

## Report of the Programme Board

*This document is submitted by the Programme Board to the Executive Committee for information.*

### 1 INTRODUCTION

This document provides a summary of the outcomes of the 20<sup>th</sup> Programme Board meeting, held by videoconference on 18-20 March 2021.

Among the key outcomes of the meeting, the Programme Board:

- Discussed the 2021 Lead Co-Chair goals and objectives and their implications for the Programme Board and the GEO Work Programme;
- Accepted Digital Earth Africa (DE Africa) as a GEO Initiative;
- Reviewed the engagement team process and agreed that it should be resumed following development of the 2023-2025 GEO Work Programme;
- Endorsed the continued development of the GEO Knowledge Hub, subject to Executive Committee approval of the allocation of Secretariat resources for this purpose;
- Considered a report on usage of the GEOSS Platform and requested that a set of proposed metrics be developed, focusing on user satisfaction and the utility of search results for users;
- Discussed the current status of planning for evolution of the GEOSS infrastructure, noting that it remains at an early stage and requested that the GEOSS Infrastructure Development Task Team prepare a document on the proposed concept;
- Reviewed progress in the Data Working Group and its three subgroups;
- Reviewed the status of the GEO Awards process and agreed that the process should proceed for individual awards in 2021;
- Reviewed a joint mapping exercise with the GEO Work Programme being coordinated by the Climate Change Working Group, Disaster Risk Reduction Working Group, and the Capacity Development Working Group;
- Discussed the planning for the GEO Symposium and endorsed the structure proposed by the Symposium Subgroup; and
- Thanked Yana Gevorgyan and Gilberto Camara for their leadership and contributions to the Programme Board.

The 20<sup>th</sup> meeting returned to the format of single, rather than split, sessions. This decision was taken based on two factors: a reduction of the total time zone spread of two hours due to daylight savings time changes and the difficulties in reaching consensus within the Programme Board when divergent views emerged in the split sessions.

## 2 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. Mr Child noted that many of the goals, objectives and indicators are carried over from previous years, reflecting the fact that many of them will take multiple years to realize. There are, however, several new areas to which he drew attention. These included a cross-cutting objective on GEO tools and other resources that could support pandemic response and recovery; new indicators related to engagement with the World Meteorological Organization and other UN agencies; steps toward an infrastructure evolution roadmap and action on coordination and sharing of *in situ* data; further engagement of developing countries, with particular attention to Pacific Island Countries and Territories; and renewed efforts on resource mobilization.

In response to a question regarding the implementation of these goals and objectives, Mr Child encouraged members to discuss which of them have implications for the Programme Board and to provide feedback if any of these topics is unclear. The OGC supported the focus on *in situ* data, noting that this requires support at a high level. Mr Child agreed and said that he looked forward to the work of the Data Working Group on this matter. The Secretariat Director noted that developing countries have been reluctant to share their data unless developed countries were willing to share their methods and models. ESA asked how engagement with developing countries would be advanced given the financial barriers that many of them face. Mr Child stated that he believes that the topic is crucial for taking forward the conclusions of the Canberra summit. The Pacific Islands Advisory Group (PIAG) is a key element of this, and its work needs to be reinvigorated. However, engagement of developing countries should also include how their needs may be addressed by the GEO Work Programme; the Programme Board has a key role in this regard.

The Programme Board noted that many of the 2021 Lead Co-Chair Goals and Objectives are being addressed by the Programme Board Work Plan and by the Programme Board subgroups. The Board agreed that it should closely follow developments related to an *in situ* data strategy and its implications for the GEO Work Programme. The Board also requested that the Secretariat take note of the request for greater communication to GEO Members and Participating Organizations, especially regarding decisions and guidance at the GEO Executive Committee level. Finally, the Board noted the ongoing challenge of engaging developing countries in the GEO Work Programme.

## 3 DIGITAL EARTH AFRICA

Adam Lewis (Australia) briefly introduced the item and then turned to his colleague Shanti Reddy for a summary of the DE Africa implementation plan. Mr Reddy stated that DE Africa's implementation plan is well established, and several achievements were realized over the past year and a half of operations. The team had been transitioning cloud operations from Australia to Cape Town, South Africa, which 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. Mr. Reddy also noted that the team was already realizing an impact through their provision of high-quality analysis-ready data (ARD) services to the GEO community in Africa.

Programme Board members asked several questions to the DE Africa team. Mexico asked how the experience with DE Africa might help other regions. Mr Reddy responded that there are many resources openly available which may be shared, including Jupyter notebooks, frameworks, algorithms, and much documentation. A strong community of practice has also been built which could provide assistance. He also underlined the importance of involving local partners in the development of any similar project. Kenya asked whether DE Africa could support country-level analysis and whether local *in situ* data could be kept within the country. Mr Reddy replied that while DE Africa is a continental system, analysis can be focused on any specific user-selected area and that locally based data sets can be used. The Secretariat Director asked if the software tools developed by GFOI, for example, could be made available in DE Africa. Mr Reddy answered that the DE Africa team is working with GFOI and others to make such tools interoperable and portable between different platforms. The open sharing of methods and tools, including code and algorithms, is a fundamental principle of DE Africa.

Richard Gross (IAG), chair of the Review Team for the DE Africa proposal, summarized the findings of the review. After briefly describing the review process, Mr Gross listed the criteria for a GEO Initiative that had been approved by the Programme Board in 2019 together with the Review Team's assessment of the DE Africa implementation plan against those criteria. He stated that the Review Team was of the opinion that DE Africa had met all of the criteria and that they therefore recommended that the Programme Board accept DE Africa as a GEO Initiative. This recommendation was accepted.

#### 4 ENGAGEMENT OF GEO WORK PROGRAMME ACTIVITIES

Craig Larlee (Secretariat) provided a brief summary of the engagement process that was established at the 16<sup>th</sup> Programme Board meeting in January 2020 and then confirmed at the 19<sup>th</sup> meeting in January 2021. The status of the 2021 process was that seven calls had been completed, with an eighth call set up for the week following the Programme Board meeting. These calls involved six of the eight Engagement Teams (a seventh Team was occupied with the review of the DE Africa implementation plan). The Regional Engagement Team, which had not conducted any calls in 2020, met with three of the four Regional GEOs. Two of the calls with GEO Flagships and Initiatives used a new format in which multiple GEO Work Programme activities in a particular domain were invited to a joint call. With the sole exception of AmeriGEO, the Programme Board had thus spoken directly with all of the GEO Flagships and Initiatives and with all Regional GEOs over the course of the year in which the engagement process had been implemented.

Mr Larlee observed that the feedback received from the GEO Work Programme activities on the engagement process was very positive. Not only did these calls result in many statements of appreciation from the activities, but they also wanted even more interaction with the Secretariat and the Programme Board members. However, the Mr

Larlee 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 GEO Work Programme 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.

Programme Board members voiced strong support for continuing the engagement team process in 2023, once the 2023-2025 GEO Work Programme 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 Programme Board.

## 5 GEO KNOWLEDGE HUB

Douglas Cripe (Secretariat) summarized the GEO Knowledge Hub (GKH) document on behalf of the GKH team, explaining that it was destined for the Executive Committee and that the Secretariat was seeking the endorsement from the Programme Board to complete the development process, which was expected to be completed by the end of 2021. He stated that changes had already been implemented to the data search and data submission modules and that webinars had been held with GEO community members to build understanding of the GKH and how it could assist them. Mr Cripe also noted that the development had been delayed somewhat due to the impact of COVID-19 on the development of the InvenioRDM software on which the GKH is based. Paola De Salvo then provided a live demonstration of some of the functionalities and resources available in the GKH at the time. Mr Cripe resumed his presentation and highlighted certain elements from the document, notably testimonials from several GEO Work Programme activities and the planned roadmap for the project.

IEEE asked about the new features that would be available in the next version of InvenioRDM. The Secretariat responded that the key new feature in the next version would allow for community forums to ask questions and support interaction among users, noting that CERN is moving forward on development of this version and no significant delays were foreseen. The European Commission asked about the demand that the GKH would place on GEO Work Programme activities to document the resources in their knowledge practices, questioning whether the proposed approach was adequately scalable. The Secretariat stated that the demand was hard to quantify but appeared to be within the amount projected in the original implementation plan. It was also emphasized that the activities benefitted from this process and that their participation is voluntary. The European Commission also asked how the GKH would be integrated with the GEOSS Platform. The Secretariat suggested that this could be achieved in multiple ways, perhaps through links from GKH to the Platform for users who wished to search for data and links in the Platform to the GKH for users who wished to find knowledge resources. Discussions were continuing within the GEOSS Infrastructure Development Task Team (GIDTT) on this question. ESIP asked why the GKH should include resources that are not open to all users, whether usability testing of both the user and knowledge provider interfaces was undertaken, and how updates to

the knowledge packages would be made. The Secretariat answered that the default approach is that all resources would be open to everyone. Ongoing curation of the knowledge packages would be the responsibility of the knowledge providers and the Secretariat was working with them to develop an appropriate schedule. Regarding usability testing, this had not been done to this point as the initial development was only just completed.

The Programme Board 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 Programme Board also advised that the GKH document for the July Executive Committee meeting take into account the comments and questions raised by Programme Board 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 Programme Board at its 21<sup>st</sup> meeting.

## 6 GEOSS PLATFORM

Ivan DeLoatch (United States), co-chair of the GIDTT, introduced the item, noting that GEOSS has evolved over time, incorporated new technologies, and demonstrated usage. He acknowledged that additional work is needed and that users need to be the focal point for these efforts. Paolo Mazzetti (Italy) summarized the document, emphasizing the growth over time in the numbers of data providers, brokered resources, user sessions on the GEOSS Portal, and machine-to-machine requests. Mr Mazzetti then described various enhancements to the GEOSS Platform, 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. Mr Mazzetti concluded with a series of recommendations regarding the continuity of the GEOSS Platform and support from the Secretariat on various activities related to engagement with the GEO community.

OGC 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. Mr Mazzetti responded that the Platform team was interested in feedback from the Programme Board on which statistics would be most relevant, though he also noted that funding for the development of usage statistics had now ended. France asked whether an analysis had been conducted on the extent to which search requests had resulted in useful results. Mr Mazzetti replied that the numbers presented were raw data and that further processing would be required to provide information relevant to the question. The United States asked why Secretariat resources were required for the data provider registration process, to which Mr Mazzetti stated that the Secretariat provided an important liaison with data providers.

The Programme Board 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. This report is expected for the 21st Programme Board meeting.

## **7 GEOSS INFRASTRUCTURE EVOLUTION**

Stefano Nativi (European Commission), GIDTT co-chair, presented the report on behalf of the GIDTT. He began with a brief history of the development of the GEOSS Platform before describing some of the current challenges and opportunities arising from the changing technological and policy landscape. 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. Mr Nativi stated that over the past few years 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.

France observed that users were not much present in the document and asked for whom and for what purpose this direction was proposed. Australia stated that GEOSS governance needs to support GEO Work Programme activities and that care must be taken to not make the activities servants of the governance process. Mr Nativi responded that this would be determined in the “step-wise approach with users”. South Africa asked what the GIDTT heard from Regional GEOs and about the relevance of cloud providers. Mr Nativi replied that GEO was being pushed by private cloud service providers and that it was time to talk about GEO community interests according to a set of principles and policies. The United States noted that the GEOSS Platform and the GKH are proceeding on different tracks and on different time scales; there does not appear to be a holistic view of what is required. Mr Nativi said that the digital ecosystem concept can accommodate multiple components which could remain separate, or which could be combined. The diagram in the document was a starting point for a discussion.

The Programme Board took note of 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 Board 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 Programme Board emphasized that any future governance structure for GEOSS should be enabling and supportive of GWP activities. As an action for the 21st Programme Board 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.

## 8 FOUNDATIONAL TASK WORKING GROUPS

### 8.1 Data Working Group

Anastasia Wahome (RCMRD), Data Working Group co-chair, provided a progress update on behalf of the Data Working Group and its three subgroups. The Data Ethics, Law and Policy Subgroup has two main activities: one to analyse 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 is 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 In-situ Data Subgroup is 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 is 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. Ms Wahome also briefly described the comments that were provided by the Data Working Group on the draft GEO Statement on Open Science, as was requested by the Executive Committee. These comments were relatively minor and are expected to strengthen and provide greater clarity to the Statement.

OGC commented that the questions being used in the GEOSS Platform Operations Team study were oriented toward data providers and should be more user oriented. Ecuador asked whether it was possible to map where data sharing barriers were greater, to which Ms Wahome said she would raise this point with the Working Group. The Secretariat Director observed that the issues being addressed by the Data Ethics Subgroup reflected the interest of developed countries rather than those of developing countries. Ms Wahome responded that the geographic representation on the Data Working Group was uneven, with more participation from developed countries; the Working Group was interested in ideas for how this could be addressed.

The Programme Board noted the challenges with regional imbalance in the Data Working Group and its subgroups. The Board 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.

### 8.2 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 Programme Board was supportive of the mapping exercise and looked forward to seeing the results.

## **9 PROGRAMME BOARD SUBGROUPS**

### **9.1 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 19<sup>th</sup> meeting, the Programme Board had discussed whether changes were required to the “institutional check” on the proposed award recipients, as was proposed by some Programme Board members to address a perceived regional imbalance in the award recipients. This proposal 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 dearth of nominations from some regions. Their proposal was to add a second award category – a group award, which may be more acceptable than individual recognition in some regions. The issue was raised again at the 54<sup>th</sup> Executive Committee meeting, resulting in a request that the Programme Board 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 20<sup>th</sup> Programme Board meeting. The Chair then posed the question to the Programme Board whether they wanted to recommit to the awards process and, if the answer was positive, whether members were willing to participate in the Subgroup to make it happen. It was noted that the creation of new award categories would entail a larger workload for the Subgroup.

The Programme Board 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.

### **9.2 2021 GEO Symposium Subgroup**

Wenbo Chu (Secretariat) presented an update on Symposium planning on behalf of the Symposium Subgroup, which is led by Jan Ramboer (European Commission) and Kathy Fontaine (ESIP) with participation from China, Ghana, South Africa, United States, CEOS, CODATA/WDS, MRI and the Secretariat. Ms Chu began by reminding Programme Board members that the feedback from the GEO community to the 2020 Symposium suggested that the sessions should be of shorter duration, with shorter presentations, more time should be available for discussion and more opportunities for speaking, include the possibility of direction interaction with speakers, use different



times to make it easier for those in other time zones to participate, and encourage greater diversity of speakers. This feedback was taken into account by the Subgroup in planning the 2021 Symposium. Ms Chu described the three types of sessions: Plenary sessions, which are focused on key cross-cutting topics; Parallel Sessions, which are longer sessions that generally address specific topics that include multiple GEO activities; and Spotlight Sessions, that allow GEO community members to briefly highlight a single activity or topic. The ability to offer multiple concurrent sessions this year has meant that many more GEO Work Programme activities and individual contributors will be able to present and to speak during the Symposium. Ms Chu then described the topics of Plenary sessions; with the exception of the session on Resilient Cities and Human Settlements (the proposed fourth GEO engagement priority), the Plenary Sessions 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, the adoption of the SEEA Ecosystem Accounting manual, and the upcoming COP 26 in Glasgow. They are 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 Programme Board endorsed the proposed Symposium structure.

## **10 ATTENDANCE AT THE 20<sup>TH</sup> PROGRAMME BOARD MEETING**

### **10.1 Present (by teleconference)**

#### GEO Members

Australia, Canada, China, Ecuador, European Commission, Finland, France, Germany, Ghana, Greece, Italy, Japan, Kenya, Mexico, South Africa, United Kingdom, United States.

#### Participating Organizations

CEOS, CODATA/WDS, EEA, ESA, ESIP, GRSS, IAG, IEEE, MRI, OGC, SWF.

### **10.2 Absent**

#### GEO Members

Cambodia, Pakistan.

#### Participating Organizations

SPREP, UN Environment.