



GROUP ON
EARTH OBSERVATIONS

GEO-XI

13-14 November 2014

GEO Strategic Plan 2016-2025: Implementing GEOSS

Document 6

This document is submitted to GEO-XI for consultation

Preliminary Draft of the “GEO Strategic Plan 2016-2025: Implementing GEOSS”

Cover Note

1 BACKGROUND

At its 10th Plenary Meeting (January 2014) GEO established the Implementation Plan Working Group (IPWG) to “undertake the preparation of a draft Implementation Plan for initial review at the GEO-XI Plenary and for acceptance at the GEO-XII Plenary and for subsequent endorsement at the next Ministerial Summit”¹. The IPWG is comprised of 15 distinguished experts and 10 members of a “Writing Team”, all of whom were nominated by the five Caucuses. To make best use of the available capacity and expertise, all members of the IPWG – including experts and Writing Team members – have been working in a fully integrated fashion.

The IPWG has met three times, in April (Geneva), June (Athens) and September (Beijing) 2014. Six further meetings have been held by WebEx between April and September 2014.

An Interim Report was presented to the GEO Executive Committee at its 31st Session in July 2014. That report presented context and critical considerations that have informed the draft presented to this Plenary and will continue to inform the work of the IPWG.

The IPWG has consulted extensively with stakeholders both inside the “GEO Community” and beyond. In particular, engagement sessions have been organized at the 2014 GEO Work Plan Symposium (May 2014), at the occasion of the 2nd and 3rd meetings of the IPWG with European scientists and stakeholders from Asia, respectively. Also, the GEO Implementation Boards and Working Groups have been invited to comment on specific issues of concern during the IPWG work.

The IPWG is planning to continue to strengthen stakeholder engagement using opportunities of relevant meetings and gatherings as they arise, and strategically targeting relevant stakeholder groups, notably from UN agencies, developing countries, the private sector, and the scientific community.

Between November 2014 and the 12th Plenary Meeting of GEO, the IPWG is planning to develop the draft “GEO Strategic Plan 2016-2025: Implementing GEOSS” in further detail, fully taking into account the guidance provided by GEO-XI Plenary. Additional milestones will be the meetings of the Executive Committee in 2015, which will present an opportunity for further guidance.

2 A STRATEGIC PLAN FOR THE NEXT GEO DECADE

The *Geneva Ministerial Declaration* and the *Vision for GEO 2025*, adopted by GEO in January 2014, have provided the frame under which the IPWG has been preparing the draft GEO Strategic Plan for the coming decade. The draft presented to the GEO-XI Plenary directly responds to these framing documents. Statements made by delegations at the Ministerial meeting in 2014, the reports of the GEO Monitoring and Evaluation Working Group, and advice collected during the IPWG’s stakeholder engagement activities have further guided the work of the IPWG.

¹ IPWG Rules of Procedure

The IPWG has entitled the document “*GEO Strategic Plan 2016-2025: Implementing GEOSS*”. This recognizes that its content, as scoped by the *Vision for GEO 2025*, goes beyond what is generally understood as “GEOSS” and included in an Implementation Plan. The IPWG recommends that this document be developed as a framework which sets out the strategies by which GEO will advance its activities, including further implementation of GEOSS, in the period 2016-2025. Supplemental documents will be developed subsequently to introduce traditional implementation elements – technical detail, a detailed resourcing plan, implementation timeframes and partners – allowing for changes to be introduced as scientific, technical and societal changes take place. The IPWG proposes that GEO employ shorter-term planning tools to guide the detailed implementation of its actions, in particular an annual or multi-annual Work Programme.

2.1 Introducing the GEO Strategic Plan

The Preliminary Draft of the Strategic Plan presented by the IPWG at GEO-XI reflects the present state of the work in progress. Different aspects – and different sections – have reached varying levels of maturity, recognizable by stylistic differences in the preliminary draft. *It must be noted that none of the content, nor any of the wording, should be considered final.* The IPWG’s purpose at this time is to present ideas and suggestions to Plenary, enabling substantial guidance to be provided on the ideas put forward.

The Strategic Plan structure is an evolution of the structure of the current Implementation Plan 2005-2015:

The **Preamble** recalls the GEO Vision and introduces GEOSS.

Section 1: sets out the purpose of the Plan.

Section 2: highlights that the Scope of GEO’s activity goes beyond facilitating GEOSS, introducing the concept of the three Action Areas: Advocate. Engage. Deliver. Also, high-level political messages in the form of Strategic Objectives are presented.

Section 3: defines the Core Functions of GEO in the context of the three Action Areas.

Section 4: to be developed over the coming year, will set out specific targets for the Core Functions.

Section 5: differentiates the six different ways by which GEO implements its functions and distinguishes how they are managed.

Section 6: presents GEO’s governance principles and outlines various governance-related topics for Plenary consideration.

Section 7: sets out options for the resourcing framework.

Section 8: presents the high-level implementation plan.

To date, the IPWG has concentrated its work on aspects deemed foundational, and has prioritized where Plenary guidance was considered most important for our work until GEO-XII. Consequently, some sections are more advanced than others.

2.2 Key aspects

2.2.1 Reconfirming the GEO vision and clarifying key concepts

The IPWG has determined that the GEO Vision declared in 2005, remains valid and should be maintained.

Striving for greater clarity around the meaning and scope of GEOSS, as well as supporting a common understanding of the specific role of GEO in regards to GEOSS implementation, the IPWG proposes to define purpose, scope and strategic objectives clearly in the Strategic Plan. We present the activities of GEO in the three broad **Action Areas “Advocate. Engage. Deliver”**. Each of these action areas

contains a number of specific **Core Functions**, to be implemented by GEO. The IPWG has derived these Core Functions from the higher-level functions in the Vision for GEO 2025 paper. They include infrastructure elements and cross-cutting activities.

2.2.2 Three Strategic Objectives, many measurable targets

The draft Strategic Plan distinguishes between strategic objectives and measurable targets. While the Strategic Objectives serve to guide the strategic positioning of GEO and are therefore intended to be articulated as ‘political messages’, the targets serve primarily to plan, manage, monitor and evaluate progress of GEO activities. Thus, IPWG intends to **develop specific, measurable targets for the Core Functions** that can support evaluation of progress.

It is worth pointing out that the political messages presented in terms of Strategic Objectives, as well as the Core Functions, in this Strategic Plan are fully consistent with the guidance provided in the Vision for GEO 2025. However, in an effort to use consistent terminology for added clarity, the IPWG has re-defined these terms (i.e. “Strategic Objectives” and “Core Functions”).

2.2.3 Using Societal Benefit Areas for building communities

The Societal Benefit Areas have come to be a recognized staple of GEO. However, they have fallen short of enabling cross-community linkages effectively. Therefore, IPWG proposes to **evolve the current set of Societal Benefit Areas** to make them a tool for engaging communities more optimally.

2.2.4 GEO’s Management Framework: Striking a balance between flexibility and structure

Both the Monitoring and Evaluation activities of GEO and responses from the broader GEO Community during IPWG engagement activities have highlighted the need to evolve the way by which GEO manages its activities within its voluntary framework. The IPWG considers this an important area for improvement for GEO. It therefore proposes that GEO define **six different management mechanisms**, each clearly **different in terms of the management and resourcing** approach taken. By this, GEO can retain the flexible management framework that has allowed communities to gather and work on a broad range of Earth observation topics, while enabling GEO to prioritize its resources effectively on specific issues.

The draft Strategic Plan indicates key aspects of the six ways in which GEO can manage its activities. IPWG intends to develop an Annex to the Strategic Plan to detail the management arrangements for these, including a transition plan for current activities.

2.2.5 A strengthened GEO Secretariat

It should be noted that the proposed role for the GEO Secretariat in the management framework would strengthen the Secretariat compared to the current status quo. It would also provide for substantially stronger roles for those Participating Organizations and Members contributing to specific Initiatives.

The GEO Secretariat would propose annual Work Programmes, to be adopted by GEO, which set out its planned implementing actions. Together with a report on the activities ongoing within GEO this would **replace the current GEO Work Plan**. This approach serves, first, GEO’s management of its own activities. Second, the clear distinction between activities that GEO implements (included in the Work Programme) and those that others implement with GEO facilitation (presented in the Activities Report) helps position GEO more clearly in its relations with stakeholders.

2.2.6 A principled approach to governance with delegated authority to subsidiary bodies

On Governance, IPWG proposes including a set of Governance Principles in the Strategic Plan. To efficiently support the required governance functions and enable a stronger role for Participating Organizations, IPWG proposes that Plenary formally delegate decisions on clearly defined aspects to subsidiary bodies, including the Executive Committee.

Also dedicated **advisory bodies** would be set up and mandated to guide the development of GEO Initiatives or Activities.

Under the proposed management arrangements, the **GEO Implementation Boards would be replaced** with appropriate subsidiary governance bodies to which Plenary would delegate responsibility, and by advisory bodies serving and supporting the GEO Flagships, Initiatives and Activities. The IPWG recognizes that such a change from Implementation Boards to a future structure matching the necessary functions in GEO must be approached with great care. A dedicated transition plan is needed to ensure that the valued membership of current boards will continue to be engaged in the appropriate function under the future set-up.

While the detailed governance structure would be defined in the GEO Rules of Procedure, to provide for appropriate flexibility, the IPWG intends to prepare a specific recommendation for decision by GEO-XII. To guide the development of this proposal, the IPWG requests guidance from Plenary on **five general topics** presented in the draft Strategic Plan:

Topic 1: whether different categories of Participating Organizations should be established as an instrument to strengthen their role.

Topic 2: whether criteria for accepting Participating Organizations should be revised, also aiming for a stronger role for the Participating Organizations.

Topic 3: whether Participating Organizations should have decision rights at Plenary.

Topic 4: whether the composition of, and nomination mechanisms for, the Executive Committee should be reviewed.

Topic 5: whether GEO should explore changes of legal status and regionalized models for the GEO Secretariat.

2.2.7 *Matching GEO's ambition and resources*

Finally, the IPWG has considered options for a strengthened framework for resourcing GEO activities, while continuing the current model of voluntary commitments. The main mechanism for GEO Flagships and Initiatives proposed in the draft Strategic Plan is that GEO Members and Participating Organizations make ***specific commitments*** at the time the respective activity is accepted. The availability of these resources will be monitored and reported regularly. Note that such resources need not be limited to public sources.

To strengthen the resourcing framework of the GEO Secretariat, the IPWG suggests the GEO Work Programme, setting out the annual plans for activities by the GEO Secretariat, include a more robust budget. This will serve to align available resources with the activities and to identify priorities as needed. The IPWG also seeks guidance from Plenary on whether Members envision indicative contributions to the operations of the GEO Secretariat.

3 GUIDANCE SOUGHT FROM PLENARY

The IPWG requests that Plenary:

- Agree with the Scope of GEO activities in the three broad Action Areas “Advocate. Engage; Deliver.” and confirm the GEO Core Functions presented in the draft Strategic Plan;
- Take note that the IPWG intends to propose an evolved set of Societal Benefit Areas at GEO-XII;
- Take note that the IPWG intends to propose specific targets for the GEO Core Functions;
- Comment on the proposed management approach, including the six management mechanisms;
- Provide guidance on governance options and take note of IPWG’s intention to propose an evolved governance framework at GEO-XII; and
- Provide guidance on the question of indicative contributions to the GEO Trust Fund.

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This draft outline of the GEO Strategic Plan 2016-2025: Implementing GEOSS represents the work of the Implementation Plan Working Group (IPWG) to date and contains initial considerations on the next ten years of GEO activities.

These considerations are presented to Plenary for discussion; boxed text (single border) indicates instances where Plenary guidance is sought on a particular topic, or Plenary acceptance of an IPWG recommendation is requested. Foundational GEO documents referenced in the text will be included in an Annex to the final Plan.

Text in italics and light grey indicate informal annotations and comments from the IPWG, to provide context and illustrate the thinking behind more formal text (black, non-italics).

GEO Strategic Plan 2016-2025: Implementing GEOSS

Preliminary Draft

PREAMBLE

This preamble confirms the Vision for GEO (from the Vision for GEO 2025: Vision): a future wherein decisions and actions for the benefit of society are informed by coordinated, comprehensive and sustained Earth observations.

Food security - water security - energy security - resilience to natural hazards - mitigation of, and adaptation to, climate change - developing a sustainable economy: these are among our greatest global challenges. These challenges are driven by Earth's changing, interconnected, environmental conditions, in concert with human activities and policy decisions made at every level of a global society. To address these challenges wisely, decision-makers around the world require comprehensive, sustained and integrated observations, data and information about the Earth and its changing conditions.

Observing the Earth and understanding its interlinked systems is too large a task for any one government or organization. The intergovernmental Group on Earth Observations (GEO) is a global partnership of governments and organizations that envisions a future wherein decisions and actions for the benefit of society are informed by coordinated, comprehensive and sustained Earth observations. GEO works through voluntary best efforts to create the Global Earth Observation System of Systems (GEOSS) from among thousands of individual Earth observations and information systems. With this distinct, integrated approach, the GEO community is putting the best available science and technology to work to deliver critical environmental knowledge across a range of societal benefit areas.

1 INTRODUCTION: PURPOSE OF THIS PLAN

This section provides information on what we have learned over the past 10 years and cites the guiding principles (what remains, what should be improved, what is new). The introduction bridges the gap between then and now. It motivates the new plan.

This Plan sets out a strategic framework for GEO to fulfill its vision, achieve its strategic objectives and produce key deliverables while determining structures and resources needed to accomplish these goals. The Plan will be implemented through a set of activities within specific timeframes that will be defined in annual or multi-annual Work Programmes. While the strategic objectives are expected to endure throughout the 10-year span, the Work Programmes will be updated periodically to account for changes that impact the course of implementation.

For Plenary acceptance:

The IPWG recommends Plenary acceptance of the title proposed for this Plan (GEO Strategic Plan 2016-2025: Implementing GEOSS) and of its purpose as described here.

2 PURPOSE, SCOPE AND STRATEGIC OBJECTIVES

This section describes the GEO Mission and outlines political messages in terms of "Strategic Objectives". It scopes how GEO works, who the GEO community is, and who the GEO users are.

2.1 Purpose

(From the Vision for GEO 2025: Case for GEO)

The purpose of GEO is to further leverage its substantial accomplishments to improve the quality, timeliness, range and availability of Earth observations, data, information and knowledge in support of:

- Achieving national and international objectives for a resilient society, sustainable economies and a healthy environment worldwide;
- Addressing global and regional challenges by deepening understanding of Earth system processes and improving the link between scientific understanding and policy-making; and
- Fostering new economic opportunities, improving efficiency, and reducing costs to public sector budgets through innovation and collaboration.

2.2 Scope and Strategic Objectives

To successfully fulfill its Purpose, during 2016-2025, GEO will actively **advocate** for the value of Earth observations as the foundation of environmental information, **engage** with stakeholder communities to address every-day societal challenges, and **deliver** critical data, information and knowledge to inform decision-making. Collectively, these three areas of action – Advocate, Engage, Deliver – constitute the scope of GEO’s activity.

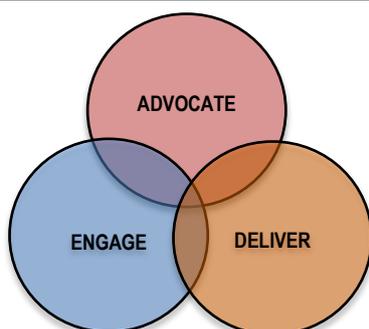
Informed, sound decision-making will lead to long-term economic benefits optimized for all elements of society, and to sustainable behavior by humankind in relation to Earth’s available environmental resources. Current and future decision-making will rely on the ability of expert communities to handle complex data from Earth observations and social and economic analyses. Through engagement with user communities, GEO will play a key role in: systematically identifying data needs and advocating for data provision; ensuring access to, while promoting interoperability among, multiple sources of data; and delivering the necessary tools, skills and services to allow intelligent exploitation of the data by the user communities. This end-to-end process of identifying needs, ensuring availability of data to develop critical information about key environmental challenges, and transforming that information into knowledge for end-users defines the scope of GEO, potentially bringing benefits to users at each step.

While recognizing the value of the GEO global approach, the IPWG fully acknowledges the clearly expressed need for strengthened regional coordination in conducting GEO activities and in implementing GEOSS, and will explore different options responding to this need.

2.3 Advocate

Strategic Objective 1:

GEO will ADVOCATE the value of Earth observations as a vital means of achieving national and international objectives for a resilient society, and sustainably growing economies and a healthy environment worldwide.



Having proven the benefits of open data sharing during its first ten years of existence, GEO will continue to be the champion and key advocate for data sharing at a global level, and will work with countries and partner organizations to endorse full and open access to Earth observation data in relevant international processes. In order to ensure continued

Figure 1: The three overlapping Strategic Objectives of GEO through 2025.

availability of Earth observation data, knowledge and information, GEO will, through its stakeholders, advocate the need to: improve observations of the Earth system; sustain national investments and leverage international collaborations; integrate emerging technologies as appropriate; and systematically identify user needs and observation gaps. To further maximize the value and benefit from data sharing, GEO will continue to work with partners to promote the use of key data management principles, as well as common standards and interoperability arrangements. This will ensure that data and information from different origins and type are comparable and compatible, facilitating their integration into models and the development of applications to derive decision support tools.

Finally, GEO will work to champion and coordinate strategies for acquiring Earth observations with relevant existing and emerging global initiatives having complementary mandates. In collaboration with these initiatives, GEO will seek to promote full and open access to Earth observation data, strengthen Earth observing networks and strategic planning, and identify the needs for applications and services in support of sound decision-making.

2.4 Engage

Strategic Objective 2:

GEO will ENGAGE with stakeholder communities to address global and regional challenges by deepening the understanding of Earth system processes and improving the links between scientific understanding and policy-making.

A key tenet of GEO's Vision is that the main purpose of publicly-acquired Earth observation data is to serve societal needs. True value is fully realized when this data is subsequently transformed into useable knowledge and information, to address these needs. GEO occupies a key, strategic, upstream coordination position in the international community with respect to observations, data and information about the Earth system, in support of other major initiatives. As such, GEO is well-positioned to actively engage with key stakeholders, including, *inter alia*, United Nations (UN) bodies, donor organizations, businesses, and other communities of intermediary- and end-users. This engagement allows the building of strategic partnerships that will inform, leverage, and optimize research and development activities. The engagement also allows the catalysis of user-driven global and regional initiatives for specific end-use applications to address the multitude of societal challenges.

The provisions/modalities to strengthen engagement with the UN and developing countries, as well as the private sector, together with the potential implications on governance, action areas and management arrangements, will be defined over the coming year.

GEO will facilitate interactions among stakeholders to identify the needs in observations, and environmental and socio-economic data analyses, which can yield advances in many Societal Benefit Areas (SBAs). Reflecting the diversity of those users of the information and knowledge supplied through GEOSS, the SBA structure should be user-focused and consistent with its user communities, with each SBA defined by its purpose and scope.

A revised set of SBAs will be defined over the coming year. Additional SBAs may be included post-2015, as they are identified. A potential, initial, non-exhaustive set of SBAs could consist of Energy, Health, Water Resource Management, Urbanization/Smart Cities, Food Security & Agriculture, Natural Resources, Disaster Management & Resilience. Such an SBA framework can serve as the primary interface between GEO and all stakeholders who wish to engage with GEO, enabling emergence of communities interested in seeking solutions to a common problem within a shared area of interest. The SBAs should not mix user domains with physical domains (e.g., "oceans" or "land cover").

To effectively and fully engage key stakeholder communities, GEO will work to augment its user base, broaden stakeholders' involvement and increase capacity in developing countries. This strategy will be pursued through community activities, and centrally-coordinated actions and initiatives, including global and regional initiatives, making use of all relevant information sources. Where appropriate, the development of associated services may also be pursued, while arranging for their subsequent uptake by relevant entities.

2.5 Deliver

Strategic Objective 3:

GEO will DELIVER data, information and knowledge enabling stakeholders to: improve their decision-making processes; promote the exchange of best practices; enable the uptake of new technologies; and create new economic opportunities, while reducing costs to public sector budgets through innovation and collaboration.

The Deliver Area of Action is where GEO directly provides specific information to particular user groups. This happens through implementing pilot programmes or projects, or operating technical elements that provide access to GEOSS resources.

Drawing on its engagement with stakeholders, GEO aims to: ensure access to data, information and knowledge, while increasingly promoting interoperability among multiple sources of data; and deliver the tools, knowledge and services suitable for intelligent exploitation by user communities.

To deliver more information and knowledge faster and farther, in response to the demand for newer and better decision support tools against the backdrop of technological innovation, GEO will advance the evolution of GEOSS. Through the implementation of a robust and user friendly GEOSS that links available systems, and by taking advantage of existing repositories, including those considered "big data", GEO will facilitate enhanced access to:

- 1) national, regional and global Earth observation data and information (including model simulations);
- 2) socio-economic data and information;
- 3) information about existing data gaps;
- 4) tools to transform a broad range of data and information, from environmental to socio-economic, into useable formats for resource management and decision-making; and
- 5) knowledge underlying the use of data, information and tools for decision-making.

A figure clarifying the relation between a number of these elements, such as Earth observation systems; other sources of data (e.g., socio-economic data); standards and interoperability; high-performance computing and modeling; visualization; user needs; decision support; and decision-makers, will be developed and included here in the final Strategic Plan.

3 AREAS OF ACTION / CORE FUNCTIONS

The actions of GEO described in this Strategic Plan are those in which GEO plays an important, often leading, role. It does not define actions taken by Members or Participating Organizations, individually or in groups, outside the scope of GEO.

This Strategic Plan defines those actions of which GEO takes ownership, to help position GEO with respect to other organizations, programmes, and stakeholders in general.

In keeping with Section 2 (Purpose, Scope and Strategic Objectives) above, GEO activities may be grouped into three areas of action – Advocate, Engage, and Deliver – and categorized as follows. It should be noted the IPWG realizes that some Core Functions could be categorized differently or into more than one area of action, as the overlapping circles in Figure 1 (Section 2) illustrate. The IPWG

considers that the categorization is primarily for presentation, and different individual views should not impact the way the Core Functions are implemented by GEO.

No priority is implied by the order of Core Functions.

3.1 Advocate

- Promote the adoption of free, full, open and timely data access as a societal benefit;
- Foster and develop commitments to strengthen and sustain observation systems (space-based, airborne and particularly *in situ*) and networks of observation systems;
- Document the need to protect the radio frequency spectra currently allocated for, and critical to, Earth observations;
- Develop common strategies to inform investment planning for observing systems to enable identification of gaps, create synergies and maximize benefits from these systems;
- Systematically identify, prioritize and mitigate gaps in information-chain knowledge, between observations and decisions in the arena of global and regional decision support;
- Document observation and related information requirements as a basis for coordinated strategies and action;
- Enable development of citizen observatories and crowd-sourcing as a means to strengthen and broaden *in situ* observing systems, as well as facilitating the use of data at multiple scales; and
- Actively promote the development of Earth observation-based information services in support of the global sustainable development agenda and evidence-based decision-making.

3.2 Engage

- Serve as a “knowledge broker”² for Earth observations and environmental information;
- Promote collective action on the basis of shared interest through fostering a coherent global observation-based understanding of key environmental challenges by stakeholders at all levels of decision-making, from political leaders to citizens;
- Demonstrate the value of Earth observations to diverse stakeholder groups, including the private sector, foundations, UN organizations, and civil society, with a purpose to cultivate demand for, and foster the use of, Earth observations;
- Grow GEO’s user base by initiating and developing relationships with communities of downstream users of Earth observations and information, and by focusing on understanding their needs, mission objectives, and preferred methods to receive and use information, in the quest to determine how GEO can help them meet those needs and objectives;
- Promote an “acting local – thinking global” mentality by strengthening national and regional capabilities to implement and make use of GEOSS, through activities such as the dissemination of best practices, strengthening of regional user communities, developing regional and national Earth observation plans, and focusing on the access to, and use of, Earth observations to deliver practical local outcomes; and

² GEO brings together the “producers” of knowledge and the potential users who need this knowledge to make decisions in a broad sense. The knowledge is collected and produced through all GEO activities and the results made accessible through GEOSS in terms of data, information, models, tools, methodologies, products, services, best practices and success stories.

- Strengthen existing communities of practice and create new ones as needed, actively promoting interoperability and connectivity among the existing and developing community portals.

3.3 Deliver

- Operate the common components of GEOSS, including a GEOSS Portal, to provide access to GEOSS data and information resources, such as a comprehensive collection of information on available Earth observations and its use (e.g., a GEO “knowledge base”);
- Provide information on the availability of, and access to, free, full, open and timely data within the GEOSS Data Collection of Open Resources for Everyone (GEOSS Data-CORE);
- Accelerate and incubate the evolution of GEOSS information delivery capabilities through prototyping services on the basis of GEOSS Implementation Pilots and new user requirements;
- Expand the content of GEOSS by systematically pursuing strategies for promoting availability of, and access to, the totality of data and information, thereby enabling users to access a complete suite of resources necessary for solving a particular problem;
- Systematically, co-define and document observation requirements, jointly with user communities, to determine and prioritize gaps in the availability of observations, and share this information as a GEOSS resource;
- Develop and implement GEOSS Data Management Principles to promote the adoption of best practices for sound data management, which include improving certain aspects such as: interoperability; data quality documentation; traceability of sources and methods for data, products and information; and long-term archiving and usability, in order to provide GEOSS users with sufficient information to judge fitness for use;
- Share best practices for creating usable information through well-coordinated Earth observations and data management;
- Progressively harmonize the attributes of GEOSS data, proceeding from a set of minimum requirements for explicitly recorded data provenance, to inter-calibration of data collected in slightly different ways to, where possible, standardization;
- Enhance the integration of observation-based models within GEOSS in order to serve user needs for spatial, temporal and variable coverage, and promote interlinkages among models in different domains;
- Include social and economic data within the scope of GEOSS; and
- Promote the principles underlying integration of different classes of data, such as remote sensing, airborne, *in situ* and citizen observations, in the GEOSS information system.

4 TARGETS AND DELIVERABLES FOR 2016-2025

This section, to be completed over the coming year, outlines the specific targets in 2016-2025 for each of the three Areas of Action, in line with the three Strategic Objectives described in Section 2 and referring to the respective Core functions.

5 MANAGEMENT

This section defines how the implementation of GEO activities will be managed. It recognizes that different types of activities require different implementation mechanisms which form the building

blocks of the overall management arrangement. In particular, this framework aims to distinguish clearly between more substantial activities with dedicated resources, and small-scale activities, often driven by best-effort initiatives of individuals. By accommodating all contributions adequately and appropriately, GEO can focus its resources on selected priorities and match expectations with available capacity. Thus, the concept framework below aims to help improve the effectiveness of the management of GEO activities.

The IPWG suggests six implementation mechanisms and identifies the key implications/features for each of them. The definition of the overall arrangement will be based on Plenary acceptance of these basic elements and on the interface with the decision-making processes and associated bodies (defined in Section 6 on Governance). The approaches to Monitoring and Evaluation will form an integral part of the overall management arrangement.

5.1 GEO Management Mechanisms

The objectives of GEO during the period 2016 to 2025 will be realized using the following six mechanisms:

- **Decisions of GEO:** decisions formally adopted by GEO are instrumental for coordinating policies or actions, advocating approaches, supporting Flagships or endorsing Initiatives. *[Adopting data management principles is one example of a GEO Decision];*
- **Community Activities:** may define user needs, explore or demonstrate technical possibilities or agree on specific protocols. Convened typically for a short period, some community activities may become: *[some Tasks or Task Components in the current Work Plan fall into this category];*
- **GEO Initiatives:** to demonstrate technical feasibility through pilot products, prove a user need and draft an implementation plan. Catalyzed by GEO and administered by the GEO Secretariat (hereafter “Secretariat”) for a 1-3 year period during which an implementing team may be formed, those which are successful in attracting sufficient commitments from GEO Members and others to be implemented graduate to becoming: *[some more substantial Tasks of the current GEO Work Plan fall into this category];*
- **GEO Flagships:** led by Steering Committees consisting of domain users and providers, self-managed with assistance from the Secretariat, annually reporting progress to Plenary and periodically evaluated for effectiveness against their agreed objectives. Some may become self-standing Participating Organizations within GEO, or subsidiaries of GEO Participating Organizations, or continue as GEO Initiatives while they are able to generate sufficient impact to attract support for their activities. Regional GEOs can be implemented using this mechanism as well. *[The Global Forest Observation Initiative (GFOI), GEO Global Agricultural Monitoring Initiative (GEOGLAM), and GEO Biodiversity Observation Network (GEO BON) may be seen as models for GEO Flagships, with some modification of how their management is linked to GEO proposed.];*
- **GEO Cross-cutting Activities:** defined in the Work Programmes and performed by GEO Community task teams, with coordination by the Secretariat, designed to promote a programmatic approach within GEO. GEO Cross-cutting Activities include, for example, Capacity Building (over and above that done in the Initiatives and Flagships); Architecture, E-infrastructure and Standards; and Gap Analysis. *[The Tasks in the cross-cutting part of the GEO Work Plan would fall into this category, as well as the work of the Data Sharing Working Group and others.];*
- **GEO Secretariat Activities:** the routine and continued actions undertaken by staff employed, seconded to or contracted by the Secretariat, in order to give effect to GEO activities. Secretariat activities include, among others, maintaining and operating the common

components of GEOSS, including the GEOSS Portal, convening and recording the Plenaries, producing the annual Work Programme and Progress Reports, and communication and outreach to existing and new stakeholders. GEO Secretariat Activities are defined in the Work Programme and Rules of Procedure.

The activity types outlined above reflect the actual evolution of GEO during its first phase; as such, formally transitioning to this structure should be feasible. At the end of its initial decade, GEO has produced three projects easily associated to Flagship-equivalent (GFOI, GEOGLAM, and GEO BON). The ambition during the second decade is to start three-to-five more, in a staggered fashion, based on the submission to Plenary of detailed demonstrations of need, capability, implementation plans and sufficient resource commitments. During the coming decade, the current Flagships will have found permanent institutional homes, or have become stand-alone organizations, or will have stopped operations. Every year, starting in 2016, GEO will support (through endorsement and, if needed, convening administrative support from the Secretariat) several Community Activities, which are selected by the Secretariat from brief proposals generated ‘bottom up’ (from the broad Earth observation community) or ‘top down’ (from GEO Plenary, Executive Committee or the Secretariat), covering the full spectrum of SBAs. These will have finite duration, and defined, measurable and achievable deliverables. Some Community Activities will be one-offs; others will demonstrate a need and potential to warrant Initiative status. If Initiatives succeed in crafting an implementation plan sufficiently compelling to attract adequate resource commitments from GEO Members and elsewhere, they will graduate to Flagships. (See Appendix, Table 1 for types of GEO Activities and their characteristics.)

5.2 The GEO Work Programme and Progress Report

All GEO Activities would fall into one of the above six categories (Section 5.1). The IPWG proposes that GEO use two instruments for managing its actions:

GEO Work Programme: An annual or multi-annual Work Programme which defines the activities to be implemented by or coordinated in the subsequent year by the Secretariat (i.e. the GEO Secretariat Activities and the GEO Cross-cutting activities, as well as some GEO Initiatives). It may also describe (for reference) the plans of GEO Flagships according to their applicable planning instruments, and Community Activities according to the best knowledge of the Secretariat. The Work Programme would be required to be consistent with the level of resources available to the Secretariat and thus require appropriate priorities be identified at the time of adoption.

GEO Progress Report: An annual report compiled by the Secretariat on all types of activities, drawing on the standard reports of the more substantial Flagships and Initiatives, and on best knowledge of Community Activities. This Progress Report should enable an evaluation of progress towards the targets identified in Section 4.

For Plenary acceptance:

The IPWG recommends Plenary acceptance that:

- 1) The six proposed Management Mechanisms (as outlined in Section 5.1 above) are sufficient to implement GEO and achieve its objectives.
- 2) The IPWG will develop a set of Management Procedures for each of the six Management Mechanisms proposed. They will become an Annex to the final Strategic Plan or included in the GEO Rules of Procedures.

6 GOVERNANCE

The GEO-X Plenary and Ministers have directed that the nature of GEO, established on a voluntary and legally non-binding basis, as well as the current basic GEO Governance structure, including the Plenary and the Executive Committee, should be maintained.

While complying with that directive, a number of Geneva Ministerial decisions and associated recommendations adopted by GEO-X Plenary have impacts on the current GEO Governance provisions; they can be summarized as follows:

- *Maintain the current nature of GEO, established as a voluntary and legally non-binding partnership;*
- *Improve the effectiveness of GEO actions;*
- *Strengthen the engagement with Participating Organizations, the UN in particular;*
- *Strengthen the engagement with developing countries as well as foster regional cooperation;*
- *Broaden the base of GEO stakeholders by engaging with non-governmental organizations, including the private sector;*
- *Explicitly broaden the purpose of GEO to include development of global/regional initiatives;*
- *Develop a knowledge base; and*
- *Sustain resources for GEOSS development and functioning.*

Consistent with the above, the Ministers gave an explicit mandate to explore modifications to the current GEO Governance, and to develop a specific and strengthened framework for sustained resource commitments.

It is appropriate to note that many GEO-X recommendations may find their practical implementation not only as part of a new Governance scheme, but also in the definition of the targets for 2016-2025 in Section 4 (e.g., prioritizing activities dedicated to developing countries), and in the Management approach outlined in Section 5.

The IPWG has consolidated a number of basic principles and elements in this regard, and has identified a number of topics that will be considered in the future, in order to develop proposals for an updated GEO Governance.

6.1 Governance Principles, Elements and Basic Organizational Structure

The extent of the Governance is defined as the decision-making process(es) within GEO, and refers to the organizational bodies mentioned above (the Plenary and the Executive Committee). The GEO Governance “structure” interfaces with the GEO Management described in Section 5 above.

6.1.1 Governance principles and elements

In order to successfully achieve its purpose and to develop all related functions, GEO implements governance arrangements consistent with the following Governance principles:

- voluntary participation;
- consensus-oriented decision-making to the extent possible;
- accountability;
- transparency;
- responsiveness;
- effectiveness;

- efficiency;
- equitability; and
- inclusiveness.

The Governance elements of GEO include:

- authority;
- decision-making mechanisms;
- stakeholder representation; and
- accountability and oversight mechanisms.

6.1.2 Basic organizational structure

GEO will meet in Plenary, the main body of GEO Principals representing GEO Members and Participating Organizations. Plenary will take decisions by consensus. GEO will also meet periodically at the Ministerial level.

The GEO Plenary may delegate explicitly and formally some of its decision-making powers to the Executive Committee and/or other bodies, to be established in accordance with the following general criteria:

- Subsidiary bodies for addressing specific aspects of GEOSS implementation, to provide a mechanism for GEO Members and Participating organizations to engage fully in the work of GEO;
- Other subsidiary bodies, as appropriate, to allow for different advisory and stakeholder representation mechanisms, such as science and technology, users, private sector, etc.; and
- A Secretariat, led by a Director and accountable to the Plenary and the Executive Committee, and other subsidiary bodies (as directed by Plenary), to facilitate and support GEO activities and GEOSS implementation. The Secretariat is to consist of well qualified professional and administrative staff.

The allocation of the Governance elements to different bodies of GEO organizational structure, as well as the composition and membership, authority delegations (if any), functions and duties, and frequency of meetings, etc., of those bodies, will be defined in depth in GEO Rules of Procedure, approved by the GEO Plenary and updated as needed.

For Plenary consideration:

The IPWG seeks Plenary guidance as to the appropriateness and completeness of the Governance principles and elements (as outlined in Section 6.1.1 above).

For Plenary acceptance:

- The IPWG recommends Plenary acceptance of the basic organizational structure (as outlined in Section 6.1.2 above), in particular the principle of Plenary delegation of decision-making powers to subsidiary bodies. While allowing the possibility to revoke that delegation at any time, this provision could increase flexibility in decision-making and responsiveness to quickly changing environments; and
- The IPWG recommends Plenary acceptance of including a consensus-derived set of Governance principles and elements in the final Strategic Plan, while recognizing the GEO Rules of Procedure remain the tool to define, in detail, the organizational bodies' functions, interactions and composition.

6.2 Topics to Explore

The IPWG has identified an initial list of main topics (many of them interrelated) to be explored to derive different scenarios that, while maintaining the basic Governance structure, could maximize the efficiency, effectiveness and success of GEO through 2025.

Topic 1: Should GEO distinguish among different categories of Participating Organizations? This categorization could provide for differentiated roles in GEO's advisory or decision-making bodies, and be an instrument to strengthen the role of Participating Organizations in GEO.

Topic 2: In connection with Topic 1, should the criteria for becoming a GEO Member or Participating Organization being revised, both in term of pre-requisites for admission and “rights and obligations” pertaining to the Partnership?

Topic 3: Should Participating Organizations be granted decision rights at Plenary?

Topic 4: Should the criteria for Executive Committee composition and the mechanisms for nomination be reviewed? In particular:

- Should the capacities of the Executive Committee be strengthened by involving Participating Organizations as members and/or observers?
- Should a certain fraction of Executive Committee Membership be allocated to developing countries?
- Should there be rotation of the Executive Committee Co-Chairs to allow for more inclusiveness and diversity in leadership, thus permitting all GEO Members to contribute more significantly to the goals and objectives of GEOSS?

Topic 5: Should GEO explore options that will enhance its management capabilities, such as:

- Obtaining administrative legal status within the next decade?
- Developing regional and/or distributed structures for the Secretariat?

For Plenary consideration:

The IPWG seeks Plenary guidance as to the appropriateness and completeness of the topics for exploration (as outlined in Section 6.2 above), and an indication of whether the IPWG should proceed to develop options for each.

7 RESOURCES THROUGH 2025

The lack of a robust resourcing mechanism has been identified as a primary obstacle to the success of GEO. It has led to frustration among those who have contributed their expertise, time and effort to GEO's activities. The uncertainties around the contributions to the GEO Trust Fund have also been noted in the independent audits of the Fund. The auditors have repeatedly recommended modifying the framework allowing the Secretariat to operate on a known budget.

Contributions to GEO may be distinguished as: (i) contributions to the GEO Trust Fund supporting the operations of the Secretariat; and (ii) contributions to GEO activities. Contributions may generally be in-kind or cash contributions.

The GEO Ministerial has agreed that “the resourcing mechanisms for the implementation of GEOSS through 2025 will continue to rely on voluntary contributions” and that “a specific and strengthened framework or mechanism for steady resource commitments to GEOSS, from both public and non-public sources, will be developed by 2016” (Vision for GEO 2025).

At this time, the IPWG proposes the mechanism of Programme Proposals for the GEO Flagships (see Section 5) as one element of a strengthened resourcing framework for GEO activities. The IPWG

intends to continue developing further options for a strengthened resourcing framework under the voluntary contribution principle, including contributions from Members, Participating Organizations, and other Stakeholders, both from public and private sectors.

7.1 Voluntary Contributions

Members and Participating Organizations may make voluntary financial or other contributions for GEO activities, including the resources commensurate for any agreed-upon activities of the Secretariat, through a Trust Fund to be administered by the Secretariat.

Other entities may make contributions to finance specific activities in the GEO framework.

The total costs for carrying out GEO's activities in all Areas of Action (Section 3), particularly implementing GEOSS, are significant, and most of the resources will be provided through existing national and international mechanisms within their ongoing mandates, and by voluntary contributions to GEO Flagships, GEO Initiatives, Community and Cross-cutting activities.

Within the coming year, the IPWG will be developing concrete resourcing recommendations, informed by other relevant work within the GEO community, such as developing and implementing a Resource Mobilization Strategy in order to explore, identify and leverage existing international, regional and national funding mechanisms.

7.2 Options to Explore for the GEO Trust Fund

Possible resourcing options for the GEO Trust Fund:

- Option 7.2a: Maintain status quo (the current model of voluntary contributions will be maintained);
- Option 7.2b: GEO will establish an **indicative, non-binding scale of contributions** to the GEO Trust Fund, based on the budget requirements to implement the GEO Work Programme.

An indicative, non-binding scale of contributions to the GEO Trust Fund may help align available resources with activities planned and supported by the Secretariat, and may also support national administrations in determining their cash contribution to the Trust Fund. Though not mandatory, the indicative scale could lead to additional contributions which would allow GEO to operate within a sounder, more predictable financial framework. The Work Programme and budget could be developed consistently with the expected level of resources, and GEO Members could prioritize the activities within this budget.

For Plenary consideration:

The IPWG seeks Plenary guidance as to whether the IPWG should develop options for an indicative scale of contributions for resourcing the GEO Trust Fund.

8 GETTING INTO ACTION - TIMETABLE OF IMPLEMENTATION

This section, to be completed over the coming year, describes the basic elements of the timetable for implementation, including the Work Programme and its review mechanism, the annual Report on Progress, and mechanisms for providing a smooth transition from the initial GEOSS 10-Year Implementation Plan 2005-2015 to the new GEO Strategic Plan 2016-2025: Implementing GEOSS. The timetable will be related to Sections 4 (Targets and Deliverables for 2016-2025) and 5 (Management) to ensure coherence.

ANNEX

FOUNDATIONAL DOCUMENTS

This section references the GEO foundational documents, including the Vision for GEO 2025, Ministerial Declarations, etc., that will be included in the final Strategic Plan.

APPENDIX

Table 1: Types of GEO Activities and their characteristics

	Six ways to operate					
	GEO Decisions	Community Activities	GEO Initiatives	GEO Flagships	GEO Secretariat Activities	Cross-cutting activities
Selection based on	Discussion in Plenary and supporting documents.	Brief proposal.	Proposal.	Proposed Flagship Plan.	Work Programme and Rules of Procedure.	Terms of reference from Work Programme, based on necessity for and alignment with GEO targets.
Decision to start taken by	Plenary.	Secretariat.	Executive Committee.	Plenary.	Plenary by approving Work Programme; Executive Committee for urgent inter-sessional activities.	Plenary by approving Work Programme.
Oversight and direction	Plenary.	Self-formed team.	Steering group drawn mainly from GEO Members.	Steering group drawn from GEO Members/ Executive Committee.	Executive Committee.	Working Group (WG) with appointed leader following terms of reference.
Coordination/administration	Not applicable.	By the proposing group, assisted on request by Secretariat.	By the proposing group, assisted on request by Secretariat.	By the Flagship management, with dedicated coordinator in Secretariat.	Secretariat.	Secretariat.
GEO Secretariat role	Organisation and reporting.	Facilitation, convening assistance, communication of outputs.	Assists with proposal and initial arrangements, seed resources.	Day by day coordination.	Fully responsible.	Facilitation and support.
Reporting by whom and to whom	Secretariat to GEO and stakeholders.	Community involved, as final report or deliverable.	Group involved, to Secretariat, minimal.	Community leadership, to Plenary.	Secretariat via Executive Committee to Plenary.	WG chairs to Plenary via report to GEO Secretariat.
Monitoring & Evaluation	Number, outcome and Impact of decisions, decadal.	Activities completed; deliverables produced.	Number initiated and number becoming Flagships.	According to M&E defined in their Implementation Plans.	Cost and effectiveness measures annually reported and evaluated every 5 years.	Number and outcomes of activities.
Role of stakeholders	Present in Plenary or informed by outreach.	Process is very broad, open and inclusive.	Required own user and stakeholder process.	Required own user and stakeholder process.	GEO is stakeholder.	Often desirable to be inclusive beyond GEO Members.

	Six ways to operate					
	GEO Decisions	Community Activities	GEO Initiatives	GEO Flagships	GEO Secretariat Activities	Cross-cutting activities
Typical characteristics	Plenary decisions on topics that require follow-up actions: advocate, engage, deliver.	Activities undertaken by and for the EO community, aligned with GEO objectives, very light touch by GEO (endorses on basis of brief proposal, receives and communicates deliverable).	- Conceptual definition of new initiatives. -1-2 year cycle. - Output is Proposed Implementation Plan covering technical proof of concept, user needs, observations and products, resources.	- Multiyear (6-10). - Required user engagement. -Based on full program proposal, deliverables, including timeline, resources, exit clause & transition plan; partners contributions.	Specific task assigned to Secretariat and suitably resourced.	Activities as needed. Requiring community decision or action on issues affecting several use social benefit or observation domains.
Examples	Open Data Adoption of Flagships.	Determine user needs in a domain, develop a product, and explore observation technology.	Forest Carbon Tracker, which then evolved into GFOI.	GEOBON, GEOGLAM, GFOI. Potential Regional GEOs.	Implementing the GEOSS Portal, communication and outreach, monitoring and reporting on GEOSS Implementation.	Data Sharing WG. Data Management WG. Gap analysis activities. M&E activities.