

Report of the Programme Board

This document is submitted to the 17th Plenary for information.

1 INTRODUCTION

This document provides a summary of the key outcomes of the 19th, 20th and 21st Programme Board (PB) meetings, as well as a brief description of plans for the development of the 2023-2025 GEO Work Programme (GWP).

2 19TH PROGRAMME BOARD MEETING – 26-28 JANUARY 2021

2.1 Co-Chair and Observer Elections

The GEO Rules of Procedure require that elections be held for PB co-chairs whenever the term of a PB member who is a co-chair is completed. Since the term of the one of the co-chairs concluded in December 2020, a co-chair election was required, and as the remaining two co-chairs represented GEO Members, the open co-chair position was reserved for Participating Organization PB members. Further, the Rules of Procedure require that all three seats of Participating Organization Observers to the Executive Committee be opened for renomination each year.

Anthony Milne of the IEEE Geoscience and Remote Sensing Society (GRSS) was elected as PB co-chair with his term continuing to the end of 2023.

The Participating Organization Observers to the Executive Committee elected for 2021 were the Committee on Earth Observation Satellites (CEOS), GRSS, and the International Association of Geodesy (IAG).

2.2 Programme Board 2021 Plan of Work

The use of a plan of work as an organizational tool for the PB was introduced by the PB co-chairs in February 2020. The [2021 plan of work](#) provided a framework for all key issues raised during the previous year and how the PB intended to address them. In most instances, individual work items were referred for action to the various PB subgroups, Foundational Task Working Groups, or the Secretariat.

2.3 GEO Work Programme Monitoring

At its first meeting of 2020, the PB established a process for monitoring the status of GEO Flagships, Initiatives and Regional GEOs based on a set of “Engagement Teams” (ETs) comprised of PB members and supported by the Secretariat. These ETs largely followed the structure of the Review Teams used in 2019 during the development of the 2020-2022 GWP.

The ET process was intended to:

- Address weaknesses or gaps identified during the 2019 review of the implementation plans;
- Provide assistance to the GWP activities on such matters as resource mobilization, communications, etc.;
- Facilitate connections with policy contacts, scientific and technical experts, user communities, and so on;
- Strengthen linkages to engagement priorities or with other GWP activities; and
- Assist with the sharing of data, services, tools, methods, etc. with the broader community, including via the GEO Knowledge Hub, the GEOSS Platform, or other means.

The approach had two key components:

1. Identification of a small set of key objectives for each GEO Flagship and Initiative, developed collaboratively with the activity leads, ET members, and the GEO Secretariat; and
2. Implementation through small teams of PB members who, with Secretariat staff, would serve as the primary contact points between the GWP activity and the PB.

At its 19th meeting, the PB reviewed the [experience](#) from the 2020 ET process. Feedback received from the Flagship and Initiative leads, as well as from the ET members, was uniformly positive. ET members who participated in the calls stated that they had a better understanding of the progress being achieved and the challenges faced by the activities. ET members also provided advice and offers of specific assistance during the calls.

Several areas for improvement were also suggested during the meeting. These included: focusing on fewer topics for discussion, exploring the use of calls with multiple GWP activities, strengthening the linkages between the ETs and the Working Groups, and posting the recordings of the calls for reference by PB members that could not attend. The ET structure was retained for 2021.

2.4 Reports from Subgroups

2.4.1 *Urban Resilience Subgroup*

In response to a request by the Executive Committee, the Urban Resilience Subgroup, assisted by the Secretariat, developed an [engagement plan](#) that would describe specific actions for implementing urban resilience as a fourth GEO engagement priority. The PB reviewed and endorsed the draft engagement plan, which was presented to the Executive Committee at its 54th meeting.

2.4.2 *Equality, Diversity, and Inclusion Subgroup*

Two items were presented by the Subgroup: a [report on the status of diversity in GEO](#) and a proposed [GEO statement](#) addressing equality, diversity, and inclusion (EDI).

The report described gender and geographical distribution in six areas where data could be obtained, including Secretariat staff (gender only); PB member representatives; Foundational Task Working Group members; speakers and participants at recent GEO events; applicants and recipients of GEO awards; and Secretariat Director recruitment.

In general, the report noted that a much higher proportion of GEO participants across the areas examined were based in Europe and North America and were men. Due to the limitations of the data examined, it was not possible to determine if these findings differed significantly from the

sector as a whole, whether they had changed over time, or the causes of the observed proportions.

The report went on to propose a set of recommendations for initial action on the findings; these recommendations addressed the following areas:

- Improvements in data collection regarding diversity of GEO participants;
- Increasing the diversity within the Subgroup;
- Various actions aimed at increasing the diversity of WG and PB participants;
- Improving the visibility of under-represented groups in GEO events;
- Measures to increase diversity within the GEO Secretariat; and
- Connecting with other EDI initiatives in partner organizations.

One of the specific recommendations was the development and promotion of a diversity statement from GEO that clearly defines expectations in terms of gender, geographic, and generational diversity within GEO entities.

The PB welcomed the report as a significant step for GEO. However, due to limitations of the data that the Subgroup analyzed, conclusions could not be drawn regarding causes or trends. It was recommended that the report be revised to reflect these limitations and to include definitions of key terms. The report could then serve as a baseline for comparison as better data are collected following implementation of the Subgroup's recommendations.

The PB endorsed the proposed EDI statement for presentation to the Executive Committee, with the requested amendments.

2.4.3 Awards Subgroup

The Awards Subgroup presented the [process and criteria used in the selection of GEO Awards recipients](#). Concerns were raised by some PB members about the lack of an “institutional check” on the proposed award winners selected by the Subgroup. It was suggested that such a check could be performed by either the PB or by the Executive Committee. The Subgroup Chair responded that the process agreed by the PB at its 15th meeting was that the nomination packages of the proposed award recipients would be sent to the PB co-chairs for a procedural review only. The packages would also be made available to other PB representatives on request. The rationale for this process was that having another body review all nominations would essentially duplicate the task of the Subgroup and thereby undermine its role.

Strong views were expressed on both sides of this issue. As no consensus for changing the process reached, the process agreed previously by the PB remained in effect.

2.5 GEO Foundational Tasks

2.5.1 Capacity Development Working Group

Markus Konkol (University of Twente, ITC) presented a draft [GEO Statement on Open Science](#) on behalf of the Capacity Development WG and the drafting team for the statement.

The PB endorsed the statement for presentation to the Executive Committee, with a request that the Capacity Development WG consider including references to the UNESCO Recommendation on Open Science, the TRUST Principles and the CARE Principles, and to consider whether changes are needed to address the relevance of the statement to models, methods, machine learning, and artificial intelligence.

2.5.2 *GEO-Microsoft Cloud Credits Programme*

The Secretariat provided an introduction to the [GEO-Microsoft Planetary Computer Programme](#). This follows in the steps of three previous programmes, namely those with Amazon Web Services, Google Earth Engine, and a separate programme with Microsoft that focused on the GEO Biodiversity Observation Network and its Essential Biodiversity Variables. In the new programme, Microsoft agreed to provide in-kind contributions of cloud credits and technical support of up to USD 1 million, plus cash grants to projects for a total of USD 550 000. The programme would be limited to GWP activities and would need to be completed within one year.

As with the previous cloud computing programmes, PB members were invited to volunteer as reviewers on the project selection panel. PB welcomed the new programme and six PB members volunteered to serve as reviewers during the meeting.

Several suggestions were noted during the discussion, including a request to examine the long-term benefits arising from the programmes, implementing measures to minimize risks of vendor lock-in for participants, and capturing and publicizing lessons-learned and results achieved in the projects.

2.5.3 *Climate Change Working Group*

The Secretariat presented a [Concept Note for a 2nd GEO Climate Workshop](#) on behalf of the Climate Change WG. PB members were reminded that the organization of the workshop was included in the WG terms of reference.

The key objectives of the 2nd GEO Climate Workshop would be to:

Present results of the 2021 mapping of climate-related activities in the GWP, which is being undertaken by the Climate Change WG;

Foster collaboration with key Earth observation and climate partners;

Identify gaps and synergies for Earth observations and climate in meeting the needs of policy makers and key partners; and

Initiate a path forward for climate-related activities in the GWP that would achieve the goals established at the Canberra Ministerial Summit.

The PB welcomed the proposal but asked that the WG consider having shorter sessions over more days given the likelihood that the event would need to be online. The use of a videoconference application with automated translation was recommended to maximize participation from underrepresented regions. The PB also recommended that the Climate Change WG prepare information on Earth observation applications for climate that could be provided to GEO Members and delegates to the United Nations Framework Convention on Climate Change (UNFCCC) well in advance of the UNFCCC 26th Conference of the Parties (COP26) scheduled for November.

3 20TH PROGRAMME BOARD MEETING – 18-20 MAY 2021

3.1 **GEO Priorities**

Patrick Child (European Commission), 2021 GEO Lead Co-Chair, gave an overview of the 2021 Lead Co-Chair Goals and Objectives, noting that the purpose of the document is to help align efforts across the various GEO bodies toward a common set of priorities.

The PB noted that many of the 2021 Lead Co-Chair Goals and Objectives are being addressed by the PB Work Plan and by the PB Subgroups. The PB agreed that it should closely follow developments related to an *in situ* data strategy and its implications for the GWP. The PB also noted the ongoing challenge of engaging developing countries in the GWP.

3.2 Digital Earth Africa

Adam Lewis and Shanti Reddy presented the [Digital Earth Africa \(DE Africa\) implementation plan](#) in application for GEO Initiative status. They stated that the implementation plan is well established, and several achievements were realized over the past year and a half of operations. Transition of cloud operations from Australia to Cape Town, South Africa, was expected to be completed by end of May 2021. Contract negotiations were continuing for the establishment of a project management office in Africa. The DE Africa team was also working on a plan to sustain operations beyond 2022, including approaching potential investors or funders. They also noted that the team was already realizing an impact through their provision of high-quality analysis-ready data services to the GEO community in Africa.

Richard Gross (IAG), chair of the Review Team for the DE Africa proposal, summarized the findings of the review. The Review Team stated that DE Africa had met all the criteria and recommended that the PB accept DE Africa as a GEO Initiative. This recommendation was accepted.

3.3 Engagement of GEO Work Programme Activities

The Secretariat provided a [summary of the engagement process](#) that had been established at the 16th PB meeting in January 2020 and later confirmed at the 19th meeting in January 2021. The feedback received from GWP activities on the engagement process was very positive. Not only did the calls result in many statements of appreciation from the activities, but they wanted even more interaction with the Secretariat and the PB members. However, it was also noted that the calls were very time consuming to schedule and that the Engagement Teams had not had opportunity to meet separately to discuss what they had heard or to coordinate on actions to assist the activities. More critically, the preparation for the launch of the development of the 2023-2025 GWP would need to begin following the GEO Symposium and that this would limit the Secretariat's ability to support the engagement process after the summer.

PB members voiced strong support for continuing the engagement team process in 2023, once the 2023-2025 GWP was in place. Several additional suggestions were proposed, including allowing time for the Engagement Teams to discuss actions after the end of the calls, sharing reporting duties to reduce the demand on the Secretariat, and to ensure information from the calls is shared with the full PB.

3.4 GEO Knowledge Hub

The Secretariat presented a [Report on Implementation of the GEO Knowledge Hub \(GKH\)](#) seeking PB endorsement to complete the development process, which was expected to be completed by the end of 2021. Changes had already been implemented to the data search and data submission modules and webinars had been held with GEO community members to build understanding of the GKH and how it could assist them. It was noted the GKH was slightly behind schedule due to the impact of COVID-19 on the development of the InvenioRDM software on which it is based. A live demonstration of some of the functionalities and resources available in the GKH was provided.

The PB endorsed the continued development of the GKH toward operational status, subject to Executive Committee approval of the allocation of Secretariat resources for this purpose. The PB advised that the GKH document for the July Executive Committee meeting consider the comments and questions raised by PB members. In addition, the Secretariat was asked to prepare a plan for usability testing and collection of metrics related to usage and user satisfaction with the GKH, for presentation to the PB at its 21st meeting.

3.5 GEOSS Platform

The GEOSS Platform team presented a [Report on Usage of the GEOSS Platform](#), which was prepared at the request of the PB co-chairs. The report emphasized the growth over time in the numbers of data providers, brokered resources, user sessions on the GEOSS Portal, and machine-to-machine requests. Various enhancements to the GEOSS Platform were described, including GEOSS Widgets, Mirrors, and Views among other functionalities intended to support users and user communities. Some information on users of the Platform was provided, notably types of users based on geolocation and owner of the IP addresses where searches were originated and the most frequently searched keywords.

PB members drew attention to the distinction between “users” seeking to find data and “data providers” who managed the systems brokered to the GEOSS Platform, this distinction being not always clear. PB members also observed that the tool in the GEOSS Platform for accessing data on usage was not working well, emphasizing that such information was critical for understanding what was and was not working. The PB requested that the GEOSS Platform team prepare, in consultation with the GIDTT and other stakeholders, a list of proposed metrics of usage of the GEOSS Platform, including of the extent to which GEOSS Portal searches yield useful results and measures of user satisfaction.

3.6 GEOSS Infrastructure Evolution

Stefano Nativi (European Commission), GIDTT co-chair, gave a presentation on [planning for the evolution of GEOSS](#). Following a brief history of the development of the GEOSS Platform, some of the current challenges and opportunities arising from the changing technological and policy landscape were described. These include shifts toward online knowledge generation using cloud computing, increasing use of commercial cloud service providers, the expectations for integrating the Platform with the GKH, and the evolving role of the Regional GEOs. It was suggested that GEOSS is becoming a “digital ecosystem”, composed of multiple autonomous systems, platforms, and cloud infrastructures. The choice before GEO then is whether the evolution from the GEOSS Platform to a digital ecosystem should be governed. This governance would require development of policy, administrative, and interoperability principles and rules, as well as control and communications instruments to apply these rules. The GIDTT recommended that a stepwise engineering approach for the advanced GEOSS Platform be adopted, starting with user and stakeholder needs collection, following which a high-level architecture would be designed.

The PB highlighted Objective 2.1 of the 2021 Lead Co-Chair Goals and Objectives regarding integration of the GKH and Regional GEO platforms with the GEOSS infrastructure, in particular the indicator of the development of an infrastructure evolution roadmap. The PB also observed that planning for GEOSS infrastructure evolution was still at an early stage, lacking clear definition of intended users and uses, and that there appeared not to be an agreed concept for integration of the GEOSS Platform and the GKH. The PB emphasized that any future governance structure for GEOSS should be enabling and supportive of GWP activities. As an action for the 21st PB meeting, the Board requested that the GIDTT prepare a document describing the

proposed concept for the next phase of the GEOSS infrastructure, including a timeline and resource estimate for its implementation.

3.7 Foundational Task Working Groups

3.7.1 Data Working Group

The Data Working Group provided a [progress update](#) covering its three subgroups. The Data Ethics, Law and Policy Subgroup reported on two main activities: one looking at the main legal, privacy and ethical issues for the GEO community when using cloud computing platforms; the other on legal interoperability of shared data. The Data Sharing and Data Management Principles Subgroup was reviewing the status of implementing the GEOSS Data Sharing Principles and Data Management Principles, determining how the uptake of these may be furthered, as well as assessing possible revisions to the principles in the context of Open Science and other sets of data principles such as [FAIR](#), [TRUST](#), and [CARE](#). The Subgroup on In Situ Data (IS-SG) was planning to analyse the in situ data landscape within GEO, promote a more coordinated approach to in situ data management, and highlight the benefits of integrated use of in situ data and satellite data. In addition, the Data Working Group was collaborating with the GEOSS Platform Operations Team on an analysis of data requirements of GEO Flagships and Initiatives and the extent to which their output data are registered in the GEOSS Platform. The comments provided by the Data Working Group on the draft GEO Statement on Open Science, as requested by the Executive Committee were briefly discussed. The comments were relatively minor and were expected to strengthen and provide greater clarity to the Statement.

The PB noted the challenges with regional imbalance in the Data Working Group and its subgroups. The PB also recommended that the Data Working Group consider addressing identification of data gaps and barriers to data sharing, that the planned survey of GEO Flagships and Initiatives take more of a user focus, and that the Data Working Group consult with Regional GEOs regarding their perspectives on its work including, but not limited to, barriers to data sharing, in situ data, data ethics, and data democracy.

3.7.2 Climate Change, Disaster Risk Reduction, and Capacity Development Working Groups

David Borges, co-chair of the Disaster Risk Reduction Working Group, presented the item on behalf of the three Working Groups. The topic of the presentation dealt with a [joint consultation process with GEO Work Programme activities](#). This process is intended to address multiple expectations in the terms of reference of each of the Working Groups. By working collaboratively, the three Working Groups expect to reduce the burden on the GEO Work Programme activities and to improve the consistency of the data. A set of questions was developed by a cross-Working Group team, whose members will enter the initial data based on existing documentation provided by the Work Programme activities, principally their implementation plans. The team members will then consult with the Work Programme activity leads to validate the data. The plan is to complete the process by the end of August so that the information may be presented in an interactive dashboard at the GEO Climate Workshop in September.

The PB was supportive of the mapping exercise and looked forward to seeing the results.

3.8 Programme Board Subgroups

3.8.1 Awards Subgroup

Yana Gevorgyan, Chair of the session, introduced the item in the absence of a prepared document or presentation from the Subgroup. At its 19th meeting, a proposal to include an

“institutional check” on the proposed award recipients did not meet with consensus, as some members said that the proposed check did not address the underlying cause of the imbalance, which is the lack of nominations from some regions. The issue was raised again at the 54th Executive Committee meeting, resulting in a request that the PB reconsider the institutional check.

Due to multiple factors, including a possible loss of morale among Subgroup members in response to the criticism, the Awards Subgroup was not convened in 2021 prior to the 20th PB meeting. The Chair then posed the question to the PB whether they wanted to recommit to the awards process.

The PB agreed to proceed with the individual awards in 2021 and several members indicated their interest in participating in the Subgroup. The Board also recommended that the Awards Subgroup involve the Equality, Diversity and Inclusion Subgroup and the Regional GEOs to help increase the number and diversity of nominations.

3.8.2 2021 GEO Symposium Subgroup

The Secretariat presented an [update on Symposium planning](#) on behalf of the Symposium Subgroup. Based on feedback from the GEO community to the 2020 Symposium the Subgroup decided that sessions should be of shorter duration and with shorter presentations, with more time available for discussion and more opportunities for speaking. The ability to offer multiple concurrent sessions this year meant that many more GWP activities and individual contributors would be able to present and to speak during the Symposium. The Plenary sessions; with the exception of the session on Resilient Cities and Human Settlements (the proposed fourth GEO engagement priority), were intended to examine three “nexus areas” that will also appear in the Anchor Sessions of the GEO Plenary. The nexus areas build on several current policy themes, such as the UN Decade of Ocean Science, the UN Decade of Ecosystem Restoration, and the upcoming COP 26 in Glasgow. These sessions were intended to stimulate the identification of new synergies among existing GEO Work Programme activities and of new opportunities for the application of Earth observations in these areas.

The PB endorsed the proposed Symposium structure.

4 21ST PROGRAMME BOARD MEETING – 28-30 SEPTEMBER 2021

4.1 Election of a New Co-Chair

Following her appointment as Secretariat Director, Yana Gevorgyan resigned as PB co-chair, thus triggering a process to fill the vacant position. Two candidates nominated themselves for the post. Following an election conducted via email, in accordance with Annex F of the GEO Rules of Procedure, Evangelos Gerasopoulos (Greece) was elected, joining Anthony Milne (GRSS) and Andiswa Mlisa (South Africa) as PB co-chair.

4.2 GEO Mid-Term Evaluation

Justyna Nicinska, chair of the Mid-Term Evaluation (MTE) team, provided a summary of the [findings and recommendations from the MTE](#). In response to a question regarding user needs, she acknowledged the previous efforts on this within GEO and clarified that the MTE did not recommend repeating a similar approach to before but to work with the GWP activities and their users. To a PB member who noted the similarity between several findings in this evaluation and those of previous evaluations, Ms Nicinska agreed that the issues are not new and stressed that many of the recommendations emphasized the need for GEO to focus, particularly as its goals

are very broad while resources are quite limited. This was a key reason for the emphasis in the MTE on the value proposition. In response to a question about the difference between reviewing the concept of GEOSS and its implementation, Ms Nicinska observed that the way in which the concept of GEOSS has been presented has changed over time and that there is not a single, shared view of what this concept currently is. Is it about infrastructure, is it about communities? The MTE team did not find a common view on this.

The PB noted that there are many parts of the MTE report that are relevant to the GWP and to the PB. It recognized that the Executive Committee was preparing a response to the MTE report for presentation to the GEO-17 Plenary. The PB agreed that it would give further consideration to how to address the evaluation findings and recommendations in its work following the Plenary.

4.3 GEOSS Infrastructure Evolution

The PB returned to the topic of the GEOSS infrastructure, this time with the benefit of a [substantive document](#). The proposed concept was described as shifting from a data sharing paradigm to a geospatial digital ecosystem model which would provide interoperability with online data analytical services and access to scalable cloud computing resources. The proposed architecture would be focused on supporting the GEO engagement priorities, would involve GEO regional and local stakeholders, and would focus on supporting implementation of the “mid-stream” of the GEO value chain. A key element of this proposal is that it would apply a governance model in which independent constituent systems would collaborate to achieve common objectives wherein the GEO Data Sharing Principles and Data Management Principles would be applied as well as possible ethical and privacy principles (currently being discussed within the Data Working Group).

The PB welcomed the flexible nature of the proposed concept and its recognition of the importance of cloud computing. Reservations were expressed regarding the role of Regional GEOs as described in the paper, noting the differences among them in terms of capacity and priorities. PB members also stressed the importance of incorporating discussion of open knowledge, open-source software, and standards as part of the concept. A better understanding of who is using the GEOSS Platform and who is expected to use the new GEOSS infrastructure is also needed.

PB members observed that the Mid-Term Evaluation recommended that the concept of GEOSS should be reviewed for its continued relevance and that weaknesses had been identified with the GEOSS Platform. Since the design of infrastructure to implement GEOSS should logically follow agreement on the concept of GEOSS, any work to further refine the infrastructure should be deferred until the conclusion of any process put in place by the Executive Committee as part of its response to the Mid-Term Evaluation.

The PB agreed to consider this topic again at a future PB meeting. The timing of this discussion will be determined following the discussion of the Executive Committee response to the Mid-Term Evaluation at the GEO-17 Plenary.

4.4 GEOSS Infrastructure User Metrics

Both the GEOSS Platform team and the Secretariat presented their plans for collecting user [metrics of the GEOSS Platform](#) and the [GEO Knowledge Hub](#) respectively.

Due to limitations of the virtual format of the meeting and the length of the discussion on the Mid-Term Evaluation, there was insufficient time to discuss the proposals in detail. The PB agreed to revisit the issue at a future meeting.

4.5 Development of the 2023-2025 GEO Work Programme

The Secretariat presented a [proposed approach for the development of the 2023-2025 GWP](#). The PB welcomed the move toward an online system for development of GWP activity implementation plans and encouraged the Secretariat to monitor progress of GWP activities more rigorously and to take action where progress has stalled. The PB approved the documents presented as the basis for the launch of the 2023-2025 GWP development process.

More detail on the process is provided in section 5 below.

4.6 Foundational Task Working Groups

4.6.1 *Cross-Working Group Mapping Exercise and Outcomes of the GEO Climate Workshop*

The Secretariat presented the item on behalf of the Climate Change, Disaster Risk Reduction, and Capacity Development Working Groups. The aim of the [mapping exercise](#) was to identify potential opportunities for synergies among GWP activities for meeting policy needs, both in the near term and for the 2023-2025 GWP. As all three Working Groups had similar duties included in their terms of reference, they decided to collaborate on a joint process. Contact with the activity leads began at the end of August and so the presentation was intended to provide some initial results pending the completion of the full report.

The presentation also provided a summary and some initial outcomes of the GEO Climate Policy and Finance Workshop, which was held as a series of virtual workshops on 21-23 September 2021.

The PB responded that they looked forward to seeing the full report of the findings of the mapping and requested that the report include recommended actions for the GEO community that could be implemented as part of the 2023-2025 GWP development process.

4.6.2 *GEO In Situ Data Strategy*

The Subgroup on In Situ Data (SG-ISD) of the Data Working Group presented an outline of a [GEO In Situ Data Strategy](#). The purpose of the paper was to seek feedback from the PB on the proposed elements of the Strategy and on a proposed consultation process leading to its finalization. The Strategy proposed several actions to be implemented by the SG-ISD, including:

- Identifying GEO Initiatives and other relevant projects for application areas that may be used to highlight benefits of in situ data sharing;
- Conducting an analysis of in situ data use, priorities, challenges and requirements for selected key GEO Flagships and Initiatives;
- Identifying and mapping GEOSS Platform-brokered in situ data providers; and
- Identifying and showcasing specific use cases to illustrate benefits, challenges, and the wealth of in situ data use.

The presentation led to an engaging discussion among PB members, with some members volunteering to join the SG-ISD. The PB recommended that the SG-ISD:

- Engage existing networks that coordinate in situ data within specific domains;
- Identify common barriers to data sharing (e.g., differences in data formats, costs of making data available, data licenses; sustainability, incentives) and propose ways to address these barriers;
- Prioritize observations needed to advance GWP activities, engaging entities that are best placed to provide access to key data sets; and
- Focus on practical actions to increase access to data that will be most relevant for advancing the GEO engagement priorities.

4.6.3 *GEO Statement on Open Knowledge*

The Secretariat presented the proposed [GEO Statement on Open Knowledge](#), an updated version of what was formerly called a Statement on Open Science. As noted above under the 19th PB meeting, the original statement was developed by the Capacity Development Working Group. The Executive Committee, on reviewing the initial draft, recommended that further consultations with the GEO community be undertaken, including with the Data Working Group to ensure alignment with the GEOSS Data Sharing Principles and Data Management Principles. A frequent comment raised during the consultations was that, while science is the foundation for GEO's work, GEO is not itself a scientific research organization but an organization with applies science to decision making. This perspective is firmly grounded in many key GEO documents, including the Strategic Plan 2016-2025 and the Canberra Declaration. Based on these comments, it was proposed to revise the name and framing of the document to a Statement on Open Knowledge.

The PB supported the change from Open Science to Open Knowledge, but several further changes were requested:

- Specific text changes to recognize unique features of traditional knowledge;
- Clarification of the text on open infrastructure, open hardware, and licenses; and
- Inclusion of reference to open standards.

The Secretariat worked with the PB members that had requested the changes and the document was circulated once more for review by all PB members. The approved document is presented to Plenary for endorsement.

4.7 **Programme Board Subgroups**

4.7.1 *Private Sector Subgroup*

The Secretariat [presented](#) on behalf of the Subgroup, beginning with a summary of the Subgroup's actions and accomplishments. It was noted that the Subgroup had made good progress in 2020, but this slowed toward the end of the year. Unfortunately, both Subgroup co-chairs resigned, one in April 2021, the other in September, due to increasing work demands and changes in national priorities. A call for a new co-chair after the first of these resignations elicited little interest among members. These developments put into question the ability of the Subgroup to lead GEO's efforts on engaging the commercial sector.

The Secretariat Director pointed to the success of the Industry Track programmes in 2019 and 2020 in engaging the commercial sector, noting the 2020 event had over 340 participants from 40 countries. She suggested that, given its limited resources, the PB consider discontinuing the Subgroup, with the engagement of the commercial sector to be led by the Secretariat. This would also allow the PB to focus on the development of the 2023-2025 GWP during 2022.

The PB recognized the challenges faced by the Subgroup and the need for renewal of its leadership if the group is to continue. PB members were requested to notify the Secretariat of their interest in this issue.

4.7.2 *Awards Subgroup*

The Awards Subgroup provided an [update](#) on the awards process for 2021. The criteria and evidence required were kept the same as in previous years, but two changes were introduced: provision for self-nomination and a request for data to support consideration of equality, diversity, and inclusion. The Subgroup stressed the importance of addressing the requirements listed in the form, especially ensuring that the connection of the nominee's work to GEO is clear.

A PB member noted that the selection appeared to be based on the quality of the nomination, and not necessarily on the best candidate. The Awards Subgroup chair acknowledged that this is often true for many awards programmes. It was not possible for the Subgroup to go back to sponsors for more information given time constraints and, for reasons of fairness, they would need to do this for all nominees. It was also mentioned that only about half of the Subgroup members actively contributed to the review of the nominations.

The PB noted several challenges faced by the Subgroup, including difficulties for some nominators to complete the form where English is not their first language, as well as the low number of nominations that had been received to date. The PB agreed to review whether the GEO Awards process should be handled by another body within GEO.

5 DEVELOPMENT OF THE 2023-2025 GEO WORK PROGRAMME

5.1 Context

The development of each three-year GWP takes about 15 months to complete, including the call for contributions, the preparation of the Implementation Plans (IPs), review of the IPs, and the consultation and endorsement by the GEO community. Since GEO was established in 2005, there have been six three-year plans/programmes (including the current one) and two one-year transitional plans/programmes. The structure and content of these plans/programmes has evolved considerably over time.

Responsibility for the development of GWPs is shared between the PB and the GEO Secretariat. The Secretariat is responsible for initiating the development of the GWP and for supporting the PB on its finalization. The Secretariat also has a key role in proposing the structure and composition of the Foundational Tasks, as it is responsible for implementing and/or supporting many of these activities. In the GWP development process, the PB is responsible for:

- Reviewing the scope and substance of the GWP activities;
- Examining proposed IPs for GEO Initiatives and Flagships and taking decisions to accept new ones; and
- Recommending GWPs for Plenary acceptance, including assessing whether the resources committed are commensurate to the activities scoped for inclusion in the GWP.

5.2 Objectives for the 2023-2025 GEO Work Programme

Based on feedback received from the GEO community since the last GWP development cycle, as well as on strategic directions discussed at the GEO Executive Committee and the findings and recommendations of the GEO Mid-Term Evaluation, the PB approved the following objectives for the 2023-2025 GWP:

1. **Greater collaboration and integration** across GWP activities, with the aim of providing users with the greatest benefit from the collective resources provided by the GWP, as well as broader portfolios of solutions to address the engagement priorities. This will be implemented by a combination of Secretariat efforts before and during the development of the IPs and the advice from the PB through the review process.
2. **Stronger emphasis on open knowledge**, that is, the sharing of methods, models, algorithms, and other components required to replicate the solutions developed by GWP activities and to adapt them to specific circumstances. Knowledge sharing is not only fundamental to GEO's value proposition but is the essential foundation for capacity development. This will be realized through revisions to the review criteria, guidance

materials to IP preparers, the Open Knowledge Statement, and other means as appropriate.

3. **More specific identification of intended/actual users** of the solutions GWP activities are developing and to involve such users in the development of those solutions from an early stage (co-design/co-production). While this will be reflected in the review criteria and guidance to the GWP activities, it should also be a key focus of the PB review process.
4. **Clearer definition of the GWP categories**, the expectations for transition between the categories, and the expected lifecycle of GWP activities. As was noted above, the review criteria during the 2020-2022 GWP development process were not finalized until after the call for IPs. It is the intent in this round to provide the criteria to IP preparers at the time of the call so they may use them as a self-assessment tool and address the criteria directly in their plans.
5. **Simplification of the IP template**, making use of standardized classifications where possible, as well as providing for online entry and updating of IP information. The Secretariat also intends to use the data collected for the IPs to populate the static fields of GWP activity webpages on the GEO website.

5.3 Clarification of the Categories and Process for Transition

The Mid-Term Evaluation (MTE) found that there was “limited guidance on the lifecycle of activities within the GEO Work Programme” and recommended that GEO should “clarify how and if GEO activities should progress from a Community Activity to an Initiative to a Flagship”. While guidance was provided to GWP applicants, and criteria for assessing the IPs were applied by the Programme Board in 2019, the criteria were not approved until well after the call for IPs was issued and were not widely publicized.

To respond to the MTE recommendations, the PB approved several modifications to the GWP guidance for the 2023-2025 GWP:

The “Community Activity” category will be renamed to “Pilot Initiatives”. The criteria for the 2020-2022 GWP were already based on the assumption that most of these activities represented early-stage collaborations that would, if successful, develop into GEO Initiatives. Revision of the name of the category would make this direction clearer for those proposing new Initiatives, as well as for others in the GEO community.

The guidance to GWP activity leads will include an expectation that Pilot Initiatives should intend to progress to GEO Initiative status and should do so within a reasonable period. The purpose of this change is to encourage activities to realistically assess the viability of their proposal and to not continue indefinitely where there has been little progress.

Guidance will also state that GEO Initiatives may apply to be recognized as GEO Flagships, but that this is not an expectation and may not apply to all GEO Initiatives.

The Secretariat will actively work with existing Community Activities that may not fit comfortably as a Pilot Initiative. Options for these activities could include redefining the activity to better fit the Pilot Initiative category, applying as a GEO Initiative, or merging with another GWP activity. Other options may also be explored with individual activities as needed.

5.4 Process

The general outline of the 2023-2025 GWP development will follow the approach used for previous GWPs, with some new elements (in italics):

- Step 1.** The Secretariat issues a call for new IPs, including for activities currently in the GWP. The call will include a request for new activities to address the engagement priorities, including the new priority of Resilient Cities and Human Settlements.
- Step 2.** GWP activity teams prepare their draft plans. The Secretariat will provide one-on-one guidance as required, **and will work with specific GWP activities, groups of activities, and/or communities to encourage re-focusing, integration, or cross-linkages**. The Secretariat will also do an initial review of the IPs against the review criteria to ensure that the IPs are reasonably complete prior to the PB review.
- Step 3.** Review teams composed of PB members, **supplemented with external experts**, review the IPs of candidate Flagships, Initiatives, Regional GEOs, and Foundational Tasks. The review process will include preparation of written comments to be provided to IP drafters, as well as teleconferences with each activity to discuss the comments and recommendations in greater detail.
- Step 4.** The GEO Symposium will provide an opportunity for the Flagships, Initiatives, Regional GEOs, and Foundational Tasks to present a summary of their plans to the GEO community and to obtain feedback. It will also be an opportunity to further develop the aspects of integration and cross-fertilization across the GWP.
- Step 5.** GWP activity leads submit revised IPs to respond to the review team comments and the feedback from the GEO community.
- Step 6.** The Secretariat compiles the IP summaries into the first draft of the GWP summary document and circulates it to GEO Principals for comment and for offers of additional participants and/or contributions.
- Step 7.** The Secretariat prepares a revised version of the GWP summary document for PB approval.
- Step 8.** Presentation of the 2023-2025 GWP for Plenary acceptance.

There are two significant new elements in this process:

- The Secretariat will play a more active role at the early stages in shaping the IPs, particularly to respond to the key themes of Agriculture-Forests-Water; Oceans and Climate; and Biodiversity and Ecosystems, that have been explored initially at the 2021 GEO Symposium and will be further examined at GEO Week 2021. The expected outcomes of these efforts will be the realization of greater value to EO users from the integration of the existing capabilities of GWP activities, as well as possible new activities that will complement existing activities. This direction is aligned with, and responds to, the recommendations of the GEO Mid-Term Evaluation.
- The Secretariat will establish a list of potential external reviewers to supplement the capabilities of the PB review teams, particularly with respect to the review of the technical aspects of the IPs and engagement of users. The reviewers will be drawn from within the GEO community but will not be involved in the activities being reviewed.

5.5 Timeline

The proposed process will follow a similar approach to the one used for the 2020-2022 GWP, but with an earlier starting date.

Table 1: Key Steps for the 2023-2025 GEO Work Programme Development

Timing	Action
PB-21: September 2021	Agree on objectives, process, timeline, review criteria and IP templates.
November 2021	Secretariat issues call for IPs
GEO Week 2021	PB co-chairs inform Plenary of the GWP development process and timeline
PB-22: January 2022	Secretariat proposes Foundational Task structure and detailed review process
Early February 2022	Deadline for submission of IPs. Review process begins.
57 th ExCom meeting: March 2022	Update to the Executive Committee on GWP development.
GEO Symposium: late March / early April 2022	Consultation with the GEO community.
PB-23: April/May 2022	Assess review status and recommendations for each of the GWP activities.
June 2022	Deadline for submission of revised IPs.
June/July 2022	Draft GWP summary document sent to GEO Principals for consultation and additional contributions.
58 th ExCom meeting: July 2022	Update to the Executive Committee on GWP development.
PB-24: September 2022	Final PB review and approval of the GWP.
September/October 2022	2023-2025 GWP summary document sent to GEO Principals for approval at Plenary.
GEO Week 2022	Approval of the 2023-2025 GWP.
December 2022	Final version of the GWP summary document, incorporating changes from Plenary, is posted on the GEO website.