OFFICE OF SCIENCE AND TECHNOLOGY POLICY

ACTION: Notice of Request for Information (RFI).

SUMMARY: The purpose of this Request for Information (RFI) is to solicit input from all interested parties regarding recommendations for the development of a National Plan for Civil Earth Observations ("National Plan"). The public input provided in response to this Notice will inform the Office of Science and Technology Policy (OSTP) as it works with Federal agencies and other stakeholders to develop this Plan.

DATES: Responses must be received by December 6, 2013 to be considered.

SUBMISSION: You may submit comments by any of the following methods.

- Downloadable form: To aid in information collection and analysis, OSTP encourages responses to be provided using this form. Please enter your responses in the fillable fields that follow the questions below.
- Email: OSTP encourages respondents to email the completed form, as an attachment, to earthobsplan@ostp.gov. Please include "National Plan for Civil Earth Observations" in the subject line of the message.
- Fax: (202) 456-6071.
- Mail: Office of Science and Technology Policy, 1650 Pennsylvania Avenue, NW, Washington, DC, 20504. Information submitted by postal mail should allow ample time for processing by security.

Response to this RFI is voluntary. Respondents need not reply to all questions listed. Each individual or institution is requested to only submit one response. Responses to this RFI, including the names of the authors and their institutional affiliations, if provided, may be posted on line. OSTP therefore requests that no business proprietary information, copyrighted information, or personally-identifiable information be submitted in response to this RFI. Given the public and governmental nature of the National Plan, OSTP deems it unnecessary to receive or to use business proprietary information in its development. Please note that the U.S. Government will not pay for response preparation, or for the use of any information contained in the response.

FOR FURTHER INFORMATION CONTACT:

Timothy Stryker, 202-419-3471, tstryker@ostp.eop.gov, OSTP.

SUPPLEMENTARY INFORMATION:

Background

The U.S. Government is the world's largest single provider of civil environmental and Earth-system data. These data are derived from Earth observations collected by numerous Federal agencies and partners in support of their missions and are critical to the protection of human life and property; economic growth; national and homeland security; and scientific research. Because they are provided through public funding, these data are made freely accessible to the greatest extent possible to all users to advance human knowledge, to enable industry to provide value-added services, and for general public use.

Federal investments in Earth observation activities ensure that decision makers, businesses, first responders, farmers, and a wide array of other stakeholders have the information they need about climate and weather; natural hazards; land-use change; ecosystem health; water; natural resources; and other characteristics of the Earth system. Taken together, Earth observations provide the indispensable foundation for meeting the Federal Government's long-term sustainability objectives and advancing the Nation's societal, environmental, and economic well-being.

As the Nation's capacity to observe Earth systems has grown, however, so has the complexity of sustaining and coordinating civil Earth observation research, operations, and related activities. In October 2010, Congress charged the Director of OSTP to address this challenge by producing and routinely updating a strategic plan for civil Earth observations (see *National Aeronautics and Space Administration Authorization Act of 2010, Public Law 111-267, Section 702*).

Responding to Congress, in April 2013, OSTP released a National Strategy for Civil Earth Observations ("the National Strategy").

In April 2013, OSTP also re-chartered the U.S. Group on Earth Observations (USGEO) Subcommittee of the National Science and Technology Council's Committee on Environment, Natural Resources, and Sustainability. USGEO will carry out the National Strategy and support the formulation of the National Plan.

As requested by Congress, the National Plan is being developed by USGEO to advise Federal agencies on the Strategy's implementation through their investments in and operation of civil Earth observation systems. The Plan will provide a routine process, on a three-year cycle, for assessing the Nation's Earth observation investments; improving data management activities; and enhancing related interagency and international coordination. Through this approach, the Plan will seek to facilitate stable, continuous, and coordinated Earth observation capabilities for the benefit of society.

Congress also requested that development of the National Plan include a process for collecting external independent advisory input. OSTP is seeking such public advisory input through this RFI. The public input provided in response to this Notice will inform OSTP and USGEO as they work with Federal agencies and other stakeholders to develop the Plan.

Definitions and Descriptions

The term "**Earth observation**" refers to data and information products from Earth-observing systems and surveys.

"**Observing systems**" refers to one or more sensing elements that directly or indirectly collect observations of the Earth, measure environmental parameters, or survey biological or other Earth resources (land surface, biosphere, solid Earth, atmosphere, and oceans).

"**Sensing elements**" may be deployed as individual sensors or in constellations or networks, and may include instrumentation or human elements.

"**Observing system platforms**" may be mobile or fixed and are space-based, airborne, terrestrial, freshwater, or marine-based. Observing systems increasingly consist of integrated platforms that support remotely sensed, *in-situ*, and human observations.

Assessing the Benefits of U.S. Civil Earth Observation Systems

To assist decision-makers at all levels of society, the U.S. Government intends to routinely assess its wide range of civil Earth observation systems according to the ability of those systems to provide relevant data and information about the following Societal Benefit Areas (SBAs):

1. Agriculture and Forestry
2. Biodiversity
3. Climate
4. Disasters
5. Ecosystems (Terrestrial and Freshwater)
6. Energy and Mineral Resources
7. Human Health
8. Ocean and Coastal Resources and Ecosystems
9. Space Weather
10. Transportation
11. Water Resources
12. Weather

The U.S. Government also intends to consider how current and future reference measurements (*e.g.*, bathymetry, geodesy, geolocation, topography) can enable improved observations and information delivery.

To address measurement needs in the SBAs, the U.S. Government operates a wide range of atmospheric, oceanic, and terrestrial observing systems. These systems are designed to provide: (a) sustained observations supporting the delivery of services, (b) sustained observations for research, or (c) experimental observations to address specific scientific questions, further technological innovation, or improve services.

Questions to Inform Development of the National Plan

Name (optional): Click here to enter text.

Position (optional): Click here to enter text.

Institution (optional): Click here to enter text.

Through this RFI, OSTP seeks responses to the following questions:

1. Are the 12 SBAs listed above sufficiently comprehensive?

Click here to enter text.

   a. Should additional SBAs be considered?

Click here to enter text.

   b. Should any SBA be eliminated?

Click here to enter text.

2. Are there alternative methods for categorizing Earth observations that would help the U.S. Government routinely evaluate the sufficiency of Earth observation systems?

Click here to enter text.

3. What management, procurement, development, and operational approaches should the U.S. Government employ to adequately support sustained observations for services, sustained observations for research, and experimental observations? What is the best ratio of support among these three areas?

Click here to enter text.

4. How should the U.S. Government ensure the continuity of key Earth observations, and for which data streams (*e.g.*, weather forecasting, land surface change analysis, sea level monitoring, climate-change research)?

Click here to enter text.

5. Are there scientific and technological advances that the U.S. Government should consider integrating into its portfolio of systems that will make Earth observations more efficient, accurate, or economical? If so, please elaborate.

- Weather Data Assimilation: As described in the National Science Foundation report "From the Ground Up: A Nationwide Network of Networks" the U.S. Government should integrate and assimilate all data available from weather sensors operated by both private-sector networks and from academic networks. Data should be combined into one database and leveraged by the National Weather Service so that the data can be used operationally within the forecast offices and in the numerical forecast models. Real-time weather data from thousands of weather stations is currently available for use. Currently, only a portion of the information available from these alternative sources are integrated and used by the federal government. By leveraging all available data sources, there is a clear opportunity to make substantial progress and improvements in the near term in the areas of forecasting and early warnings. As we have seen time and time again – and most recently with the November 2013 Midwest tornado outbreak – minutes truly matter when it comes to safeguarding lives when severe weather threatens. Assimilating additional data will further help save lives.

- Total Lightning Data Assimilation: Total lightning, which includes both cloud-to-ground and in-cloud lightning strikes, offers more information about storm severity and structure than cloud-to-ground lightning alone. The continuous monitoring of total lightning flash rate from the forthcoming GOES-R Lightning Mapper (GLM) is expected to improve tornado and severe storm warning lead time and improve hurricane track and intensity forecasts. Yet total lightning information is already available today via the Earth Networks Total Lightning Network, which is an extensive, privately owned and operated network that detects total lightning with high efficiency. Additionally, data from the forthcoming GOES-R/GLM instrument will be substantially inferior to the ground based ENTLN network data set as it will have lower resolution, not have the ability to discriminate between in-cloud and cloud-to-ground flashes, not be able to measure amplitude or polarity of lighting activity. Also, the GLM's enormous costs and space-based risk profiles are all major issues versus the currently available, low cost ground based ENTLN system. NOAA and NWS are currently utilizing data from the Earth Networks Total Lightning Network, both operationally and in research, to advance severe weather forecasting and warning applications. The United States Air Force's Air Force Weather Agency (AFWA) and Federal Aviation Administration are also using data from the Earth Networks Total Lightning Network. Moreover, data are available not only for the Western Hemisphere, but also for large portions of Europe, Asia, and Western Africa.

- Lightning-Based Early Warning Assimilation: A major private-sector innovation is already in use delivering critical, life-saving information and alerts to large portions of the population. Earth Networks' Dangerous Thunderstorm Alerts (DTAs), which are based on total lightning activity, have demonstrated improved alerting times 50% greater than warnings based on existing capabilities, providing 27 minutes, on average, of lead time. Moreover, DTAs are fully automated and are issued when total lightning rates exceed a high threshold. At present, DTAs are issued to millions of consumers via the WeatherBug mobile app for iPhone and Android devices. We strongly recommend that the federal government immediately engage the private sector to leverage and enable NOAA/NWS to receive DTAs within their operations.

6. How can the U.S. Government improve the spatial and temporal resolution, sample density, and geographic coverage of its Earth observation networks with cost-effective, innovative new approaches?

Per our answer to question 5 above, NOAA/NWS can benefit immediately and substantially from the infusion of data from observational networks operated by non-federal partners including the private sector, academia as well as state and local governments to improve the spatial and temporal resolution, sample density, and geographic coverage of its nowcasting programs and forecasting models.

7. Are there management or organizational improvements that the U.S. Government should consider that will make Earth observation more efficient or economical?

Click here to enter text.

8. Can advances in information and data management technologies enable coordinated observing and the integration of observations from multiple U.S. Government Earth observation platforms?

The federal government should always consider first, what can be adequately observed from the ground before investing in long term extremely expensive space based initiatives. While satellites are very important to earth observations and should continue, extreme care should be taken with respect to what types of instruments are flown and for what purposes. Only those parameters that cannot be observed adequately either today or in the relatively near future should be explored for space platforms. As a nation, we must be judicious regarding the funding available for these initiatives and a balance must be struck relative to ground and space based observing platforms…both are needed, but there must be balance.

9. What policies and procedures should the U.S. Government consider to ensure that its Earth observation data and information products are fully discoverable, accessible, and useable?

Click here to enter text.

10. Are there policies or technological advances that the U.S. Government should consider to enhance access to Earth observation data while also reducing management redundancies across Federal agencies?

See numbers 5 above and 11 below

11. What types of public-private partnerships should the U.S. Government consider to address current gaps in Earth observation data coverage and enhance the full and open exchange of Earth observation data for national and global applications?

Sensor technology has advanced to the point in which sensors are smaller, faster, more accurate, more reliable, and less expensive. Private companies are deploying sensor networks around the world. In some cases, such as in Guinea, Africa, automated weather stations and total lightning sensors are being

deployed, networked, and in operation in a matter of weeks for the first time. The deployment of privately operated sensor networks and the availability of new data sources can enable public-private partnerships in which data can be quickly and more cost-effectively integrated into government operations – in that NOAA will not have to necessarily invest in the observational technology and can simply acquire the data that is already collected by these alternative data sources.

As technology continues to evolve rapidly, the assimilation of atmospheric data can occur faster. Atmospheric information can be put into the hands of the forecasters immediately in order to help ensure that warnings and forecasts are more precise and faster.

12. What types of interagency and international agreements can and should be pursued for these same purposes?

The US Federal government should at a minimum ensure that the US including both public and private sector organizations are not disadvantaged by any international agreements for data exchange. Agreements, such WMO resolution 40 must ensure that other countries or private sector organziations within those countries are not provided a competitive advantage, particularly here in the US. We often find this situation currently given foreign governments preferential treatment of in-country organizations for access to information produced by that country while the US's open data availability policy to all creates an uneven playing field.