

A.50 GROUP ON EARTH OBSERVATIONS WORK PROGRAMME

NOTICE: November 29, 2016. This amendment adds a new opportunity, in program element A.50, which had not previously been in ROSES-2016. Notices of Intent to propose are requested by January 6, 2017, and proposals are due February 28, 2017.

Overview

The NASA Earth Science Division (ESD) solicits proposals to advance specific elements of the Group on Earth Observations (GEO) Work Programme 2017-2019. NASA is especially interested in involving non-Federal domestic organizations in contributing to and achieving progress on the GEO Work Programme. The ESD Applied Sciences Program manages this call for proposals and the awards.

Work through this call for proposals includes projects, studies, workshops, trainings, and other activities, and it involves innovative communications work. For each particular GEO Work Programme element (see Section 3), there are other organizations around the world also involved with the element, and awardees will be expected to communicate and coordinate effectively with them.

Section 1 provides background information. Section 2 describes the purpose, objectives, and scope. Section 3 articulates the eligible GEO Work Programme elements. Section 4 describes available funding. Section 5 describes proposal content, review criteria, and reporting requirements. Section 6 provides a summary table of information.

1. Background Information

1.1 NASA Earth Science and Applied Sciences Program

Using the global vantage point of space, the Earth Science Division builds fundamental knowledge of how Earth works and how it is changing. ESD advances understanding of the planet as an integrated system and develops and tests applications that deliver direct societal benefit. ESD is organized around four programmatic areas: flight, research, applied sciences, and technology. Together these areas include programs and projects that are responsible for: conducting and sponsoring research to advance scientific understanding of Earth as a system, collecting and disseminating new observations, developing new technologies and computational models, and developing applications of Earth science observations.

The ESD 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 uses of Earth observations that inform organizations' decisions and resulting actions that identify and promote societal

benefits from Earth observations¹ 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 measurable and sustained uses of and benefits from the Earth observations. The Applied Sciences Program has three primary lines of business: Applications, Capacity Building, and Satellite Mission Planning. For more information, visit the Applied Sciences Program website at <http://AppliedSciences.NASA.gov/>.

1.2 Group on Earth Observations

The Group on Earth Observations (GEO) is an intergovernmental organization working to improve the availability, access, and use of Earth observations to inform decisions and benefit society. GEO organizes efforts to coordinate observations from thousands of ground, airborne, in situ, and space-based instruments, and GEO is a strong proponent for full and open data.

GEO is comprised of Member Countries (i.e., national governments) and Participating Organizations (PO), which are international and regional organizations with a mandate in Earth observation or related activities. GEO has over 100 Members and over 100 POs. The GEO Secretariat is located in Geneva, Switzerland, and provides oversight, coordination, and administrative functions. NASA is a significant contributor to GEO both through the United States as a GEO Member Country and through involvement in POs, especially the Committee on Earth Observation Satellites (CEOS).

GEO engages with user communities and acts as a broker, connecting users, data providers, engineers, scientists and other relevant experts to create innovative solutions to global challenges that transcend both national and disciplinary boundaries. This role involves engagement with and understanding of communities in both developed and developing countries. The ultimate goal is to help create the innovative products, tools, and services required to produce the actionable information necessary to address critical global and regional challenges and opportunities.

GEO works across eight Societal Benefit Areas (SBA), including: Biodiversity and Ecosystem Sustainability; Disaster Resilience; Energy and Mineral Resources Management; Food Security and Sustainable Agriculture; Infrastructure and Transport Management; Public Health Surveillance; Sustainable Urban Development; and Water Resources Management. Notably, weather and climate are viewed as cross-cutting phenomena touching each and all of the SBAs.

More information about GEO is available at: <http://earthobservations.org>.

1.3 GEO Work Programme

GEO maintains a Work Programme, which articulates the activities that the GEO community commits to perform. Activities range from substantial global efforts with large stakeholder communities to single-focus activities in small groups. The GEO Work Programme includes 67 elements across four implementation categories: Community Activities, Initiatives, Flagships,

¹ Earth observations broadly includes 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.

and Foundational Tasks. Community Activities develop concepts and allow bottom-up efforts. Initiatives demonstrate and mature services and they have broad coordination and contributions. Flagships are based on a policy-relevant mandate, and they develop and implement near-operational services and are fully resourced. Foundational Tasks provide important support functions and enabling purposes. GEO Members and POs primarily manage the Community Activities, Initiatives, and Flagships; the GEO Secretariat primarily manages the Foundational Tasks. For the purposes of this call for proposals, NASA is using the GEO 2017-2019 Work Programme as the current version; it is available via the GEO website and under “Other Documents” on the NSPIRES webpage for this ROSES appendix.

1.4 United States Group on Earth Observations

The U.S. Group on Earth Observations (USGEO) is a Subcommittee of the Committee on Environment, Natural Resources, and Sustainability of the National Science and Technology Council. USGEO is comprised of thirteen Federal departments and agencies.² USGEO serves to coordinate, plan, and assess Federal Earth observation activities in cooperation with domestic stakeholders; foster improved Earth system data management and interoperability throughout the Federal Government; and engage international stakeholders by formulating the U.S. position for, and coordinating U.S. participation in GEO.

2. Purpose, Objectives, and Scope

2.1 Purpose and Objectives

NASA solicits proposals to support and advance specific elements of the GEO Work Programme 2017-2019. ESD, especially the Applied Sciences Program, has supported ad hoc projects and internal NASA activities related to past GEO Work Programmes. These past projects and activities have demonstrated a strong ability to support and advance GEO, to further U.S. and NASA interests, and to demonstrate U.S. and NASA commitments to GEO. The ESD Applied Sciences Program created this call for proposals to foster broader domestic involvement in a U.S. national approach to GEO and the Work Programme.

Key objectives include:

- Achieve demonstrable progress, results, and accomplishments in specific elements of the GEO Work Programme;
- Advance use of Earth observations to inform decisions and actions;
- Advance and broaden domestic involvement in the U.S. national support to GEO and the GEO Work Programme;
- Increase the uptake of Earth observations to inform decisions and actions and broaden the organizations routinely using them;
- Increase international collaboration and partnering across GEO and broaden the GEO community;

² Departments and agencies represented on USGEO include: Agriculture, Commerce, Defense, Energy, Homeland Security, Interior, State, Transportation, Environmental Protection Agency, NASA, National Science Foundation, Smithsonian Institution, and U.S. Agency for International Development.

- Advance communication of the benefits of Earth science and observations.

As a result of the awards from this call, NASA seeks to increase GEO's achievements, to enable greater uses of Earth observations, and to better articulate the import of, and return on investment from, Earth observations. Successful endeavors can expand the depth and breadth of understanding of the value of Earth observations with the private sector, civil society, academia, public sector, and the public at large.

Note: This call is for proposals addressing specific elements of the GEO Work Programme. Proposals that aim to conduct fundamental Earth science research or applications outside of the GEO Work Programme will be considered noncompliant. For such pursuits, the reader is referred to other ROSES-2016 Earth Science appendices or upcoming ROSES.

2.2 Scope

The GEO Work Programme includes a summary description of each element, such as the purpose, objectives, activities, and future plans. The scope includes work to advance the elements, and the specific type of work (e.g., projects, studies, workshops) depends on the element and NASA interests; Section 3 articulates the GEO Work Programme elements eligible for this call for proposals.

Numerous organizations globally may be involved in a GEO Work Programme element.³ Awardees are expected to coordinate effectively and proactively with other organizations working on the element; proposal teams should describe how they will conduct their proposed work in coordination with them⁴. The work may be international in nature, so some foreign travel is likely required; proposal teams are expected to budget for travel accordingly. The scope allows for engagement and work with intermediary organizations (aka, boundary organizations), if appropriate to the particular element. In addition, the GEO community makes updates to the Work Programme annually, and the scope includes efforts to update and refine the element.

The scope includes the identification of possible data products (or refinements) that would advance the use of Earth observations by communities associated with the GEO Work Programme element and other communities. The scope includes applications development and applied research, if appropriate to the element; basic research is outside the scope of this call.⁵ Proposers can include web services, application program interfaces, and other means to encourage broader discovery, access, and use of Earth observations.

NASA Earth Science is interested in showcasing the value and benefits of Earth observations across the range of Earth satellite missions and observation types. While the Program recognizes

³ In developing a proposal for a specific GEO Work Programme element, NASA encourages proposal teams to consult with organizations (domestic or foreign) that are already involved with the element.

⁴ Proposers are encouraged to coordinate as much as possible; however, not all of the proposed work for an element will necessarily require coordination and partnership. Proposers should articulate the work that will and will not be conducted in coordination with other organizations working on the element.

⁵ During an award, awardees may identify basic research questions that arise, and awardees can either convey them to ESD and/or pursue the questions through other ROSES calls.

that some missions and observations are used more than others in applications, the Program 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 non-U.S. and commercial satellites, if used in conjunction with some NASA observations, models, or capabilities.

The call for proposals includes efforts to examine experimental approaches, both technical and programmatic, to enable the objectives of the GEO Work Programme element. Experimentation with programmatic approaches (e.g, crowd sourcing, challenges) is strongly encouraged and expected. Proposal teams should offer some approaches in their proposal as examples.⁶

The scope includes significant external communications and outreach. NASA encourages teams to consider innovative and creative methods, graphic design, and other approaches as part of their efforts to convey and showcase progress, accomplishments, and benefits. NASA suggests that proposal teams consider both physical and virtual means of communications, including a social media presence if appropriate.

3. GEO Work Programme Elements

Applicants may propose to any of the elements listed below; there should be a primary focus on one element. Proposal teams interested in more than one element should submit a separate proposal for each element.⁷ Element descriptions are paraphrased below, and the GEO Work Programme has a full description of each. Some elements have an implementation plan, which, if existent, are available via the GEO website.

All proposals are encouraged to incorporate aspects of relevant United Nations Sustainable Development Goals (aka, *Agenda 2030*), and teams should expect to engage national statistical offices, line ministries, or other appropriate entities in the respective countries where the proposed work is focused.

The elements below are listed in alphabetical order. All of the elements are of equal interest and importance; the amount of text for each does not imply any relative interest, importance, or priority.

3.1 AmeriGEOSS

This GEO Initiative promotes collaboration and coordination among GEO members of the Americas.⁸ It focuses on four GEO SBAs: Food security and sustainable agriculture, Disaster resilience, Water resources management, and Biodiversity and ecosystem sustainability. It also

⁶ Awardees will not be limited to pursue only the example approaches offered in the proposal; they are primarily illustrative for purposes of the panel review.

⁷ A proposal with a primary focus on one element may have alignments with other elements in Section 3; this alignment doesn't necessitate a separate proposal. Separate proposals are needed for when the primary focus is on different elements.

⁸ Americas Caucus includes: Argentina, Bahamas, Belize, Brazil, Canada, Chile, Colombia, Costa Rica, Ecuador, Honduras, Mexico, Panama, Paraguay, Peru, U.S., and Uruguay; and observers Guatemala and Bolivia.

addresses foundational tasks, such as capacity building and data infrastructure. Through this initiative, GEO and others are joining to apply space-based and in-situ Earth observations for societal benefit for all in the region. The AmeriGEOSS implementation plan and other materials for reference are available via the GEO website.⁹

NASA requests proposals on one or more of four AmeriGEOSS items:

Needs Assessments. NASA requests proposals to work with in-region stakeholders to characterize current approaches to decisions and actions of the four focus SBAs; what and how Earth observations are used; characterization of Earth observation infrastructure; adequacy of existing products and services and the need for new or refined data, products, and services; and, related analyses. Such proposals should include efforts, such as gap analyses and comparative studies, to identify opportunities for AmeriGEOSS and for GEO flagships, initiatives, and community activities to address in the Americas.

AmeriGEOSS Webinar and On-site Trainings. NASA requests proposals for integrated webinar and on-site training series that build capacity to use Earth observations data, products, and tools to address decisions in the four focus SBAs. Such proposals should target nongovernmental organization (NGO), indigenous, government, or private sector decision-making communities at the national or multinational scale; team with targeted stakeholders, academia, and others in the proposed location; provide training and materials in English, Spanish, and/or Portuguese; train trainers, as appropriate; leverage best practices of the NASA Applied Remote Sensing Training program (ARSET);¹⁰ and, use existing AmeriGEOSS communications tools (e.g., AmeriGEOSS Community Platform) to build awareness of the training.¹¹ Proposals for on-site trainings should articulate approaches to leverage in-region resources, such as facilities and participant travel.

AmeriGEOSS Demonstration and Pilot Projects. NASA requests proposals for specific pilot and demonstration projects in one or more of the four focus SBAs and aligned with other GEO Work Programme elements, particularly the ones listed here in Section 3. Such proposals should be in collaboration with stakeholders in the Americas; include co-design of projects; address user needs in using Earth observations in decisions, actions, and policies; include gap analysis to assess the adequacy of existing products and services and decision-making approaches and the need for the proposed new project; and, perform testing and validation for sustained uses.

AmeriGEOSS Integrated Watershed Projects. NASA requests proposals for integrated watershed management projects, including management plans for that watershed over the next 10 to 30 years to enable resilience, accounting for a changing climate and other factors. Such proposals should be developed in collaboration with stakeholders in the watershed, account for factors of the four focus SBAs, and identify and address decision trades and options that best enable resilience development of the watershed.

⁹ <https://www.earthobservations.org/amerigeoss.php>

¹⁰ <https://arset.gsfc.nasa.gov/all/webinars/best-practices-2016>

¹¹ Proposals may include activities that align with NASA's ARSET training program; however, the ARSET project and staff should not be part of a proposal submission.

The point of contact for AmeriGEOSS inquiries is Nancy Searby, nancy.d.searby@nasa.gov, 202-358-0395.

3.2 Earth Observations for Ecosystem Accounting, EO4EA

This GEO Initiative seeks to enhance the use of Earth observations (EO) for the development of ecosystem accounts and contribute to the measurement and monitoring of natural capital and ecosystem services. It seeks to provide governments with tools to aid development planning and assessment and to inform management and policy options for any activity that will impact a country's natural capital or substantial natural capital flows and the ecosystem services arising from this natural capital and from the flows.

NASA requests proposals to address one or more of the initiative's four work streams: Overview of current ecosystem accounting efforts; EO contributions to monitoring and assessing ecosystem extent and condition for ecosystem accounting; EO contributions to the identification, measurement and monitoring of ecosystem services; Pilots to test improved data and methods of using EO for ecosystem accounting. Proposed work can include projects, studies, workshops, and other activities suitable for the respective stream(s).

Proposal teams interested in serving as the EO4EA Initiative Lead should articulate this interest, including its qualifications and its proposed approach to manage the initiative;¹² interested teams should propose a budget supplement for this role.

The point of contact for EO4EA inquiries is Woody Turner, woody.turner@nasa.gov, 202-358-1662.

3.3 Earth Observations for Health¹³

This Community Activity focuses on development and uses of Earth observations that improve the strategic and tactical capacities to anticipate, respond to, and reduce environment-related health risks, such as infectious diseases and vector-borne diseases. The element addresses combinations of Earth observations with social, demographic, and health information to enhance analysis, preparedness, and resilience. NASA recently resumed a leadership role in the GEO Health and Environment Community of Practice.

NASA requests proposals that connect Earth observations with vector-borne and infectious disease issues, challenges, and decision-making through active partnerships with public health managers and organizations, such as NGOs, that support them. Proposals should address topics related to vector-borne disease (e.g., malaria, zika, dengue fever, chik-v) and water-related disease (e.g., cholera). Proposed efforts may address: Applications projects; Feasibility studies, including testing and validation of proofs-of-concept of possible applications; Development of data-fusion products with strong applications and applied research potential; Demonstrations that complete the transition, adoption, and sustained use of Earth observations; training; Activities to

¹² Interested proposal teams are allowed one additional page (dedicated to EO4EA lead only), plus pages for budget and budget justification.

¹³ This element will appear in an updated version of the GEO Work Programme 2017-2019 released on or about December 12, 2016.

demonstrate and enable uses of Earth observations to support the *Agenda 2030* Sustainable Development Goals; and, Studies on value of Earth observations for decision making, preparedness, response, or resilience. NASA particularly encourages proposals focused on AfriGEOSS and AmeriGEOSS member countries as well as on mosquito-borne disease in Central America, South America, and the Caribbean.

The point of contact for health inquiries is John Haynes, jhaynes@nasa.gov, 202-358-4665.

3.4 GEO Biodiversity Observation Network, GEO BON

This GEO Flagship is developing a global biodiversity observation network (BON) that contributes to effective management policies for the world's biodiversity and tracking changes in ecosystem services. It improves the acquisition, coordination, and delivery of observations of biodiversity and ecosystem services change to users, including decision makers and the scientific community in support of policy. As a network of networks, GEO BON facilitates the development and enhancement of national, regional, and thematic biodiversity observation networks. This Flagship has created the framework of Essential Biodiversity Variables (EBV) and developed BON in a Box, which is a capacity building and technology transfer mechanism that provides online tools allowing countries and regions to develop or enhance their biodiversity observation systems.

NASA requests proposals on one or more of three GEO BON items:

Applications of Essential Biodiversity Variables. NASA requests proposals to apply, test, demonstrate, and enable sustained uses of EO-enabled Essential Biodiversity Variables (EBV) to support countries' obligations under the Convention on Biological Diversity or Ramsar convention; activities under the Sustainable Development Goals; or, assessments under the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystems Services (IPBES). To accomplish this, proposal teams can use candidate EBVs or propose and develop new EBVs.¹⁴ Proposal teams should identify prospective countries, and include them in the proposal development and in the projects.

BON in a Box. NASA requests proposals to develop and enable sustained uses of BON in a Box tools to support countries' obligations under the Convention on Biological Diversity or Ramsar convention; activities under the Sustainable Development Goals; or, assessments under IPBES. NASA particularly encourages proposals focused on AfriGEOSS, AOGEOSS, and AmeriGEOSS member countries.¹⁵

Biodiversity Observation Networks. NASA requests proposals to enhance the development of existing BONs¹⁶ and/or support tools for the initiation, development, and implementation of new national, regional, or thematic BONs. These enhancements and tools should address the needs of users at a national or multinational level.

¹⁴ Proposal teams should review the current list of EBVs and consult with the GEO BON Management Committee to discuss needs for EBVs; see <http://geobon.org/> for information on EBVs and committee.

¹⁵ Proposal teams should talk with the GEO BON personnel regarding current and potential BON in the Box tools.

¹⁶ The GEO Work Programme 2017-2019 identifies existing BONs.

The point of contact for GEO BON inquiries is Woody Turner, woody.turner@nasa.gov, 202-358-1662.

3.5 GEO Global Water Sustainability, GEOGLOWS

This GEO Initiative addresses effective water management, planning, and support for policy development. It facilitates understanding and uses of Earth observation assets to enhance water sustainability and mitigate water shortages, excesses, and degraded quality. It covers the responsibility areas of member nations, as well as global overviews needed to make the connections between data and global or regional policy. There is a strong emphasis on projects, analyses, capacity building, and user engagement; collaboration with in-country ministries and organizations is expected to co-design appropriate and desired activities.

NASA requests proposals on one or more of four GEOGLOWS items below; efforts may include projects, studies, workshops, or other activities suitable for the respective GEOGLOWS item.

User Assessment. NASA requests proposals for user characterization analyses and user needs assessments for data, products, and services. Such proposals should include efforts, such as gap analyses, to evaluate global or regional data center holdings and to clarify the adequacy of existing products and services, as well as the need for new or refined data, products, and services.

Basin and Regional Risk. NASA requests proposals that apply Earth observations to minimize risk and improve response to water resource extremes (e.g., water quality degradation, drought, flooding) at basin and regional scales. Transboundary issues are allowed. Such proposals must include a plan for integration into an existing water resource management decision-making process, involving water management/policy personnel who will facilitate the transition to sustained operational use. Particular interest is in the scalability of solutions.

Essential Water Variables. NASA requests proposals that analyze essential water variables and develop indicators to support improved water management decisions, advance knowledge for water sustainability, and/or address specific, documented societal needs. Proposals should specify the stakeholder(s), decision-making process(es), or policy(s) that the indicators will impact. Innovative solutions are encouraged, and proposals must provide open and sustainable indicator processing solutions.

Capacity Development and Basin/Regional Engagement. NASA requests proposals for specific training and community engagement/outreach activities for water resource management organizations which leverage Earth observations, including NASA Earth science. These proposals should specify the communities of need, the water resource information needs, the training needs, and other community engagement plans.

There are connections between GEOGLOWS and the GEO Community Activity Earth Observations for the Water-Energy-Food Nexus; proposal teams may propose work aligned with and supporting both.

The point of contact for GEOGLOWS inquiries is Brad Doorn, bradley.doorn@nasa.gov, 202-255-7957.

3.6 GEO Vision for Energy, GEOVENER

This GEO Initiative supports the development of Earth observation products and services for energy management, including information to support end-to-end energy production systems (including planning, generation, transmission, distribution, and integrated operations). It has a particular focus on Earth observations for renewable energy systems and renewable energy policy.

NASA requests proposals for applying Earth observations to address renewable energy decision support needs, such as increased productivity and optimized investment decisions; all renewable energy types are appropriate. Efforts may include projects, feasibility studies, demonstrations, workshops, or other suitable activities. Some topical examples might include increasing confidence in solar forecast accuracy; improved grid integration of renewables; and prediction of significant ramping events from sudden wind or solar insolation changes. Also, ESD held an energy management workshop in April 2016, and proposals are encouraged to address items in the workshop report that align with GEOVENER.¹⁷ Proposals addressing decision support on renewable energy must demonstrate significant interaction with and uptake of the products derived from this work with decision support tool developers, intermediary organizations, and/or downstream users (e.g., power plant developers, financiers, insurers, utilities, grid operators) of these data.

The point of contact for GEOVENER inquiries is Richard Eckman, richard.s.eckman@nasa.gov, 757-272-5565.

3.7 Global Flood Risk Monitoring

This GEO Community Activity seeks to improve flood/inundation mapping and to support objective characterization (e.g., location, intensity and duration) of extreme flood events globally. It aims to use globally-consistent information from past events to its maximum utility in defining areas of flood risk, as well as during new floods to assist with their characterization. It pursues opportunities for early prediction and characterization of flood inundation in near real time, and it supports developing nations' efforts to directly identify hazardous land areas. It also addresses flood risk and stationarity of flood frequency distributions in light of a changing climate.

NASA requests proposals that: Advance flood/inundation extent mapping and damage mapping; Develop, test, and apply methods to use Earth observations with models and maps to estimate the location, intensity and duration of floods globally; Advance tools for situational awareness for effective response and tools to help assess risk and promote preparedness; Support intercomparison of global/regional flood and inundation models; or Test and validate the utility of products through scenario exercises and case studies. An emphasis is on the utility of satellite and other Earth observations to develop flood maps and decision tools in standard geospatial

¹⁷ Workshop report is available at: http://wiki.esipfed.org/index.php/Energy_and_Climate.

information and web services. Particular interest is in the scalability of information and data products. The assistance and input of users from the response, relief, and recovery communities of practice is expected.

The point of contact for Global Flood Risk Monitoring inquiries is David Green, david.s.green@nasa.gov, 202-358-0032.

3.8 Global Wildfire Information System, GWIS

This GEO Initiative provides a platform for coordination and harmonized information among major national and regional fire information providers. GWIS relies on collaborative sharing of international EO data systems, as well as national and regional information sources (fire records, etc.). For countries and regions that do not maintain a comprehensive wildfire database, GWIS provides a gap-filler system; where wildfire information systems exist, GWIS provides a complementary source of data to national and regional sources. The GWIS web map tool serves information on wildfires indices (e.g., fire danger forecast, burned areas), and the GWIS web map service supports visualization of information. The initiative has four main items: Harmonized Fire Information Data Sets; International Networking; Workshop Training; and Cross-Platform Info Sharing at Common Scales.

NASA requests proposals on one or more of two items:

Data Compilation and Analysis. NASA requests proposals for GWIS enhancements and tools for on-demand statistics, tabular information, and graphical information at various spatial scales (subnational to continental) and temporal domains. Information on indices and fire variables would be derived from EO and other sources.

Workshops and Trainings. NASA requests proposals for webinars, workshops, and in-person trainings to increase awareness, familiarity, and use of GWIS, as well as to characterize users and identify needs. Such proposals should target NGO, indigenous, government, or commercial organizations. Proposals for onsite trainings and workshops should articulate approaches to leverage in-region resources, such as for training facilities and participant travel. NASA particularly encourages proposals focused on AfriGEOSS, AOGEOSS, and AmeriGEOSS member countries.

The point of contact for GWIS inquiries is Vincent Ambrosia, vincent.g.ambrosia@nasa.gov, 650-604-6565.

3.9 Human Planet

This GEO Initiative seeks to develop a new generation of measurements and information products that provide new scientific evidence and a comprehensive understanding of the human presence on the planet and that can support global policy processes. Human Planet plans to: Improve the state-of-the art of EO-derived global open data describing the physical infrastructures of human settlements; Improve the state-of-the art of global open and public data describing population in human settlements; Improve the integration of global open spatial data

on population and physical infrastructures; and Test and demonstrate the use of new integrated global spatial data to support *Agenda 2030*.

NASA requests proposals on one or more of two items:

Accuracy Assessments. NASA requests proposals that advance accuracy assessments and global/regional validation of data related to this initiative. Proposals should address thematic, spatial, and/or temporal aspects and components; decametric and metric spatial resolution global and regional thematic products can be considered. Proposals can include crowd-sourcing approaches, and such proposals should articulate plans to effectively guide and manage crowd-sourced efforts to support validation.

Agenda 2030. NASA requests proposals to apply, test, demonstrate, and enable sustained uses Earth-observation derived data and integrated data on population and human settlements to support one or more of the Sustainable Development Goals (SDGs) and the associated Targets and Indicators. Proposals should articulate plans to engage national statistical offices, line ministries, or other appropriate entities in the respective countries where the proposed work is focused or appropriate inter-governmental organizations. The primary objectives should be to enable sustained use of the data in measuring and reporting on the SDGs, tracking progress, supporting planning efforts, and informing policy and management decisions that contribute toward achieving the SDGs.

In either item, proposals can include efforts for across-sensor systematic information comparison activities, including issues such as bias and complementarity.

The point of contact for Human Planet inquiries is Lawrence Friedl, lfriedl@nasa.gov, 202-358-7200.

4. Award Information

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| Maximum Period of Performance | 36 months |
| Expected Project Start Date | ~Six months after the proposal due date |
| Total Amount of NASA Funding (FY17-20) | \$8M |
| Anticipated Number of Awards | 20-25 |
| Expected Level of Awards | \$30K-200K per year |
| 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. |

ESD plans to post frequently asked questions (FAQ) under "Other Documents" on the NSPIRES web page for this call for proposals. Proposal teams are encouraged to check regularly the NSPIRES page associated with this call for the FAQs and any updates.

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

As permitted in the ROSES *Summary of Solicitation* in Section I(h), the following information provides clarifications or amendments that supersede 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 Eligibility Information: Changes to Section III(a) of the *Summary of Solicitation*

Multisectoral and transdisciplinary teams are strongly encouraged. A person or organization can be involved in and included on more than one proposal.

Representatives from USGEO member agencies are eligible to propose and/or be part of a proposal; see also Section 5.2.

5.2 Funding and Award Policies: Changes to Section II of the *Summary of Solicitation*

Representatives from USGEO member agencies (non-NASA) must be sponsored by their respective agency or otherwise provide their own financial resources. For this particular call for proposals, NASA will not provide funding to representatives from other (non-NASA) USGEO member agencies.

NASA may augment an award based on demonstration of results and characterization of additional opportunities.

Proposers are reminded of Section II(d) Rephasing of Award Budgets: NASA assesses the record of financial billing and uncosted carryover and may adjust the timing of funding renewals based on the history of costing.

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 5.6). 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 two items modify *NASA Guidebook* Section 2.3: The page limit for the Scientific/Technical/Management (STM) section of a proposal is 12 pages;¹⁸ the STM section must include a discrete subsection on Anticipated Results.¹⁹

5.4.1 *Schedule*

Proposals should include and describe a schedule for the proposed work, including milestones. The page limit for this section is two pages.

5.4.2 *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 organizations about the proposal team or about the letter writer's interest in the results. The letters may include input from organizations or individuals involved in the GEO Work Programme element. All statements or letters must be delivered to the Principal Investigator (PI) and included in the proposal. Letters sent to NASA ESD or 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 factors given in the *NASA Guidebook for Proposers*, the evaluation criterion "cost realism and reasonableness" specifically includes the following factors:

- Overall approach and ability to manage the project cost effectively to achieve stated objectives;
- Sponsorship of a representative of USGEO member agencies (non NASA);
- 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 one or separate peer review panels for the GEO Work Programme elements listed in Section 3. NASA will assign proposals to a panel based on the element specified by the proposing team and NASA's assessment of the proposal content. While NASA is soliciting proposals for each of the elements, NASA reserves the right to select proposals in none, one, or several elements depending on the nature and distribution of proposals received and the outcome

¹⁸ For proposals to the EO4EA element (Section 3.2), teams proposing to be the EO4EA Initiative Lead get one additional page.

¹⁹ Anticipated Results must describe the expected progress over the current state of the GEO Work Programme element, as well as the expected accomplishments, outcomes, and benefits from the proposed work.

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 awardees 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 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 items are required of the awardees:

- **Project and Costing Plan**

Within 30 days of the award, awardees will produce a project plan to articulate activities, milestones, and other information on execution of the project. Included in this is a monthly financial costing plan (see Section 5.2) for the entire period of performance. The project plan and costing plan will be updated as needed throughout the period of performance.

- **Periodic Reporting**

Awardees will produce brief reports for NASA ESD on a quarterly basis. These brief reports should provide a summary of the work, activities, events, etc. 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.

Both USGEO and GEO periodically (two to four times per year) request information on the status, activities, progress, etc. of each GEO Work Programme element. Teams must respond timely and substantively to requests from the USGEO representative for such information. Teams must respond to and support the Lead for their GEO Work Programme element to provide timely and substantive input to GEO.²⁰

- **Annual Summary/Progress Report**

The awardees will produce an annual 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). NASA may request a presentation (physical or virtual) of the annual summary.

²⁰ The information from the quarterly summary reports to NASA will likely serve a significant portion of the USGEO and GEO reporting.

- Communications, Outreach and Inreach

The scope includes communications activities, and these activities may require and involve the development of specialized materials, examples, briefings, articles, and other items. Proposal teams should budget for these accordingly.

Periodically, the Earth Science Division, Applied Sciences Program, USGEO, and/or GEO may request information about projects, achievements, and key events to support their respective communications and outreach activities. The awardees are expected to support such requests and should budget for these accordingly.

- Publications

The awardees are expected to publish their work with scholarly, grey, and popular literature, including online. On a semiannual basis (January-June and July-December), awardees will produce an annotated bibliography of all their publications directly associated with the award from the prior period.

- GEO Plenary and Work Programme Symposium

GEO conducts annual events, such as the Plenary and Work Programme Symposium, at which people gather and take stock of GEO’s progress. These events often have side events and other activities to showcase results of particular items. Proposal teams should budget accordingly to attend one GEO-level event each year. (While the location will likely rotate, teams can use Geneva, Switzerland, as the location for budgetary purposes.)

- Final Report

The Final Report summarizes the overall activities of the award, including achievements, progress, impacts, smart practices, experimental 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 the GEO Work Programme element 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

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| Expected program budget | See Section 4 |
| Number of new awards pending adequate proposals of merit | 20-25 |
| Maximum duration of awards | 36 months |
| Due date for Notice of Intent to propose (NOI) | See Tables 2 and 3 in the <i>ROSES Summary of Solicitation</i> |
| Due date for proposals | See Tables 2 and 3 in the <i>ROSES Summary of Solicitation</i> |
| Planning date for start of investigation | ~Six months after the proposal due date |
| Page limit for the central Science-Technical-Management section of proposal | 12 pp; see Section 5.4 of this document (EO4EA Initiative Lead proposals get one additional page, see Section 3.2) |

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| 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 | NNH16ZDA001N-GEO |
| Main 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 GEO WP Inquiry" in the subject line. |
| Points of contact for inquiries about elements in Section 3 | AmeriGEOSS inquiries: Nancy Searby, nancy.d.searby@nasa.gov , 202-358-0395. EO4EA inquiries: Woody Turner, woody.turner@nasa.gov , 202-358-1662. Earth Observations for Health inquiries: John Haynes, jhaynes@nasa.gov , 202-358-4665. GEO BON inquiries: Woody Turner, woody.turner@nasa.gov , 202-358-1662. GEOGLOWS inquiries: Brad Doorn, bradley.doorn@nasa.gov , 202-255-7957. |

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| | <p>GEOVENER inquiries: Richard Eckman, richard.s.eckman@nasa.gov, 757-272-5565.</p> <p>Global Flood Risk Monitoring inquiries: David Green, david.s.green@nasa.gov, 202-358-0032.</p> <p>GWIS inquiries: Vincent Ambrosia, vincent.g.ambrosia@nasa.gov, 650.604.6565.</p> <p>Human Planet inquiries: Lawrence Friedl, lfriedl@nasa.gov, 202-358-7200.</p> |
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