



GROUP ON
EARTH OBSERVATIONS

GEO-VI

17-18 November 2009

Report of GEO-V

Document 4

As approved at GEO-VI

DRAFT REPORT of GEO-V

19 - 20 November 2008

1 OPENING OF THE SESSION

1.1 Welcome and Opening Remarks

The Fifth Plenary meeting of the Group on Earth Observations, GEO-V, was chaired by GEO Co-Chair Zoran Stančić of the European Commission (EC). He called the meeting to order at 9h30 and invited H.E. Minister Anton Anton of the Ministry of Education and Research of Romania to address the participants.

In his remarks, Minister Anton emphasized the importance to all countries of investing in scientific research. He expressed his particular interest in promoting a better understanding of the Earth system and his personal commitment to engaging with the global community. He concluded by wishing the meeting every success.

Mr Marius Piso, President of the Romanian Space Agency (ROSA) and host of GEO-V, thanked the GEO community for giving Romania the opportunity to develop its own capacities and to coordinate its Earth observation efforts with others. He noted that Romania is one of GEO's newest Members.

The Chair thanked Romania and noted the challenges it had faced in organizing GEO-V with just a few months' notice. He then recognized the major contribution of Adm. Conrad Lautenbacher, the previous US Co-Chair who recently retired from government service, without whose vision GEO would not be as dynamic as it is today. He stated that, with the success of GEO-IV and the Cape Town Ministerial Summit in November 2007, GEO has now entered a new and challenging period and must maintain momentum. Key issues today are developing the new GEO 2009-2011 Work Plan, revising the 10-year implementation Targets for the Global Earth Observation System of Systems (GEOSS), strengthening the governance indicators and reporting methodology used within GEO, building the GEOSS Common Infrastructure (GCI), adding more components to the GEOSS registries, and strengthening contributions to the Trust Fund. Based on past performance and the excellent spirit that exists within the GEO community, he expressed optimism that this voluntary effort to construct GEOSS will succeed.

The GEO Co-Chair from China, Mr Zheng Guoguang, described the natural disasters that struck his country over the preceding year. He stated that, as a result of these tragedies, the government had been forced to postpone offers to host a number of international meetings, including GEO-V. However, China continues to see Earth observation as a priority, as demonstrated by its continued support of GEONETCast and the recent satellite launches for disaster-monitoring and other functions.

The Co-Chair from South Africa, Mr Philemon Mjwara, thanked ROSA for hosting the meeting. He stated that GEO is maturing and ready to move from building an organization to building GEOSS itself. He encouraged participants to engage actively in the critical discussions that would take place over the next two days.

Mr Mark Myers, serving as US Co-Chair during the GEO-V Plenary, emphasized the US commitment to GEO and the importance that the US GEO team places on ensuring a smooth transition for GEOSS implementation as a new administration takes office. He also stated that US Secretary of the Interior Dirk Kempthorne had been impressed by his experience at Cape Town, which had led to the recent US

announcement that the Landsat archives would now be made freely available. He thanked Japan for its role in advancing Group of Eight (G8) support for GEOSS through the July 2008 Hokkaido Declaration.

The Chair noted that the next G8 Summit will take place in Italy and could offer an opportunity to maintain the momentum of GEO.

The Secretariat Director, Mr José Achache, highlighted the progress since Cape Town and the critical contribution that Adm. Lautenbacher had made to GEO. He noted that the framework provided by the new Work Plan and the updated Targets would be the central issue for discussion at GEO-V. He recommended that establishing a global carbon monitoring system and strengthening GEOSS in Africa be considered important priorities for the year ahead. He also supported the Chair's proposal to promote GEOSS at next year's G8 Summit in Italy.

1.2 Administrative Announcements

The Secretariat announced the 10h30 official opening of the GEO-V Exhibition.

1.3 Adoption of the Agenda

The Chair introduced the agenda. Canada suggested adding an item on preparing for the 2010 Ministerial Summit. The Chair informed the Plenary that this issue had been discussed by the Executive Committee the day before and proposed that the Plenary discuss the issues relating to the 2010 Ministerial Summit under the appropriate agenda items.. The agenda was thus adopted.

1.4 Recognition of New Members (Document 2 (Rev. 1))

The Secretariat Director informed the meeting that four new Member governments had joined GEO since the previous Plenary: Turkey on 9 May, Estonia on 29 May, the Bahamas on 24 October, and Peru on 29 October. GEO now has 77 Members. The Chair extended a warm welcome to the new Members on behalf of the Co-Chairs and the entire Plenary.

1.5 Statements from New Members

The representative of Turkey stated that it was a great pleasure for the Government of Turkey and its science research council to participate in GEO-V. Turkey intends to contribute to GEOSS and to integrate its national activities into the European approach to GEO.

Estonia said that a common understanding existed within its government about the need to cooperate on Earth observation at the global level. With its world-class scientists and remote-sensing and in-situ observation systems, Estonia aims to contribute actively to GEOSS.

Peru stressed the importance of living in harmony with the planet and described its space agency's use of remote sensing to meet national needs. The country's contribution to GEO will include activities in the Societal Benefit Area of Biodiversity.

1.6 Recognition of Participating Organizations and Observers (Document 4)

The Secretariat Director presented the Executive Committee's recommendation that the Plenary recognize five new applicants as Participating Organizations: Delivery of Advanced Network Technology to Europe (DANTE), Global Learning and Observations to Benefit the Environment (GLOBE), the International Centre for Integrated Mountain Development (ICIMOD), the International Institute for Applied Systems Analysis (IIASA) and the United Nations Economic Commission for Africa (UNECA). In addition, the Committee had asked the Secretariat to request additional information from a sixth applicant, the Consortium of Universities for the Advancement of Hydrological Sciences (CUAHSI), before a decision could be taken.

Canada, supported by Italy, remarked that the Plenary has the final responsibility for accepting new Participating Organizations and needs to receive more documentation in a timely manner. Canada reminded the Plenary that the GEO Rules of Procedure (Para. 3.7) require the Secretariat to release the documents prepared for Executive Committee meetings to all GEO Members and Participating Organizations for information at least 15 calendar days prior to each meeting.

The Chair explained that, indeed, to see the whole picture it was also necessary to read the Report of the Executive Committee to GEO-V (Document 14); he also noted that information on applications was often received by the Executive Committee very late.

Canada recommended supplementing the available documents with a more detailed description of each organization's profile and potential contribution to GEOSS.

The Chair thanked Canada for this guidance and proposed that the Executive Committee should present a note to a future Plenary meeting elaborating the expectations of GEO Members regarding the added-value of entities requesting official recognition as a GEO Participating Organization. The Plenary then accepted the Committee's recommendations and recognized the five new Participating Organizations."

In thanking the Plenary, the representative from DANTE explained that the organization consisted mainly of a European research and education network, but that it reached virtually all other continents and sought to expand its activities to other regions. GLOBE described itself as a worldwide education and science organization that works with teachers and one million students in over 20,000 schools to promote interest in Earth observation.

1.7 Approval of GEO-IV Report (Document 3)

The Chair introduced the GEO-IV report, and the Plenary approved it without comment.

2 GEOSS IMPLEMENTATION PROGRESS

2.1 GEO National and Regional Activities

The Chair invited interested participants to make brief presentations about their efforts to advance GEOSS.

Australia noted that it is taking a leadership role in developing the new Task on carbon tracking. As recognized by the recent GEO Forest Monitoring Symposium in Brazil, measuring forest-related carbon stocks and emissions will require integrating models, in-situ monitoring and remote sensing. Australia is working to further engage its scientific community in GEO and seeking opportunities to use GEOSS to address water and food security both nationally and around the world.

Canada spoke on behalf of the GEOSS in the Americas conference, which was held in Panama City in September. Attended by some 100 decision makers, the meeting focused on the needs and priorities of the region. One of the highlights was the active participation of the Community of Practice for agricultural monitoring.

The EC stressed the strong engagement of Europe in developing GEOSS. The Global Monitoring for Environment and Security (GMES) programme recently established four core services, and it is developing data-sharing policies consistent with the GEO data-sharing principles. The EC's Joint Research Center (JRC) is transforming satellite data into practical information for decision makers. Backbone networks, ICT tools, and the INSPIRE directive are being implemented and support the development of the GEOSS Common Infrastructure. The European Development Fund finances Capacity Building Programmes. The European Space Agency, EUMETSAT, the European Centre for Medium range Weather Forecasting (ECMWF), EuroGeoSurveys and the European Environment Agency are also working to make GEOSS operational. Other contributions are based on financial

support from the EC's 7th Framework Programme (FP7), including, for example, the European Biodiversity Observation Network (EBONE) and EnviroGRIDS, a capacity-building project for Earth observation in the Black Sea region.

Korea noted its financial and in-kind contributions to the GEO Secretariat and pledged to maintain them. It plans to launch the Communication Oceanography Meteorology Satellite (COMS) in 2009 as a contribution to space-based global observing systems. Korea is particularly committed to international cooperation on climate monitoring systems, and it aims to establish a national operational center to coordinate its various domestic observation systems. Korea also highlighted its offer to host the 2010 Ministerial Summit and the GEO-VII Plenary meeting.

The Netherlands stated that it has been particularly active in the field of capacity building for Earth observation. It has focused on providing various training courses, supporting the Global Climate Observing System (GCOS) for Africa and other activities in that region, and making a significant financial contribution to GMES for measuring air quality and levels of greenhouse gases.

The Russian Federation maintains Earth observation activities in the Arctic region and has launched a number of Earth observation satellites.

South Africa has developed the South African Earth Observation Strategy (SAEOS), which is aimed at promoting an integrated Earth observation system. The SAEOS Earth Observation Data Centre and Portal will be completed by next year and could form the basis for other African Earth observation strategies. Other activities include a sensor web initiative, the promotion of GEO membership around Africa, the organization of a workshop in 2009 similar to the GEOSS in the Americas event, the EC-funded African Monitoring of Environment for Sustainable Development (AMESD) programme in the Southern African Development Community (SADC) region, and the African Resource and Environmental Management Constellation (ARM). South Africa has also been chairing the Committee on Earth Observation Satellites (CEOS).

Switzerland is participating in the implementation of GMES, the INSPIRE initiative and other European environmental information systems. Earlier this year it adopted national legislation on geographic information systems aimed at facilitating access to geographical information and data. The Swiss delegate highlighted the ongoing preparations for next year's World Climate Conference – 3 (WCC-3), which aims to establish a mechanism for delivering tools and products for adaptation and variability.

Brazil reported on the progress being made by the China Brazil Earth Resources Satellite (CBERS). CBERS reception desks have been opened in the Canary Islands and in South Africa; discussions are underway to open a similar desk in western Africa in order to extend coverage. By 2009, CBERS should be available fully free of cost throughout Africa. Meanwhile, the Brazilian National Institute for Space Research (INPE) is creating a new regional campus in eastern Amazonia for promoting the use of remote-sensing data in the tropics; it should be fully operational by 2010. A new ground station established in the extreme north of the country will make free CBERS data available to most of Central America and the Caribbean.

China has launched a new generation of technologically advanced polar-orbiting satellites that will provide data for weather forecasting; these data will be universally available and free of charge. In December, China will launch a geostationary weather satellite. The China Meteorological Organization and EUMETSAT have signed an agreement on data sharing. Finally, China is focusing on advancing its capabilities in the field of risk assessment.

Japan noted that the G8 Declaration adopted in Hokkaido last July responded to the growing demand for Earth observation data. The G8 will accelerate efforts within GEOSS in priority areas, particularly climate change and water-resources management, by strengthening observation, prediction and data sharing. Japan hosted the Second GEOSS Asia-Pacific Symposium earlier this year in Tokyo, where the Chair of the Intergovernmental Panel on Climate Change (IPCC) gave a keynote presentation, and it will host the Third Symposium in February in Kyoto; it encouraged other countries in the region to

consider hosting the Fourth GEOSS Asia-Pacific Symposium. Finally, Japan will launch GOSAT, a satellite for tracking greenhouse gases, in January 2009.

The US cited the growing success story of SERVIR, which is a satellite visualization service for Central America. SERVIR will shortly announce a regional hub in Kenya that will allow it to extend its services, including the Climate Change Mapper and early warning tools for flooding, to Africa. Meanwhile, AIRNow International is helping to catalyze the global standardization of air quality data. GEONETCast in the Americas is now fully operational in its initial operating mode; partnerships with other data providers to enhance this service would be welcome. The US has formed a GEONETCast coordinating group. Finally, the US and Canada organized a water and ice workshop aimed at advancing collaboration on this issue.

The Committee on Earth Observation Satellites (CEOS) stated that it remains committed to serving as the space arm of GEOSS, as indicated by the significant resources it allocated in 2008 to GEO Work Plan activities. Over the past year, CEOS updated its handbook on space-based Earth observation, contributed to 22 GEO Tasks, and allocated resources for completing 16 other top priority actions. This resulted in improving the availability of data and products to all countries, including a long-term data set on climate change from 1981 to the present.

The Global Spatial Data Infrastructure Association (GSDI) stressed its interest in fully engaging with GEO. The Association is working with over 80 countries to develop spatial data infrastructures (SDIs). It is promoting the use of a common set of standards and the registration of SDIs, standards and best practices in the GEOSS registries. Based on guidance from GEO, the GSDI “Cookbook” is promoting interoperability and the GEOSS data-sharing principles.

The Institute of Electrical and Electronics Engineers (IEEE) highlighted its efforts to develop a game competition for raising awareness about Earth observation. The winner of the competition will be announced at the 2010 Plenary meeting.

The United Nations Office for Outer Space Affairs (UNOOSA) is responsible for promoting the peaceful use of outer space. It is also implementing the space applications of various UN programmes, particularly in developing countries. UNOOSA regional centers are supporting the capacity-building efforts being pursued by GEO. Through the UN Geographic Information Working Group, UNOOSA is also promoting synergies and cooperation between GEO and UN agencies. It will contribute to the new Work Plan and continue its cooperation with the GEO Secretariat. UNOOSA also acts as the Executive Secretariat of the International Committee on Global Navigation System of Systems. A presentation on the potential for cooperation between GEOSS and the GNSS was also announced for the lunch break.

The Committee on Space Research (COSPAR), which was established by the International Council of Scientific Unions (ICSU), is determined to play its role of promoting science within GEO. In addition to serving as Co-Chair of the Science and Technology Committee (STC), it aims to raise the profile of GEO within the research community and to engage this community under the GEO banner. COSPAR seeks to organize capacity-building activities and to promote the study of the Earth system through interdisciplinary lectures, symposia and roundtables.

The African Association of Remote Sensing of the Environment (AARSE) has played an active role in GEO, most recently by organizing its third GEOSS workshop for the African region, which was held in Accra. The Vice President of Ghana attended, and the GEO Secretariat gave the plenary keynote address. Next year’s meeting will also emphasize GEO and will be held in Kampala; a fifth meeting is already being planned for 2010. With over 1,000 members, AARSE is the largest GEO-related organization in Africa.

The Chair thanked the Member governments and Participating Organizations for their efforts to make GEOSS a reality.

2.2 Report on GEOSS Common Infrastructure (Document 5)

The document was presented by the GEOSS Common Infrastructure Initial Operating Capability Task Force Co-Chair Mr Ivan DeLoatch. He stated that the GEOSS Common Infrastructure (GCI) is now up and running, even if it is not yet perfected. He described the infrastructure itself, the one-year Initial Operating Capability (IOC) phase, the IOC Task Force, the registration process for components and standards, the importance of populating the registries and ensuring the GCI's sustained operation, and the next steps for moving this issue forward.

France commented that it would be interesting to be able to see the names of those who have registered their components. The Open Geospatial Consortium (OGC) confirmed the central importance of the GCI and said that the IOC constitutes a significant first step toward achieving GEO's vision of making Earth observations widely available for decision making.

Germany joined the previous speakers in applauding the results of the IOC Task Force. He expressed disappointment that the number of registrations remained low and wondered if an additional marketing effort would be needed to ensure that the IOC assessment phase would be a success. An analysis and collection of lessons learned could be useful. He suggested that some attention may need to be paid to Resolution 40 of the World Meteorological Organization, which may be an obstacle to the more active engagement of meteorological and hydrological offices.

The European Space Agency (ESA) congratulated the GCI IOC Task Force and noted that the GEO Portals occupy a critical position in the design of the GCI. He noted that the Portal designed and developed by ESA together with the Food and Agriculture Organization (FAO) was now fully operational as demonstrated at the GEO-IV and GEO-V Exhibitions. ESA will continue to support it, and he encouraged the GEO community to register its components with the GCI.

Canada applauded the GCI effort, which he would never have imagined could be so successful. He agreed that the Plenary should reinforce the efforts that have gone into building and designing the infrastructure by promoting the need to populate the GCI with data and services. He acknowledged that his own country, too, needed to make a greater push to register its assets and pledged to ensure that it does.

Mr deLoatch responded to the various comments by noting that information about who has registered can indeed be made available. He also agreed that more outreach will be required. The registration process has been greatly improved and simplified since September. He also urged the Plenary to encourage all Member governments and Participating Organizations to register their services, best practices and other contributions to GEOSS.

The Chair restated the need to give a strong signal about registration to the GEO community and encouraged all GEO Members and Participating Organizations to contribute to the realization of the vision for GEOSS by registering their systems and services in the GCI. The registration of resources and components will represent a significant contribution in support of the GCI IOC, enabling the GEO community the opportunity to use and comment on the potential functionalities of the GCI. The Secretariat Director encouraged the meeting participants to visit the GEO-V Exhibition and to explore the portals and services being showcased there. The Plenary then accepted the document.

2.3 Report on Data Sharing Principles (Document 6)

Ms Joanne Irene Gabrynowicz of the International Institute for Space Law (IISL) presented the document, which had been prepared by the team working on Task DA-06-01. She reminded participants that the GEOSS data-sharing principles call for the full and open exchange of data, metadata and products at minimal cost and delay. A task team led by the Committee on Data for Science and Technology (CODATA) has drafted a White Paper and is continuing to elaborate a set of proposed guidelines for implementing the principles. In accordance with the Cape Town Declaration, the team will present revised guidelines to GEO-VI and then finalize them for adoption by GEO-VII and presentation to the 2010 GEO Ministerial Summit.

Germany stated that the developments to date on this issue have been remarkable and wondered how best to proceed from here. He noted that institutions have their own kinds of data-related rules and conventions, and that GEO is taking a major step by asking them to adopt the GEOSS data-sharing principles. The various owners of Earth observation systems and data each have their own governing bodies, and the concerns of these bodies will need to be addressed.

France appreciated the work that has been done but noted that a number of questions remain concerning how to move this issue from theory to practice. He noted that when the owners of systems register them with the GEOSS registries they will want clarity about the kind of commitment they are making concerning data sharing.

The US thanked the data-sharing team for the significant advances it has made so far. He noted the importance of moving at a considered pace to enable governments to ensure that they will indeed be able to implement any future agreement. Because data-sharing is fundamentally important for GEOSS, some short-term solutions may also be needed while the issue matures. The US then called for the establishment of a new Data Sharing Principles task force to advance this issue in preparation for the 2010 GEO Ministerial Summit.

Canada praised the white paper and also raised the issue of how best to move forward in this area, which involve public vs private interests and other complexities. He believed that the work of the task team offered a framework and policy guidance for the future.

EUMETSAT informed the Plenary about new developments concerning the availability of its own data. First, all archived data is now available via a new Earth observations portal. Second, the EUMETSAT Council has agreed to provide all of its data to GMES for a limited period. This decision demonstrates the willingness of the European meteorological community to follow the data-sharing principles.

China recognized the progress that has been made and commended WMO's successful work in this area to the GEO community. He also emphasized the importance of capacity building to ensuring the effectiveness of the data-sharing principles.

The EC welcomed the report from the task team and thanked all those involved in preparing the white paper and implementation plan. The EC supports the full and open sharing of data, provided relevant international instruments and national policies and legislation are recognized and emphasized that promoting the benefits of full and open access to GEOSS data would help to engage additional providers and users. The EC further supported the setting up of a task force to advance the issue of the implementing guidelines, as proposed by the US and supported by China.

Ms Gabrynowicz thanked the participants for their support and said that the team is already responding to many of the points that had been presented. She agreed that the work going forward has to be consistent with the national policies of the various Member governments, and she stated that the team understood that there are legitimate and necessary constraints in many situations. These issues have been addressed in a number of case studies.

The Chair observed that the data-sharing issue is critically important to GEO's goal of expanding the use of Earth observations for decision-making. He noted that the Plenary had endorsed the proposal that a Data Sharing Principles Task Force comprising GEO Members and including the current Task team should be established following GEO-V. The Chair asked the GEO Secretariat to initiate the process of establishing this Task Force so that it could come forward to the next meeting of the Executive Committee with proposals regarding the preparations for the 2010 Ministerial.

2.4 GEO BON (Document 7)

Ms Anne Larigauderie of DIVERSITAS Intl and Mr Nick King of the Global Biodiversity Information Facility (GBIF) presented the document on the Group on Earth Observations Biodiversity Observation Network (GEO BON). They described the emergence of a large consortium of biodiversity data users

and providers and the drafting of the GEO BON Implementation Outline and GEO BON Concept Document. During 2008, the GEO BON participants held a first interim steering committee meeting and a second international workshop (in Potsdam, Germany in April). Next year, the focus will be on finalizing the implementation plan, producing a number of “early products” and formalizing the network. The GEO BON steering committee will report back to the GEO Plenary on progress.

The Chair thanked the presenters and the GEO BON participants for the excellent work that has been undertaken. Germany expressed admiration for the work of the network and stated that the implementation outline provides a very worthwhile way forward. He noted the complexity of the biodiversity issue and that the issue has started to gain political traction.

Italy also welcomed the documents and agreed on the importance of the Biodiversity SBA. He noted that GEO BON is a good example of a Community of Practice. He also reminded participants that the Conference of Parties to the Convention on Biological Diversity had supported the establishment of GEO BON in one of its official decisions earlier in the year. He urged the Plenary to continue to support this strategic and important effort. He noted that it would be helpful to the GEO community to have more information about who is participating in this network.

Norway agreed that the Plenary should offer full support to GEO BON and its Implementation Outline. He noted that all Member governments have an interest in this issue. GEO BON should seek to engage the GEO community more widely and ensure that its Steering Committee is open and inclusive.

France suggested that it would be useful for the Plenary to receive reports of this type on all the Societal Benefit Areas (SBAs).

Canada said that the documents presented were a good example of the role GEO can play in launching such initiatives. He noted that the presentation did not fully explain how GEO BON was linked to the GEO committees and other institutional structures of GEO. He suggested that ways of ensuring the GEO structure supports this initiative should be explored.

The US underscored the point made in the presentation of the importance of building on existing networks. This will keep costs down in the long term and support the original purposes of some of the participating organizations. She recommended that GEO BON be implemented but with the caveat that the issues of governance and costs be addressed more fully. The Concept Document should be considered a work in progress. She concluded by encouraging the GEO BON members to register their data and tools in the GEOSS registry.

Switzerland welcomed the Implementation Outline and the importance of generating and sharing scientific knowledge about biodiversity. GEO BON can provide valuable services to the international community, including the Convention on Biological Diversity. Switzerland is providing financial support to GEO BON for secretariat services and early products and looks forward to participating further in its work.

ICSU supported the work on biodiversity. Ensuring success will require addressing many important scientific issues and linking the initiative to the work of the User Interface Committee. He welcomed the role played by DIVERSITAS.

The International Union for Conservation of Nature (IUCN) said that it would be useful to have updates on how the implementation of GEO BON is progressing. He supported a link to the possible monitoring framework for the CBD targets that is being facilitated by Japan. Addressing the issue of governance and developing a full implementation plan are important next steps.

The UK supported the need for GEO BON and emphasized that this initiative should support the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) and build on the Global Biodiversity Information Facility (GBIF). Such partnerships and linkages are important as is the right governance structure.

The Netherlands supported GEO BON but, responding to concerns expressed by GBIF-Netherlands, said that existing initiatives such as GBIF must be recognized as the key informatics infrastructure on which to build GEO BON.

In response, the presenters stated that the GEO BON participants recognize the need to formalize a full steering committee. GEO BON is a work in progress, and, now that activities are up and running, the group will issue a Call for Participation in a planning meeting scheduled for next April. It will also actively encourage the GEO community to nominate representatives for the steering committee. They asked Member governments to encourage their relevant national institutions to participate in GEO BON to ensure greater access to biodiversity data.

The Chair observed that there was strong support for the GEO BON effort. There was also interest in strengthening the role in GEO BON of the GEO membership and the GEO structures. The Chair asked those leading the GEO BON initiative to take note of the comments of the various delegations. The Plenary then accepted the document.

2.5 Outcome of Forest Monitoring Symposium

Speaking on behalf of the Forest Community of Practice, Mr Michael Brady of Canada presented the outcome of the Forest Monitoring Symposium hosted in Iguazu by the Brazilian Institute for Space Research (INPE) with support from the GEO Secretariat, Australia, Norway and the US. He noted that the event endorsed the sub-Task on Forest Carbon Tracking, which is included in the new GEO 2009-2011 Work Plan.

Canada applauded the results of the Symposium and announced its intention to make its archive of SAR data acquired over tropical forests available to the forest monitoring community. He looked forward to working with the GEO Forest Community of Practice and with space agencies to advance this SAR initiative.

The European Space Agency (ESA) remarked that there are many excellent reasons for forest monitoring, including the important role of forests in climate change and, soon, carbon markets. The space agencies contributing to GEOSS would like to demonstrate to the policymakers involved in the United Nations Framework Convention on Climate Change (UNFCCC) that GEO has the ability to put in place a reliable mechanism for tracking changes in forest carbon stocks. It was very urgent to deliver a validated GEOSS demonstration within one year.

Italy also noted the importance of forest monitoring, especially in terms of synergies with the UNFCCC. There is a need to apply newly available technologies for tracking and analyzing changes in forests in order to assist countries that are most affected by deforestation. He was pleased to see that key international forestry organizations such as the Food and Agriculture Organization were present at the Symposium.

Korea stated that its researchers are active in the remote sensing of forest fires and forest degradation. The UK noted the growing chorus of support for this initiative and highlighted the need to finance capacity building in this area.

The presenter thanked Canada for its plan to open up its lengthy archive of radar data, which will help to overcome the serious problem of monitoring forests when they are covered by clouds. Noting that his presentation had not explicitly mentioned the UNFCCC negotiation on Reducing Emissions from Deforestation and forest Degradation (REDD), Mr Brady observed that scientists need to focus on methodological issues rather than policy. He encouraged participants to read the full report from the Symposium when it becomes available.

The Chair highlighted the opportunity that forest monitoring presents to GEO and the high expectations from various user communities. GEO's work on forests, he suggested, should be integrated into some of the updated Targets and into the new Work Plan.

2.6 Report from the C4 and Committees

The Chair invited representatives of the C4 and the four Committees to present their work from over the past year.

Mr Alessandro Annoni, Co-Chair of the Architecture and Data Committee (ADC), described the Committee's efforts to guide the various Tasks for building a transverse GEOSS. He observed that, with the launch of the GEOSS Common Infrastructure Initial Operating Capability, GEOSS was starting to become operational. The Architecture Implementation Pilot is also moving GEOSS in this direction. Mr Annoni highlighted the completion of the GEO reference document on radio spectrums and frequency protection, the approval of two new satellite constellations, and the availability to users of the ALOS PALSAR Antarctic mosaic. The Committee's recommendations include populating the GEOSS registries, encouraging user communities to explore GEOSS and provide feedback, establishing sustained operations for the Common Infrastructure and registered GEO resources, implementing the GEOSS Data Sharing Principles and clarifying the role of the private sector in GEOSS.

Ms Marta Angoloti, Co-Chair of the Capacity Building Committee (CBC), described the Committee's integrated approach to building capacity for infrastructure, institutions and individuals (I³). The capacity-building Tasks are generally advancing well. The EC's 7th Framework Programme has issued a Call for Proposals aimed at establishing a capacity-building advisory capability in support of Earth observation activities, this capability is to build upon and complement existing actions in this domain. GEO's other achievements and contributions in capacity building include work on open-source software, the GEONETCast training channel, the Helioclim database, SSE data sets for energy policy planning, activities for integrated Earth observations for water-resource management, the extension of SERVIR to Africa, progress on ChloroGIN, and a series of training and education courses and programmes. Under the 2009-2011 Work Plan, GEO's capacity-building activities are to be organized into five over-arching Tasks. Resource mobilization and interaction with other Committees will remain critical priorities for the CBC.

The Chair invited comments from the floor. The African Association of Remote Sensing of the Environment (AARSE) noted that the United Nations Environment Programme has supported capacity building by producing a 365-page atlas of the African environment. China appreciated the work of the CBC and recommended developing additional strategies and policies for supporting developing countries.

Mr Udo Gärtner, Co-Chair of the Science and Technology Committee (STC), set out the Committee's vision and main activities. He stressed the importance of state-of-the-art science and technology to building GEOSS and improving scientific understanding of the Earth system. The Committee has focused on overseeing a number of Tasks, supporting the GEOSS Common Infrastructure, reviewing the data-sharing principles and advancing the Science and Technology Road Map. The Committee has thus far organized its reviews of Tasks by SBA; in the future it aims to take a broader look at all GEO Tasks and to treat science and technology as an overarching theme. The STC supports the inclusion in Part I (A Transverse GEOSS) of science and technology Tasks, in line with the proposal made by the European Commission. The S&T Committee will also contribute to the drafting of a GEOSS roadmap regarding the scientific and technological content. To improve the role and functioning of the Committee, it is now seeking to establish a core membership to guide its future work.

Commenting on the STC presentation, EuroGeoSurvey highlighted the importance of raw materials and minerals, while Canada noted that minerals are not now identified as a Societal Benefit Area in the GEO framework. Mr Gärtner elaborated on the Committee's efforts to strengthen its membership and method of operating.

Mr Gary Foley, Co-Chair of the User Interface Committee (UIC), described the Committee's efforts to engage users and oversee the Communities of Practice. He described its work on documenting user requirements for each SBA. During 2008, the Committee provided a user perspective for the GEOSS

Common Infrastructure through its active participation in the Initial Operating Capability (IOC) Task Force. Together with the Capacity Building Committee it was currently drafting a Call for Participation aimed at jointly identifying user needs and capacity-building opportunities. The UIC continued its partnership with the Architecture and Data Committee by participating in the Architectural Implementation Pilots and working together to develop the User Requirements Registry. The Committee has also gathered additional Points of Contact from organizations in order to increase and enhance membership and participation in the Committee and the Communities of Practice. He concluded by suggesting that the GEO web site could serve as an even more user-oriented entry point to GEOSS by including materials and tools to engage the “novice” user.

Japan pointed out the importance of the UIC’s role in addressing user needs and stated that it plans to engage with the Committee’s work. CEOS asked for the role of the Communities of Practice to be described on each of the Task sheets. Germany requested a clarification of the definition of and correspondence between the Societal Benefit Areas and the Communities of Practice.

Messrs Udo Gärtner and Jay Pearlman of the C4 (Co-Chairs Coordination Committee) described the C4’s role of aligning the work and activities of the GEO committees. A typical C4 meeting agenda addresses the roles and relationships of committees, the coordination and monitoring of Tasks, and recommendations on critical issues. The presenters shared the C4’s views on the 2009-2011 Work Plan. They also summarized its recommendation for establishing a planning process for the 2010 Ministerial Summit, which could include selecting five mid-term achievements to demonstrate GEO’s progress towards its strategic targets and ensuring that the 2010 Declaration maintains the high visibility of GEOSS. The C4 believes that the new task force on data-sharing principles should start working quickly, without waiting for the next Executive Committee meeting. They also suggested that the Executive Committee be mandated to provide more information to the GEO community about the strategic direction of GEO.

Italy suggested that future oral presentations from the committees should be supplemented by written reports distributed well in advance.

The Chair agreed on the need to have a list of recommendations on how best to advance towards 2010 and beyond. He proposed that the Plenary take note of the conclusions tabled by the C4 and ask the C4, together with the committees, to work closely together to prepare a paper on this forward-looking process. This paper would be considered by the Executive Committee which would then report to GEO-VI. This approach was accepted by the Plenary.

2.7 GEO 2007-2009 Work Plan Progress Report (Document 8)

The Secretariat Director presented the report. He drew special attention to the data management activities as being real achievements for 2008. The Chair complimented the work of the GEO Secretariat’s Work Plan Coordinator. The Chair also expressed his thanks to all the members of the GEO community who have worked so hard to advance these Tasks. The Plenary accepted the report.

3 GEOSS IMPLEMENTATION FRAMEWORK

3.1 Report of the Target Task Team (Documents 9 and 10)

The Chair acknowledged the efforts made by the Target Task Team (T3) to accelerate its work, which will make it possible to align the revised Targets and the new GEO 2009-2011 Work Plan by the time the Work Plan is updated for GEO-VI. With this introduction, he invited T3 Co-Chair Mr Greg Withee to introduce both the T3’s report and its draft text on revised Targets.

The Target Task Team, which consists of 29 members, was given its mandate last March by the Executive Committee. It had been generally recognized in GEO that, with the development of the new three-year Work Plan advancing well, the 10-year Targets would need to be updated and aligned with

the new Work Plan Tasks. The T3 has met three times so far and will meet again in January to review the present draft text. It will also start to coordinate its work with the new process on elaborating a GEOSS Performance Monitoring and Evaluation (M&E) Framework [see Agenda Item 3.2 below]. The ultimate aim is to craft crisp, one-sentence targets that are attractive to Ministers. The current draft text contains seven Targets for establishing an integrated GEOSS, which includes architecture and data management, capacity building, user engagement and science and technology. Another 11 Targets have been proposed for the SBAs. Mr Withee emphasized the importance of the updated Targets to the revised GEO Work Plan and encouraged Plenary participants to review the document and send comments to the task team by mid-January. He asked the Chair to request the acceptance of the task team report (Document 9) and to clarify that the draft text on the updated Targets (Document 10) was for information only.

The Chair opened the floor for comments and stressed that the discussions should focus on the process and not on the content of Document 10.

Japan appreciated the T3's work on producing the draft text as a basis for a common understanding amongst GEO Members. He made three recommendations for the T3 process: 1) there should be evaluation indicators for evaluating the degree to which a Target has been achieved; 2) the revised Targets need to strengthen the relationship between Earth observations and the needs of end users; and 3) the role of GEOSS in responding to public needs and providing societal benefits should be advanced through a regular demonstration of its achievements.

The US supported the new document on Targets and recognized the effort that had been made to align the Work Plan, the Targets and the proposed Monitoring and Evaluation Framework. The US would be pleased to participate in this effort. The new Target 12 on a global carbon and analysis system could lend credibility to GEO and should be considered a priority.

Germany supported the document and noted that the text will remain open for delegates who may still want to submit comments.

Australia also supported the document and called it an effective marketing tool for GEOSS. If presented in the right format, the document could help to communicate what GEO is trying to deliver. The contributors to GEOSS need to be able to recognize their efforts in this text. Australia will propose some additional language for Target 11 on climate to highlight the roles of programmes such as the Global Climate Observing System (GCOS).

The Russian Federation thanked the T3 and said that the document is very important for the future of GEO. He noted that it is a draft text that will be further improved. The revised version should better reflect the contributions that the World Meteorological Organization makes to GEOSS.

Canada acknowledged the challenge of producing a consolidated list of Targets that will be meaningful to Ministers. This work should be linked to efforts to develop a Monitoring and Evaluation Framework. It can also provide a basis for looking beyond the year 2015 when the GEOSS 10-Year Implementation Plan concludes.

The EC stated that Document 10 forms an excellent foundation for finalizing the updated Targets. She noted a preference for developing a single Target for each SBA (although Climate may require more given the need for a carbon monitoring system). The document should be finalized in early 2009 taking into account the GEO community's comments. The Executive Committee should be mandated to review the next version so that a document can be drafted for the GEO-VI Plenary.

Italy applauded the work achieved and agreed with the earlier comments by the EC and the Russian Federation. The strategic Targets should also be linked more firmly to a range of international environmental treaties.

WMO thanked the T3 and supported the comments of Australia and the Russian Federation. WMO would be pleased to assist with improving the targets for the Climate and Weather SBAs.

The Chair summed up the debate by proposing that the Plenary thank the Target Task Team for its excellent work. The team has now received additional guidance for moving forward. He proposed that the Plenary ask participants to send written comments and suggestions to the T3 via the Secretariat by 31 January 2009 and to mandate the Executive Committee to review the updated document at its next meeting in the second quarter of 2009. The document will then be released as a working document in time for GEO-VI. This approach was accepted by the Plenary.

3.2 GEOSS Monitoring & Evaluation Framework (Document 11)

Mr Ed Washburn of the US presented the document. He described the process that led to the current text. He noted the timeliness of developing a Monitoring and Evaluation Framework for GEOSS, pointing to the concurrent processes for updating the Targets and the Work Plan and the 2010 mid-term evaluation. He recommended that the Plenary take note of the document, establish a Monitoring and Evaluation Working Group, task it with developing a Monitoring and Evaluation Framework for GEOSS Implementation, and commit to a first independent evaluation of GEOSS implementation by mid-2010.

The Chair stated that the Plenary needs to provide clear guidance on how to take the proposal for a working group forward.

Canada remarked that an “independent” evaluation may not be appropriate as it would be costly, difficult for an external partner to quickly understand GEOSS, and it was in any event up to GEO to oversee itself. A working group should be created, and its terms of reference should focus on identifying the value that GEO brings to other organizations. It should also focus on outcomes of value to users rather than on inputs; this will require a tight link between the working group and the users in each SBA.

Argentina also supported the creation of a dedicated working group on monitoring and evaluation. He stated that the group should work with the User Interface Committee.

The EC supported the establishment of the group but expressed some concerns about section 3 (Approach and Functions) of the document. The overall evaluation exercise should be kept at a reasonable size given the limited resources and voluntary nature of the GEO initiative. It should be based as much as possible on self-monitoring of the Tasks themselves and on the simple and classic performance indicators categories: relevance, effectiveness, efficiency, utility and sustainability.

Japan suggested looking at how Tasks contribute to the strategic Targets and noted that some outstanding GEO activities should be evaluated as best practices, which will motivate participating agencies to contribute to GEOSS. He expressed interest in supporting the working group and in reviewing the group’s detailed mandate.

China also supported the working group, agreed with the proposed working schedule and expressed interest in becoming a member.

Germany stated that, given the limited budgets of Member governments and of the Secretariat, it was important to rely on a light structure with low costs. He agreed with the general philosophy that had been proposed, and he stressed that the group should make good use of the Task sheets and other existing assets. He sounded a cautionary note about GEO creating too many groups.

Italy believed that evaluating the performance of GEO was important, and he agreed with Canada that an independent evaluation would be too expensive. A simple approach within a timeframe of perhaps six months would be appropriate.

Argentina supported the creation of an independent working group. While recognizing the need to allocate resources to the existing committees, he stressed the importance of the Evaluation and Monitoring Working Group and suggested it be made a permanent body of GEO. Its results will be essential for enabling GEO to explain and justify its delivery to Ministers.

The Chair noted that a number of apparently divergent opinions had been expressed, but suggested that they were in fact not really that far apart. A light operation that avoids additional, complex structures was clearly important. While an institutional link with the UIC might be going too far, the working group does need to have a user focus. He stated that in order to have results by 2010 it would be important to establish the group now rather than postponing a decision. The Executive Committee could then finalize the Terms of Reference based on the current discussion.

Germany agreed on the importance of being prepared for a mid-term evaluation. He suggested that the Plenary focus on the issue of the Terms of Reference, particularly the working group's composition. He also advised avoiding the term "independent"; Argentina clarified that he had used the word to indicate independence from the committees, not from GEO.

The Chair remarked that it would not be possible at GEO-V to fine-tune the Terms of Reference, but that the sense of the meeting was that it would be necessary to launch the process now in order to have results for 2010. The Plenary then agreed to task the Executive Committee with defining the terms of reference and moving the process forward. In addition, it decided to open up the group to additional membership.

4 GEO 2009-2011 WORK PLAN (DOCUMENT 12)

The document was presented by Ms Alexia Massacand of the GEO Secretariat. She described the history of how the new Work Plan was developed. The Work Plan includes a number of new proposals from the GEO community and has undergone three rounds of consultation. It consolidates new and existing Tasks into 42 strategic overarching tasks and places them within a two-part structure consisting of a section on the "transverse GEOSS" (including fundamental infrastructure) and a section on the nine Societal Benefit Areas (comprising many services and issue-specific components). The new Plan aims to build on the cross-cutting nature of GEOSS and to enhance the sharing and distribution of data and the delivery of products and services to users. It stresses coordination, linkages and continuity. The Committees and Communities of Practice are expected to play a stronger role in guiding its implementation. The Work Plan is being submitted to the Plenary for "acceptance as a living document" that will be updated annually. The 2009 update will be particularly important as it will take full account of the work on updating the GEOSS Targets and establishing the GEOSS Performance Monitoring and Evaluation (M&E) Framework. This "reconciliation" process should be initiated in March at a meeting bringing together the Target Task Team (T3), the Committee Co-Chair Coordination (C4) and the Monitoring and Evaluation Framework Working Group.

The Chair asked for strategic comments and questions, noting that the details of particular Tasks can be discussed directly with the Secretariat.

EuroGeoSurvey stated that interoperability is the key driver for the GEO process and explained the important terminological differences between the words geophysics and geology.

WMO appreciated the effort that went into developing the new Work Plan. He noted that ICSU and several United Nations agencies (the International Oceanographic Commission, UNEP and WMO) are co-sponsoring a number of global observing systems and programmes that make important contributions to GEOSS, including GOOS, GTOS, GOS and GCOS. Given the cross-cutting nature of these systems, he proposed that the Task on "Sustained Observing Systems" be removed from the Climate SBA and returned to the transverse Architecture section. He offered to provide specific wording to the GEO Secretariat.

Australia endorsed the WMO proposal. She appreciated the Work Plan's new structure for highlighting transverse areas as well as SBAs. She suggested that when Committees monitor Tasks they should focus on the genuine value-added of GEO, which is its cross-cutting nature. This could be compensated for by taking a lighter approach to the monitoring of SBA Tasks. The word "transverse" may not convey the added value of GEOSS as well as "fundamental" or "foundation" might.

The EC recognized the considerable improvement in the current version of the Work Plan. She also welcomed the inclusion of the consolidated list of comments from reviewers. The EC recommended adding a clearer description of the management structure for the overarching Tasks. The 2009-2011 Work Plan should be accepted subject to the agreement that it will be updated in early 2009 based on the guidance provided by GEO-V. It should also be aligned with the revised GEOSS implementation Targets and the performance indicators with the active participation of the various GEO Committees and Task teams.

The Russian Federation welcomed the document. He called for aligning it with the new Targets and coordinating with WMO in areas such as weather and climate. The Work Plan must be considered as a living document. In addition, it would be useful to add some reference, or regulatory, text in the form of a guide or manual to help people engage with GEOSS in general and participate in the Work Plan process in particular.

ICSU expressed its general support and noted that the Work Plan is a living document. He agreed with WMO that the Global Climate Observing System (GCOS), the Global Ocean Observing System (GOOS), the Global Terrestrial Observing System (GTOS) and the WMO's Global Observing System (GOS) have a much broader focus than climate and should be reinstated in the first section of the document.

The US recognized the significant progress that had been made in developing the Work Plan over the past year. She recommended that the Plenary accept the Work Plan now but agree a clear process for moving forward. Reconciling the Plan with the updated Targets and the Monitoring and Evaluation Framework is particularly important. The next annual update of the document should be distributed for review well in advance of GEO-VI to ensure that a more polished product results. In response to an earlier comment by EuroGeoSurvey, the US agreed that some consideration should be given to mineral observations in GEOSS, particularly within the Health SBA.

South Africa returned to the issue of geophysics and remarked that GEO has a responsibility to capture investigations and studies in this field as well.

Germany was satisfied with the document. He expressed some concern about the high number of Tasks and hoped that the development of a GEOSS roadmap would make it possible to establish priorities. The management of overarching Tasks is important and should be addressed sooner rather than later.

Italy agreed on the need for a more explicit management structure for the overarching Tasks. He suggested that additional reference could be made to ongoing international cooperation in the field of disasters and offered to provide a written proposal that could be incorporated into the Work Plan.

The Chair invited the Secretariat to inform the Plenary of the plans for a reconciliation process. The Secretariat Director drew the attention of the participants to Executive Committee Document 6, which proposes two cycles of Committee meetings in 2009 as well as a schedule for the reconciliation process. This calls for the T3, the M&E Framework Working Group, and the C4 to meet in March to reconcile the Work Plan and all ongoing processes. The outcome will then be transmitted to the May meetings of the Committees and the Executive Committee for discussion and review, followed by the development, and circulation in June, of a draft Work Plan update. The reconciliation process will enter a second cycle in August-October.

The Chair resumed the discussion, noting that there had been comments on the content, governance and structure of the Work Plan as well as on the reconciliation process over the coming year. He proposed that the meeting accept the current version of the Work Plan as a living document and that delegations then provide any further comments in writing by the end of the year to the Secretariat, which will update the Plan in early 2009. He also proposed that the Executive Committee oversee the reconciliation process and report to GEO Principals about the evolution of both the Work Plan update and the reconciliation process after its next meeting in May 2009.

In response to a question from Germany, the Secretariat Director recommended that the Secretariat work on a proposal for the management of the overarching Tasks. In response to a point raised by Italy, the Chair emphasized that there will be a great deal of ongoing interaction within the GEO community and that the Executive Committee will communicate effectively in order to ensure that any potential problems with the two processes are addressed sufficiently early.

CEOS applauded the Work Plan and highlighted the importance of ensuring that all of the Task teams are strong and active. CEOS, for example, will co-lead 13 Tasks with other non-space agencies, and this will require it to make an intensive effort to ensure that these Tasks move forward.

The Plenary then accepted the GEO 2009-2011 Work Plan as a living document that will be updated in early 2009 based on the Plenary discussion and written comments received by 31 December. The Plenary also asked the Executive Committee to oversee this process, paying special attention to the issue of overarching Tasks and taking into account the revised GEOSS Strategic Targets and the work of the Monitoring and Evaluation Working Group, and to report back to the GEO Principals after its May meeting.

5 COMPLETION OF IGOS-P TRANSITION (DOCUMENT 13)

Mr Michael Tanner of the GEO Secretariat presented the document. He described the history of the highly successful IGOS-P transition over the past two years. Eight themes have now transitioned into GEO Communities of Practice; they are atmospheric chemistry, carbon, coastal, cryosphere, geohazards, land, ocean and water. The User Interface Committee will help to maintain the momentum generated by the transition. A key next step will be to organize a GEO Communities of Practice Symposium at the time of the GEO-VI Plenary. The Communities of Practice will now focus on widening the scope of GEOSS implementation from setting requirements for scientific observations to meeting broader user requirements.

The European Space Agency congratulated the IGOS-P themes and recognized the important and concrete legacy of their work, including their reports, methodology and philosophy. He noted that very few groups succeed in constructively winding up their affairs. Integrating the themes into GEO may be challenging in cases where the themes and SBAs do not map on a one-to-one basis, and he encouraged the UIC and the Secretariat to invest their efforts in managing this.

As a co-sponsor of IGOS-P, the International Council for Science (ICSU) stated that the transition will greatly strengthen GEO and GEOSS. He appreciated the Secretariat's continuing efforts to assure that the full IGOS-P legacy is maintained.

The Chair asked the Secretariat to note the comments from the Plenary, and the Plenary accepted the document.

6 REPORT OF THE EXECUTIVE COMMITTEE TO GEO-V (DOCUMENT 14)

Mr Philemon Mjwara, the Co-Chair from South Africa, presented the document. He summarized some of the key issues addressed by the Executive Committee over the past year, including performance indicators for the Secretariat, the appointment of the Secretariat Director, endorsement of the GEO logo and its legal protection, the GEOSS Common Infrastructure and its Initial Operating Capability, the Secretariat budget and the need for additional contributions, the external audit results, the proposal that the Secretariat start issuing an electronic newsletter, the meetings schedule for 2009 and the review of the applications for becoming a GEO Participating Organization.

Italy noted an earlier Executive Committee decision to promote GEO with the G8, including by making a presentation to the G8 science ministers in 2009. Since GEOSS is user-oriented, other ministers may also constitute an appropriate audience. Italy, which is hosting next year's G8 Summit, will seek to follow Japan's example in advocating for GEOSS at the Sherpa level. He also suggested

that to improve transparency it would be useful for the entire GEO community to receive the minutes of Executive Committee meetings in a timely manner. Canada agreed that it would be useful to receive more frequent information from the Committee.

The Co-Chair from South Africa agreed on the value of increased information flows, including via the regional caucuses. He also acknowledged the value of further reflection on which G8 ministers to approach.

The Chair confirmed the Executive Committee's commitment to adhering to the Rules of Procedure regarding information flows and in particular Para. 3.7 of the GEO Rules of Procedure, which require the GEO Secretariat to release all the documents prepared for an Executive Committee meeting to all GEO Members and Participating Organizations for information at least 15 calendar days prior to the meeting

7 EXECUTIVE COMMITTEE MEMBERSHIP

The Secretariat Director reported that the regional caucuses had all met and proposed their 2009 nominees for the Executive Committee. The nominees are South Africa (continuing as Co-Chair) and Uganda for Africa; the Russian Federation for the Commonwealth of Independent States (CIS); the EC (as Co-Chair), France and Norway for Europe; Argentina, Belize and the US (Co-Chair) for the Americas; and Australia, China (Co-Chair) and Korea for Asia/Oceania. Argentina, Belize and Norway will serve for one year only. The Asia/Oceania caucus, noting that the size of the Executive Committee had been set when GEO was much smaller, invited the Plenary to reflect on the possibility of increasing the size of the Committee to allow four countries from Asia/Oceania to participate.

The Chair invited the Plenary to accept the nominations and to commend all of the outgoing Executive Committees for their excellent work. The Plenary agreed.

The Plenary then held an extensive discussion on the issue of expanding the size of the Executive Committee. Germany suggested that each caucus could receive an additional seat. The US stated that expansion was a serious issue that could impact the effectiveness of GEO; the caucuses should consider it further before a decision is taken. Italy observed that allowing each caucus to nominate an additional member could increase transparency, participation and action. Brazil supported the current size but suggested opening a discussion that could conclude in 2010. Norway noted that it would be difficult for smaller countries to engage actively in the Committee so this might not solve the problems created by the Executive Committee's growing importance. The Russian Federation supported an additional member for each caucus. Canada, supported by Australia, noted the importance of rotation amongst Committee members and thought that any change in the governance structure should be done mindfully and not rushed; he suggested that a document exploring the implications could be submitted to the next Plenary. The US supported the idea of creating such a document for consideration by the caucuses.

The Chair stated that a structured approach would be needed in any debate over a possible change to the Committee's size. The Chair therefore asked the Plenary to agree to a proposal that the Executive Committee should prepare a paper setting out possible options for the expansion of the Executive Committee, to be circulated to GEO Principals after the Committee's 15th meeting and presented for discussion at GEO-VI. This approach was accepted by the Plenary.

8 FINANCIAL REPORTS

8.1 2007 Financial Statement (Document 15)

The Secretariat Director presented the document. There were no comments and the Plenary accepted the document.

8.2 Report of the External Auditor (Document 16)

The Chair introduced the item by thanking the UK National Audit Office for its work. The Co-Chair from South Africa then presented the document. He explained that the aim of the audit was to provide assurances to the GEO Plenary about the financial management of GEO. The auditor had examined the Trust Fund statements for 2007 and found that they satisfied the rules governing the Fund and international standards. The Chair confirmed that the audit had discovered no errors or problems.

Australia, supported by the US, pointed to recommendation no. 3 in the oral report relating to the possibility of attracting commercial sponsorship and suggested that the ethos and data-sharing principles of GEO made any implication that Earth observations were being sold for money extremely dangerous. The Secretariat Director noted that this recommendation should be seen within the UK context where the law requires public organizations to try to profit from their data; this clearly does not apply to GEO, which in any case does not own the data from GEOSS. Australia stated that in adopting the report the Plenary should note that this one recommendation may not be relevant.

Italy suggested that the report should be accepted for information but not adopted or endorsed. He also proposed that in the future a fourth column could be added to describe the response of GEO management to the auditor's final comment.

The Plenary then accepted the report for information and noted that the recommendation on private contributions may not be relevant.

8.3 Report on Income and Expenditure (January to September 2008) (Document 17)

8.4 Secretariat Operations Budget for 2009 (Document 18 (Rev. 1))

8.5 Report from Informal Finance Review

These three sub-items were addressed together. The Secretariat Director started by introducing the Report on Income and Expenditure (Document 17). He explained that additional contributions have been received since the document had been drafted, so that total income for 2008 now equals CHF 6.7 million. He noted that the Secretariat had intentionally reduced spending during the year to limit the budget shortfall. He explained that because the financial procedures of WMO require that staff salaries for the year be covered as of 1 January, the Secretariat needed to have a working capital fund of at least CHF 2 million at the beginning of the year for both salaries and initial operating costs.

The Secretariat Director then presented the Secretariat Operations Budget for 2009 (Document 18 (Rev.1)). Noting that the 2009 budget was accepted in principle at GEO-III, he anticipated a total expenditure level of CHF 6 million. With the announcements by Japan of its intention to contribute CHF 400,000 francs and by The Netherlands that it will provide € 100,000 to hire a seconded expert, the cash and in-kind pledges for 2009 received so far now total CHF 4 million.

Ms Sue Barrell of Australia reported on the informal financial review that had been held in Bucharest immediately before GEO-V. Participants in the review were Australia, Switzerland, WMO and the GEO Secretariat. They concluded that the appropriate budget level for GEO Secretariat activities was CHF 4.5 million in cash and CHF 1.5 million in kind. However, because there has been a general decline in cash contributions, the Trust Fund is on track to have an annual shortfall. The WMO request for a working capital fund at the start of each year does make good management sense. The reviewers brainstormed about how to reduce expenditure and increase income. They noted that this year's reduction in programme costs mainly affected developing-country travel. Solving this by offering travelers only partial funding could, however, be counterproductive. Perhaps travel funds could be used more efficiently if meetings are planned well in advance. The budget for contractors, who are needed to fill gaps in the seconded expertise, was high, and could perhaps be reduced by ensuring that the appropriate mix of experts are seconded. More contributions could be encouraged by acknowledging and highlighting even modest, ad hoc donations. The recent letter from the Co-Chairs

encouraging contributions had some impact, and such measures should be expanded. Publicity materials, case studies and the updated targets document could be used to highlight the benefits of GEOSS to potential contributors. While the current global financial situation increases the difficulty, it should be recognized that a budget below CHF 6 million (including cash and in-kind) will not be sufficient to deliver on GEOSS.

The Chair thanked Australia for her timely and valuable report and opened the floor for comment on the three sub-items. Italy noted the importance of the finance review and of pursuing efficiencies. The US applauded the mix of developed and developing countries that had contributed to the Trust Fund in 2008 and stated that the US is likely to maintain its level of cash and in-kind contributions in 2009, plus it will provide an additional in-kind contribution by hosting the Plenary. Regarding the financial review, he recommended a balanced approach that includes efficiencies plus additional sources of support. The US would be pleased to participate in the informal financial review.

Estonia pledged to make a small financial contribution for 2009. The EC stated that its 2009 contribution would remain at €600,000 and, if its member states agree, it plans to continue this support into the future. China cited the current financial crisis and suggested considering the private sector and reducing the travel costs for meetings. It pledged to second an expert and to contribute USD 80,000 in 2009.

The Chair observed that GEO faces both short- and long-term issues with regard to contributions to the GEO Trust Fund. . One of the immediate issues is the carry-forward from 2008 to 2009, with regard to the WMO requirement that staff salaries for the year be covered as of 1 January. The Secretariat was asked, therefore, to enter into discussions with WMO to seek flexibility with respect to this requirement.

The Chair also asked that the report of the informal financial review be finalized and distributed in written form to the GEO Principals.

The Chair then proposed that the Report on Income and Expenditure 2008 (Document 17 (Rev.1)) be accepted. The Chair also proposed acceptance of the Secretariat Operations Budget for 2009 (Document 18 (Rev.1)), with the request that the Secretariat prepare Rev. 2 integrating additional pledges. The Chair also suggested that the Secretariat should explore ways of reducing spending without affecting core activities and that it should work with the informal financial review team to identify new sources of funding. The Plenary accepted the Chair's proposals.

9 GEO COMMITTEES

9.1 Recommendations on Committees and Working Groups

The Chair described the Executive Committee's recommendation that the Plenary decide that the Tsunami Working Group has completed its work and should therefore be disbanded. He noted that its activities will be continued through the Work Plan, and he thanked the Group for its efforts. This was accepted by the Plenary.

9.2 Nominations of Committee and Working Group Co-Chairs

Germany offered to serve as Co-Chair of the User Interface Committee. Australia volunteered to Co-Chair the Science and Technology Committee. Italy will contribute to the Monitoring and Evaluation Working Group and also offered to serve as Co-Chair of the Science and Technology Committee. The Chair encouraged participants to consult further when they returned to their capitals and to inform the Secretariat later of their willingness to chair committees.

10 RULES OF PROCEDURE UPDATE

The Secretariat Director informed the participants that several parts of the Rules of Procedure should be updated. A new annex E, which has been appended to the Report by the Executive Committee to GEO-V (Document 14), sets out the procedures for GEO Secretariat arrangements. Reference to the Tsunami Working Group should be removed, and the new Monitoring and Evaluation Working Group should be added, together with its Terms of Reference. The Chair clarified that the Working Group's Terms of Reference would be further fine-tuned on the basis of the earlier discussion. With that, the Plenary adopted the proposed changes.

11 ANNOUNCEMENT OF GEO-VI AND OTHER ANNOUNCEMENTS (DOCUMENT 19)

The US announced its offer to host GEO-VI next year in Washington DC. The Chair thanked the US for its offer, which was accepted by the Plenary.

Japan announced that the first African Water Cycle Symposium would be held from 6-8 January 2009 in Tunisia. This event would offer a good opportunity to develop this Task, and he invited interested Members and Participating Organizations to attend.

China congratulated the US for hosting the next Plenary and applauded the overall US contribution to GEO. China offered to host the 2010 Ministerial Summit and GEO-VII.

Korea stated that participants would be aware that it has already made an offer to host the 2010 meeting. Korea is committed to playing an important international role in GEO and reiterated its offer.

The Secretariat Director, on behalf of the Romanian host, announced an international workshop on data mining techniques to be co-sponsored by Germany, Romania, Switzerland and the US from 31 August – 1 September 2009.

The Chair expressed the Plenary's gratitude to both China and Korea for their offers to host the 2010 meeting. These offers demonstrated their commitment to supporting GEO and making GEOSS a reality. He proposed that the Plenary take note of and welcome both offers, and he asked China and Korea to discuss the issue together and return to GEO-VI with a joint proposal. The two Members agreed, and the Plenary accepted this approach.

The Plenary concluded this item with a round of applause for the US offer.

12 REVIEW OF SESSION OUTCOMES

The Secretariat projected a list of session outcomes on the overhead screen for comments. Canada asked that outcomes be included on the process for handling applications to become a Participating Organization and for preparing the 2010 Summit. The US agreed on the importance of an early preparation of the Summit, clarified that it was offering to be a participant in the financial review, and suggested that in the future a written document should supplement the oral report on the changes to the Rules of Procedure. WMO stated that it should be clear that the comments made during Plenary would be included as inputs to the reconciliation process. Australia clarified that the financial review went beyond proposing budget cuts to emphasizing the benefits to be reaped by better planning. IEEE, supported by Canada, said that the Executive Committee had asked the C4 to provide recommendations on governance and management.

The EC stated that a task force was to be established on data-sharing principles. IISL said that the task force on data-sharing principles should be an expanded version of the existing Work Group. The US stated that the point was to build on and maintain the good work of CODATA and the Working

Group, but to expand the number of participants and ensure that the task force was led by Member governments.

Italy suggested that the Secretariat provide membership lists for all Committees and Working Groups. The Chair noted that the meeting outcomes now being projected were not the final record of the meeting and that they would be corrected based on the current discussion. He also observed that only Italy had so far volunteered to join the Evaluation and Monitoring Working Group, and he invited participants to send additional nominations to the Secretariat.

13 CONCLUDING REMARKS

The US Co-Chair congratulated his fellow participants for a very productive meeting and noted the positive progress that had been made. Despite the challenging financial times, it was important to remain focused on implementing GEOSS and maintaining the positive relationships that have been developed within GEO.

The South Africa Co-Chair offered the metaphor of an airplane taking off on a journey; it may suffer bumps and turbulence as it starts to climb up through the clouds, but then it reaches its cruising altitude and stabilizes. The implementation of GEOSS is now approaching this cruising mode.

China stated that the decisions and plans agreed at GEO-V would greatly benefit GEO's progress. He expected that there would be a large amount of work over the coming year. He stated that he looked forward to working with Korea to reach an agreement on the 2010 meeting.

The Secretariat Director thanked the delegates as well as the Secretariat staff. He announced the recent and pending departures of four valued seconded experts: Osamu Ochiai of Japan, Imraan Saloojee of South Africa, Doug Muchoney of the US and Michael Rast of ESA.

The Chair concluded the GEO-V Plenary meeting by recognizing the leadership of the host, Mr Mario Piso of Romania, and the intense and dedicated work of the Romanian Space Agency staff, in particular Mr Ion Nedelcu and Mr Cosmin Nistor. He also thanked the Secretariat and all of the participating delegations. He believed that the Bucharest Plenary had set in motion several processes that will enhance GEO and accelerate progress towards GEOSS. GEOSS is now becoming a reality, with an internationally shared working common infrastructure, although the work is far from over. He ended with an appeal to all participants to register their components and services in the GEOSS registries as soon as possible. The meeting closed at 17h.

**2008 GEO-V Plenary Session
Attendance list****Argentina**

Conrado Varotto
Ana Medico

Australia

Susan Barrell
Alex Held
Stuart Minchin
Gary Richards

Brazil

Joao Viane Soares
Fernando Ramos
Canada
David Grimes
Michael Brady
Michael Crowe
Kenneth Korporal
Thomas Piekutowski

China

Guoguang Zheng
Huadong Guo
Yiming Jin
Naimeng Lu
Xiaozhe Qiang
Dake Yang
Jun Yu
Rusheng Zhang
Xingying Zhang
Datong Zhao

Croatia

Zvonimir Katusin

Denmark

Flemming Jensen

Estonia

Tiit Kutser
Reet Talkop

European Commission

Zoran Stančič
Manuela Soares
Alessandro Annoni
Florence Beroud
Gerard Bradley
Hugo De Groof
Alan Edwards
Mauro Facchini
Ariana Nastaseanu
Gilles Ollier
Francesco Pignatelli
Patrick Vittet-philippe

Finland

Tuomo Suortti
Yrjö Sucksdorff

France

Daniel Vidal-madjar
Steven Hosford

Germany

Udo Gärtner
Paul Becker
Michael Nyenhuis
Helmut Staudenrausch

Greece

Vasileios Tritakis

Hungary

Zoltán Dunkel

India

Radhika Ramachandran

Iran

Ali Mohammad Noorian

Italy

Ezio Bussoletti

Maria Dalla Costa

Susanna Zerbini

Barbara Bendandi

Nico Bonora

Lorenzo Ciccarese

Luca Guerrieri

Japan

Masaaki Tanaka

Hirota Tani

William Burford

Akiko Goda

Koki Iwao

Makoto Kajii

Toshio Koike

Hiroshi Kudo

Tsuneo Matsunaga

Satoko Miura

Shin Miyazaki

Ryosuke Shibasaki

Rio Tanabe

Emi Uchida

Yuuki Yajima

Korea, Republic of

Won-geun Eom

Tae-byeong Chae

Lim-seok Chang

Tae-dong Kim

Seung-ho Lee

Yong-seob Lee

Netherlands

Frits Brouwer

Niger

Issoufou Wata Sama

Norway

Per Erik Skrøvseth

Øystein Nesje

Evie Hagen

Peru

Katherine Gonzales

Portugal

Adérito Serrão

Tiago Saborida

Romania

Marius-ioan Piso

Alexandru Badea

Vasile Craciunescu

Iulia Dana

Andrei Diamande

Vladimir Gancz

Anca Ghinescu

Ion Grigoras

Gheorghe Marmureanu

Marcel Maruntiu

Gheorghe Oaie

Anca Racheru

Romania (continued)

Ion Sandu
Constantin Sava
Florin Serban
Iulia Simion
Gheorghe Stancalie
Viorel Vulturescu

Russian Federation

Alexander Gusev
Dmitry Votrin
Valeriy Kukosh
Alexander Panfilov
Victor Sendetskiy
Alexander Tkachenko
Leonid Vedeshin
Nina Zharova

Slovakia

Jozef Franzen
Miroslav Zachar

Slovenia

Silvo Žlebir
Marjan Vezjak

South Africa

Philemon Mjwara
Matlou Mabokano
Humbulani Mudau
Mmboneni Muofhe
Terence Van Zyl

Spain

Marta Angoloti

Sweden

Maria Ågren
Erik Liljas

Switzerland

José Romero
Nando Foppa
Veronika Elgart
Simon Geissbühler

Thailand

Thongchai Charupatt
Soontaree Srisuwan

Turkey

Tamer Ozalp
Ugur Leloglu

Ukraine

Eduard Kuznetsov
Oleg Fedorov

United Kingdom

Michael Rose
Andrew Shaw

United States

Mark Myers
Mary Glackin
Heather Allen
Madelyn Appelbaum
Bryan Bailey
Michael Bender
Elizabeth Blood
Tyra Brown
James Collins
Peter Colohan
Bryant Cramer
Ivan Deloatch
James Devine
Phil Dickerson
Gary Foley

United States (continued)

Barbara Haines-parmele
John Lyon
David McCabe
Douglas Muchoney
Douglas Nebert
Bernadette Roberts
Carla Sullivan
Daniel Walker
Emily Wallace
Ed Washburn
Pai-Yei Whung
Greg Withee
Shira Yoffe

Uzbekistan

Natalya Shulgina

AARSE

Tsehaie Woldai

CEOS

Pakorn Apaphant
Wabile Motswasele
Asanda Ntisana
Ivan Petiteville
Brent Smith

COSPAR

Roger Bonnet

DIVERSITAS

Anne Larigauderie
Norbert Juergens

ECMWF

Dominique Marbouty
Manfred Kloeppe

ESA

Stephen Briggs
Jérôme Bequignon
Simonetta Cheli
Rob Koopman
Evangelina Oriol-pibernat
Mirko Albani
Michael Rast

EUMETNET

Steve Noyes

EUMETSAT

Lars Prahm
Paul Counet
Michael Williams
Lothar Wolf

EuroGeoSurveys

Patrice Christmann
Emile Elewaut
Luca Demicheli

FAO

Renato Cumani

FDSN

Constantin Ionescu

GBIF

Nicholas King
Éamonn Ó Tuama
Alberto González Talaván

GSDI

Bas Kok
Gábor Remetey-fülöpp

IAG

Markus Rothacher
Hans-peter Plag

ICSU

Gisbert Glaser
Kathleen Cass
Robert Chen

IEEE

Jay Pearlman
Tom Wiener
Siri-jodha Khalsa
Ellsworth Ledrew
Budd Leo
Françoise Pearlman

IHO

Romeo Bosneagu

IISL

Joanne Gabrynowicz

INCOSE

Ken Crowder

OGC

Robert Brammer
George Percivall
Marten Hogeweg
Robert Thomas

POGO

Trevor Platt

UNOOSA

Lórant Czárán
Sharafat Gadimova

WCRP

Rick Lawford

WMO

Wenjian Zhang
Barbara Ryan
Brian O'donnell

Austria

Fritz Neuwirth
Liane Lippsky

ISC

Constantin Ionescu

DANTE

Hans Doebbeling
Richard Hughes-jones

GLOBE

Ed Geary

GEO Secretariat

José Achache
Hendrik Baeyens
Natasha Brutsch
Douglas Cripe
Veronica Grasso
Yong-seong Kang
Alexia Massacand
Sebastien Miazza
Osamu Ochiai
Giovanni Rum
Imraan Saloojee
Michael Tanner
Michael Williams