

Interim Report of the Implementation Plan Working Group: Towards the 10-Year Implementation Plan 2016-2025

The Executive Committee is requested to comment on the Interim Report and provide further guidance to the Implementation Plan Working Group on the development of the new Implementation Plan 2016-2025.

To respond to the Ministers' request at the Geneva Summit in January 2014, an Implementation Plan Working Group (IPWG) has been established to draft a new 10-year Implementation Plan (2016-2025) for initial review at the GEO-XI Plenary in November 2014 and for acceptance at the GEO-XII Plenary, and subsequent endorsement at the associated Ministerial Summit, at the end of 2015.

Nominations to the IPWG were forwarded by each caucus; the GEO Co-Chairs reviewed these nominations and proposed the composition of the Group that was then endorsed by the GEO Executive Committee on 31 March 2014.

The GEO Executive Committee and GEO Co-Chairs received the mandate from the Plenary to oversee and steer the process of developing the new 10-year Implementation Plan and they agreed to a two-phase approach to guide the IPWG work an initial reflective phase, followed by a longer 'synthesis and formulation' phase.

The initial reflective phase – or 'fresh perspectives' exercise – started with the 1st IPWG face to face meeting on 10-11 April 2014 and ended with the submission to the GEO Executive Committee of this Interim Report, which summarizes the results of the IPWG work.

The Interim Report is officially transmitted to the Executive Committee by the two IPWG Facilitators (transmittal letter in Appendix 1).

The Interim Report is enclosed as Appendix 2.

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APPENDIX 1

REPORT TRANSMITTAL LETTER FROM THE IPWG FACILITATORS TO THE
EXECUTIVE COMMITTEE



Group on Earth Observations (GEO)
Executive Committee
Geneva, Switzerland

June 24, 2014

Dear Members of the Executive Committee,

On behalf of the Implementation Plan Working Group (IPWG) we are pleased to provide you with an update on the IPWG's activities and progress. During the first phase of the IPWG's deliberations, the 'reflective phase', the group was tasked to consider what the next ten years of GEO/GEOSS will look like. In bringing this phase to a close, the IPWG is submitting for your consideration the "Interim Report of the Implementation Plan Working Group: towards the 10-year Implementation Plan 2016-2025", which summarizes the results of the first phase of the IPWG's work. This Interim Report represents the first step along the path to developing the Implementation Plan, and it is the intention of the IPWG to share it with the broader GEO community following its presentation to you.

The report outlines the IPWG's thought process during the 'reflective phase' by providing an overview of stakeholders' expectations, an analysis of the evolving context since the drafting of the first Implementation Plan, lessons from the past, and considerations for the future. Of particular note, the IPWG will seek your guidance on the considerations for the future and the way forward. The considerations have been grouped into three categories: 1) Functions/activities to maintain and strengthen; 2) Opportunities for improvement; 3) New action areas to explore.

With a separate document, a revised Terms of Reference that reflect how the IPWG is working are also submitted for your endorsement.

As we advance to the next phase, the IPWG has established a process to name co-chairs and organize itself. The group will continue to engage with stakeholders during the summer months as it prepares to meet again in late summer in China.

Looking forward to a fulsome discussion at the forthcoming Executive Committee meeting,

Sincerely,



Danielle Lacasse



Stuart Minchin

IPWG Phase 1 Facilitators

APPENDIX 2

**INTERIM REPORT OF THE IMPLEMENTATION PLAN WORKING GROUP
TOWARDS THE 10 YEAR IMPLEMENTATION PLAN 2016-2025**

**INTERIM REPORT OF THE IPWG:
TOWARDS THE 10 YEAR IMPLEMENTATION PLAN 2016 -2025**

PREFACE

In writing this report, members of the Implementation Plan Working Group (IPWG) have attempted to highlight key messages about what needs to change in GEO as it embarks in its second decade. In doing so, the IPWG has tried to reach a balance between outlining our successes and areas where improvement is needed. As part of the GEO community IPWG members are proud of what has been accomplished, how far GEO has come since 2005 and fully appreciate the engagement and wisdom that other members of the Community have brought to this process. GEO/GEOSS is a success story, full of energy and dynamism and well on the way to maturity. The IPWG is relying on the community's contribution to help us make a good plan for the next 10 years so the success story continues.

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1 INTRODUCTION

Global environmental issues are among the primary challenges of mankind today. Concerted, global action is needed to respond to these challenges in a sustainable and equitable way to improve living conditions for all people and ensure good living conditions for future generations. Sustainability and equitability require that humankind makes intelligent decisions about the use of increasingly scarce resources (e.g. food, water and energy) and recognizes the interdependencies between behavior and effects on the planet.

Crises, such as major natural disasters, climate extremes including floods, droughts and heat-waves, and pandemics of infectious disease, jeopardize water, food and energy security, endanger ecosystems, and cause loss of life and property.

In this inter-connected world, the impact of one event can immediately cross borders and bring cascading consequences to geographically remote countries. Earth observations from all sources together provide powerful tools for understanding the present and potential consequences of human action on the planet and provides a framework to better manage these risks and create more resilient society. In this context, GEO/GEOSS represents a unique initiative, which enables the integration of Earth observations globally to facilitate decision-making. The graphic below represents the role of GEO/GEOSS in support of sustainable development and human security.

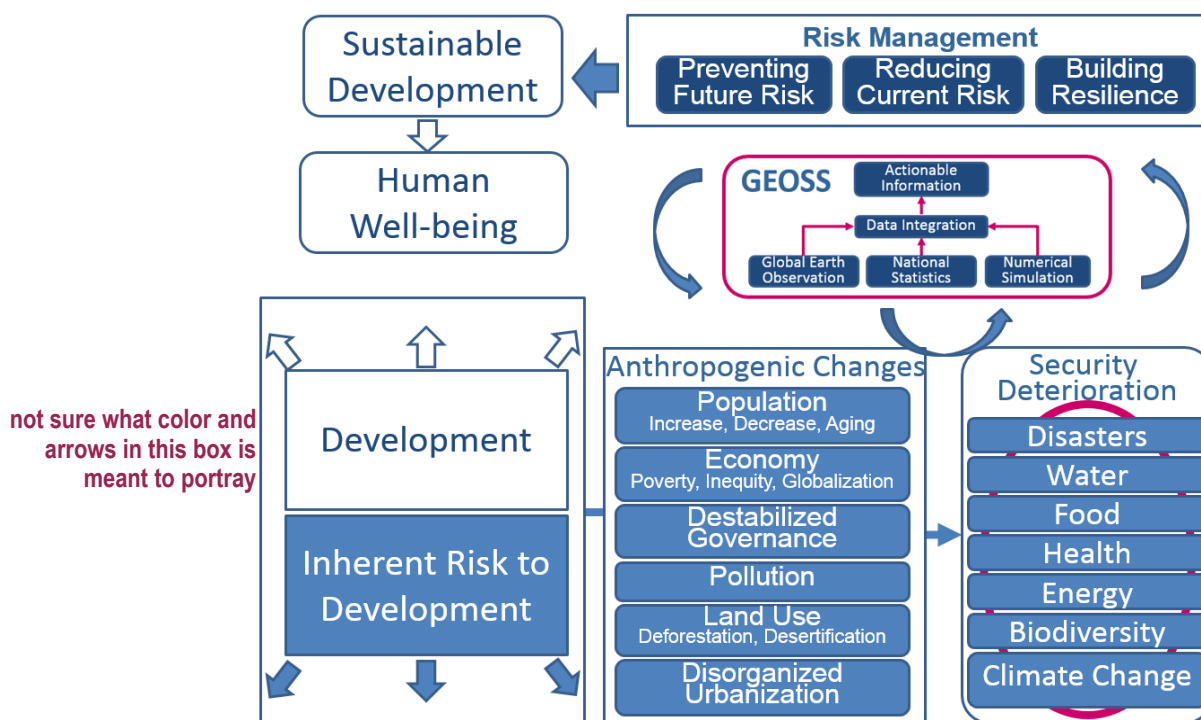


Figure: The role of GEOSS towards sustainable development and human security.

A collective global effort and know-how is required to use Earth observation resources to their full potential. For a truly global impact, this effort must include participation of all stakeholders in developed and developing countries. Shared interests and common objectives will drive cooperation and enable common approaches to address challenges.

In recognition of this effort, Ministers of member countries of GEO agreed in January 2014 to extend the mandate of GEO for a further 10 years in order to respond to these societal challenges. The

Implementation Plan Working Group (IPWG) was formed to prepare an implementation plan building on the accomplishments to-date and Ministerial outcomes. This interim report represents a first deliverable from the IPWG to the GEO Executive Committee, and marks the end of the initial reflective phase, or 'fresh perspectives' exercise. It represents a key milestone towards the Implementation Plan, an initial outline of which will be presented to the GEO Plenary in Gabon in November 2014. This outline of the IP will include, in particular, issues and various scenarios upon which the IPWG would welcome guidance from the Plenary.

The 'fresh perspectives' phase was a window of opportunity to bring nominated experts together, to gather exchanges and individual thoughts and to build the group into a collaborative structure. The work was framed by the considerable foundations provided by GEO Vision 2025 and Plenary / Ministerial documents from late 2013 / early 2014. The group has revisited these documents and tested key statements through dialogue and questioning, as well as through consultation with the GEO community to ascertain that we share a common understanding and identify where further development or refinements are needed.

Whilst this report was requested by the Executive Committee, the IPWG sees the report as a means to provide insight for the wider GEO community about IPWG reflections and as a mechanism to further the pace of engagement across the community, participating organisations and member countries.

The decision from the Ministerial Summit in Geneva in January 2014 to renew the mandate of the Group on Earth Observations (GEO) stems from the very definition, of GEO:

- *Is a unique global initiative mandated to coordinate and facilitate the integration of, and access to the data from atmosphere, land and ocean observing networks (both in situ and remote sensing) and their associated information systems;*
- *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; and*
- *brings together Governments and all relevant intergovernmental, international and regional organizations, Non-Governmental Organizations (NGO) and the private sector, all with an interest in Earth observations, under a flexible, voluntary framework for coordinating strategies and investments, as well as developing new initiatives, through the on-going implementation and use of the Global Earth Observation System of Systems (GEOSS) as the main vehicle for cooperation.*

As we develop the implementation plan through to 2025, GEO is being positioned to play a key role in catalyzing this global action to help governments, institutions, and citizens around the world to make informed decisions. Today's decisions require a vast amount of information from a large variety of sources. Provision of information of different origin and type but in comparable and compatible forms requires multi-stage and strong information management, which in turn requires a wide range of expertise. Integrating physical data with social and economic information will enable rigorous analysis and information analytics. Decision-makers and individuals need usable and actionable information and knowledge on a temporal scale ranging from real-time to climate-scale, and on a spatial scale ranging from local to global.

With the vast expertise and capabilities of its internal stakeholders ranging from data providers, scientific bodies, technology companies, and information users, global cooperation through GEO will afford global communities the means to accurate, quality, timely, useful information.

2 DRIVERS FOR CHANGE, CONSULTATION WITH STAKEHOLDERS, LESSONS LEARNED AND STRENGTHS WEAKNESSES OPPORTUNITIES AND THREATS

This section outlines how the landscape has evolved during the first decade of GEO/GEOSS. Some attention is given to external drivers as well as to how GEO/GEOSS itself has evolved. A summary of key messages derived from consultation with stakeholders is also included. Together these elements create the basis for an overview analysis of some strengths, weaknesses, opportunities and threats (SWOT). This information is drawn together into several key lessons learned and forms the basis for the action areas for GEO presented in section 3.

2.1 Input from the GEO community to the fresh perspectives phase of the GEO Implementation plan

As a starting point, the IPWG took note of: “the 2014 GEO Ministerial Declaration” from the Geneva Summit; the “Summary of the discussions from the Ministerial Session: Guidance for the Future of GEO”, as prepared for the IPWG by the GEO Secretariat; and the recommendations set out in the “Vision for GEO 2025”, which were adopted by the GEO-X Plenary. In accordance with its mandate, during this initial phase the IPWG has also sought input from across the GEO Community, most notably from existing GEO Working Groups and Implementation Boards, and those carrying out Work Plan tasks through IPWG engagement at the GEO Work Plan Symposium. The IPWG also conducted a survey within the GEO Community. The GEO Community Engagement Process during Phase 1 is summarized in the **Enclosure 1** to this Report. This section synthesizes the results of the consultation with stakeholders to-date into brief statements as well as grouping some thoughts from the community into fresh perspectives.

GEO’s organizing principles and foundations are still valid.

The unique aspects of GEO should be kept: the System of Systems; a Community of Communities approach, which provides a great deal of flexibility to work with different stakeholders from different sectors, (GEO Members, POs, the private sector, etc.); and the agility and flexibility in the GEO structure which enables key challenges to be addressed quickly. However, it is also important for GEO not to repeat any mistakes made during the period 2005-2014 and to carefully apply the lessons learnt.

New technologies

GEO has a key role to play and should strengthen its efforts to ensure that relevant new technologies can be easily implemented and then evaluated over time.

GEO has been very successful in those collaborative efforts where its role in relation to other organisations has been clearly defined and accepted by all.

Noteworthy examples include, e.g., GEOGLAM, GFOI, CEOS, etc. However, perceptions of GEO's role vary widely and this lack of clarity has been a barrier to GEO achieving its full potential. GEO should therefore clearly articulate its unique role and mission, especially with respect to other international organisations.

Contradictions between broad statements in strategic documents and the actual delivered enhancements.

The future Strategic Targets need to be specific, measurable and achievable under the scope of GEO's activities, reflecting the potential and constraints of the Implementation Plan period and GEO's commitment mechanisms.

A concise and clear understanding of the targeted GEOSS users is essential.

To date, many GEO participants acknowledge that the first 10-year period has largely been driven by a data-provider perspective and that GEO action has mainly focused on access to data and information that exists. To really be user-driven, GEO should therefore have a more ambitious objective and also

look at what is needed, understand what is missing and act to make it available. The next years should focus more on users, rather than on development: delivery to end-users should be a priority.

Systematic user engagement

Progress has been made to identify and engage users in many specific areas, but these efforts have not yet become systematic. For example, all five M&E evaluations have pointed to gaps in user engagement and have themselves had difficulty in obtaining user input to the evaluation process. GEO should therefore target key categories of users, particularly those who require Earth observations and information for the production of end-user products and services and who need information from multiple domains or disciplines. Better use should also be made of Communities of Practice, seeing one of their functionalities as that of users with links to scientific communities in particular.

GEOSS Common Infrastructure (GCI)

The need for implementing a more robust GCI and its operations varies depending on the users. Sustainable funding arrangements to both develop and operate GCI beyond 2015 are needed in order to meet user expectations

GEO/GEOSS relevance is key to GEOSS sustainability.

There is a need to convert environmental information into relevant and sought-after economic and social information.

The modelling effort and connection to modelling communities needs to be enhanced

Although model products are present in GEOSS, they don't currently stand out and they don't have a champion. GEO should be very clear that modelling is an integral part of GEOSS. This effort may be enhanced by the use of a Model Web.

will the term "Model Web" be understood by EcComm?

GEO needs more resources and stronger commitments.

Use instead "Many statements were made regarding dysfunctional management at the task level"

Many statements state that there is dysfunctional management at task level, with a lack of resources permeating every aspect of implementation.

Work Plan Task commitment is both uneven and inconsistent.

GEO has shifted over time from what might be termed a more "bottom-up" process, whereby any and all contributions were accepted into the Work Plan, to a more "top-down" process in which there is a conscious intent to manage the Tasks so as to maximise progress towards the Strategic Targets. To increase GEO's ability to achieve its objectives and alleviate some of the burden and inefficiencies associated with reporting and management, one step may be to have categories of contributions to the Work Plan, where "core" activities are subject to greater reporting requirements and greater management attention, while "non-core" contributions may still be accepted, but without triggering the same degree of effort in tracking.

There is a lack of in-situ observation network coordination.

GEO should define actions to help in-situ communities to act in a more coordinated fashion. For example, virtual in-situ constellations could be created, (similar to that of the global seismology network). GEO should also consider establishing in-situ network forums to define appropriate "global" networks and to incentivise countries to develop, share data and sustain operations of the agreed national complements.

Fresh Perspectives from the Community

A key deliverable of the IPWG during this first phase was to seek out 'fresh perspectives' for the next GEOSS Implementation Plan. Stakeholders delivered some new ideas that the IPWG will reflect upon during the second phase of its work. Namely stakeholders indicated that:

- **GEO should consider making Essential Variables a core concept for the next IP**, (whilst recognizing that it can take a long time to agree on Essential Variables);
- **GEO should develop and initiate ‘coordinating talks’ with other organisations** about their needs, what we can provide, thereby enabling GEO to contribute towards their goals. GEO should act strategically when reaching out to other organisations, looking to build “strategic working” partnerships;
- **GEO should consider developing a "Community of Communities" framework for the implementation of GEOSS Post-2015**. This would: build on existing capacities, enhancing communities, whilst respecting their mandates and not supplanting them; offer a high level of flexibility; be open to new innovations as technology evolves; provide the capability for interoperability between communities and sources of cultural, social and economic information, which will play a critical role in decision making;
- **GEO should seek to become the point of reference for Earth observations and information in the area of the Sustainable Development Goals (SDGs)**. Given the need for both monitoring and “understanding” in support of the SDGs, GEO should align its agenda with that of the SDGs;
- **GEO should support timely and knowledge-based decision-making in both public and private spheres** for improving the quality of life of people around the world and advancing global sustainability;
- **GEO should take account of the changing “data landscape”, with Governments now often passing responsibility for data collection to the private sector and to social media**. This leads to a more complicated “data landscape”, with the private sector moving beyond a simple “data provider / value-added service / end-user” categorisation, to one in which data providers within the private sector are also investing in data processing services to better serve users by quickly moving to product generation;
- **GEO should look to “add value” for the private sector by:** increasing the Earth observation market (e.g. facilitating business development); facilitating the dialogue between policy and decision makers and service providers; sharing the responsibility and costs for innovation and capacity building; etc.;
- **GEO should recognise that the “service provider” constituency of the Private Sector will want to use the GEOSS data infrastructure**. GEO will therefore need to identify and support those functionalities that are required to support application development. GEO should also engage with the Private Sector to ensure that the Private Sector will contribute towards the costs of upgrading the infrastructure to serve the private sector’s needs.

2.2 Drivers for change: A scan of key external trends affecting GEO in the last ten years

Much has changed in the world since the intergovernmental Group on Earth Observations developed the first GEO Implementation Plan. Technology and science has progressed significantly, there has been an increasing realization of the scale of environmental changes affecting the planet, the political and policy context has shifted and the social and economic changes affecting the world have been global in scale and impact. “have progressed”

In order for the second GEO Implementation Plan to address the challenges and opportunities offered by these global changes, first they must be acknowledged and understood. This chapter aims to highlight some of the key changes in the last ten years, which have impacted the implementation of GEOSS and should therefore inform the approach and scope of the 2016 - 2025 Implementation Plan. This list is not exhaustive, but highlights some of the most important trends.

2.2.1 Advances in Science and Technology

Internet, applications, and smart phones

The rapid growth of Internet content, applications and the explosion of smart phone use is driving new ways to consume, create and manipulate information.

Rising expectations of being connected anywhere and anytime

There is a growing trend in both consumers and workplaces to expect global connectivity, and access to communication and information outside of our offices/homes.

Google granting public access to, and increasing expectation of, geographic information

The advent of Google Maps and Google Earth in the early days of GEO transformed user expectations and led to a growing familiarity with geospatial information and earth observations.

Spatial location services/GPS in everything/improvements in spatial accuracy

The development of smaller and more accurate GPS sensors during the last ten years has allowed highly accurate geospatial location to be built into handheld devices and mobile phones, enabling a range of location aware services.

Information and Communication Technology (ICT) advancements

Increasingly, advances in ICT are transforming our ability to make use of Earth observations. A mobile phone today contains more computing power and storage than an average desktop computer during the time development of the first GEO implementation plan. There has been an increasing trend to using modular software systems and increasing use and sophistication in the development and standardization of open source software tools.

Crowdsourcing and sensors in mobile phones (for both data acquisition and dissemination)

The power of harnessing “the crowd” in large-scale analysis of data has been demonstrated a number of times over the last ten years. Crowdsourcing was used after the Haiti earthquake to rapidly map the street network and inform emergency and recovery services of the status of buildings impacted. The increasing inclusion of sensitive sensors in mobile phones and also machines, along with accurate location awareness raises the tantalizing potential of crowd sourcing acquisition and calibration.

New space/satellite missions

Advances in the development of satellite observation platforms continues apace, with the development and continuation of key operational earth observation platforms with open data policies such as Landsat and the European Sentinel satellite series becoming increasingly useful in providing a long term record of change.

Physical/Geophysical data and advances in monitoring technology

Our ability to gain insights about the depths of the oceans and the subsurface of our planet has developed significantly over the last ten years using new geophysical approaches to data acquisition. As well as development of new geophysical methods, the ongoing process of miniaturization and mass production of useful sensors has led a revolution in the capability of sensing devices.

Airborne missions (including UAVs)

There is currently rapid global development of airborne earth observation systems, driven largely by the relatively affordable deployment of Unmanned Aerial Vehicle (UAV) technology.

Citizens' Observatories

A rapidly developing and important change is the emerging importance of Citizens' Observatories. Citizens' Observatories are based upon the development of community-based environmental monitoring and information systems using innovative and novel Earth observation applications.

Advances in High Performance Computing and High Performance Data/Big data

The advent of increasingly powerful supercomputing facilities combined with organization of Earth observation data at the same location as the computational power has the potential to revolutionize Earth observation data handling.

Modelling advances (including integration and interpretation)

Advances in computing power now enable more complex, interdependent models that more adequately represent the physical systems. The combination of empirical, deterministic and Bayesian approaches to modeling and the application of these to modeling of complex interrelated earth systems and processes is progressing apace, but the reliability of model predictions is an area of increased scientific scrutiny. **mention should be made also of advances in earth system modeling frameworks that make it easier to share and link model components.**

Data quality, uncertainty and traceability

Some of the key emerging issues for the use of Earth observations to support decision making are the issues of data quality, reliability, uncertainty and information provenance (traceability). Decisions are increasingly being made on the basis of Earth observation information that may derive from a mix of source sensors, organisations and countries. Understanding the quality of this information and its "fitness for use" is increasingly critical information for the user to understand.

yes to understanding quality and fitness for use, but also important is figuring out how to convey this information in a clear and consistent manner

2.2.2 Environmental Change

Ten years is a short period in which to observe and measure environmental change. Many of the environmental change drivers listed here are the same as they were when the first GEO Implementation Plan was developed. If anything has changed, it is perhaps our understanding of these changes and the urgency of our need to address them. Having the capability to measure, understand and act on these global changes was one of the key reasons for the formation of GEO and the development of GEOSS.

Climate change international consensus: IPCC sets out challenges ahead

The last ten years has seen the issue of anthropogenic climate change become a major focus of world governments. IPCC predictions for climate change over the last ten years have reflected broad scientific consensus and there has been a convergence among climate scientists globally about the scale of the changes we will see, and a recognition that we have already started to see some of the impacts of this change. Increasing challenges with weather and natural systems are one aspect with frequency and/or severity of natural phenomena such as earthquakes, floods, droughts, cyclones, storms, fires and heat waves are predicted in many areas of the world.

Impacts on the natural and human environments; Impact on food security

Climate change and human development has increased stresses on our environment over the past decade. A trend of increasing urbanization and a move from subsistence agriculture to modern farming methods has driven a rise in agricultural productivity across many areas of the world. The pace of these adjustments has slowed however as we have begun to hit the natural limits of our environment and constraints such as nutrient, soil and water availability will impact global food security in the very near future.

Focus on adaptation

The global scientific consensus is that human induced climate change is now inevitable, while limiting the extent and severity of the change is the subject of significant international negotiations and activity. The predicted increase in extreme events (droughts, floods, cyclones, fires, earthquakes) will require the earth observation community to develop tools and services which support the global population to adapt, prepare and mitigate the risks of these changes.

Water, water quality and availability

Water stress and scarcity are affecting and will continue to affect the stability of communities in the next decade, leading to many more countries experiencing water stress (This is caused by a combination of changes water availability due to environmental factors and population related trends in these countries).

Ocean acidification

As carbon dioxide levels rise in the atmosphere, the oceans buffering effect is leading to a change in the carbonate/bicarbonate balance and the world's oceans are becoming more acidic. The impacts of this to coral reefs, ocean productivity and biodiversity are only now being understood and the importance of international cooperation to understand, observe, model and manage these impacts has never been greater.

Land use change, deforestation, forest degradation

The impact of land use change and deforestation on greenhouse gas accounting has become much clearer over the past decade. Reducing deforestation and forest degradation has become a key focus of action by countries to mitigate the extent of anthropogenic climate change.

*2.2.3 Political, Social and Economic Changes***Increasing globalization and international cooperation**

The past ten years have seen some real successes in international cooperation in the Earth observation and information domains. At the same time, continued globalization of the economy is a major “driver for change”. Globalized production and trade increase the need for global monitoring of these activities to improve the evidence base for resource management and related decision-making (e.g. agriculture, forestry, fisheries, energy).

Vulnerability to global environmental change

Society is becoming increasingly vulnerable to severe extreme weather, climate and water events. Vulnerability is driven by both risk and exposure, and is not solely driven by changes to weather or natural risk, but also due to population and societal changes.

New business models and economic valuation paradigms

New business models continue to emerge for information and services, driven by innovation in technology and sophistication in computer power and accessibility. The recognition of the value provided by ecosystem services themselves has increasingly been recognized in economic terms. The implications of this shift for ensuring we have the Earth observation information to measure and track these services will have big implications over the next 10 years.

Changing concepts of community

Our traditional concept of communities has been largely geographically driven, driven by the primacy of nation states and the concept that we have more in common with the people that live in our proximity than those living far away. The increase in global connectivity and improvements in communication, the rise of social media and the ability to associate with likeminded people

geographically distant is changing our concept of communities. A set of GEO/GEOSS communities have emerged in the first decade of GEO and thus the design of the second implementation plan will be different, seeking to actively engage the community in the design phase as well as allowing for adaptation to the changing concepts of community in the timeframe of the next ten year. These, and other communities now exist in an increasingly non-geographic sense. The implication of this on decision-making and global political evolution is still unclear.

Changing GEO/GEOSS stakeholder profiles

Similarly, the stakeholder base of GEO/GEOSS has grown and changed significantly in the last 10 years. There are now dozens of new players, including a rapidly growing private sector engaging with GEO and the focus of activity within GEOSS has expanded much broader than satellite based observation to recognize the critical role of in-situ, airborne, and modeling data in a global earth observing system.

2.3 Internal factors - Common threads and lessons learnt

As the IPWG needs to be cognizant of the rapidly changing world and emerging expectations from stakeholders to help shape the next Implementation Plan, it also needs to carefully review the lessons learned from GEO's successes and challenges over the past decade. Some key trends outlining what were the success or failure factors for GEO are outlined below. These reflect a combination of what the IPWG heard from the GEO community, results from the GEO evaluations, as well as IPWG's own SWOT analysis, which is found in **Enclosure 2**.

Individual commitment – A strong driver on which to build

The nature of GEO “voluntary commitment framework” has been interpreted differently in different cases and is often not reliable enough to build on. Sometimes this is perceived as a lack of real national engagement and has led to increased insecurity beyond the work area directly affected. There needs to be a strengthening that “commitments” translate into real-world delivery even if made voluntarily. Personal engagement in GEO is often a strong driver for individuals to maintain their commitment; links between individual, regional and national objectives and commitments need to be strengthened.

Global initiatives – A success model to follow

mismatched case Global Initiatives (e.g. GFOI, GLAM, GEOBON,) targeted around a specific use case and global policy issue are considered a success; there is wide-spread recognition that GEO has been good at nurturing these. Common elements for success were identified, including: specific and committed resources by few initially, engagement of principal players early on (including users) and a hand-over plan to key external players/stakeholders. These initiatives articulated clearly the niche of GEO *vis-à-vis* other international organizations in these processes and avoided perceived competition with Participating Organizations. Based on these positive learnings, the global initiative approach needs to be broadened so that the niche of GEO in relation to other global issues is clearly set out.

A need to better define and communicate GEO's own “brand”

As demonstrated in the previous paragraph, GEO was successful in carving its own niche through the global initiatives. Similarly, the GEO “brand” has been effective in linking and consolidating existing disparate activities into a “system of systems”. However, this process has at times created tensions related to perceived “re-branding” by GEO (i.e. putting GEO stamp on others' activities) without perceived added value. The GEO “brand” needs to be more specifically associated with improvements it brings, whether through resources, principles, guidance, coordination or cooperation. A more proactive communication strategy is also needed to better communicate GEO's value-added.

Engagement of users still too often sporadic

The lack of systematic user engagement and ambiguity about who the targeted users are has been noted as an ongoing limitation in evaluations.

Lack of prioritisation prevents effective implementation

While GEO has been successful in developing strategic roadmaps and other similar visionary documents (e.g. on capacity building, science and technology, user engagement, data citation, data quality, *etc.*), these have not always resulted in full implementation. Consequently, there is a need for more effective linkages among decision-making, prioritisation and resourcing mechanisms. This will lead to more effective and focused implementation and prevent dedicated individuals from being side-tracked by competing priorities.

Resources are a constant challenge

The lack of sustained resourcing mechanisms and disparity to ambition level has been identified as a recurrent limitation. Furthermore, the missing link to developing banks, science foundations, private foundations, or other donors has further impeded GEO's ability to succeed in its endeavors, given inability to leverage resources and capacity from these organizations. Going forward, it was recognized that a stronger engagement with the private sector will need to be further explored, in order to expand and diversify GEO's resource base.

“development
banks”

Evaluating performance useful but somewhat cumbersome

During the course of the first 10 year plan, Strategic Targets were only created mid-way through and there was no logic model or standard criteria for monitoring progress, effort and results. Later, when Strategic Targets were created, these were subsequently strongly decreased in number. Currently, there is some focus on reporting and evaluating progress, however this is rapidly becoming a burden for contributors and links to improvement mechanisms are missing. A new structure needs to be put in place that recognizes both (vertical) silos and cross cutting structures, links targets to delivery and indicators, and is dimensioned to the resourcing. Reinforced good practice, guidance and minimal standards are needed.

3 DESTINATION 2025: CONSIDERATIONS FOR THE FUTURE

The purpose of this section is to serve as a guiding principle for the development of the Implementation Plan for the next ten years. Taking into account that there is consensus that GEO is not changing its overarching goal or vision, this section sets out some objectives and then outlines main areas of activity foreseen for the coming decade. During the first phase of its work, IPWG's efforts focused on further defining and detailing the key objectives and key actions that will form the content of GEO's portfolio in 2016-2025. During this first stage, IPWG had not begun to determine the implementation structure for GEOSS implementation.

Parts of the text in this section are extracted from the GEO-X and Ministerial Summit documents, to place the resulting IPWG analysis in context.

Vision

The current vision for GEOSS is as follows: The vision for GEOSS is to realize a future wherein decisions and actions for the benefit of humankind are informed by coordinated, comprehensive and sustained Earth observations and information.

GEO Purpose & Strategic Objectives

The purpose of GEO is to build upon GEO's substantial accomplishments to improve the quality, range and availability of Earth observations and information for the purposes of:

- Achieving national and international objectives for a resilient society, sustainable economy and healthy environment worldwide;
- Addressing global and regional challenges by deepening understanding of the Earth system processes and improving the link between scientific understanding and policymaking at these levels;
- Sustainably growing economies, reducing redundancy and reducing costs to public sector budgets through innovation and shared collaborations.

Considering the increasing demand for Earth observations required to address sustainable development needs and future challenges, and inform decision-makers, GEO will focus on the following Strategic Objectives through 2025:

- Coordinating strategies for acquiring Earth observations, seeking active collaboration with relevant existing and emerging global initiatives with complementary mandates to both promote full and open access to Earth observation data, and strengthen Earth observing networks, strategic planning and identification of the needs for applications and services¹;
- Facilitating enhanced access to: 1) national, regional and global Earth observation data and information (including “big data”²) by implementing a robust and user friendly GEOSS information system that links available systems, also taking advantage of repositories of “big data”; and 2) tools to transform the data and information into useable formats for resource management and decision-making; **provision, validation and support of these tools will be a huge challenge**
- Fostering global initiatives that address identified gaps in Earth observation information including, where appropriate, facilitating the development of associated services and arranging for their subsequent uptake by relevant entities.

To achieve these objectives, GEO will perform key actions in the following three areas – *Policy, Knowledge, and Information*. IPWG has chosen this organizing structure for the action areas as it closely follows the domains of the three Strategic Objectives.

In the POLICY action area, GEO will:

- 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 by focusing on understanding their needs, mission objectives, preferred methods to receive and use information and determine how GEO can help them meet those needs and objectives.**

¹ Note: In the context of this paper, the term “service” is defined as the delivery of products based on Earth observation data and information addressing user needs through the coordinated use of the infrastructure and assets of the Members and Participation Organizations.

² Note: in the context of this paper, the term “big data” is defined as becomes difficult to process them using on-hand database management tools or traditional data processing applications. The collections of data sets so large and complex that it challenges include capture, curation, storage, search, sharing, transfer, analysis and visualization

- Promote the adoption of free, full, open and timely data access as a societal benefit;
- Foster and develop commitments to strengthen observation systems (space-based, airborne and particularly *in-situ*) and networks of observation systems;
- Develop common strategies to inform investment planning for observing systems to enable gaps to be identified, create synergies and maximize benefits from these systems;
- Promote “acting local – thinking global” mentality through strengthening regional and national capabilities to implement and make use of GEOSS, especially but not exclusively in developing countries, through activities such as the dissemination of best practices, strengthening of regional user communities, the development of regional and national Earth observation plans and focusing on the access to and use of observations to deliver practical local outcomes.

In the KNOWLEDGE action area, GEO will:

- Strengthen existing communities of practice and create new ones as needed, actively promoting interoperability and connectivity between the existing and developing Community portals;
- Systematically identify, prioritise and mitigate gaps in knowledge in the information chain between observations and decisions in the arena of global decision support;
- Expand the content of GEOSS by systematically pursuing availability and access to the totality of needed data and information to enable users to access a complete suite of resources needed for a particular problem solving;
- Systematically, co-define and document observation requirements, jointly with user communities, and determine and prioritise gaps in the availability of observations, and share this information as a GEOSS resource;
- Document observation and related information requirements as a basis for coordinated strategies and action;
- Develop and implement GEOSS Data Management Principles to promote the adoption of best practices of sound data management to improve aspects such as interoperability, data quality documentation and traceability, long-term archiving and usability;
- Share best practices for creating usable information by well-coordinated observations and data management;
- Define best practices for data management, including defining and implementing methods to document observation quality and the traceability of sources and methods for data, products and information, with the intent of providing GEOSS users with sufficient information to judge fitness for use; **make it clearer that this is in part the purpose of the DMP**
- Progressively harmonize the attributes of GEOSS data, proceeding from a minimum requirements of explicitly recorded data provenance, to inter-calibration of data collected in slightly different ways to, where possible, standardization;
- Include social and economic data into the scope of GEOSS;
- 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;

GEO can only advocate adoption of the DMP. And doesn't advancement of the DMPs belong under policy, alongside data sharing?

- Enhance the integration of observation-based models within GEOSS in order to serve user needs for spatial, temporal and variable coverage. Promote interlinkages among models in different domains;
- Enable development of citizen observatories as a means to strengthen observing systems, as well as also facilitating the use of data at multiple scales.

In the INFORMATION action area, GEO will

- Prototype selected services through global or regional initiatives;
- Actively promote the development of Earth observation-based information services in support of the global sustainable development agenda and evidence-based decision making;
- Accelerate and incubate the evolution of the GEOSS information delivery capability through prototyping services on the basis of GEOSS Implementation Pilots and new user requirements;
- Serve as an “honest knowledge broker” for Earth observations and environmental information;
- Operate a GEO Portal that provides access to GEOSS data and information resources, including GEO’s “knowledge base”, a comprehensive collection of information on available Earth observations and its use.

It is essential that GEOSS resources also be accessible through interfaces (APIs) and not just the web portal. Include a bullet stating that GEOSS will be responsive to stakeholder requirements for interoperability with the GCI

4 CONCLUSION: KEY TAKE AWAY MESSAGES FOR THE GEO EXECUTIVE COMMITTEE

In conclusion, the IPWG would like to convey key take away messages to the GEO Executive Committee. These points came up through discussions during the first phase within the IPWG and through engagement with key stakeholders. These messages reflect the background presented in this report, and will help shape the next Implementation Plan.

The key messages/considerations have been divided under three main categories:

1. **Maintain and strengthen;**
2. **Opportunities for improvement;**
3. **Fresh perspectives.**

This categorisation keeps focus on what has worked and needs to be continued whilst also acknowledging the room for improvements that exist in response to drivers and lessons learned. It should be noted that some potential solutions have been identified under the “Opportunities for Improvement” section. These solutions and the considerations as a whole will require a fulsome evaluation by the IPWG as we advance in phase 2.

4.1 Maintain and strengthen:

- **Inclusivity.** GEO should continue to engage with a wide variety of organisations (governments, non-governmental organisations, and private sector);
- **Networking.** GEO should remain a meeting point for both political and technical stakeholders. Political buy-in at the ministerial level provides legitimacy, while discussion fora provide the opportunity for technical considerations and user needs;

- **Adaptability.** GEO is an “agile organisation” that can quickly address change (e.g. emerging issues and emerging technologies). Communities of Practice are one component that allows GEO to react to these changes;
- **Interoperability.** A focus on interoperability provides a basis for increased use of Earth observations, information and data, and provides an avenue for synergies within, and added-value to, the GEO community;
- **Data sharing and access.** Clearly stated positions on data sharing and free, full, open and timely access. This foundation needs to be strengthened through the development of principles and application guidelines on data management, data quality and traceability / provenance;
- **Framework for cooperation.** The intergovernmental partnership that is GEO should be strengthened by establishing “end-to-end” initiatives in support of sustainable development and environmental stewardship;
- **Capacity building.** This should now be viewed as a universal action, such that capacity building will encompass all GEO Members and Participating Organizations (i.e. not only developing countries);
- **User focus.** GEO needs to establish an efficient mechanism for identifying, engaging with and enabling delivery of Earth observation data and information to end users.

4.2 Opportunities for improvement:

- **Performance assessment.** The current Monitoring and Evaluation process has required substantial effort and does not lead to actionable recommendations at the Task level.
 - Potential solution: Streamline Monitoring & Evaluation procedures, acknowledging the different characteristics of activities and their levels of maturity, while ensuring the connection to GEOSS implementation tasks and clearer objectives at task level setting out what will be achieved.
- **GEOSS Information delivery.** Expectations vary with respect to the breadth and depth of GEO in connection with information delivery. Clarity is needed. Concern has been expressed over the proliferation of small and uncoordinated tasks within the GEO community, alongside which global initiatives have sprung up within GEO in response to the need for coherent, targeted, end-to-end solutions for decision-making.
 - Potential solutions:
 - Breadth: Special attention should be paid to prioritization, grouping of initiatives, incubation and alignment of activities;
 - Depth: GEO should continue incubating/prototyping required / requested services based on globally and regionally coordinated framework.

- **Resources.** The uncertainty around levels of available resources and the mismatch between objectives and committed resources have hampered GEO implementation, led to imbalances and reputational issues.
 - There is no easy solution. The IPWG will examine options in phase 2 for how to establish a robust, steady resourcing mechanism within the voluntary framework of GEO, matching priorities and scope of a task with the identified committed resources.
- **Fostering buy-in at a national level.** It is difficult for nations to recognize, reflect and leverage the GEO initiative in their decision making process.
 - Potential solution: Support nations to reflect the GEO achievements into their decision-making process to achieve stronger buy-in at national level.
- **Definition of GEOSS.** Considering the need to supply reliable Earth observation data and information to end users, a clear definition of GEOSS and its vision and purpose are needed.
- **Geographic balance.** More geographically-balanced contributions by all members, particularly developing countries and regional initiatives must be achieved.
 - Potential solutions: Proactively assist GEO Members in establishing national and regional GEOs. Further contributions can also be achieved through incentivizing active participation through the promotion/illustration of the benefits of intergovernmental and interagency collaboration within a voluntary framework.
- **Environmental costs.** Quantification of costs through inaction or incorrect decisions in the context of environmental challenges should be a priority focus for GEO.
 - Potential solutions: Emphasize decision support based on Earth observations and information as essential for sound “evidence-based” decision-making. Establish a generic “risk management” (health, environmental, disaster) approach to clearly link decisions (at the user level) with actions (within GEO).
- **Inter-linkages.** GEO should strengthen inter-linkages between SBAs through a “Community of Communities” concept.
- **Partnership.** GEO should evolve its forms of engagement with key partners and stakeholders, based on jointly agreed objectives and roles.

4.3 Fresh perspectives:

(To note: Of the three categories outlined in this section, the “fresh perspectives” category is the one that still requires the most attention from the IPWG; more efforts are needed to more effectively incorporate what we heard from the stakeholders and the findings of the evaluations. Below is an initial glimpse only of the IPWG’s thinking so far.)

- Establish GEOSS as the Knowledge Broker for Earth observations and environmental information;

- Document and maintain observation and related information requirements for GEOSS and identify, prioritise and work to fill current gaps;
- Integrate economic and social data in GEOSS;
- Explicitly enhance model integration into GEOSS by forming bi-directional partnerships with the modeling communities within a broader framework of enabling decision support;
- Evolve GEOSS objectives to include economic benefits from the use of Earth observations and information for decision-making in the private sector and among individuals;
- Leverage new technologies and emerging approaches (e.g. citizen observatories);
- Provide users of GEOSS-served data with sufficient information to judge its fitness for use;
- Through members and participating organisations, explicitly develop more critical elements of GEOSS to a more “operational status” (to ensure reliable and repeatable information delivery);
- Pursuit of “free” and timely access to earth observation data, in addition to the customary “full and open”.

ENCLOSURE 1

IPWG INTERIM REPORT

SUMMARY OF GEO COMMUNITY ENGAGEMENT PROCESS

TABLE OF CONTENTS

1. Introduction and scope
2. Sources of information
3. Summaries of the Geneva GEO week meetings and events
4. GEO Work Plan Symposium discussions
5. Joint meeting of GEO Boards and Working Groups
6. GEO Community Survey
7. Involvement of GEO Implementation Boards and Working Groups

Annex 1 GEO Community Survey questionnaire

Table 1.1 and Table 1.2 Replies to Question 1 of the GEO Community Survey

1 INTRODUCTION AND SCOPE

The IPWG Terms of Reference instructed the IPWG to involve the GEO Community in the development of the new Implementation Plan.

Starting from the results of the Geneva Summit and GEO-X Plenary and in order to incorporate to the extent feasible the expectations of the GEO Community into its Phase 1 Interim Report, the IPWG has immediately undertaken specific actions and has taken advantage of already scheduled GEO events to maximize input gathering from the Community during Phase 1.

While the Section 2.1 of the Report provides an initial and general overview on how the Community assesses the GEO accomplishments and what would be some preferred directions for the future, this Enclosure summarizes how GEO Community inputs were gathered.

2 SOURCES OF INFORMATION

The main sources of information to understand the Expectations of the GEO Community can be summarized as follows:

1. The summaries of the Geneva GEO week meetings and events, namely the GEO-X Plenary, the High-Level Event on the Perspectives on the Value of Earth Observations and the GEO Geneva Summit;
2. The discussions held at the GEO Work Plan Symposium (28-30 April), not only during a dedicated session, “Looking into the future of GEO and GEOSS”, but also throughout all the Symposium agenda on matters of relevance for the IPWG mandate;
3. The discussions held at the Joint meeting of GEO Boards and Working Groups on May 2, especially those related to the role that these existing bodies could play in this transition to the second GEO period and on preliminary recommendations to the IPWG;
4. The results of a GEO Community Survey, designed by the IPWG, launched on April 24 and closed on May 8;
5. The replies of the GEO Implementation Boards and Working Groups to a letter sent by the IPWG Facilitators on 13 May.

In addition to the above, the Secretariat has received, and immediately forwarded to the IPWG, unsolicited inputs from CEOS, the Committee on Earth Observation Satellites and ESA, the European Space Agency - two GEO Participating Organizations. Both letters were focused on the substantial contribution of the Participating Organizations to GEO and GEOSS and on the need, from their perspective, for a more substantial involvement in the GEO governance and strategic thinking.

The following sections provide additional details on these sources.

3 SUMMARIES OF THE GENEVA GEO WEEK MEETINGS AND EVENTS

Several documents were produced and distributed to the IPWG to summarize the discussion that took place during the Geneva week.

- Official documents, namely the GEO-X draft summary report (prepared by the Secretariat and circulated to GEO Principals);
- Working documents, which were prepared by the Secretariat, by consulting the written statements received by Delegation and the video recording of the meetings, aiming at

providing to the IPWG a fair background of the discussions and the statements on the future of GEO. They are:

- A Compilation of the GEO-X and Summit statements, made with the objective of identifying GEO Successes and GEO Value added across a number of different areas;
- The Summary of the Session 4 – Guidance for the Future of GEO of the Geneva Summit;
- Inputs from the GEO-X discussions, which provides the details of the discussion at the Plenary on items related to the IPWG mandate;
- A Compilation of Ministerial statements looking forward and providing hints on what different members and POs think on GEO directions and priorities for the next decade;
- The report on the GEO week, including a summary of the High level panel.

4 GEO WORK PLAN SYMPOSIUM DISCUSSIONS

In addition to the usual summary of the overall WP Symposium proceedings, a specific summary was developed focused on the discussions and conclusions of relevance for IPWG from various sessions and a specific summary of Session 6 – Looking into the future of GEO and GEOSS.

5 JOINT MEETING OF GEO BOARDS AND WORKING GROUPS

A significant portion of the joint meeting was devoted to the discussion on GEO's past, present and future and a number of conclusions and recommendations of relevance/interest for the IPWG emerged.

The summary of the joint meeting was provided to IPWG for consideration.

6 GEO COMMUNITY SURVEY

The IPWG developed a questionnaire for a survey targeting the GEO Community which was launched on 24 April and concluded on May 8. (Questionnaire attached as Annex 1).

6.1 Survey questions

The survey was organized around the following six questions, the first one structured in predefined answers to be rated, the other five offering room for individual answers.

1. How do you rate the importance of the following GEO objectives and to what extent has GEO achieved them?
2. Which do you think should be GEOs 5 primary strategic objectives and/or functions for the next 10 years?
3. Where has GEO been successful? What has enabled GEO to achieve this?
4. Where has GEO failed to achieve its objectives? Why? What would need to be changed to overcome the past difficulties?
5. Where do you see the greatest need for improvement?
6. What should be maintained?

6.2 Survey Statistics

Responses: 49 in total, 6 anonymous

Participants' involvement in GEO:

Plenary Delegation Member	17
Implementation Board Member	8
Task Lead / Point of Contact	11
GEO Working Group Member	10
Task Contributor	18
Other (please specify)	0

Participants' Institutional background

United Nations Organization / Programme	3
Other international Programme / Organization	4
GEO Participating Organization	10
Research institute	12
Government agency	23
Funding agency	2
Foundation / trust	0
NGO	2
Company	5

6.3 Replies summary

The overall summary of the replies to the six questions is described in the section 2.1 of the report.

Tables 1.1 and 1.3 summarize the Community reply to Question 1, for which the survey questionnaire presented pre-identified GEO objectives (and their achievement) to rate.

7 INVOLVEMENT OF GEO IMPLEMENTATION BOARDS AND WORKING GROUPS

In order to ensure an explicit and early involvement of the existing GEO bodies into the IP 2025 drafting process, the IPWG Facilitators, on 13 May, wrote a letter to the Co-Chairs of the GEO Implementation Boards and GEO Working Groups asking for two sets of inputs:

- 1) Specific inputs to be reflected into the Phase 1 IPWG Report, taking into account the “fresh perspectives” lens;

- 2) A list and description of the on-going activities, led by each Board/Working Group that address issues of relevance to the IPWG mandate, together with their proposals on how these could be coordinated with the IPWG activities in Phase 2.

Specific responses were received from the Infrastructure Implementation Board, the Monitoring and Evaluation Working Group and the Data Sharing Working Group. The other two Boards didn't provide a specific answer but pointed the IPWG to the summary of the joint meeting of the 2 May, referred above.

It is fair to state that all these inputs were widely reflected in the IPWG Interim Report.

ANNEX 1
SURVEY FORM

REQUEST FOR INPUT TO THE IMPLEMENTATION PLAN WORKING GROUP (IPWG)

The Implementation Plan Working Group was established by GEO-X and tasked to develop a draft GEO Implementation Plan by GEO-XI (November 2014). To accomplish this objective, the IPWG seeks to engage with the broad stakeholder community that will be important for the success of GEO over the coming 10 years.

The current “GEO community” has gained experience on GEOSS implementation since 2005. Their perspectives are a valuable asset in learning from the past to help chart the course for the future.

In this spirit, the IPWG invites your answers to the six questions below. If you wish to support the IPWG by sharing your thoughts and insights, please submit your contribution to the GEO Secretariat secretariat@geosec.org and to Giovanni Rum (grum@geosec.org).

SECTION I: VISION

7.1 QUESTION 1:

7.2 HOW DO YOU RATE THE IMPORTANCE OF THE FOLLOWING GEO OBJECTIVES AND TO WHAT EXTENT HAS GEO ACHIEVED THEM³?

make superscript

		Importance			GEO has achieved		
		Low	Medium	High	Low	Medium	High
1	Support informed decision-making at <u>global</u> political level	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Support informed decision-making at <u>regional</u> political level	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Support informed decision-making at <u>national</u> political level	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Support decision-making at level of individual citizens	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Raise citizen’s awareness of environmental issues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Strengthening observation systems (improved perspectives for the sustained availability and operation of earth observation system)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Advocacy for EO activities at political level	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

³ The objectives below include the “GEO Core Functions“ defined in the “Vision for GEO 2025” accepted at the Geneva Ministerial, 2014.

8	Strengthening networks among observation systems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	Efficiency gains through better coordination of EO activities globally	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	Advancing interoperability of EO data	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	Advancing data quality standards and quality measures for EO data	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	Advancing integration of different EO data	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	Producing integrated information products / services supporting activities in environmental conservation and environmental risk reduction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	Promoting and implementing the GEOSS Data Sharing Principles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	Promote a global standardized spatial data infrastructure initiative	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16	Building and sustaining an information system that provides access to data and products from Members and Participating Organizations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17	Operation of a portal providing access to a comprehensive catalogue of EO data and products	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18	Developing capacity in developing countries to collect and use EO data	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19	Developing capacity in developed countries to collect and use EO data	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20	Develop and maintain regional coordination mechanisms for information provision	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21	Supporting research and development of integrated applications of EO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22	Providing a cooperation framework to develop global EO initiatives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23	Develop regional champion initiatives showcasing EO-supported decision making	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24	Bringing together practitioners and resourcing institutions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25	Collect and consolidate regional EO requirements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26	Providing a framework for agreeing on global EO priorities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<i>Further objective</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<i>Further objective</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7.3 QUESTION 2:

7.4 WHICH DO YOU THINK SHOULD BE GEOs 5 PRIMARY STRATEGIC OBJECTIVES AND/OR FUNCTIONS FOR THE NEXT 10 YEARS?

1. _____
2. _____
3. _____
4. _____
5. _____

SECTION II: LESSONS LEARNED

7.5 QUESTION 3:

7.6 WHERE HAS GEO BEEN SUCCESSFUL? WHAT HAS ENABLED GEO TO ACHIEVE THIS?

7.7 QUESTION 4:

7.8 WHERE HAS GEO FAILED TO ACHIEVE ITS OBJECTIVES? WHY? WHAT WOULD NEED TO BE CHANGED TO OVERCOME THE PAST DIFFICULTIES?

SECTION III: GEOs STRUCTURE, APPROACH AND WORKING ARRANGEMENTS

7.9 QUESTION 5:

7.10 WHERE DO YOU SEE THE GREATEST NEED FOR IMPROVEMENT? (UP TO 3)

1. _____
2. _____
3. _____

7.11 QUESTION 6:

7.12 WHAT SHOULD BE MAINTAINED?

SECTION IV: ABOUT YOURSELF

To help the IPWG interpreting and understanding the views and expectations expressed, please consider characterizing yourself (more than one may apply):

GEO		Institutional Background	
Plenary Delegation Member	<input type="checkbox"/>	United Nations Organization / Programme	<input type="checkbox"/>
Implementation Board Member	<input type="checkbox"/>	Other international Programme / Organization	<input type="checkbox"/>
Task Lead / Point of Contact	<input type="checkbox"/>	GEO Participating Organization	<input type="checkbox"/>
GEO Working Group Member	<input type="checkbox"/>	Research institute	<input type="checkbox"/>
Task Contributor	<input type="checkbox"/>	Government agency	<input type="checkbox"/>
Other (please specify)	<input type="checkbox"/>	Funding agency	<input type="checkbox"/>
		Foundation / trust	<input type="checkbox"/>
		NGO	<input type="checkbox"/>
		Company	<input type="checkbox"/>

(Optional)

Your name: _____

Institution: _____

Table 1.1 REPLIES TO QUESTION 1

		IMPORTANCE	ACHIEVEMENT
1	Support informed decision-making at <u>global</u> political level	VERY HIGH	MEDIUM
2	Support informed decision-making at regional political level	VERY HIGH	MEDIUM
3	Support informed decision-making at national political level	VERY HIGH	LOW
4	Support decision-making at level of individual citizens	MEDIUM	VERY LOW
5	Raise citizen's awareness of environmental issues	HIGH	VERY LOW
6	Strengthening observation systems (improved perspectives for the sustained availability and operation of earth observation system)	VERY HIGH	MEDIUM
7	Advocacy for EO activities at political level	VERY HIGH	MEDIUM
8	Strengthening networks among observation systems	VERY HIGH	MEDIUM
9	Efficiency gains through better coordination of EO activities globally	VERY HIGH	MEDIUM
10	Advancing interoperability of EO data	VERY HIGH	MEDIUM
11	Advancing data quality standards and quality measures for EO data	VERY HIGH	MEDIUM
12	Advancing integration of different EO data	VERY HIGH	MEDIUM
13	Producing integrated information products / services supporting activities in environmental conservation and environmental risk reduction	VERY HIGH	LOW

Table 1.2 REPLIES TO QUESTION 1

		IMPORTANCE	ACHIEVEMENTS
14	Promoting and implementing the GEOSS Data Sharing Principles	VERY HIGH	MEDIUM
15	Promote a global standardized spatial data infrastructure initiative	HIGH	LOW
16	Building and sustaining an information system that provides access to data and products from Members and Participating Organizations	HIGH	MEDIUM
17	Operation of a portal providing access to a comprehensive catalogue of EO data and products	VERY HIGH	MEDIUM
18	Developing capacity in developing countries to collect and use EO data	VERY HIGH	MEDIUM
19	Developing capacity in developed countries to collect and use EO data	MEDIUM	MEDIUM
20	Develop and maintain regional coordination mechanisms for information provision	HIGH	MEDIUM
21	Supporting research and development of integrated applications of EO	HIGH	MEDIUM
22	Providing a cooperation framework to develop global EO initiatives	VERY HIGH	MEDIUM
23	Develop regional champion initiatives showcasing EO-supported decision making	MEDIUM	MEDIUM
24	Bringing together practitioners and resourcing institutions	VERY HIGH	MEDIUM
25	Collect and consolidate regional EO requirements	HIGH	LOW
26	Providing a framework for agreeing on global EO priorities	VERY HIGH	MEDIUM

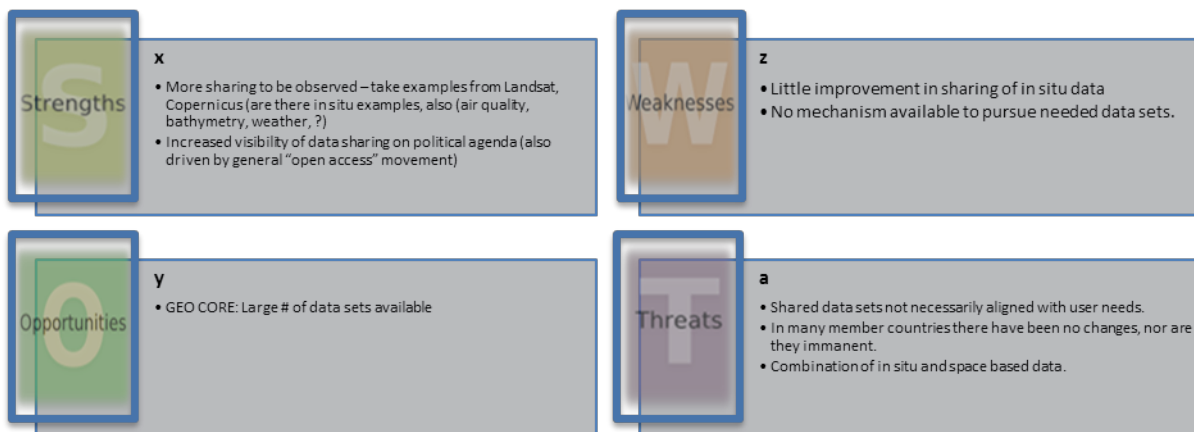
ENCLOSURE 2

GEO SWOT ANALYSIS

STRENGTHS WEAKNESSES OPPORTUNITIES AND THREATS

The IPWG has worked towards integrating external factors (opportunities and threats) and the internal considerations (strengths and weaknesses derived mainly from lessons learned) together with the stakeholder expectations. An initial analysis has been carried out by IPWG on four key areas drawing on information received, namely: for data sharing, global initiatives, the CGCI, and Coordination of EO systems.

SWOT on Data Sharing



SWOT on Global initiatives (GFOI, GEOBON, GEOGLAM)



SWOT on GEOSS Common Infrastructure / GEO Portal

<p>Strengths</p>	<p>x</p> <ul style="list-style-type: none"> • Functional architecture set up (importance of GEOSS Broker often cited) • Resourced from ESA and EC 	<p>Weaknesses</p>	<p>z</p> <ul style="list-style-type: none"> • National Monitoring Biodiversity Strategies • Took extremely long to set up • GEO Label has not worked • Missing function to communicate data quality or fitness-for-purpose
<p>Opportunities</p>	<p>y</p> <ul style="list-style-type: none"> • Link to IPBES • Increased Visibility of issue, role of GEO and solutions • Essential Biodiversity Variables" concept considered strong and useful – potential model for others. • Institutional players (beneficiaries) increasingly engaged (FAO) • Transfer experience to other initiatives 	<p>Threats</p>	<p>a</p> <ul style="list-style-type: none"> • Very low "market share" – known and used only by few insiders • Substantial criticism by users: "not usable" • Little added value of GEO Portal vs. other portals

SWOT on Coordinating observing systems / EO activities:

<p>Strengths</p>	<p>x</p> <ul style="list-style-type: none"> • xxx 	<p>Weaknesses</p>	<p>z</p> <ul style="list-style-type: none"> • Lack of commonly agreed requirements. Observation requirements report (prepared under NASA leadership some years back) out of date and not used in determining decisions on future investments. • GEO decision-making did not work. Lack of authority. • Cross-task coordination failed – management capacity at task level inadequate (structural issue, not personal)
<p>Opportunities</p>	<p>y</p> <ul style="list-style-type: none"> • xxx 	<p>Threats</p>	<p>a</p> <ul style="list-style-type: none"> • No traceable role of GEO in developing interoperability between systems (data formats, ...) • Substantial criticism by users: "not usable" • Little added value of GEO Portal vs. other portals