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GEO Bulletin

A Daily Report of the Tenth Plenary Session of the Group on Earth Observations (GEO-X) and Geneva Ministerial Summit
Published by the International Institute for Sustainable Development (IISD)



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Federal Office for the Environment FOEN

TENTH PLENARY SESSION OF THE GROUP ON EARTH OBSERVATIONS (GEO-X) AND GENEVA MINISTERIAL SUMMIT 15-17 JANUARY 2014

The Tenth Plenary Session of the Group on Earth Observations (GEO-X) will convene from 15-16 January 2014 in Geneva, Switzerland, followed by a high-level panel on the afternoon of Thursday, 16 January, and the third GEO Ministerial Summit on Friday, 17 January. The GEO Week started on 12 January prior to the official GEO meetings, and includes side events, working meetings and a Ministerial Summit Exhibition. The GEO Executive Committee (ExCom) held its meeting on 14 January. The Plenary and high-level discussions are expected to guide the Ministerial Summit, tasked with deliberating on a renewed mandate for GEO through 2025 and the adoption of a Geneva Declaration containing high-level recommendations to guide the development of a detailed 2015-2025 Implementation Plan for the Global Earth Observation System of Systems (GEOSS).

GEO is a voluntary partnership consisting of Members and Participating Organizations that are coordinating efforts to build the GEOSS. The European Commission and any UN member state that formally endorses the GEOSS 10-Year Implementation Plan can be a GEO Member. Participating Organizations are intergovernmental, international and regional organizations with a mandate in Earth observations or related activities who have formally endorsed the GEOSS 10-Year Implementation Plan and been approved by GEO Members meeting in Plenary. Currently, GEO consists of 89 Member countries and the European Commission and 67 Participating Organizations. The current Implementation Plan was endorsed by ministers in 2005.

The annual Plenary is GEO's primary decision-making body, while the ExCom guides GEO between Plenary sessions. The other GEO governance components are the Implementation Boards and working groups of the Plenary, and a Secretariat, based in Geneva, Switzerland. Implementation Boards have been established in the areas of infrastructure implementation, institutions and development, and social benefits. Currently, working groups support GEO in monitoring and evaluation, data sharing, and post-2015 GEOSS implementation.

As a "system of systems," GEOSS seeks to link existing and planned observing systems around the world, and support the development of new systems where gaps currently exist, with a

view to providing key data to assist decision makers, planners and emergency managers in nine "Societal Benefit Areas": disasters, health, energy, climate, water, weather, ecosystems, agriculture and biodiversity. Work in many of these Societal Benefit Areas are guided by "Communities of Practice" (CoPs) voluntarily formed by stakeholders, from providers to the final beneficiaries of Earth observation data and information, with a common interest in specific aspects of societal benefits to be realized by GEOSS implementation. Current CoPs include those on air quality, atmospheric chemistry, biodiversity, carbon, coastal zones, cryosphere, energy, forests, geohazards, global agricultural monitoring, health and the environment, and the water cycle.

A BRIEF HISTORY OF THE GEO

WORLD SUMMIT ON SUSTAINABLE DEVELOPMENT (WSSD): Held from 26 August to 4 September 2002 in Johannesburg, South Africa, the WSSD highlighted the need for coordinated observations relating to the state of the Earth.

FIRST EARTH OBSERVATION SUMMIT (EOS-I): High-level representatives of 34 governments meeting on 31 July 2003 in Washington, DC, US, adopted a declaration establishing the *ad hoc* intergovernmental Group on Earth Observations (*ad hoc* GEO), co-chaired by the European Commission, Japan, South Africa and the US, to draft a 10-Year Implementation Plan.

SECOND EARTH OBSERVATION SUMMIT (EOS-II): Convened on 24 April 2004 in Tokyo, Japan, this Summit of 40 governments adopted a Framework Document defining the scope and intent of GEOSS.

THIRD EARTH OBSERVATION SUMMIT (EOS-III): This Summit was convened on 16 February 2005 in Brussels, Belgium. In a resolution, delegations from almost 60 countries endorsed the 2005-2015 GEOSS 10-Year Implementation Plan and established the intergovernmental GEO to implement it.

FIRST PLENARY SESSION OF GEO (GEO-I): GEO-I was held from 3-4 May 2005 in Geneva, Switzerland. GEO-I agreed on the structure and duties of the ExCom to guide GEO between plenaries, with 12 members, with three members apiece for Europe, Asia/Oceania and the Americas, two from Africa and one from the Commonwealth of Independent States. The session also agreed to have four co-chairs, two representing

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developed countries and two representing developing countries, who would chair the ExCom and Plenary. GEO-I also endorsed the proposed User Interface Mechanism.

SECOND PLENARY SESSION OF GEO (GEO-II): Held from 14-15 December 2005 in Geneva, Switzerland, GEO-II adopted the GEO Rules of Procedure and approved the GEO Work Plan for 2006.

THIRD PLENARY SESSION OF GEO (GEO-III): GEO-III convened from 28-29 November 2006 in Bonn, Germany. GEO-III accepted the 2007-2009 Work Plan on the basis that it will be updated annually, along with the accompanying Outreach Plan and Capacity Building Strategy. GEO-III also accepted, *inter alia*, the Guidance for Recognition of New GEO Participating Organizations and Observers and the Guidelines for Additional Contributions.

FOURTH PLENARY SESSION OF GEO (GEO-IV)/ FIRST GEO MINISTERIAL SUMMIT: GEO-IV was held from 28-29 November 2007, followed by the Ministerial Summit on 30 November, in Cape Town, South Africa. The Ministerial Summit supported the establishment of a process with the objective of reaching consensus on the implementation of Data Sharing Principles for GEOSS to be presented to the next GEO Ministerial Summit. The Summit also committed to exploring ways and means for the sustained operation of the shared architectural GEOSS components and related information infrastructure, and to work together to improve the interoperability of and access to observation and associated prediction and information systems.

FIFTH PLENARY SESSION OF GEO (GEO-V): GEO-V was held from 19-20 November 2008 in Bucharest, Romania. GEO-V created a Data Sharing Principles Task Force and a Monitoring and Evaluation Working Group, accepted the 2009-2011 Work Plan subject to annual updates, reviewed work on Strategic Targets for GEOSS Implementation by 2015, and asked the ExCom to provide options for the Committee's expansion.

SIXTH PLENARY SESSION OF GEO (GEO-VI): GEO-VI was held from 17-18 November 2009 in Washington, DC, US, and discussed implementation of the Data Sharing Principles and recommendations for long-term operations of common infrastructure. It also approved a revised set of 14 GEOSS Strategic Targets, one apiece for each of the nine Societal Benefits Areas and five regarding architecture, data management, capacity building, science and technology, and user engagement.

SEVENTH PLENARY SESSION OF GEO (GEO-VII)/ SECOND GEO MINISTERIAL SUMMIT: GEO-VII was held from 3-4 November 2010, and the Ministerial on 5 November, in Beijing, China. GEO-VII reviewed a mid-term evaluation of GEOSS implementation, updated the 2009-2011 Work Plan, started work on developing the 2012-2015 Work Plan, and accepted a proposal for a Global Forest Observation Initiative (GFOI) relating to the GEO Forest Carbon Tracking Task.

The Ministerial Summit Declaration endorsed the refined GEO Targets and committed to: maximizing the number of documented datasets made available on the basis of full and

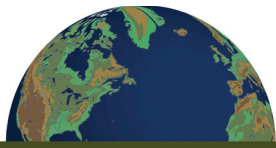
open access; creating the GEOSS Data Collection of Open Resources for Everyone (GEOSS Data-CORE); and developing flexible national and international policy frameworks to ensure a more open data environment. The Declaration also: called on UN bodies, other international organizations, and donor agencies to further contribute to GEOSS implementation and support capacity building for GEOSS users; and encouraged the provision of data and information to all emerging GEOSS initiatives, such as the global carbon observation and analysis system, GFOI, the GEO Biodiversity Observation Network (GEO BON), and a global land cover initiative.

EIGHTH PLENARY SESSION OF GEO (GEO-VIII): GEO-VIII was held from 16-17 November 2011 in Istanbul, Turkey. GEO-VIII examined a second GEOSS implementation report, as well as reports on GEOSS common infrastructure, data sharing, Data-CORE, GEO BON, the African Water Cycle Initiative, the Black Sea Environment Project, Global Drought Monitor, GEO Global Agricultural Monitoring Initiative (GEOGLAM), and an implementation plan for GFOI. GEO-VIII also accepted the GEO 2012-2015 Work Plan.

UN CONFERENCE ON SUSTAINABLE DEVELOPMENT (UNCSD or Rio+20): Rio+20 recognized: the importance of space-technology-based data, *in situ* monitoring, and reliable geospatial information for sustainable development policy making, programming and project operations; and efforts towards developing global environmental observing systems, including GEOSS.

NINTH PLENARY SESSION OF GEO (GEO-IX): GEO-IX was held from 22-23 November 2012 in Foz do Iguaçu, Brazil, and reviewed the third GEOSS implementation evaluation report, approved the 2012-2015 Work Plan subject to annual updates, and endorsed transforming the GFOI Task Force into a GFOI Steering Committee.

GEO-IX also began discussions about the future of GEOSS post-2015 based on the interim report of a working group, which recommended: continuing GEO and the implementation of GEOSS through 2025; GEO incubating specific applications and services based on Earth observations, and arranging for them to be adopted, supported and managed by specific governments and organizations; maintaining the current Societal Benefit Area structure while exploring linkages to three sustainable development framework themes: "sustainable economies" (economic development), "resilient society" (social development) and "vibrant planet" (environmental protection); and maintaining the current GEO governance structure. While most Members and Participating Organizations voiced support for continuing GEO and GEOSS implementation to 2025, they diverged on the working group's other recommendations. GEO-IX asked the GEO Secretariat to draft a compelling case for ministers regarding the achievements of GEOSS and the need for continuing GEO and the GEOSS into the future.



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GEO-X AND GENEVA MINISTERIAL SUMMIT HIGHLIGHTS: WEDNESDAY, 15 JANUARY 2014

The tenth plenary session of the Group on Earth Observations (GEO-X) opened on Wednesday, 15 January 2014, in Geneva, Switzerland. The opening session was addressed by the four GEO Co-Chairs and GEO Secretariat Director Barbara Ryan. The morning sessions then discussed the vision of GEO to 2025, preparations for the next GEOSS Implementation Plan, and the draft Geneva Declaration to be adopted by the Ministerial Summit. The afternoon session focused on GEOSS implementation and highlights.

OPENING SESSION

Welcoming participants to Geneva, Karine Siegwart, Head of Delegation, Switzerland, noted that GEO-X has the highest number of participants and ministers in attendance of any GEO-related meeting.

GEO Co-Chair Kathryn Sullivan (US) suggested that GEO illustrates that open and publicly available data drives innovation in the public and private sectors, saves lives, speeds relief to disasters, and enables leaders to respond more wisely to a changing world. She urged the re-endorsement of GEO's mandate for a second decade. Co-Chair Jianlin Cao (China) highlighted work undertaken in the Asia region, including on natural disasters, such as floods, typhoons and large-scale forest fires. Co-Chair Rudolf Strohmeier (European Commission) underscored the importance of a successful Ministerial Summit towards a renewed mandate for the 2016-2025 period. Co-Chair Philemon Mjwara (South Africa) outlined two tasks for the Plenary: reflecting on the progress and achievements of GEO and GEOSS; and starting the development of a vision for the future of GEO beyond 2015. He reminded participants about the need to restore the high-level political profile GEO had in its early stages.

GEO Secretariat Director Ryan expressed hope that the Ministerial Summit will endorse the next decade of GEO activities, and called on delegates to elaborate on lessons learned from past successes and failures.

The Plenary then adopted the draft agenda (Document 1) without amendments, recognized Georgia as a new Member (Document 2 Rev1), and approved ten new Participating Organizations (POs) and two observers (Document 3 Rev3). The opening session concluded with the adoption of the report of GEO-IX (Document 4).

GEO TO 2025

GENEVA MINISTERIAL SUMMIT DRAFT AGENDA AND CONTENT OF MINISTERIAL FOLDER: Secretariat Director Ryan explained that the documents relevant to the Summit (Document MS1) had been prepared by a Ministerial Working Group, and Working Group Co-Chair José Romero (Switzerland) explained the Group's mandate and process.

VISION FOR GEO 2025: GEO Co-Chair Sullivan invited comments on the draft Vision for GEO 2025 (Document MS2). The UK welcomed the recommendations, encouraged GEO

to build better links with users, and suggested GEO make a stronger economic case for its work to increase financial contributions. SWITZERLAND supported the overall vision and called on GEO to illustrate how the provision of data leads to concrete and measurable outcomes. He welcomed a focus on land cover mapping and suggested merging the work on ecosystems and biodiversity to develop synergies. GERMANY suggested increasing the number of ExCom members. CHINA said the vision demonstrates a strong strategy for GEOSS.

AUSTRALIA suggested building on the contributions of participants to GEO and stressed the need to realize its potential at the user level, in particular in developing countries. The COMMITTEE ON EARTH OBSERVATION SATELLITES recommended that GEO remain focused on its overarching goal of creating the GEOSS. ITALY suggested focusing on achieving a larger commitment from countries and institutions actively participating in GEO. CANADA highlighted exploring modifications to the Societal Benefit Areas (SBAs) system. He also called for a "responsible" ExCom expansion and engagement with POs between Plenary sessions. The EUROPEAN SPACE AGENCY (ESA) stressed the need for a coherent statement on data needs for addressing societal challenges. The WORLD METEOROLOGICAL ORGANIZATION emphasized promotion of open data access. The FOOD AND AGRICULTURE ORGANIZATION suggested that iterations of the vision encompass a nexus-based approach to food security.

GEO-X approved the document with an amendment suggested by Australia to add "to apply the associated data" in relation to use of Earth observation data in developing countries, and agreed to forward other comments to the Implementation Plan Working Group (IPWG) expected to be established. Considering the importance of various key questions that had been raised, GEO Co-Chair Sullivan urged participants to nominate "distinguished experts" to the IPWG to assist in engaging with the issues.

GEO PROGRESS REPORT: The Secretariat presented a document on the achievements of GEO (Document MS3) to the Plenary.

MINISTERIAL GUIDANCE ON THE EVOLUTION OF GEOSS: GEO Co-Chair Mjwara presented documents on Guidance on the Evolution of GEOSS (Document MS4) and Preliminary Guidance for GEO 2025 (Document 5) for the Plenary's consultation and information, respectively. Reflecting on the former, he emphasized the need to: restore high-level political support; enhance capacity in developing countries to use available data to inform decision making; and comprehend the breadth of the GEOSS architecture and related resource needs.

The EUROPEAN COMMISSION, supported by many participants, expressed support for the documents' contents. ITALY, supported by GERMANY and AUSTRALIA, underscored the need for stronger political support. He also suggested better-defined GEOSS-related responsibilities for Members and POs. JAPAN suggested better engagement with the post-2015 development agenda. SWITZERLAND,

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supported by the OPEN GEOSPATIAL CONSORTIUM (OGC), FRANCE and the UK, drew attention to the need for GEO to engage the private sector and users. The US underscored the importance of added rigor in the next ten years of work. COLOMBIA and NIGERIA stressed the need for capacity building to enable developing countries to access GEOSS-related data. NORWAY stated that data sharing should be elevated from being a principle to a practice. The ESA, supported by FAO, suggested GEO move beyond collating data and actively evaluate what new data are required.

GEO HIGHLIGHTS FACT SHEET: GEO Co-Chair Sullivan presented a GEO fact sheet (Document MS5) to the Plenary for information and invited delegates to submit their comments to the Secretariat.

PREPARATION OF THE NEXT GEOSS IMPLEMENTATION PLAN: GEO Co-Chair Strohmeier presented a proposal outlining the process towards a new implementation plan (Document 6), including the establishment of an IPWG. He said the cornerstone of the proposal is that the GEO community must be strongly represented and in control of the process. He introduced a proposed modification consisting of increasing the number of distinguished experts to up to three per caucus. He explained the steps of the roadmap are envisioned to include a review of a draft Implementation Plan by GEO-XI, adoption of the Plan by GEO-XII, and subsequent endorsement by ministers.

JAPAN, CHINA, CANADA, AUSTRALIA and the US supported the proposal. CANADA called for clear articulation of the expected outcome, attention to the consultative process, and reflection on the roles and division of responsibilities between the Plenary and ExCom. AUSTRALIA inquired about how other processes, such as possible modifications to the SBAs, might affect the preparatory process. NORWAY requested time to review the new proposal prior to its approval. GEO Co-Chair Sullivan suggested the Plenary return to the sub-item on Thursday morning for approval of the document.

DRAFT GENEVA DECLARATION

Ministerial Working Group Co-Chair Ezio Bussoletti (Italy) introduced the document (Document MS6) and suggested that the subtitle “Integrating Observations to Sustain Our Planet” could include the word “information.” NORWAY, opposed by JAPAN, suggested replacing text referencing “environmental observing systems” with “GEOSS.” ITALY, opposed by FRANCE, the US, CANADA and AUSTRALIA, suggested a drafting group convene to assess the suggestions. The drafting group was not established.

GEOSS IMPLEMENTATION AND HIGHLIGHTS ASSESSMENT OF PROGRESS – TARGET AND TASK:

Stuart Marsh, Co-Chair, Institutions and Development Implementation Board, introduced the 2013 Assessment of Progress report (Document 7). He stated that the latest assessment is based on more information than the first, indicates overall improvement, and suggests the tasks would benefit from increased funding. The GLOBAL CLIMATE OBSERVING SYSTEM expressed concern about the fact that the climate target is aspirational and that the recommendations emphasize modeling instead of observations. GERMANY called for monitoring implementation of the report’s recommendations. The US stressed the need for linkages between targets. CANADA suggested that, in addition to the current approach, a quantitative assessment would be useful. In response, Board Co-Chair Marsh said that while the targets are fixed and aspirational, it is important to approach them with pragmatism. The Plenary approved the document.

MONITORING AND EVALUATION: John Adamec, Co-Chair, Monitoring and Evaluation Group (M&E WG), summarized recommendations of the Fourth Evaluation of GEOSS Implementation (Document 8), including: creating new tasks or components; increasing cross-SBA cooperation; strengthening user identification and engagement; and identifying clear performance indicators. Ian Davidson,

ExCom Member, presented the Committee’s response to the recommendations by the M&E WG. The Plenary approved the document without modifications.

Presenting findings of the report on Progress on Implementation of Recommendations from GEOSS Evaluation (Document 9) and an update on current and upcoming evaluations, M&E WG Co-Chair Adamec described satisfactory process in reported responses to recommendations, and noted the ongoing Fifth Evaluation, expected to be ready by May 2014, and the final comprehensive evaluation, to be carried out in 2014-2015.

The EUROPEAN COMMISSION, supported by the ESA and the US, suggested upgrading the status of progress in utilization of current generation technology, given the progress under the GEO Common Infrastructure. Noting the comments, GEO Co-Chair Sullivan suggested approving the document with the proposed modification and called for delegates to support the work of the forthcoming final evaluation. The Plenary approved Document 8 with the suggested change.

GEO 2012-2015 WORK PLAN UPDATE: The Secretariat presented on the 2014 update of the 2012-2015 Work Plan (Document 10). She explained the document incorporates the technical and official comments received from the GEO community during May-November 2013 and draws from the recommendations of the Work Plan Symposium, held in June 2013 in Geneva, Switzerland. She said six new task components have been created: services for the coastal zone; developing capacity and social awareness; land cover for Africa; global wildfire information system; fostering utilization of Earth observation remote sensing data for all phases of disaster risk management; and a global network for observations and information in mountain environments. The document was approved as a “living document” without changes.

GEOSS IMPLEMENTATION HIGHLIGHTS: The Secretariat presented on 2013 contributions from GEO Members and POs to GEOSS implementation, citing examples on, *inter alia*: crop information for decision making; energy tools and services; tracking pollutants; carbon assessment and budgets; forests; biodiversity; global and local urban footprints; disasters information; climate change detection and adaptation; water; cold regions; and building ocean communities. She updated on initiatives to develop capacity to use GEOSS, the expansion of GEONETCast, and efforts to mobilize resources for GEOSS. Participants were shown a film summarizing hydrology-related initiatives.

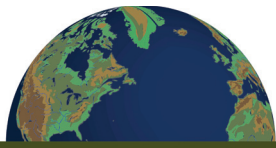
CHINA underscored the importance of international verification of data sets. The COMMITTEE ON SPACE RESEARCH presented on its work in the context of GEOSS implementation and encouraged the Data Sharing Working Group to address its North-South and gender balances.

Antonello Provenzale, Global Ecosystem Monitoring Task Coordinator, presented on the Global Network for Observation and Information in Mountain Environments (GEO-GNOME). He said GEO-GNOME will collect data, identify key questions, support policy actions and develop capacity-building strategies.

Andiswa Mlisa, AfriGEOSS Working Group, outlined the establishment, objectives, implementation approach and organizational arrangements for the AfriGEOSS initiative (Document 11). She called for strengthening relationships between AfriGEOSS and the international and GEO communities.

Numerous Members and POs expressed support to GEO-GNOME and AfriGEOSS and described their contributions to each.

Guido Colangeli, ESA, presented on the GEOSS Portal (www.geoportal.org) launched in December 2013, noting features, such as “latest news,” YouTube tutorials, and the search and feedback functions.



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GEO-X AND GENEVA MINISTERIAL SUMMIT HIGHLIGHTS: THURSDAY, 16 JANUARY 2014

The second day of GEO-X opened on Thursday, 16 January 2014 in Geneva, Switzerland. GEO-X approved the proposal for preparation of the next GEOSS Implementation Plan, discussed the draft Geneva Declaration, and considered the 2013 ExCom report, GEO financial reports and the 2014 operations budget, Implementation Board and ExCom membership, and the rules of procedure. The Plenary also heard a series of formal statements from Members and Partnership Organizations (POs) on key events and activities. It was announced that GEO-XI will be held in November 2014 in Gabon.

In the afternoon, Karine Siegwart, Vice Director, Federal Office for the Environment (FOEN), Switzerland, moderated a high-level panel on “Perspectives on the Value of Earth Observations.”

PREPARATION OF THE NEXT GEOSS IMPLEMENTATION PLAN

GEO Co-Chair Sullivan (US) presented the revised document on the preparation of the next GEOSS Implementation Plan (Document 6 Rev1) and it was approved.

DRAFT GENEVA DECLARATION

ITALY, opposed by the EUROPEAN SPACE AGENCY (ESA) and CROATIA, reiterated his request to include the word “information” in the draft Declaration’s subtitle (Document MS6). After a show of flags, Co-Chair Sullivan determined there was consensus to keep the text unchanged.

2013 REPORT OF THE EXECUTIVE COMMITTEE

GEO Co-Chair Mjwara (South Africa) presented the ExCom report for 2013 (Document 12). Apologizing for the absence of an evaluation of the Secretariat, he said the ExCom would send the finalized report to Members upon its completion. The Plenary approved the report pending the evaluation and its subsequent review.

FORMAL STATEMENTS FROM MEMBERS AND PARTICIPATING ORGANIZATIONS

AUSTRALIA underscored the capacity building it is providing to Oceania countries. BANGLADESH called for capacity building for developing countries that are accident-prone, food-insecure and affected by climate change. BELGIUM mentioned the PROBA-V global vegetation monitoring mission. BRAZIL highlighted its capacity-building work, especially in Latin America and with regard to oceans via the Blue Planet initiative.

CANADA noted its leadership on a range of biome-related systems and work in the Polar Space Task Group. CHINA provided an overview of important GEOSS-related events held in China and its past and future satellite launches. COLOMBIA highlighted its undertaking on forests, carbon tracking and mining.

The EUROPEAN COMMISSION drew attention to its work on Copernicus. FRANCE discussed the work it has undertaken to broker the first major contribution from the private sector to GEOSS to develop an extensive world heritage archive of

spot images. GERMANY highlighted its support for the GEO Trust Fund. ITALY reminded participants that it was an original funder of GEO. JAPAN announced the Japan Aerospace Exploration Agency is providing free and unlimited access to low and medium resolution satellite data.

MADAGASCAR said satellite images are indispensable tools for development. PARAGUAY emphasized the importance of capacity building and region-based approaches. The RUSSIAN FEDERATION highlighted its recent remote sensing work. SOUTH AFRICA noted it hosts the GEO BON Secretariat and its support for AfriGEOSS. SPAIN informed it has created a national-level management structure for GEO, and CHILE said it is setting up a national secretariat.

SWEDEN declared that the Swedish Meteorological and Hydrological Institute is making all its data available from 2014 onwards. SWITZERLAND mentioned its contribution in developing the Global Risk Data Platform. The US suggested GEO should build broader engagements beyond its usual partners.

The AFRICAN ASSOCIATION OF REMOTE SENSING OF THE ENVIRONMENT described its GEO-related capacity building work with African legislators. The COMMITTEE ON SPACE RESEARCH outlined its work on monitoring and evaluation. DIVERSITAS highlighted GEO BON. The EUROPEAN CENTER FOR MEDIUM-RANGE WEATHER FORECASTS stated that it coordinates 40 million observations per day. The EEA highlighted its contributions to, *inter alia*, Copernicus, the GEOSS Data-Core, and access to *in situ* data.

The EUROPEAN PLATE OBSERVING SYSTEM mentioned its work on improving research infrastructure and on the Geohazard Supersites Initiative. The ESA suggested that the Global Forest Observation Initiative (GFOI) “alone justifies GEO.”

The COMMITTEE ON EARTH OBSERVATION SATELLITES described its activities to support GEO in, *inter alia*: disaster management, forest observation, agriculture, climate observation, carbon, data sharing and access, and capacity building. The EUROPEAN UNION SATELLITE CENTRE, INTERNATIONAL TRAINING CENTRE and INTERNATIONAL ASTRONAUTICAL FEDERATION thanked GEO for their acceptance as POs. EUMETSAT said its contribution to GEOSS remains focused on the GEONETCast initiative. FAO said it looked forward to cooperating with African partners, particularly regarding land cover data.

The INTERNATIONAL CENTRE FOR INTEGRATED MOUNTAIN DEVELOPMENT highlighted that the Himalayas provide ecosystem services to millions of people and that it warrants a “Himalayan GEOSS.”

The INTERNATIONAL COUNCIL FOR SCIENCE highlighted the Future Earth initiative. The INTERNATIONAL ASSOCIATION OF GEODESY discussed a network of new geodesy telescopes. The INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS set out its work on quantifying the societal benefits of GEOSS. The INTERNATIONAL HYDROGRAPHIC ORGANIZATION detailed its work on the General Bathymetric Chart of the Oceans. The INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION highlighted its contribution to better

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understanding coastal and marine environments. The INTERNATIONAL SOCIETY FOR DIGITAL EARTH gave an overview of the recent Asia-based meetings.

FINANCIAL REPORTS

Luckson Ngwira, World Meteorological Organization, and Hakim Hadjeres, Swiss Federal Audit Office, presented the 2012 Financial Statements and the Report of the External Auditor (Document 13), respectively, which the Plenary approved. The Secretariat provided an overview of the Interim Report on Income and Expenditure 2013 (Document 14), which the Plenary noted.

The Secretariat presented the Secretariat Operations Budget for 2014 (Document 15). Co-Chair Sullivan reported that ExCom recommended approving the budget and establishing a working group to develop a programmatic annex to the budget that better illustrates the linkages with GEO's strategy, to be made available at the first 2014 ExCom meeting. GERMANY and ITALY suggested that the working group be open also to Members not in the ExCom as a means to promote transparency. The Plenary approved the budget and the proposal to establish a working group open to all Members to develop a programmatic annex.

Ryan presented on the management of the GEO Trust Fund (Document 16) along with a proposal to establish a Working Capital Fund to assist with budgetary shortfalls that would be capitalized with one million Swiss Francs. The Plenary approved the proposal.

Ryan also presented a proposal for an assessment for special initiatives that is designed to cover the costs associated with support services provided by the Secretariat for special initiatives. The proposal and Document 16 were approved by the Plenary.

RULES OF PROCEDURE UPDATE

The Secretariat introduced the proposed new membership of two Infrastructure Boards (Document 17), which was approved by Plenary.

Ryan listed the changes to the rules of procedure proposed since the last Plenary (Document 18). The EUROPEAN COMMISSION inquired whether the creation of the new Data Management Committee should be reflected in the rules of procedure. GERMANY requested ExCom to explore expanded membership of the ExCom for discussion by GEO-XI. Plenary approved the document, with GEO Co-Chair Sullivan noting that Germany's proposal would be followed up.

PRESENTATION OF THE NOMINEES FOR THE EXECUTIVE COMMITTEE

Co-Chair Sullivan presented, and the Plenary approved, the composition of the ExCom as follows: Argentina, Australia, China, Colombia, Estonia, the European Commission, Gabon, Italy, Japan, Republic of Korea, the Russian Federation, South Africa and the US. Mexico will replace Argentina in 2015.

ANNOUNCEMENT OF GEO-XI

The Plenary accepted GABON's offer to host GEO-XI. The Secretariat said it would consult with Gabon on possible dates in November 2014.

OTHER BUSINESS

The EUROPEAN COMMISSION, supported by FRANCE, the UK and WMO, expressed concern that the loss of quality of the Sentinel-1 data will affect all GEO Members and urged them to follow these developments in the International Telecommunications Union (ITU), and to educate domestic representatives to ITU about the potential implications for GEO equities. AUSTRALIA and ESA suggested that the Secretariat develop resources for this task, and the Secretariat agreed.

REVIEW OF SESSION OUTCOMES

Ryan reviewed the session outcomes.

CLOSING REMARKS

Ryan thanked Switzerland for its support for GEO-X. The four GEO Co-Chairs congratulated participants on a successful GEO-X.

GEO-X was gavelled to a close at 3:18 pm.

HIGH-LEVEL PANEL ON PERSPECTIVES ON THE VALUE OF EARTH OBSERVATIONS

Opening the discussion, moderator Karine Siegwart, Vice Director, Swiss Federal Office for the Environment, outlined the panel's purpose as providing input to the Ministerial Summit.

Achim Steiner, Executive Director, UN Environment Programme, described translating the growing volume of Earth observation data for policy making and to the global level as a key challenge. He said that the "ability to join the dots of how our planet functions and how resources can or cannot be used" is fundamental for reimagining future economies, and stressed the importance of "not being paralyzed by the inability to have perfect information before acting."

Margareta Wahlström, Special Representative of the UN Secretary-General for Disaster Risk Reduction (UNISDR), said that many disasters are avoidable, and data will help in the challenge of "dealing with the disaster before the disaster has happened." She suggested that UNISDR is a "transformation point," turning large amounts of data into "options for decision makers." She concluded that "science should be useful and used" and that scientists should be "in the middle of society, not on the side."

Philippe Gillet, Acting President, École Polytechnique Fédérale de Lausanne, argued producing "not only more data but better models" is a new paradigm in science. He said satellite data and data from the ground need to be integrated. He suggested that, in order to process all data produced and to be able to make predictions, a visualization model of all Earth observation data is required. He also underscored the importance of education, and proposed GEO launch courses to teach citizens globally how to use data for understanding our planet.

Serge Tröber, Swiss Re, explained that an important part of insurance is assessing the risks and responding to them, and Earth observations can support this aspect of their business. He said that climate change is a good example, particularly in the context of the increasing frequency and severity of floods. He explained that in the 2013 floods in Germany, Swiss Re received real time images of the floods from ESA. Based on that information, it was able to estimate and begin to mitigate its losses.

Answering the moderator's question about whether data can be trusted, Gillet pointed out there is diversity in the ability to predict outcomes, giving sea-level rise as an example of a risk that can be predicted and an asteroid collision as one that cannot. To increase trust in data, Wahlström suggested GEO promote the idea that risk is dynamic and help in "downscaling" data from the global level to individual countries' needs. Steiner suggested that how data is used and what assumptions are made in processing it are important, and emphasized the importance of "trusted institutions," such as the UN and universities.

A range of issues was raised in the subsequent discussion, including: the importance of data for informing and monitoring the post-2015 development agenda and the its implementation; the relevance of the establishment of the Intergovernmental Platform on Biodiversity and Ecosystem Services to GEOSS; the need to use data to develop new paradigms, such as increased understanding of the importance of trees to the sequestration of carbon, which has led to the program on reducing emissions from deforestation and forest degradation; the limitations of models and the need for greater engagement between the collection of data and modeling; the need for data to drive development, particularly in infrastructure to ensure that risk is reduced in the long-term; and the requirement for an "insurability test" whereby something should not be built if it cannot be insured.

Closing the meeting, moderator Siegwart said the panel had raised many questions and also provided some interesting answers.



SUMMARY OF THE TENTH PLENARY SESSION OF THE GROUP ON EARTH OBSERVATIONS (GEO-X) AND GENEVA MINISTERIAL SUMMIT 15-17 JANUARY 2014

The Tenth Plenary Session of the Group on Earth Observations (GEO-X) convened from 15-16 January 2014 in Geneva, Switzerland, followed by a high-level panel on the afternoon of Thursday, 16 January, and the third GEO Ministerial Summit on Friday, 17 January. Approximately 700 delegates attended the Plenary and Ministerial Summit, representing over 50 countries and more than 45 organizations. The week began on 12 January prior to the official GEO meetings, and included side events, working meetings and a Ministerial Summit Exhibition. The GEO Executive Committee (ExCom) convened on 14 January.

The principal outcomes of these meetings included a renewed mandate for GEO through 2025 and the adoption of the Geneva Declaration, containing high-level recommendations to guide the development of a detailed 2015-2025 Implementation Plan for the Global Earth Observation System of Systems (GEOSS).



GEO Co-Chair Kathryn Sullivan, Acting Under Secretary of Commerce for Oceans and Atmosphere and Acting National Oceanic and Atmospheric Administration (NOAA) Administrator, US, opened GEO-X.

A BRIEF HISTORY OF GEO

GEO is a voluntary partnership consisting of Members and Participating Organizations (POs) that are coordinating efforts to build GEOSS. The European Commission and any UN member state that formally endorses the GEOSS 10-Year Implementation Plan can be a GEO Member. POs are intergovernmental, international and regional organizations with a mandate in Earth observations or related activities who have formally endorsed the GEOSS 10-Year Implementation Plan and been approved by GEO Members in a GEO Plenary session. Currently, GEO consists of 90 Member countries and the European Commission and 77 POs. Ministers endorsed the current Implementation Plan in 2005.

The annual Plenary is GEO's primary decision-making body, while the ExCom guides GEO between Plenary sessions. The other GEO governance components are the Implementation Boards and *ad hoc* working groups of the Plenary, and a Secretariat, based in Geneva, Switzerland. Implementation Boards exist in the areas of infrastructure implementation, institutions and development, and social benefits.

As a "system of systems," GEOSS seeks to link existing and planned observing systems around the world, and support the development of new systems where gaps currently exist, with a view to providing key data to assist decision makers, planners and emergency managers in nine "Societal Benefit

Areas" (SBAs), namely: disasters, health, energy, climate, water, weather, ecosystems, agriculture and biodiversity. Work in many of these SBAs is guided by "Communities of Practice" (CoPs) voluntarily formed by stakeholders, from providers to the final beneficiaries of Earth observation data and information, with a common interest in specific aspects of societal benefits to be realized by GEOSS implementation. Current CoPs include those on air quality, atmospheric chemistry, biodiversity, carbon, coastal zones, cryosphere, energy, forests, geohazards, global agricultural monitoring, health and the environment, and the water cycle.

WORLD SUMMIT ON SUSTAINABLE DEVELOPMENT (WSSD): Held from 26 August to 4 September 2002 in Johannesburg, South Africa, the WSSD highlighted the need for coordinated observations relating to the state of the Earth.

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FIRST EARTH OBSERVATION SUMMIT (EOS-I):

High-level representatives of 34 governments met on 31 July 2003 in Washington, DC, US, and adopted a declaration establishing the *ad hoc* intergovernmental Group on Earth Observations (*ad hoc* GEO), co-chaired by the European Commission, Japan, South Africa and the US, to draft a 10-Year Implementation Plan.

SECOND EARTH OBSERVATION SUMMIT (EOS-II):

Convened on 24 April 2004 in Tokyo, Japan, this Summit of 40 governments adopted a Framework Document defining the scope and intent of GEOSS.

THIRD EARTH OBSERVATION SUMMIT (EOS-III):

This Summit was convened on 16 February 2005, in Brussels, Belgium. In a resolution, delegations from almost 60 countries endorsed the 2005-2015 GEOSS 10-Year Implementation Plan and established the intergovernmental GEO to implement it.

FIRST PLENARY SESSION OF GEO (GEO-I): GEO-I, held from 3-4 May 2005 in Geneva, Switzerland, agreed on the structure and duties of the ExCom to guide GEO between Plenaries, with 12 members: three members apiece for Europe, Asia/Oceania and the Americas; two from Africa; and one from the Commonwealth of Independent States. The session also agreed that four co-chairs, two representing developed countries and two representing developing countries, would chair the ExCom and Plenary. In addition, GEO-I endorsed the proposed User Interface Mechanism.

SECOND PLENARY SESSION OF GEO (GEO-II):

Held from 14-15 December 2005 in Geneva, Switzerland, GEO-II adopted the GEO Rules of Procedure and approved the GEO Work Plan for 2006.

THIRD PLENARY SESSION OF GEO (GEO-III):

GEO-III convened from 28-29 November 2006 in Bonn, Germany, and accepted the 2007-2009 Work Plan, which will be updated annually, along with the accompanying Outreach Plan and Capacity Building Strategy. GEO-III also accepted, *inter alia*, the Guidance for Recognition of New GEO POs and Observers, and the Guidelines for Additional Contributions.

FOURTH PLENARY SESSION OF GEO (GEO-IV)/

FIRST GEO MINISTERIAL SUMMIT: GEO-IV was held from 28-29 November 2007, followed by the Ministerial Summit on 30 November, in Cape Town, South Africa. The Ministerial Summit supported the establishment of a process to reach consensus on the implementation of Data Sharing Principles for GEOSS to be presented to the next GEO Ministerial Summit. The Summit also committed to exploring ways and means for the sustained operation of the shared architectural GEOSS components and related

information infrastructure, and to work together to improve the interoperability of and access to observation and associated prediction and information systems.

FIFTH PLENARY SESSION OF GEO (GEO-V):

GEO-V was held from 19-20 November 2008 in Bucharest, Romania. GEO-V created a Data Sharing Principles Task Force and a Monitoring and Evaluation Working Group, accepted the 2009-2011 Work Plan subject to annual updates, reviewed work on Strategic Targets for GEOSS Implementation by 2015, and asked the ExCom to provide options for the Committee's expansion.

SIXTH PLENARY SESSION OF GEO (GEO-VI):

GEO-VI was held from 17-18 November 2009 in Washington, DC, US, and discussed implementation of the Data Sharing Principles and recommendations for long-term operations of common infrastructure. It also approved a revised set of 14 GEOSS Strategic Targets, one apiece for each of the nine SBAs and five regarding architecture, data management, capacity building, science and technology, and user engagement.

SEVENTH PLENARY SESSION OF GEO (GEO-VII)/ SECOND GEO MINISTERIAL SUMMIT: GEO-VII was held from 3-4 November 2010, and the Ministerial Summit on 5 November, in Beijing, China. GEO-VII reviewed a mid-term evaluation of GEOSS implementation, updated the 2009-2011 Work Plan, began work on developing the 2012-2015 Work Plan, and accepted a proposal for a Global Forest Observation Initiative (GFOI) relating to the GEO Forest Carbon Tracking Task.

The Ministerial Summit Declaration endorsed the refined GEO Targets and committed to: maximizing the number of documented datasets made available on the basis of full and open access; creating the GEOSS Data Collection of Open Resources for Everyone (GEOSS Data-CORE); and developing flexible national and international policy frameworks to ensure a more open data environment. The Declaration also: called on UN bodies, other international organizations, and donor agencies to further contribute to GEOSS implementation and support capacity building for GEOSS users; and encouraged the provision of data and information to all emerging GEOSS initiatives, such as the global carbon observation and analysis system, GFOI, the GEO Biodiversity Observation Network (GEO BON), and a global land cover initiative.

EIGHTH PLENARY SESSION OF GEO (GEO-VIII):

GEO-VIII was held from 16-17 November 2011 in Istanbul, Turkey. GEO-VIII examined a second GEOSS implementation report, as well as reports on GEOSS common infrastructure, data sharing, Data-CORE, GEO BON, the African Water Cycle Initiative, the Black Sea Environment Project, Global Drought Monitor, GEO Global Agricultural Monitoring Initiative, and an implementation plan for GFOI. GEO-VIII also accepted the GEO 2012-2015 Work Plan.

UN CONFERENCE ON SUSTAINABLE DEVELOPMENT (UNCSD or Rio+20): Rio+20 resulted in a number of outcomes of relevance to GEO, and recognized: the importance of space-technology-based data, *in situ* monitoring, and reliable geospatial information for sustainable development policy making, programming and project operations; and efforts towards developing global environmental observing systems, including GEOSS.

NINTH PLENARY SESSION OF GEO (GEO-IX):

GEO-IX was held from 22-23 November 2012 in Foz do Iguaçu, Brazil, and reviewed the third GEOSS implementation



View of the Geneva International Convention Centre, venue of the event

evaluation report, approved the 2012–2015 Work Plan subject to annual updates, and endorsed transforming the GEO Task Force into the GEO Steering Committee.

GEO-IX also began discussions about the future of GEOSS post-2015 based on the interim report of a working group, which recommended: continuing GEO and the implementation of GEOSS through 2025; GEO incubating specific applications and services based on Earth observations, and arranging for them to be adopted, supported and managed by specific governments and organizations; maintaining the current SBA structure, while exploring linkages to three sustainable development framework themes—“sustainable economies” (economic development), “resilient society” (social development) and “vibrant planet” (environmental protection); and maintaining the current GEO governance structure. While most GEO Members and POs voiced support for continuing GEO and GEOSS implementation to 2025, they diverged on the working group’s other recommendations. GEO-IX asked the GEO Secretariat to draft a compelling case for ministers regarding the past achievements of GEOSS and the future need for continuing GEO and GEOSS.

SUMMARY OF THE GEO-X PLENARY

OPENING SESSION

Addressing the opening session on Wednesday morning, Karine Siegwart, Vice Director, Swiss Federal Office for the Environment, welcomed participants to Geneva, and noted that GEO-X had the highest number of participants and ministers in attendance than any past GEO-related meeting.

GEO Co-Chair Kathryn Sullivan (US) stated that GEO illustrates the fact that open and publicly available data drives innovation in the public and private sectors, saves lives, ensures rapid disaster relief, and enables leaders to respond more wisely to a changing world, and, in that context, urged the re-endorsement of GEO’s mandate for a second decade. Co-Chair Jianlin Cao (China) highlighted work undertaken in the Asia region, including on natural disasters, such as floods, typhoons and large-scale forest fires. Co-Chair Rudolf Strohmeier (European Commission) underscored the importance of a successful Ministerial Summit for a renewed mandate for the period 2015–2025. Co-Chair Philemon Mjwara (South Africa) outlined two tasks for GEO-X, namely: reflecting on the progress and achievements of GEO and GEOSS; and starting the development of a vision for the future of GEO beyond 2015. He reminded participants about the need to restore the high-level political profile that GEO had in its early stages.

GEO Secretariat Director Barbara Ryan expressed hope that the Ministerial Summit would endorse the next decade of GEO activities, and called on delegates to elaborate on lessons learned from past successes and failures.

The Plenary then adopted the draft agenda (Document 1) without amendments, recognized Georgia as a new Member (Document 2 Rev1), and approved ten new POs and two observers (Document 3 Rev3). The opening session concluded with the adoption of the GEO-IX report (Document 4).



Karine Siegwart,
Switzerland

GEO TO 2025

GENEVA MINISTERIAL SUMMIT DRAFT AGENDA AND CONTENT OF MINISTERIAL FOLDER: GEO Secretariat Director Ryan introduced the draft agenda for the Ministerial Summit (Document MS1 Rev1) and explained that a Ministerial Working Group had prepared a set of documents relevant for the Summit (Document MS0). Working Group Co-Chair José Romero (Switzerland) explained that the working group’s mandate was provided at GEO-IX, and thanked the Secretariat for their support throughout the process of developing, among other documents, the Vision for GEO 2025.

VISION FOR GEO 2025: The Vision for GEO 2025 was discussed on Wednesday. Opening the discussion, GEO Co-Chair Sullivan invited comments on the draft Vision for GEO 2025 (Document MS2). The UK welcomed the recommendations, encouraged GEO to build better links with users, and suggested GEO make a stronger economic case for its work as a means to increase financial contributions. Switzerland supported the overall vision and called on GEO to illustrate how the provision of data leads to concrete and measurable outcomes. He welcomed a focus on land cover mapping and suggested merging the work on ecosystems and biodiversity to develop synergies. Germany suggested increasing the number of ExCom members. China said the vision demonstrates a strong strategy for the future development of GEOSS.

Australia suggested building on the contributions of GEO participants and stressed the need to realize GEO’s potential at the user level, particularly in developing countries. The Committee on Earth Observation Satellites (CEOS) recommended that GEO remain focused on its overarching goal of creating GEOSS and called, *inter alia*, for more active interaction with international organizations and the promotion of “data democracy.” Italy suggested focusing on achieving a larger commitment from countries and institutions actively participating in GEO. In relation to societal challenges to be addressed through GEO post-2015, Canada emphasized the need to explore modifications to the SBA system, and called for a “responsible” ExCom expansion and engagement with POs between Plenary sessions.

The European Space Agency (ESA) stressed the need for a coherent statement on data needs for addressing societal challenges. The African Association of Remote Sensing of the Environment (AARSE) emphasized land observation and resource exploitation. The World Meteorological Organization (WMO) emphasized the promotion of open data access. The Food and Agriculture Organization of the United Nations (FAO) suggested that iterations of the vision encompass a nexus-based approach to food security.

The Plenary approved the document with an amendment suggested by Australia to add “to apply the associated data” in relation to use of Earth observation data in developing countries, and agreed to forward other comments to the Implementation Plan Working Group (IPWG), expected to be established by GEO-X under the agenda item “Preparation of the Next GEOSS



Stephen Briggs, European
Space Agency (ESA)

Implementation Plan.” Closing the discussion, Sullivan urged participants to nominate “distinguished experts” to the IPWG to assist in engaging with the questions and issues that had been raised.

GEO PROGRESS REPORT: The Secretariat presented a document on the achievements of GEO (Document MS3 Rev1) for the Plenary’s information, explaining it would also provide the foundation for a compendium on GEO’s achievements over the first decade that is to be prepared over the next two years.

MINISTERIAL GUIDANCE ON THE EVOLUTION OF GEOSS: Participants discussed ministerial guidance on the evolution of GEOSS on Wednesday. GEO Co-Chair Mjwara presented documents on Guidance on the Evolution of GEOSS (Document MS4) and Preliminary Guidance for GEO 2025 (Document 5) for the Plenary’s consultation and information, respectively. Reflecting on the former, Mjwara emphasized the need to: restore high-level political support; enhance capacity in developing countries to use available data to inform decision making; and understand the breadth of the GEOSS architecture and related resource needs.

The EC, with many participants, expressed support for the documents’ contents. Italy, supported by Germany and Australia, underscored the need for stronger political support. He also suggested better-defined GEOSS-related responsibilities for Members and POs. Japan suggested better engagement with the post-2015 development agenda. Switzerland, supported by the Open Geospatial Consortium, France and the UK, drew attention to the need for GEO to better engage the private sector and other users. The US underscored the importance of added rigor during the next ten years of work. Colombia and Nigeria stressed the need for capacity building to enable developing countries to access GEOSS-related data. Norway stated that data sharing should be elevated from being a principle to a practice. ESA, supported by FAO, emphasized the need for GEO to move beyond collating data and more actively evaluate what new data are required.

GEO HIGHLIGHTS FACT SHEET: GEO Co-Chair Sullivan presented a GEO highlights fact sheet (Document MS5) to Plenary and invited delegates to submit their comments directly to the Secretariat.

PREPARATION OF THE NEXT GEOSS

IMPLEMENTATION PLAN: On Wednesday morning, GEO Co-Chair Strohmeier presented a proposal outlining the process towards a new implementation plan (Document 6), including the establishment of an IPWG. He said the cornerstone of the proposal is that the GEO community must be strongly represented and in control of the process.

Strohmeier introduced a proposed modification consisting of increasing the number of “distinguished experts” in the group to up to three per caucus. He explained that these experts could come from any organization, and could be non-Members and POs, with the GEO Co-Chairs steering and supervising the process. Strohmeier explained that the steps of the process are envisioned to include a review of a draft Implementation Plan by GEO-XI, adoption of the Plan by GEO-XII, and subsequent endorsement by ministers.



GEO Co-Chair Rudolf Strohmeier, European Commission

Japan, China, Canada and the US supported the proposal. Canada, supported by Australia, called for clear articulation of the expected outcome, a consultative process, and reflection on the roles and division of responsibilities between the Plenary and ExCom. Australia inquired about how other processes, such as possible modifications to the SBAs, might affect the preparatory process. Raising concern over the unavailability of the modified document to Plenary, Norway requested time to review the new proposal prior to its approval.

GEO Co-Chair Sullivan assured Plenary that defining the process of planning the work would be among the early tasks of the IPWG, and emphasized the importance of a timely nominating process with qualified nominees. She described the planning process “like the first formation of GEO all over again.” Finally, Sullivan suggested the Plenary return to the sub-item on Thursday morning for clarification and approval of the document.

On Thursday morning, Sullivan presented the revised text (Document 6 Rev1) for the Plenary’s acceptance. In the absence of objections, she declared the document approved.

DRAFT GENEVA DECLARATION: On Wednesday morning, Ministerial Working Group Co-Chair Ezio Bussoletti (Italy) introduced the draft Declaration (Document MS6) for the Plenary’s consideration, and suggested adding the word “information” to the subtitle “Integrating Observations to Sustain Our Planet.” Norway, opposed by Japan, suggested replacing text referencing “environmental observing systems” with “GEOSS.” Italy, opposed by France, the US, Canada and Australia, suggested a drafting group convene to assess the suggestions. However, a drafting group was not established due to lack of consensus in Plenary.



Ezio Bussoletti, Italy

On Thursday morning, the Plenary resumed discussions on this item. Italy, opposed by ESA and Croatia, reiterated his request to include “information” in the draft Declaration’s subtitle.

After a show of flags, GEO Co-Chair Sullivan determined there was consensus “from a visual point of view” to maintain the original text. Accepting the “view of the majority,” Italy expressed disappointment with participants for not having understood “the story of this organization,” which he said is “also about information.”

GEOSS IMPLEMENTATION AND HIGHLIGHTS

ASSESSMENT OF PROGRESS – TARGET AND TASK:

On Wednesday afternoon, Stuart Marsh, Institutions and Development Implementation Board Co-Chair, introduced the 2011-2013 Assessment of Progress report (Document 7). He stated that the latest assessment: is based on more information than the first one was; indicates overall improvement; and suggests the tasks would benefit from increased funding.

The Global Climate Observing System expressed concern that the climate target is aspirational and the recommendations emphasize modeling instead of observations. Germany called for monitoring implementation of the report’s recommendations. The US stressed the need for linkages among targets. Canada suggested that, in addition to the current approach, a quantitative assessment would be useful.

In response, Marsh said that while the targets are fixed and aspirational, it is important to approach them with pragmatism. GEO-X approved the document.

MONITORING AND EVALUATION: John Adamec, Monitoring and Evaluation Working Group Co-Chair, summarized the recommendations of the Fourth Evaluation of GEOSS Implementation (Document 8), which include: creating new tasks or components; increasing cross-SBA cooperation; strengthening user identification and engagement; and identifying clear performance indicators. Ian Davidson, ExCom Member, then presented the Committee's response to the Working Group's recommendations (Document 8).



John Adamec, Co-Chair, Monitoring and Evaluation Working Group

China suggested improvements to future evaluations, including extracting concise goals for evaluation areas and highlighting key issues. Germany said it will support the next evaluation and called for others to do so as well. Plenary approved the

evaluation report without modifications.

Presenting findings of the report on Progress on Implementation of Recommendations from GEOSS Evaluation (Document 9) and an update on current and upcoming evaluations, Adamec described satisfactory progress in reported responses to recommendations. He also noted the ongoing Fifth Evaluation, expected to be ready by May 2014, and the final comprehensive evaluation, to be carried out in 2014-2015.

The European Commission, supported by ESA and the US, suggested upgrading the status of progress in the utilization of current generation technology, given recent progress under the GEOSS Common Infrastructure (GCI). Noting the comments, GEO Co-Chair Sullivan suggested approving the document with the proposed modification and called for delegates to support the work of the forthcoming final evaluation. Plenary approved the assessment report (Document 9) with the suggested change.

GEO 2012-2015 WORK PLAN UPDATE: The Secretariat presented on the 2014 update of the 2012-2015 Work Plan (Document 10). She explained that the document incorporates the technical and official comments received from the GEO community during May-November 2013 and draws from the recommendations of the Work Plan Symposium, held in June 2013 in Geneva, Switzerland. She said six new task components have been created: services for the coastal zone; developing capacity and social awareness; land cover for Africa; a global wildfire information system; fostering utilization of Earth observation remote sensing data for all phases of disaster risk management; and a global network for observations and information in mountain environments. The document was approved without changes as a "living document" subject to future updates.

GEOSS IMPLEMENTATION HIGHLIGHTS: On Wednesday afternoon, the Secretariat presented on 2013 contributions by GEO Members and POs to GEOSS

implementation, citing examples of programmes related to, *inter alia*, crops, energy, pollutants, carbon, forests, biodiversity, urban footprints, disasters, climate change, water, cold regions and ocean communities. She provided updates on initiatives to develop capacity to use GEOSS, the expansion of GEONETCast, and efforts to mobilize resources for GEOSS. Participants also watched a film summarizing hydrology-related initiatives.

China underscored the importance of international verification of data sets. The Committee on Space Research (COSPAR) presented on its work in the context of GEOSS implementation and encouraged the Data Sharing Working Group to address its North-South and gender balances.

FEATURED INITIATIVES: Antonello Provenzale, Global Ecosystem Monitoring Task Coordinator, presented on the Global Network for Observations and Information in Mountain Environments (GEO-GNOME). He explained that monitoring and modeling in mountain environments should be driven by societal needs, and underscored the importance of global cooperative actions and initiatives. He said GEO-GNOME will collect data, identify key questions, support policy actions and develop capacity-building strategies.

Andiswa Mlisa, AfriGEOSS Working Group, outlined the establishment, objectives, implementation approach and organizational arrangements for the AfriGEOSS initiative (Document 11). She stressed access to information and informed decision making as priorities for Africa, and called for strengthening relationships between AfriGEOSS and the international and GEO communities.



Andiswa Mlisa, AfriGEOSS Working Group

Numerous Members and POs expressed their support for both initiatives and described their contributions to each, including: financial resources; capacity-building support; conferences and symposia; and research projects and collaboration.

GEOSS COMMON INFRASTRUCTURE: Guido Colangeli, ESA, presented on the GEOSS Portal (www.geoportal.org), launched in December 2013.

2013 REPORT OF THE EXECUTIVE COMMITTEE

GEO Co-Chair Mjwara presented the ExCom report for 2013 (Document 12). Apologizing for the absence of an evaluation of the Secretariat, he said the ExCom would send the finalized report to Members upon its completion. The Plenary approved the report pending the evaluation and its subsequent review.



Guido Colangeli, ESA

FORMAL STATEMENTS FROM MEMBERS AND PARTICIPATING ORGANIZATIONS ON GEOSS IMPLEMENTATION

On Thursday morning, Members and POs offered formal statements about key events and activities related to GEOSS implementation.



Sue Barrell, Australia

Australia underscored its active support for sharing data, hosting international conferences on related issues, and the capacity building it is providing to Oceania countries.

Bangladesh called for

capacity building for developing countries that are accident-prone, food-insecure and affected by climate change. Belgium mentioned the Project for Onboard Autonomy – Vegetation (PROBA-V), a global vegetation satellite-monitoring mission. Brazil highlighted its capacity-building work, especially in Latin America and with regard to oceans via the Blue Planet initiative.

Canada noted its leadership on a range of biome-related systems and work in the Polar Space Task Group. China provided an overview of important GEOSS-related events held in China and its past and future satellite launches. Colombia highlighted its undertakings on forests, carbon tracking and mining.

The European Commission drew attention to its work on the European Earth Observation Programme (Copernicus), underscoring that the Programme is also active outside the European Union, including in providing assistance to the Philippines, post-Typhoon Haiyan. France discussed the work it has undertaken to broker the first major contribution from the private sector to GEOSS to develop an extensive world heritage archive of spot images. Germany highlighted its support for the GEO Trust Fund. Italy reminded participants that it was an original funder of GEO.

Japan described its contribution to the GEO 2012-2015 Work Plan in remote sensing, global forest maps, and capacity building in water management and observation in Africa. He announced the Japan Aerospace Exploration Agency is providing free and unlimited access to low- and medium-resolution satellite data.

Madagascar stressed the importance of environmental data for good environmental governance and said satellite images are indispensable tools for development. Paraguay emphasized the importance of capacity building and region-based approaches. The Russian Federation highlighted its recent remote sensing work. South Africa noted it hosts the GEO BON Secretariat and its support for AfriGEOSS. Spain informed it has created a national-level management structure for GEO, and Chile said it is setting up a national secretariat.

Sweden declared that the Swedish Meteorological and Hydrological Institute is making all its data available from 2014 onwards. Switzerland mentioned its contribution in developing the Global Risk Data Platform. The US said GEO's power emerges from partnerships to combine Earth observations data with understanding of natural processes, and suggested GEO should build broader engagements beyond its usual partners.

AARSE described its GEO-related capacity-building work with African legislators. COSPAR outlined its work on monitoring and evaluation. DIVERSITAS underscored its work with GEO BON. The European Center for Medium-Range Weather Forecasts stated that it coordinates 40 million observations per day, but noted that such an intensive

programme requires significant funding. The European Environment Agency highlighted its contributions to, *inter alia*, Copernicus, the GEOSS Data-Core and access to *in situ* data.

The European Plate Observing System mentioned its work on improving research infrastructure and the Geohazard Supersites Initiative. ESA suggested that the GFOI “alone justifies GEO.”

CEOS described its activities to support GEO in, *inter alia*, disaster management, forest observation, agriculture, climate observation, carbon, data sharing and access, and capacity building. The European Union Satellite Centre, International Training Centre and International Astronautical Federation thanked GEO for accepting them as POs. The European Organization for the Exploitation of Meteorological Satellites (EUMETSAT) said its contribution to GEOSS remains focused on the GEONETCast initiative. FAO said it looked forward to cooperating with African partners, particularly regarding land cover data.

The International Centre for Integrated Mountain Development highlighted that the Himalayas provide ecosystem services to millions of people and that this warrants a “Himalayan GEOSS” to improve the flow of information “from space to the village.”

The International Council for Science highlighted Future Earth, which is a new research initiative that will develop knowledge on global environmental change and support the transformation towards global sustainability. The International Association of Geodesy discussed a network of new geodesy telescopes. The Institute of Electrical and Electronics Engineers (IEEE) set out its work on quantifying the societal benefits of GEOSS. The International Hydrographic Organization (IHO) detailed its work on the General Bathymetric Chart of the Oceans and the Geospatial Information Register. The Intergovernmental Oceanographic Commission of the UN Educational, Scientific and Cultural Organization (UNESCO) highlighted its work with the International Joint Commission on Oceanography and GEO BON, which contributes to better understanding of coastal and marine environments. The International Society for Digital Earth provided an overview of the recent Asia-based meetings.

The International Union of Geological Sciences introduced the Resourcing Future Generations initiative that will attempt to identify and address key challenges in mineral and other natural resources provision. The Regional Centre for Mapping of Resources for Development and the UN Economic Commission for Africa highlighted their contributions to AfriGEOSS and related work in Africa, including: capacity building; land use and land cover mapping; hazard and risk management; and water cycle initiatives. The World Climate Research Programme (WCRP) said its work to improve the understanding of climate predictability and human influence on the climate relies on sustained Earth observations and observation networks.

GEO Co-Chair Sullivan closed the session by thanking those organizations that are aligning their work with GEO, and suggested participants consider whether more efficient ways exist to share updates on activities in the future, given the continuing growth of GEO and the Plenary's full agenda.



Anne-Hélène Prieur-Richard, DIVERSITAS

FINANCIAL REPORTS

2012 FINANCIAL STATEMENTS AND REPORT

OF THE EXTERNAL AUDITOR: On Thursday morning, Luckson Ngwira, WMO, and Hakim Hadjeres, Swiss Federal Audit Office, presented the 2012 Financial Statements and the Report of the External Auditor (Document 13), respectively, which the Plenary approved.

INTERIM REPORT ON INCOME AND

EXPENDITURE 2013: The Secretariat provided an overview of the Interim Report on Income and Expenditure 2013 (Document 14 Rev1), which the Plenary noted.

SECRETARIAT OPERATIONS BUDGET FOR 2014:

The Secretariat presented the Secretariat Operations Budget for 2014 (Document 15 Rev1).

GEO Co-Chair Sullivan reported that the ExCom recommended approving the budget and establishing a working group to develop a programmatic annex to the budget that better illustrates the linkages with GEO's strategy, to be made available at the first 2014 ExCom meeting. Germany and Italy suggested that the working group also be open to Members not represented in the ExCom as a means to promote transparency.

The Plenary approved the budget and the proposal to establish a working group open to all Members to develop a programmatic annex.

MANAGEMENT OF GEO TRUST FUND: Working Capital Fund: GEO Secretariat Director Ryan presented on the management of the GEO Trust Fund (Document 16), along with a proposal to establish a Working Capital Fund to assist with budgetary shortfalls that would be capitalized with one million Swiss Francs. The Plenary approved the proposal.

Assessment for Special Initiatives: Ryan also presented a proposal for an assessment for Special Initiatives. She explained that while current expenditures from the GEO Trust Fund are assessed at 7% by the WMO, the proposal suggests that an additional assessment be applied to the Special Initiatives, such as GFOI, to: cover administrative costs of these initiatives being coordinated by the GEO Secretariat; and encourage continued contributions by GEO Members to the regular Trust Fund. The proposal and Document 16 were approved by the Plenary.

RULES OF PROCEDURE UPDATE

On Thursday afternoon, the Secretariat introduced the proposed new membership of two Infrastructure Boards (Document 17), which Plenary approved.

During the same session, GEO Secretariat Director Ryan listed the changes to the rules of procedure proposed since the last Plenary (Document 18). The European Commission inquired whether the creation of the new Data Management



Barbara Ryan, Director, GEO Secretariat

Committee should be reflected in the rules of procedure. Germany requested the ExCom to explore expanded membership for discussion by GEO-XI. Plenary approved the document, with GEO Co-Chair Sullivan noting that the ExCom and the IPWG would follow up on Germany's proposal.

PRESENTATION OF THE NOMINEES FOR THE EXECUTIVE COMMITTEE

On Thursday afternoon, GEO Co-Chair Sullivan presented, and the Plenary approved, the composition of the ExCom as follows: Australia, China (Co-Chair), Japan and the Republic of Korea from the Asia/Oceania; Estonia, the European Commission (Co-Chair) and Italy from Europe; Argentina, Colombia and the US (Co-Chair) from the Americas for 2014, with Mexico replacing Argentina in 2015; Gabon and South Africa (Co-Chair) from Africa; and the Russian Federation from the Commonwealth of Independent States.

ANNOUNCEMENT OF GEO-XI

On Thursday afternoon, the Plenary accepted Gabon's offer to host GEO-XI. The Secretariat said it would consult with Gabon on possible dates in November 2014.

OTHER BUSINESS

In Plenary on Thursday, the European Commission, supported by France, the UK and the WMO, expressed concern that the loss of quality of data from the Sentinel-1, a polar-orbiting satellite, will affect all GEO Members, and urged Members and POs to follow these developments in



Tanguay Gahouma, Gabon, informed the GEO-X Plenary of his country's offer to host GEO-XI

the International Telecommunications Union (ITU), and to educate domestic representatives to the ITU about the potential implications for GEO equities. Australia and ESA suggested that the Secretariat develop resources for this task, and the Secretariat agreed.

REVIEW OF SESSION OUTCOMES

GEO Secretariat Director Ryan presented an overhead slide summarizing the key action points from the meeting. These session outcomes were confirmed and accepted by GEO-X.

CLOSING REMARKS

Secretariat Director Ryan thanked Switzerland for its support for GEO-X. The four GEO Co-Chairs congratulated participants on a successful GEO-X. GEO Co-Chair Sullivan gavelled GEO-X to a close at 3:18 pm.

SUMMARY OF THE HIGH-LEVEL EVENT ON PERSPECTIVES ON THE VALUE OF EARTH OBSERVATIONS

Opening the discussion on Thursday evening, moderator Karine Siegwart, Vice Director, Swiss Federal Office for the Environment, said the panel's purpose was to provide input to the Ministerial Summit.

Achim Steiner, Executive Director, UN Environment Programme (UNEP), described translating the growing volume of Earth observation data for policy making and to the global level as a key challenge. He said that the "ability to join the dots of how our planet functions and how resources can or cannot be used" is fundamental for reimagining future economies. He also stressed the importance of shortening the



L-R: Philippe Gillet, Acting President, École Polytechnique Fédérale de Lausanne; Margareta Wahlström, Special Representative of the UN Secretary-General for Disaster Risk Reduction; Karine Siegwart, Vice Director, Federal Office for the Environment, Switzerland; Achim Steiner, Executive Director, UNEP; and Serge Tröber, Chief Underwriting Officer of Corporate Solutions, Swiss Re

timeline between science and policymaking by accelerating the usability of information through work by UN institutions, and “not being paralyzed by the inability to have perfect information before acting.” He suggested that, through its cooperation and by providing real-time information, GEO is enhancing the global capability to respond to these challenges.

Margareta Wahlström, Special Representative of the UN Secretary-General for Disaster Risk Reduction (UNISDR), said that many disasters are avoidable, and that data will help in the challenge of “dealing with the disaster before the disaster has happened.” She suggested that UNISDR is a “transformation point,” turning large amounts of data into “options for decision makers.” She concluded that “science should be useful and used” and that scientists should be “in the middle of society, not on the side.”

Philippe Gillet, Acting President, École Polytechnique Fédérale de Lausanne, argued that producing “not only more data but better models” is a new paradigm in science. He said satellite data and data from the ground need to be integrated, and that big data, or large data sets, is another central issue and will change how science is done. He suggested that, in order to process all data produced and to be able to make predictions, a visualization model of all Earth observation data, similar to the European Human Brain Project, is required. He also underscored the importance of education, and proposed GEO launch courses to teach citizens globally how to use data for understanding our planet.

Serge Tröber, Swiss Re, explained that assessing and responding to risks is an important part of insurance, and that Earth observations can support this aspect of the business.



Achim Steiner, Executive Director, UNEP



Philippe Gillet, Acting President, École Polytechnique Fédérale de Lausanne

He cited climate change as a good example, particularly in the context of the increasing frequency and severity of floods. He explained that during the 2013 floods in Germany, Swiss Re received real-time images from ESA. Based on that information, Swiss Re was able to estimate and begin to mitigate its losses. As an example, he explained that satellite images could be used to observe storm damage to roofs that can be mended before more serious damage occurs.

Answering moderator Siegwart’s question about whether data can be trusted, Gillet pointed to diversity in the ability to predict outcomes, using sea-level rise as an example of a risk that can be predicted and an asteroid collision as one that cannot. To increase trust in data, Wahlström suggested GEO promote the idea that risk is dynamic and help in “downscaling” data from the global level to individual countries’ needs. Steiner suggested that how data is used and what assumptions are made in processing it are important, and emphasized the importance of “trusted institutions,” such as the UN and universities.

Participants brought up a range of issues in the subsequent discussion, including: the importance of data for informing and monitoring the post-2015 development agenda and its implementation; the relevance of the establishment of the Intergovernmental Platform on Biodiversity and Ecosystem Services to GEOSS; the need to use data to develop new paradigms, such as increased understanding of the importance of trees to the sequestration of carbon, which led to the program on reducing emissions from deforestation and forest degradation; the limitations of models and the need for greater engagement between the collection of data and modeling; the need for data to drive development, particularly in infrastructure, to ensure that risk is reduced in the long term; the requirement for an “insurability test” whereby something should not be built if it cannot be insured; and the suggestion that the private sector should be more creative about making use of data.

Closing the meeting, moderator Siegwart said the panel had raised many questions and provided some interesting answers for the ministers to consider.

SUMMARY OF THE GEO GENEVA MINISTERIAL SUMMIT

OPENING AND WELCOME

Opening the Ministerial Summit on Friday morning, 17 January, Bruno Oberle, State Secretary, Swiss Federal Office for the Environment, welcomed delegates to Geneva and



L-R: Barbara Ryan, Director, GEO Secretariat; GEO Co-Chair Rudolf Strohmeier, European Commission; Janez Potočnik, European Commissioner for the Environment; GEO Co-Chair Kathryn Sullivan, US; Patrick Gallagher, Acting Deputy Secretary of Commerce, US; Bruno Oberle, State Secretary, FOEN, Switzerland; Derek Hanekom, Minister of Science and Technology, South Africa; GEO Co-Chair Philemon Mjwara, South Africa; Jianlin Cao, Vice Minister of Science and Technology, China; Linhao Chen, China; Achim Steiner, Executive Director, UNEP

explained that the gathering will decide on the continuation of GEO for the next decade. Delegates adopted the agenda (Document MS1 Rev1). Participants also viewed a number of short films explaining the rationale and achievements of GEO and GEOSS.

INTRODUCTION

Janez Potočnik, European Commissioner for the Environment, chaired this session.

INTRODUCTORY ADDRESSES BY GEO

MINISTERIAL SUMMIT CO-CHAIRS: In his introductory address, Potočnik reminded delegates that the Geneva Summit builds on five successful Earth observation summits, and constitutes a crucial milestone for the renewal of the GEO mandate to 2025. He included as GEO's achievements: growth in membership; effectiveness of GEOSS tools, including GEONETCast, in producing data for sound environmental decision making; success in advocacy for open access to data globally, including a recent announcement by France to deliver, free of charge, over 20 years of spot images for non-commercial use; SBA-related multilateral cooperation initiatives; and benefits to the global economy. He suggested: a strategy for increasing Earth observation capacity in countries; strengthening the Secretariat; aligning the SBAs with the post-2015 development agenda; attention to *in situ* data, big data and modeling; and a strengthened mechanism for



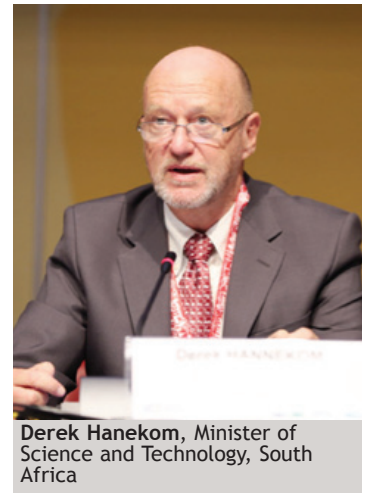
Janez Potočnik, European Commissioner for the Environment

resource commitments.

Jianlin Cao, Vice Minister of Science and Technology, China, said GEO is at a critical juncture, and will soon enter a new development phase. He commended the achievements since 2005 and described GEO as the largest and most authoritative intergovernmental Earth observation organization. Cao described a number of successes since the Beijing Ministerial Summit in 2010, including: significantly improved Earth observation data and regional and national GEOSS initiatives; strengthened capacity; and closer cooperation among Members and POs in SBAs. He said the new 10-Year Implementation Plan, defined by the Geneva Declaration, will enable GEO and GEOSS to meet the growing demand

for Earth observation data, and called for coordination at all levels, capacity building in developing countries and enhanced cooperation.

Derek Hanekom, Minister of Science and Technology, South Africa, said GEO offers a unique platform for Earth observation data that can be used in planning and decision making. He noted the progress GEO has made since its creation, particularly with the adoption of the GEOSS Data Sharing Principles and the announcement by China and Brazil that their satellite data would be offered free of charge. He highlighted South Africa's achievements in Earth observation and participation in GEOSS initiatives. He urged the GEO community to renew the GEO and GEOSS mandates and build on gains already achieved, while stressing that the long-term sustainability of GEOSS depends on the strong commitment of its Members and POs. Hanekom called for greater emphasis on fostering national Earth observation systems and scaling up regional coordination efforts similar to AfriGEOSS, where Earth observation capabilities are harnessed to meet regional priorities.



Derek Hanekom, Minister of Science and Technology, South Africa

Patrick Gallagher, Acting Deputy Secretary of Commerce, US, characterized GEO as "a game changer." He said the GEO Report on Progress 2011-2013 clarifies that a "vibrant ecosystem of innovation" is being created through GEO initiatives. He listed many examples of how collaborations fostered by GEO have added value, noting that the US was proud to participate in many of them, including the Global Ocean Acidification Observing Network, GFOI's capacity building through the SilvaCarbon initiative, and the cholera early warning system. He underscored the importance of the principle of open, accessible and timely data, but urged moving beyond only making the observations available to facilitating their use. He called for continual widening of the GEO community through leveraging current partnerships, attracting new ones, seeking fresh sources of support, and increasing the

capacity of users everywhere. He acknowledged that technical, scientific and policy challenges will have to be worked through, but expressed optimism these can be met.

KEYNOTE ADDRESSES: Jacqueline McGlade, Senior Advisor, UNEP, delivered the keynote address of UNEP Executive Director Achim Steiner on his behalf. Steiner stressed that GEO-X's focus on strengthening the link between *in situ* and satellite data is particularly crucial for UNEP's core mandate to keep the environment under review. He indicated UNEP's wish to work with GEO in the areas of "citizen science," where public access to data empowers



Jacqueline McGlade, Senior Advisor, UNEP, speaking on behalf of Achim Steiner, Executive Director, UNEP

people to play a greater role in monitoring their environment and participating in decision making. He noted the launch of UNEP Live, which seeks to widen the user community for GEOSS products and to link satellite and *in situ* data with relevant policy processes. He explained that through UNEP Live,

UNEP proposes to work

with many global partners to advise on the prioritization of environmental data sets for collection and sharing with the public as part of the post-2015 development agenda. He suggested that by incubating applications and services based on Earth observation and societal benefits, and providing access to information to governments and organizations, GEO's work is at the heart of the transformation to a low-carbon, resource-efficient, job-generating and inclusive green economy.

State Secretary Oberle congratulated GEO for making available thousands of valuable data sets and establishing major new global initiatives on biodiversity, carbon, forests, crops, and major seismic and volcanic zones. He noted that GEO has filled observation gaps, and developed technical tools, CoPs and innovative projects. He said that GEO's achievements overall are promoting better-informed decision making and contributing to the post-2015 development agenda. Oberle suggested that, among other things, GEO should continue its work towards a more rational management of global resources. In conclusion, he noted that a number of challenges remain, including: increasing participation; strengthening engagement with developing countries; expanding cooperation with an increasing number of organizations, including UN agencies; and more effectively involving the private sector.

GENEVA DECLARATION

Opening the session on Friday morning, Co-Chair Cao characterized the Geneva Declaration as a major output of the Summit, explaining that the draft Declaration (Document MS6) was the result of a joint commitment by GEO working groups and had been considered by the Plenary. State Secretary Oberle then read the draft Declaration for the Summit audience.

Several Member countries expressed their support for and endorsement of the Geneva Declaration, emphasized the increasing importance of Earth observation data for decision

making, commended GEO for its achievements, and affirmed their commitment to supporting GEO over the next 10-year period and beyond.

Indonesia described Earth observations as an important instrument for sustaining the planet, and the Philippines emphasized the importance of international collaboration for their effective use. Niger supported development policies based on better scientific observation of Earth systems. Brazil said global monitoring projects constitute important dimensions of GEO's work and need to be strengthened.

Portugal and Colombia described the work of national GEO working groups that promote GEO and the use of Earth observations. Morocco said the implementation of its National Charter for Environment and Sustainable Development requires the use of science, and Portugal described the information and services provided by GEO as crucial for supporting its green economy strategy. Canada, Norway, Sweden and Finland, among others, discussed the alignment of their data-sharing policies with and support to the GEO Data Sharing Principles.

Japan highlighted its work in: modeling; clarifying the Asian water cycle; satellite-based problem solving; and data integration and conversion into socially-useful information. Colombia explained its efforts in forest carbon tracking and called for better availability of high-resolution data at regional and national scales, and interoperability. Romania and Norway emphasized Copernicus as a significant regional contribution to GEOSS. Georgia expressed its gratitude for being accepted as a GEO Member.

Madagascar, Mexico, Paraguay and others, called for supporting and strengthening capacity in developing countries, whilst the Republic of Korea and Croatia, among others, described their contributions in this area. Egypt, with Ghana and Brazil, expressed support to the AfriGEOSS initiative, and Egypt called for, *inter alia*, "downscaling" data for national and regional use and enhancing GEO governance.

Germany drew attention to the need to maintain and improve the Earth observation infrastructure and announced it will double its contribution to the GEO Trust Fund in 2014. Madagascar called for progress in remote sensing and technology transfer.

The Russian Federation drew attention to "linguistic limitations" in GEO meetings and GEOSS products,



H.E. Prime Minister Jean Omer Beriziky, Madagascar



Amb. Thomas Fitschen, Deputy Permanent Representative of Germany to the UN and Other International Organizations in Geneva

explaining that it provides information and Russian-language Internet resources to the countries of the Commonwealth of Independent States.

The UK recommended strengthening links with end users of data, addressing gaps in observation networks, and broader adoption of the Data Sharing Principles. France expressed support for involving new actors in GEO, including the private sector, in line with GEO principles.

The Netherlands said GEO has been the incubator of a number of new projects. Chile said GEO and GEOSS have matured but their refinement needs to continue. Italy called for a more ambitious trajectory for GEO, and Australia encouraged increased focus on the second part of the motto “think globally, act locally.”

Noting the support expressed by Members for the Geneva Declaration and describing it as an indicator for GEO to



Jianlin Cao, Vice Minister of Science and Technology, China

enter its second decade, Co-Chair Cao announced the Declaration as adopted.

Fifteen POs made statements on the Geneva Declaration. Many expressed their support for GEO and the Declaration. POs called for, *inter alia*: increased availability of and open access to high-quality data; new investments in GEOSS; and promotion of the Data Sharing Principles at the national level.

ESA underscored the need for a deeper inquiry

into what types of new data and information are required. IEEE stressed that, as more data becomes available, it is important to devote more efforts, time and resources to understanding data quality. IHO welcomed the strengthening of cooperation with developing countries. The International Society for Photogrammetry and Remote Sensing called for allocating funding to enable scientists and experts to work on implementing GEO tasks and ensure their timely implementation.

FINAL TEXT OF THE GENEVA DECLARATION:

The Geneva Declaration recalls, *inter alia*: the importance recognized by Rio+20 of space-based and *in situ* observations; and the mandate of the Beijing Ministerial Summit for GEO to review progress of implementation against the GEOSS Strategic Targets and the recommendations for the future of GEO post-2015, and to take the necessary decisions.

Regarding GEO’s mandate through 2025, the Geneva Declaration, *inter alia*:

- renews the mandate of GEO through 2025, retaining the current nature of the partnership, its general governance structure and resourcing mechanism, while exploring modifications;
- agrees to develop the work of GEO through 2025 in line with GEO-X recommendations;
- requests the preparation of a new Implementation Plan through 2025 for endorsement at the next GEO Ministerial Summit, planned for the time window November 2015-January 2016, in accordance with the agreed-upon

principles and strategic objectives, and taking into account commitments to the UN sustainable development themes; and

- resolves to develop a framework for sustained resource commitments in support of the new Implementation Plan. Furthermore, the Declaration, *inter alia*:
- notes with satisfaction the progress towards GEOSS Strategic Targets for 2015;
- resolves to continue work to achieve the objectives of the 2005-2015 Implementation Plan, in particular with regard to availability of open access datasets, streamlining the GEOSS Common Infrastructure, consolidating observing networks, improving global coverage and availability of data, further developing GEO global initiatives, and continuing engagement of GEO users, data providers and citizens;
- resolves to improve the effectiveness of GEO’s actions, broaden engagement with stakeholders, and sustain resources for GEOSS’ development and functioning;
- resolves to strengthen engagement with developing countries, foster regional cooperation, and broaden engagement with nongovernmental organizations, non-profit organizations, foundations and the private sector;
- encourages Members to strengthen national GEO arrangements; and
- invites all UN Member states and welcomes additional participants, in particular UN organizations and programmes, to join GEO.

GUIDANCE FOR THE FUTURE OF GEO

On Friday afternoon, Ministerial Summit Co-Chair Hanekom introduced the session, and asked for inputs focusing on resources and practical next steps.

Delegates then watched a film, which provided an overview of a range of initiatives, such as the GEOSS Interoperability for Weather, Ocean and Water project, Global Atlas and Blue Planet, and concluded by stating that: “We cannot manage what we cannot measure.”

GEO Co-Chair Mjwara provided an overview of Ministerial Guidance on the Evolution of GEOSS (Document MS 4). He highlighted the many initiatives being undertaken by GEO, but underscored that their outcomes will need to be communicated to advocate for the value of Earth observations and the need to continue improving their capacity to observe the Earth. In this context, he urged Members and POs to adopt the Data Sharing Principles. Speaking about anticipated activities beyond 2015, Mjwara suggested that GEOSS architecture is an intelligent information system, and should better integrate social and economic data, and develop a comprehensive interdisciplinary Earth observation knowledge base that will: document new information on essential observation requirements for key domains and integrate with existing observation requirements databases; allow for gap analysis of requirements through an interactive documentation process; and introduce best practices for documents, including harmonization



GEO Co-Chair Philemon Mjwara, South Africa

and comparison of processing tools and methodologies. In conclusion, Mjwara suggested three potential and non-exclusive “pathways beyond 2015,” namely: an increase in contributions to the GEO Trust Fund; a moderate increase in contributions; or, as a minimum, sustaining the current level of contributions.

Ministerial Summit Co-Chair Gallagher stated that GEO is unique in that it is a “system of systems and a network of networks” and suggested GEO should “optimize the agility, flexibility and participation” that characterizes it.

Brazil recalled that the Rio+20 outcome document explicitly recognizes global environment observation systems and refers to GEOSS, as well as to the need to support the collection of environmental data by developing countries. Italy stated that GEOSS is an “intelligent information system” and will



Patrick Gallagher, Acting Deputy Secretary of Commerce, US

require increased funding that may have to be generated through a GEO membership fee. Japan underscored the need to integrate different types of data, such as on how rainfall, river discharge, floods and drought relate to each other and to economic performance. China suggested the maximization of full and openly available data sets backed up by national level frameworks, and mentioned China GEOSS as an example of this approach.

Australia suggested GEO focus on end use, and, in doing so, suggested innovating on the current nine SBAs. Switzerland, called for: a clear profile of GEOSS’s products; a gap analysis to determine what more is needed; a more integrated approach to existing silos in areas, such as water, energy and food; and merging SBAs such as biodiversity and ecosystem.

The Open Geospatial Consortium suggested an annual technical conference on practical uses of GEOSS data, including how it can be more effectively used at the national level, by the private sector and among other users. ESA urged that GEO be “user-driven” and “ambitious.” AARSE stated that the use of data generated by GEOSS should be more clearly articulated, because “only when the data is deemed useful, will people support it.” IHO reminded delegates that better charts exist of the moon or Mars than for the Earth’s oceans. In this context, he called for GEOSS to address the lack of high-resolution charts for many of the world’s coastal areas and oceans.

Summarizing, Hanekom congratulated GEO on its “outstanding work” and suggested that going forward GEO be made more relevant to global challenges and “be seen to be responsive.” Generating the data is important, he said, but data is not “an end in itself.” He urged GEO to: remain agile; focus on where it wants to be in 10 years; design programs with end use in mind; develop capacity in developing countries; and explore partnerships with the private sector. To do this, he stated that GEO will require more resources and stronger commitments from its Members and POs.

CLOSING STATEMENTS

Ministerial Co-Chair Gallagher began the closing session of the Ministerial Summit by inviting the four Ministerial Summit Co-Chairs and the Swiss host, State Secretary Oberle, to make final remarks.

Co-Chair Hanekom suggested that the Ministerial Summit had made “huge progress,” providing the entire GEO community with a better understanding of the value of GEO’s work and the challenges GEO faces, and preparing all to “take it to the next level.”

Recalling that he had also attended the Third Earth Observation Summit in Brussels in 2005 that launched GEO, Co-Chair Potočnik said the Geneva Ministerial Summit demonstrated the remarkable achievements and progress that GEO has made in its first nine years. He suggested that, if the GEO community continued with the goodwill on display at the Geneva Ministerial Summit, it could look forward to substantial achievements in the next decade of GEOSS implementation.

Co-Chair Cao declared the Geneva Ministerial Summit a significant GEO milestone, noting it had discussed guidance documents, approved the Geneva Declaration and laid the foundation for the long-term development of GEOSS. He stressed the importance of promoting GEOSS implementation at the regional level, with regional data sharing aimed at promoting sustainable development. He reiterated China’s commitment to gradually accelerate sharing its Earth observation data, and helping develop national GEOs. He expressed China’s belief that with the strong support of Members and POs, GEO will prove even more productive in its second decade than in its first.

Co-Chair Gallagher said he was excited by what he had seen and heard during the Summit. He emphasized strong and continuing US support for GEO, due to its cooperative and flexible approach, commitment to transparency and data sharing, and focus on addressing some of the biggest questions facing humanity today. Noting predictions that over the next 10 years countries will experience increasing water scarcity, ecosystem degradation and economic challenges, he urged GEO to provide information to decision makers to improve their responses to such challenges. He concluded by saying that GEO and GEOSS are now “leaving their childhood and about to enter into young adulthood.”

Declaring that participants should be satisfied with the Geneva Declaration adopted by the Ministerial Summit, State Secretary Oberle gavelled the Summit to a close at 4:51 pm.



Bruno Oberle, State Secretary, FOEN, Switzerland, gavelled the Geneva Ministerial Summit to a close at 4:51 pm

UPCOMING MEETINGS

WCRP Conference for Latin America and the Caribbean: Developing, Linking and Applying Climate Knowledge: This conference is being co-organized by the WCRP, UNESCO, the Inter-American Development Bank, the Inter-American Institute, Argentina's Center for Research on Oceans and Atmosphere, and Uruguay's University of the Republic. The WCRP Conference for Latin America and the Caribbean (LAC) aims to identify gaps and ways to overcome limitations in the chain of knowledge from basic to applied climate science to informing policy and decisions that are particularly relevant for LAC. **dates:** 17-21 March 2014 **location:** Montevideo, Uruguay **contact:** Analía Fein **email:** 2014wcrp@gmail.com **www:** <http://www.cima.fcen.uba.ar/WCRP/>

3rd International Conference on the Use of Space Technology for Water Management: The UN Office for Outer Space Affairs, the Government of Morocco and the Prince Sultan bin Abdulaziz International Prize for Water are jointly co-organizing this conference, with ESA and the Inter-Islamic Network on Space Sciences and Technology as cosponsors. The Conference will discuss how space technology can contribute in better managing water resources, including combating desertification, ensuring access to safe drinking water, and managing water-related emergencies in developing countries. **dates:** 1-4 April 2014 **location:** Rabat, Morocco **contact:** Sergei Chernikov, UNOOSA **phone:** +43-1-26060-4948 **email:** sergei.chernikov@unoosa.org **www:** <http://www.oosa.unvienna.org/oosa/en/SAP/act2014/Morocco/index.html>

CAPIGI 2014: The Community on Agricultural Policy Implementation and Geo-Information (CAPIGI) brings together governments, industry and research to discuss the impact of geo-information in implementing agricultural policy. CAPIGI 2014 will discuss themes, such as remote sensing, climate-smart farming, sustainable intensification, and the use of the Global Navigation Satellite System for agriculture. **dates:** 2-4 April 2014 **location:** Amsterdam, The Netherlands **phone:** +31-35-694-64-48 **email:** info@capigi.eu **www:** <http://www.capigi.eu>

Geospatial World Forum: Hosted by the Open Geospatial Consortium, the Geospatial World Forum will address the ways in which geospatial technology extends the ability to harness data for improved leadership. Deliberations at the conference will focus on innovative and integrative

geospatial technologies. **dates:** 5-9 May 2014 **location:** Geneva, Switzerland **phone:** +31-652-892-142 **email:** info@geospatialworldforum.org **www:** www.geospatialworldforum.org

Seventh GEOSS Asia-Pacific Symposium: Information and expertise on GEOSS implementation in the Asia-Pacific region will be exchanged under five working groups on: the Asian Water Cycle Initiative; agriculture and food security; forest carbon tracking; Asia-Pacific Biodiversity Observation Network; and ocean observation and society. **dates:** 26-28 May 2014 **location:** Tokyo, Japan **email:** kankyou@mext.go.jp

Global Space Applications Conference (GLAC) 2014: Organized by the International Astronautical Federation and UNESCO, this conference will provide an opportunity to review cutting edge, satellite-based applications from a holistic perspective. GLAC 2014 will bring together the global satellite-based services stakeholder community, including senior representatives of the major space agencies, industry, governments, academia and nongovernmental organizations. These leaders in the field will meet in Paris to present results, exchange ideas, debate roadmaps, and discuss the future opportunities provided by satellite-based applications. **dates:** 2-4 June 2014 **location:** Paris, France **phone:** +33-1-45-67-42-60 **fax:** +33-1-42-73-21-20 **email:** glac2014@iafastro.org **www:** <http://www.iafastro.org/index.php/events/global-series-conferences/glac-2014>

UN Environmental Assembly: The first meeting of the UN Environmental Assembly of the UN Environment Programme (UNEP), which has replaced the UNEP Governing Council, is scheduled for June 2014. **dates:** 23-27 June 2014 **location:** Nairobi, Kenya **contact:** Jamil Ahmad, Secretary of Governing Bodies, UNEP **phone:** +254-20-7623431 **email:** unep.sgb@unep.org **www:** <http://www.unep.org/>

International Workshop on Open Data for Science and Sustainability in Developing Countries: This workshop is being organized by UNESCO, the International Council for Science's (ICSU) Committee on Data for Science and Technology, the World Federation of Engineering Organizations' Communication and Information Committee, and Kenya's Ministry of Communication and Information. It will discuss strategies and objectives of sponsoring and participating organizations concerning open data for science and sustainability in developing countries, with special



Group photo of GEO-X participants

consideration for the post-2015 Sustainable Development Goals and ICSU's Future Earth research program in developing countries. The workshop will also develop and endorse a set of principles and guidelines for preservation of and open access to research data in developing countries. **dates:** 6-8 August 2014 **location:** Nairobi, Kenya **contact:** Paul Uhlir, US National Academy of Sciences **phone:** +1-202-334-1531 **fax:** +1-202-334-2231 **email:** puhilir@nas.edu **www:** <http://www.wfeo.net/international-workshop-open-data-science-sustainability-developing-countries-oddc/>

11th European Organization for the Exploitation of Meteorological Satellites (EUMETSAT) User Forum in Africa: The purpose of the EUMETSAT User Forum in Africa is to reinforce dialogue between EUMETSAT and the African user community in order to facilitate the use of EUMETSAT satellite data throughout the continent. The Forum is organized on a biennial basis and provides the opportunity to identify actions and initiatives that could be taken by EUMETSAT and its partners to meet the requirements of its African users. **dates:** 8-12 September 2014 **location:** Addis Ababa, Ethiopia **contact:** Fetene Teshome **phone:** +49-6151-807-6040 **fax:** +49-6151-807-6150 **email:** ufa@eumetsat.int **www:** <http://ufa.eumetsat.int/>

EUMETSAT Meteorological Satellite Conference: This conference will focus on the use of satellite data for forecasting and studying atmospheric processes, emphasizing current capabilities and future evolutions of satellite observations with a view to fostering applications of the data from new satellite generations. Weather, ocean and climate observations, as well as atmospheric composition, will be core topics discussed. **dates:** 22-26 September 2014 **location:** Geneva, Switzerland **contact:** Lorna Putze, EUMETSAT **fax:** +49-6151-807-5550 **email:** lorna.putze@eumetsat.int **www:** https://www.eumetsat.int/website/home/News/ConferencesandEvents/DAT_2076129.html

The Climate Symposium: The Climate Symposium is intended to bring together international experts in climate observations, research, analysis and modeling to present and discuss results from their studies, with a particular emphasis on the role of space-based Earth observations in improving knowledge of the current climate at global and regional scales, and in the assessment of models used for climate projections. **dates:** 13-17 October 2014 **location:** Darmstadt, Germany **contact:** Rowanna Comerford, EUMETSAT **phone:** +49-6151-807-6040 **email:** rowanna.comerford@eumetsat.int **www:** <http://www.theclimatesymposium2014.com/>

ForestSAT2014: A Bridge between Forest Sciences, Remote Sensing and Geo-Spatial Applications: The ForestSAT 2014 conference is aimed at promoting the integration of Earth observation with other geo-spatial applications and traditional forest sciences. The conference covers all possible scientifically-based developments and applications of remote-sensing and GIS tools for monitoring, mapping or modeling forest systems, and aims to facilitate a better understanding of their functioning and support their inventory and sustainable management. **dates:** 4-7 November 2014 **location:** Riva del Garda, Trento, Italy **email:** info@forestsat2014.com **www:** <http://forestsat2014.com/>

GEO-XI: The Eleventh Plenary Session of the GEO (GEO-XI) will, among other things, review the draft of the GEOSS Implementation Plan for 2015-2025. **dates:** November 2014 (*tentative*) **location:** Libreville, Gabon (*tentative*) **contact:** GEO Secretariat **phone:** +41-22-730-8505 **fax:** +41-22-730-8520 **email:** secretariat@geosec.org **www:** <http://www.earthobservations.org/index.shtml>

GLOSSARY

CEOS	Committee on Earth Observation Satellites
CoP	Community of Practice
COSPAR	Committee on Space Research
Data-CORE	Data Collection of Open Resources for Everyone
ESA	European Space Agency
ExCom	Executive Committee
EUMETSAT	European Organization for the Exploitation of Meteorological Satellites
FAO	Food and Agricultural Organization of the United Nations
GCI	GEOSS Common Infrastructure
GEO	Group on Earth Observations
GEO-X	Tenth Plenary Session of the Group on Earth Observations
GEOSS	Global Earth Observation System of Systems
GEO BON	GEO Biodiversity Observation Network
GEO-GNOME	Global Network for Observation and Information in Mountain Environments
GFOI	Global Forest Observation Initiative
IEEE	Institute of Electrical and Electronics Engineers
IHO	International Hydrological Organization
IPWG	Implementation Plan Working Group
ITU	International Telecommunications Union
PO	Participating Organization
SBA	Societal Benefit Area
UNEP	UN Environment Programme
UNISDR	United Nations International Strategy for Disaster Reduction
WMO	World Meteorological Organization



Janez Potočnik, European Commissioner for the Environment,