

A.45 EARTH SCIENCE APPLICATIONS: SOCIOECONOMIC BENEFITS

NOTICE: Amended on December 7, 2015. This amendment presents the final text for this Program Element. Notices of Intent to propose are requested by January 22, 2016. Proposals are due March 24, 2016.

1. Overview

The NASA Earth Science Division Applied Sciences Program solicits proposals to develop, implement, and manage a program of activities for the articulation of socioeconomic benefits of Earth science applications.

Key objectives of this solicitation are to develop, advance, and exercise socioeconomic impact analysis techniques and methodologies applied to Earth observations and decision-support applications; expand case study examples and literature base; encourage cross-disciplinary awareness and collaboration; and build capacity in the Earth science community regarding socioeconomic impacts analysis and concepts. This solicitation includes innovative communications work as part of the activities and articulation of benefits.

The solicitation encompasses two elements: Impact Assessments and Community Outreach. Proposal teams may submit to one of the elements or to both elements. The Applied Sciences Program strongly encourages that proposals to this solicitation involve a multidisciplinary, multisectoral team of organizations as a consortium to achieve the objectives. NASA plans to pursue a Cooperative Agreement funding vehicle for this solicitation.

2. Program Information

2.1 Applied Sciences Program

The Applied Sciences Program (hereinafter, the Program) promotes efforts to discover and demonstrate innovative, practical, and beneficial uses of Earth observations. The Program supports applied science research and applications projects to enable near-term uses of Earth observations that inform organizations' decisions and resulting actions, that identify and promote societal benefits from Earth observations², and that build key capabilities in the Earth science community and broader workforce. The projects are carried out in partnership with private and public-sector organizations to achieve sustained uses of and sustained benefits from the Earth observations. For more information, visit the Applied Sciences Program website at <http://AppliedSciences.NASA.gov/>.

¹ Examples include Government agencies, companies, regional associations, international organizations, multinational financial institutions, philanthropic institutions, tribal organizations, not-for-profit organizations.

² The Program considers that Earth observations broadly include a range of products and capabilities, including Earth-observing satellite measurements (NASA, other U.S. agencies, foreign, and commercial), outputs and predictive capabilities from Earth science models, algorithms, visualizations, knowledge about the Earth system, and other geospatial products.

The Applied Sciences Program has three primary lines of business: Applications, Capacity Building, and Satellite Mission Planning. The Applications themes include four of the eight societal benefit areas (SBA) of the international Group on Earth Observations (GEO): Health (including Air Quality), Disasters, Ecological Forecasting, and Water Resources.³ In addition, there is a cross-cutting Wildfires theme and an initiative on Food Security. The Program includes the impacts from a changing climate within each of these topics.

The Capacity Building program improves the ability of individuals and institutions in the United States and abroad, especially in developing countries, to access and apply Earth observations. The program includes three components: [ARSET](#) training sessions for professionals; [DEVELOP](#) for workforce development and short-term applications projects; and [SERVIR](#) for applications in developing countries (joint with the United States Agency for International Development).

Note: This solicitation is for proposals addressing methods and capabilities specifically related to socioeconomic impacts assessments. Proposals that aim to conduct applications projects or fundamental Earth science research will be considered noncompliant. For such pursuits, the reader is referred to other ROSES-2015 Earth Science appendices.

2.2 Socioeconomic Benefits

National and international organizations are placing greater emphasis on the societal and economic benefits that can be derived from applications of Earth observations. The determination of the specific societal and economic impacts, especially quantitatively, can be challenging, yet these determinations are critical to the value proposition of Earth observations. For new knowledge and as a strategic pursuit, NASA's Earth Science Division (ESD) considers it important to substantiate the benefits of Earth science applications in socially and economically meaningful terms, and to communicate those benefits to audiences beyond the Earth science community. Having enabled many successful examples of Earth science applications, the Applied Sciences Program is pursuing this solicitation with these goals in mind.

Historically, it has been challenging to substantiate fully such benefits and to communicate them to a wide audience for a number of reasons, such as a lack of familiarity with socioeconomic terms and concepts within the Earth science community, few connections to experts in social and economic sciences, and limited opportunities for interdisciplinary collaborations on the topic. Yet, the audience for such valuations is potentially sizable and includes NASA stakeholders, Government officials, private companies, non-Governmental organizations, the public, and the Earth science community itself. Overall, it is strategically important for the Earth science community to build skills, networks, examples, and capabilities to determine and document socioeconomic benefits from the use of Earth science in informing organizations' analyses, decisions, and actions.

³ The eight GEO SBAs are: Agriculture, Ecosystems/Biodiversity, Disasters, Energy/Minerals, Health, Infrastructure/Transportation, Urban Development, and Water Resources.

There are some articles on the value of Earth science data in the wide scholarly literature, yet the number is limited; the number of case studies and methodological examples across the range of societal benefit areas is equally limited. There have been some recent advances that have improved the understanding of the economic value of information, resources, health, and ecosystems, among others. Tools and techniques for ascribing value to such public goods and services are advancing, providing potential means to complement and solidify the link between Earth observations and economic and societal value.

The Applied Sciences Program has sought to advance socioeconomic assessments of Earth science, both to expand knowledge and to induce broader interest in Earth observations applications. Since 2010, the Program has sponsored a series of annual workshops, supported a limited number of project impact assessments, and developed a primer entitled [*Measuring Socioeconomic Impacts of Earth Observations*](#)⁴ for the Earth science community. However, these efforts have largely been *ad hoc* and incremental. The Program is now interested in a more formal, deliberate, and comprehensive approach to advance socioeconomic impact valuation.

3. Solicitation Information

This section provides information on the intent of this solicitation. Section 3.1 describes the purpose and objectives. Section 3.2 conveys the two elements of the solicitation. Section 3.3 describes the scope of the solicitation. Section 3.4 provides suggestions for proposal teams to consider in preparing a proposal.

3.1 Purpose

NASA solicits proposals for a program of activities for the articulation of socioeconomic impacts of Earth science applications. The program of activities encompasses two major elements: Impact Assessments and Community Outreach. Applied Sciences will select 1-2 proposals to lead, develop, implement, and manage the program and its two elements. As described below, proposers can propose to focus on one element or both elements. Applied Sciences expects a considerable level of postaward interaction and cooperation with the awardee(s), and thus it plans to pursue a cooperative agreement as the award instrument.

Overall, Applied Sciences seeks to advance the state of practice in socioeconomic impact assessments, with a particular emphasis on quantitative analysis of the use of Earth observations in management, business, and policy decisions and activities. The Program seeks to increase capabilities to produce high-quality impact assessments, which can demonstrate the benefits of Earth science and observations and can induce greater use and uptake of Earth science applications.

Key objectives to achieve through the program of activities include:

- Advances and refinements in assessment methodologies and analytic techniques, addressing any unique aspects of Earth science data and applications;

⁴ Primer is available at: <http://appliedsciences.nasa.gov/system/files/docs/SocioeconomicImpacts.pdf>

- Advances in knowledge and body of literature on impact assessments concerning the explicit use of Earth observations in decision support;
- Greater number of applications of assessment methodologies across themes, sectors, decision types, and other meaningful factors;
- Greater effectiveness and use of impact assessments for Earth observations and geospatial information;
- Advances in familiarity, skills, and capacity within the Earth science community with socioeconomic impacts analysis, concepts, and methods;
- Greater awareness about Earth science data and information within the social, economic, and decision sciences communities;
- Improved networking across and substantive collaborations between the Earth science community and the social, economic, and decision sciences communities;
- Advances in communications approaches and innovation for the expression of Earth science impacts.

As a result of this solicitation, NASA and the Earth science community hope to better articulate the import of, and return on investment from, NASA Earth science. Successful activities can expand the depth and breadth of understanding of the value of Earth science applications within the broader space community, public and private sectors, and the public at large.

3.2 Solicitation Elements

The solicitation encompasses two elements: Impact Assessments and Community Outreach.

- **Impact Assessments**
This element includes advancing impact assessment methodologies and analytic techniques as well as exercising existing ones, especially to determine which are most effective for particular themes, types of decisions, audiences, etc. This element also includes the refinement of current methods and the development of new methods and analytic techniques, if appropriate. Proposals can involve methods across the spectrum from traditional approaches to innovative, nontraditional ones. Envisioned activities include collaborations between the Earth science community and social, economic, and decision science communities as well as innovative approaches to communicate impacts. Overall, this element should increase the quality, quantity, and breadth of Earth observations impact analyses and examples, helping advance knowledge and build the body of literature.
- **Community Outreach**
This element addresses engagement with the Earth science community to build awareness, capacity, and familiarity with impact assessments terms, concepts, methods, and analytic techniques. Proposals can include engagement and capacity building approaches from traditional to innovative, nontraditional, and experimental ones. This element addresses engagement with the social, economic, and decision sciences communities about Earth science data, capabilities, applications, and assets. This element involves creating connections and enabling networking between the Earth science community and the social, economic, and decision science communities as well as innovative approaches to communicate impacts and build awareness. Overall, this element should increase the

knowledge within the Earth science community about socioeconomic impact assessments and about potential people and organizations with whom they can consult and collaborate.

Proposals must identify which element(s) is the focus of their activity. Teams may propose to focus on one of the elements or on both. Teams interested in both elements may submit either one proposal encompassing both elements, or a separate proposal for each element. See Section 5.4 for information on proposal content and page limits.

3.3 Scope

This section describes items that are encompassed in the general scope of the solicitation as well as items that are specific to each element.

The scope includes the assessment of value and benefits at microeconomic and macroeconomic scales. The Program strongly prefers and encourages a greater focus on the former. The emphasis of the solicitation is on quantitative assessment and analysis, although this does not necessarily imply monetization of impacts. Nonmarket valuation is allowed.

The activities involve work with the Earth science community, work with communities external to Earth science (e.g., decision science, economics, social science), and cross-disciplinary work spanning the communities.⁵ Both elements involve networking between the Earth science and other communities, including connections on both practitioner and scholarly pursuits.

There is a rich array of decision types (and resultant actions) that Earth observations can support, such as planning, early warnings, and resource allocation, among many others. The solicitation encompasses the full range of decision types. Proposal teams may wish to present a framework by which they propose to conduct their activities across the range of decision types.

The adoption of new data, information, and techniques by organizations and decision makers can be affected by their sense of the value and benefits. Thus, the scope involves efforts to understand organizational contexts and issues that affect the willingness to accept impact analyses and socioeconomic valuations. Relatedly, it includes efforts to understand the kinds of methods, analytic techniques, approaches to communicate results that are most accepted by particular types of organizations. This information can help ESD and the Applied Sciences Program design activities and interventions to lower organizational barriers to consider, adopt, and use Earth observations.

The Program is interested in assessing and tracking advances in knowledge of and capacity with socioeconomic impacts terms, concepts and techniques. The scope includes the development, testing, application, and refinement of indicators to evaluate and communicate progress toward the objectives through the proposed program of activities.

⁵ While both elements involve this work, the nature of the specific work will likely be different for each element.

3.3.1 Impact Assessments

In the application of methodologies and analytic techniques, there may be issues associated with unique aspects of Earth science data and applications that warrant special attention. These issues may need to be addressed to better understand the economic and societal impacts of Earth observations and geospatial information. The scope includes the identification of and attention to issues presented by satellite data in the context of the methods; the scope includes efforts to determine the kinds of information that are most important to assess the impacts of particular methods.

Substantial impact assessment work has already been performed on weather applications and use of meteorological observations. The scope of this solicitation includes broad types of Earth observations, and the scope and intent are purposefully broader than weather applications. For the purposes of this solicitation, while weather applications and meteorological observations can be included, a proposal that is solely or primarily focused on these will be downgraded.

3.3.2 Community Outreach

Significant effort will likely be required to engage the Earth science community in building familiarity and capacity with impact assessments, terms, concepts, and methods. The Earth science community is broad and contains numerous disciplines, all of which are included in the solicitation's scope. Proposal teams may choose to focus on specific disciplines at different stages of their project. NASA encourages teams to present a framework by which they propose to conduct their engagement and develop awareness, capacity, and familiarity across the broad community.

Social scientists, decision scientists, and the communities involved with economic valuation activities on the environment, natural resources, health, disasters, and other topics may have low or limited awareness of the Earth science community, including Earth system science, concepts, observations, data and information products, modeling capabilities, etc. Significant effort is expected to engage (or enable engagement) with highly relevant portions of the social sciences community, such as economic and decision sciences, and other relevant communities about Earth science. As part of the overall engagement and networking, the scope includes efforts to inform them about Earth science capabilities, contacts, and assets for their ongoing endeavors.

3.4 Specific Suggestions and Considerations

Proposals to this solicitation should involve a multidisciplinary, multisectoral team of organizations in a consortium arrangement to achieve the desired objectives. The Program encourages a consortium as a way to have a breadth of experience and the flexibility and agility to respond to needs as the work unfolds; such an arrangement will require an effective management structure. The solicitation allows for private sector entities to be involved in a consortium and/or to submit proposals.

Applied Sciences is interested in showcasing the value and benefits across the range of Earth satellite missions and observations. While the Program recognizes that some missions and

observations are used more than others in applications, the Program strongly encourages that proposed work show breadth in the satellite missions and observations covered. Teams can consider impacts from data products from non-NASA satellites, including foreign satellites, if used in conjunction with some NASA observations, models, or capabilities.

Applied Sciences recognizes that the scope of this solicitation includes multiple aspects. The Program suggests that teams offer, where appropriate, a conceptual framework(s) that outlines the intended foci, dimensionality, or stages of their proposed work. If offered, proposals should articulate the rationale underlying the framework(s).

The Program encourages involvement with personnel knowledgeable about NASA Earth science, data, and disciplines during proposal development and throughout the project itself. However, people in leadership roles with the Applied Sciences Program at NASA Centers should not be part of a proposal submission⁶.

The solicitation includes communications work as part of the activities and articulation of benefits. For both elements of the solicitation, the Program encourages teams to consider innovative and creative methods, visualizations, scenarios, graphic design, and other approaches as part of their efforts to convey value, impacts, concepts, methods, or techniques.

It is important for the awardee(s) to interact with NASA Earth mission science teams⁷. The Program expects proposers to plan to attend and participate in at least two mission science team meetings per year, and proposal teams should budget accordingly.

As a standard practice, Applied Sciences Program personnel participate in conferences that practitioners and end users attend, which supports two-way dialogue. The Program expects the awardee(s) to follow similar practices, especially to learn which valuation metrics resonate with particular applications communities and their types of decisions. Similar practices could occur with community meetings related to social, economic, and decision sciences. The Program expects proposers to plan to attend and participate in at least two community meetings per year, and proposal teams should budget accordingly.

The awardee(s) will be expected to produce annual work plans. The Program expects significant coordination through teleconferences and virtual means. The Program expects at least one in-person meeting with the awardee(s) each fiscal year to discuss progress and plans. Proposal teams should budget for one trip for its primary personnel to the Washington, DC area per year.⁸ See also Section 5.5 for reporting information.

⁶ The Applied Sciences Program has an Applied Remote Sensing Training project, ARSET. Proposal teams can consult with ARSET and can include activities that align with, make use of, or supplement that project. However, the ARSET project and staff should not be part of a proposal submission.

⁷ These are competitively-selected teams associated with Earth science missions, sensors, or measurements. Examples include the Aura Science Team, MODIS Science Team, and Sea Surface Temperature Science Team.

⁸ In reality, this meeting may occur in conjunction with other events and conferences. For budget purposes, teams should plan for one such meeting.

There are professional organizations and associations focused on decision sciences and economic topics which may be beneficial to proposal teams. The Program suggests that proposal teams (and awardee(s)) consider them in the context of this solicitation, in areas such as partnering, networking and brokering. Examples include but are not limited to:

- Association of Environmental Resource Economists, <http://aere.org/>
- Decision Science Institute, <http://www.decisionsciences.org/>
- American Evaluators Association, <http://www.eval.org/>
- World Bank Institute, <http://wbi.worldbank.org/wbi/>
- American Geophysical Union Societal Impacts and Policy Sciences Focus Group, <http://sites.agu.org/leadership/sections-focus-groups/sips/>

3.4.1 Community Outreach

In the Earth science community, baseline knowledge of and skill with socioeconomic terms and impact assessment methodologies is limited. Applied Sciences encourages proposal teams to consider producing a range of introductory materials for this audience, such as briefings, case study examples, and tutorials. The Program suggests that proposal teams consider publishing articles on the state of practice and review of the literature near the beginning and the end of their work.

Applied Sciences suggests that proposal teams consider both physical and virtual means of community outreach. Innovative, experimental approaches are encouraged along with traditional approaches to engagement. Proposals may include capability-building activities, such as summer schools and community workshops, among others. The Program encourages proposal teams to include skilled, professional communications experts as part of their team and consortium.

4. Solicitation Information

Maximum Period of Performance	5 years
Type of Award	Cooperative Agreement
Expected Project Start Date	August 1, 2016
Total Amount of NASA Funding (FY16-20)	\$3.5M total
Anticipated Number of Awards	1-2 awards
Expected Level of Awards	\$700K per year total Impact Assessments: \$400K-500K Community Outreach: \$200K-300K
Contributions from Other Organizations	See Sections 5.3 and 5.5. Note: Contributed funding is in addition to NASA funding; it does not count toward funding level guidelines.

5. Amendments and Clarifications to the *Summary of Solicitation*

The following information provides clarifications of or amendments to the *Summary of Solicitation* of this NRA. The information below supersedes direction provided in the respective sections of the *Summary of Solicitation*. Potential participants in projects involving private sector

organizations and/or proprietary products and services are strongly encouraged to read the definition of cooperative agreement in Section D.1.2 of the [Guidebook for Proposers](#) and NASA guidelines on cooperative agreements in the [Grant and Cooperative Agreement Manual](#).

5.1 Funding and Award Policies: Changes to Section II(a) of the *Summary of Solicitation*

The Applied Sciences Program plans to pursue a cooperative agreement funding instrument, given the substantial level of interaction and cooperation expected to achieve the desired objectives. As such, a proposal should describe the relationship it envisions with NASA.

The Program may augment the award(s) for certain activities based on results of coordination and interaction in the cooperative agreement.

5.2 Award Period of Performance: Changes to Section II(b) of the *Summary of Solicitation*

The total period of performance is five years. In accordance with the *NASA Guidebook for Proposers* and *NASA Grants and Cooperative Agreement Handbook*, the Program will conduct a full peer evaluation of all awards after the first three years in order to qualify for continued funding.

5.3 Cost Sharing: Changes to Section III(d) of the *Summary of Solicitation*

Cost sharing, contributions from proposing institutions, and external resource contributions to a venture are encouraged, though not required nor part of the evaluation criteria (see Section 5.5). The Program accepts explicit financial contributions and in-kind contributions during the course of the venture as cost sharing. Relevant past work, prior results, or previous support and accomplishments may be described, but the Program does not consider these as cost sharing or in-kind contributions for proposals to this solicitation. Ventures involving commercial organizations are encouraged to read [Section D, §1274.204, "Costs and Payments"](#) of the NASA grant and cooperative agreement manual.

5.4 Proposal Format and Contents: Changes to Section IV(b)(ii) of the *Summary of Solicitation*

Proposals should provide sufficient detail to allow reviewers to assess the viability and potential success. Section 2.3 of the *NASA Guidebook for Proposers* provides information on the proposal content. The following items modify Section 2.3.

In the proposal summary, teams should identify which element(s) – Impact Assessments and/or Community Outreach – the proposal addresses. Overall, teams should tailor the information in their proposal to that element(s).

5.4.1 Scientific-Technical-Management

For Section 2.3.5, proposals should include the following additional items in the content for the Scientific/Technical/Management section:

- Characterization of the current state of practice;

- Comprehension of the topic and how the proposed work will augment the current state;
- A program of activities and how it relates to the purpose, objectives, and scope in Section 3;
- Description of the breadth, depth, or focus of the program of activities, including any framework(s) offered;
- The mechanisms and approaches to be used to conduct the program of activities;
- Description of the consortium and how the consortium will address the proposed work; description of the consortium's expertise across Earth science, social/economic/decisions sciences, engagement activities, communications, and other key topics and factors described within;
- Descriptions of the challenges and risks affecting success of the venture, and the approaches to address the challenges and risks.

For proposals to one element of the solicitation, the page limit for this Scientific-Technical-Management section is 15 pages. For proposals to both elements of the solicitation, the page limit for this section is 22 pages. NASA encourages proposal teams to be succinct.

In addition, proposals should have the following discrete subsections in the Scientific-Technical-Management section⁹:

Indicators

This subsection describes the indicators and/or indicator framework proposed to assess and communicate progress toward the objectives.

Anticipated Results/Improvements

This subsection describes the expected outputs, results, and outcomes from the program of activities and proposed work offered in the proposal. The subsection can include metrics for performance.

Consortium Management

This subsection describes the approach used to manage the proposed work and program of activities. Topics might include consortium structure, management arrangements, roles and responsibilities, governance, and other aspects describing how the proposal team plans to organize, coordinate, conduct, review, and adjust its work.

5.4.2 Schedule and Milestones

Proposals should include and describe a schedule for the proposed work and program of activities, including milestones for key elements in the proposed program. The page limit for this section is two pages.

5.4.3 Letters of Reference

As a modification to Section 2.3.9 of the *NASA Guidebook for Proposers*, proposals may, in addition to guidelines in that section, include up to four, one-page letters of reference from

⁹ There are no guidelines for page limits for these subsections; proposal teams can determine the space to allocate to these within the page totals for the Scientific/Technical/Management section.

organizations about the proposal team or about the writer's interest in the results. The letters may include input from the community and beneficiaries served by the organizations. All statements or letters must be delivered to the Principal Investigator (PI) and included in the proposal. Letters sent to NASA Applied Sciences (or delivered after the deadline) will not be considered in the review process.

5.5 Evaluation Criteria: Factors for Section VI(a) of the Summary of Solicitation and Section C.2 of the NASA Guidebook for Proposers

In addition to the Key objectives given in Section 3.1, the evaluation criterion "relevance" specifically includes the following factors:

- Intent, scope, and plan to advance the articulation of the value and benefits of Earth observations and their application in decision making and associated actions;
- Intent, scope, and plan to include an array of Earth observations, themes, and decision types;
- Intent, scope, and plan to advance cross-disciplinary connections and collaborations;
- Impact Assessment element: Intent, scope, and plan to advance impact assessments, methodologies, and analytic techniques (especially quantitative ones);
- Community Outreach element: Intent, scope, and plan to build Earth science community awareness, capacity, and familiarity with impact analysis concepts and techniques.

In addition to the factors given in the *NASA Guidebook for Proposers*, the evaluation criterion "intrinsic merit" specifically includes the following factors:

- Likelihood for potential, demonstrable impact to the state of practice and community capabilities;
- Quality, creativity, and adequacy of the proposed work and the program of activities;
- Quality and adequacy of proposed approaches and mechanisms to conduct the program of activities;
- Quality and adequacy of the proposed breadth, depth, or focus of the program of activities;
- Quality and adequacy of consortium expertise, structure, and arrangements.

In addition to the factors given in the *NASA Guidebook for Proposers*, the evaluation criterion "cost realism and reasonableness" specifically includes the following factors:

- Overall approach to manage the project and to achieve stated objectives, and
- Appropriate level of effort to meet the offered objectives cost-effectively.

Cost-sharing and external resource contributions to a consortium are not part of the evaluation criteria and are not included in the peer review scores. However, at the time of project selection, NASA may consider these contributions as one of the factors when deciding between proposals of otherwise equal merit.

NASA may use separate peer review panels for the two elements of the solicitation. NASA will assign proposals to a panel based on the element specified by the proposing team and NASA's assessment of the proposal content. For proposals encompassing both elements, NASA may

assign such proposals to both panels or hold a separate panel. While NASA expects to select a proposal in each element, NASA reserves the right to select proposals in none, one, or both elements depending on the nature and distribution of proposals received and the outcome of the peer review process. NASA will notify all proposers of the outcome of the evaluation process.

5.6 Award Reporting Requirements: Changes to Section VII(c) of *the Summary of Solicitation*

If a team of organizations or subcontractors exist, consolidated project reports, including financial records, must be submitted and are the responsibility of the lead organization. The proposed budget should provide for these reporting requirements.

The awardee(s) will be responsible for timely maintenance (via an online system) of information, status updates, highlights, and milestone achievements. NASA will coordinate with the PI at the time of the award to provide the necessary information for the online system.

During award negotiation, NASA representatives will discuss methods, including electronic reporting, to transmit the reports and presentation packages. The NASA Shared Services Center (NSSC) will also solicit and archive the annual progress reports and final report.

The following reports are required of the awardee(s). The specific reporting requirements will be laid out in the cooperative agreement.

- **Quarterly Summary**

The awardee(s) will produce brief written reports on a quarterly basis. These brief reports should provide a summary of activities from the past quarter; key highlights and achievements; progress or adjustments to milestones; major activities, events, and milestones in the next two quarters; and issues, problems, risks, and plans of action to address them. Key members of the team may have a quarterly telecon with an Applied Sciences Program representative to discuss the quarterly report and any actions to be taken.

- **Annual Progress Report**

The awardee(s) will produce an annual written summary of its activities, using information from the quarterly summaries and additional materials to highlight achievements for the year and changes in plans. The Applied Sciences Program will post a version on its website and will incorporate information into its own Annual Report. (Note: This item satisfies the requirement for Annual Progress Reports in Appendix D of the *Guidebook for Proposers*) The Program may request a virtual presentation of the annual summary.

- **NASA Outreach and Inreach**

Periodically, the Applied Sciences Program and Earth Science Division request information about projects, achievements, and key events to support communications and outreach both internal and external to NASA. The awardee(s) is expected to support such requests and should budget for these accordingly.

- Engagement Materials and Publications (Community Outreach)

As the scope includes significant engagement, capacity building, and communications activities, these activities may require and involve specialized materials, examples, briefings, articles, and other items. The team is expected to produce articles for popular, grey, or scholarly/refereed/peer literature. By the end of each calendar year, the team will provide an annotated timeline of activities, a set of materials, and a compiled list of publications directly associated with the award from the prior year.

- Literature Review and Publications (Impact Assessment)

On a semiannual basis, the awardee(s) will produce an annotated bibliography of all relevant publications (scholarly, grey, popular literature) from the previous half year.

The team is expected to produce articles for scholarly, grey, and popular literature. By the end of each calendar year, the team will provide a compiled list of the publications directly associated with the award from the prior year.

- Applied Sciences Program Reviews

Applied Sciences conducts program-wide reviews six times a year to review status, progress, achievements, and financial situations within the applications areas, capacity building, and selected projects. The awardee(s) is expected to provide information on request to support the program reviews where this venture is covered, which is planned to occur twice a year. If desired, a representative from the team can participate (physically or virtually) in the program reviews.

- Annual Results Event

Awardee representative(s) should plan to travel and participate in one Program-sponsored results workshop/conference per year. The Applied Sciences Program will coordinate this activity with the awardee(s) during the course of the project; the proposal teams should budget accordingly to attend these annual events. (While the location will likely rotate, teams can use Washington, D.C., as a domestic location for budgetary purposes.)

- Final Report

The Final Report summarizes the overall activities of the award, including achievements, progress, impacts, smart practices, findings and conclusions, remaining issues to address, and other information to provide an appropriate documentation of the award. The report should also explain any variations in the anticipated results and a discussion of major problems (technical or other). The report should describe the state-of-practice at the end of the venture, and it should include lessons learned and recommendations. (Note: This final report, with the additions mentioned, is the same item referred to in Appendix D of the Guidebook for proposers) The Program may request a presentation of the report, findings, recommendations, and achievements.

6. Summary of Key Information

Expected program budget	See Section 4
Number of new awards pending adequate proposals of merit	1-2

Maximum duration of awards	5 years (3 years plus 2-year extension option)
Due date for Notice of Intent to propose (NOI)	January 22, 2016.
Due date for proposals	March 24, 2016.
Planning date for start of investigation	August 1, 2016
Page limit for the central Science-Technical-Management section of proposal	15-22 pp; see Section 5.4 of this document
Relevance to NASA	This program is relevant to the Earth science questions and goals in the NASA Science Plan. Proposals that are relevant to this program are, by definition, relevant to NASA.
General information and overview of this solicitation	See the <i>ROSES Summary of Solicitation</i> .
Detailed instructions for the preparation and submission of proposals	See the <i>NASA Guidebook for Proposers</i> at http://www.hq.nasa.gov/office/procurement/nraguidebook/ .
Submission medium	Electronic proposal submission is required; no hard copy is required or permitted. See Section IV of the <i>ROSES Summary of Solicitation</i> and Chapter 3 of the <i>NASA Guidebook for Proposers</i> .
Web site for submission of proposal via NSPIRES	http://nspires.nasaprs.com/ (help desk available at nspires-help@nasaprs.com or (202) 479-9376)
Web site for submission of proposal via Grants.gov	http://grants.gov/ (help desk available at support@grants.gov or (800) 518-4726)
Funding opportunity number for downloading an application package from Grants.gov	NNH15ZDA001N-SEB
NASA point of contact concerning this activity	Lawrence Friedl Applied Sciences Program Earth Science Division Science Mission Directorate NASA Headquarters Washington, DC 20546-0001 Telephone: (202) 358-7200 E-mail: kathryn.a.carroll@nasa.gov Submit all e-mail inquiries with "ROSES SEB Inquiry" in the subject line and cc LFriedl@nasa.gov .