Update from the EAG

This document is submitted by the Secretariat to the Programme Board for discussion.

1. BACKGROUND

As a result of the GEO Midterm Evaluation, an Expert Advisory Group (EAG) on GEOSS was established in February 2022 to assess whether

- the concept of GEOSS continues to be relevant to the GEO Mission and, if so, how this concept should be defined in the context of GEO's current understanding of its value proposition and
- GEO should continue to serve as a provider of geospatial information and services infrastructure and, if so, what main function the said infrastructure should provide and what form it should.

Nominated by the GEO Caucuses and the GEO Secretariat, the EAG consists of 26 internationally acknowledged Earth Observation (EO) experts drawn from the public and private sectors, academia, national and international agencies, intergovernmental bodies, and civil society. The work modalities, deliverables and the implementation plan are captured in the approved EAG Terms of References.

2. STATUS AND PROGRESS

2.1. EAG Meetings

Following a virtual kick-off meeting on 7th of March 2022, three virtual technical meetings were held on 12th of April, 8th of June 2022 and 17 August 2022. All meetings were guided by an agenda and concluded with action points which were implemented and reported by consensus.

The major outcomes of these meetings were the development of the assessment approach and clarity on work modalities resulting in the establishment of two working groups focussing on GEOSS as a concept (WG 1) and the Providers, Users and Utilisation of GEOSS and its components (WG2). For each WG, nominated leads and co-leads coordinate the activities with support from the EAG Coordinator.

2.2. Working Group activities

The leads, and co/leads of both working groups met in May to develop a procedure for the assessment of the GEOSS concept and its implantation and an outline of a short report capturing the major points guiding the discussions in the plenary. Working group meetings were held on 7 June to consolidate initial results and presented to the EAG for discussion during the 2nd Technical Meeting on 8th of June. Based on the review of existing documentation and the

results from the GEO community Engagement, the following topics will be covered by the working groups during the next few weeks and consolidated in the EAG Technical Meeting:

WG 1: GEOSS Concept	WG2: Provider, User and Utilization
- Relevance in the context of GEO objectives - Does GEOSS serve global needs - Global GEOSS v topic-specific portals - GEOSS Architecture and fitness for emerging technologies - Addition of in-situ and local data, models etc - Link between GEOSS and regional GEOs - Manageability over next 10 years - Should GEOSS (as a global system of systems) be coordinated in GEO - Impact assessment	- State-of-the-art and future of geospatial services - Data providers: data, users, and access - Infrastructure providers - Current value proposition of GEOSS for different user communities? - User community perspectives (developer, research, scientist and academia, decision maker / policy maker, resource provider) - Potential scenarios to address user community needs

2.3. GEO Community Engagement

In support of the assessments of the working groups and the EAG, the EAG has started with the GEO community engagement activities which focussed on two main aspects:

- Familiarization with the technical status of GEOSS and its use in the GEO Community and beyond
- Compiling information on the perception and expectations of the GEO Community in terms of GEOSS

The GEO community engagement included presentations and discussions at the Executive Committee meeting in July as well as the Programme Board Meeting in June 2022. In addition, EAG updates were provided at meetings of the GEOSS Infrastructure Development Task Team (GIDTT), the EU High Level working Group and the Data Working Group (DWG).

An open engagement with the GEO community was undertaken at the EAG Session during the GEO Symposium. The session provided a platform for the GEO Community to share use cases and perspectives on GEOSS which was supported by a moderated discussion and a poll. The 1.5 hr session was attended by 104 participants. The relevance of GEOSS as a concept was debated, including clarifications regarding the definition of GEOSS, its impact on GEO messaging, the value-added of GEO versus GEOSS, and what might be lost if the GEOSS concept is deemphasized or no longer used. Activities such as GEOSS Platform Plus, NextEOS and Work Programme activities were presented or mentioned and discussed. The discussion will inform the EAG for its findings and recommendations.

Currently, an EAG Survey is undertaken to better assess the user landscape and utilisation of the GEOSS Platform. Acknowledging the utilisation of the GEOSS platform by users and providers from developed countries, the survey focuses on all user groups but will particularly find out the needs of users from Low and Middle Income Countries (LMIC) . Due to a delay in publishing the survey, the deadline for feedback was extended to 31 August 2022 and first robust results are expected by mid-September. On 29th of August, 145 full responses were received.

The progress report by EAG to ExCom in July 2022 was well received and further guidance was given to EAG. It was concluded that consensus on the topics of interest may be desirable, but it is not required for the EAG deliverable. The expectations regarding the EAG deliverable for each option presented are:

- The definition of GEOSS may vary by user and by the environment or system under discussion. To clarify the discussion, define what is meant by GEOSS in each option bearing in mind the current implications for GEO. Be specific of what is included in each option, what services are retained, and what additional work and resources may be required of GEO to meet each GEOSS construct.
- Present analysis-based evidence on pros and cons for each option. Be as specific and quantitative as needed to clarify the assessments of your Group.
- Focus on the future impacts of each option, including technological, financial, communications, and user impacts for GEO to successfully implement it.

3. PRELIMINARY FINDINGS AND IMPLICATIONS ON THE WAY FORWARD

Based on the consolidated results from the review of key documents, the EAG session at the GEO Symposium, and the WG and EAG discussions in the technical meetings as well as the guidance provided by ExCom, the following preliminary findings and implications can be summarised.

- The EAG observed that terms are often used interchangeably. Thus, EAG suggest developing a clear definition of all GEO supported products and services.
- The EAG has recognised that GEOSS as a concept was developed in an environment with only a limited number of EO data providers serving a fairly small number of end users, mainly from academia/research or specialized institutions with very specific requirements. Operationalization of EO data processing and service provision was mainly undertaken by those end-users according to needs. The private sector played no significant role as a data provider.
- EAG observed that the originally conceived GEOSS concept, i.e. the coordination aspect including setting of principles, facilitating data sharing, interoperability and standardisation as well as coordinating and advising on investments in observation technology was only partially realised. Whilst significant progress was achieved by GEO in developing an infrastructure allowing timely sharing of EO data, supporting open data and knowledge exchange and coordinating and collaborating with data providers and partially users, its role as a driver of investments in EO technology was not fulfilled. Reasons, amongst others, are an emerging private sector leading to the vast commercialisation of satellite technologies and observation supported by the great demand on information and data by a rapidly increasing user community, but also limited funding.
- The EAG acknowledges challenges to assess the GEOSS concept and infrastructure against the past and present whilst GEO undergoes a substantial transformation (2023-2025 WP, Post-2025 GEO) and revises its value proposition. This may affect or create

missed opportunities for integration with activities of GEO WP, regional GEOs and others.

- The deliberations, at this stage, indicate that no unanimous positions might be foreseeable and reaching consensus might become a challenge, if not unrealistic.
- Despite the acknowledgement of the value GEOSS has created to various communities, the positions within EAG range from supporting of the existing GEOSS concept and its underlying infrastructure and further refinements/improvements to an outsourcing of components to specialised agencies and GEO partners, or even the cessation of GEOSS altogether.

At the commencement of the EAG review process four potential future models were described as options for GEOSS moving forward. These options are further discussed in the perspective of the outcomes of the user and utilisation survey and engagement with the GEO Community. The below findings are preliminary and subject to further technical discussions in the EAG Work group and technical meetings. The 4 options and possible implications are:

a. Complete cease of GEOSS as a concept and 'de-branding' of GEOSS Infrastructure.

Pros	Cons
• Significant reduction in operating burden for GEO • Potential opportunity for private sector or third-party data provider to host into the future	• Unknown future of a comprehensive global resource • Loss of value to data providers • Potential transfer of global resource to private sector ownership

Recommendation: The EAG may not recommend this as a reasonable or necessary option and exclude it from further discussions. The EAG sees significant additional benefit and opportunity for by GEO providing ongoing support for GEOSS.

b. GEOSS infrastructure, and its underlying updated concept, will be modernised and continue with enhancements in its functionalities as an operational, user-oriented data provision service leveraging the investments already made and building on the on-going developments.

Pros	Cons
• Facilitates improved functionality and user experience for a valuable global resource • Built on existing infrastructure • Secured funding for the forthcoming years (GPP) • Established provider networks will be strengthened	• By itself, this option does not explicitly provide significant extended opportunities for impact • Uncertainty on funding post-2025 • difficulties to align with WP activities and flagships

Recommendation: Improving the operation, functionality and user experience of GEOSS is likely to improve its utility to most existing user groups. Under this model proposed by the EAG (i.e. Central GEOSS and smaller GEOSS subsets), technical improvements would be implemented across all GEOSS instances. It is recommended that the search engine, and data

recommendation facilities should be enhanced as a minimum. Elements of this model are required to meet the model proposed by the EAG.

c. GEOSS revised and adapted based on partnerships with specialised agencies and private sector to transform GEOSS into a tailor-made service serving particular end-users communities such as developing countries with customised data and products.

Pros	Cons
• Improves impact by closer connections to communities focussing on thematic and/or regional issues • Alignment with WP activities more realistic • Strengthened partnership with the private sector and other players (PPP)	• Expensive to achieve and maintain • A significant extension of GEO's current capability • Implies the replication of services provided by other specialist organisations • Implies potential duplication of datasets and products amongst the GEOSS instances • Private sector involvements may have implications for ongoing support and data sharing opportunities • Potentially lack of support from various GEO communities

Recommendation: This model includes retaining a central large GEOSS, which is seen as a valued service for and by data providers, and the development of tools to enable smaller curated subsets of GEOSS contents to be created around thematic or regional needs. That proposed model may provide a similar increase in impact and improvement in utility for end users but at a significantly lower operational burden for GEO than option 3 above. Elements of this model are required to meet the model proposed by the EAG.

d. GEOSS concept with a reduced scope to act as a common denominator of regional and/or thematic nodes and communities, to guide users to the right content, ensure common data management and interoperability principles, and hence enabling cross-regional and cross-domain use cases.

Pros	Cons
• Potentially increases impact by focussing on thematic and regional nodes and communities • Improved data management and interoperability functions underpin greater flexibility of applications • Increases the range of datasets that can be readily linked to GEOSS • Takes advantage of one of the opportunities unique to GEO, which is to drive the development of common data management and interoperability principles for geospatial and associated datasets globally	• Reduced scope may make GEOSS less attractive to data providers • Reduce scope does not build on existing investment in GEOSS • Reduced scope may constrain the breadth of impact possible through GEOSS

Recommendation: GEO should consider the investment required to set the common data management and interoperability principles globally. GEO is in a unique position to lead in this globally. The model proposed by the EAG envisions the ability for end users to create thematic or regionally focussed subsets of GEOSS, while retaining the GEOSS functionality and structure. That model may provide similar opportunities for increased impact without the reduction in scope described in option 4. Elements of this model are required to meet the model proposed by the EAG.

4. NEXT STEPS AND TENTATIVE TIME PLAN

Action	Date	Expected Outcome
Working Group Meetings	30/31 August 2022	Consolidation of respective assessments
Report Compilation	31 August 2022	First Draft of assessment
GEO Community Engagement (EAG Survey)	3 - 31 Aug 2022	Evidence-based Overview on the utilisation, needs and recommendations for the GEOSS Platform
Report programme Board	7/8 September 2022	Feedback on preliminary findings
Report Revision	9 September 2022	Advanced Draft of Assessment
GEO Community Engagement	12-23 Sep 2022	Input into the advanced draft
4th Technical Meeting	26-29 Sep 2022	Prefinal version of the Assessment report and recommendation
Report Finalisation	7 Oct 2022	Final Version of the Assessment report
Presentation at GEO Week	31 Oct-4 Nov 2022	Approval of Assessment report and Follow-up actions