

MINUTES OF THE 24th CEOS PLENARY MEETING

13th – 14th October 2010
Rio de Janeiro, Brazil

1 Welcome and Opening Remarks

The Chair, Gilberto Câmara (INPE), opened the meeting and welcomed participants to the 24th CEOS Plenary and to Brazil. He thanked all contributors to the CEOS effort throughout 2010 – including the SIT team, the CEO, and the SEO, as well as the INPE CEOS Chair team.

2 Organisational and Membership Matters

Gilberto Câmara (Chair) noted the following membership matters had arisen in the course of the last year:

- an application for Member status from the National Satellite Meteorological Centre (NSMC) of China;
- an application for Member status from the South African National Space Agency (SANSa);
- a change of name for the British National Space Centre – to the UK Space Agency (UKSA); and
- the interest of the National Institute of Aeronautics and Space (Lembaga Penerbangan dan Antariksa Nasional – LAPAN) of Indonesia – which has yet to result in any formal approach to CEOS; JAXA as the regional SEC member will pursue this with LAPAN in the coming year.

Gilberto recalled the criteria for CEOS Membership and invited both NSMC and SANSa to make brief presentations.

NSMC: Jinsong Wang (Deputy Director General, NSMC) gave a presentation explaining the heritage and activities of NSMC. NSMC is responsible for the development and operation of the FengYun (FY) meteorological satellites for China, which includes both a polar and geostationary series. The launch schedule for coming years was shown, and a brief summary of data sharing was given, noting that some data is available online at: <http://fy3.satellite.cma.gov.cn/arsen/>. CMA is already active in WGCV, and NSMC is willing to take an active part in CEOS activities.

SANSa: Asanda Ntswana (SANSa) reported that SANSa is under the South African Department of Science and Technology and is integrating the SAC ground stations, the Magnetic Observatory, and the satellite testing facility in the Western Cape. South Africa is committed to CEOS efforts, and is developing a national EO Roadmap including CEOS and GEO activities. She stated that, independently to SANSa's request to become a CEOS Member, CSIR/SAC shall continue as a CEOS Associate.

Gilberto noted that South Africa and China are both active in GEO and serve as Co-Chairs within the GEO Executive Committee. Gilberto also noted the presence of CRESDA at CEOS Plenary for the first time and welcomed their participation.

UKSA: Mark Churchyard (UKSA) confirmed that BNSC has evolved to agency status within UK Government, and is now called the UK Space Agency (UKSA). This means the Agency will have its own budget as opposed to budget allocations from the various BNSC partners.

NSMC, SANSA and UKSA representatives left the room briefly while Plenary discussed their applications for CEOS membership. Mary Kicza (NOAA) expressed full support for all three agency applications noting they have much to contribute to CEOS and are fully qualified. This was seconded by Makoto Kajii (SIT Chair, JAXA). Gilberto noted that he had visited NSMC and was impressed by their capabilities and willingness to share data. He invited the three representatives back into the room and welcomed them all as the newest Members of CEOS.

3 Coordination of Open Actions from 23rd Plenary

Stephen Ward (INPE) reviewed status of actions from the 23rd CEOS Plenary.

No.	Action	Due Date	Status
23-1	CEOS agencies asked to support the 2010 update of the CEOS Missions, Instruments and Measurements database	CEOS 24	COMPLETE 2010 update survey completed (Report item 17)
23-2	CEOS Chair and SIT Chair, in consultation with CEOS SEC and CEOS Troika, to poll CEOS agencies to identify candidates for the CEO position from November 2010	CEOS 24	COMPLETE Item 5 on agenda
23-3	SEO to implement on-line CEOS-GEO action tracking tool to help address the administrative burden of this activity	July 2010.	COMPLETE New system currently being tested, and will be brought into use post-CEOS-24
23-4	CEOS agencies to provide opinions to INPE as to the most important efforts to be pursued in 2010 in the Data Democracy initiative	January 2010	COMPLETE (Items 10 & 22)
23-5	CEOS Chair to cooperate with GEOSEC to provide a letter accompanying submission of the GEO Carbon Report to UNFCCC SEC ahead of COP-15; and to ensure copies are available at CEOS & GEO events in Copenhagen	SUPERCEDED	
23-6	CEOS and SIT Chairs to work with the FCT Co-Leads to confirm CEOS agency commitments and timetable for	December 2009	COMPLETE Report under item 12

	processing and product development for the 2009 GEO Forest Carbon dataset		
23-7	CEOS Climate SBA Coordinator to work with SIT Chair to: coordinate CEOS review of the updated GCOS IP; establish a coordinated CEOS Response to the Updated GCOS IP; and associated progress report to SBSTA of UNFCCC	October 2010 (response and SBSTA report)	COMPLETE CEOS report to SBSTA submitted. GCOS IP finalised in August 2010, with CEOS response likely to be completed in early-to-mid 2011. CEOS-24 should agree on appropriate actions for 2011. (Report under item 13)
23-8	CEOS Climate SBA Coordinator to work with SIT Chair to respond to GCOS on the issue of the need for an update of the GCOS Satellite Supplement in 2010	April 2010	COMPLETE Update to GCOS Satellite Supplement to be issued in early 2011. CEOS-24 should agree on appropriate actions for 2011.
23-9	CEOS Chair to write to WMO (cc GCOS) indicating the value of the independent expert role of GCOS, the importance which CEOS places on its relationship with GCOS, and encouraging GCOS representation at future CEOS SIT and Plenary meetings	December 2009	COMPLETE
23-10	On behalf of OST Constellation, CEOS Chair to raise issue of HY-2 availability with SOA/China in support of OST Constellation objectives	January 2010	COMPLETE Data not likely available to agencies outside China
23-11	Agencies interested in providing the next WGCV Chair term should forward nominations to WGCV Chair	SIT-25	COMPLETE (Report under 16.3)
23-12	GEO FCT Co-Leads to provide CEOS with the 2010 Data Requirements document and CEOS agencies encouraged to respond to meet the satellite data requirements therein	December 2009	COMPLETE
23-13	WGCV Chair to work with GEO FCT Co-Leads to identify the supporting role for WGCV in the calibration and validation aspects of the FCT initiative	April 2010	OPEN

23-14	JAXA to confer with CEOS SEC on the way forward organisationally (esp. in relation to the ACC) for the activities currently promoted by the Carbon Task Force – including definition of Deliverables for the GEO Ministerial	April 2010	COMPLETE Full report in item 11.
23-15	ESA, in consultation with CEOS Chair and SIT Chair, to set up a small team (including the Climate SBA Coordinator) to develop a coordinated approach to improve the management of climate-related activities within CEOS, reflecting the content of discussion at CEOS Plenary 23 - including mechanisms for an ECV-by-ECV analysis of progress by CEOS. A proposal for the way forward should be circulated in time for discussion at SIT-25.	SIT-25	COMPLETE Proposal for a CEOS Working Group on Climate put to CEOS-24, agenda item 22.
23-16	CSIR to work with SFCG, supported by CEOS SEC, to prepare the document on socio-economic benefits of Earth observations	May 2010	CSIR to provide update. Frequency issues to be discussed under CEOS-24 agenda item 23.
23-17	ESA to circulate the WRC document to establish whether it might serve as the foundation for an official CEOS statement on frequency requirements (to be coordinated by CEOS SEC). CEOS Agencies encouraged to respond.	SIT-25	COMPLETE
23-18	CEOS Agencies to use the “WRC-12 SFCG Objectives” document when attending radio frequency related meetings with their national administrations, and to submit it to any relevant national or international forum.	Ongoing	Frequency issues to be discussed under CEOS-24 agenda item 23.
23-19	CEOS Chair and SIT Chair will confer to finalise the Calendar of meetings for 2010	February 2010	COMPLETE
23-20	CEOS Chair to secure confirmation in writing from ISRO that they are willing to serve as Chair for 2012	January 2010	COMPLETE ISRO has written a letter confirming their CEOS Chair term for 2012.

4 Report from the Chair: Accomplishments and Challenges

Gilberto Câmara (Chair) reported on the CEOS Chair accomplishments and challenges for 2010, including continued excellent progress towards the implementation of the GEOSS space segment. He noted two key drivers in giving CEOS focus and direction: the establishment of GEO; and the need for society to develop information in support of climate change and the resulting need for continuous, operational surveying of key variables. There is a clear need to coordinate Earth observation and science programmes to ensure interoperability. These programmes dominate public investment in non-human spaceflight activities.

Gilberto stressed the importance of the Virtual Constellations concept to develop common requirements, and compatible data from independent satellites. INPE looks to the Constellations as reference points for Earth observation.

The Forest Carbon Tracking (FCT) Task has been instrumental in showing practical applications of the Constellations. The recent SIT Workshop highlighted some of the challenges facing CEOS. For example, as we move from the provision of interoperable and calibrated data to the provision of services we encounter structural limitations in the CEOS arrangements. The provision of services should be carried through other international organisations such as GEO, and the trend towards open data access policies is essential in this regard.

The top priority activities for CEOS in 2010 included:

- Forest Carbon Tracking;
- Global Monitoring of Greenhouse Gases from Space;
- Data Democracy; and
- Climate Change (e.g. CEOS response to the GCOS IP).

CEOS has led or co-led 17 GEO Tasks, and overall has supported 20% of GEO Work Plan tasks. Priorities for CEOS in 2010 have included FCT, Data Democracy, and establishment of a new Working Group on Climate. CEOS has defined a number of internal actions to address its GEO Work Plan commitments, 95% of which are closed or progressing, which should be considered a major success by CEOS. Several major documents and new portals have been developed in 2010 – notably the update and upgrade of the CEOS Missions, Instruments and Measurements (MIM) database – several workshops and training courses have been held, and several new public datasets have been generated in 2010.

In conclusion, the CEOS Chair is pleased to report good overall performance by CEOS in support of GEO. We need to share what we have, and we need to work with GEO to ensure CEOS agency data is converted to tools and services. Gilberto noted the global trend and emergence of developing countries contributing to Earth observations and welcomed this as contributing to a more equitable world. Gilberto hoped that emerging contributors to Earth observations could follow models which will contribute openly to common causes in support of a prosperous global society.

5 CEOS Executive Officer Report

Ivan Petiteville (CEO, ESA) reported that, in 2010, the CEOS Executive Officer (CEO) had a central role in defining and tracking the CEOS actions in support of GEO – starting with the declared CEOS priorities, and the workshop in Arlington in January 2010.

Ivan reported that, as the CEO, he prepared the CEOS Report to the GEO-VII Plenary, as well as the CEOS Rio Statement for the GEO Ministerial and other events (e.g. COP-16). He provided further inputs to the CEOS High Level Publication, and the Carbon and Capacity Building showcase videos, and represented CEOS at the 1st GEO Work Plan Symposium in South Africa in May 2010. He supported the CEOS representative to the SCOPE-CM planning meetings and attended the WCRP Joint Scientific Committee and Observations and Assimilation Panel meetings. He provided significant inputs to the recent SIT Workshop, and has provided a number of updates to the CEOS Implementation Plan.

Ivan shared some lessons learned during his term as CEO, noting an increasing demand for Earth observation data since the inception of GEO. This increase requires additional resources from individual agencies to support the activities of CEOS, and increases the need for cooperation. To make the best use of available resources, CEOS must continue to establish strategic priorities to ensure focus and work towards achievable outcomes. To inform these priorities, CEOS must have some permanent staff capable of analysing and developing strategic choices for the consideration of CEOS Principals. These staff are also important in interfacing with other groups, and facilitating internal progress and cooperation.

Ivan will formally hand over the CEO role on 1st December 2010 to Tim Stryker (USGS), who will be ably assisted by the new Deputy CEO, Kerry Sawyer (NOAA). Ivan's handover will coincide with the completion of GEO Plenary and the update to the CEOS Implementation Plan.

Ivan thanked all CEOS colleagues for their support during his term as the CEO. Gilberto thanked Ivan, Jean-Louis Fellous (his predecessor) and ESA for their huge contribution to the goals of CEOS, noting that CEOS simply could not accomplish what we have without this full time effort.

Tim Stryker (USGS) acknowledged the efforts of Ivan and looked forward to working with Kerry to continue the important contribution of the CEO role. José Achache (GEO Secretariat) added his thanks to Ivan for the development of the relationship between CEOS and GEO Secretariat. Volker Liebig (ESA) acknowledged the foresight of the decision to establish the CEO role and was happy that ESA could contribute.

6 CEOS Systems Engineering Office Report

Brian Killough (NASA) reported on the CEOS Systems Engineering Office (SEO) functions and accomplishments for 2010. He noted that the CEOS SEO was formed by NASA in April 2007, and has provided both technical and management services for CEOS including: requirements definition, gap assessments, system tools, and print and on-line products for CEOS outreach and communication.

Accomplishments for 2010 include: a CO₂ gap analysis report for the Atmospheric Composition Constellation (ACC) meeting and Carbon From Space Workshop; continued support to the ESA team for the Missions, Instruments and Measurements (MIM) database; the first full release of the CEOS Visualization Environment (COVE) tool; first draft of the Land Surface Imaging (LSI) mid-resolution optical standards document; improved CEOS website; and updated mailing lists.

Plans for 2011 include: working with the Carbon Task Force and the ACC to add more details to the GHG gap assessments including CH₄ and N₂O; work with ESA to merge the Systems Database and MIM functionalities; continue to work with the COVE tool by adding more missions and instruments; complete the LSI standards document; and work with the new CEOS Working Group on Climate to support their ECV-level analysis.

Brian also reported that the GEO User Interface Committee (UIC), through GEO task US-09-01a, is looking at priority observations across all GEO SBAs to understand commonalities between areas to try and identify priority measurements.

GEO Task US-09-01a	
Top 19 Critical Earth Observation Parameters Common to Many GEO SBAs	
1. Precipitation	11. Vegetation Type
2. Soil Moisture	12. Surface Atmospheric
3. Surface Air Temperature	13. Glacier/Ice Sheet Extent
4. Surface Wind Speed	14. Urbanization
5. Surface Humidity	15. Sea Surface Temperature
6. Land Cover	16. Leaf Area Index
7. Surface Wind Direction	17. Upper Level Winds
8. NDVI	18. Stream/River Flow
9. Vegetation Cover	19. Upper Level Humidity
10. Land Surface Temperature	

Mike Freilich (NASA) added that the study focused on societal benefits and the conclusions are impressive and serve as a focus for future gap analyses. The results will be presented to the GEO Plenary, and he urged that the CEOS Plenary consider a statement of support for the Report. Gilberto Câmara (Chair) asked that the Report be made available on the Plenary website and asked that participants review it before the end of the meeting.

Pascal Lecomte (WGCV) acknowledged the strong support of the SEO in 2010. Gilberto expressed sincere thanks for the SEO and all the contributions to CEOS.

7 GEO Report

José Achache (GEO Secretariat) reported that he was grateful for the significant contribution of CEOS to the development of the GEOSS space segment. GEO now has 84 Members, recently adding Gabon, Ethiopia and Burkina Faso.

The GEOSS Common Infrastructure (GCI) was a major highlight for 2010, and included several contributions from CEOS members: the GEO Portal (ESA/FAO); and, the GEOSS Clearinghouse (USGS). To date 254 components have been registered in the GCI associated with around 11,000 datasets and 171 standards/arrangements. This is a minority of GEOSS-relevant resources and CEOS agencies are encouraged to register their data resources.

José confirmed that Nepal has indicated an interest in joining the Forest Carbon Tracking (FCT) Task as a National Demonstrator (ND), and noted that the new set of NDs has been based on willingness of governments to join the GEO activity. Interaction with UN REDD is improving, and GEO has been invited to attend the forthcoming REDD+ Ministerial meeting in Nagoya later in October. The Global Forest Observations Initiative (GFOI) of GEO has completed its concept definition phase and a planning phase is foreseen for 2011. A GEO FCT booth will be at the GEO Beijing meetings and at Forest Day 4 at COP-16.

José reported on several other GEO accomplishments for 2010:

- The GEO Carbon Community of Practice has updated the GEO Carbon Strategy, noting that the terrestrial and oceanic parts of the strategy remain underdeveloped;

- Development of the Geohazards Supersites continued, where CEOS has made a significant contribution;
- GEONETCast is progressing well adding a new product navigator and training and alert channels;
- A number of new global datasets have been developed – although there is a tendency to fragmentation, with data management needing to be improved;
- A full and open ASTER Global DEM is an important step in data sharing, with a second release in preparation; and
- a number of Ministerial Summit showcases are in development: health, carbon, geohazards, capacity building, GEOBON, Asian region.

José noted that data access policies will be critical for the future success of GEO, flagging problems with data policy restricting access to data in support of the recent Pakistan floods. He suggested that the coordinated data acquisition strategy undertaken for FCT should be repeated for Supersites, agriculture monitoring, and water management. In general, there is a need for more interaction across GEO Tasks, transverse themes, and Societal Benefit Areas.

José noted the need for coordination and interoperability in support of GEO. He cited the example of the recent receiving station established at ICIMOD, with data access restricted to disaster applications only, but with the potential of being applied to a considerably wider set of applications. He noted that the GEO Ministerial Summit is expected to adopt a Data Sharing Action Plan including the establishment of a GEOSS Data CORE where all GEO Members and data providing agencies will be solicited to contribute datasets into a pool of fully and openly accessible data.

24-1	CEOS Agencies encouraged to register their datasets and information resources with the GEOSS Common Infrastructure.	November 2010
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José noted that the LSI Constellation is of particular importance to GEOSS, and that further portal tools to benefit users need to be developed – for example standardised tools and search function across data providers and graphics support. He also noted that the FCT portal, which uses the Google Earth platform, allows for data discovery.

José reported on JECAM, a GEO Agriculture Monitoring Community of Practice initiative to enhance international collaboration around agricultural monitoring, and address issues associated with the use of Earth observations for food security and a sustainable and a profitable agricultural sector worldwide. JECAM will achieve this objective by facilitating the inter-comparison of monitoring and modelling methods, product accuracy assessments, data fusion and product integration for agricultural monitoring, establishing a network distributed regional experiments, and acquiring, sharing and analyzing time series datasets from a variety of Earth observing satellites and *in situ* data. CEOS assistance will be sought to help acquire the satellite data in support of this initiative.

José reported on GFOI progress, noting that this is an important development of the FCT Task in 2010, looking towards sustained and operational supply of observations in support of national forest information systems. He outlined a number of related recommendations to CEOS from GEO Secretariat:

- strive to establish stable data policies in line with GEO Data Sharing Principles;

- contribute resources to the GEO Data CORE;
- populate the GCI registries with CEOS resources and provide the tools for user-friendly data discovery;
- realise the transverse nature of CEOS-led tasks and strengthen the connections with in-situ observation networks (as in FCT); and
- harmonise and coordinate new initiatives ensuring that they are integrated into the Work Plan (eg SERVIR Himalaya).

Tim Stryker (USGS) questioned the complaint regarding the Pakistani activation of the Disaster Charter, noting that the recent Charter Board meeting had not received any information to that effect. Stephen Briggs (ESA) noted that Pakistani agencies had received data from the Charter and without complaint. Makoto Kajii (SIT Chair) appreciated the frank feedback from the GEO Secretariat. He assured the GEO Secretariat that CEOS would respond to these challenges, and he is looking forward to the CEOS-GEO Coordination meeting in December.

24-2	CEO to investigate the timeliness of data provided by CEOS agencies in response to activation of the Disaster Charter for the recent Pakistan floods, and report on any lessons learned.	SIT-26
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Stephen questioned the challenge of having a single integrated database of satellite products for all applications. Gilberto Câmara (Chair) suggested that the CEOS SEO, and others in CEOS (e.g. CEO), could work with the GEO Secretariat to study how to rationalise the multiplicity of portals available. Some analysis work will be necessary to determine the best strategy for migration and to ensure the GEO portals can support the diverse types of information.

24-3	CEOS Chair to work with the SEO, outgoing and incoming CEO, and GEO Secretariat to study possibilities for rationalisation of the multiplicity of portals and tools provided by CEOS and its agencies (including the LSI portal and CWIC) in support of GEO objectives.	SIT-26
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Klaus Schmidt (DLR) proposed that the issues raised by GEO be worked in a systematic fashion as part of an annual CEOS-GEO interaction cycle, and that the GEO Secretariat should document these issues, allowing CEOS to respond. José noted that he hoped his presentations to CEOS Plenary would be regarded as formal and for action by CEOS.

Gilberto assured the GEO Secretariat of full attention by CEOS to the matters raised in José's Plenary presentation and to be managed by the incoming CEOS Chair team and the incoming CEO, including through the Plenary actions recorded.

8 SIT Report

Makoto Kajii (SIT Chair) provided a summary of SIT objectives and goals for 2010. CEOS SIT priorities for 2010 were: GHG from Space and the CEOS Carbon Task Force (CTF); Forest Carbon Tracking (FCT); Data Democracy; and Climate; as well as preparing a high profile publication.

The CTF coordinated the CEOS input to the GEO Carbon report, and worked to provide an effective interface to the GEO Carbon Community of Practice. A CTF session was arranged at the

Carbon From Space (CFS) Workshop in the UK in September 2010. NASA has kindly provided a co-chair for the CTF (Diane Wickland) and a number of CEOS agencies have volunteered representatives to assist with the CEOS Response to the GEO Carbon Strategy.

CEOS agency satellite acquisitions in support of FCT in 2009-2010 have been impressive. SIT-25 actions (25-9, 25-10, 25-11) related to future coverage strategy and to institutional arrangements for CEOS and FCT are well underway, and it is expected that the way forward will reflect GEO-VII and COP-16 outcomes.

There were three major CEOS meetings on Climate in 2010: Climate Coordination Discussion Meeting (February in Geneva); SIT-25 (April in Tokyo); and, CEOS Climate ad hoc Group Meeting (July in Harwell). One of the key 2010 outcomes is the proposal to form the new CEOS Working Group on Climate.

There were a number of major achievements related to Data Democracy this year: enhanced free and open data access, by CEOS member agencies in Brazil, the United States, and Europe; free access to satellite data for disaster management throughout Asia, with the support of the Sentinel Asia Program; and, a Data Democracy Workshop on Climate Change in Bangkok, led by GISTDA, Thailand. There are several major ongoing activities: development of a Data Democracy Portal/Wiki to access up-to-date data, software tools and training courses; and, participation of Data Democracy in the Capacity Building Showcase, to be shown during the GEO 2010 Ministerial Summit.

The CEOS *Satellites, Science and Society* publication and Rio Statement have been promoted as outreach channels for CEOS achievements. A draft of the Rio Statement has been circulated to Plenary attendees and any suggestions are invited to be handed to the JAXA team during the course of the day before CEOS moves to endorse the Statement the next day.

The three key SIT meetings of the year were: the CEOS-GEO Actions Workshop in January; SIT-25 in April in Tokyo; the SIT Technical Workshop in September in Montreal. The SIT-26 meeting is being planned for Tokyo in mid-March 2011.

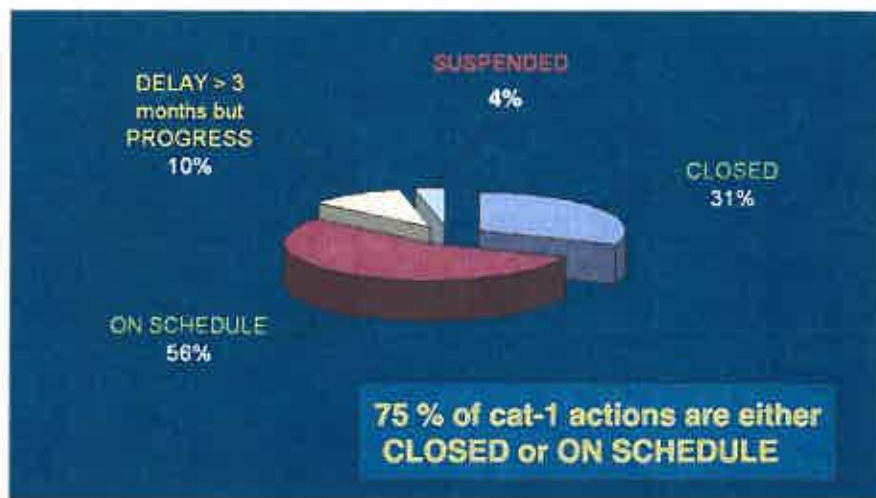
Mr Kajii concluded by noting that CEOS activities have reached a critical mass and represent a major force supporting implementation of the GEOSS.

9 GEOSS Space Segment Progress in 2010

Ivan Petiteville (CEO) presented a summary of GEOSS Space Segment progress in 2010, noting that CEOS is point of contact for 13 GEO Tasks (out of 17 co-led by CEOS). CEOS provides support to many GEO groups (eg GEO Committees, *ad hoc* groups, GEO Task Teams), and has strong involvement through its Working Groups, Virtual Constellation, SBA teams, the CEOS SEO, and with many resources from CEOS Agencies.

CEOS is engaged in 25 GEO 2009-2011 Work Plan Tasks (about 20% of the total) and is currently working 54 internal GEO-related actions (linked to the 25 GEO Tasks), and 59 "GCOS" actions (CL-06-01c). Most of the 2010 actions will be closed on schedule.

CEOS  **Overall CEOS GEO Actions Status** 



A number of key documents have been produced, for example in support of the Constellations and Working Groups, such as the LSI mid-resolution guidelines and the QA4EO documentation. About five web portals have been implemented or upgraded, eight workshops and training courses have been provided this year (e.g. on Ocean Colour Remote Sensing data for African coastal seas). Several new key datasets have been compiled in 2010: more than 64,000 optical and radar scenes for FCT; real time malaria risk maps; and near real-time volcanic ash advisory applications. These will all be added to the GEOSS Registry.

Ivan also noted the extension of TRMM flight operations and data processing through September 2011 to support GPM Preparatory Phase of the Precipitation Constellation.

Ivan reviewed a couple of lessons learned from CEOS support to GEOSS:

- the tracking of CEOS-GEO actions is time consuming, and it is anticipated that the online tracking tool from the SEO will aid the management task of the CEO;
- the SIT Technical Workshop was very useful in preparing for GEO Plenary;
- the CEOS co-leads of some of the GEO Tasks need to communicate better with their fellow co-leads;
- the contributions from CEOS SBA Team coordinators is highly variable and should be reviewed;

Overall Ivan recommended CEOS continue to pursue substantive outcomes, while narrowing the focus to consider a few priority activities.

24-4	CEOS and SIT Chairs, aided by the CEO, to review and confirm current SBA Team Coordinators to check whether all are active or whether replacements are required. A related SIT-26 agenda item should be included.	SIT-26
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10 Data Democracy 2010 Progress

Hilcéa Ferreira (INPE) presented an update on the progress made by CEOS on Data Democracy in 2010. She noted that the data democracy initiative calls for: unhindered access to Earth observation information; reliance on Open Source software and open systems interfaces; approaches which can function within the bandwidth constraints of many developing countries; promotion of locally-initiated domestic and international collaborative projects; and, intensive capacity building and training. The CEOS efforts are coordinated under GEO Task CB-09-05e.

The main accomplishments in 2010 include:

- a Data Democracy Workshop on Climate Change held in June in Bangkok, with 45 participants from 10 Asian countries participating;
- GCI Training provided at the GEO Work Plan Symposium (May, 20 participants) and by WEBEX (September, 60 people connected).

Poonthip Sirikulchayanon (GISTDA) presented the status of the Data Democracy portal, giving a brief tour of the portal (prototype: <http://www.datademocracyportal.org/>) and showing the main data discovery functionality and Google Maps search interface. She noted that one of the key objectives of the activity is to strengthen Earth observation data utilization by increasing data dissemination capabilities in developing countries as a contribution to GEO Sub Task CB-09-05e_3.

Gilberto Câmara (Chair) stressed the challenge of ensuring that data made available is widely advertised by CEOS and GEO to the user communities who need it.

24-5	CEOS Agencies encouraged to provide resources for populating the Data Democracy Portal datasets and training materials.	SIT-26
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11 Status Report on CEOS Carbon Task Force

Osamu Ochiai (JAXA) reported on the activities of the CEOS Carbon Task Force (CTF) on behalf of Takashi Moriyama (JAXA) and Diane Wickland (NASA) as the Co-Chairs of the CTF.

The CEOS Carbon Task Force was proposed by JAXA at SIT-23 with the aim of providing coordination CEOS carbon related activities; specifically GEO Tasks CL-09-03a, b, and c. The three tasks cover: Integrated Global Carbon Observations; Forest Carbon Tracking; and Global Monitoring of Greenhouse Gases (GHG) from Space. The CTF was also intended to provide an effective interface to the GEO Carbon Community of Practice (CCoP).

The CTF has supported a number of events in 2010, including the Carbon from Space Workshop in Oxford in September. NASA volunteered a co-chair (Diane) for the CTF in 2010 and a number of representatives joined from NOAA, DLR, CNES, EUMETSAT, WMO, and others agencies.

A key outcome for 2010 was the update to the GEO Carbon Strategy Report, available from: http://www.earthobservations.org/documents/sbas/cl/201006_geo_carbon_strategy_report.pdf

The CTF intends to work with CEOS Members to develop the CEOS response to the GEO Carbon Strategy Report, framed as a CEOS Strategy for Carbon Observations from Space. The way forward will be discussed on the 2nd day of Plenary.

The CTF has also assisted in the development of the GEO Ministerial Carbon Showcase, with a video currently being developed.

Pascal Lecomte (ESA) reported on the 2nd Carbon from Space Workshop, held in Oxford in September. The workshop recognised three key groups for the way forward: the Global Carbon Project (GCP), GEO, and the CEOS CTF. The objectives of the workshop were to clarify the necessary steps and identify a set of practical activities to implement the Integrated Global Carbon Observing System, and to generate a consolidated position paper by the Workshop Participants for publication in a peer-reviewed journal. A number of draft recommendations have been developed around GHG observations, stocks and fluxes, networks, and consistency. The workshop accomplished many of its objectives, had good attendance, and a number of the recommendations are being translated into actions.

Ivan Petiteville (CEO) noted overlaps between the GEO Carbon Strategy Report and the GCOS Implementation Plan and urged that CEOS carefully consider this when responding to both in 2011. Mark Dowell noted that the CTF may be lacking terrestrial and oceanic expertise and this may need attention.

Gilberto Câmara (Chair) raised potential duplication of effort between the CTF and a Working Group on Climate. He proposed that CEOS consider phasing out the CTF, merging it into the Working Group on Climate. Stephen Briggs (ESA) asked that we give it some consideration in the coming days. Mike Freilich (NASA) urged caution on loading too much work onto the new Working Group. Mary Kicza (NOAA) suggested that both groups have a significant workload and that both should be allowed to proceed a while longer before considering a merger. Klaus Schmidt (DLR) expressed support for the Chair's proposal.

Gilberto suggested that the CTF sounds more like a Virtual Constellation and could be considered as such in future.

24-6	CEOS Chair, in consultation with SIT Chair, WGClimate Chair and CTF Co-Chairs, to poll opinions on the best way forward organisationally for the ambitions expressed by the CEOS Carbon Task Force.	November 2010
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12 Status Report on Forest Carbon Tracking

Alex Held (CSIRO) presented a status update on the Forest Carbon Tracking activity. The GEO FCT Task is aiming to support countries who wish to meet UNFCCC requirements in future for emissions reporting.

The FCT Task has been extremely well supported by CEOS in 2009 and 2010, with approximately 64,000 scenes acquired through the FCT coordinated data acquisition activity. The FCT Portal allows users to identify what data is available for particular regions, including *in situ* data provided by particular National Demonstrator (ND) countries. On-line bandwidth remains a significant challenge for many developing countries and practical support from agencies like USGS providing and shipping hard drives has been essential to ensure data reaches the end users.

CEOS Satellite Data Acquisitions 2010

Sensor	Brazil	Guyana	Colombia	Peru	Mexico	Cameroun	DR Congo	Tanzania	Indonesia	Taiwan
ALOS PALSAR	3709	225	1344	1299	1838	2630*	1054	1551	26	
RADARSAT-2	NA	52	114	153	240	acquisition by ENVISAT		182	154	
ENVISAT ASAR	601	53	64	150	580	1010*	353	80	40	
COSMO - Skymed	no information									
TerraSAR-X	6	12	NA	NA	26	21	NA	15	15	18
Landsat 5 & 7	4432	218	1038	904	2363	271	849	387	500	120
SPOT	contribution as Third Party Mission with ESA, but restrictions related to reauthorization					2982*		contribution as Third Party Mission with ESA, but restrictions related to reauthorization		
CBERS-2B CCD	no information									
IRS	no information									

* Overall Congo Basin

Summary table of acquisitions from May to August 2010 over National Demonstrators and Verification Sites

NA

not feasible

some restrictions

limited information

Alex shared some sample products, stressing the need for wall-to-wall data on a national level at better than 30m resolution in order to meet IPCC guidelines for the resulting information products.

Alex noted that a GEO FCT CEOS Data Strategy Workshop was held in Rio the Monday before Plenary, and that the next steps for the task include:

- finalisation of all FCT Draft Guidance Documents (January 2011);
- FCT “Science Data and ND Summit” (FAO Rome, February 2011);
- FCT “Satellite Data Coordination” meeting (ESA ESRIN, February 2011);
- regional FCT Technical workshops (various 2010-2011); and
- GEO FCT Review Meeting (prior to ISRSE-34 in Sydney, Australia, April 10, 2010).

Gilberto Câmara (Chair) thanked Alex, Gary Richards and Per-Erik Skrovseth (NSC) for their enormous efforts in support of FCT. Gilberto asked about the challenges of working with the National Demonstrators and Alex replied that the intention is to work with the MRV implementing agencies within each country, and that these relationships are sometimes difficult to secure. Some links are well developed, while others need significant work.

Gilberto asked where CEOS members envisioned the FCT Task leading, and the time horizon for the CEOS FCT “Task Force”. Alex suggested that success would involve countries implementing a consistent set of MRV systems, but the activity is very much still in a demonstration phase. Per-Erik pointed out that the FCT effort is not strictly regarded as a Task Force within CEOS and we need to clarify how the GFOI effort will impact this. Gilberto suggested that the incoming CEO and Chair could perhaps consider how we handle this organisationally.

13 Climate SBA Report

Mitch Goldberg (Climate SBA Lead, NOAA) provided an update on the activities of the Climate SBA team. The two main roles of the team have been to organize CEOS responses to GCOS Implementation Plans and provide progress reports of CEOS climate actions to UNFCCC and GEO.

The CEOS Response to the GCOS Implementation Plan (IP) released in August 2010 is a priority for CEOS in 2011. Actions formulated in response to the IP must include ownership and a clear way forward in response to each of the GCOS requirements. The approach will involve the identification of domain leads, and coordinating with the various CEOS groups to develop the response.

Subject matter experts will be identified for each IP action, and will be asked to develop a response using a common template which will be finalised by January 2011. A workshop may be held in Q1 2011 to review and vet actions, with a report development planned from Q2 2011. Domain leads include Mitch for Atmosphere, Mark Dowell (JRC) for Ocean, and Ivan Csiszar (NOAA) for Terrestrial.

Mitch invited comments on the CEOS Climate Action template draft.

24-7	CEOS Agencies to review and comment to Mitch Goldberg on the draft CEOS Climate Action template.	November 2010
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Mitch has drafted a response to the recent request for support on the peer review of Climate Data Records and Essential Climate Variables received from GCOS and WCRP for support which needs to be coordinated by the CEOS Chair.

24-8	CEOS Chair to arrange a response to the recent request for assistance in a peer review of CDRs and ECVs received from GCOS & WCRP.	October 2010
24-9	Mitch Goldberg, in coordination with WGClimate, to lead development of the CEOS Response to the 2010 GCOS Implementation Plan, and to support GCOS as required for the development of the GCOS IP Satellite Supplement. CEOS Agencies encouraged to supply suitable supporting experts.	October 2011

14 Virtual Constellations: 2010 Progress on Implementation Targets

Atmospheric Composition Virtual Constellation (ACC) presented by Richard Eckman (NASA).

2010 achievements for the ACC include: ACC-5 workshop (Montreal, March); Volcanic Ash from Space Workshop (Frascati, May); ACC-6 workshop (Oxford, September); support to the CEOS GCOS IP response; and, the alpha release of the AC portal (<http://wdc.dlr.de/acp/>).

Future plans include: joint ECV projects (to be discussed at ACC-7 Q1/Q2 2011); geostationary air quality constellation; increased use of satellite measurements in IPCC AR5; and, CO₂ and CH₄ gap analyses (discussed at ACC-6).

The ACC welcomes the role envisioned for the new Working Group on Climate to help better coordinate harmonisation of ECV production.

Barbara Ryan (WMO) noted there is scope for coordination between the ACC and one of the SCOPE CM pilot projects. Further, it would be useful for both GAW and EUMETSAT to be made aware of some of the ACC activities since they have related ambitions.

Precipitation Virtual Constellation (PC) presented by Chris Blackerby (NASA).

The activities of the PC are driven by a 2-year Work Plan and a 10-year Implementation Plan. The main achievements for the PC in 2010 included:

- enhancement of the Precipitation Constellation Space Segment including progress on GPM instrument and Core Spacecraft development, and progress towards Megha-Tropiques launch;
- completion of 13 years of TRMM 3-hr, multi-satellite standard products (TMPA, 3B42), see <ftp://trmmopen.gsfc.nasa.gov/pub/merged>;
- study of the availability of conical scanning microwave imagers (MI) in the late-GPM Phase and the Post-GPM Phase of the Precipitation Constellation;
- implementation of improved TRMM algorithm (Version 7), see <http://trmm.gsfc.nasa.gov>; and
- improvements in inter-satellite calibration techniques through the X-Cal WG, see <http://www.gpm-x-cal.info/>.

The 2011-2012 Precipitation Constellation Work Plan (draft) will be confirmed at the 4th CEOS Precipitation Constellation Workshop this November.

Land Surface Imaging Virtual Constellation (LSI) presented by Tom Holm (USGS).

The recent accomplishments and milestones for the LSI include:

- LSI Portal enhancements including cross-system, granule-level, search and data retrieval; Link to WGCV portal (and others); and, expanding the data set, sensor, and platform information;
- LSI Mid-Resolution Optical Guidelines document, defining a set of ideal or optimal guidelines for mid-resolution optical mission, instrument, and data policy characteristics;
- LSI Freeware tools including a Command line tool (Windows and Linux) and a SPRING GIS plug-in (Windows and Linux); and
- Support to the GEO Forest Carbon Tracking Task.

The current challenges include:

- developing an acquisition strategy for GEO FCT involving both continuation and an expanded demonstration mode in 2011 and 2012; securing support from CEOS LSI member agencies;
- developing a gap filling strategy for GEO FCT if Landsat 5 and 7 fail prior to LDCM launch; and
- pursuing LSI's first objective to allow "...land surfacing imaging satellite systems, to cooperate more closely together to operate those systems as a real prototype Land Surface Imaging Constellation." – will free and open data policies be adopted by more

CEOS Members?

The LSI is also requesting CEOS Space Agency data support to GEO Task AG-07-03 (Global Agricultural Monitoring System of Systems), and in particular to the Joint Experiments on Crop Assessment and Monitoring (JECAM) activity.

Gilberto Câmara (Chair) noted the request from GEO to support the JECAM activity, and that CEOS should respond to this request through the LSI. He noted that this support could be a major activity for CEOS and for the LSI. José Achache (GEO Secretariat) noted that the JECAM task is seeking a technical meeting with CEOS and this perhaps should take place with the LSI.

24-10	CEOS Agencies with supporting missions are encouraged to respond to the request for support to JECAM. LSI will serve as the CEOS point of contact.	December 2010
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Tim Stryker (USGS) confirmed that the CEOS Agriculture SBA Coordinator, Prasad Thenkabail (USGS), is eager to facilitate the dialogue with JECAM. Tim suggested that the first thing to do is to determine whether data can be made available by CEOS Agencies for the JECAM project.

Gilberto asked whether we need CWIC after we have the GCI, noting José's comments about whether additional infrastructure is required. Tom Holm (USGS) stressed that CWIC is about access to data, and that it applies a translator to take query information into native languages and is a tool that the GCI could use. José asked that CEOS plan to migrate the LSI portal into the GEO portal, noting it should be straightforward given both ESA and USGS are involved.

Barbara noted that the lack of communication infrastructure in developing countries is an obstacle to the provision of observations to these countries, and suggested this could be a matter to raise at GEO in Beijing.

Ocean Surface Topography Virtual Constellation (OST) presented by Stan Wilson (NOAA).

The focus for the OST Constellation has been continuity of the climate record for sea level. Jason-3 development is underway, and a phase B1 study will be initiated soon for Jason-CS. Continuity of complementary coverage (e.g. Cryosat-2 and SARAL/Altika) is also important for increased spatial sampling and ocean weather.

The *Understanding Sea-level Rise and Variability* publication has recently been released, and relies on the activities of the OST Constellation.

Timely access to data from future Chinese altimeters remains an open issue, however the provision by CNES to fly DORIS on HY-2A may present an opportunity to progress the matter.

Ocean Vector Winds Virtual Constellation (OVW) presented by Stan Wilson (NOAA).

The continuity of Ku-band OVW measurements is a priority. ISRO has provided six months of Oceansat-2 scatterometer (OSCAT) data, and a meeting among NOAA, NASA, EUMETSAT, KNMI and ECMWF was held to discuss calibration/validation of this data. ISRO is planning to launch SCATSAT with scatterometer in 2012. Other observations of interest include:

- C-band: ASCAT/Metop-B launch is planned for 2012 to overlap with Metop-A;
- Ku- and C-band: combined observations are in the planning by NOAA, ISRO and CMA.

Timely access to data for future Chinese (SOA) and Russian scatterometers remains an open issue.

Training courses on the use of satellite wind and wave products in marine forecasting have been developed, and have raised the need for a single point of access for this type of data. The OVW is planning to stress operational use to the crucial missions planned for coming years.

Ocean Colour Radiometry Virtual Constellation (OCR) presented by Mark Dowell (EC-JRC).

The objectives of the OCR constellation include: OCR measurement continuity; provision of high quality datasets; data harmonization in support of ECVs; facilitating timely and easy access to data; and, capacity building and outreach. The development and execution of an inter-agency OCR ECV implementation strategy is a high priority for the group.

There is a concerted inter-agency effort on activities relating to sensor inter-comparison and uncertainty assessment of datasets required for ECV generation (INSITU-OCR). Activities include: sensor inter-comparison; product validation; investigate vicarious calibration approaches; algorithm parameterization; instrument inter-calibration; and, building on previous investments and prototype programs.

Upcoming activities include:

- OCR ECVs: Provide, with IOCCG, input from scientific community on GCOS Satellite Supplement revision for OCR - by end November 2010; and, discussion of the inter-agency implementation strategy for OCR ECV at IOCCG-16 meeting (Feb. 2011); and
- INSITU-OCR: October 2010 workshop held in conjunction with WGCV-IVOS conference; discussion on main tasks for focus of INSITU-OCR at IOCCG-16

The OCR community will be represented at the GEO Ministerial in Beijing through the ocean-related GEO Tasks.

The **Sea Surface Temperature (SST) Constellation** proposal was presented by Stephen Briggs (ESA) for information, noting that the creation of the SST Constellation will be considered at SIT-26.

Constellations Summary

Makoto Kajii (SIT Chair) summarised the concept of the virtual constellations, noting that they are progressing well in most cases. He noted that the CEOS Virtual Constellations process paper provides appropriate definitions and procedures for the creation of VCs. He summarised the status of each of the Constellations.

VC	Objective	Major Status	Support	VC	Objective	Major Status	SIT Status
ACC	To collect and deliver data to improve monitoring, assessment, and predictive capabilities for changes in ozone, air quality, and climate	-Developing Data Portal -Completed Gap Analysis -On-going Coordination with Carbon TF -Initiate the position paper of AC from Geostationally Orbit	Coordination with Carbon TF	OSW	Promote the widespread use of scatterometer-derived surface vector winds and altimetry-derived significant wave heights in operational marine analysis and forecasts worldwide	-Maintain continuity scatterometers -Integrated datasets -Training Course	- Membership issue (China and Russia)
LSI	To determine optimal capabilities to acquire, receive, process, archive, and distribute land surface image data to the global user community.	-Data Portal enhancement -Drafting Mid resolution guidance document -Optical Observation Coordination for FCT support		OST	The implementation of a sustained, systematic capability to observe the topography of the surface of the global oceans ranging from basin-scale to mesoscale.	-Maintain continuity altimeters (Success Jason-3 budget) -Next 15yrs User Requirement document	- Membership issue (China)
OCR	To provide long time series of calibrated ocean color radiance (OCR) at key wavelength bands from measurements obtained from multiple satellites	-Prioritize the Ocean ECV -L1 data requirement for future Ocean mission	-To be identified (activities are just started)	PC	To guide, facilitate, and coordinate continued advancements of multi-satellite global precipitation missions.	-GPM mission implementation -Post-GPM study begun	- Membership issue (China and Russia)

Makoto also summarised the key features of each of the Constellations.

	Major features	Remarks
ACC	Cover over all atmospheric area. Utilize many type of satellites or sensor Valious user science community.	* Coordination with Carbon TF
LSI	Clear type of satellite or sensor. Valious application users.*	* intensive support to FCT
PC	Focus on the GPM constellation* and its users**	* future system study started **IGECG, GEWEX
OCR	Clear requirement from Science Community.* Clear type of Sensor.	*IOCCG
OST	Clear requirement from science community* Clear type of satellite or sensor	* OST science community
OSVV	Clear type of satellite or sensor. Orienting operational observation.*	* Active in training.

Makoto proposed additional guidelines for new Constellations in order to avoid new Constellations overlapping with existing efforts. He also reviewed a number of discussion points for SIT-26:

- establishment of new Constellations (eg SST);
- guidelines for new Constellations;
- how Constellations and Working Groups support the new Working Group on Climate;
- how ACC supports the CEOS response to the GEO Carbon Strategy.

Carolin Richter (GCOS) hoped that the VCs would be involved in the upcoming satellite supplement. Ivan noted that the Constellations Process Paper calls for new Constellations to be submitted to SIT, but that was when there were two SIT meetings annually. With just one SIT meeting, perhaps proposals should be allowed to be brought to CEOS Plenary. Gilberto suggested that the frequency of SIT meetings could be discussed further in CEOS SEC.

Closing Remarks on GEOSS Space Segment Progress

Gilberto noted the enormous progress that CEOS has made on progressing the space segment of GEOSS, and also noted the increasing number of demands from GEO and GCOS. He noted that the Constellations are in a transition phase, and that more and more they will be involved in data provision and how to provide data operationally. A number of portals have been established as a means of communication with the different communities, but CEOS should consider possible rationalisation and convergence, including in support of the GCI (and a Plenary action has been defined for this purpose, above).

Gilberto encouraged increased participation in the Constellations from new actors, including China, India, and others.

15 Working Groups: 2010 Report and Actions

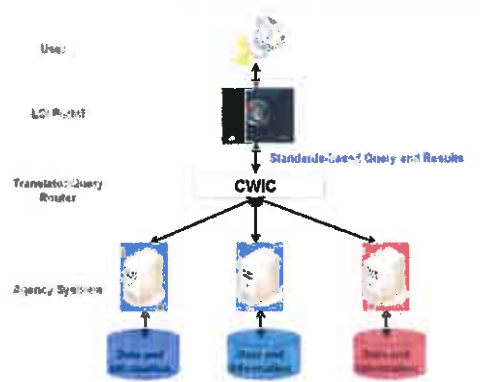
WGISS presented by Pakorn Apaphant (GISTDA).

Pakorn summarised the *WGISS* activities noting the close alignment with the 2010 CEOS Work Plan. He reported that *WGISS-29* was held in Bonn in May and *WGISS 30* (joint with *WGCV*) in Montreal in September. Pakorn reviewed the *WGISS* structure, noting that it has been re-organised around a technology-to-application model.

He noted the Water Portal project is under the application sub-group led by JAXA. This activity is an expansion of JAXA's WTF-CEOP into CEOS Water Portal, with the objective of providing assistance to the water relevant scientists and general users (or non-researchers) in the development of data services associated with data integration and distribution.

Pakorn summarised 2010 WGISS accomplishments and highlights including:

- WGISS Architecture and Data Contributions Project(WADC) and the development of the CEOS/WGISS Integrated Catalog (CWIC);
- the beta version of the AC Portal; participation in ACC Workshops; and, a planned video of the beta AC Portal for CEOS Plenary and GEO-VII Plenary;
- continued development of the International Directory Network; and
- evolution of the LSI portal prototype to include Forest Carbon Tracking information and links; and, use of the CWIC to provide users a map-based query and direct access to satellite data granules.



WGISS is also looking at issues like GRID computing, sensor web technologies, the establishment of CWIC as a web service, global datasets (DEM showcase for QA4EO), and cooperation with UN-SPIDER.

Pakorn reported that WGISS is working closely with the other CEOS Working Groups, including the recent joint meeting with WGCV. Joint activities discussed included: the development of joint case studies; implementation of QA4EO; and, the development of a demo for the 2011 GEO Plenary. Joint case studies to be considered included: Terrain Elevation; Air Quality; and, Forest Carbon Tracking.

Objectives for 2011 include efficient contributions to GEO and GEOSS, strengthening connections with the Constellations, development of the joint WGCV activities, development and promotion of the CWIC, and promotion of the ACC portal, and further study of the technical challenges in GRID computing, sensor webs, and other areas.

CEOS agencies are asked to consider the call for WGISS Vice Chair to serve for the 2011-2013 timeframe, continuing as WGISS Chair for 2013-2015.

24-11	CEOS Agencies encouraged to provide nominations to WGISS Chair for the WGISS Vice-Chair role in 2011-2013, continuing as WGISS Chair 2013-2015.	23 May 2011
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Pakorn also encouraged incoming CEOS chair agencies to attend the WGISS meetings to better understand the Working Group activities.

Steven Hosford (CNES) expressed concern that CWIC is not well coordinated with other initiatives such as HMA (Heterogeneous Missions Accessibility - ESA with its European partners) and WGISS should avoid reinventing the wheel. Pakorn noted that ESA attended the last WGISS meeting and this issue was highlighted. Stephen Briggs stressed the point, noting that HMA links to 20+ catalogues and is consistent already with the GCI. Gilberto recalled that the SEO-led study actioned by Plenary will address this issue.

WGEdU presented by George Jungbluth (NOAA).

The WGEdU strategy includes: coordination of specific training activities and programming between space agencies, UN agencies and other bodies; providing opportunities for CEOS Agencies to network with educational and training institutions; providing timely updates of EO data and techniques for training activities; providing opportunity for CEOS Agencies to disseminate materials, data, information, expertise and guidance worldwide; promoting the development of new specialists in EO to expand use and application of environmental data worldwide; enabling better outreach to international community and general public; and, educating to underscore relevance of EO for policy development and societal benefit at all levels of government.

Current membership includes CONAE, EUMETSAT, ESA, GISTDA, INPE, NASA, NOAA, UNESCO and USGS, but all CEOS Members are welcome and needed.

WGEdU has developed an EduFlow publication, which was circulated to Plenary delegates. The publication includes a focus on environmental applications in South America. The idea is to repeat the exercise annually based on themes from CEOS agencies, and next year will look at volcanic ash applications.

A number of past and future WGEdU events were reviewed:

- WGEdU 2010 annual meeting hosted by CONAE in Puerto Iguazu;
- workshop dedicated to geo-information technologies for natural disasters in Latin America in Brazil in March;
- the 2011 workshop (theme TBA) will be in Panama with support from USGS; and
- WGEdU 2011 annual meeting to be held in Hampton, VA, USA, 7th-9th June 2011.

WGCV presented by Pascal Lecomte (ESA).

Pascal reviewed a number of 2011 WGCV accomplishments:

- development of concepts for 3 QA4EO showcases in support of Forest Carbon Tracking, Air Quality and Terrain Elevation;
- working with the SEO on the COVE tool, including the input of new requirements for further development by SEO;
- development of a closer working relationship with GSICS; and
- improving connections with the Constellations.

A number of current and future challenges were identified:

- the development of a new WGCV 5-year plan in 2011;

- the definition a set of CEOS Calibration/Validation reference sites that would represent the minimum set of mandatory sites that should be maintained long term; and
- a subgroup review of generic procedures to aid inter-comparison between products.

Activities of each of the main subgroups were presented including: SAR, Terrain Mapping, Atmospheric Composition, IVOS, LPV and Microwave. The microwave subgroup is seeking a vice chair to serve with Xialong Dong (NSMC).

Future WGCV objectives include: support the GEO QA4EO efforts via leadership in the QA4EO team and enhanced member support; continue working strong relationship in GCOS and the Constellations; and enhancing interaction between CEOS SBA groups and the new CEOS Working Group on Climate, and help define calibration/validation requirements. Future meetings include:

- a GEO QA4EO workshop in April 2011 in the UK; and
- WGCV-33 hosted by ROSCOSMOS, 17-20 May 2011, Moscow, Russia.

Pascal reviewed three recommendations from WGCV:

1. Having agreed to establish a set of CEOS endorsed reference sites to facilitate interoperability, the WGCV recommends that these sites be appropriately instrumented and continuously maintained to ensure that the site characteristics and properties are traceable and available in a free and open manner.
2. Strong interference has been observed at different places in SAR data from ground-based radars. The WGCV therefore recommends that CEOS defend the frequency allocations used by the SAR community at the WRC.
3. Having established the Quality Assurance Framework for Earth Observation (QA4EO), in direct response to GEO task DA-09-01a, the WGCV is continuing its work on implementation of QA4EO for CEOS. However, QA4EO was developed not just with satellite EO in mind but with the aim of its implementation throughout GEOSS. The initiative now requires new leadership and active participation and support not just from CEOS but from the wider GEOSS community. As QA4EO moves forward outside of the space domain, the WGCV recommends that CEOS Agencies continue to actively support its evolution and to adopt its principles at a working level.

Pascal noted that the ESA support to QA4EO finishes at the end of November including in relation to the Secretariat and provision of the GEO QA4EO website. He encouraged CEOS Agencies to provide support for its continuation.

24-12	CEOS Agencies encouraged to consider taking on responsibility for QA4EO secretariat and website maintenance.	November 2010
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Pascal is stepping down as WGCV Chair, and Greg Stensaas (USGS) is taking over with Satish Srivastava (CSA) as the new Vice Chair. Gilberto Câmara thanked Pascal for all hard work in support of WGCV. Pakorn thanked Pascal for his work in support of WGISS-WGCV joint activities.

Barbara Ryan (WMO) suggested that all connections with GSICS should be taken advantage of. She noted the appeal for data for the 300 calibration/validation sites, and highlighted that this issue needs more visibility in all space agencies.

24-13	WGCV will provide a list of CEOS endorsed reference sites over which CEOS Member Agencies should collect and provide information in order to facilitate interoperability and underpin internationally harmonised calibration/validation. The list will also include recommended resource requirements for active agency support of site instrumentation and maintenance.	SIT-26
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16 CEOS Missions, Instruments and Measurements (MIM) Database

Simonetta Cheli (ESA) presented the updated status of the CEOS MIM Database. She noted that the MIM serves as backbone of the EO handbook, and is a key tool for the various gap analyses. She thanked the Symbios team for having organised the 2010 survey to update the database. She also thanked the NASA SEO for its cooperation and for funding an external contractor (Bizzarro Bizzarri) to help with review of database measurement content. She noted that the online MIM now includes connections to both the GOS Dossier and the ESA EO Portal, and she announced that this activity will be continue in 2011.

Stephen Ward performed a live demo of the MIM online (database.eohandbook.com). In addition to the on-line version, Stephen introduced a PDF summary of missions and instruments that can be downloaded from www.eohandbook.com. He presented some new online features like the mission and instrument indexes. He noted that the main improvement for 2010 is the measurements overview area, which can be used to review what instruments are making a particular measurement in support of gap analysis.

Mike Freilich (NASA) thanked ESA, Stephen Ward, and George Dyke for contributing the MIM to the community. He also noted that the development and maintenance of this portal requires a good understanding of Earth observation matters and NASA appreciates this valuable resource and its ongoing maintenance, being a crucial tool in support of the SEO and other analyses.

24-14	CEOS Agencies to respond to the 2011 call for programme updates in support of the annual update of the CEOS MIM database.	May 2011
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17 Update on GCOS Activities and Plans

Carolin Richter (GCOS) reported on GCOS activities, noting a number of 2010 accomplishments and future challenges including:

- update of the GCOS Implementation Plan;
- update of the Satellite Supplement to this Implementation Plan (release January 2011);
- issuing of a call for *peer review* of ECVs;

- planning regional and national implementation;
- establishment of a systematic improvement and assessment cycle; and
- system improvement through all domains (atmosphere, ocean and land).

The following summary and requests to CEOS were presented:

Update of the GCOS Implementation Plan: GCOS expects a decision from UNFCCC SBSTA/COP16 and a report on progress and/or adequacy of observing systems. There is also a COP-16 side-event on observations planned in which CEOS participation is required.

24-15	CEOS Chair to liaise with GCOS on support for the COP-16 side event on observations, and to ensure synergy with the proposed CEOS side event.	October 2010
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Update of the *Satellite Supplement*: CEOS Constellations will play an important role in both the CEOS response to GCOS and the development of CEOS work-plans. CEOS contributions to the update of the *Satellite Supplement* are both expected and welcomed.

Call for *Peer Review* of ECVs: an essential element of GCOS is the *GCOS Improvement and Assessment Cycle*, and this should be taken into account by CEOS as it puts together its work plans.

Plan regional and national implementation: an action plan for regional and national integration of GCOS will be discussed by GCOS in 2011. This plan will be closely linked to climate adaptation measures and socio-economic benefit discussions, and CEOS cooperation is required.

Continue with the *GCOS Improvement and Assessment Cycle*: the process of establishing an assessment process, possibly publishing a 3rd Adequacy Report, requires CEOS contributions.

System improvement through all domains (atmosphere, ocean and land): data is required as a supplement for in-situ networks, and CEOS expertise on calibration and validation is required.

Gilberto Câmara (Chair) was delighted to have GCOS represented at CEOS Plenary, and noted that CEOS takes the relationship with GCOS seriously. He also stressed the importance of the QA4EO initiative to GCOS.

24-16	CEOS and SIT Chairs, in coordination with Climate SBA and WGClimate, to liaise with GCOS to plan coordination on the key GCOS documents and activities in 2011.	November 2011
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Per-Erik Skrovseth (NSC) noted that an integrated Arctic Earth Observation system is currently in its preparatory phase, and that inputs are being invited. This may represent an opportunity for CEOS and/or GCOS to coordinate its efforts.

18 Geohazards Supersites Proposal

Falk Amelung (University of Miami) presented a summary of the geohazard supersites. He noted there will be a showcase at the GEO Plenary, and that the initiative aims to better understand the geophysical processes causing geohazards (earthquakes and volcanoes initially). The effort is made up of a global partnership of scientists, satellite and *in situ* data providers (multi-sensor

InSAR, seismic, GPS, complete data sets). Data generated can be used in support of national authorities.

The supersites focus on real risk locations like Tokyo (eg 35% chance of large quake in next 30 years), with benefits to include better scientific understanding of geohazards and improved volcano and earthquake monitoring. The organisation will include a Scientific Advisory Committee, and for satellite operators it offers the chance for direct dialogue with users, to make use of decade-long multi-satellite data readily available, and to improve coordination of SAR observation systems. It is expected that the activity will generate new applications.

Achievements to date include the development of a concept White Paper. A number of data-related discussions have taken place: ESA data is available for all supersites; DLR data is being secured; RADARSAT-2 has been tasked; and, some ALOS images have been acquired for Haiti and Chile. The value of satellite imagery after the Haiti earthquake will be used to give some insight into the nature of the quake. In addition the data has been used by local authorities including in relation to the relocation of Port au Prince. It is expected that challenges will include access to ALOS, RADARSAT-1/2, and COSMO-SkyMed data.

24-17	CEOS Agencies to review the GEO Geohazards Supersites White Paper and to respond to the data requests therein (including the urgent requests for the GEO Ministerial). Incoming CEOS Chair and SIT Chair will ensure suitable coordination and interface.	November 2010
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Additional information can be found here: <http://supersites.earthobservations.org>.

Stephen Briggs (ESA) expressed full support for the initiative but urged that CEOS not consider in the first instance a Virtual Constellation in response to the challenge. Per-Erik Skrovseth (NSC) asked about other geohazards risks – such as landslides – being included in the future effort. Falk confirmed this is within future plans subject to good progress on the initial priorities.

Brent Smith (NOAA) noted the large toll from natural disasters in 2010. He queried whether there has been discussion in the International Disaster Charter and how this effort relates to that activity. Falk noted that scientists have not had success acquiring data through the Charter. Stephen confirmed that this is seen as additional to the Charter, which does not make provision for routine acquisitions in dangerous areas but is a responsive mechanism. Once data are acquired they are however available for this purpose. Tim Stryker (USGS) agreed with the comment from ESA.

Gilberto Câmara (Chair) recalled that the Virtual Constellations are a mechanism for coordinating different missions for a single purpose but also to focus resources to respond to external needs. Gilberto suggested that the LSI take on the interface to the Supersites initiative.

José Achache urged focus on the proposed priorities for the Supersites initiative, noting that there is no real overlap with the Disaster Charter. The key is data provision focused on the selected high risk sites, and the number of sites is not large and easily manageable by CEOS. The continuous INSAR data could be a new source of information for the science of hazard prediction. He hoped that CEOS could establish an efficient process to respond to the data request and responsibilities should be clear for the first steps to contact with the agencies.

Gilberto repeated that the LSI could be the mechanism and interface for effective collection of data – supporting the CEOS Chair in responding formally to GEO. Steven Hosford (CNES) noted

that the FCT example shows that this can be an effective mechanism. Conrado Varrotto (CONAE) expressed concern at too many tasks falling on the Virtual Constellations.

Guy Seguin (CSA, on behalf of the Disaster SBA team) suggested that the matter be submitted to SIT as there is already an action in the 2010 plan for which the White paper and the data request are the first deliverables. Stephen suggested that the few agencies concerned discuss with José and work out a way forward – noting the scale of the Supersites effort is considerably smaller than the Forest Carbon Tracking initiative. Gilberto suggested that CEOS Chair have an agenda item at SIT-26 on how CEOS should handle such GEO requests.

19 Forest Carbon Tracking Outcomes in 2010

Per-Erik Skrovseth (NSC) presented a **summary of future Forest Carbon Tracking ideas, including the Global Forest Observation Initiative (GFOI) in 2011** and beyond. He noted that one of the key objectives of the FCT activity, and the GFOI, is to foster the sustained availability of data. He presented the operating context noting that governments developing national systems are the main GFOI users. In addition, the GFOI will support long-term observation needs of the United Nations Framework Convention on Climate Change (UNFCCC). In addition, he noted that to realise the mission of the GFOI, GEO will engage with other key users, in particular FAO and the IPCC. He also noted that GEO is providing an important link to user communities, facilitating the increased exploitation of observations.

Per-Erik noted that the GFOI Concept Phase report will be submitted to the GEO-VII Plenary for endorsement. The report has been prepared by a broad-based Planning Group, and a number of CEOS members have been engaged in the process. The Concept Phase will end as of the GEO-VII Plenary, with a detailed Planning Phase to follow in 2011. The objective of the Planning Phase will be to produce a detailed plan for the development of the GFOI in time for the GEO-VIII Plenary. The Planning Phase will require a more structured approach with dedicated full-time staff. A broad overview of the GFOI Plan includes:

- identifying existing national capabilities for producing national forest information;
- identifying strategies needed to improve national capabilities;
- identifying potential sources of observations (satellite and in-situ) and associated data policies;
- identifying recommendations to GEO Plenary (and Members and Participating Organisations) for future action; and
- including proposals for measuring success.

Stephen Ward presented the **CEOS data strategy and the outcomes of the workshop held on Monday**. The current issue facing CEOS is the continuation of wall to wall coverage of the FCT National Demonstrators (currently 10). He stressed the need to involve key user institutions, noting that CEOS would welcome seeing products being generated from the Earth observation data.

He raised the issue of the data policies of several of the missions currently contributing data, and stated the need for further contributing missions like RESOURCESAT.

The FCT Task plans to engage with the SEO and the LSI to establish an acquisition strategy plan for the core data streams identified (CBERS-3, Landsat-8, Sentinel-2, Sentinel-1). CEOS should

continue current acquisitions until the end of the demonstration phase in 2013, and noted that the CEOS focus is on the data acquisition and supply (not product development).

He presented the main milestones including: COP-16; National Demonstrator/UN-REDD Summit 7th-8th February 2010 (FAO, Rome); FCT Science and Data Summit 9th-10th February (FAO, Rome); and, Space Data Coordination Group meeting 11th February (ESRIN).

Stephen presented several suggested actions discussed at the CEOS data strategy workshop:

- CEOS agencies requested to continue their excellent support on the coordinated FCT data acquisition strategy;
- CEOS Chair seek guidance from GEO on future data coverage priorities – and how these might be driven by linkages with World Bank, UN-REDD, and Paris- Oslo (REDD+);
- CEOS Chair request GEO task to provide a status report on the development of products from data supplied to date and their exploitation by ND authorities; and
- SEO and LSI to collaborate with the FCT Co-leads to develop constellation studies for the anticipated core data streams.

Gilberto Câmara (Chair) asked about the value being added by the GFOI relative to the current FCT activity. Stephen noted that the current FCT activity is focused on tools and demonstrations and development of knowledge, whilst the GFOI is the embodiment of ambitions to convert these into sustained and operational capabilities globally for any country that needs them – and will address the need for future permanent institutional arrangements.

Doug Muchoney (USGS) and Stephen recalled that forests were not covered by the Kyoto Protocol because satellite data were not considered to be a mature or sustained information resources. They insisted that we cannot miss the opportunity to include forests in a post-Kyoto framework or to demonstrate that satellite data streams are technically adequate and that CEOS is able to provide the coordination required to secure continuity.

Stephen thanked CEOS Agencies for their efforts in satisfying the FCT data needs.

24-18	CEOS Agencies requested to support the coordinated FCT data acquisition strategy in 2011.	SIT-26
24-19	CEOS Chair to seek guidance from GEO (GFOI Task Force) on future data coverage priorities – and how these might be driven by linkages with World Bank, UN-REDD, and Paris-Oslo (REDD+).	SIT-26
24-20	CEOS Chair will request the GEO FCT Task to provide a status report on the development of products from data supplied to date and their exploitation by ND authorities.	SIT-26

20 Carbon Task Force

Osamu Ochiai (JAXA) presented a summary of CEOS Carbon Task Force (CTF) plans for 2011 on behalf of CTF Co-Chairs Diane Wickland (NASA) and Takashi Moriyama (JAXA). The focus

of CTF activities for 2011 will be the development of the CEOS response to the GEO Carbon Strategy.

The initial focus of the CTF has been on greenhouse gases (GHG) and the challenge to coordinate among the large number of GHG measuring satellite missions being developed, planned, or proposed. However, space-based observations of carbon include stocks and fluxes on the land and in the ocean, and so a comprehensive, balanced, and coordinated approach is needed.

Near-term actions in the development of the CEOS response to GEO Carbon Strategy include:

- Takashi to develop a schedule for the CEOS response to the GEO Carbon Strategy (covering approximately one year of CTF activity);
- CTF Co-Chairs to seek additional expertise/representation for the CTF with respect to space-based observations of carbon on the land and in the ocean;
- Co-Chairs to consult with the relevant CEOS Constellations with respect to an integrated response to the GEO Carbon Strategy; and
- Co-Chairs to convene the CTF as soon as above actions have been completed to initiate the work of crafting the response.

It was noted that the CEOS response likely will need to address the interfaces with the non-space observational components called for in the GEO Carbon Strategy.

An action has been defined above to address the way forward for the CTF (action 24-5).

21 Space Agency Coordination for Climate

Stephen Briggs (ESA) reported on the process undertaken in 2010, which resulted in a proposal for CEOS to establish a standing Working Group on Climate (WGClimate). Draft Terms of Reference for the Working Group were proposed at the meeting in Harwell, UK in July.

Stephen noted the key headline for the proposed Terms of Reference: that the group will support the work of GCOS in defining and delivering the ECVs required by the UNFCCC. It will support and advise on the overall interface of CEOS with the UNFCCC and IPCC.

Mark Dowell (EC JRC) has agreed to be the Chair, and John Bates (NOAA's National Climatic Data Center, NCDC) has agreed to be Vice Chair – both candidates being eminently qualified.

The initial work plan proposed for the WGClimate was outlined including: a CEOS agency ECV meta-analysis to identify multi-agency teams for each ECV and review their actions; building a link to the IPCC modelling community to facilitate the inter-comparison of model outputs and data; and, to develop an ECV-by-ECV implementation strategy.

The first meeting will be in Q1 2011 (possibly 8-9 March), and revisions to the terms of reference are invited by end November 2010.

Stephen invited Plenary to endorse the recommendation to set up the Working Group on Climate with the usual *modus operandi* of CEOS Working Groups. Gilberto Câmara (Chair) thanked Stephen for his vision and leadership in reaching this point and noted the significance of this milestone. Mike Freilich (NASA) added his thanks to Stephen and offered some edits to the terms of reference (questioning the word 'oversee' in relation to the Climate SBA – suggested to replace with 'review'). Mary Kicza (NOAA) welcomed the proposal and thanked Stephen with

full support from NOAA – noting the good relationship with the Climate SBA, which is proposed.

Gilberto, as Chair, proposed the adoption of the Working Group on Climate and the proposed Terms of Reference (version 2nd October 2010) and actions for 2011 and this was agreed by the meeting.

24-21	CEOS Agencies to provide final comments on the proposed Terms of Reference for the standing Working Group on Climate and to respond to the expected request for representatives.	30 November 2010
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22 Expanding the Data Democracy Initiative

Gilberto Câmara (Chair) gave some perspectives on the international requirement for education in matters related to Earth observation, noting that WGEdu was set up to establish training activities. He noted the average duration of education in populous countries such as India and China. He showed the shift in science output of developing countries over the last 10 years – with increases in China, India and Brazil. He suggested that training courses should no longer be the emphasis, in particular given the increase in developing country education and internet connectivity. He stressed that Data Democracy is an issue of access, and showed world statistics for access by populations around the world, noting that web and non-web strategies are needed for data democracy. He raised the question of whether channels such as GEONETCast could be used for Data Democracy, and suggested that the future in data democracy in CEOS is to build the connections.

Volker Liebig (ESA) commended Gilberto on the presentation, and suggested that Africa lags in both education and connectivity. Gilberto suggested that traditional training courses will not reach the masses and does not scale well, and that we need to aim higher and reach large populations. Gilberto cited the 140,000 downloads of the INPE SPRING software and how INPE could never hope to train as many users.

George Jungbluth (WGEdu) supported an increased emphasis on data democracy. He noted that training efforts in WGEdu are very focused and there remains a place for these efforts and the demand is apparent through bodies such as the GEO Capacity Building Committee.

Stephen Briggs (ESA) suggested that it would be interesting to contemplate an expansion of the role of the WGEdu but not to rule out training completely, especially for Africa. He also noted that Data Democracy may not be the best title since the need extends far beyond data but the basic idea has a lot of merit.

Gilberto proposed an action for WGEdu to propose ways to take account of needs of countries that need capacity building, and how the Data Democracy initiative could be better embedded into the CEOS organisation.

24-22	CEOS Chair, in coordination with WG Chairs and CEOS SEC, to develop a proposal for CEOS Plenary 25 for how best to incorporate ambitions of the Data Democracy initiative within the CEOS structure.	CEOS Plenary 25
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Hilcéa Ferreira (INPE) noted that Data Democracy is already a GEO Task within the GEO structure. Pakorn Apaphant (GISTDA) noted that this has been an activity of the Troika in the past. Tim Stryker (USGS) noted that CEOS SEC can also have a role in plotting the way forward.

23 Radio Frequency Coordination Matters

Stephen Ward reported that there is no representative or report from the Space Frequency Coordination Group (SFCG, typically presented by Edoardo Marelli of ESA). The SFCG remains busy on our behalf in WRC and ITU processes, including supporting a report on socio-economic benefits of Earth observations for ITU working group activities. It is clear in 2010 that pressure on remote sensing spectrum is more severe than ever. During 2010 impacts have been identified on L-band SAR, and SMOS being used to actively identify illegal sources of radio signal.

The typical representatives of CEOS Plenary are perhaps not the ideal audience for the issues raised by SFCG and CEOS has always struggled to give the matter full attention between meetings. It has been suggested that a critical mass of effort could be achieved if CEOS were to combine forces with CGMS and WMO who are both active in this domain and Stephen suggested that this be put to Plenary for consideration – with an approach by CEOS Chair to CGMS and WMO if the action is approved.

Rob Husband (EUMETSAT) suggested that more coordination would give more weight to the efforts of CEOS and supported the action.

24-23	CEOS Chair to contact CGMS and WMO to explore possibilities for closer coordination on radiofrequency matters and to bring a proposed way forward to SIT-26.	SIT-26
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24 CEOS Engagement at GEO & UNFCCC Meetings

Brent Smith (NOAA) and Pakorn Apaphant (GISTDA) initiated the discussion on preparations for the GEO Ministerial. The GEO Ministerial Task Force has worked during the last year, including on the showcase developments – with GEO having selected six for display to Ministers in Beijing (Capacity Building, Carbon, Disasters, GEO BON, Health, Asian Regional Showcase). CEOS has made significant contributions to the development of the showcases including: JAXA is leading development of the Carbon Showcase video; the CEOS Data Democracy team has contributed feature elements to the Capacity Building Showcase; and, multiple CEOS agencies have been involved in the other Showcases.

The Task Force has drafted the Ministerial Declaration, the Ministerial agenda, and a Report on Progress, as well as addressing relevant issues relating to Ministerial representation and to the Exhibition. Brent hoped that CEOS representatives could connect with their national GEO representatives to ensure the CEOS contribution is well understood.

Plenary previewed the Disasters Showcase video being planned for the GEO Ministerial. Gilberto Câmara (Chair) thanked the team for their fine efforts in preparing the excellent video.

24-24	CEOS representatives to the GEO Ministerial Task Force to coordinate the conclusion of the CEOS inputs to the various	GEO-VII
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GEO Summit related meetings.	
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Poonthip Sirikulchayanon (GISTDA) reported on the status of the **'Satellites, Science and Society' Publication** which GISTDA and JAXA have coordinated on behalf of CEOS. The publication is ready for print and will include the Rio Statement. CEOS members will receive a digital version in the near future, 300 copies will be sent to Beijing via CRESDA's office for distribution at the GEO Summit, and a PDF version will be added to the CEOS website. The document will also be used at COP-16, and any other relevant events.

Poonthip thanked everyone involved in the process, in particular the CEO team (Ivan Petiteville, Tim Stryker, and Kerry Sawyer), and the GISTDA and JAXA teams. Gilberto thanked everyone for this splendid result.

Julio Dalge (INPE) noted that CEOS will provide a report to COP-16 which should be prepared by CEOS Chair (ASI), with assistance from the CEO. A COP-16 CEOS side event proposal has been submitted, and acceptance is still pending from UNFCCC SEC. Should the side event proposal be accepted, the proposed speaking line-up would be the CEOS Chair and CEOS representatives from the USA, EU, China/India/South Africa, and INPE.

It was noted that a Plenary action (24-15) has been agreed calling for coordination of the CEOS and GCOS side events in Cancun to avoid overlaps and ensure efficiency in participation.

25 CEOS Priorities for 2011

Makoto Kajii (SIT Chair) suggested that the mid-point for the GEOSS implementation represents a good opportunity to evaluate the CEOS strategy for the next 5 years, but suggested that the current priorities should remain the focus. He outlined a number of CEOS priorities for 2011:

- support for Virtual Constellation activities should be strengthened;
- development of the CEOS data strategy for Forest Carbon Tracking;
- development of the CEOS Strategy for Carbon Observations from Space (CTF);
- development of the Working Group on Climate; and
- Data Democracy.

A number of SIT-related meetings are anticipated for 2011:

- CEOS-GEO coordination meeting (December 2010);
- SIT Workshop (January in Washington DC);
- SIT-26 (March 16-17 in Tokyo); and
- SIT workshop (Sept or Oct 2011).

Stefano Bruzzi (ASI) presented the **vision and goals for ASI's CEOS Chair term**. He reflected on the fact that ASI's assumption of the Chair term was a last minute decision, but that ASI intends to be an enthusiastic and engaged Chair, and that Earth observation is an important programme for ASI and a strategic priority. It is clear that CEOS has grown rapidly in recent years, and the CEOS Chair term is seen as a further opportunity to contribute to international cooperation and to re-assert the crucial role of Earth observations.

Stefano noted that ASI will seek to maintain CEOS' momentum, continue focus on the existing priorities, and work to ensure further development of the Constellations concept. ASI will work to ensure CEOS presence at critical events, and also ensure a high profile in community communications. Immediate priorities will include the development of the 2011 CEOS Work Plan to guide CEOS SEC activities, and further detail on the Plenary arrangements.

Gilberto Câmara (Chair, INPE) sincerely thanked ASI for having stepped up at short notice to take on the CEOS Chair role.

Ivan Petiteville (CEO) recalled several other CEOS priorities for 2011 including: the GCI, Data Sharing Task Force, QA4EO, and Global Land Cover (related to JECAM). José Achache (GEO Secretariat) agreed, stressing that CEOS should address more than climate and carbon. The 2011 GEO Work Plan will take us to the completion of the GEOSS in 2015 and will address a wide range of issues within the 9 SBAs. The planned CEOS-GEO meeting in December should advance this discussion. Tim Stryker (USGS) noted that time should be allowed for discussion at SIT-26 on the role of the SBA coordinators and their tasks.

Makoto Kajii (SIT Chair) agreed that the outcomes of GEO-VII and Ministerial should be covered in the planned December meeting.

Gilberto summarised by noting that ASI and JAXA are fully aware of the broader agenda ahead. He hoped that the working groups will take full account of the issues arising from Beijing in relation to GCI, data policy, etc. He also noted that INPE, as a Troika member, will work to ensure due consideration for the broader GEO issues.

26 Finalising the CEOS Rio Statement

Osamu Ochiai (JAXA) introduced the minor revisions to the draft Rio statement and invited comments. Ivan Petiteville suggested that the statement may not be entirely up to date with the CEOS Report to GEO Plenary as the Rio Statement does not reflect the priorities listed in the GEO Beijing Declaration. There were some suggestions regarding specific wording, including:

- NRSCC noted the terms *CEOS Agencies* and *CEOS Member Agencies* are used interchangeably in the document and these need to be rationalised;
- DLR suggested to clarify use of the term *Earth Science programmes*;
- ASI provided some suggestions on language.

Gilberto Câmara (Chair) suggested that CEOS SEC address these points and finalise the statement before the end of the day. He thanked JAXA for their leadership on this.

27 Calendar for 2011

Tim Stryker (USGS) ran through the key dates for the coming 12 months. The following key CEOS meetings are planned in the lead-up to SIT-26:

- CEOS-GEO Work Plan (13th-14th December, Geneva);
- CEOS-GEO Action Workshop (18th-20th January, Washington DC);
- CEOS Working Group on Climate (March, Italy);

- CEOS SIT-26 (16th-17th March, Tokyo).

The CEOS website has an on-line calendar which is kept current and includes links to further information on each event. Tim encouraged agencies to share schedule information and meeting details with him and other members of the CEOS Management Support Team, in order to maximise the value of the on-line calendar.

<http://www.ceos.org/CEOSCalendar/>

28 CEOS publications and outreach

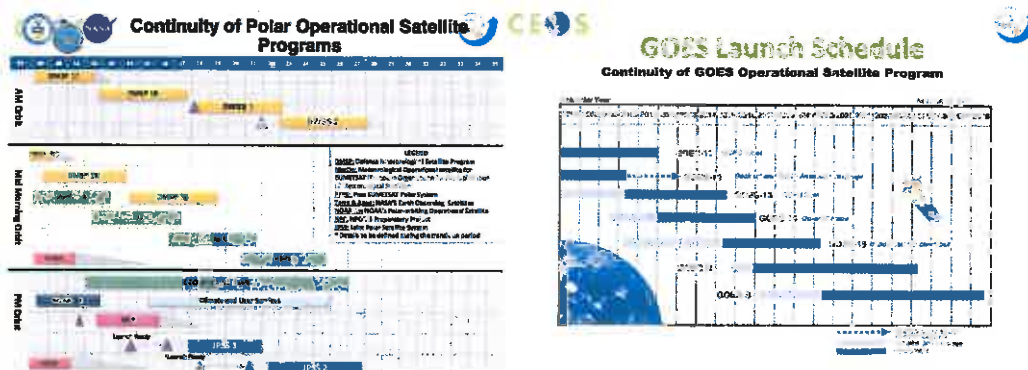
Osamu Ochiai (JAXA) noted the release of the most recent CEOS Newsletter (35th). The 36th edition will be planned for print in February 2011, with articles due on the 20th of December.

Brian Killough (SEO) reported on education outreach activities and communications efforts, including the CEOS website and the action tracker tool. He reported that 20,000 visitors came to the CEOS website in 2010 from 160 countries, noting that comments and suggestions on the website should be directed to Kim Keith.

The CEOS action tracking tool is at www.ceos-actions.org and will be used to support tracking CEOS-GEO actions online, and will be discussed at the January CEOS-GEO Action Workshop.

29 Short agency reports

NOAA: Mary Kicza (NOAA) reported on the development of NOAA's Joint Polar Satellite System (JPSS), noting that JPSS-1 will be an NPP clone, while JPSS-2 will be open to competitive bids. She also gave an overview of the GOES launch schedule.



EC: Mauro Facchini (EC) explained that the space component of GMES involves ESA (as the prime partner), EUMETSAT, and other European national space agencies. He noted that discussions are currently underway to ensure the operational programme after deployment of the Sentinels. GMES data policy is expected to be public good with full and open access to data, though there may be some security-related restrictions, and GMES will seek not to disturb existing Earth observation data markets. GMES will feed into international partnerships and it is expected that they in turn can feed data back into GMES Services, and GEO and CEOS are seen as key partners.

Gilberto Câmara (Chair) commended the EC on its decision to pursue a fully open data policy.

DLR: Klaus Schmidt (DLR) directed members to the written DLR report, noting that ENVISAT's lifespan has been extended to end of 2013 at least, and GRACE will operate through to end of life in cooperation with NASA. He noted that TerraSAR-X continues to operate, now in formation with TANDEM-X, and that DLR plans to produce a global DEM available to PIs for science purposes. He noted that the CHAMP mission is now complete, and that ENMAP will be launched in 2014, and a methane LIDAR mission will be launched in 2014.

CRESDA: Zhigang Wang (CRESDA) explained CRESDA's activities including in relation to the CBERS, HJ and ZY series satellites. CBERS has experienced rapid growth in the number of domestic users for its satellite data products in China, notably for R&D, agriculture, and land management. CRESDA is a national centre for land observation satellite data, processing, storage and distribution, and has an extensive network of international links including ground stations in South Africa and Thailand.

Gilberto Câmara (Chair) welcomed the active participation of CRESDA on the CEOS Working Groups, Virtual Constellations, and in other areas.

ISRO: Kiran Kumar (ISRO) presented a summary of ISRO's Earth observation program. The program currently has nine satellites in operation, including Oceansat-2 (OCM) which is a part of the CEOS OCR-VC, and scatterometers which are part of the OSVW-VC. Resourcesat-2 will be launched in December and have a global acquisition capability. A total of 15 missions through to 2014 have been identified for launch.

ISRO invited all CEOS agencies to the 2012 Plenary in India.

CSA: Savi Sachdev (CSA) reported that CSA has been reorganised to better align CSA programmes with government priorities, better service government partners, and better promote the three key business streams: Space Utilization, Space Exploration, and Space Science & Technology. The RADARSAT Constellation has entered Phase C and was awarded funding for three satellites. The Polar Communication and Weather, and Chemical and Aerosol Sounding Satellite (CASS) missions are under study. New northern ground stations are being planned and these may be of interest to space agencies for future use.

WMO: Barbara Ryan (WMO) noted that WMO members are the national hydro-meteorological services of countries. She also noted that WMO co-sponsors GCOS, IPCC and WCRP. The space component of the GOS was shown including an increasing number of research missions, and SCOPE-CM pilot projects were explained. An Architecture for Climate Monitoring from Space has been outlined by WMO and will be available for review by CEOS agencies. More coordination is needed in this area, with WMO hoping to leverage CEOS contributions.

NASA: Mike Freilich (NASA) reported on the 13 operating research satellites NASA is currently flying, including continued A-Train operations. NASA's Earth Science Division has gained significant extra funding during the last year and subsequent approval for an ambitious programme of 16 new spacecraft between 2010 and 2022 including GLORY, Aquarius, OCO-2, GPM, SAGE-III, and SMAP. Mike reported that NASA has an integrated programme for water availability and quantity with many supporting missions, and a similar number of missions which will focus on the carbon cycle.

ESA: Volker Liebig (ESA) noted that ENVISAT is in its 9th year and it will run until at least 2013 with a changed orbit, and ERS-2 should continue until mid-2011. He noted that all internet datasets produced by ESA are available on a free and open basis, though commercial distributors remain for radar imagery. He reported that: CryoSat has been launched since last Plenary; GOCE is operating smoothly again after resolving an anomaly; and, SMOS datasets are now available.

ESA's Climate Change Initiative is underway and 11 ECVs will be addressed in the first wave, with a further 10 to be launched next year. The Sentinel satellites are under development and the ground segment is being implemented. Sustainability of an operational GMES system is the most important political challenge for the coming years.

30 Future CEOS and SIT Chairmanships

Gilberto Câmara (Chair) gave some parting thoughts to the Plenary, thanking Barbara Ryan for proposing to Gilberto that INPE accept the role of CEOS Chair. He thanked José Achache for giving CEOS direction and motivation to progress forward. He thanked the Working Group Chairs, the Virtual Constellation leads and participants, the FCT and CTF teams, ESA for supporting Ivan Petiteville as the CEO, and USGS and NOAA for supporting the incoming CEO (Tim Stryker) and Deputy CEO (Kerry Sawyer). He thanked JAXA for their support as SIT Chair, ASI for stepping up as CEOS Chair 2011, and ISRO and CSA for agreeing to terms in 2012 and 2013 respectively. He thanked SANSa for initiating CEOS Data Democracy efforts, and GISTDA and JAXA for championing the *Satellites, Science and Society* publication. He extended a welcome to NSMC and CRESDA, participating in their first Plenary, and thanked GCOS for its participation.

He extended special thanks to Ivan Petiteville, Brent Smith, and Steve Briggs for their support, as well as a number of other CEOS representatives for their support and valuable contributions.

Finally he thanked INPE staff for their support in arranging Plenary, and the INPE team including Julio Dalge, Hilcéa Ferreira, Márcia Alvarenga, Stephen Ward and George Dyke.

31 Adjourn

Gilberto Câmara (Chair) invited Stefano Bruzzi (ASI) to the floor to accept the Chairmanship on behalf of Enrico Saggese, and the meeting was adjourned.

List of Participants

Agency	Name
ASI	Stefano Bruzzi
	Vittorio De Cosmo
	Simona Di Ciaccio
CNES	Steven Hosford
CONAE	Conrado Varotto
CONAE	Alberto Ridner
CRESDA	Wang Zhigang
CRESDA	Fu Qiaoyan
CRESDA	Li Zhaozhou
CSA	Savi Sachdev
CSA	Guy Seguin
CSIRO	Alex Held
DLR	Klaus Schmidt
EC	Mauro Facchini
EC-JRC	Mark Dowell
ESA	Volker Liebig
ESA	Stephen Briggs
ESA	Simonetta Cheli
ESA	Ivan Petiteville
EUMETSAT	Robert Husband
GCOS	Carolin Richter
GEOSEC	José Achache
GEOSEC	Giovanni Rum
GISTDA	Poonthip Sirikulchayanon
GISTDA	Taksaporn Sungsi
GISTDA	Chaowalit Silapathong
INPE	Gilberto Câmara
INPE	Julio Dalge
INPE	Hilcéa Ferreira
INPE	Márcia Alvarenga
INPE	Tania Maria Sausen
INPE	Stephen Ward
ISRO	Kiran Kumar
ISRO	Rajeev Kumar Jaiswal
JAXA	Makoto Kajii
JAXA	Chiyoshi Kawamoto
JAXA	Osamu Ochiai
NASA	Mike Freilich
NASA	Richard Eckman
NASA	Brian Killough
NASA	Chris Blackerby
NASA	Steve Neeck
NASA	Kim Keith
NOAA	Mary Kicza

NOAA	Kerry Sawyer
NOAA	D. Brent Smith
NOAA	Stan Wilson
NOAA	Mitch Goldberg
NOAA	John Bates
NOAA	Eric Madsen
NRSCC	Li ChungRong
NRSCC	Tang LingLi
NRSCC	Guocheng Zhang
NRSCC	Hongbing Niu
NSC	Per-Erik Skråvseth
NSMC/CMA	Jinsong Wang
SANSA	Asanda Ntisana
UKSA	Mark Churchyard
University of Miami	Falk Amelung
USGS	Timothy Stryker
USGS	Doug Muchoney
USGS	Tom Holm
US State Dept	Robert Ford
WGCV/ESA	Pascal Lecomte
WGCV/ESA	Marie-Claire Greening
WGCV/USGS	Greg Stensaas
WGEDU/NOAA	George Jungbluth
WGISS/GISTDA	Pakorn Apaphant
WMO	Barbara Ryan
WMO	Azusa Sakamoto

24th CEOS Plenary Actions
v1.0 FINAL

No.	Action	Due Date
24-1	CEOS Agencies encouraged to register their datasets and information resources with the GEOSS Common Infrastructure.	November 2010
24-2	CEO to investigate the timeliness of data provided by CEOS agencies in response to activation of the Disaster Charter for the recent Pakistan floods, and report on any lessons learned.	SIT-26
24-3	CEOS Chair to work with the SEO, outgoing and incoming CEO, and GEO Secretariat to study possibilities for rationalisation of the multiplicity of portals and tools provided by CEOS and its agencies (including the LSI portal and CWIC) in support of GEO objectives.	SIT-26
24-4	CEOS and SIT Chairs, aided by the CEO, to review and confirm current SBA Team Coordinators to check whether all are active or whether replacements are required. A related SIT-26 agenda item should be included.	SIT-26
24-5	CEOS Agencies encouraged to provide resources for populating the Data Democracy Portal datasets and training materials.	SIT-26
24-6	CEOS Chair, in consultation with SIT Chair, WGClimate Chair and CTF Co-Chairs, to poll opinions on the best way forward organisationally for the ambitions expressed by the CEOS Carbon Task Force.	November 2010
24-7	CEOS Agencies to review and comment to Mitch Goldberg on the draft CEOS Climate Action template.	November 2010
24-8	CEOS Chair to arrange a response to the recent request for assistance in a peer review of CDRs and ECVs received from GCOS & WCRP.	October 2010
24-9	Mitch Goldberg, in coordination with WGClimate, to lead development of the CEOS Response to the 2010 GCOS Implementation Plan, and to support GCOS as required for the development of the GCOS IP Satellite Supplement. CEOS Agencies encouraged to supply suitable supporting experts.	October 2011
24-10	CEOS Agencies with supporting missions are encouraged to respond to the request for support to JECAM. LSI will serve as the CEOS point of contact.	December 2010
24-11	CEOS Agencies encouraged to provide nominations to WGISS Chair for the WGISS Vice-Chair role in 2011-2013, continuing as WGISS Chair 2013-2015.	23 May 2011
24-12	CEOS Agencies encouraged to consider taking on responsibility for QA4EO secretariat and website maintenance.	November 2010

24-13	WGCV will provide a list of CEOS endorsed reference sites over which CEOS Member Agencies should collect and provide information in order to facilitate interoperability and underpin internationally harmonised calibration/validation. The list will also include recommended resource requirements for active agency support of site instrumentation and maintenance.	SIT-26
24-14	CEOS Agencies to respond to the 2011 call for programme updates in support of the annual update of the CEOS MIM database.	May 2011
24-15	CEOS Chair to liaise with GCOS on support for the COP-16 side event on observations, and to ensure synergy with the proposed CEOS side event.	October 2010
24-16	CEOS and SIT Chairs, in coordination with Climate SBA and WGClimate, to liaise with GCOS to plan coordination on the key GCOS documents and activities in 2011.	November 2011
24-17	CEOS Agencies to review the GEO Geohazards Supersites White Paper and to respond to the data requests therein (including the urgent requests for the GEO Ministerial). Incoming CEOS Chair and SIT Chair will ensure suitable coordination and interface.	November 2010
24-18	CEOS Agencies requested to support the coordinated FCT data acquisition strategy in 2011.	SIT-26
24-19	CEOS Chair to seek guidance from GEO (GFOI Task Force) on future data coverage priorities – and how these might be driven by linkages with World Bank, UN-REDD, and Paris-Oslo (REDD+).	SIT-26
24-20	CEOS Chair will request the GEO FCT task to provide a status report on the development of products from data supplied to date and their exploitation by ND authorities.	SIT-26
24-21	CEOS agencies to provide final comments on the proposed Terms of Reference for the standing Working Group on Climate and to respond to the expected request for representatives.	30 November 2010
24-22	CEOS Chair, in coordination with WG Chairs and CEOS SEC, to develop a proposal for CEOS Plenary 25 for how best to incorporate ambitions of the Data Democracy initiative within the CEOS structure.	CEOS Plenary 25
24-23	CEOS Chair to contact CGMS and WMO to explore possibilities for closer coordination on radiofrequency matters and to bring a proposed way forward to SIT-26.	SIT-26
24-24	CEOS representatives to the GEO Ministerial Task Force to coordinate the conclusion of the CEOS inputs to the various GEO Summit related meetings.	GEO-VII

