



GROUP ON
EARTH OBSERVATIONS

GEO-V

19-20 November 2008

GEO-IV Report

Document 3

As approved at GEO-V

DRAFT REPORT of GEO-IV

28 – 29 November 2007

(As approved at GEO-V)

1 OPENING OF THE SESSION

1.1 Welcome and Opening Remarks

The Fourth Plenary Meeting of the Group on Earth Observations, GEO-IV, was chaired by GEO Co-Chair Philemon Mjwara of the Republic of South Africa. He called the meeting to order at 9h00, welcomed the participants and set out three goals for GEO-IV: assessing progress, preparing for the Ministerial Summit, and maintaining momentum for the 10-Year Implementation Plan for the Global Earth Observation System of Systems (GEOSS).

The GEO Co-Chair from the People's Republic of China, Mr Zheng Guoguang, emphasized the huge Task that lay before the Plenary Meeting. He also highlighted China's contributions of FengYunCast and the China Brazil Earth Resources Satellite Programme (CBERS).

The Co-Chair from the European Commission (EC), Mr Zoran Stančič, stressed the vitality of the GEO process and the enormous progress that had been made in establishing GEOSS. He called GEO-IV "the end of the beginning".

The Co-Chair from the United States, Adm. Conrad Lautenbacher, drew the link between GEO-IV and the 2002 World Summit on Sustainable Development, which was also held in South Africa. He noted the significant progress made to date on implementing GEOSS and the relevance of GEO to policymakers.

1.2 Welcome from the Secretariat Director

The GEO Secretariat Director, José Achache, thanked the host government and expressed his satisfaction in GEO's achievements. He observed that GEO-IV would mark a major transition in the growth and development of GEOSS, and he highlighted some of the key decisions that would be taken at the meeting.

1.3 Administrative Announcements

The Secretariat Director announced that simultaneous interpretation was available in Chinese, English, French, Russian and Spanish. He thanked Spain for translating key documents into Spanish. He then described the activities contained in the Week at a Glance document, including the "CBERS in Africa" launch and the opening of the GEO Exhibition on Earth observations, featuring some 60 exhibition booths and a "video wall" displaying films contributed by participants (see annex for list of exhibitors). Other announcements related to regional caucuses, official dinners, the launch of a new full-colour book entitled "The Full Picture", and the Ministerial Summit. He stated that almost 500 people would participate in GEO-IV and the Summit, compared to 350 at GEO-III.

1.4 Recognition of New Members (*Document 2*)

The meeting chair announced the list of new Member countries. They included the Czech Republic (joined 25 January 2007), Bangladesh (16 February), Romania (22 March), Costa Rica (16 May),

Panama (4 July) and Pakistan (19 November). GEO's membership now totals 72 countries plus the EC. The meeting formally acknowledged the new Members.

1.5 Statements from New Members

The Czech Republic explained that its Ministry of Environment in collaboration with the Ministry of Education is responsible for coordinating the country's work on Earth observations. An inventory of Earth observation resources has been completed. The Czech Republic is committed to contributing to the GEO committees and to the Global Monitoring for Environment and Security (GMES) initiative, the Infrastructure for Spatial Information in the European Community (INSPIRE), and the future GEOPortal.

Bangladesh joined GEO in good part because it saw that GEOSS could provide an effective means for monitoring disasters. It has joined the Asian Water Cycle Initiative (AWCI) in order to better manage the Ganges river delta, which dominates the country. Bangladesh also recognized China's contribution of the FengYunCast system.

Romania highlighted the important role of the European Commission and its intention to integrate its work on GEOSS into the European Union context.

Panama noted that it is hosting SERVIR, which will assist all Mesoamerican countries to mainstream Earth observations into their policy processes. The government plans to hold a national meeting to inform national institutions that address the nine Societal Benefit Areas about GEO.

1.6 Adoption of Agenda (*Document 1*)

The chair introduced the agenda and asked the Secretariat Director to describe the various activities and events that would take place. The agenda was adopted without comment.

1.7 Approval of GEO-III Report (*Document 3*)

The chair introduced the GEO-III report. The Secretariat Director read out a correction to the printed text, clarifying that the sentence "The Secretariat presented a new draft "Guidance for Recognition of new GEO Participation Organizations and Observers, Annex C to the Rules of Procedure, which was accepted by GEO-III." should be inserted before section 7. The Netherlands noted an error on page 9, asking that the Task reference be corrected to "CB-07-01b". With these two changes, the document was accepted as a true reflection of the discussions held at GEO-III in Bonn in November 2006.

1.8 Recognition of Participating Organizations and Observers (*Document 4*)

The chair asked the Secretariat Director to present the Executive Committee recommendations on requests to become Participating Organizations of GEO.

The Director stated that the Executive Committee recommended accepting the Water Centre for Humid Tropics of Latin America and the Caribbean (CATHALAC), the Caribbean Meteorological Organization, the Committee on Space Research (COSPAR), Environmental Information Systems-Africa (EIS/AFRICA), and the Global Biodiversity Information Facility (GBIF) as Participating Organizations; the Federation of Earth Science Information Partners (ESIP), the International Seismological Centre (ISC), the International Soil Reference and Information Centre (ISRIC) and the World Federation of Public Health Associations (WFPHA) as observers.

Canada observed that WFPHA plays an important role in the health Societal Benefit Area (SBA) and urged that it be accepted as a Participating Organization. The representative of WFPHA explained his organization's interest in, and relevance to, GEO. The meeting agreed to accept WFPHA as a Participating Organization, and it confirmed all of the Executive Committee's other recommendations.

2 DRAFT CAPE TOWN DECLARATION (*DOCUMENTS 5 AND 5 REV.1*)

The chair opened the discussion on the draft Cape Town Declaration. He explained that rev.1 of the document contained comments recently received from about 20 delegations. Asked to summarize the comments, the Secretariat Director said that some of the more substantive ones related to the inclusion of modelling in GEOSS, the ownership of the GEOSS components, the reference to the International Telecommunication Union (ITU) and its protection of radio frequencies, and the reference to the upcoming United Nations Framework Convention on Climate Change (UNFCCC) conference in Bali, Indonesia. The chair then invited comments from the floor.

Germany supported the main thrust of the Declaration and said the new comments in Document 5 rev.1 were worth considering. France raised the issue of GEO's mandate and expressed its concern about the inclusion of data assimilation, prediction and information systems. The Netherlands supported the inclusion of modelling in GEOSS and opposed the deletion of line 17 on advancing the implementation of data-sharing principles, as proposed by one of the rev.1 comments. Australia, Brazil, Canada, China, India, Japan and the US supported The Netherlands and highlighted the importance of open access to data and the relevance of modelling and information systems to the Societal Benefit Areas, developing countries and ministers.

Russia agreed with retaining paragraph 17, proposed dropping the reference to protecting radio frequencies as being too technical, and expressed satisfaction with the draft text.

The European Centre for Medium-Range Weather Forecasts (ECMWF) supported a broad interpretation of the GEO mandate and suggested that the reference to radio frequencies could be revised to acknowledge the adoption of a resolution on the matter by the ITU's World Radio Conference 07. The United Nations Environment Programme recommended broadening paragraph 9 to refer to the United Nations Geographic Information (UNGI) Working Group and to the United Nations as a whole. The African Association of Remote Sensing of the Environment (AARSE) supported the inclusion of models and applications, and EuroGeoSurvey supported the inclusion of paragraph 17.

Chile called for making a reference to the Millennium Development Goals. The United Nations University (UNU) supported the inclusion of paragraph 17. The Global Climate Observing System (GCOS) remarked that it should be possible to bridge the different views over the breadth of the GEO mandate. France clarified that it supported the inclusion of paragraph 17 and elaborated its view that an overly broad mandate could hamper GEO's effectiveness. Ireland supported a broad, "end-to-end" mandate for GEO and endorsed the inclusion of paragraph 17.

The Global Spatial Data Infrastructure Association (GSDI) endorsed a broad GEO mandate and the inclusion of the UNGI Working Group. Argentina agreed with Brazil and others on the inclusion of modelling. Norway also supported the inclusion of modelling while urging a focus on ensuring the sustainability of observations.

The chair summarized the discussion by identifying four main issues: the inclusion of modelling and data assimilation, the inclusion of paragraph 17 on data sharing, the inclusion of a reference to the ITU and radio-frequency protection, and whether the reference to UN bodies and conventions should be general or specific. He then proposed setting up a small but open-ended task team chaired by Mr Dan du Toit of South Africa to finalize the Declaration for acceptance by GEO-IV.

The GEO Co-Chair from the EC took over the chair, and a discussion ensued over the mandate of the task team. It was agreed that the entire text remained open for negotiation. It was further agreed that detailed negotiation while meeting in plenary was not a workable approach, so members of the task team departed to start their work.

Later in the day, with the Co-Chair from South Africa back in the chair, the chair of the open-ended task team returned to report on progress to the Plenary Meeting. The task team, he said, was a representative and dynamic group and had completed perhaps two thirds of its work.

The task team returned to Plenary Meeting on the second day of GEO-IV and announced that it had agreed a text with the exception of one section. The task team chair presented the newly revised draft text, the product of 11 hours of discussion. The main issues had been solved by referring to modelling and assimilation as “associated” systems, referencing the three so-called Rio conventions on biodiversity, climate change and desertification, and maintaining and improving the paragraphs on data-sharing and on radio frequencies.

The Meeting reviewed the new text paragraph by paragraph on an overhead screen. Brazil complemented the leadership of the task team chair. A discussion ensued, and it was agreed that providing further detailed comments on this carefully negotiated and balanced package would not be fruitful. The bracketed paragraph, no.19, was discussed, edited and moved to the preamble. Canada expressed concern over the clarity of paragraph 18, and some revisions were accepted.

Towards the end of the second day, the draft Declaration as revised by the Plenary Meeting was circulated to all participants. The chair noted that the final sentence of paragraph 10 had inadvertently been left in and should be deleted. The Meeting agreed by consensus to forward the text to the Ministers and heads of delegation for their consideration and adoption at the following day’s Summit.

3 GEOSS IMPLEMENTATION PROGRESS

3.1 GEO National and Regional activities

The chair invited Members and Participating Organizations to make brief presentations from the floor about their national and regional activities relevant to GEO.

Russia described its interagency commission, which includes 15 ministries and agencies, for implementing GEOSS. It highlighted its national space programme, the rebuilding of its system of meteorological satellites, permanent satellite observations of the northern regions of the planet, GEONETCast, the MITRA satellite dissemination system, an assessment of coastal pollution in the Azov and Black Seas, plans to publish key GEO documents in Russian, and the upcoming Meteo Expo in St Petersburg, which will feature a section on GEOSS.

The EC outlined its 7th Framework Programme, which provides strong support for GEO through activities in the fields of environment, space and development policy. The EC has launched a call for proposals in the area of environmental research, including a call for specific proposals dedicated to Earth and ocean observation systems and monitoring methods for the environment and sustainable development. Further calls will be launched in this domain in the coming years. Other relevant EC activities include INSPIRE, the African Monitoring of the Environment for Sustainable Development programme for capacity building in Africa, and GMES for space policy. The EC also seeks to ensure that GMES, its main contribution to GEOSS, is sustainable and effectively integrates the contributions of the European Space Agency (ESA), EUMETSAT, Europe’s national space agencies, and various programmes for in-situ observations.

Germany described its contribution to INSPIRE and GMES. It stated that the TerraSAR radar satellite forms a substantial contribution to GEOSS and provides data free of charge for scientific use. Germany is also focusing on rapid data dissemination and on its national GEO implementation plan.

Japan highlighted its main data activities, its contribution to the Asian Water Cycle Initiative, and its cooperation with 18 countries in Asia. It is pursuing an open-data policy and is focusing on data integration, prediction, and decision-support capabilities.

The US applauded the major progress that has been achieved through GEO on international coordination. The US recently set up a science and technology committee consisting of representatives from research and observing systems. Other activities include a global drought information system, GEO-IV side events on air quality, and contributions to GEONETCast and SERVIR.

The European Space Agency (ESA) emphasized the importance of space for managing the planet and described its contributions to GEOSS in the field of disasters. ESA has been chairing the strategic implementation team of the Committee on Earth Observation Satellites (CEOS), which steers the Committee's relationship with GEO. It also contributes to GMES and supports European and national policies. ESA will launch two new Earth observation satellites in 2008.

India stated that it considers the use of space technology applications to be of vital importance. It seeks to ensure that satellites meet the needs of natural resources planning, rural development and capacity building. India's satellites are part of the CEOS virtual constellation and provide data to the GEO community. India has also consolidated all its available Earth observation information and has developed a portal.

Switzerland hosts several international calibration and data centres (e.g. on radiation, greenhouse gases, and glaciers). The Swiss GCOS Office has completed the first comprehensive inventory of Swiss climate measurement series. The inventory identifies a set of essential climate variables and international centres whose continuity is not assured and which need to be placed on a sustainable footing.

China has launched new Earth observation satellites over the past year. It has released its 10-year plan on Earth observations, and it has advanced CBERS, its joint programme with Brazil. Next year will see the launch of a new-generation meteorological satellite which will disseminate data free of charge to the entire world. The GEO Task force on the 2008 Olympics in Beijing has made strong progress.

Hungary highlighted the importance of phenology and expressed its interest in conducting further time series analyses of vegetation changes over time in order to track the growing season.

South Africa is pursuing Earth observations as a vehicle for development. It has started to establish a national space agency to coordinate and integrate various space-related activities. SAEON, to be launched during the conference, will also provide fisheries and climate data from the Southern Ocean. These national advances can only be achieved in partnership with the international community.

The African Association of Remote Sensing of the Environment (AARSE) is particularly active in capacity building for GEOSS. This includes promoting a regional infrastructure in Africa for all Societal Benefit Areas.

The Partnership for Observation of the Global Oceans (POGO) has been active in outreach, including with the media. It recently developed two DVDs, one featuring a census of marine life and the other addressing the oceans in general.

The Global Climate Observing System (GCOS) is promoting the development and coordination of national GCOS implementation plans to complement the 10 regional action plans that already exist. GCOS noted particular successes in China and Switzerland and highlighted the Climate for Development in Africa initiative.

The United Nations University, together with a South African institution, has established a joint Cooperation Unit for Southern Africa. It provides post-graduate studies in the field of space-based Earth observations to support human security. The UNU is also engaged with disaster risk legislation, science and technology for Africa, and the SPIDER initiative.

The Netherlands contributes capacity building, including a special training course in water management and Earth observations, as well as funding for GCOS and other critical Earth observation activities.

The European Environment Agency supports GMES and has a mandate to supply EU institutions and citizens with environmental information and appraisals. Using the data generated by GEOSS components it generates information products such as the Environment for Europe report delivered to the recent Belgrade conference. Key priorities include work on improving data flows from in-situ instruments.

EUMETSAT emphasized the contributions of its satellite programmes to both meteorology and climate change monitoring. These currently include the Meteosat Second Generation (MSG), the EUMETSAT Polar System (EPS) and participation in Jason. In addition to providing observational continuity with respect to its current satellite systems, EUMETSAT will ensure that requirements for monitoring climate change (taking due account of the inputs from GCOS) are reflected in the design of the forthcoming Meteosat Third Generation (MTG) and Post-EPS satellite programmes.

The Global Biodiversity Information Facility (GBIF) welcomed its acceptance as a Participating Organization at GEO-IV. It has led the development of world-class information technology architecture for the free and rapid exchange of biodiversity data via the internet. It offered its expertise to GEO and pledged to contribute substantially to the GEO Biodiversity Observation Network, with the aim of expanding its data portal of 128 million biodiversity data to over one billion data records in 2008.

The Global Terrestrial Observing System (GTOS) is developing agricultural monitoring systems with the Food and Agriculture Organization (FAO) as well as fire-warning systems at the local level. It is drawing attention to the declining financial support being given to in situ networks, and it called on GEO to help address the operational needs of these networks.

Korea is carrying out a range of activities. In the field of capacity building, it organized a training workshop on numerical prediction for 16 GEO members in April. It considers capacity building and data sharing to be two key issues for GEO and encouraged more active participation in these issues.

EuroGeoSurveys informed participants about next year's launch of the Africa-EU-GEO Resources Information System, which will be funded by the European Community. The aim is to coordinate efforts to build an interoperable system linking Europe and Africa and to bring existing data into a unique web-based system. The global geological community is working through GEO to advance interoperability between geological data and all other Earth observation data.

DIVERSITAS expressed its commitment to GEOSS. Together with the National Aeronautics and Space Administration (NASA) of the US, it is advancing work plan Task BI-07-01. An upcoming meeting in April 2008 will develop the vision and implementation plan for a global Biodiversity Observation Network (GEO BON). Participants were invited to send biodiversity experts to the meeting and to consider co-sponsoring it.

The chair concluded this agenda item by complementing participants on the activities that they had described. He acknowledged the broad range of existing projects and activities, the new satellites being launched and the new programmes being developed for implementing GEOSS. He encouraged the continued sharing of ideas and infrastructure for supporting GEO.

3.2 2007-2009 Work Plan progress (*Documents 6, 21, 22, 23, 24, 25, 26*)

The Secretariat Director introduced the work plan progress report as well as six related information documents describing progress on various work plan Tasks. The report describes the fairly high level of progress that has been achieved on the 72 Tasks and highlights both successes and problems. The three annexes contain colour-coded tables indicating the degree of progress on each Task as well as on each two- and six-year target in the 10-Year GEOSS Implementation Plan. He noted that two thirds of the Tasks are coloured green for “excellent or very good”, 21 are yellow for “progressing but more effort required”, and eight are red, signifying “insufficient progress”. He pointed out that the water and health SBAs are of particular concern.

The chair opened the floor for comment. Germany observed that the silence in the room indicated general satisfaction with the report and the progress made so far. He said that many of the red-coded Tasks were quite important and need to be addressed.

Canada observed that at GEO-III there had been a great deal of discussion about performance indicators. He complemented the Secretariat for providing at least a subjective assessment with useful

signals in a readable report. He noted that many Tasks are not clearly linked to particular targets. With two SBAs in trouble, the question is, do we fix them or drop them? He argued for investing greater efforts in both health and water.

Commenting on Task WE-07-01, the World Meteorological Organization (WMO) stated that it has published a report about all of the activities relevant to the Task, and that much more has been achieved than what is indicated in the progress report.

CEOS stated that it has led eight Tasks and contributed to 39 others. It highlighted the work on space-based virtual constellations. Four prototypes are under development and others are planned.

The EC thanked the Secretariat for the comprehensive overview of progress and the helpful colour coding. The EC noted the good progress made on the majority of Tasks and endorsed the report.

GCOS stated that, in the field of climate observations, a key concern is the dramatic decline in the worldwide availability of in-situ water and hydrological data.

The US reminded delegates that at GEO-III it offered to lead the development of performance indicators for GEO and GEOSS. The generic framework developed by the US and Canada is described in document 26. Canada has applied this framework to soil moisture, and the US has tested it on the Air Now programme.

Argentina described its development of a research programme on Earth observations that will enable students to obtain a Masters degree.

Australia referred to Task WE-07-01 and stated that the apparent underperformance was probably a matter of reporting. It will soon make more information available about the relevant work. Australia also highlighted the important work conducted on radio frequencies by the WMO Commission.

South Africa expressed its satisfaction with the progress on the work plan and with the Secretariat's report.

The Secretariat Director interpreted the comments as indicating that improving the work programme on health and water should be a priority. He noted that the Secretariat has hired contractors to bolster its support to the health and water SBAs, that a representative of the World Health Organization was attending GEO-IV, and that the new Hydrological Applications and Run-Off Network (HARON) Task was designed to address the decline in water data. Responding to WMO's comments on Task WE-07-01, he suggested that the related activities could perhaps be merged with other assimilation activities underway.

WHO thanked GEO for inviting it to attend GEO-IV and observed that the meeting was an excellent opportunity to strengthen partnerships and to exchange information on the links between health and the environment. WHO's new cluster on Health Security and Environment is building a computerized system called Open Health to make it possible to combine various kinds of data in a user-friendly format.

A presentation was then made on "A Weather, Climate and Earth-System Prediction Project for the 21st Century" that is the subject of Task CL-07-01. The presenter described the three expected project outcomes: predictions of the frequency and intensity of extreme weather events; early warning systems to reduce vulnerability to drought, famine and other threats; and impact assessments of climate geo-engineering schemes. Delivering these benefits will require unprecedented international cooperation within the framework of GEO.

Japan stated its support for this project and noted that the World Climate Research Programme continues to provide scientific inputs for climate change mitigation, adaptation and prediction.

Resuming the discussion on performance indicators, Canada noted the importance of tracking open items from previous Plenary meetings. A decision paper on performance indicators could be prepared for GEO-V. The chair proposed advancing the issue through the C4.

3.3 Interim Report on Data Sharing Principles (*Document 27*)

The Secretariat presented the document and described the process for drafting and advancing it. The Secretariat Director confirmed that the interim report will continue to be improved and amended and invited all participants with a stake in the issue to join the team for Task DA-06-01.

3.4 2007-2009 Work Plan Update (*Document 7*)

The chair confirmed that all SBAs, including health and water, would be maintained.

The Secretariat Director introduced the document. He said that, to maintain the value of the current three-year work plan, the Secretariat was proposing minimal changes to only 13 Tasks. The only major changes relate to the health and water SBAs. The four main health Tasks have been reshuffled, while two health Tasks have been merged in order to create HARON and halt the decline in water monitoring networks. In addition, a new capacity-building Task has been proposed. The total number of Tasks remains at 72. He noted that five Tasks currently have no identified lead, and that the Tsunami Task Force is inactive. The Secretariat would clarify with Australia how to proceed on Task WE-07-01.

The chair proposed granting another year to identify the missing Task leads. Germany agreed, and the US encouraged all participants to consider how they might help to reinforce the low-performing Tasks. The Intergovernmental Oceanographic Commission (IOC) remarked that the apparent lack of progress on the tsunami Task could simply be a reporting problem. FAO stated that the strategic agricultural plan Task had in fact made progress and that this too could reflect a reporting problem.

The work plan update was accepted, and the chair asked the Secretariat to circulate the updated three-year work plan to the GEO Members and Participating Organizations.

3.5 GEO Report on Progress – Document for Ministerial Summit (*Document 29*)

Mr David Grimes of Canada presented the process for preparing the Report on Progress and the Annex. The process involved obtaining inputs from the C4 and from the Committees. A template was provided to contributors to the Annex.

The Report on Progress explains GEO's story in a clear and concise manner, provides a "take-home" message for Ministers, highlights five areas of progress, and suggests "what the Ministers can do for us". Meanwhile the Annex to the Report describes 100 Early Achievements that have contributed to the rapid start-up of GEOSS. Together these documents demonstrate that the early implementation of GEOSS is on track but that significant work remains. The next morning, Mr Grimes showed delegates his slides for the presentation to Ministers.

The US commended Mr Grimes for his hard work and the quality of the presentation and suggested he emphasize the idea a common alert protocol when addressing ministers. Germany complemented his excellent presentation. The Meeting confirmed its satisfaction with the Report on Progress and with Mr Grimes's proposed presentation to Ministers.

3.6 Annex of Early Achievements to the GEO Report on Progress – *Document for Ministerial Summit (Document 30)*

See item 3.5 above.

4 COMMITTEES ACTIVITIES

4.1 Reports from Committees and Working Group (*Documents 8 to 12, 18*)

This session was chaired by the GEO Co-Chair from the USA.

Mr Gary Foley of the US presented the work of the User Interface Committee (UIC). He stated that the Committee has set a two-year timeline for its key Task, US-06-01, aimed at identifying identify critical Earth observation priorities and synergies between SBAs. The UIC and the Architecture and Data Committee (ADC) have agreed on the work together on linking user requirements and architecture in the fields of health, water and land. The databases and registries of user types, applications and requirements for each SBA will be interlinked, as will UIC databases and ADC registries of components and services.

Meanwhile, the CEOS project on virtual constellations for atmospheric chemistry, the Integrated Global Observing Strategy Partners (IGOS-P) coastal-zone project, and SERVIR are all focusing on engaging users. The UIC is encouraging and coordinating the work of communities of practices and seeking other user networks to engage. It is working proactively with the C4 to integrate the work of the four Committees. Finally, the Committee needs more developing country members. In summary, the Committee is actively engaging the ADC, the process for gathering user requirements is moving forward, and the user databases are being developed and populated, as is the link to the GEOSS architecture registries.

Mr João Viane of Brazil spoke for the Capacity Building Committee (CBC). The Committee adheres to the accepted principles for capacity-building – e.g. focus on user needs, do not reinvent the wheel, promote collaboration and partnership, take a holistic view, and pursue sustainability. The Seville Capacity Building Symposium, held in September, produced the Seville roadmap on mobilizing resources; according to the roadmap, GEO aims to position itself as an efficient coordinator of resource mobilization activities and as an honest broker serving Earth observation users and producers and potential resource providers.

A series of regional capacity-building workshops has been held. Many of the various capacity-building Tasks, as well as on other Tasks that have a capacity-building component, have made good progress. The CBERS-2B launch and the EC offer of additional funding for capacity building projects in 2008 are notable examples of progress. The Committee is recommending an update to Task CB-07-01a on engaging donors and the addition of a new Task CB-08-01. The potential of cross-border education and training needs to be more strongly recognized. Mr Viane asked GEO-IV to endorse a continued emphasis on capacity building, the implementation of the road map, and the sharing of good practices and experiences regarding how to establish national GEOs.

Mr Udo Gaertner of Germany presented the activities of the Science and Technology Committee (STC). He expressed disappointment that ICSU had stepped down as a co-chair, as this left the co-chair team without a real overview of activities in the scientific community. All of GEO's 72 Tasks contain one or more elements of research or technology, so in an effort to strengthen the contribution of science and technology, the Committee has produced document 28 on the Role of Science and Technology in GEOSS. Some Tasks remain without a lead, which means that institutions that could potentially become active need to be contacted.

One suggestion has been to hold STC meetings in conjunction with other important scientific conferences and events. The social sciences and related socioeconomic aspects should be better represented in the work of GEO. Another suggestion has been to assign one Task to two committees so that they are required to work together. Of the work plan Tasks overseen by the STC, 11 have made good progress, four are off to a slow start, and four show no reported activities.

Mr Jay Pearlman of the Institute of Electrical and Electronics Engineers (IEEE) presented for the Architecture and Data Committee (ADC). He referred to an IEEE outreach programme aimed at facilitating wider participation in GEOSS and promoting the use of user-driven standards. In 2007, the

ADC focused on creating the interoperable structure of GEOSS and implementing registries for components and standards. Using the library as a metaphor to elucidate the GEOSS architecture, he compared the Clearinghouse to the card catalogue and the GEOSS data and services to the books on the shelves. The GEOSS architecture now has an initial operating capability and includes standards, an interoperability register (featuring 75 services to date), a Clearinghouse, and, soon, a GEOPortal, plus standards for human intervention when special arrangements are needed.

The ADC has issued guidance documents to assist Members and Participating Organizations. Three potential GEO web portals and three clearinghouses, all technically capable, have been developed. Other accomplishments include GEONETCast, the four CEOS virtual constellations and the Active Sensor Web Development. A key issue to consider is whether GEO should rely on voluntary contributions or commercial contracts for developing the GEOPortal. The ADC is committed to improving coordination with the other committees. There is a need to strengthen the operational capabilities of Members and Participating Organizations. The protection of radio frequencies is important. Finally, it should be recognized that GEOSS is “people and technology working together”.

The chair opened the floor for comment. Japan called attention to the Advanced Spaceborne Thermal Emission and Reflection Radiometer/Global Digital Elevation Model (ASTER/GDEM), a free new service provided jointly by Japan and the US that provides images with a resolution of 30m rather than 90m. Chile remarked that establishing a clear link between technology and people, as mentioned by the ADC presenter, is a key issue that is often absent from the global debate. France supported all of the activities presented, stated it would engage more fully with the ADC and the CBC, and offered to present a candidate for co-chair of the UIC.

India complemented the four presenters and, responding to the UIC plea for more developing country engagement, offered to provide a co-chair for the UIC. Canada was impressed by the amount of work undertaken by the four committees and by the scale of cooperation. He drew attention to the work that went into the two ADC documents, acknowledged the achievements of the UIC with the communities of practice, supported the STC proposal on “A Weather, Climate and Earth-System Prediction Project for the 21st Century”, and encouraged ICSU to remain engaged in the STC.

Uganda suggested that the CBC take another look at how best to establish national GEOs. He noted the need for regional implementation mechanisms based on established institutions and networks in Africa and other regions in order to avoid duplication.

China emphasized the importance of data distribution and called this a high priority for 2008. The EC thanked all of the committees for their excellent work and offered to provide a co-chair for the UIC.

Brazil commended all the committees. He asked the ADC to provide estimates of the effort needed to implement its vision and to provide technical support to assist developing countries to conform to the GEOSS standards and protocols.

Panama recognized the support given by the US to the Mesoamerican region for implementing SERVIR. A training facility has been established in Panama. Latin American environment ministers have reached an agreement on how to proceed, with the support of UNEP, on an aggressive agenda for capacity building.

The US acknowledged the leadership of the committees’ co-chairs and the Japan/US offer of 30m resolution images from ASTER/GDEM. He recognized the UIC’s efforts to reach across the various committees and the ADC’s vision of the GEOSS architecture, urging all participants to contribute to the registries. The US will continue to support the efforts of the CBC to match the needs of users and donors. USAID, together with the US Geological Survey, has conducted a survey of remote sensing needs in Africa, and it is developing a system similar to SERVIR that could help to build capacity in that region.

Switzerland appreciated the reports of the committees and the importance of coordination amongst committees and Tasks. He noted that none of the presentations raised the issue of any financial needs

the committees may have. The Global Spatial Data Infrastructure Association (GSDI) congratulated the committees and stated its desire to contribute even further to their activities.

In response, the UIC thanked the participants for recognizing the work of the committee and for providing additional co-chairs. The CBC took particular note of the comments urging greater coordination amongst the committees. The STC appealed again for a scientist to serve as co-chair. The ADC expanded on the issue of collaboration amongst the committees, reiterated the importance of registering components and services, and mentioned ongoing discussions with the Secretariat about possible support for a helpdesk and for outreach.

The session chair proposed holding joint committee co-chair meetings in order to promote greater collaboration. He observed that GEO's committee-based structure seemed to be working well. He acknowledged the importance of the Seville Symposium and the CBERS announcement to building capacity, and he also commended the efforts of the UIC, STC and ADC.

4.2 Recommendation on Committees and Working Groups

The Meeting agreed to forward consideration of whether to disband the Tsunami Working Group or perhaps integrate its work into the Multi-hazards Working Group to the next meeting of the Executive Committee. It also agreed to maintain the existing committee structure.

4.3 Nomination of Committees and Working Groups Co-chairs

Based on the discussions in the regional caucuses, the Secretariat Director announced the renewed list of co-chairs for the four committees. The EC, Germany, South Africa and COSPAR will co-chair the Science and Technology Committee; the EC/JRC, France, India, US and IEEE will co-chair the User Interface Committee; China, the EC, Japan, US, CEOS, IEEE and WMO will co-chair the Architecture and Data Committee; and Brazil, the EC, Spain, South Africa and UNESCO will co-chair the Capacity Building Committee.

As a newly accepted Participating Organization, COSPAR expressed its appreciation for the opportunity to serve as co-chair of the STC.

4.4 Schedule of meetings for 2008 (*Document 13*)

The Secretariat Director stated that the Secretariat would ensure that the future meeting dates of the committees were properly set and that overlaps would be avoided.

5 SECRETARIAT ARRANGEMENTS

The chair explained that the Executive Committee had extended the contract of the Secretariat Director through 2008. The Meeting took note of the report on Secretariat Arrangements.

6 RENEWAL OF EXECUTIVE COMMITTEE MEMBERSHIP

The five regional caucuses of GEO met before and during the meeting. The following slate of nominees was presented to GEO-IV for approval:

For a two-year term:

- Republic of South Africa (Co-Chair)
- Uganda
- Argentina
- United States (Co-Chair)

- Australia
- China (Co-Chair)
- Russian Federation
- European Commission (Co-Chair)
- Norway

For a one-year term:

- Panama, to be succeeded by Belize
- Japan
- Germany

Japan expressed concern about how to accommodate Members desiring to be more deeply involved in GEO activities. Argentina asked for clarification about the one-year terms for Japan and Germany; the Secretariat Director confirmed that the caucuses would elect their replacements.

The chair noted that the proposed slate was consistent with the three basic principles of continuity, rotation and balance which had been recognized by GEO as guiding the renewal of Executive Committee membership. The Meeting adopted the new slate by consensus.

7 FINANCIAL REPORTS

7.1 Report of the External Audit (*Document 14*)

This session was chaired by the EC Co-Chair. He presented the report of the external auditor and observed that the audit was intended to strengthen the functioning of GEO and its Secretariat. The audit found that GEO's finances and financial procedures were in good order. He stated that the Secretariat had taken note of the recommendations of the National Audit Office and would report at GEO-V on the action taken on these recommendations.

7.2 Financial Report 2005 (*Document 15*)

The document was presented by the chair and accepted without discussion.

7.3 Financial Report 2006 (*Document 16*)

The document was presented by the chair and accepted without discussion.

7.4 Report on Income and Expenditure – January to October 2007 (*Document 17*)

The meeting chair introduced the document and asked the Secretariat Director to summarize it. The Director noted the opening balance of CHF 1.8 million and explained that a number of pledges totaling CHF 1.9 million were not reflected in this figure because they were made after GEO-III. He also noted that the seconded experts were budgeted as a CHF 1.4 million contribution and that the in-kind contribution of office space from WMO was budgeted at CHF 80,000. The total budget for 2007 was therefore some CHF 6 million. He referred to the table in Annex 1 which shows the trends over the first three years of GEO's existence.

7.5 Secretariat Operations Budget for 2008 (*Document 18*)

The Secretariat Director summarized the document. He stated that maintaining the level of secondments at seven to eight experts would be essential to maintaining the required level of work. As activities will increase in 2008, a similar or higher level of contributions, between CHF 3.5 and 4 million, will be required. Meanwhile, the opening balance for 2008 will be a CHF 1.5 million deficit.

Pledges for 2008 have thus far been received from the EC, Germany, Korea and South Africa . The number of seconded experts is set to remain the same, as will the in-kind contribution from WMO. The total proposed level of expenditure for 2008 is close to CHF 6 million.

The Netherlands expressed its strong interest in water management and therefore its intention to second an expert on water for one or possibly two years. Brazil reiterated its earlier commitment to second an expert for two years starting in 2008. Chile said that it was exploring the possibility of seconding an expert.

The US stated its intention to maintain a similar level of contribution and to continue seconding an expert. Switzerland indicated that its contribution should arrive shortly. Argentina stated that it would maintain its contribution. South Africa pledged to increase its contribution from 850,000 to 1 million Rand and to maintain its secondment

The Secretariat Director thanked the Members for their pledges. He noted that he anticipated three secondments from the Asia region (China, Japan, Korea), one from Africa (South Africa), and two from the Americas (Brazil, US). The two current secondments from Europe (Italy, ESA) are uncertain and discussions continue; however The Netherlands has now offered one expert. The Executive Committee had recommended informing the regional caucuses of their levels of secondments, with the understanding that each caucus should seek to maintain its level over the years.

The chair noted that the 2008 budget was close to break-even. The budget was adopted by the Plenary Meeting.

7.6 Proposal for a Finance Task Team (*Document 19*)

The Secretariat Director introduced the document. The proposal seeks to establish a small task team that would work by phone and email and append any face-to-face meetings to other meetings to eliminate additional travel costs.

Switzerland suggested that this informal approach could assist the Secretariat with fund-raising and speed up the consideration of financial issues by plenary meetings. Australia welcomed the proposal and indicated that a similar approach at the IPCC has worked well. Canada was more sceptical of its value, suggesting that the current informal system was working well. Norway too was doubtful.

The USA Co-Chair recognized that some Members not on the Executive Committee might wish better access to the financial information. He proposed a compromise whereby two Executive Committee members would be formally designated to review the budget, together with all other interested parties, on the evening before each plenary meeting, thus ensuring transparency while retaining informality. This proposal was accepted by the delegates.

8 TRANSITIONING OF IGOS-P THEMES INTO GEO (*DOCUMENT 20*)

The IGOS co-chairs described the contributions of IGOS-P to capacity building and other GEO activities. They outlined the transition process that will lead up to a final IGOS-P meeting in March 2008. The IGOS co-chairs, the United States Geological Survey (USGS) and the United Nations Educational, Scientific and Cultural Organization (UNESCO) will remain engaged to ensure the smooth transition of the IGOS-P themes into GEO.

9 ANNOUNCEMENT OF GEO-V AND OTHER ANNOUNCEMENTS

The representative of the Peoples Republic of China announced China's offer to host the GEO-V Plenary Meeting in 2008. The chair and the Secretariat Director welcomed the offer. China will submit its formal offer to the Executive Committee and engage with the Secretariat to make the necessary logistical arrangements.

10 REVIEW OF SESSION OUTCOME

The Secretariat Director presented an overhead slide summarizing the key action points from the meeting. These session outcomes were confirmed and accepted by GEO-IV. (See Annex I.)

11 CONCLUDING REMARKS

The GEO Co-Chair from China acknowledged the positive results from GEO-IV, the full discussion of the Declaration and the addition of new members. He reiterated China's pleasure in hosting GEO-V.

The GEO Co-Chair from the EC described the meeting as fruitful. It has set new policy directions for GEO, and, although democratic governance is not always easy, it delivers the goods.

The GEO Co-Chair from the USA called GEO an extraordinary organization and expressed satisfaction with the exhibition "trade show". He noted that two years ago many thought a Ministerial Summit could not be held as early as 2007, but indeed the quantity and quality of the Early Achievements had proven otherwise.

The Secretariat Director expressed his personal commitment to GEO, highlighted the positive response from the press, congratulated the contributors to the Annex, The Full Picture and the Exhibition, and thanked the staff of the host government and of the GEO Secretariat.

The GEO Co-Chair from South Africa serving as the chair of GEO-IV concluded the meeting by remarking on the high quality of the discussions and the unique nature of the voluntary GEO process.

The meeting closed at 17h00.

ANNEX I: KEY ACTION POINTS FROM GEO-IV

1. Acknowledgement of six new Members: Czech Republic, Bangladesh, Romania, Costa Rica, Panama, Pakistan
2. Acceptance of GEO-III Summary (Document 3)
3. Recognition of six new Participating Organizations: CATHALAC, CMO, COSPAR, EIS-AFRICA, GBIF, WFPHA
4. Recognition of two observers: ESIP and ISC
5. Acceptance of the 2007-2009 Work Plan Progress Report (Document 6)
6. Acceptance of 2007-2009 Work Plan Update (Document 7)
7. Performance Indicators document forwarded to C4 for action (document 26)
8. Interim report on data sharing principles presented as a working document (document 27)
9. Renewal of GEO Committees on Architecture and Data, Capacity Building, Science and Technology and User Interface
10. Recognition of Committee Co-Chairs: EC, Germany, South Africa and COSPAR for STC; EC/JRC, France, India, US and IEEE for UIC; China, EC, Japan, US, CEOS, IEEE and WMO for ADC; and Brazil, EC, Spain, South Africa and UNESCO for CBC.
11. Renewal of Working Group on Tsunamis deferred to Executive Committee
12. Acceptance of the draft Cape Town Declaration (document 5, 29 November Final draft)
13. Renewal of Executive Committee Membership (document 32)
14. Acceptance of the Meetings for 2008 (document 13)
15. Acceptance of Report of the External Auditor (document 14)
16. Acceptance of the Financial Report 2005 (document 15)
17. Acceptance of the Financial Report 2006 (document 16)
18. Acceptance of the Report on Income and Expenditure (January to October 2007) (doc 17 Rev.2)
19. Acceptance of the Secretariat Operations Budget for 2008 (document 18 Rev2)
20. Acceptance of a proposal for an informal Task team on finance co-chaired by two members of the Executive Committee (document 19)
21. Acceptance of the Transitioning of IGOS-P into GEO (document 20)
22. Acceptance of offer of China to host GEO-V in 2008

ANNEX II: LIST OF EXHIBITORS

African Climate Atlas / WCRP

Air Quality - AIRnow

ARC/ISCW – Institute for soil, climate and water

Asian Water Cycle Initiative

Biodiversity Observing Network

Canadian Group on Earth Observations (CGEO) - Groupe canadien des observations de la terre (GCOT)

China

Committee on EO Satellites (CEOS)

Compusult

CSIR EcoEO & Meraka RSRU

DLR

DST

ESRI

EU

EUMETSAT

EuroGeoSurveys

European Space Agency

GEO Ecosystems

GEOBene

GEOland

GEONETCast

Global Earth Observation Grid (Grid Technology Research Centre, AIST, Japan)

GOOS Africa

IA/GGOS

ICSU / DIVERSITAS

IEEE

Institute for Coastal Research, Germany

International Polar Year

Iridium

ITC

JACCO / GMGG

JAMSTEC (HARIMAU)

KNMI

Land Imaging

Meraka Institute, CSIR

Normind

North American Drought Monitor

Ocean United (Argo, ChlorogGIN, CoML, GOOS, GOOS Africa, IOC, Jason, JCOMM, POGO, SAHFOS).

Ocean United (Argo, ChlorogGIN, CoML, GOOS, GOOS Africa, IOC, Jason, JCOMM, POGO, SAHFOS).

Ocean United (Argo, ChlorogGIN, CoML, GOOS, GOOS Africa, IOC, Jason, JCOMM, POGO, SAHFOS).

Ocean United (Argo, ChlorogGIN, CoML, GOOS, GOOS Africa, IOC, Jason, JCOMM, POGO, SAHFOS).

Ocean United (Argo, ChlorogGIN, CoML, GOOS, GOOS Africa, IOC, Jason, JCOMM, POGO, SAHFOS).

Oceans (including POGO/CoML/IOC/GOOS/JCOMM/GOOS SA/ SAHFOS/
ChloroGIN/Argo/Jason)

Open Geospacial Consortium (Inc)

SAEON

Sentinel Asia

SERVIR - GEOSS in the Americas

South African Council for Geoscience

South African Weather Service

State of the Climate - Using EO to monitor the Global Climate

Stellenbosch University

Sun, Space and Information Systems

The Met Office / Global Ocean Data Assimilation Experiment High Resolution Sea Surface Temperature Pilot Project (GHRSSST-PP)

USGEO

WMO

List of participants

Member Countries

Argentina	Frulla	Laura	
	Levaggi	Marcia	
	Medico	Ana Gabriela	
	Varotto	Conrado Franco	
Australia	Barrell	Susan	
	Lane	Agnes	
Bangladesh	Iqbal	Shah	
	Islam	Sirajul	
Belgium	Mutton	Jan F.	
Belize	Jones	Albert	
	Usher	Alan	
Brazil	Bacellar	Jose	
	Barreto de Castro	Luiz Antonio	
	Câmara	Gilberto	
	Duprat	Marcos	
	Montserrat-Filho	Jose	
	Soares	Joao Viane	
	Velloso	Bernardo	
	Angle	Bruce	
Canada	Brown	Christopher	
	Chartrand-Houlden	Carmen	
	Clegg	Neil	
	Grimes	David	
	Kamukosi	Nina	
	Korporal	Kenneth	
	Manore	Michael	
	Quealey	Patrick	
	Small	Lauren	
	Central African Republic	Padou	Lambert
	Chile	Gonzalez	Raimundo
Lafourcade		Jorge	
China	Fan	Jinlong	
	Guo	Huadong	
	Huang	Jianfa	
	Jin	Yiming	
	Li	Mingmei	
	Liao	Xiaohan	

	Lu	Naimeng
	Qiang	Xiaozhe
	Ren	Min
	Wang	Zhenyao
	Wen	Kegang
	Yu	Jin
	Zhang	Wenjian
	Zhao	Ming
	Zheng	Guoguang
	Zhou	Heng
Croatia	Cacic	Ivan
	Katusin	Zvonimir
	Vikic-Topic	Drazen
Czech Republic	Hradec	Jiri
	Obrusnik	Ivan
Denmark	Aakjaer	Peter
	Buch	Erik
	Jun	She
	Müller	Mette
European Commission	Annoni	Alessandro
	Bradley	Gerard
	Bursvik	Eva
	de Bruine	Frans
	Edwards	Alan
	Le Grand	Pascal
	Moutarlier	Valère
	Ollier	Gilles
	Pignatelli	Francesco
	Schimak	Gerald
	Simonis	Ingo
	Soares	Manuela
	Stančič	Zoran
	Ulrich	Jan
	Vittet-Philippe	Patrick
	Weissenberg	Paul
Finland	Koskinen	Jarkko
	Sucksdorff	Yrjö
France	Bauer	Pierre
	Lafon	Xavier
	Marty	Agnes
	Menard	Lionel
	Ranchin	Thierry

	Ultré-Guérard	Pascale
	Vidal-Madjar	Daniel
Germany	Gärtner	Udo
	Grünreich	Dietmar
	Hoffmann	Jörn
	Kusch	Wolfgang
	Rösner	Stefan
	Staudenrausch	Helmut
	von Janowsky	Dagmar
Greece	Xanthopoulos	Spyridon
	Tritakis	Vasilis
Honduras	Bocanegra	Carolina
	Gutiérrez	Valerio
Hungary	Dunkel	Zoltán
India	Navalgund	Ranganath
	Venkatakishnan	Jayaraman
Iran	Noorian	Ali Mohammad
	Vazifeh	Ahad
Ireland	O'Connor	Patrick
Italy	Demicheli	Luca
	Martino	Jacopo
Japan	Aizawa	Kengo
	Aoki	Yasunobu
	Aoyama	Shin
	Burford	Ben
	Fujitani	Tokunosuke
	Ichikawa	Setsuko
	Kajii	Makoto
	Koike	Toshio
	Kuriyama	Ikuko
	Matsunaga	Tsuneo
	Miura	Satoko
	Miyazaki	Shin
	Nojiri	Yukihiro
	Sekiguchi	Satoshi
	Shibasaki	Ryosuke
	Tamagawa	Katsunori
	Tsu	Hiroji
	Watanabe (Ishida)	Chu
	Yamanaka	Manabu
Korea, Republic of	Chung	Soon-Kab
	Kim	Changwoo

	Kim	Se-Won
	Kim	Byoungsoo
	Kim	Cheolmin
	Lee	Dong Il
	Lee	Yongseob
	Lee	Kyounglim
	Lim	Hyosuk
Latvia	Leitass	Andris
	Pukitis	Guntis
	Vejonis	Raimonds
Luxembourg	Berger	Eugène
Malaysia	Ismail	Che Gayah
Nepal	Bogati	Jagat Bahadur
	Chhatkuli	Raja Ram
Netherlands	Brouwer	Frits J.J.
	Kappelhof	Antoinette
	Kelder	Hennie
	Mannaerts	Chris
	Molenaar	Martien
New Zealand	Boyle	Brendan
Niger	Issoufou	Wata Sama
Norway	Andersen	Bo
	Nesje	Øystein
	Skrøvseth	Per Erik
	Stange	Helge
Panama	Castro De Doens	Ligia
	Sempris	Emilio
Portugal	Direitinho Tavares	Carlos José
	Serrão	Adérito Vicente
Romania	Diamandi	Andrei
	Nedelcu	Ion
Russian Federation	Dyadyuchenko	Valery
	Gusev	Alexander
	Ladygin	Alexander
	Panfilov	Alexander
	Tkachenko	Alexander
	Vedeshin	Leonid
Slovakia	Franzen	Jozef
Slovenia	Zlebir	Silvo
South Africa	Canca	Anati Judith
	Fortescue	Alex
	Frost	Philip

	Hendricks	Philip
	Luck	Wolfgang
	Mabokano	Matlou
	Makuleni	Linda
	Mlisa	Andiswa
	Mooketsi	Tsholofelo
	Mudau	Humbulani
	Mudau	Naledzani
	Muofhe	Mmboneni
	Nepfumbada	Mbangiseni
	Poti	Luvoyo
	Pretorius	Dirk Jacobus
	Sebake	Daniel
	Senoko	Lerato
	van Zyl	Terence Lesley
	Vogel	Melanie
	Williams	Lance
Spain	Angoloti	Marta
	Cadarso	Francisco
	Fernandez-Renau	Alix
	Gutiérrez De La	
	Cámara	María Jesús
	Marcos	José M.
Sweden	Ågren	Maria
	Boberg	Göran
	Liljas	Erik
Switzerland	Christen	Viktor
	Foppa	Nando
	Kolly	Thomas
	Romero	José
Thailand	Amphat	Phanumat
	Bunnag	Domedej
	Chandraprabha	Chayanee
	Charupatt	Thongchai
	Dowreang	Darasri
	Hongsombud	Kittipod
	Ketudhat	Rosnimanee
	Komolmit	Jantanee
	Makwisai	Sunee
	Patanakanog	Boonruck
	Rakthong	Pol
	Rangsikanbhum	Thanomsri

	Tansiri	Bandith
	Ungphakorn	Sittichai
	Watcharakuldilok	Sunthorn
	Wiwatwanont	Kajtiti
	Yuthavong	Yongyuth
Uganda	Owaro	Johnson
Ukraine	Aleksieiev	Yurii
	Fedorov	Oleg
United Kingdom	Davies	Arwyn
	Donlon	Craig
	Shaw	Andrew
	Williams	David
United States	Appelbaum	Madelyn
	Bailey	G. Bryan
	Bartel	Paul
	Bergmann	Trisha
	Bost	Eric
	Collins	James
	Colohan	Peter
	Deloatch	Ivan
	Devine	James
	Eshelman	Stephanie
	Foley	Gary J.
	Friedl	Lawrence
	Friedl	Randall
	Fryberger	Teresa
	Fulton	Richard
	Gray	George
	Hartman	Colleen
	Irwin	Daniel Eric
	Kicza	Mary E.
	Killough	Brian
	La Lime	Helen
	Lautenbacher, Jr.	Conrad Charles
	Lyon	John Grimson
	Moodie	Linda
	Myers	Mark
	Olsen	Kathie
	Quirk	Bruce
	Ryan	Barbara J.
	Sandford	Stephen P.
	Sayre	Roger

Schafer	Jacqueline
Silah	Michael J.
Simms	Patricia
Srinivasan	Margaret
Stokes	Carrie
Sullivan	Carla
Thompson	Tabatha
Washburn	Edward
Whitney	Gene
Withee	Gregory
Wonkovich	Elizabeth
Yoffe	Shira

Observing Counties

Austria	Haubold	Herbert
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Participating Organizations

AARSE	Kufoniyi	Jide
	Woldai	Tsehaie
CEOS	Fellous	Jean-Louis
	Motswasele	Wabile
	Ntisana	Asanda
	Petiteville	Ivan
	Smith	David Brent
CGMS	Hinsman	Donald
DIVERSITAS	Juergens	Norbert
	Larigauderie	Anne
	Walther	Bruno
ECMWF	Kloeppe	Manfred
	Marbouty	Dominique
EEA	Lowson	Robert
	Rayner	Ralph
ESA	Bruzzi	Stefano
	Cheli	Simonetta
	De Cooker	Chris
	Gibson	Roy
EUMETSAT	Coelho	Sandra
	Counet	Paul

	Gabaglio	Vincent
	Guevel	Guenole
	Jacobs	Tim
	Maathuis	Ben
	Maathuis	Ben
	Patchett	Anthony
	Prahn	Lars
	Wannop	Sally
	Williams	Michael
EuroGeoSurveys	Christmann	Patrice
	Elewaut	Emile
FAO	Latham	John S.
GBIF	Eamonn	O Tuama
	Nicholas	David
GCOS	Zillman	John W.
GOOS	Altalo	Mary
	Field	John
	Gross	Thomas
GSDI	Deloatch	Ivan
	Nebert	Douglas
	Remetey-Fülöpp	Gabor
	Terborgh	Carmelle
GTOS	Brady	Michael
	John S.	Latham
IAG	Neilan	Ruth
	Plag	Hans-Peter
	Rothacher	Markus
ICSU	Bongani	Bongani Gerald Matthalela
	Cass	Kathleen
	Enow	Andrew Achuo
	Glaser	Gisbert
	Halpern	David
	Rosswall	Thomas
	Roussouw	Steve
IEEE	Jamieson	Leah
	Khalsa	Siri Jodha Singh
	Ledrew	Ellsworth
	Pearlman	Jay
	Terman	Lewis
	Wiener	Thomas
IGBP	Noone	Kevin

IGFA	Conway	Dawn
IGOS-P	Dargaville	Roger
	Key	Jeffrey
	Marsh	Stuart
	Townshend	John
IHO	Kampfer	Abri
IISL	Gabrynowicz	Joanne Irene
INCOSE	Hale	Patrick
	Hartmann	Ralf
IOC	Alverson	Keith
OGC	Buehler	Greg
	Foust	Jeanne
	Percivall	George
	Thomas	Robert
	Ungar	Stephen
	Zimble	Daniel
POGO	Burkinn	Peter
	Farmer	David
	Roe	Howard S.J.
UNEP	Fernandez	Ramon Norberto
	Gilruth	Peter
UNESCO	Ahanhanzo	Justin
	Erdelen	Walter
	Missotten	Robert
UNOOSA	Balogh	Werner Rudolf
WCRP	Freeland	Howard John
	Shapiro	Mel
WMO	Hinsman	Donald
	O'Donnell	Brian

Observing Participating Organizations

ISC	Grobbelaar	Michelle
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GEO Secretariat

Achache	José
Baeyens	Hendrik
Brutsch	Natasha
Kang	Yong-Seong

Massacand	Alexia
Muchoney	Douglas
Ochiai	Osamu
Rast	Michael
Rum	Giovanni
Saloojee	Imraan
Williams	Michael
Zhao	Datong
Firth	Emily
Parker	Niki
Rodriguez-Soto	Sofia
Tiberghien	Chloé
Menthon	Anne