members of the community-of-practice for NASA Earth science is accessible at <http://webserv.gsfc.nasa.gov/images/aiwg.html>. Projects should develop network configuration analyses and diagrams, demonstrate network function, and analyze network performance.

This solicitation is open to all organizations – domestic and foreign, private and government, for profit and nonprofit. Teams of organizations are strongly encouraged and recommended

for proposals in response to this solicitation. Participation by non-U.S. organizations in this program is permitted and is subject to NASA's policy of no-exchange-of-funds.

NASA plans to use cooperative agreements as a funding instrument; however, other methods, such as grants or inter- or intra-Government fund transfers, may also be used depending on the nature of the proposing organization and/or NASA requirements.

Integrated System Solutions. For this component, NASA expects to award approximately \$18 million for FY05-07. The Program expects to support 12-30 projects for up to three years with an award range of \$200,000 to \$450,000 per year.

Solutions Networks. For this component, NASA expects to award approximately \$5 million for FY05-07. NASA expects to support 2-6 projects with an award range of \$250,000 to \$750,000 per year with a performance period of 18-36 months.

Logistics. NASA may transfer funds between the two components of this solicitation. Organizations may propose to one or both components of the solicitation, and they may submit multiple proposals to a component. *Each proposal must be a separate, stand-alone document for evaluation purposes.* Additional logistics information is contained within this document. NASA expects to announce the awards by March 2005.

This document provides information to support organizations considering or preparing a proposal, including a brief description of the specific priorities for this solicitation as well as the systems approach that NASA uses to achieve its objectives. This document references additional resources, such as websites, that may provide useful information for the preparation of a proposal.

Further information about the Applied Science Program (Applications Program) is available at <http://www.earth.nasa.gov/eseapps>. The Earth Science Applications Plan is accessible at www.earth.nasa.gov/visions, and the roadmaps and integrated system solution configurations are available at <http://www.earth.nasa.gov/roadmaps>.

Proposal information is available at:
<http://www.hq.nasa.gov/office/procurement/nraguidebook/>.

Step 1 proposals: Due October 22, 2004 Question may be submitted through:
Step 2 proposals: Due December 17, 2004 Lawrence Friedl (202-358-1599)

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Science Research scientific focus areas and their respective roadmaps is available at: <http://www.earth.nasa.gov/science> and <http://www.earth.nasa.gov/roadmaps>. The NASA Earth Science Strategic Plan is available at <http://www.earth.nasa.gov/visions>.

Earth system science research results typically include measurements and observations from NASA Earth observation satellite missions, predictions and outputs from NASA-sponsored models or models that use NASA measurements, products from Earth science research efforts, algorithms, aircraft measurements from field campaigns, visualizations, and other techniques and activities supported by NASA or using NASA measurements. The Science Mission Directorate Applied Sciences Program (hereinafter, the “Program”) contributes to the transition from research to operations, and, therefore, it emphasizes the use of sustained measurements that will likely continue to be available to the partners following a successful benchmarking project. The Program’s *primary* focus is on enabling the use of measurements from Earth observation satellites and outputs from Earth System Science models (that use NASA satellite measurements) in decision support systems.

Additional information about Earth science results, such as observations, geophysical parameters, and models is available at:

- NASA Earth science components: <http://news.gsfc.nasa.gov/coin.html>
- NASA DAACS: <http://nasadaacs.eos.nasa.gov>
- Earth Science Network: <http://webserv.gsfc.nasa.gov/images/aiwg.html>
- Operational Satellite Simulation Experiments (OSSE): <http://atmospheres.gsfc.nasa.gov/>

NASA follows competitive sourcing principles to select projects contributing to solutions for applications of national priority (Note: national priorities may include regional and international activities in the national interest). The projects selected through this solicitation may contribute to NASA participation in interagency programs and activities that include, but are not limited to, the Climate Change Science Program (CCSP), the Climate Change Technology Program (CCTP), the US Weather Research Program (USWRP), the Earthscope program, the Interagency Working Group on Earth Observations, and the Commercial Remote Sensing Space Policy Implementation Working Group. Key intergovernmental programs and activities include the Intergovernmental Panel on Climate Change (IPCC), the World Weather Watch (WWW) program, the International Strategy on Disaster Reduction (ISDR), the *ad hoc* Group on Earth Observations, and the World Summit on Sustainable Development (WSSD).

B. The Applied Sciences Program and the Systems Approach

NASA employs an “end-to-end” systems approach to enable the assimilation of Earth science results - especially satellite observations and predictions from Earth system models – to serve as inputs to decision support tools. NASA engages with public, academic, and private organizations through partnerships, contracts, and grants to pursue innovative approaches to extend Earth science research results into their decision making processes. The outcomes are manifest in the partners’ enhanced policy, business, and management decisions, and the impacts are the resulting socioeconomic benefits from the improved decisions.

Figure 1 illustrates the systems approach and the “Integrated Systems Solutions” architecture. On the “decision support” side of the figure (right side), agencies and organizations own, develop, and operate decision support tools to aid their decision-making processes. In the “bridge” domain of the figure (center area), NASA seeks to extend Earth science research results in the form of observations, model predictions, data handling, and computational techniques. For each integrated system solution configuration where Earth science products are evaluated to have potential application, NASA and the partners collaborate on assimilation of products into specific decision support tools. The Program seeks competitive projects to a) support verification and validation of specific observations and predictions and their capacity to be assimilated into decision support tools and b) to support partnering agencies and organizations to “benchmark” the performance of observations and predictions integrated into decision support tools. The intended outcome is the partner’s adoption of Earth science products in their operational configurations for sustainable operational uses.

In collaborating with partners to pursue integrated system solutions, NASA employs functional, systems-engineering steps of evaluation, verification and validation, and benchmarking. Appendix A defines these steps and other terms of reference.

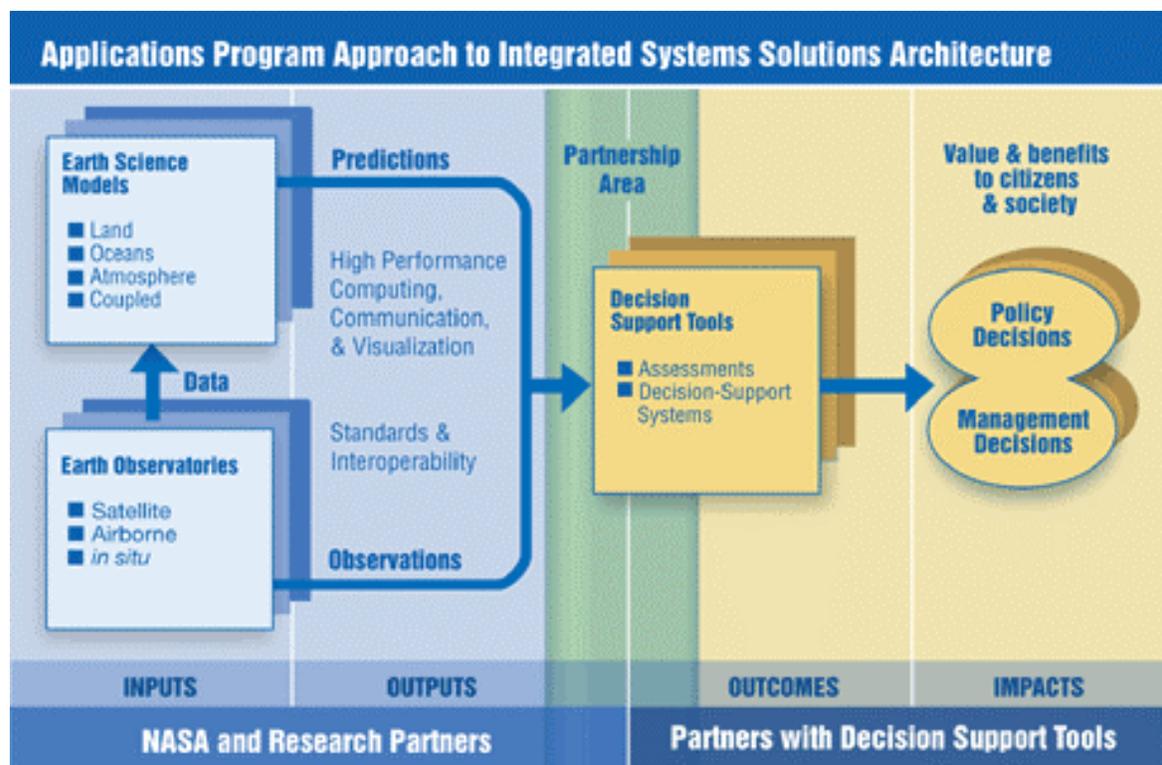


Figure 1. Integrated Systems Solutions Architecture

The Science Mission Directorate Applied Sciences Program is organized into two program elements: National Applications and Crosscutting Solutions. The National Applications element focuses on extending NASA Earth science results to decision support tools in twelve areas of national priority. Integrated System Solutions is one of the key crosscutting activities to accomplish the goals and objectives of the National Applications element for each and all of the priorities in:

Agricultural Efficiency	Aviation
Air Quality	Carbon Management
Coastal Management	Disaster Management
Ecological Forecasting	Energy Management
Homeland Security	Invasive Species
Public Health	Water Management

The Crosscutting Solutions element focuses on systems management and engineering that addresses requirements spanning multiple applications. Solutions Networks is one of the activities within Crosscutting Solutions. The purpose of Solutions Networks is to evolve a network of partners and funded organizations to optimize the Earth science-based solutions in support of integrated system solutions for twelve applications on national priority.

It is important to note that NASA – through this solicitation or otherwise – does not build or fund the development of decision support tools for Earth science organizations or partner agencies. NASA seeks proposals for projects to a) enable the assimilation of products resulting from NASA Earth science research into the decision tools sponsored by partnering organizations and b) enable the introduction of such products and tools to the network(s) of users nation-wide.

As stated previously, the intended **outcome** of the program is to serve the nation through the benefits of routine, sustained use of NASA Earth science observations, data products, Earth system model outputs, and technology in the decision support tools employed by national organizations and federal agencies to meet their mandated policy and management responsibilities. The primary **outputs** of the program include prototypes, verification and validation reports, and benchmark reports of integrated systems solutions. The benchmark reports document the improved performance of the decision tools, the process used to determine performance (i.e., the benchmarking process), and the approach to enable the assimilation of data and model products. The purpose of the benchmark reports is to facilitate the adoption of the approach and results for extended use nation-wide to maximize the benefits of U.S. Government investments in the NASA Earth science program.

For terms of reference used by the Program, please refer to Appendix A.

C. Goals of the Solicitation

The overall goals of this solicitation are to 1) extend NASA Earth science results to serve policy, business, and management responsibilities through integrated system solutions; and 2) improve the ability of users to access NASA information networks and the ability of partner organizations to harness NASA Earth science research to meet national needs.

To address these goals, this announcement solicits proposals for two major components – **Solutions Networks** and **Integrated System Solutions** (assimilating NASA Earth science research results into systems solutions for applications of national priority).

Through appropriate project activities and products such as systems engineering models, system testbeds, prototypes, demonstrations in operational environments, and performance characterizations, successful projects will advance the readiness level and overall use of the Earth science results in decision support tools and optimize networks to identify Earth science results and connect them to users. Successful projects will consider utilization of open consensus standards (as delineated by ISO, Federal Geographic Data Committee (FGDC) and Open GIS Consortium (OGC)) towards interoperability of disparate systems in order to maximize the use of NASA funded products by the broadest group of users nationwide.

Products resulting from funded projects are to be made available for use by NASA, other NASA-sponsored projects, and agencies participating in the project. NASA promotes the full and open sharing of project results with all users with minimum restrictions. The greater the availability of the products of funded projects, the more quickly and effectively the user communities can utilize the information to develop innovative practical applications to benefit society.

Data collected and funded by NASA represent a significant public investment. In this context the term “data” includes the observation data, metadata, products, information, algorithms, documentation, models, prototypes, images, and research results from NASA sponsored projects. The NASA Earth Science Enterprise Statement on Data and Information Policy is available at http://eosps0.gsfc.nasa.gov/ftp_docs/handbook99.pdf.

Integrated System Solutions Projects

Through the Integrated System Solutions portion of this solicitation, the Program supports results-oriented projects focused on systematic methods to enable the integration of Earth science research results (e.g., satellite observations, model predictions, visualization techniques, etc.) into existing decision support tools related to one or more of the 12 applications of national priority (see Section II and Appendix B).

This solicitation is envisioned to be flexible enough to accept application concepts at various stages of maturity (provided there is an *existing* decision support tool). The Program seeks projects that will validate methods, develop rapid prototypes, and benchmark performance to enable government agencies, industry groups, non-governmental organizations, and others to adapt and/or adopt NASA Earth science measurements and predictions into operational use on a sustained basis.

The Program emphasizes a systems engineering approach – involving Evaluation, Verification and Validation, and Benchmarking – to 1) identify Earth science results of value to the partners’ decision systems, 2) address technical issues and develop rapid prototype solutions and products, and 3) document the performance of the results to support the transition and partners’ adoption in their operational use. The program also emphasizes the

appropriate use of open consensus standards toward interoperability of disparate systems. The proposed projects should benefit both NASA and the partnering organizations – successful projects will improve the decision support system through the use of NASA-sponsored observations and model predictions.

Successful projects will include an evaluation of feasibility, requirements analysis, systems configurations, prototype development, demonstration in an operational environment, and analysis of system performance and effectiveness (e.g., benchmark report). Projects should plan for at least two demonstrations – one to show the prototype’s configuration and performance and one to show the use and performance in the partners’ operational environment. It is expected that the project develops an estimate of the resources (cost and schedule) needed to transition or enable effective adoption of the prototype in an operational setting. The proposed projects must define the starting point and the exit or success criteria for the proposed activity from the onset and throughout the lifetime of the project.

The Program focuses on extending NASA Earth science results to decision tools that are primarily national in scope or have the potential to be distributed nationally (albeit used to serve local decision makers). In some cases, the decisions or decision tools may be inherently regional in nature but have the potential to extend to other regions or the whole nation. The Program may pursue a project that enables a benchmark solution when the issue or region is of national importance. The Program does not support projects focusing only on one local area unless there are established, *a priori* plans to extend the application of the solution broadly.

Figure 1 presents a generic Integrated System Solutions diagram that serves as the architectural base of the Program. Each of the 12 applications of national priority maintains a specific version of this diagram. Appendix B includes the configuration diagrams for each national application as well as a description of the scope of activity desired through this solicitation for each application. These configurations are also included in the Earth Science Applications Plan, which is available at <http://www.earth.nasa.gov/visions>.

Solutions Networks Projects

Through the Solutions Networks component of this solicitation, NASA seeks proposals for projects with approaches to evolve a network of organizations within the Earth science community-of-practice (e.g., universities, industry, government, non-profits, etc.). The nodes of the network are funded by NASA and/or the partner organizations engaged in the proposed project(s) to achieve NASA’s Earth science mission.

The purposes of the Solutions Networks are to a) assess the effectiveness of applicability of results NASA science and technology results through the sponsored projects and activities; b) routinely identify, prioritize, and communicate relevant results for use in the National Applications; c) identify and analyze existing interactions of contributing organizations; d) formulate plans to further optimize the effectiveness of the users network(s); and, e) evolve the network(s) configurations to broaden its reach with minimum development and maximum reach. Successful projects will create connections to enable the networks to evolve and be self-sustaining.

This solicitation is envisioned to be flexible enough to accept network concepts at various stages of maturity. Each proposed project should include a baseline assessment of the network, analysis of network configurations, optimization (and evolution) of network configurations, routine identification of Earth science results, and the prioritization and communication of results to the applications of national priority. The projects should develop effective network configurations (including dynamic changes allowing for evaluation), demonstration(s) of network function, block and/or wiring diagrams, and analysis of network performance. The projects should maintain metrics on the network (including effectiveness) and the use of Earth science results through the network. The project should develop an estimate of the resources (cost and schedule) needed to sustain the network on an on-going basis and how the network will achieve a sustaining status independent of NASA sponsorship.

To respond to this solicitation effectively, it will be necessary to consult and become familiar with several (to all) of the 12 National Applications, their individual solution configuration diagrams, program plans, and the respective decision support tools and priorities (Appendix B). The configuration charts evolve over time based on NASA innovations and evolving direction, so proposals should include an approach to adapting to, contributing to, and supporting spiral development and evolution of the integrated system solution configurations based on developments from on-going NASA sponsored Earth system science research and missions.

Source materials for Earth science results and information include the previous, current, and recently selected NASA research projects in the Earth system science focus areas (listed in Section I.A). Appendix B includes information about the 12 applications of national priority. Additional information about the 12 applications and the Solutions Networks is available through the website at <http://www.earth.nasa.gov/eseapps>.

Indicators of Successful Projects

Proposals should include and demonstrate the following information and characteristics:

- Address existing or developing decision support tool(s) that focuses on a topic related to one or more of the applications of national priority sponsored by NASA
- Present a clear understanding of the user community, its policy/management issues, use of decision processes and tools, and how NASA Earth science data enhances the users' decision capabilities
- Present a valuable and realistic approach to extend NASA Earth science products to the decision tools and user community drawing on evaluation, verification/validation, and benchmarking of the proposed approach
- Utilize an array of Earth science research results (including different types of observations of geophysical parameters and model outputs) and/or research results associated with the NASA science focus areas
- Demonstrate the appropriate utilization of open consensus approaches (as defined by ISO, FGDC, and OGC) towards interoperability of disparate systems and decision support tools to enable maximum dissemination with minimum re-development

- Present well-constructed teams and partnerships and propose ways of working with existing Earth science organizations, such as NASA field centers, DAACs, and Earth science laboratories and existing user networks
- Demonstrate a familiarity and knowledge of Earth system science and NASA Earth science results (especially NASA remote sensing satellite observations and models that use NASA satellite observations)
- Present innovative approaches to identify NASA Earth science results and innovative network relationships with Earth science organizations
- Present activities that will benefit both NASA and partner organizations
- Demonstrate a superior depth of knowledge in some to all of the applications of national priority as well as how to identify solutions based on NASA Earth science results that the applications can use
- Present letters of support from user communities that indicate their interest and commitment to the proposed project and its results on a sustained basis
- Present a well-conceived *a priori* approach to extend project results and transition capabilities to user communities (i.e., proposals with a “build it and they will come” approach will not be evaluated as highly as proposals with a clear approach to extend specific NASA research results); present a well-conceived, cogent “exit strategy” to complete the project and transition results to the operational community
- Present a well-conceived approach to managing the project and partnerships
- Include a plan for delivering project results to NASA and the partnering organizations

Note: Proposals seeking NASA funds to create new decision support tools will be judged as non-compliant in response to this solicitation. For Integrated System Solutions, the proposals must align with one or more of the solutions associated with the applications of national priority. In addition, proposals that require significant fundamental research/development and proposals that propose to collect new measurements to explore a potential application are outside the scope of activities for the Program and this solicitation.

Figure 1 presented a general Integrated System Solutions diagram. Proposers are encouraged to use this diagram to illustrate the concept of their proposed project. For example, proposers may use the diagram to identify specific observations, geophysical parameters, Earth science models and model outputs, visualization techniques, etc. as well as the decision support tool(s) and associated characteristics and the qualitative and quantitative benefits of improved decisions to society. The ultimate objective is to demonstrate the effectiveness and enable maximum use of NASA sponsored science and technology to the broadest network of users.

D. Additional Information

Safety is a top priority for all of NASA's programs. As such, all proposers should consider the following statement:

“Safety is the freedom from those conditions that can cause death, injury, occupational illness, damage to or loss of equipment or property, or damage to the environment. NASA’s safety priority is to protect: (1) the public, (2) astronauts and pilots, (3) the NASA workforce (including employees working under NASA award instruments), and (4) high-value equipment and property.”

Proposers should be aware that funds are not currently available for awards under this announcement. The Government's obligation to make award(s) is contingent upon the availability of appropriated funds from which payment can be made and the receipt of proposals that NASA determines are acceptable for award under this announcement.

II. AWARD INFORMATION

The Program expects to use cooperative agreements as a funding instrument. However, the Program will make awards as cooperative agreements, grants, or inter- or intra-Government transfers depending on the nature of the proposing organization and/or program requirements. A NASA awards officer will determine the appropriate award instrument for the selections resulting from this solicitation.

For cooperative agreements, the proposal should describe the support envisioned from NASA – section I.A lists several websites with data and information resources and organizational references. NASA will work with the awardees regarding data management issues, access to NASA models, research, and observations, and interoperability standards. NASA expects to work with the awardees regarding the Program's systems engineering approach and provide guidance on benchmarking standards. NASA human resources in support of the science, engineering, systems, and standards are available at the NASA field centers, as described in the NASA Earth Science Strategic Plan (<http://www.earth.nasa.gov/visions>).

This solicitation notice is for new awards. NASA will not accept proposals for renewals or supplemental funding of existing projects in response to this solicitation.

Proposals will be considered for periods of performance of up to three years. Projects may be partially funded within fiscal years (i.e., incremental funding) to minimize the Agencies' uncosted carry over.

Integrated System Solutions

Through this solicitation, the Integrated Systems Solutions component expects to fund projects for up to three years and may consider proposals for supplemental funding during annual reviews. The Program may not (necessarily) fund projects in all twelve applications of national priority.

Integrated System Solutions Component	
Total Amount of Funding (FY05-07)	\$18 million
Anticipated Number of Awards	12 - 30 projects
Expected Range of Awards	\$200K - \$450K per annum
Maximum Annual Budget	Not to exceed \$530K
Expected Period of Performance	1-3 years
Contributions from Partner Organizations	Strongly encouraged. Partner funding does not count toward funding level guidelines.

Opportunity to Expand Results

The Program expects that some projects, through the course of their activities, may identify opportunities to expand on their results and further contribute to achieving the Program's objectives. Thus, the Program expects to make an additional \$2 million available in FY07 to support the acceleration or expansion of highly-achieving projects. At the second annual review, projects can submit a proposal for additional funding to expand their activities in the third year and beyond. Based on competitive-sourcing guidelines, the Program will distribute the additional funds to sound proposals from projects that have shown significant progress and have demonstrated potential to:

- 1) accelerate project results and objectives,
- 2) expand and achieve additional results and successes, or
- 3) both.

Solutions Networks

Through this solicitation, the Solutions Networks component expects to fund projects for up to three years.

Solutions Networks Component	
Total Amount of Funding (FY05-07)	\$5 million
Anticipated Number of Awards	2 - 6 projects
Expected Range of Awards *	\$250K - \$750K per annum
Maximum Annual Budget	Not to exceed \$800K
Expected Period of Performance	1-3 years
Contributions from Partner Organizations	Strongly encouraged. Partner funding does not count toward funding level guidelines.

*Note: Only projects with very high performance goals should propose budgets near the top of the range.

Period of Performance

The minimum period of performance is 12 months. The total proposed period of performance must not exceed 36 months. The Government will award contracts for a 1-year base period, with up to two 1-year options exercisable by the Government. The Government will award grants and cooperative agreements on a multiyear basis for a period not to exceed three years. Proposals must define clear, measurable milestones to be achieved in order to warrant exercise of any options.

Other Information

Based on proposal review, availability of funds, and program balance, NASA reserves the right to transfer funds between the components of this solicitation. For example, NASA may draw some to all of the approximately \$6 million annual funds from the Integrated System Solutions component of this solicitation to support proposals to the Solutions Networks component.

Procurement contracts will not be awarded through this solicitation.

Contributions from partner organizations are strongly encouraged. See Section III.B for information on cost sharing.

III. ELIGIBILITY INFORMATION

A. Eligible Applicants

Participation in this program is open to all categories of U.S. and non-U.S. organizations, including educational institutions, industry, nonprofit institutions, nongovernmental organizations (e.g., World Bank, United Nations), NASA centers, and other U.S. Government agencies. Historically Black Colleges and Universities, other minority educational institutions, and small businesses and organizations owned and controlled by socially and economically disadvantaged individuals or women are particularly encouraged to apply. Participation by non-U.S. organizations in this program is encouraged subject to NASA's policy of no-exchange-of-funds. Participation by non-U.S. institutions must be proposed within the specific guidelines described in Appendix E, sections (h) and (i), which include a no-exchange-of-funds provision. Further information on foreign participation is provided in Section §1260.12(e), "Choice of award instrument" of the NASA Grant and Cooperative Agreement Handbook, accessible at <http://ec.msfc.nasa.gov/hq/grcover.htm>.

The proposal must designate the lead and/or submitting organization(s). Collaborations amongst institutions, especially different types of organizations, are strongly encouraged. NASA Field Centers, Data Active Archive Centers, Earth science laboratories, and other entities (with the exception of personnel at NASA Headquarters) are eligible to submit

proposals and/or to collaborate with submitting organizations. The Program encourages organizations other than NASA-organizations to serve as the sole lead on a proposal. NASA organizations may be co-leads on proposals.

B. Cost Sharing or Matching

Generally, cost sharing is highly encouraged, but not required, by proposing institutions and partner organizations. The Program accepts in-kind contributions during the course of the project as cost sharing. The Program does not accept past work, prior results, or previous support and accomplishments as cost sharing for this solicitation.

If an institution of higher education, hospital, or other non-profit organization wants to receive a cooperative agreement, cost sharing is not required; however, NASA can accept cost sharing if it is voluntarily offered. Section B, Provision §1260.123, “Cost sharing or matching” of the NASA Grant and Cooperative Agreement Handbook describes the acceptable forms of cost sharing.

If a commercial organization wants to receive a cooperative agreement, cost sharing is required, unless the commercial organization can demonstrate that they are not likely to receive substantial compensating benefits for performance of the work. If no substantial compensating benefits are likely to be received, then cost sharing is not required, but can be accepted. Section D, Provision §1274.204, “Costs and Payments” of the NASA Grant and Cooperative Agreement Handbook describes the acceptable forms of cost sharing.

C. Other

There are no restrictions on the number of proposals that eligible organizations may submit or be part of for either or both portions of this solicitation. However, each proposal must be a stand-alone, separate document.

Integrated System Solutions

NASA strongly encourages and recommends that “project teams” collaborate to prepare proposals and conduct the projects. Proposals should identify the lead systems integrator and the team members and organization(s) with the expertise and commitment to accomplish all aspects of the project. Proposals need to articulate and demonstrate expertise in the following areas:

- End-user decisions/issues (e.g., familiarity with users’ decision-making and decision support tools)
- Familiarity with assimilation of Earth science research results into system solutions
- Systems engineering capabilities and experience
- Project management experience (including performance measures & efficiency measures)

The proposal should identify the lead organization(s) in the team as the lead systems integrator; however, the lead need not be the operational agency or user groups.

Projects must have a potential to extend the benefits of resulting solutions to applications of Earth science at a national, regional, or international levels. This requirement may affect the composition of project teams.

Solutions Networks

NASA strongly encourages and recommends that “project teams” collaborate to prepare proposals. Proposals should identify the team members and organization(s) with the expertise and commitment to accomplish aspects of the project. Proposals need to demonstrate expertise in the following areas:

- Familiarity with Earth science organizations and Earth science research results
- Familiarity with several to all of the applications of national priority
- Sound approach to assess, analyze, optimize and evolve organizational networks; including the dimensions of relationships, collaborative interactions, integrated results, and communication of capacity to national applications and partners
- Organizational network and systems management capabilities and experience

The proposal should identify the lead organization(s) in the team.

IV. PROPOSAL and SUBMISSION INFORMATION

A. General Information

This announcement contains references to the required proposal materials. Proposers may consult <http://proposals.hq.nasa.gov> for additional information and forms. If electronic access is not available to prospective proposers, a hard copy of relevant reference(s) can be requested by calling (202) 358-3552 and leaving a voice mail message (include your full name, zip code, and area code and telephone number).

Data Universal Numbering System

All applicants must provide the Dun and Bradstreet Data Universal Numbering System (DUNS) number for their organization in the Cover Page of their proposal. (Note: This requirement applies to prospective new awards as well as renewals of awards for other NASA announcements.) The DUNS number is a unique nine-character identification number provided by the commercial company Dun & Bradstreet (D&B).

Applicants may call D&B at 1-866-705-5711 to register and obtain a DUNS number, or they may access the D&B website at: <http://www.dnb.com/us/>. The process to request a DUNS number by telephone takes about 10 minutes and is free of charge. The process to obtain a DUNS number through the website takes about fourteen days and is also free of charge. Organizations will use the same DUNS number with every proposal submitted for a Federal grant and cooperative agreement. Note: The DUNS number is site-specific.

Central Contractor Registration

NASA also requires the applicant’s organization to be registered in the Central Contractor Registration (CCR) database and obtain a Commercial and Government Entity (CAGE) code prior to submitting a proposal. The purpose of this requirement is to help centralize

information about grant recipients and provide a central location for grant recipients to change organizational information. Information for registering in the CCR and online documents can be found at <http://www.ccr.gov>. Before registering applicants and recipients should review the Central Contractor Registration Handbook, which is also located at <http://www.ccr.gov>. The process for obtaining a CAGE code is incorporated into the CCR registration.

B. Content and Form of Proposal Submission

Step 1 proposal

NASA requests that all prospective proposers submit a “Step 1 proposal” in response to this announcement by no later than October 22, 2004. The Step 1 proposals are intended to reduce proposal preparation time for the community, minimize review time for NASA and the peer review community, and expedite distribution of funds to successful proposals.

Appendix C has information on the content, submission procedure, and specific location to send the Step 1 proposals. Proposers should submit their Step 1 proposal both electronically (following instructions in Appendix C) and in hard copy format. If electronic submission is not possible, NASA will accept a FAX copy containing the information described in Appendix C and sent to (202) 479-0511.

Following a review of the Step 1 proposals (see *Section V - Proposal Review*), the Program will notify proposers whether they are “encouraged” or “discouraged” from submitting a Step 2 proposal. The Program expects to notify the proposers within 3 weeks of the Step 1 proposal due date (no later than November 12, 2004).

A Step 1 proposal is strongly encouraged but not required for the submission of a Step 2 proposal. In addition, the Step 1 proposal judgments (i.e., “encourage” or “discourage”) are not binding. The Program will review and consider all proposals received by the Step 2 proposal deadline.

Step 2 proposal: Content and Format

Each proposal should be self-contained, and they should not refer reviewers to external sources or websites for critical information. The main body of the proposal may be a maximum of 12 pages of text (single-spaced, 12-point type).

Details on the proposal format, content, and order of materials are provided in Appendix D. Proposers are strongly urged to read the information in these appendices carefully and to follow the specific guidelines.

C. Submission Dates and Location

Step 2 proposals may be submitted at any time during the period ending at 4:30 p.m. ET on December 17, 2004.

The estimated schedule for this solicitation is as follows:

Release Date	September 17, 2004
Step 1 proposals Due	4:30 p.m. ET; October 22, 2004
Step 1 proposals Notification	No later than: November 12, 2004
Step 2 proposals Due	4:30 p.m. ET; December 17, 2004
Peer Review	Expected January-February, 2004
Announcement of Final Selection	Expected by March, 2004

All due dates and times refer to the deadline by which NASA must receive the proposals, regardless of submission method (e.g., postal mail, courier, overnight delivery, or personal delivery). Proposals received within 3 business days of the deadline will be reviewed, but they will receive secondary consideration in the final programmatic selection. Proposals received after 3 business days of the deadline will not be reviewed.

The following items apply only to this announcement.

Identifier: NN-H-04-Z-YO-010-C

Submit Proposals to: Decisions through Earth Science 2005
NASA Peer Review Services, Code Y
Suite 200
500 E Street, SW
Washington, DC 20024-2760

Copies to Send:

Step 1 proposals	5
Step 2 proposals	20

For overnight mail delivery purposes only, the recipient telephone number is (202) 479-9030.

D. Funding Restrictions

Refer to information in *Section II-Award Information*, which provides an estimate of the available funding and the approximate number of awards. In addition, this solicitation has the following restrictions:

The construction of facilities is not an allowed activity.

Travel, including foreign travel, is allowed as may be necessary for the meaningful completion of the proposed investigation, as well as for the publicizing its results at an appropriate professional meeting.

U.S. research award recipients may directly purchase supplies and/or services that do not constitute research from non-U.S. sources, but award funds may not be used to fund research carried out by non-U.S. organizations. However, subject to possible export control restrictions, foreign nationals may conduct research while employed by a U.S. organization.

Regardless of whether serving as a team lead or as a team member, personnel from NASA Centers must propose budgets based on Full Cost Accounting (FCA). Non-NASA U.S. Government organizations should propose based on FCA unless no such standards are in effect; in that case such proposers should follow the Managerial Cost Accounting Standards for the Federal Government as recommended by the Federal Accounting Standards Advisory Board, which is accessible at <http://www.hq.nasa.gov/fullcost/>.

E. Other Submission Requirements

Appendix D provides information on required proposal format and content and the proposal evaluation criteria. Appendices F and G contain information about and a sample proposal cover sheet with required institutional declarations. Appendix H contains a budget summary form. If electronic access is not available to prospective proposers, a hard copy of relevant reference(s) can be requested by calling (202) 358-3552 and leaving a voice mail message (include your full name, zip code, and area code and telephone number). Appendix I & J provided language on assurance and compliance with nondiscriminatory and lobbying activities. *Prospective investigators are urged to read the information in all of the appendices carefully and to follow completely the specific guidelines therein.*

V. PROPOSAL REVIEW INFORMATION

A. Criteria

The Evaluation Criteria for Step 1 proposals are: 1) Intrinsic merit, and 2) Relevance to NASA objectives and national priorities. See Appendix C for further discussion of these criteria.

The Evaluation Criteria for Step 2 proposals are: 1) Intrinsic merit; 2) Relevance to NASA's objectives and national priorities, and 3) Cost reasonableness and management. See Appendix D for further discussion of these criteria.

B. Review and Selection Process

For Step 1 proposals, the NASA Program Office personnel at NASA Headquarters will review the Step 1 proposals according to the criteria.

For Step 2 proposals, NASA (and partner federal agencies) will subject all proposals a full peer review, including external reviewers, which may involve mail reviews, panel reviews, or both. Following the peer review, NASA (and partner federal agencies) will conduct a programmatic review of the proposals, in which the NASA managers will assess program balance across the competitive range of proposals and evaluate any logistical, implementation, cost, and/or management concerns.

NASA will make final decisions promptly, and NASA will notify proposers by electronic mail, surface mail, telephone, or a combination.

The official making the final selection for awards is:

Ronald J. Birk
Program Director, Applied Sciences Program
Sun-Earth Systems Division
NASA Science Mission Directorate
300 E St., SW (Code YO)
Washington, DC 20546

Phone: 202-358-2287
rbirk@hq.nasa.gov

C. Selection Announcement and Award Dates

The Program expects to respond to the Step 1 proposals within 30-45 days of their due date.

NASA's stated goal is to announce selections within 150 days of the Step 2 proposal due date. For this solicitation, this 150-day period applies to the time between the due date of the Step 2 proposals and selections.

If NASA has not contacted the proposers within these two respective time periods (45-days and 150-days), proposers may contact the responsible officials listed in *Section VII – NASA Contacts*.

Those proposers not selected for award will be notified by mail and offered a debriefing consistent with the policy in Section G.1 of Appendix E. For Step 1 proposals, the Program cannot provide information and rationale on Step 1 proposal judgments until the entire selection process is complete. Following the final selection of the projects, organizations may request information on the encourage/discourage determination mentioned in the Step 1 proposal response letter.

VI. AWARD ADMINISTRATION INFORMATION

A. Award Notices

For proposers submitting a Step 1 proposal, NASA will notify all proposers – through postal mail, electronic mail, telephone, or combination – to inform them whether the Program either encourages or discourages them to submit a Step 2 proposal.

For proposers submitting a Step 2 proposal, NASA will notify all proposers – through postal mail, electronic mail, telephone, or combination – to inform them whether the Program has rejected or accepted the proposal to receive an award. Letters indicating acceptance should NOT be used as authorization to begin performance. A notice of award signed by the grant officer (or equivalent) will be the authorizing document. Any costs incurred by the offeror in anticipation of an award will not be reimbursed.

NASA will contact accepted proposers – by postal mail, electronic mail, telephone, or combination – to discuss the award, negotiate any changes, and discuss the budget for the project. The Program expects to use cooperative agreements as a funding instrument; however, the Program will make awards appropriate to the nature of the proposing organization and/or program requirements. Agreements with investigators from some

institutions may take the form of a more common agreement mechanism used between NASA and these institutions, such as interagency agreements between NASA and other federal agencies.

B. Administrative and National Policy Requirements

This solicitation does not invoke any special administrative or national policy requirements, nor do the awards that will be made involve any special terms and conditions that differ from NASA's general terms and conditions as given in the NASA Grant and Cooperative Agreement Handbook.

C. Reporting Requirements

The following reports will be required of awarded proposals. In cases where teams of organizations or subcontracts exist, consolidated project reports, including financial records, must be submitted and is the responsibility of the lead organization. The proposed budget should provide for these reporting requirements.

All written reports and review presentation materials should be submitted in electronic format (Microsoft Word, PowerPoint, or Excel compatible) or paper copy 7 days prior to the review.

Bimonthly Reports – Financial and Performance

The bimonthly reports should provide an overall assessment of the project every two months. The report should be approximately 1-2 written pages, with the actual length depending on the level of activity during the preceding two months. The initial report in a year should include a plan for technical, schedule, and resource activities for the year.

Reports should address the following:

- Summarize major activities and accomplishments for the preceding two months
- Summarize schedule status
- Assessment of application development or network development (and basis for that assessment)
- Summarize planned vs. actual financial activity for the preceding two months (if a fixed price contract is awarded, no financial reporting is needed)

In addition, the bimonthly reports should include a “quad chart,” which consists of four sections as follows (Powerpoint format preferred):

Upper-left – Major Accomplishments	Upper-right – Major Milestones/Activities
Lower-left – Risks and Mitigation	Lower-right – Action Items & Issues.

Annual Reviews

Annual reviews, which may be coordinated with Program meetings, will occur annually for 1-2 days in Washington, DC, and require the attendance of 1-2 persons. A presentation format review to address the following:

- Describe the primary project status and development progress, and results of tests and/or demonstrations
- Discuss work planned for upcoming phase and any critical issues related to continuation

- Summarize financial and schedule status including schedule slippage/acceleration
- Present updates to block diagrams or wiring diagrams (e.g., Integrated System Solution diagrams)
- Present project metrics
- Application development results or network development results
- The lead organization should recommend whether the work should continue based on results to date, including a strong rationale for the recommendation

In addition to hard copy handouts at the review, the interim review package shall also be submitted in Microsoft Word or PowerPoint compatible formats.

Integrated System Solutions - For the final annual review, the focus should be on plans and issues related to transfer and adoption by the partner agency and key research needs for NASA.

Solutions Network – For the final annual review, the focus should be on plans and issues related to sustaining the network and further optimization.

Demonstrations and Prototypes

Projects should plan for at least two demonstrations to show technical results and status.

For Integrated System Solutions, projects should plan a demonstration to show the prototype's configuration and performance and one to show the use in the partners' operational environment. Plans for delivery of project prototypes, algorithms, etc. to NASA and partner agencies should be consistent with the NASA Data and Information Policy. This policy is available at http://eospsso.gsfc.nasa.gov/ftp_docs/handbook99.pdf.

For Solutions Networks, projects should plan two separate demonstrations to show the development of the network and the identification of Earth science results through network optimization.

Final Report / Benchmark Report

For Integrated System Solutions, the final report should be a benchmark report to address the following:

- Performance of the decision support system with the Earth science results compared to benchmark decision tools or systems
- Results of requirements analysis and issues resolved during verification and validation
- Plans and issues related to transfer and adoption by the partner agency
- Robust documentation of procedures and guidelines to describe the steps to access and utilize the Earth science research results

For Solutions Networks, the final report should address the following:

- Network configuration development and optimization
- Analysis of network performance
- Metrics on network and the Earth science results examined and/or shared through the network
- Plans and issues related to sustaining the network and further optimization

The Handbook-Exhibit G references the standard required reports for cooperative agreements (<http://ec.msfc.nasa.gov/hq/grcover.htm>); specific reporting requirements, if different from above, will be articulated in the cooperative agreement.

Distribution of Reports and Presentation Packages:

All electronic reports and presentation packages described in the preceding section shall be submitted to the program manager using award administration e-books. In order to protect any proprietary information, access to this system is restricted via usernames and passwords. Only the PI and the program manager will have access to the reports and presentations. A username and password will be provided to the PI to gain access to the system prior to the due date for the first monthly report. Details on this system will be provided during contract negotiation.

VII. NASA CONTACTS

Points of Contact for Further Information

General questions, comments, and requests for further information regarding this CAN may be directed to:

For questions or issues related to:

Programmatic Purpose and Content

Lawrence Friedl
Sun-Earth Systems Division
NASA Science Mission Directorate
300 E Street, SW
Washington, DC 20546-0001
202-358-1599
202-358-3098 fax

Administrative Issues

Desiree Santa
Business Management Division
NASA Science Mission Directorate
300 E Street, SW
Washington, DC 20546-0001
202-358-2102
202-358-2891

For questions or issues related to the two main portions of this solicitation:

Integrated Systems Solutions Inquiries*

Lawrence Friedl
Sun-Earth Systems Division
NASA Science Mission Directorate
300 E Street, SW
Washington, DC 20546-0001
202-358-1599
202-358-3098 fax

Solutions Networks Inquiries

Martin Frederick
Sun-Earth Systems Division
NASA Science Mission Directorate
300 E Street, SW
Washington, DC 20546-0001
202-358-0913
202-358-3098 fax

* Note: Appendix B has points of contact for the individual Program Managers associated with each of the twelve applications of national priority.

VIII. OTHER INFORMATION

Commercially Available Data Sets

NASA's Science Mission Directorate has adopted commercial data purchases as a mainstream way of acquiring research-quality data, as these commercial capabilities become available. NASA encourages the use of commercially available data sets by Principal Investigators as long as it meets the scientific requirements and is cost-effective. When responding to a NASA Research Announcement, the proposer should identify the commercial data sources intended for use and the associated cost.

IX. CONCLUDING STATEMENT

Your interest and cooperation in participating in this opportunity are appreciated.

Ghassem R. Asrar, Ph.D.
Deputy Associate Administrator
Science Mission Directorate

APPENDIX

- A. Terms of Reference for Applied Sciences
- B. National Applications: Priorities & Integrated Systems Solutions Diagrams
- C. Step 1 Proposal Information
- D. Proposal Format, Content, and Evaluation Criteria (Amendatory Guidance)
- E. Standard NASA Instructions for Responding to NRA
- F. Required Step 2 Proposal Cover Page
- G. Sample Proposal Cover Page
- H. Step 2 Proposal Budget Summary
- I. Assurance of Compliance with the NASA Regulations Pursuant to Nondiscrimination in Federally Assisted Programs
- J. Certifications, Disclosures, and Assurances Regarding Lobbying and Debarment & Suspension

APPENDIX A

Terms of Reference for Applied Sciences

NASA pursues, and encourages others to pursue, a systems engineering approach to extending Earth science results to decision support tools. As the Program defines it, this systems engineering approach involves three main phases – Evaluation, Verification and Validation, and Benchmarking. The overall intent of this systems engineering approach is to provide a systematic rigor to determine potential Earth science results to extend, develop prototypes and resolve technical issues associated with use of Earth science results in decision support tools, and document value of the Earth science results to enable partners to adopt the Earth science results in a sustainable manner. The terms associated with the three main phases are described below, and the Program encourages proposers to reference or adopt this language in their proposals.

Evaluation.

This phase establishes (evaluates) the correlation between user defined requirements of decision support tools whose inputs may be served by Earth science research results. Activities typically include: identifying decision support tools associated with an application area; examining the partners' plans for developing its decision support tool; assessing potential value and technical feasibility of current and future Earth science results in the tools; and, assessing partner commitment and the project value relative NASA funds, objectives, and portfolio. Following this evaluation phase, NASA and partnering agencies decide whether to pursue further collaboration on a project.

Verification & Validation.

This phase focuses on determining and measuring the performance characteristics of Earth science products (i.e., NASA outputs) to meet the input requirements of the decision support tools. The purpose is to ensure that the end-to-end system meets the intended objectives with the innovative inputs. In this phase, NASA and partners may develop prototype products to address requirements and resolve technical issues related to the introduction of the Earth science products into the decision support tools. Verification determines how the actual performance of an observation, prediction, or other Earth science product meets the user-defined requirements within a specified tolerance. Validation determines if the performance of the algorithms (or logic) using the Earth science data or product can achieve the intended outcomes.

Benchmarking.

This phase applies a rigorous process to compare the performance of a decision support tool using Earth science products to a standard benchmark or reference scenario in order to document the value of the Earth science products in the tool. Where partners have existing metrics and performance standards to evaluate their tools and decisions, NASA uses those metrics for assessment and those standards as benchmarks. To support adoption by the partner, this phase includes robust documentation of procedures and guidelines to describe the steps to access and utilize the Earth science research results.

These three phases provide a systematic approach to follow the integrated system solutions architecture and apply NASA's systems engineering expertise. The purposes of this rigorous approach are to identify and resolve data exchange problems, build partners' confidence and reduce risk in adopting Earth science products, and strengthen partners' abilities to use the data and predictions in their decision support tools.

APPENDIX B

National Applications: Priorities & Integrated System Solution Diagrams

****The set of integrated system solutions configurations and roadmaps are accessible at <http://www.earth.nasa.gov/roadmaps>.****

1. Agricultural Efficiency

Program Manager – Ed Sheffner (202-358-0239)

Program Plan: http://aiwg.gsfc.nasa.gov/esappdocs/progplans/ElementPlan-AgEff_v27.doc

Information on vegetation condition derived from remote sensing has long been used in decisions concerning agricultural production. Collaborations among the National Aeronautics and Space Administration (NASA), the National Oceanic and Atmospheric Administration (NOAA) and the U.S. Department of Agriculture (USDA) in the 1970's and 1980's demonstrated that observations and measurements from Earth observing satellites provided valuable information on crop production, yield, and condition.

The current generation of NASA Earth science observations (Terra, Aqua, TRMM, etc.) and models provides opportunities for the agricultural community to predict and monitor global and domestic agricultural production and yield—assessments that help to drive the U.S. agricultural industry. In the next decade NASA will launch a number of new Earth science missions to provide new sources observations and measurements to address NASA's Earth science mission. The observations and measurements from the new missions, (e.g., the Orbiting Carbon Observatory (OCO), Aquarius and the Hydrosphere State Mission (HYDROS)) may also provide improvements to the decision support systems and tools employed by USDA and other organizations with mandates to monitor agricultural efficiency.

The Agricultural Efficiency program element focuses on prediction of production and yield through two areas of concentration. The first is the integration of NASA capabilities—especially data and modeling capabilities in weather, climate, and natural hazards—into the global and domestic production and yield forecasting mandates of USDA (U.S. Department of Agriculture). The second area addresses a legacy partnership with USDA known as Ag20/20. Ag20/20 involves the development of remote sensing-based information products for “precision” agriculture applications and utilizes high-resolution satellite and airborne imagery from commercial sources to assist producers in making in-season production management decisions.

USDA and NASA are partners in a number of program elements that affect USDA mandates. The partnership is formally recognized in a Memorandum of Understanding (MOU) between NASA and USDA signed in May, 2003. An interagency working group, authorized under the MOU, is meeting regularly to define collaborative projects in agricultural efficiency and other NASA national application program elements including carbon management, invasive species, air quality, water quality, disaster management, and homeland security. In identifying collaborative projects between USDA and NASA in agricultural efficiency, the

requirements and contributions from the other program elements are considered by the interagency working group to ensure efficiency and prevent duplication of effort.

2. Air Quality

Program Manager – Lawrence Friedl (202-358-1599)

Program Plan: <http://aiwg.gsfc.nasa.gov/esappdocs/progplans/AirQuality.doc>

The Air Quality Management program element extends Earth science research results to issues of concern and decision-making related to air quality planning, compliance, and forecasting. The program focuses on air quality decision tools serving the following types of issues: air quality planning and assessment; emissions sources and inventories; transport and deposition; compliance and regulation; air quality forecasting; international atmospheric policies and treaties; economic management and trade; and, public and environmental health. The program has focused especially on particulate matter (PM) and ozone in addition to other criteria air pollutants. The program currently has activities with EPA and NOAA related to PM and air quality forecasting, and the program has activities with EPA on ozone boundary conditions related to CMAQ.

For this solicitation, the Air Quality program will accept proposals across the types of issues mentioned above. The program encourages proposals to extend Earth science results to existing air quality decision support tools beyond CMAQ. Some suggestions for topics include:

- enhanced and evolved PM and aerosol products for air quality forecasting
- use of Aura observations (directly or through models) for forecasting
- use of proposed observations from CloudSat and CALIPSO missions
- aviation emissions (ground and/or airborne)
- use of physical atmospheric characteristics and land cover/use in CMAQ and other air quality decision support tools
- involvement of US Regional Planning Organizations and other countries

3. Aviation

Program Manager -- John Haynes (202-358-4665)

Program Plan:

http://aiwg.gsfc.nasa.gov/esappdocs/progplans/Av_Plan_ESE_Jan04_FINAL.doc

This element focuses on the infusion of quality science observations from NASA Earth science satellite missions and predictions from Earth System Science models into aviation Decision Support Systems (DSSs) managed by partner agencies and organizations. The purpose of the Aviation program element is to extend Earth science satellite data and Earth System Science models to support the benchmarking of frequent, densely distributed Earth science observations to support the National Airspace System (NAS) and address capacity, security, environmental, or safety issues. Data from Earth science satellites such as TRMM, QuikScat, Terra, and Aqua support this purpose. Data from future Earth Science research missions have the potential to add even more value. The ESE Aviation program element partners with the NASA Aeronautics Enterprise as well as several Federal organizations, including the Federal Aviation Administration (FAA), the Office of the Federal Coordinator

for Meteorology (OFCM), and the National Oceanic and Atmospheric Administration (NOAA).

A major thrust of the Earth Science Aviation program element is the Advanced Satellite Aviation-weather Products (ASAP) activity (co-funded with the NASA Aeronautics Enterprise). This initiative began in 2002 and its objectives are:

- 1) to fill a critical gap in the integration of current NOAA series and Geostationary Operational Environmental Satellite (GOES) imagery and sounding data in the production of operational aviation weather products (produced by the NOAA National Weather Service) that are developed by the FAA Aviation Weather Research Program (AWRP);
- 2) to bridge the gap between developing aviation weather products using current Earth observation satellite imagery and sounding data and integrating next generation hyperspectral satellite observations of the atmosphere into aviation weather product development.

The Aviation program element is emphasizing proposals for the development of algorithms to be used as discriminators in FAA Aviation Weather Research Program (AWRP) expert decision support systems for the areas of volcanic ash detection, turbulence, oceanic convective weather, and ceiling/visibility. A partner agency's approval or participation in such proposals is encouraged.

4. Carbon Management

Program Manager – Ed Sheffner (202-358-0239)

Program Plan: http://aiwg.gsfc.nasa.gov/esappdocs/progplans/Carbon_Management.doc

Carbon management is a key resource management and policy issue of the 21st century. The atmospheric concentration of CO₂ increased by about 25% during the 20th century and is continuing to increase in part due to the burning of fossil fuels and changes in land cover and land use. Increases in the atmospheric concentration of CO₂ and other greenhouse gases are likely to produce significant changes in global climate and accompanying changes in the energy and water cycles. These changes will have profound impacts on society and the Earth's ecosystems.

The US administration launched an initiative in 2001 to address specific elements of the climate change issue. The carbon management program element responds to the Climate Change Research Initiative (CCRI) and focuses on carbon emissions and sequestration in terrestrial, oceanic and geologic systems. The program element responds to requirements and programs of the operational agencies responsible for implementation of the Climate Change Technology Initiative (CCTI) in regard to the use of NASA systems (e.g., Landsat, Terra/Aqua, Aura, SeaWiFS, Orbiting Carbon Observatory (OCO)) to measure and monitor carbon sequestration in terrestrial, lacustrine and oceanic environments and the flux of carbon among these environments and the atmosphere. Projects sponsored through this program element build toward an operational carbon management regime that informs resource managers and policy makers of the current state of the distribution of carbon sources and

sinks and provides information on near-term and long-term impacts of mitigation actions. Measurements and observations from NASA's Earth orbiting systems will be especially useful in scaling up in situ and local measurements to regional and global scales. The carbon management program will also consider carbon emissions commencing in FY05.

The carbon management program also benefits from models developed by NASA centers and laboratories and international collaborations, especially with the carbon sequestration research and operational implementation of Australia.

In developing a science-based carbon management regime knowledge of the carbon cycle is exploited to assist operational agencies (e.g., the US Department of Agriculture (USDA), Department of Energy (DOE), Environmental Protection Agency (EPA), and the US Geological Survey (USGS)) fulfill their mandates to manage carbon and to support local, regional, national, and global policy and planning for control of carbon in the environment. The program element collaborates with academic and government laboratories and operational agencies in the North American Carbon Program (NACP) to develop, test, and implement new technologies for measuring, monitoring, and validation of carbon management practices.

5. Coastal Management

Program Manager – Lawrence Friedl (202-358-1599)

Program Plan: <http://aiwg.gsfc.nasa.gov>

The Coastal Management program element extends Earth science research results to issues of concern and decision-making related to coastal environments. The program includes activities related to marine, oceanic, estuaries, reefs, and similarly related environments. The program focuses on coastal decision support tools serving the following types of issues: Environmental resource management; economic management and trade (e.g., marine fisheries); emergency management and response; mitigation & adaptation of sea level changes; and, public and environmental health. The program has largely focused on Harmful Algal Blooms (HAB) to date and has a significant on-going project related to HABs in the Gulf of Mexico, including a project with the Naval Research Laboratory and Applied Coherent Technology, Inc. in cooperation with NOAA. The program is near completion of evaluation reports related to the potential of Earth science products to support decision making on oil spills and coral reefs.

For this solicitation, the Coastal Management program will accept proposals across the types of issues mentioned above (assuming there's an existing decision support tool supporting the issue). However, the program strongly discourages proposals focused on HABs in the Gulf of Mexico. Organizations wishing to review the evaluation reports for oil spills and coral reefs may access those reports by contacting the Program Manager above.

The program recognizes that coastal issues are often regional in nature. The program will accept proposals focused on regional decision support tools. In these cases, the proposed project should serve a large regional area, should describe plans to extend results broadly, and should articulate the importance of the regional area to the overall nation.

6. Disaster Management

Program Manager – Steve Ambrose (202-358-0851)

Program Plan:

http://aiwg.gsfc.nasa.gov/esappdocs/progplans/DM_Program_Plan_2004_v7.doc

The Disaster Management Program addresses issues of concern and decision-making related to volcanoes, earthquakes, drought, wildfire, hurricanes, climate, wind, tornadoes, and flood planning, compliance, and forecasting. The DM Program focuses on partnerships with regional-national organizations that have Disaster Management responsibilities and mandates to support Disaster Management managers and policy makers. Primary partners are the DHS- (FEMA), NOAA (NWS and NESDIS), USDA (including USFS), and USGS. The DM Program working through WMO/IGOS, UNESCO, CEOS, WSSD, and other international countries and partners.

Priority Earth science missions for the Disaster Management Program include, but are not limited to, Terra, Aqua, the ICESat, QuikScat, CloudSAT, NPOESS, NPP, TOPEX, SRTM, TRMM, Landsat, and GRACE. Sensors include MODIS, AIRS, AMSR-E, GLAS, LIS, SeaWinds, ETM, and other multispectral and visible sensors. Priority Earth science models include: MM5, GCM, ETA, WRF, Wind, Tree Blowdown, NOAA/NWS FLDWAV, WAVEWATCH III, and other models.

Proposals using, improving, or adapting outputs from these missions and models into decisions support systems are the primary goals of the Disaster Management Program. The DM Program is especially interested in proposals that can directly support HAZUS-MH or the AWIPS decision support tools. The DM Program is also interested in proposals that support other DSS that support Federal Agency partners using NASA satellite remotely sensed data or models. Having a partner agency approve or participate in such proposals is encouraged.

7. Ecological Forecasting

Program Manager – Woody Turner (202-358-1662)

Program Plan: http://aiwg.gsfc.nasa.gov/esappdocs/progplans/Ecological_Forecasting.doc

This program uses Earth observation data in conjunction with models to predict the impacts of environmental change on the ecosystems that support the existence of life on Earth. The program currently focuses on three themes.

1. Regional Networks supporting Biodiversity Conservation and Sustainable Development
2. Protected Area Management
3. Marine Fisheries Forecasting

Under the Regional Networks theme, the Ecological Forecasting program is working with the Central American Commission on the Environment and Development (CCAD), the U.S. Agency for International Development (USAID), and the World Bank as they assemble tools for managing the multinational Mesoamerican Biological Corridor. The name of this

international project is SERVIR. More information about it is available at <<http://servir.nsstc.nasa.gov/home.html>>. Of interest here are proposals seeking to augment NASA's activities in Mesoamerica or expand this approach to other regions.

The Protected Area Management theme seeks to integrate NASA data products and supported models into decision support tools for protected area managers around the world. This theme also works with those seeking to measure the effectiveness of protected areas and associated conservation activities.

The Marine Fisheries Forecasting theme will assist those developing models and other decision support tools to improve the management of fisheries. For example, the coupling of climate models, at various scales, with ecological models holds promise for enhancing the sustainability of fisheries in the U.S. and abroad.

An overarching priority for the Ecological Forecasting program is the growing number of decision support systems addressing the conservation of biodiversity. Biodiversity loss is a global change of particular urgency as lost species and ecosystems cannot be recovered. Under this overarching priority, the following criteria help establish which potential partnerships are most appropriate for NASA support:

- Presence of a partner institution with an existing or planned decision support system that is able to accept or adapt NASA's observations and forecasts;
- Importance of the ecosystem services involved (for example, priority locations might be those especially rich in biodiversity or vital to the maintenance of fresh water or healthy fisheries); and
- Existence of a NASA research program that allows the extension of Earth Science research results into decision support systems of particular user communities.

8. Energy Management

Program Manager – Greg Stover (757-864-7097)

Program Plan: http://aiwg.gsfc.nasa.gov/esappdocs/progplans/Energy_Management.doc

NASA implements the Energy Management element of the Earth Science Applied Sciences Program by partnering with federal and private organizations to improve their decisions and assessments that impact the Energy sector. These improvements are enabled by leveraging the Earth system knowledge generated from research resulting from satellite observations and model predictions conducted by NASA and providing these as inputs to the decision support and scenario assessment tools used by partner organizations. The primary areas the Energy Management element focuses its efforts to provide for improved decisions and assessments are:

1. Energy production
2. Energy efficiency
3. Measuring and monitoring of greenhouse and other gases
4. Carbon sequestration as related to the energy sector

The Energy Management element seeks proposals that provide for the evaluation of opportunities where historical, near-real time, and forecasted environmental data generated from NASA missions and model outputs can be used as inputs to DSTs for management decisions and scenario assessments for policy in the four specified areas. The evaluation should provide information that includes the DST purpose, decisions supported, inputs/outputs, requirements, technical and programmatic design, as well as plans and directions of the DST sponsoring organization. The evaluation must provide a quantitative evaluation/comparison/analysis of candidate Earth science products relative to DST inputs/outputs/requirements, and provide recommendations of the products best suited to support the DST. The identification of input requirements and an approach to the verification and validation of the implementation that meets these requirements should also be provided in the evaluation. Candidate architectures for the implementation which includes the identification of data sources and expertise in the Earth science products along with any developments necessary for the implementation should be presented. A cost benefits analysis of the implementation and alternatives should be provided along with an analysis of the potential societal impacts. Risk and barriers to success should be identified and a mitigation plan recommended.

The evaluations will be used to assess priority Earth science results/products and will aid in establishing program direction and formulating future solicitation opportunities that implement the approach identified in the evaluation. Proposals that provide for impacts on a national and international scale are especially sought. The timeframe for performing the evaluations is not expected to be of long duration and multiple evaluations can be proposed. Proposers are encouraged to assess opportunities for project implementations in Energy Management that will include impacts in multiple National Applications priorities such as Water, Air Quality and Public Health.

The Energy Management element also requests proposals for projects and activities to develop information pathways from NASA satellite observations and Earth system modeling to Decision Support Tools in the four Energy Management focus areas. The projects that develop these pathways will be required to provide an evaluation of the (DST) as described above, and provide a plan to implement the information pathway that will be assessed for project continuation. The project implementation should include activities that allow for the verification and validation of the information pathway and should allow for the benchmarking of the information pathway such that the DST owner can utilize the results of the project in forming future activities that extend the results in an operational environment. A focus on the use of near-real time, and forecasted environmental data as inputs to the DST for management decisions and scenario assessments for policy is highly desirable.

9. Homeland Security

Program Manager – Steve Ambrose (202-358-0851)

Program Plan:

http://aiwg.gsfc.nasa.gov/esappdocs/progplans/HS_Program_Plan_2004_v72.doc

The Homeland Security program addresses such areas of concern and decision-making as chemical, biological, nuclear, and radiological terrorism; geospatial enabling of Homeland Security operations facilities; and national security issues, such as border and transportation security. The Homeland Security Program focuses on decision tools serving the following classes of issues:

- Homeland Security planning and decision support system strategies
- Integrated Operation Facility development, such as an air plume modeling center
- Coordination with the National Response Plan of the U.S. Department of Homeland Security (DHS)
- Information technology, interoperability, and Web services
- Research and development of model and data assimilation and prediction
- Coordination with international security issues
- Economic management and the built environment (buildings physical structure and urban environments)
- Public response, recovery, mitigation, social science, and welfare

The Homeland Security Program works with NASA partners, Federal agencies, and regional-national organizations that have Homeland Security responsibilities and mandates to support Homeland Security managers. Primary partners are the DHS (including Coast Guard and FEMA), State Department - Humanitarian Information Unit, DOD, DOD-DTRA, DOT, NOAA, EPA, DOE, NRC, and USDA.

Priority Earth science missions for the Homeland Security program include, but are not limited to, Terra, Aqua, QuikSCAT, CloudSAT, TRMM, NPOESS, NPP, CALIPSO, and GRACE. Priority Earth science models include the EPA's Areal Locations of Hazardous Atmospheres (ALOHA®), NOAA's Hybrid Single-Particle Lagrangian Integrated Trajectory (HYSPLIT), the Pennsylvania State University/National Center for Atmospheric Research Mesoscale Model (MM5), and the National Center for Environmental Prediction ETA and WRF models.

Proposals using, improving, or adapting outputs from these missions and models to applications are the primary goals of the Homeland Security Program. Proposals should be related to an existing decision support tool, system, or center-of-value or in use at the DHS and other agencies, such as the USDA (food security applications for example) or DOT (infrastructure protection or transportation monitoring). Having a partner agency approve or participate in such proposals is encouraged.

10. Invasive Species

Program Manager – Ed Sheffner (202-358-0239)

Program Plan: http://aiwg.gsfc.nasa.gov/esappdocs/proglans/ElementPlan-InvSpe_v25.doc

Management and control of invasive species is a major national concern. Estimates on the annual cost to management agencies in the United States, at all levels of government, to control invasive species are as much as \$100 billion per year, and likely to grow. Eradication is no longer a viable response for species that have become endemic in certain areas. The current focus is on predicting sites where invasive species are likely to venture and directing control efforts at eradication of emergent, small stands of invasives while the cost of eradication remains reasonable.

The purpose of the invasive species management element is to assist operational agencies meet their mandates to manage invasive species. The purpose will be met through partnerships between NASA and the operational agencies. These partnerships will take advantage of NASA's Earth observations, modeling and computational capabilities to develop tools that predict the spread of invasive species and help the operational agencies maximize the use of available resources for response to the invasive species threat. The collaboration among NASA, the Department of the Interior (DOI – especially USGS), the US Department of Agriculture (USDA) and National Oceanic and Atmospheric Administration (NOAA) on invasive species is illustrative of the integrated systems solutions that the Science Mission Directorate Applied Sciences Program seeks with its partners.

The spread of invasive species is increasing as global travel and shipping expands the opportunity for movement of undesirable organisms. The issue has developed diverse stakeholder support, ranging from state and federal land management agencies, the agricultural and recreational industries, conservation organizations, and private landowner groups. The National Research Council's Committee on Grand Challenges in Environmental Sciences has identified increased understanding of biodiversity and ecosystem functioning as one of eight "Grand Challenges in Environmental Science" facing our nation and the world today. The committee emphasized the need for developing an ecological forecasting capability and improved management techniques for non-indigenous species. As such, the invasive species program element is closely related to the ecological forecasting program element.

The long term goal of the invasive species application element is the integration of NASA Earth science data, modeling and systems engineering capabilities into the operational procedures of federal agencies and other organizations with mandates to respond to the incursion and spread of invasive species in terrestrial and aquatic habitats. This goal is manifest in the integration of NASA observations, modeling and systems engineering in the National Invasive Species Forecasting System (NISFS). The USGS is the lead agency developing the NISFS on behalf of the National Invasive Species Council (NISC).

11. Public Health

Program Manager -- John Haynes (202-358-4665)

Program Plan: http://aiwg.gsfc.nasa.gov/esappdocs/progplans/Public_Health.doc

The Public Health Applied Sciences Program extends products derived from Earth science information, models, technology, and other capabilities into partners' decision support tools for public health, medical, and environmental health issues. The foci of partnerships with the public health practice community are their decision support systems known as *epidemiologic surveillance systems* in the areas of infectious disease, environmental health, and public health preparedness and response.

NASA collaborates with the professional public health community that is responsible for surveillance to understand and respond to factors in the environment that adversely impact the health of the American public. These factors include disease vectors, air and water contaminants, ambient temperature extremes, ultra-violet radiation and a myriad of other factors associated with public health problems.

Priority Earth science measurements for the Public Health Applied Sciences Program include those derived from sensors on: Aura, Terra, Aqua, EO-1, Landsat-7, TOMS-EP, SRTM, TRMM, and SeaWiFS because NASA research has shown that these provide information on environmental factors associated with disease phenomena. The project plans associated with the Public Health Applied Sciences Program identify specific sensors, measurements, and models, and they state specific activities with the partners to extend Earth science measurements, including environmental data records and geophysical parameters.

The Public Health Applied Sciences Program is particularly interested in proposals that support the integration of Earth system science results into decision support tools or systems to enhance malaria and other vector borne disease surveillance. These systems are the subjects of collaboration between NASA and the Department of Defense and the Centers for Disease Control and Prevention. The Public Health Applied Sciences Program also is interested in public health preparedness and response systems and is interested in proposals to develop network solutions to integrate Earth science results in this area. NASA is collaborating with the Department of Health and Human Services (DHHS), Office of the Secretary for this purpose. DOD and DHHS partnership in the proposal is strongly encouraged.

12. Water Management

Program Manager – Jared Entin (202-358- 0275)

Program Plan:

http://aiwg.gsfc.nasa.gov/esappdocs/progplans/WM_ElementPlan_v9_signed.doc

The Water Management Program element extends products derived from Earth science information, models, technology, and other capabilities into partners' decision support tools for water management issues. NASA partners with Federal agencies and other organizations that have water management responsibilities and mandates to support water resource managers. The program may include activities with international organizations, particularly

through involvement of US partner organizations. Partnerships with the Environmental Protection Agency (EPA), Department of Interior Bureau of Reclamation (BoR), and United States Department of Agriculture (USDA) have been established. The program seeks new partnerships, including those with international potential, as resources allow.

The Water Management Program element addresses issues of concern and decision-making related to water quality and availability. NASA data products to improve assessment of water quantity and quality can include those that support the following activities: Estimating water storage (e.g. snowpack size, soil moisture); Modeling and predicting water fluxes (e.g. evapotranspiration, precipitation, river runoff); Remote sensing of water quality (e.g. turbidity, dissolved oxygen). NASA's recent solicitation entitled "NASA's Energy- and Water-cycle Sponsored Research" (NN-H-04-2-YS-005-N) released on June 22, 2004 sought proposals to do these types of activities. Proposals to this NRA should specifically investigate areas where these Water Management activities can lead to improved water management in the context of at least one other National Application program element. For example, improving snowpack size estimation and melt-timing prediction to enabling improved hydro-electrical power generation (Energy forecasting). Another example would be combining precipitation, soil moisture, and river runoff information to aid in flood and drought prediction and assessment (Disaster Management). Only those proposals that combine the goals of the water management program element with another National Applied Sciences Program element will be considered responsive to this section of the NRA.

APPENDIX C

Step 1 Proposal Information

Prospective proposers are encouraged to submit a Step 1 proposal that concisely describes the project to be proposed. The Step 1 proposal process is intended to reduce proposal preparation time for the community, minimize review time for the Program, and expedite distribution of funds to successful proposals.

The submission of a Step 1 proposal is not a commitment to submit a Step 2 proposal. Step 1 proposals are to be submitted electronically by entering the requested information through SYS-EYFUS Web site located at <http://proposals.hq.nasa.gov>. In addition, NASA must receive 5 hard copies of the final Step 1 proposal SYS-EYFUS submission by the due date.

User identifications (IDs) and passwords are required by NASA security policies in order to access the SYS-EYFUS Web site. If a proposer has obtained a User ID and password in the process of submitting a proposal for a previous research opportunity announcement, the same user UserID and password can be used to complete the electronic Step 1 proposal.

If you do not have a SYS-EYFUS UserID or password, you may obtain one electronically by going to <http://proposals.hq.nasa.gov/> and performing the following steps:

1. Click the hyperlink for **new user**, that will open the Personal Information Search Page.
2. Enter your first and last name. SYS-EYFUS will **search** for your record information in the SYS-EYFUS database.
3. Confirm your personal information by **choosing** the record displayed.
4. Select **continue**, and a User ID and password will be e-mailed to you.

Once you receive your User ID and Password, **login** to the SYS-EYFUS Web site and follow the instructions for **New Proposal Cover Page**.

At a minimum, the following information will be requested:

- CAN number or identification
- Type of “Decisions” proposal (check Integrated Systems Solutions or Solutions Networks):
 - Integrated System Solutions
 - Solutions Networks
- The team leader/principal investigator's name, mailing address, phone number, and e-mail address
- The name(s) of any team members/co-investigator(s) and institution(s)
- A descriptive title of the intended project or activity

- A brief, 3-4 page, text-only description of the investigation to be proposed (not to exceed 2,000 words and no smaller than 12-point font) that includes the following information:

Integrated System Solutions (of Earth science for applications of national priority)

- Synopsis of the management and/or policy decision support and user community
- Specify which of the 12 application(s) of national priority
- Description of the decision support tool(s) (including its use by user community to address the issue(s))
- Synopsis of the NASA Earth Science research results (observations, models, etc.) to extend and a brief rationale for their potential support to the decision tools
- Synopsis of the organizations partnering in the proposal & brief description of the responsibilities
- Description of the expected results (i.e., the improved decisions & resulting benefits)
- Brief statement of the management plan and overall approach

Solutions Networks

- Synopsis of approach for assessment, analysis, optimization, and evolution of the network of Earth science research organizations to contribute to integrated system solutions
- Synopsis of the organizations partnering in the proposal & brief description of the responsibilities
- Description of the expected results (i.e., higher performance from the networked results of contributing organizations)
- Brief statement of the management plan and overall approach

A separate Step 1 proposal must be submitted for each intended (and thus corresponding) Step 2 proposal.

Note: The Step 1 proposal review will not evaluate the proposed budget, and no funds will be distributed as part of the Step 1 proposal review process. Therefore, formal budget estimates, signatures, and certification/disclosure forms are not required for Step 1 proposals

Step 1 proposal Evaluation Criteria

The following descriptions provide additional information to criteria mentioned in *Section V.A - Proposal Review Information*. These criteria mirror the criteria for the Step 2 proposal (Appendix D) and they supersede those listed in Appendix E. These criteria are of approximately equal importance and weight.

Intrinsic Merit

- a. Overall merit, including innovative methods and technical and management approaches
- b. Demonstrated understanding of the policy or management issue(s) and the user

- community to extend Earth science results with considerable likelihood
- c. Quality of project design; evidence of a genuine, good idea, and evidence of sound approach for implementation
 - d. Qualifications, capabilities, and relevant experience of team members as an indication of their ability to carry the project to a successful conclusion
 - e. *Integrated System Solutions*: Sound approach to apply systems engineering principles to extend Earth science results to enhance decision support capabilities
 - f. *Solutions Networks*: Sound approach to identify Earth science results (type, number, range, frequency, innovation, etc.) with adequate potential to extend to decision support tools

Relevance to NASA’s Objectives and National Priorities

- a. Alignment and relevance the Program’s objectives and the potential to serve individual applications of national priority
- b. Probability for improving the routine, sustained use of NASA Earth science results in decision support tools employed by an operational entity to meet its mandated policy and management responsibilities and extend results to user community and decision makers
- c. Probability of achieving expected benefits and potential to transition successful activities, achieve sustainable results, and extend results broadly

APPENDIX D

Proposal Format, Content, and Evaluation Criteria

(Amendatory Guidance to Appendix E)

Purpose

These guidelines contain general and specific information regarding the submission of proposals in response to this NASA Cooperative Agreement Notice (CAN). Formats for submission of Step 2 proposals related to this solicitation are provided, and the evaluation criteria are specified. Appendix E contains general instructions. Where conflicts exist between this appendix and Appendix E, this appendix (i.e., Appendix D) shall be the controlling document.

Proposal Format and Contents

The proposal should provide sufficient detail to enable a reviewer to assess the value of the proposed project, its relation to the objectives of the CAN, and the probability that the investigators and project team will be able to accomplish the stated objectives within the requested resources and schedule. Capabilities of the proposing organizations should be described, including the qualifications and experience of the principal investigator and any co-investigators. The proposal should be self-contained and should not refer reviewers to external sources or web sites for critical information.

The main part of the proposal is limited to the equivalent of 12 pages of text, single-spaced, with type no smaller than 12 pt. A reasonable number of figures and tables (not to exceed 4 pages) may be appended. Short resumes – no more than 1–2 pages per investigator – should be included. Statements of current and pending projects and research (including proposal name, funding agency, duration, and total funding) for all investigators should be included. The cover letter, proposal cover page, table of contents, abstract, list of references, performance measures, cost plan, resumes, letters of support, and statements of current and pending funding need not count in the 12-page limit. If color is used, proposers should ensure that all copies have color. To facilitate recycling, proposals should not be bound or submitted in covers.

Page Limits

Offerors must adhere to the following page limits:

Cover Letter	1
Proposal Cover Page	1–2
Table of Contents	1
Abstract	1
Project Plan & Approach (Technical Plan & Management Approach)	12
- Integrated System Solution Chart (optional)	
Schedule	1-2
Performance Measures (incl. management metrics)	1-2
List of References	1–4

Budget & Cost Plan	3–6
Letters of Support	1-4
Resumes	1– 2 per investigator
Current/Proposed Projects	as needed
Other Enclosures	as few as possible

Content

Each Step 2 proposal should contain the following materials assembled in the order given.

1. Cover Letter. A cover letter must preface each Step 2 proposal. The letter should be signed by an official of the investigator's institution who is authorized to legally bind the organization to the proposal and its content (unless the signature appears on the proposal itself). The cover letter should refer to the Decisions 2005 CAN (Solutions Networks or Integrated System Solutions).
2. Proposal Cover Page. Please see Appendices F& G. The Cover Page should specify whether the proposal is directed to Solutions Networks or the Integrated System Solutions. If it is directed at the Integrated System Solutions portion, the Cover Page should specify which of the twelve applications of national priority.
3. Table of Contents. The table of contents should list the page numbers for key sections of the proposal, including cost and budget.
4. Abstract (1 page maximum). The abstract should summarize the proposed activity in one page or less. The abstract should contain a simple, concise overview of the project, its objectives, policy/management issue (including decision support tool(s) if appropriate), technical and management approach, expected results, and the value of its results to NASA's Earth Science applications objectives.
5. Project Plan & Approach (length must not exceed 12 pages). The main body of the Step 2 proposal should contain a full statement of the project and should describe key background, objectives, project team and the technical and management approach. The key components of the project should be clearly identified and related to each other. The methods or approaches to be used should be described, and, as appropriate, the advantages of the selected methods or approaches over alternatives should be discussed. The anticipated results should be identified, and their relation to the proposal's stated objectives and NASA's objectives, as outlined in this CAN, should be discussed.

The project should be described in sufficient detail that peer reviewers can adequately assess the technical approach, management methods, and overall quality of the work proposed.

For Integrated System Solutions, this section should include and/or describe:

- The management/policy issue(s) decision support that is the focus of the integrated system solution and user community
- Description of the decision support tool(s) (including its use by user community to address the issue(s)) and its national/regional/international importance
- NASA Earth science results (observations, models, etc.) to extend, including the rationale for their potential support to the decision tools
- Innovation and impact (potential for improving decision support)
- Issues affecting project success (technical, policy, operations, management, etc.) and the approach to address them
- Team and partnership arrangements; roles and responsibilities (including roles of contractors and/or non-institutional support)
- Plan to transition results to operational agency and/or extent results broadly
- Description of the expected results (i.e., the improved decisions & resulting benefits)

The Program encourages proposers to the Integrated System Solutions portion to illustrate their proposal by populating an ISS chart (see *Section I.B – Earth Science Applications*).

For Solutions Networks, this section should describe the approach to:

- Assess, analyze, optimize and evolve network of contributing organizations
- Define requirements of targeted partner decision support tools
- Design, develop, and augment Earth science information networks
- Determine which NASA outputs are potential solutions for partner decision support requirements
- Team and partnership arrangements; roles and responsibilities
- Identify critical components needed to implement specific solutions networks

6. Schedule (1–2 pages). The schedule should articulate the phases in the project, duration of major activities, and major milestones expected to complete the project. A schedule for reporting results, including articles and/or attendance and paper presentations at major conferences, should be included.

7. Performance Measures, including management metrics (1–2 pages). This section should articulate the quantitative/qualitative measures the team and project manager will use to monitor progress toward their objectives, communicate status and achievements, identify issues, and make any necessary corrections to their approach. Note: Meetings do not qualify as measures or metrics.

8. List of References (1–4 pages). A complete list of references cited in the Project Plan section must be provided. Each reference should include the title, names of all authors, book or journal title, volume number, page numbers, and

year of publication. While it is important to be concise, proposers should follow accepted scholarly practices in providing citations for source materials relied upon when preparing any section of the proposal.

9. Budgets & Cost Plan. Please see Appendix H for guidance and summary forms. Contributions from any cost-sharing plan or other support for the proposed activity should be detailed. Costs for the acquisition, storage, or processing of all required data should be included.

Full costs for the purchase of data from commercial sources should be included in the budget and the requirement documented in the proposal. Costs for activities associated with validating processes to extend data, developing prototypes, working with models and model outputs, and related activities should be included. Proposers should assume that NASA Earth science data received is scientifically validated. If use of supercomputer resources is anticipated, an estimate of computational requirements should be included as part of the budget submission.

To ensure adequate communications between investigators, proposers should plan for funds for appropriate team members to attend one NASA-related meeting of two-days duration and located in the US on an annual basis during the course of the project.

10. Letters of Commitment & Support (1-4 pages). Please include letters of commitment from organizations that are part of the team. The letters should help indicate the team members' commitment, interest, responsibilities, and level of participation in the project.

Please include letters of support from the end-user organizations (those on your team and others) that may potentially benefit from the proposed project. The letters should help indicate the national importance of this project (including regional and international). Letters should indicate and express their organization's interest, commitment, level of participation and potential application of Earth science results if the project is successful.

11. Resumes (1–2 pages per investigator). Brief resumes for all named investigators should be appended to the Step 2 proposal.

12. Current/Proposed Projects (as needed). Include proposal name, funding agency, duration and total funding.

13. Other Enclosures (as few as possible). Proposals should be self-contained, and reviewers are under no obligation to read any enclosures. Proposers may include other materials, such as preprints or reprints of relevant publications, background on new measurement or analysis approaches, or participation by scientists and/or institutions. Such materials are considered ancillary. Information in the Project Plan of the proposal should stand alone. Other materials will not be evaluated

Evaluation Criteria

The following descriptions provide additional information to criteria mentioned in *Section V.A - Proposal Review Information*. These criteria supersede those listed in Appendix E. These criteria are of approximately equal importance and weight.

Intrinsic Merit

- a. Overall technical merit, including innovative methods, approaches, or concepts
- b. Demonstrated understanding of policy or management issue and relationship with user community to extend Earth science results with considerable likelihood
- c. Quality of project design; evidence of a genuine, good idea and thoroughness in implementation
- d. Qualifications, capabilities, and relevant experience of team members as an indication of their ability to carry the project to a successful conclusion
- e. Integrated System Solutions: Sound approach to apply systems engineering principles to extend Earth science results to enhance decision support capabilities
- f. Solutions Networks: Sound approach to identify Earth science results (type, number, range, frequency, innovation, etc.) with adequate potential to extend to decision support tools

Relevance to NASA's Objectives and National Priorities

- a. Alignment and relevance the Program's objectives and the potential to serve individual applications of national priority
- b. Potential to transition successful activities, achieve sustainable results, and extend results broadly
- c. Probability of achieving expected benefit and extending results to user community and decision makers
- d. Probability for improving the routine, sustained use of NASA Earth science results in decision support tools employed by an operational entity to meet its mandated policy and management responsibilities

Cost Reasonableness and Management

- a. Realism and reasonableness of the proposed budget in relation to proposed activities
- b. Realism and reasonableness of the proposed budget in relation to impact
- c. Proposal is clearly organized and demonstrates a high probability for successful implementation
- d. Clear lines of management responsibilities, clear and well constructed plan and approach, and appropriate performance measures/metrics

Other Information

NASA reserves the right to select and make an award covering only a portion of a proposer's investigation, in which case the investigator will be given the opportunity to accept or decline such partial acceptance. In cases in which two or more proposals address similar problems and/or adopt similar approaches to data analysis, NASA may desire joint participation on the part of two or more proposers in a single project. If such overlap involves more than one

funding organization, NASA and those organizations will confer and mutually agree to the disposition of those proposals.

Cooperative agreements awarded to commercial awardees

For awards to commercial organizations in which there is cost-sharing, the terms and conditions under NASA Grant and Cooperative Agreement Handbook, 14 CFR Part 1274, unless otherwise indicated in this CAN, will apply. Awards to commercial organizations where there is no cost sharing are subject to the terms and conditions in 14 CFR Part 1260. Respondents should pay careful attention to these referenced provisions and conditions and indicate in their proposal if they take exception to any of these terms and conditions.

APPENDIX E

General Instructions for Responding to this Announcement

Note: In case of discrepancies with this Appendix, Appendix D and the Main Body of Announcement shall be the controlling text.

A. General

1. Proposals received in response to this Announcement will be used only for evaluation purposes. NASA does not allow a proposal, the contents of which are not available without restriction from another source, or any unique ideas submitted in response to this Announcement to be used as the basis of a solicitation or in negotiation with other organizations, nor is a pre-award synopsis published for individual proposals.

2. A solicited proposal that results in a NASA award becomes part of the record of that transaction and may be available to the public on specific request; however, information or material that NASA and the awardee mutually agree to be of a privileged nature will be held in confidence to the extent permitted by law, including the Freedom of Information Act.

3. Any resultant cooperative agreements will be awarded and administered in accordance with the NASA Grant and Cooperative Agreement Handbook (NPG 5800.1).

4. NASA does not have mandatory forms or formats for responses to NRAs; however, it is requested that proposals conform to the guidelines in these instructions. NASA may accept proposals without discussion; hence, proposals should initially be as complete as possible and be submitted on the proposers' most favorable terms.

5. To be considered for award, a submission must, at a minimum, present a specific project within the areas delineated by this Announcement; contain sufficient technical and cost information to permit a meaningful evaluation; be signed by an official authorized to legally bind the submitting organization; not merely offer to perform standard services or to just provide computer facilities or services; and not significantly duplicate a more specific current or pending NASA solicitation.

B. Restriction on Use and Disclosure of Proposal Information. Information contained in proposals is used for evaluation purposes only. Offerors or quoters should, in order to maximize protection of trade secrets or other information that is confidential or privileged, place the following notice on the title page of the proposal and specify the information subject to the notice by inserting an appropriate identification in the notice. In any event, information contained in proposals will be protected to the extent permitted by law, but NASA assumes no liability for use and disclosure of information not made subject to the notice.

Notice: Restriction on Use and Disclosure of Proposal Information

The information (data) contained in [insert page numbers or other identification] of this proposal constitutes a trade secret and/or information that is commercial or financial and confidential or privileged. It is furnished to the Government in confidence with the understanding that it will not, without permission of the offeror, be used or disclosed other than for evaluation purposes; provided, however, that in the event a contract (or other agreement) is awarded on the basis of this proposal the Government shall have the right to use and disclose this information (data) to the extent provided in the contract (or other agreement). This restriction does not limit the Government's right to use or disclose this information (data) if obtained from another source without restriction.

C. Joint Proposals

1. Where multiple organizations are involved, the proposal may be submitted by only one of them. It should clearly describe the role to be played by the other organizations and indicate the legal and managerial arrangements contemplated. In other instances, simultaneous submission of related proposals from each organization might be appropriate, in which case parallel awards would be made.

2. Where a project of a cooperative nature with NASA is contemplated, describe the contributions expected from any participating NASA investigator and agency facilities or equipment which may be required. The proposal must be confined only to that which the proposing organization can commit itself. "Joint" proposals which specify the internal arrangements NASA will actually make are not acceptable as a means of establishing an agency commitment.

D. Late Proposals. Step-2 proposals or proposal modifications received after the latest date specified for receipt may be considered if a significant reduction in cost to the Government is probable or if there are significant technical advantages, as compared with proposals previously received.

E. Withdrawal. Proposals may be withdrawn by the proposer at any time before award. Offerors are requested to notify NASA if the proposal is funded by another organization or of other changed circumstances which dictate termination of evaluation.

F. Evaluation Techniques. Selection decisions will be made following peer and/or scientific review of the proposals. Several evaluation techniques are regularly used within NASA. In all cases proposals are subject to scientific review by discipline specialists in the area of the proposal. Some proposals are reviewed entirely in-house, others are evaluated by a combination of in-house and selected external reviewers, while yet others are subject to the full external peer review technique (with due regard for conflict-of-interest and protection of proposal information), such as by mail or through assembled panels. The final decisions are made by a NASA selecting official. A proposal which is scientifically and programmatically meritorious, but not selected for award during its initial review, may be included in subsequent reviews unless the proposer requests otherwise.

G. Selection for Award.

1. When a proposal is not selected for award, the proposer will be notified. NASA will explain generally why the proposal was not selected. Proposers desiring additional information may contact the selecting official who will arrange a debriefing.
2. When a proposal is selected for award, negotiation and award will be handled by the procurement office in the funding installation. The proposal is used as the basis for negotiation. The grants officer may request certain business data and may forward a model award instrument and other information pertinent to negotiation.

H. Additional Guidelines Applicable to Foreign Proposals and Proposals Including Foreign Participation.

1. NASA welcomes proposals from outside the U.S. However, foreign entities are generally not eligible for funding from NASA. Therefore, unless otherwise noted in the Announcement, proposals from foreign entities should not include a cost plan unless the proposal involves collaboration with a U.S. institution, in which case a cost plan for only the participation of the U.S. entity must be included. Proposals from foreign entities and proposals from U.S. entities that include foreign participation must be endorsed by the respective government agency or funding/sponsoring institution in the country from which the foreign entity is proposing. Such endorsement should indicate that the proposal merits careful consideration by NASA, and if the proposal is selected, sufficient funds will be made available to undertake the activity as proposed.
2. All foreign proposals must be typewritten in English and comply with all other submission requirements stated in the Announcement. All foreign proposals will undergo the same evaluation and selection process as those originating in the U.S. All proposals must be received before the established closing date. Those received after the closing date will be treated in accordance with paragraph (g) of this provision. Sponsoring foreign government agencies or funding institutions may, in exceptional situations, forward a proposal without endorsement if endorsement is not possible before the announced closing date. In such cases, the NASA sponsoring office should be advised when a decision on endorsement can be expected.
3. Successful and unsuccessful foreign entities will be contacted directly by the NASA sponsoring office. Copies of these letters will be sent to the foreign sponsor. Should a foreign proposal or a U.S. proposal with foreign participation be selected, NASA's Office of External Relations will arrange with the foreign sponsor for the proposed participation on a no-exchange-of-funds basis, in which NASA and the non-U.S. sponsoring agency or funding institution will each bear the cost of discharging their respective responsibilities.
4. Depending on the nature and extent of the proposed cooperation, these arrangements may entail:
 - (a) An exchange of letters between NASA and the foreign sponsor; or
 - (b) A formal Agency-to-Agency Memorandum of Understanding (MOU).

I. Export Control Guidelines Applicable to Foreign Proposals and Proposals Including Foreign Participation. U.S. proposals including foreign participation must include a section discussing compliance with U.S. export laws and regulations, e.g., 22 CFR Parts 120-130 and 15 CFR Parts 730-774, as applicable to the circumstances surrounding the particular foreign participation. The discussion must describe in detail the proposed foreign participation and is to include, but not limited to, whether or not the foreign participation may require the prospective proposer to obtain the prior approval of the Department of State or the Department of Commerce via a technical assistance agreement or an export license, or whether a license exemption/exception may apply. If prior approvals via licenses are necessary, discuss whether the license has been applied for or if not, the projected timing of the application and any implications for the schedule. Information regarding U.S. export regulations is available at <http://www.pmdtc.org> and <http://www.bxa.doc.gov>. Proposers are advised that under U.S. law and regulations, spacecraft and their specifically designed, modified, or configured systems, components, and parts are generally considered "Defense Articles" on the United States Munitions List and subject to the provisions of the International Traffic in Arms Regulations (ITAR), 22 CFR Parts 120-130.

J. Cancellation of Announcement. NASA reserves the right to make no awards under this Announcement and to cancel this Announcement. NASA assumes no liability for canceling the Announcement or for anyone's failure to receive actual notice of cancellation.

APPENDIX F

Required Step 2 Proposal Cover Page

Two steps are required to submit a cover page:

1) The first step is to complete the proposal cover page (see a sample in Appendix F) **electronically** to the SYS-EYFUS Website located at <http://proposals.hq.nasa.gov/>.

If the proposer has submitted an electronic Step 1 proposal to SYS-EYFUS, the same user UserID and password can be used to complete the electronic proposal cover page. If the proposer obtained a User ID and password in the process of submitting a proposal for a previous research opportunity announcement, the same user UserID and password can be used to complete the electronic proposal cover page in response to this research opportunity announcement. Be sure to click on “Edit Personal Information” if any of your correspondence information in SYS-EYFUS is not current.

2) The second step is to print a **hard copy** (see a sample in Appendix F) of the electronic cover page that must be signed by the Principal Investigator and an official of the investigator’s organization who is authorized to commit the organization. This authorizing signature also certifies that the proposing institution has read and is in compliance with the required certifications printed in full, therefore, these certifications do not need to be submitted separately. This page will not be counted against the page limit of the proposal.

If you do not have a SYS-EYFUS UserID or password, you may obtain one electronically by going to <http://proposals.hq.nasa.gov> and performing the following steps:

- I. Click the hyperlink for **new user** that will take you to the Personal Information Search Page.
- II. Enter your first and last name. SYS-EYFUS will **search** for your record information in the SYS-EYFUS database.
- III. Confirm your personal information by **choosing** the record displayed.
- IV. Select **continue**, and a User ID and password will be e-mailed to you.

Once you receive your User ID and Password, **login** to the SYS-EYFUS website and follow the instructions for **New Proposal Cover Page**.

Proposers without access to the web or who experience difficulty in using this site may contact the Help Desk at proposals@hq.nasa.gov (or call 202-479-9376) for assistance. After you have submitted your notice of intent or proposal cover page electronically, if you are unsure if it has been successfully submitted, **do not re-submit**. Please call the Help Desk. They will be able to promptly tell you if your submission has been received. Please note that submission of the electronic cover page does not satisfy the deadline for proposal submission.

APPENDIX G

Proposal Cover Page

Proposal Number: _____



Date: ___/___/___

Name of Submitting Institution: _____

Congressional District: _____

Proposal Title: _____	
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Name of Submitting Institution: _____	Congressional District: _____
--	--------------------------------------

Certification of Compliance with Applicable Executive Orders and US Code

By submitting the proposal identified in this *Cover Sheet/Proposal Summary* in response to this Research Announcement, the Authorizing Official of the proposing institution (or the individual proposer if there is no proposing institution) as identified below:

- certifies that the statements made in this proposal are true and complete to the best of his/her knowledge;
- agrees to accept the obligations to comply with NASA award terms and conditions if an award is made as a result of this proposal; and
- confirms compliance with all provisions, rules, and stipulations set forth in the two Certifications contained in this NRA [namely, (i) *Assurance of Compliance with the NASA Regulations Pursuant to Nondiscrimination in Federally Assisted Programs*, and (ii) *Certifications, Disclosures, And Assurances Regarding Lobbying and Debarment & Suspension*].

Willful provision of false information in this proposal and/or its supporting documents, or in reports required under an ensuing award, is a criminal offense (U.S. Code, Title 18, Section 1001).

NASA PROCEDURE FOR HANDLING PROPOSALS

This proposal shall be used and disclosed for evaluation purposes only, and a copy of this Government notice shall be applied to any reproduction or abstract thereof. Any authorized restrictive notices that the submitter places on this proposal shall also be strictly complied with. Disclosure of this proposal for any reason outside the Government evaluation purposes shall be made only to the extent authorized by the Government.

Principal Investigator Name: _____ Organization: _____ Department: _____ Mailing Address: _____ City, State Zip: _____ Telephone Number: _____ Fax Number: _____ Email Address: _____	Authorized Institutional Official Name: _____ Organization: _____ Department: _____ Address: _____ City State Zip: _____ Telephone Number: _____ Fax Number: _____ Email Address: _____
<div style="font-size: 100px; opacity: 0.5; font-family: cursive;">Sample</div>	
Principal Investigator Signature: _____ Date: _____	Authorized Institutional Official Signature: _____ Date: _____

Co-Investigator:				
Name	Telephone	Email	Institution	Address

Budget:	
Year	Budget
1	
2	

3	
Total	

APPENDIX H

Step 2 Proposal Budget Summary

For period from March 1, 2005 to _____ (Enter a date no later than February 28, 2008)

- Assume a March 1, 2005 project start date
- Projects may have up to a 3-year duration
- Due to an assumed March start-time, projects can span 3 or 4 Federal fiscal years
- Enter the proposed estimated costs in each column.
- Provide as attachments detailed computations of all estimates in each cost category with narratives as required to fully explain each proposed cost. See *Instructions for Budget Summary* on following page for details.

-OR-	Year 1 <i>FY05</i>	Year 2 <i>FY06</i>	Year 3 <i>FY07</i>	<i>FY08</i>	Total Total
1. Direct Labor (salaries, wages, and fringe benefits)	_____	_____	_____	_____	_____
2. Other Direct Costs:					
a. Subcontracts	_____	_____	_____	_____	_____
b. Consultants	_____	_____	_____	_____	_____
c. Equipment	_____	_____	_____	_____	_____
d. Supplies	_____	_____	_____	_____	_____
e. Travel	_____	_____	_____	_____	_____
f. Data Costs	_____	_____	_____	_____	_____
g. Other	_____	_____	_____	_____	_____
3. Facilities and Administrative Costs	_____	_____	_____	_____	_____
4. Other Applicable Costs:	_____	_____	_____	_____	_____
5. SUBTOTAL--Estimated Costs	_____	_____	_____	_____	_____
6. Less Proposed Cost Sharing (if any)	_____	_____	_____	_____	_____
7. Total NASA Cost	_____	_____	_____	_____	_____

Instructions for Step 2 Proposal Budget Summary

During the next several years, NASA must effectively and efficiently implement a variety of new Federal and Agency standards and initiatives to support long-term financial and resources management excellence. These standards include recent Federal standards related to managerial cost accounting (full costing). The NASA full cost concept and approach integrates full-cost accounting, budgeting, and management practices to enhance cost-effective mission performance by providing complete cost information for improved (more fully informed) decision making and management. The initiative introduces a concept that ties all Agency costs (including all Civil Service and other personnel costs) to major activities (programs and projects) and budgets, accounts, reports, and manage programs and projects from a full cost perspective.

Therefore, Step 2 proposals submitted to this CAN should report their full cost including all contributions on lines 1-5 of the required budget page. Every effort should be made to account for the full cost including contributed expenses (such as facilities, salaries, benefits etc.) by partner universities, agencies and NASA centers (i.e., civil service salaries, benefits, travel, and training), as these will be seen to strengthen the proposal's merits.

The portion of the full project cost contributed by the proposing institution or its partners should be explicitly specified on line 6, and detailed in the attached budget explanation. Thus, the actual funding requested from NASA in support of the proposal should be summarized on line 7.

Since partner contributions generally strengthen proposed projects and benefit NASA, the guidance on suggested proposal cost caps for this announcement applies to the NASA cost on line 7.

General Instruction

- Provide specific and complete data as requested below.
- When "Basis of Estimate" is requested, this means provide the details and methodology used to determine the estimate.
- Costs on the Budget Summary Sheet with no supporting rationale or basis of estimate will be considered incomplete, and proposal scores will reflect this lack of supporting information.
- If more than one institution is involved, provide a separate budget sheet for each institution, plus a summary budget sheet for the complete project.
- Cost data are **not** included in page count limitations.
- All costs, including those for developing prototypes and preparing benchmark reports, should be included in the budget request.

1. Direct Labor (salaries, wages, and fringe benefits).

Attachments should list the number and titles of personnel, amounts of time to be devoted to the cooperative agreement, and fully-burdened rates of pay. This item should include all labor costs, including those contributed by the proposing institution.

2. Other Direct Costs.

(a) **Subcontracts:** Attachments should describe the work to be subcontracted, estimated amount, recipient (if known), and the reason for subcontracting.

(b) **Consultants:** Identify consultants to be used, why they are necessary, the time they will spend on the project, and rates of pay.

(c) **Equipment:** List separately. Explain the need for items costing more than \$5,000. Describe basis for estimated cost. General purpose equipment is not allowable as a direct cost unless specifically approved by the NASA Grant Officer. Any general purpose equipment purchase requested to be made as a direct charge under this award must include the equipment description, how it will be used in the conduct of the basic research proposed and include a written certification that the equipment will be used exclusively for research activities.

(d) **Supplies:** Provide general categories of needed supplies, the method of acquisition, and the estimated cost.

(e) **Travel:** Describe the purpose of the proposed travel in relation to the award and provide the basis of estimate, including information on destination, and number of travelers.

(f) **Data:** Enter estimated cost of commercial data and public data sets. Include itemized list indicating type of data, from whom it will be purchased, quantity and cost.

(g) **Other:** Enter the total of direct costs not covered by 2a through 2e. Attach an itemized list explaining the need for each item and the basis for the estimate.

3. Facilities and Administrative (F&A) Costs.

Identify F&A cost rate(s) and base(s) as approved by the cognizant Federal agency, including the effective period of the rate. Provide the name, address, and telephone number of the Federal agency official having cognizance. If unapproved rates are used, explain why, and include the computational basis for the indirect expense pool and corresponding allocation base for each rate.

4. Other Applicable Costs. Enter total explaining the need for each item.

5. Subtotal-Estimated Costs. Enter the sum of items 1 through 4.

6. Less Proposed Cost Sharing (if any).

Enter any amount proposed. If cost sharing is based on specific cost items, identify each item and amount in an attachment. This item should include any contributions reported in items 1-5 that will be supported from sources other than this budget request.

7. Total NASA Cost. Enter the total after subtracting item 6 from item 5.

APPENDIX I

Assurance of Compliance with the NASA Regulations Pursuant to Nondiscrimination in Federally Assisted Programs

The (*Institution, corporation, firm, or other organization on whose behalf this assurance is signed, hereinafter called "Applicant "*) hereby agrees that it will comply with Title VI of the Civil Rights Act of 1964 (P.L. 88-352), Title IX of the Education Amendments of 1972 (20 U.S.C. 1680 et seq.), Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), and the Age Discrimination Act of 1975 (42 U.S.C. 16101 et seq.), and all requirements imposed by or pursuant to the Regulation of the National Aeronautics and Space Administration (14 CFR Part 1250) (hereinafter called "NASA") issued pursuant to these laws, to the end that in accordance with these laws and regulations, no person in the United States shall, on the basis of race, color, national origin, sex, handicapped condition, or age be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity for which the Applicant receives federal financial assistance from NASA; and hereby give assurance that it will immediately take any measure necessary to effectuate this agreement.

If any real property or structure thereon is provided or improved with the aid of federal financial assistance extended to the Applicant by NASA, this assurance shall obligate the Applicant, or in the case of any transfer of such property, any transferee, for the period during which the real property or structure is used for a purpose for which the federal financial assistance is extended or for another purpose involving the provision of similar services or benefits. If any personal property is so provided, this assurance shall obligate the Applicant for the period during which it retains ownership or possession of the property. In all other cases, this assurance shall obligate the Applicant for the period during which the federal financial assistance is extended to it by NASA.

This assurance is given in consideration of and for the purpose of obtaining any and all federal grants, loans, contracts, property, discounts, or other federal financial assistance extended after the date hereof to the Applicant by NASA, including installment payments after such date on account of applications for federal financial assistance which were approved before such date. The Applicant recognizes and agrees that such federal financial assistance will be extended in reliance on the representations and agreements made in this assurance, and that the United States shall have the right to seek judicial enforcement of this assurance. This assurance is binding on the Applicant, its successors, transferees, and assignees, and the person or persons whose signatures appear on the Proposal Cover Sheet above are authorized to sign on behalf of the Applicant.

NASA FORM 1206 JUN 2001 PREVIOUS EDITIONS ARE OBSOLETE

APPENDIX J

Certifications, Disclosures, And Assurances Regarding Lobbying And Debarment & Suspension

1. LOBBYING

As required by Section 1352, Title 31 of the U.S. Code, and implemented at 14 CFR Part 1271, as defined at 14 CFR Subparts 1271.110 and 1260.117, with each submission that initiates agency consideration of such applicant for award of a Federal contract, grant, or cooperative agreement exceeding \$ 100,000, the applicant must **certify** that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit a Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

2. GOVERNMENTWIDE DEBARMENT AND SUSPENSION

As required by Executive Order 12549, and implemented at 14 CFR 1260.510, for prospective participants in primary covered transactions, as defined at 14 CFR Subparts 1265.510 and 1260.117—

(1) The prospective primary participant **certifies** to the best of its knowledge and belief, that it and its principals:

(a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded by any Federal department or agency;

(b) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and

(d) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

(2) Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

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