

Draft Report of GEO-18

This Document is submitted to Plenary for decision.

Wednesday, 2 November 2022

1 OPENING SESSION

GEO-18 formally opened on Wednesday, 2 November 2022. In his opening remarks, GEO Lead Co-Chair Stephen Volz, United States, welcomed delegates and participants, noting that GEO-18's theme "Global action for local impact" is anchored around fostering synergies across all GEO activities to enable people to make better choices with Earth observations (EO) products and services. Kwaku Afriyie, Minister of Environment, Science, Technology, and Innovation, Ghana, welcomed delegates and introduced Mahamudu Bawumia, Vice President, Ghana.

In his keynote address, the Vice President emphasized that GEO Week presented a unique opportunity to renew a joint unequivocal commitment to deepen international collaborations and develop national EO capabilities to support socio-economic transformation for the achievement of the "Africa We Want" and the "World We Want", as articulated in the agenda 2063 and post-2030 Agenda respectively. He noted that Ghana is applying the products of Digital Earth Africa (DE Africa) to monitor land-use changes due to illegal mining and developing an interoperable "data ecosystem" that combines EO with socioeconomic data, citizen science, and statistical data for meaningful and impactful sustainable development. He stressed the many applications of EO systems to important mitigation efforts, such as the impact of unplanned spatial expansion in cities, natural resource depletion, unsustainable mining, inadequate waste management and sanitation. Recognizing GEO's role in fostering cooperation and partnerships, he called upon the GEO community to sustain and build on its gains to bridge the continued EO gap in countries that lack resources and capacities.

Caryn Dasah, Cameroon Women's Peace Movement, highlighted that those countries most vulnerable to environmental shocks are the least prepared for them, and that young people in her region require their governments to use data to build peace and address environmental challenges.

United States Alternate Principal and Head of Delegation David Applegate, United States, explained the role of USGEO and lauded efforts to coordinate GEO regionally through the AmeriGEO coordination mechanism. He stressed the importance of EO in addressing climate change and biodiversity loss and reiterated strong United States support for GEO and its activities.

Via video, GEO Co-Chair Guangjun Zhang, China, shared progress made in his country, including the establishment of the UN Global Geospatial Centre in China and the ChinaGEOSS compendium publication. He highlighted the South-South cooperation to provide agricultural monitoring cloud services and technical training, and announced the data from the Sustainable Development Science Satellite-1 (SDGSAT-1) was open and available globally.

GEO Co-Chair Joanna Drake, European Commission, stressed that the European Green Deal is a roadmap toward becoming the first carbon-neutral continent by 2050. She highlighted how Copernicus products and services will help in the required energy and digital transition and emphasized that environmental challenges will only be solved through collaboration.

GEO Co-Chair Mmboneni Muofhe, South Africa, stressed EO's relevance in dealing with disaster and climate change impacts. He emphasized the connections between the environment, health, and the economy, pointing to EO and data sharing as economic opportunities. He drew attention to GEO's post-2025 role in increasing data access worldwide.

Yana Gevorgyan, GEO Secretariat, encouraged GEO Members to: “tap into ambition” to set a bold agenda for the future GEO to drive trusted consensus-driven solutions for decision-makers to “future-proof” their actions; “reach and aim for upwards consensus” to set an agenda that will empower the most vulnerable communities; and “build a bridge from today to the future” based on GEO's achievements to date with strong commitments of key resources in terms of talents, time, funding, advocacy, and communication.

1.1 Approval of Agenda and Draft Report of GEO-17 Plenary

Participants adopted the GEO-18 agenda and the GEO-17 draft report (GEO-18-1.2/GEO-18-1.3).

1.2 New members and participating organizations

Plenary welcomed new Members and Participating Organizations to GEO:

- Members:
 - Democratic Republic of Congo.
- Participating Organizations:
 - Sociedad Futura (SF);
 - Space for Climate Observatory (SCO);
 - West and Central African Research Network (WACREN).

Total number of GEO Participating Organizations: 144.

2 OPERATIONAL SERVICES FOR AFRICA

Atiewin Mbillah-Lawson, Ghanaian Journalist, moderated the session, stating that Africa faces multiple challenges in its journey to achieve the Sustainable Development Goals

(SDGs), and noted these challenges can be addressed by accessible, available, and operational EO. Participants watched a video on EO for coastal monitoring in West Africa, led by DE Africa.

Thembi Xaba, Managing Director, DE Africa, underscored that the monitoring of the coasts of Africa is a service provided uniquely for Africa. She underlined that for DE Africa, the key is the provision of accessible and readily available data to governments and other stakeholders for implementation of the SDGs. On the impacts of EO for decision making, she pointed to DE Africa services related to tracking and mapping the availability of water resources, agricultural productivity, and environmental sustainability. Xaba stressed that the most vulnerable are usually left behind in terms of accessing data, underlining that DE Africa is working to bridge this gap. Sharing her philosophy of bringing science to the people, she said the DE Africa's delivery model works through partnerships with organizations working with communities on the ground.

Samuel Kobina Annim, Government Statistician, Ghana, stated that in 2020, Ghana estimated that 20% of forests were subject to illegal logging and mining activities and underlined the role of EO in addressing this issue. He also noted the role of EO in addressing urban sprawl and stressed the need to integrate statistics with EO to better guide decision making. He underlined the need for crop mapping data to respond to food insecurity and welcomed collaborations to enhance EO for national planning purposes.

Samuel Abu Jinapor, Minister of Lands and Natural Resources, Ghana, highlighted that illegal small-scale mining has had a devastating impact on Ghanaian forest cover, underscoring the importance of reformative mining approaches and stronger enforcement measures. He highlighted that the government is partnering with DE Africa to access the data required to improve policymaking procedures with respect to illegal mining. Jinapor stressed the need for EO to assist in taking informed decisions on illegal mining and forest protection, noting the importance of balancing between expanding the food basket and protecting the environment. He underlined the importance of data in the distribution of national funding to projects and programmes throughout the continent.

Tidiane Ouattara, African Union Commission (AUC), lauded DE Africa for their contribution to the continent's ability to access and use data. Pointing to the "Africa We Want" as contained in Agenda 2063, he stressed the need for sustainable socio-economic development grounded in data and information. He welcomed DE Africa's role in providing data and information for decision makers. He noted the importance of engaging with decision makers on the African Space Policy and Strategy to align national priorities with regional ones. He stressed the importance of making sure all stakeholders are on the same page, working together, as opposed to in competition with each other, in the provision of services on the continent. For capacity building in the geospatial sphere, he called for a focus on skills development for young people across the continent, underlining the important role of Africa's human capital in this regard. He explained that DE Africa will be joining an existing ecosystem on the continent. Giving the practical example of the empowering work delivered through Global Monitoring for Environment and Security (GMES) and Africa, he outlined how data on storm conditions in the ocean has assisted Ghanaian fishers in reducing the number of human deaths in open ocean storms. He

concluded that DE Africa will further strengthen African communities in accessing development data and information.

Berenice Owen-Jones, High Commissioner to Ghana, Australia, noted her country had recognized the potential of DE Africa in improving the lives of people in practical ways through EO to support SDG outcomes. She pointed to Australia's role in the establishment of DE Africa, noting that Geoscience Australia had handed over DE Africa to be fully run in Africa by Africans, commending the role DE Africa has already played in policymaking for climate change, and for the SDGs. She discussed Digital Earth Australia, noting its role in ensuring productivity for a wide range of sectors, including tracking the evolution of coastlines and its work using infrared technology to detect bushfires.

In the ensuing discussion, panellists and participants considered, inter alia, the links between coastal monitoring and vulnerability in Africa, the use of information on fire prediction and management, data collection to support the most vulnerable, capacity building and funding needs around EO in Africa, and integrating women and youth into DE Africa's programmes. Participants reflected on the importance of recognizing investments by organizations in supporting the work of DE Africa and other operational services in Africa so as to ensure the sustainability of these initiatives.

2.1 Session outcomes and recommendations:

- The participants reached a consensus that:
 - There is a strong investment case for developing and implementing EO initiatives and innovations that would support socioeconomic and environmental decisions and deliver change in Africa;
 - There was a need to increase knowledge of DE Africa and its critical role in providing ready analysis EO data and services;
 - Important to continue to build synergies among existing EO initiatives and programmes to achieve wider outreach and deliver maximum impact in Africa;
 - Africa is to continuously develop its institutional, organizational and individual capacities to become resourceful on EO data, technologies and innovations.

- On specific action points, participants called for:
 - African countries to deepen engagement and take advantage of available EO data, technologies, and services offered;
 - DE Africa to strengthen partnerships at the continental level;
 - Increased financial and resource investments for DE Africa to support capacity developments and in-country initiatives;
 - Building synergies among existing EO initiatives and programmes to achieve wider outreach and deliver maximum impact in Africa; and
 - Developing Africa's capacities to become resourceful on EO data, technologies, and innovations.

3 EARTH OBSERVATIONS FOR NATURE-BASED SOLUTIONS

This session, moderated by Madeeha Bajwa, GEO Secretariat, centered on the role of EO in contributing to Nature-based Solutions (NbS), climate mitigation and adaptation, and biodiversity conservation. The session took the form of a high-level panel, beginning with a video presentation from Guy Loando Mboyo, Minister of Land Management, Democratic Republic of Congo (DRC), who called for greater technical support from all GEO Members to preserve his country's biodiversity and improve resilience to climate change.

Ambassador Tosi Mpanu-Mpanu, DRC, and Chair of the Subsidiary Body for Scientific and Technological Advice (SBSTA) under the UN Framework Convention on Climate Change (UNFCCC), mentioned key priorities for his country, including land reform and developing an ecological agricultural production model, among others. On a question regarding the role of local communities and Indigenous Peoples in land reform, Mpanu-Mpanu stressed the importance of providing scientific knowledge to communities “to monetize the forest resources they have” and to use technological tools to sell data that can enhance knowledge generation.

George Ortsin, UN Development Programme (UNDP), stressed the importance of targeting investments to the “epicenter of critical issues that can have ripple effects” from local to regional to national scales. As an example, he identified the need to predict where threats like illegal mining and forest fires may emerge, their causes, how they can be addressed, and how conditions can be monitored. He noted the outcome of using EO for community resilience is to enhance “landscape assets” built on improved ecosystem services.

3.1 Keynote address

Jillian Campbell, Convention on Biological Diversity (CBD), highlighted that EO contributes to measuring ecosystem interactions. She explained the global to national data gap as it relates to the indicator on natural ecosystem extent of the Post-2020 Global Biodiversity Framework, which is expected to be adopted at the Convention of Biodiversity's 15th meeting of the Conference of the Parties (COP 15). She called for a global ecosystem extent mapping and monitoring product that could respond to this data and monitoring gap and advance our understanding of interdependencies between ecosystems. This global product would be used for global policy goal setting and measurement, reporting and verification but also allow for localization for country-specific and community applications.

3.2 Panel discussion

In the ensuing panel discussion on how to respond to the global to national data gap challenge, Lisa-Maria Rebelo, Ramsar Convention STRP, stressed that the information from many critical wetland inventories can be obtained by EO. She highlighted the revival of the GEO Wetlands Initiative over the course of the last year since GEO-17, which will build on the more than 35 existing wetlands monitoring programmes that have been invited to contribute. She concluded by emphasizing the unique opportunity for the GEO community to meet and respond to the demand for wetlands information with the available EO science, data and technology.

Barron Joseph Orr, UN Convention to Combat Desertification (UNCCD), presented the GEO Land Degradation Neutrality Initiative (GEO-LDN) as an integrative value-addition to NbS using EO datasets and the enablers of its success. He explained that the 197 Parties of the UNCCD need more than just comparable data, they need ownership of how this data is selected, analysed and used and this is what GEO-LDN is able to provide to the national and local levels.

François Soulard, Census of Environment Statistics, Canada, highlighted his country's recently launched EO strategy and explained the Ecosystem Accounting of the UN System of Environmental Economic Accounting (UN SEEA) as a system of integrated environment data whose purpose is to understand the relationship between the environment and the economy. This internationally recognized statistical framework provides a common basis to understand the composition and health of ecosystems and allows countries to generate ecosystem accounts.

Lawrence Friedl, Committee on Earth Observations Satellites (CEOS), explained that the persisting ecosystem extent data gap is a collective action problem which presents a great opportunity for GEO to play its convening role. He highlighted that an ecosystem-extended task team will be proposed at the CEOS plenary later in November, which will get the benefits of other ongoing work of CEOS including via new satellites capabilities and analysis ready data. He concluded by calling on GEO playing a convening role to co-design this programme on ecosystem extent mapping and monitoring.

In the ensuing discussion, panellists highlighted: the need to apply the FAIR (Findability, Accessibility, Interoperable, and Reusability) principles to the NbS data; the need to raise ambition on the minimum data standards for community use; and the importance of partnerships across multilateral environmental agreements, industry, data communities, and other stakeholders. Delegates also raised questions related to, among others: how to incorporate data on urban spaces in NbS actions; the role of NbS in mitigating extreme events; and how GEO can influence data-related climate finance decisions. They also considered how to: embed LDN into national planning processes as a core NbS; promote innovative financing solutions for developing countries; and use nature-based accounting in decision making for developing countries.

As a final takeaway for the panel, Rebelo stressed that protecting wetlands is dependent on knowledge and applying that knowledge, and Orr reflected on framing the issue by ensuring that there is no deterioration in any dimension as it relates to land. Soulard stated that efforts should not be duplicated, and those overlapping efforts should be capitalized on. Friedl echoed earlier comments on the need to avoid overselling the abilities of EO, but to give credible hope to partners around risk and the importance of accurate ecosystem accounting.

3.3 Session outcomes and recommendations

- The participants reached a consensus that:
 - Global ecosystem extent mapping and monitoring is a strategic need for multiple multilateral environmental agreements and the implementation of NbS;

- GEO is uniquely placed to lead the development of this programme through coordination and consensus building;
- There is an urgency to act on this;
- The programme needs multi-stakeholder engagement and enabling financing.
- On specific action points, participants called for:
 - Partnerships for co-design and implementation: It is important to convene key expert communities from within GEO and new partners;
 - Adopt best practices from GEO (and beyond), e.g., GEO-LDN;
 - Finance: A call for action to raise seed funding to accelerate design and launch the global ecosystem extent mapping and monitoring programme.

4 ROAD TO GEO POST-2025

4.1 Road to GEO Post-2025

Katy Matthews, National Oceanic and Atmospheric Administration, United States, moderated the session which offered an opportunity for GEO Members, Participating Organizations and Associates to provide feedback on the evolving strategy for GEO's Post-2025 Strategic Mission, as outlined in the Interim Report of the Post-2025 Working Group. A short video was presented with voices of members of the Post-2025 Working Group and other stakeholders sharing what they saw as GEO's most important benefits and their expectations for the future.

Melanie Hutchinson, Department for Environment, Food, and Rural Affairs, United Kingdom, presented the Interim Report in her role as a member of the post-2025 Working Group. She highlighted the process and deliberations of the Working Group to date and the next steps. She presented key considerations contained in the Interim Report for GEO Member feedback, including, increasing equitable access to EO, strengthening GEO governance, mobilizing new donors, and enhancing communications and advocacy.

Using an interactive online survey tool (Slido.com), participants responded to a series of questions, including questions aimed at defining GEO's value proposition and response to the initial considerations captured in the interim report. Mexico noted the importance of a strong focus on collaborative projects, Kenya mentioned the role of an aggregated data system for countries, and Canada stressed importance of producing concrete results and the role of marketing GEO goods and services. Japan and Costa Rica highlighted the unique value of GEO as a high-level convener and Nigeria as a catalyst for mainstreaming EO products and services into governance. France recalled the importance of first defining the strategic axes for governments before considering the interest of potential funders.

On known gaps that GEO is best positioned to bridge, participants both online and in-person mentioned, among others, in situ data standards, time-series analytics, and citizen observation. Sweden pointed to real time and near real time services and Finland to matching high resolution EO with in situ observation. On what inclusiveness and equity would look like in GEO's future governance model, participants mentioned, inter alia, greater consideration of Indigenous Peoples' voices, knowledge sharing, and free and open

data access. On new partnerships and investments needed to drive scalability, participants stressed the role of public-private partnerships (PPPs) and open-source communities to operationalizing the work of GEO.

Switzerland, supported by Canada and others, highlighted three points for the Post-2025 GEO: focusing on a limited number of priority areas of high strategic importance, which are closely aligned with the needs of stakeholder governments; ensuring government retains “oversight and control” over private-sector partnerships to mobilize innovative financing; and identifying GEO’s target audience for the greatest impact, urging Members to better integrate GEO’s work in existing technical reports, such as UNEP’s Global Environmental Outlook, rather than a proposed annual GEO landmark on the state of EO.

Some members of the Working Group then gave their final takeaway messages. Yuqi Bai, Tsinghua University, China, stressed the need to determine mechanisms for innovative financing for EO. Humbulani Mudau, Department of Science and Innovation, South Africa, mentioned strengthening coordination across GEO processes. Angelica Gutierrez, National Oceanic and Atmospheric Administration, United States, and Amadou Moctar Dièye, Centre de Suivi Écologique, Senegal, urged greater connectivity to national GEOs. Alejandro José Román Molinas, Paraguayan Space Agency, stressed collaboration and knowledge sharing for emerging economies.

4.2 Session outcomes and recommendations

- On specific action points, participants called for:
 - Input by the GEO Plenary: Delegations to provide additional input to the interim report by 25 November 2022;
 - Continue the work: The Post-2025 Working Group to reflect points raised by the GEO Plenary and throughout GEO Week when continuing its work towards a proposal of a Post-2025 GEO;
 - Engagement: The Post-2025 Working Group to continue to engage with the GEO community at large.

Thursday, 3 November 2022

5 FUTURE-PROOFING NATIONAL ADAPTATION PLANS

On Thursday, Moderator Atiewin Mbillah-Lawson, Ghanaian Journalist, opened the day with this session centred on recognising the importance of early action capacity for adaptation to climate change, in line with UN Secretary General’s call for life-saving early warning systems for all by 2027. When introducing the session, she highlighted the implications of climate impacts on the agricultural sector in Africa and elsewhere. She also noted the need to unlock finance for integrating EO into national adaptation plans (NAPs).

5.1 Keynote address

In a keynote address, Paul Desanker, Manager of the Adaptation Programme, UNFCCC Secretariat, emphasized that the quest for getting big data on climate change into the hands of decision makers from the developing world has been ongoing for 25 years, noting several innovations over time, including the production of CD-ROMs containing EO for wide distribution in the 1990s. He shared that adaptation is a progressive, learn-by-doing journey, underscoring that it is a global responsibility which connects to regional, national, and local actions. He stressed the need for more EO data to directly support countries that are now facing extreme shocks more frequently. Highlighting adaptation milestones under the UNFCCC, he pointed to the 2015 Paris Agreement which ramped up adaptation goals already being addressed by the Framework Convention. He pointed to various adaptation initiatives, including: Open NAPs for direct country support; technical guidance and support through the Least Developed Countries Expert Group (LEG); the UN Secretary-General’s Adaptation Pipeline Accelerator to support the development of NAPs and adaptation project proposals, and a UN-wide mobilization in support of NAPs (UN₄NAPs). He called on the EO community to support on the development of guidelines for formulation and implementation of NAPs; to support the global goal on adaptation including identifying adaptation priorities and monitoring progress through indicators; and underlined the need for more EO capacity in finding solutions to loss and damage through the recently established Santiago Network. He underscored the importance of connecting data with real issues through analytical methods and models, for pragmatic aspects, such as support to subsistence farmers; and crop monitors as essential and practical tools for adaptation.

5.2 Presentations on integrating Earth observations into early warning systems and NAPs

Esther Makabe, Capacity Development Coordinator, GEO Global Agricultural Monitoring Initiative (GEOGLAM), presented GEOGLAM’s activities on co-developing national crop monitoring systems in 8 African countries and one region. She shared the success story of the national Uganda crop monitor, which gave three months of early warning of crops likely to fail due to drought in 2017 which triggered a disaster risk financing facility. USD 14 million of financing indirectly benefitted over 90,000 households, and over the 4 years, proactive programmes saved the government roughly USD 11 million. She highlighted the importance of guidelines to support NAPs with EO and announced the launch of the new GEO Supplement to the UNFCCC NAP Technical Guidelines, endorsed by the LEG. She briefly presented the stepwise approach included in the guidelines, which support LDCs to establish an institutional and technical framework for agriculture monitoring, and access capacity development and funding. She invited beneficiary countries to request GEOGLAM’s support, and national and international development agencies to provide funding to scale-up projects.

Samuel Joseph Gama, Principal Mitigation Officer, Department of Disaster Management Affairs, Malawi, presented a community-based flood early warning system for effective disaster preparedness and recovery, funded by the United States Agency for International Development (USAID) and implemented by the Regional Centre for Mapping of Resources for Development (RCMRD) in close collaboration with the national government. This is a

sub-component of a larger project M-CLIMES, funded by the Green Climate Fund (GCF) through UNDP. This integrated, low-cost, operational early warning system was enhanced by implementing the GEO Global Water Sustainability (GEOGloWS)-ECMWF streamflow forecast service, which provides information on potential floods 15 days ahead and allows the community to better prepare, as opposed to the standard few hours' lead time. He shared its remarkable performance during Cyclone Ana in early 2022 in Southern Malawi and drew attention to the economic impact reduction achieved through this system. As next steps, with support from the World Bank, there is a plan to upscale the early warning system to more flood-prone districts in Malawi. There is also interest to replicate it in other African countries, and RCMRD and GEOGloWS partners, through the SERVIR Program, are working to do so and increase the institutional capacity in the region. GEOGloWS is looking to develop guidelines to connect the streamflow forecast service to NAPs in other countries.

In the ensuing discussion, panellists responded to questions relating to: free and open in situ data use, multi-scalar capacity building, and ways that GEO can facilitate collaboration for long-range prediction modelling influencing NAPs to respond to crises like droughts and crop failure. Algeria questioned the accuracy of flood prediction data, with Gama noting the “near 100% accuracy” of GEOGloWS data for disaster risk reduction. On a question posed by the Netherlands on greater private sector involvement, Makabe stressed the need to “better define and clarify the value proposition for the private sector and for GEO to work more efficiently” in providing EO data. On future challenges and expectations, Desanker underscored the “digital divide” and ensuring assistance in distilling large quantities of data into “useable information.” Makabe underlined the challenge of ensuring interoperability that creates better data handling measures and standards to improve data efficiency.

5.3 Session outcomes and recommendations

- The participants reached a consensus that:
 - Integrating EO into NAPs is important for access to technical and financial support;
 - GEO should continue engaging on providing technical support for implementation of national/regional, sector-specific early warning systems, such as crop monitors based on EO in the context of NAP processes;
 - GEO should expand its support to other areas important to countries in different sectors beyond early warning systems.
- On specific action points, participants called for:
 - Partnerships for technical support: GEOGLAM to continue capacity development and support to design proposals for funding; GEOGLOWS to develop supplementary technical guidance on NAPs;
 - Finance: A call for action to raise seed funding for capacity development and ramping up EO-based monitoring systems for NAP implementation;

- Advocacy: Country delegations to raise the profile of GEO within the UNFCCC in relation to NAP support and UN Secretary General’s call on Early Warning for All.

6 COLLECTIVE ACTION ON OCEANS, CLIMATE AND BIODIVERSITY

6.1 Collective Action on Oceans, Climate and Biodiversity

Moderator Mbillah-Lawson, Ghanaian Journalist, introduced the session noting that more than 80% of the Ocean has never been mapped, lamenting the dearth of funding for ocean science. She also highlighted that the session is centred on the challenge and opportunity around oceans, climate change and biodiversity loss, and the lack of integration among the three communities.

6.2 Keynote address

In a virtual keynote address, Nicole LeBoeuf, Assistant Administrator for the National Ocean Service, National Oceanic and Atmospheric Administration (NOAA), United States, noted over 40% of the global population lives in coastal areas, pointing to the need for more EO to monitor them. She stressed that NOAA is looking to coastal and ocean data to fuel climate investments and efforts, sharing that the United States New Blue Economy Agenda will contribute to the country’s climate resilience and adaptation goals. She highlighted the importance of autonomous ocean sensors which, she noted, will continue to be essential in planning for hurricane responses in the Americas. She underlined that marine science must be included in discussions on NbS under both climate and biodiversity negotiations. She said UNFCCC COP 27 will be an implementation COP, pointing to the need for action in, among others, reducing shipping emissions, noting co-benefits for reducing underwater noise, and marine ecosystem conservation. She stressed that ocean data will be key to implement solutions advantageous for both climate and biodiversity and highlighted the need for more granular data collection led by coastal communities. She highlighted that GEO has an opportunity to increase the utility of observations, bringing together providers and users to meet critical, time-sensitive needs around ocean and coastal ecosystems and climate change.

6.3 Formal remarks

Ambassador Tosi Mpanu-Mpanu, DRC, and UNFCCC SBSTA Chair, noted the need for a new systems approach to address threats to the Earth’s climate, biodiversity, and ocean ecosystem. He highlighted the role of EO in this regard, mentioning the need for free and unrestricted access to all climate-related observations. Mpanu-Mpanu underlined that a global coordinated approach on systematic observation and action-oriented framework is necessary to address climate threats. He hoped for a decision on the fundamental place of EO at COP27. On the need for a common monitoring framework for reporting under the UNFCCC and the CBD, he noted that this would assist in generating synergies and opening doors to increased financing.

6.4 Presentation on the outcomes of GEO Blue Planet Symposium

Presenting the outcomes of the GEO Blue Planet Symposium, Nikelene Mclean, National Oceanic and Atmospheric Administration, United States, explained that GEO Blue Planet acts on stakeholder engagement, capacity development, cooperation, and co-design to deliver actionable activities. She said the Symposium, which had convened earlier in October 2022 in Accra, Ghana, featured discussions on fisheries, coastal hazards, and ocean observations. She highlighted the need for: exposing youth to the prospects of ocean science, particularly in Africa; more support for local and regional ocean observation projects; an information hub for fisher folk to prevent storm-related deaths; support for the guidance on NAPs with an emphasis on coastal adaptation; and increased land-to-sea litter monitoring using EO.

6.5 Panel discussion on cooperation

Panellists, including Isa Elegbede, Lagos State University, Nigeria, and Toste Tanhua, Co-chair, Global Ocean Observing System (GOOS), expressed the need for reliable and high-quality fully open access data, strengthening ocean observation capacity, and fostering Nbs. Tanhua also stressed the importance of having one voice with a powerful message. Others echoed challenges mentioned by panellists included open data access, interoperability, strong networks, and ocean observation collaboration. In final remarks, panellists emphasized: the unique position of GEO to provide insights and ways forward; GEO Blue Planet's role in achieving integration; and the importance of the GEO data sharing and data management policy.

6.6 Session outcomes and recommendations

- The participants reached a consensus that:
 - A new direction should be towards integrating ocean-climate-biodiversity communities;
 - It is important to consider a common monitoring framework to reconcile reporting under UNFCCC and CBD to avoid duplication;
 - GEO is uniquely positioned to: support integration among communities and space/in situ observations; mobilize resources; reach the communities on the ground.
- On specific action points, participants called for:
 - Partnerships for technical support: GEO Blue Planet to continue work on NAP guidance for coastal zones, involving Marine Biodiversity Observation Network (MBON) and other partners to provide datasets and products;
 - Advocacy: Speak with one voice: streamline messaging, have joint position between GEO, GOOS, POGO and others in relevant fora; GEO Member to advocate for GEO at UNFCCC and CBD;
 - Finance: tap into multiple sources, including private sector.

7 THE WAY AHEAD: PLENARY BUSINESS AND DECISIONS

7.1 Recommendations from the Expert Advisory Group on GEOSS

Neil Sims, Commonwealth Scientific and Industrial Research Organization (CSIRO), Australia, reported on the final report of the Expert Advisory Group (EAG) on the GEOSS to review whether the GEOSS continues to be relevant to the GEO Mission. In presenting results of a survey of GEOSS users and through national and regional consultations, he noted that the lack of tailored filter and search tools and user-friendliness remain limiting factors of the GEOSS platform. He presented three options for advancing GEOSS going forward, including: discontinuing investment; pivoting investments from the current GEOSS platform towards end-user needs, including to better support low to middle-income countries; and continuing to invest in the GEO-hosted GEOSS platform and enhance its functionality, including by improving search functionality and integration with the GEO Knowledge Hub. He presented some key recommendations and next steps including to consider improving in situ data support and to coordinate an in-depth cost-benefit analysis of the options.

In the ensuing discussion, Finland, supported by the United Kingdom, Switzerland, and Germany, noted that “GEO does not own GEOSS,” stressing the importance of further discussion on the motivations underlying the GEOSS Platform. Ghana highlighted the need to ensure GEOSS and other similar systems feed into the GEO Knowledge Hub. Greece urged greater support for the regional character of the GEOSS Platform. The European Commission reminded Members that GEOSS should be tailored to the EO community. She echoed comments by Costa Rica and the United Kingdom on the need to further engage with national and regional GEO stakeholders to refine the options further, and to define the technical and financial implications of each, stressing there could be different combinations of options that are not mutually exclusive. Moderator Volz, together with Sims, agreed on the need for additional engagement.

- The participants reached consensus on the following action points:
 - The work started under the leadership of EAG shall be continued as part of a fact-based process, in the run-up to the 2023 Ministerial Conference. The value of regional and of additional tailoring has been demonstrated;
 - GEO will continue to evaluate the implications of the merger of proposed options, as well as their implementation impacts (financial, technical and organizational);
 - Input by the GEO Plenary: Delegations to provide additional input to the EAG report by 25 November 2022.

7.2 GEO Work Programme 2023-2025

Evangelos Gerasopoulos, Co-Chair of the GEO Programme Board, presented the process towards drafting the GEO Work Programme for 2023-2025. He informed delegates that the Work Programme would also launch post-2025 incubators to tackle important domains including on health and NbS. He noted that the number of programmes had been reduced, due to the integration of activities, and announced the GEO-LDN as a new GEO Flagship and the EO for Disaster Risk Reduction as a new Initiative. He expressed gratitude

to the donors supporting the implementation of activities, noting the need to encourage more states and non-profit organizations to provide activity funding. He noted this new Work Programme ushers in a period of transition, which comes with both challenges and opportunities.

In the ensuing discussion, Germany congratulated the GEO-LDN for becoming a new GEO Flagship, noting it benefited from EUR 6.2 million of German funding, and calling for other Members to provide additional funding to sustain it. Ghana and France also congratulated the GEO-LDN steering committee and the UNCCD for their work on the GEO-LDN Initiative. France queried the process for new activities joining the Programme.

Finland underlined the goal that the Work Programme continues to provide operational services. China welcomed the new Work Programme, noting the number of Chinese experts supporting activities, and called on more participation from developing countries.

The UNCCD congratulated all the organizations involved in the work towards launching the GEO-LDN Flagship. Senegal expressed appreciation for the Work Programme, acknowledging that this is an opportunity for the world to understand what GEO offers, and looked forward to discussions on the Post-2025 Strategic Plan. Delegates then approved the Work Programme 2023-2025.

The Plenary approved the GEO Work Programme 2023-2025.

7.3 2021 Financial Statements and Audit Report

Brian Cover, Chief of the Finance Division, World Meteorological Organization (WMO), virtually presented the 2021 Financial Statements and Audit Report. He reminded Members that WMO administers the GEO Trust Fund and lauded the GEO's current strong financial position.

The Plenary approved the Financial Statement and Audit Report.

7.4 2023 GEO Secretariat Trust Fund Budget and Pledges

Lawrence Friedl, GEO Budget Working Group Co-Chair, presented the 2023 GEO Secretariat Trust Fund Budget, noting that the total amount of CHF 8,870,000 (cash and in-kind) operational budget will support GEO work and activities in 2023.

The Plenary then approved the budget.

7.5 Executive Committee & Programme Board Members for 2023

Yana Gevorgyan, Director, GEO Secretariat, presented the Executive Committee Members for 2023, including, Nigeria, Senegal, South Africa, Costa Rica, Peru, United States, Australia, Japan, China, Republic of Korea, Spain, France, and Italy.

Wenbo Chu, GEO Secretariat, presented the Programme Board Members for 2023, noting that eight nominations had been received for eight vacancies.

The Plenary noted the announcement of Executive Committee members and approved the Programme Board slate.

8 CLOSING SESSION: RECOGNIZING YOUTH, PUBLIC-PRIVATE PARTNERSHIPS AND EXCELLENCE IN GEO

8.1 Showcase highlights from the youth and industry tracks

Mary Namukose, Women in GIS-Uganda, and Patricia Cummins, Esri, offered highlights from the Youth and Industry Tracks, respectively. Namukose urged GEO Members to enhance their financing to address challenges in EO data access for youth, including by supporting the private sector and research and academic institutions. Cummins outlined a key message from industry track discussions was that successful public private partnerships are built along trust and relationships. She encouraged inclusive cross-sectoral collaborations together governments, non-profits, academic and private sector to address enduring global challenges.

8.2 Awards ceremony

GEO Secretariat Director Yana Gevorgyan presented the GEO Individual Excellence Awards together with Jean Dusart, European Commission, and Phoebe Oduor, RCMRD, who served as members of the Awards Jury. The awardees were:

- Lynwill Garth Martin, for promoting mercury monitoring activities through the GEO Flagship Global Observation for Mercury (GOS4M);
- Christina Justice, for building the GEOGLAM Crop Monitor for Early Warning;
- Neil Sims, for his excellence in leadership within GEO both for the GEO-LDN Flagship and in the GEO Expert Advisory Panel; and
- Michael Souffrant, for his work with GEOglows global streamflow forecast services.

Lawrence Friedl, National Aeronautics and Space Administration, United States, together with Maryam Rabiee, UN Sustainable Development Solutions Network (SDSN), presented the GEO SDG Awards under six categories. Winners were:

- Reforestamos Mexico (for GEO Member Country);
- UNOSAT (for GEO Participating Organization);
- Digital Earth Africa (for GEO Work Programme Activity);
- KTH Royal, Division of Geoinformatics (for Academia);
- EOS Data Analytics (for Commercial Sector); and
- UNDP and Costa Rica Ministry of Environment (for Collaboration).

8.3 Announcement of GEO-19 and 2023 Ministerial Summit

GEO Co-Chair Mmboneni Muofhe, Department of Science and Technology, South Africa, announced that the 2023 Ministerial Summit would be held in Cape Town, South Africa, from 4-8 December 2023.

8.4 Announcement of the members for the Ministerial Working Group

GEO Secretariat Director Yana Gevorgyan announced that the deadline for nominations of the Ministerial Working Group had been extended to 25 November 2022, calling for delegations to please make their nominations for Working Group members.

8.5 Review of Plenary Outcomes

Erika Alex, GEO Secretariat, gave a brief overview of GEO-18, including session outcomes and action points. Yana Gevorgyan stressed that Members may send comments and official delegation statements on the EAG report and the post-2025 interim report to the GEO Secretariat until 25 November 2022. She informed the Plenary that statements on the post-2025 working group interim report will be posted online.

8.6 Closing Remarks

Kwaku Afriyie, Minister of Environment, Science, Technology and Innovation, Ghana, offered closing remarks. He stressed that “business as usual cannot be enough,” highlighting the need to strengthen institutional capacities in developing countries to transform datasets into actionable information for decision makers. Afriyie announced that the country would establish a national GEO. He lauded Germany’s financial support in combating LDN and emphasized Ghana’s commitment to position itself to define innovative ways of using information technology and EO goods and services to achieve sustainable development.

US Alternate Principal and Head of Delegation David Applegate, United States Geological Survey, United States, underlined the importance of EO to support the SDGs and decision making for humanity and the planet, noting the issues that need to be addressed are complex but can be overcome if “we work together.” He said that the Plenary was key to setting the future stage for GEO and looked forward to a vibrant vision for GEO’s mission.

Via video, Guangjun Zhang, Ministry of Science and Technology, China, noted that GEO-18 had laid a solid foundation for the future of the process. He called on the GEO community to build on previous achievements and promote coordinated efforts to support EO in decision-making processing. He urged support for developing countries in their capacity needs and noted that as GEO Co-Chair, China will share best practices on EO to address global challenges.

Joanna Drake, European Commission, acknowledged the progress made on thematic areas within the GEO community and called for a renewed commitment towards achievement of the Paris Agreement and the SDGs.

Mmboneni Muofhe, South Africa, thanked the government of Ghana for hosting an excellent GEO Week. He expressed appreciation for the level of discussion and engagement throughout the conference and highlighted that even though challenges exist that need to be addressed on the continent, there is still a “sense that things are going in the right direction.”

Yana Gevorgyan thanked the host government and the entire GEO community for the very productive week. She invited all GEO Members to “hop on the bus” towards a new direction for GEO and welcomed delegates to the 2023 Ministerial Summit in Cape Town in December 2023. GEO Lead Co-Chair Stephen Volz closed the GEO-18 Plenary at 6:05 pm.