

MINUTES OF THE 28th CEOS PLENARY MEETING

29th-30th October 2014

Tromsø, Norway

(Plenary presentations and Plenary Agenda can be found on the CEOS Website)

1. Welcome and Opening Remarks

The CEOS Chair, Alain Ratier (EUMETSAT) opened the 28th CEOS Plenary by welcoming all the Participants to Norway. He introduced the meeting co-hosts, Met Norway and the Norwegian Space Centre, explaining that Norway was currently the Chair of the EUMETSAT Council. The Chair then invited the co-hosts to address the meeting.

Bo Anderson, Director General of the Norwegian Space Centre, welcomed the Plenary Participants to Norway and noted that, whilst many of the CEOS Space Agencies owned and operated satellites, Norway was a high user of satellite data and was, in fact, the highest user per capita in Europe. Norway gratefully acknowledged the contributions of CEOS and was therefore pleased to be able to host the CEOS Plenary.

Jens Sunde, Deputy Director-General of MET Norway also welcomed the CEOS Participants to Tromsø, which is known as the remote sensing capital of Norway. Jens reinforced how important satellite data are for meteorological services for the monitoring of weather, ocean state and sea ice. Space observations play an extremely important role in a region so far north, where *in situ* observations are very scarce. Recognising the contributions that CEOS has made over the past 30 years, Jens wished CEOS success for the next 30 years.

Following the welcome, the Chair invited Plenary Participants to introduce themselves during a tour-de-table.

The draft agenda was then reviewed and endorsed, noting that for efficiency reasons key GEO agenda items would be grouped together, resulting in agenda item 27 “*CEOS Preparations for Key GEO Meetings*” being inserted directly after agenda item 12.

2. Chair Perspective on 28th CEOS Plenary: Alain Ratier – CEOS Chair

The Chair began by outlining the major topics that will be addressed during the Plenary, together with the expected main outcomes:

- Advancement of the CEOS Virtual Constellations (VC) and Working Groups (WG)
 - A way forward for the LSI VC
 - The approach for addressing the outcomes of the Climate Symposium
- Support to Key Stakeholders Initiatives:
 - Assignment of Implementation Responsibilities for CEOS Strategy for Carbon Observations from Space
 - CEOS approach to responding to the GEOSS Water Strategy
 - Endorsement of the CEOS Acquisition Strategy for GEOGLAM
- Outreach to Key Stakeholders:
 - CEOS proposed involvement in the development of the Post-2015 GEO Implementation Plan
 - CEOS preparation for the 2015 GEO Ministerial Summit
 - CEOS preparation for COP-21 in November-December 2015
 - CEOS preparation for the UN World Conference on Disaster Risk reduction (WCDRR) in March 2015

- CEOS Tromsø Statement
- Organisational Issues:
 - CEO/DCEO transitional arrangements
 - SIT Vice-chair nominations
- Identification of 2015 CEOS Chair Priorities

3. Membership Matters: Paul Counet – CEOS Chair Team

Paul noted that it was not planned to discuss potential new members at this Plenary, but informed Plenary that requests had been received from: (i) The EU Satellite Centre (Spain) to become an CEOS Associate Member, and (ii) Agence d'Etudes et d'Observations Spatiales (AGEOS – Gabon) to become a CEOS Member. These requests were received before the 2014 Plenary but did not contain the full set of information necessary for CEOS to make a decision. Further information is currently being sought so that a decision on membership can be made by CEOS at a later date. In the meantime, as the EU Satellite Centre is based in Europe, they will be invited to make a presentation under AOB describing their potential contributions to CEOS.

4. Status of Actions arising from previous CEOS Plenaries: Kerry Sawyer - CEO

The CEO, Kerry Sawyer was pleased to report that all 6 of the outstanding Actions from the 26th Plenary, as well as all 23 of the Actions from the 27th Plenary, had been closed during the course of the year.

5. Introduction of the Tromsø Statement: Alain Ratier - CEOS Chair

Following careful consideration as to whether there was a need for a CEOS Statement from this Plenary it was concluded that, as 2015 is an exceptional year with three key events that are very important for CEOS (i.e. COP-21, World Conference on Disaster Risk Reduction and the GEO Ministerial), a CEOS Statement would be appropriate. The draft Tromsø Statement was then introduced, noting that it builds upon the Montreal Statement and places emphasis on conveying the main CEOS messages at these three key events in 2015.

CEOS participants were invited to comment on the Draft Tromsø Statement, noting that it would be updated during the course of the Plenary to reflect comments received, and subsequently presented for endorsement under agenda item 31. The Chair also reminded participants that the agreed text would be a legacy for JAXA, the incoming CEOS Chair.

6. Presentation of the CEOS Three-Year Work Plan: Kerry Sawyer - CEO

The Chair introduced this agenda item reminding Participants that this document provided a reference point by which CEOS could monitor progress. The Chair also noted that it was a rolling plan which would continually develop, and thanked the Virtual Constellations (VCs), Working Groups (WGs), SIT Team and the CEO for their contributions.

Kerry pointed out that the current CEOS Three-Year Work Plan ran from 2014-2016 and that the development of the rolling 2015-2017 Three-Year Work Plan would take into consideration the prevailing status, including the objectives/deliverables that had already been achieved. Kerry noted that the expressions of cooperation within the Montreal Statement were translated into expected outcomes for 2014-2016. The expected outcomes for the 2014-2016 Work Plan are grouped around 9 thematic areas: (i) Climate Monitoring, Research, and Services, (ii) Carbon Observations, Including Forested Regions, (iii) Observations for Agriculture, (iv) Observations for Disasters, (v) Capacity Building, Data

Access, Availability and Quality, (vi) Advancement of the CEOS Virtual Constellations, (vii) Support to Other Key Stakeholder Initiatives, (viii) Outreach to Key Stakeholders, and (ix) Organisational Issues.

The Three-Year Work Plan, emphasises objectives and deliverables together with associated timescales and implementation responsibilities. As such, it provides a solid foundation for measuring CEOS achievements. The current Work Plan was released in June 2014 and contained 80 deliverables for the three-year period. Due to the complete revision of the Work Plan, the on-line action tracking system is currently being updated to accommodate the new Work Plan format and, until this is available, deliverables are being tracked using an Excel spreadsheet. This spreadsheet contains a colour-coded system to track the current status (e.g. Closed, Open and On-track, Open and Delayed, Status Unknown). Of the 36 actions due for completion by the end of 2014: 14 are closed, 15 are open and on-track, 4 are open but delayed, and 3 have an unknown status (update expected shortly).

Due to the rolling nature of the CEOS Three-Year Work Plan, the development of the 2015-2017 Work Plan must begin now, and all CEOS entities should be considering, and providing, their identified objectives/deliverables and activities for this new version of the Work Plan. It is proposed to produce an initial draft by mid-December 2014 reflecting the outcomes of both the CEOS and GEO Plenaries. This draft will then be circulated to contributors for review in early January 2015. In mid-January 2015 a CEOS-GEO bilateral will take place where outcomes from the discussions on CEOS and GEO priorities will be taken into consideration. By late January 2015 an updated draft will be circulated to all CEOS Agencies with comments and inputs due by early February. The final version of the CEOS 2015-2017 Work Plan will be published in mid-February 2015. Kerry thanked all the past contributors and looked forward to a successful next version.

The Chair concluded by reinforcing the fact that this was a living document, and a tool against which CEOS can gauge its progress. Furthermore, the Chair noted that this first Three-Year Work Plan was an excellent achievement by everyone involved.

7. GEO Secretariat Report: Barbara Ryan - GEO SEC

GEO Secretariat Director Barbara Ryan began by thanking CEOS for its contributions as a Participating Organisation of GEO and recognised the particular benefits that CEOS brings to GEO.

Barbara reminded participants of GEO objectives and noted their extensive reflection in the CEOS Work Plan. Barbara also recalled that the aim of GEO was to create a System of Systems based on the original 9 Societal Benefit Areas encompassing all types of observations (space, *in situ*, airborne, marine,...). GEO membership has increased to 94 member countries (roughly half of UN membership). In addition, there were 77 Participating Organisations, of which CEOS is a major contributor.

Barbara also noted in order to maximise ownership and encourage further engagement in GEO activities, GEO recognises the importance of broadening the stakeholder network to include the private sector (remarking that there are many definitions of “private sector” and the term “non-governmental” covers them all) ranging from organisations such as the World Bank to the commercial sector and SMEs. However, early consideration of the issue by a “Private Sector Think-Tank” identified that with such a large diverse community, one engagement approach did not fit all, and a wide set of mechanisms would be needed. It was also noted that Member Countries want to have a key role in this dialogue and the way forward would be an important discussion topic at the forthcoming Executive Committee (EXCOM) meeting and GEO Plenary.

The presentation then focused on CEOS contributions to the GEO Work Plan, particularly in relation to major global tasks. Concerning the Global Forest Observations Initiative (GFOI) of which CEOS is a major partner, it was noted that GEO has had clear guidance from the GEO Governing Body that it will not run operational programmes (except for the GEOSS Common Infrastructure Programme). Therefore, GEO is currently transitioning the coordination activities of the GFOI to the FAO and this is currently under negotiation. Concerning GEOGLAM, a major development has been the guidance from the G20 Agriculture Ministers encouraging GEOGLAM to work closely with the Agricultural Market Information System (AMIS). This has led to crop monitoring information being delivered on a monthly basis for the past year, resulting in positive feedback from the marketing community. Whilst *in situ* data is essential in this process, the availability of satellite data is extremely important. GEOGLAM is also coordinating with "Countries at Risk" through Early Warning Crop Monitoring. This has been made possible through the early research work done by JECAM and the support of the Asian community, which GEO hopes will continue. Concerning the Disasters SBA, GEO recognises CEOS' strong links with the Disaster Charter, and GEO encourages CEOS to continue their efforts in this area through the newly established Disasters Working Group. Oceans feature in the CEOS Work Plan through the "Blue Planet" initiative as well as through the Virtual Constellations.

Barbara informed CEOS about the development of the AfriGEOSS regional initiative and the Implementation Plan that will be presented for approval at the GEO-XI Plenary (brochure available). The general aim of this initiative is to condense global activities down to the regional/continental area of Africa, making the most of lessons learned.

With regard to the GEOSS Common Infrastructure, a new web portal is being provided by ESA connected to a central "Discovery and Access Broker" which allows discovery and access to data sources provided by GEO Members and Participating Organisations without the data having to reside within GEO. This is also available to the commercial sector, with the aim of encouraging the use and development of new products to stimulate further economic growth. There are currently 35 brokered data providers that publish 14 million data core resources with other 80 million individual resources (satellite scenes, rain gauge records, etc.).

The winners of the GEO Appathon 2014 will be announced at the forthcoming GEO-XI Plenary which will take place from 13th to 14th November in Geneva.

Barbara also noted that Dr. Gary Geller of NASA will be a U.S. secondment to the GEO Secretariat who will focus on biodiversity activities.

The Chair thanked Barbara for her presentation and noted the positive way in which the Global initiatives continue to develop. With reference to GEOGLAM, it was pleasing to see that progress was being made and that the Data Acquisition Strategy will be proposed for endorsement later on in the Plenary agenda. The Chair then opened the topic for discussion.

Mike Freilich (NASA) thanked Barbara for the recognition of CEOS and the contributions made by CEOS members. Mike asked how the positive contributions by CEOS could be reconciled with the performance ratings of the IN-01 GEO Tasks (which in recent years GEO rated as red and only recently have been rated yellow) when the individual CEOS Task contributions from space-based observations are green. Barbara acknowledged that this was because the *in situ* status brings the overall rating down, and that in the matrix there were some inherent flaws which would be corrected in the future. With regard to *in-situ* observations, there is no counterpart international coordination body comparable to CEOS. Barbara noted that when she participated in CEOS, there was a conscious decision taken that CEOS would not coordinate *in situ* observations. In response, Mike stated that he

understood the logic but was fearful that, from the viewpoint of national decision makers and programmatic leaders, only receiving a yellow rating raised questions as to the effectiveness of national contributions, and whether such investments are a best use of resources, or if such resources would be better used elsewhere. In this respect, he remarked that it would be beneficial if the positive recognition from GEO on the successful CEOS contributions of space-based observations could be reflected in GEO performance-related documents and the matrix.

Mike's suggestion received widespread support from Plenary, and the Chair pointed out that in these difficult funding times unwarranted negative signals are not helpful. Alain Ratier asked that GEO take this into account and noted that this request be recorded in the CEOS plenary meeting minutes.

28-01	CEOS SIT Chair to discuss with the GEO Secretariat the need to ensure that the very successful CEOS contributions to GEO Task IN-01 are accurately reflected in the GEOSS evaluation process that GEO communicates to ministers and national policy-makers at its Plenary.	GEO-XI
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Volker Liebig (ESA) agreed that the new Food and Water initiatives, along with the established Disaster and Climate themes, would bring big challenges for the future especially with the predicted population increases. Concerning *in situ* coordination, Volker noted that this will be a difficult area to address as within Europe there is no coordination of *in situ* measurements, with everybody acting independently, which seems to work but there is no obvious solution for harmonisation. Stephen Briggs (ESA) agreed with the overall comments on *in situ* measurements and coordination but pointed out that some progress had been made in terms of ocean measurements, and through GCOS, which would suggest that closer ties are needed between GEO and GCOS in this area in the future. Ivan Petiteville (ESA) commented on the user community aspect, and that the space sector was perceived as very much technology-focused and that there is a need for a more user-friendly interface. This could be provided by organisations such as GEO that are more focused on user communities.

8. Progress on the CEOS Implementation of GEOSS Space Segment: Pascale Ultré-Guérard - SIT Chair

The presentation was divided into 3 parts:

- CEOS contribution to the GEO Work Plan 2012-2015
- CEOS leadership of GEO Infrastructure task IN-01-C2
- CEOS Virtual Constellation contributions (reported under agenda item 12)

CEOS contribution to the GEO Work Plan 2012-2015: Pascale Ultré-Guérard - SIT Chair

Pascale explained how CEOS contributes to the GEO Work Plan 2012-2015, which has been designed to meet the 2015 GEOSS Strategic Targets (described in Document 7 presented at GEO X). Pascale described how the GEO Work Plan was divided into three major parts: Infrastructure; Institutions and Development; and Information for Societal Benefits. The GEO Work Plan contains 26 Tasks that include a number of Task Components. CEOS, as the contributor of space-based observations to GEO, commits large resources and is identified as the lead in 16 of the 60 Tasks/Components, and has identified roles in 21 others. The main CEOS contributions to the Tasks/Components were described and Pascale thanked all contributors for their dedication and commitment. Pascale noted that CEOS needs to update the information on the Disaster Task/Component (D1-01-C1) and JAXA needs to provide a nominated lead to the Water Task/Component (WA-01-C1: to

be provided prior to the January 2015 GEO-CEOS Coordination meeting). Pascale was pleased to report that all 47 CEOS-GEO 2013 actions, including the 23 outstanding actions reported at the SIT Technical Workshop, had been dispositioned and all were closed by virtue of mapping to the 2014-2016 and 2015-2017 Work Plans, by updates to the Actions, or by lack of update due to inactivity. It remains to be established how the new actions and deliverables will be entered into the revised CEOS action tracking tool.

In addition, Pascale noted some highlights and achievements that would be further discussed during the course of the Plenary:

- Climate Activities
 - First meeting of the CEOS-CGMS WGClimate
 - Successful Climate Symposium (CEOS climate brochure provided in information pack)
- Carbon Activities
 - Release of the CEOS Strategy for Carbon Observations from Space (CD copy made available)
- Disasters Activities
 - Creation of the WGDisasters
 - Preparations for WCDRR
- Progress of the Space Data Coordination Group for Global Forest Observations Initiative.

CEOS leadership of GEO Infrastructure Task IN-01-C2: Brian Killough - SEO

Brian Killough (SEO) reported on the leadership of the GEO Infrastructure Task IN-01-C2 which is one of four components within IN-01. Regarding earlier discussions, he reminded the Plenary that surface/*in situ* components are covered (IN-01-C1) within the overall task envelope. Brian noted that there has been/will be 10 new missions in 2014 with a further 8 planned for 2015 and asked Agencies to provide any known launch schedule updates in order to keep the launch profile up-to-date (which is published on the CEOS website). A further point to note was that when the CEOS-CGMS WGClimate met in March 2014, and focused on the ECV inventory, the inclusion of *in situ* data records in the Inventory was discussed.

In conclusion, Brian noted that CEOS is meeting its objectives in this GEO Work Plan Task and CEOS agencies are contributing a large amount of data, from the 109 missions operated by CEOS, to support global initiatives (GEO Task IN-01-C2 is classified as green). However, as discussed previously, the performance of the overall Task (IN-01) has been classified as “Yellow” due to *in situ* considerations.

The Chair concluded that this summary demonstrated CEOS' commitment to GEO and congratulated all those involved. Alain then clarified that Jason-3 was a joint Europe/U.S. mission, the partners being EUMETSAT, CNES, NOAA and NASA.

Klaus Schmidt (DLR) asked for a fundamental discussion on the commitment of CEOS to *in situ* data coordination and the Chair, acknowledging the seriousness of the topic and with the agreement of Plenary, postponed consideration of *in situ* data to agenda item 12.

Report on CEOS Virtual Constellations (addressed under agenda item 18)

9. GCOS Status and Plans: Carolin Richter - GCOS

Carolin presented an overview of where the GCOS programme fits within the international arena, and its cross-cutting relationship with the many climate programmes. Being a partner organisation, it is important for GCOS to discuss how best to collaborate with the GEOSS and this will need to be better addressed over the next few years. Carolin provided an overview of GCOS' achievements over the past 20 years along with a description of the three expert panels that GCOS works with in the atmospheric, oceanic and terrestrial domains, noting that whilst space observations are used wherever feasible to derive Essential Climate Variables (ECVs), for all three domains, heavy reliance is also placed on *in situ* observations.

After 20 successful years, GCOS acknowledges the need to secure its continued success through the ability to adapt to future science requirements. During 2013, a review was instigated by the sponsoring organisations, through an independent review board of experts, to assess the added value of the GCOS programme. The review has concluded and the report was made available in March 2014. It contained a list of Strategic Recommendations, Strengthening of Partnerships (including GEO) and a revision of the Memorandum of Understanding for the WMO Congress to endorse in May 2015. The main outcome was that the sponsors agreed that GCOS should continue, and over the next two years, renew itself based on the recommendations from the review. It is anticipated that GCOS will support the development of climate services through the Global Framework for Climate Services (GFCS), and to this end, a number of questions have been formulated:

- What needs to be observed to support Climate Services?
- What observations are needed to make the right decisions on adaptation and mitigation measures?
- What observations are needed to assess impacts of adaption and mitigation actions?

GCOS is currently undergoing a Continuous Improvement & Assessment Cycle and has already begun to prepare the next GCOS Status Report to be available by end of 2015 for SBSTA 43 at COP21, in Paris, France. It will review the overall status of each Essential Climate Variable, assess progress against the 2010 GCOS Implementation Plan and identify gaps. In parallel with the Status Report, GCOS will have to start drafting a new Implementation Plan which requires that GCOS will consider new developments, systems and frameworks, such as the Global Framework for Climate Services and the Global Earth Observation System of Systems. It will also need to take into account the findings of the Intergovernmental Panel on Climate Change Fifth Assessment Report, the ICSU-led initiative Future Earth, the IOC-led initiative Blue Planet, and the UNEP-led Programme of Research on Climate Change Vulnerability, Impacts and Adaptation (PROVIA). The new GCOS Implementation Plan, to be published at the end of 2016, will be a milestone that will influence the agenda for climate observations on a global and regional scale. GCOS is planning to submit the Implementation Plan to SBSTA 45 at COP22, as a follow-up document to the Status Report.

During 2014, GCOS held workshops on “Observations for Adaption to Climate Variability and Change” and “Observations for Climate Change Mitigation” and reports from these workshops are available on GCOS website. Carolin also informed CEOS about two forthcoming meetings in 2015:

- “Enhancing Observations to support preparedness and adaption in a changing climate – Learning from the Fifth IPCC Assessment Report (AR5) – 10-12 February 2015, UNFCCC, Bonn, Germany
- Tentative title: “Global Climate Observations – Road to the Future” – GCOS Science Conference – launch of the New GCOS Implementation Plan (late 2015/early 2016).

The Chair welcomed the GCOS report and offered EUMETSAT support for the hosting of the event associated with the launch of the new GCOS Implementation Plan. The floor was then opened for questions and comments.

Adam Lewis (Geoscience Australia) raised the question of Earth Observation cross-cutting issues such as inland water quality, which cuts across carbon, biodiversity, health and climate and where it should reside. Stephen Briggs (as Chair of the GCOS Steering Committee) commented that from the two presentations from GEO and GCOS, it was apparent that there was convergence and complementarity between the two organisations, and the experience gained by GCOS over the years in how observations can be organised with specific objectives in mind is very important. The breadth of GEO's ambitions is a challenge and GEO can learn from the progress that GCOS has made to date. From the GCOS presentation it was clear that GCOS has evolved its programme objectives to respond to adaptation and mitigation in addition to what it considered as its core activities. With this evolution there are definitely benefits to be had by closer cooperation between GEO and GCOS and this should be encouraged. John Bates (CEOS-CGMS WGClimate Chair) noted that from the perspective of the CEOS-CGMS Working Group on Climate it is good to get consolidated/validated requirements from GCOS which in turn are fed into climate services. Many of the products or services that are being fulfilled are at what is termed the "boundary" and it would be helpful when formulating the next set of requirements to include the elapsed time to product delivery, and the trade-off with product quality when reducing this elapsed time.

10. Update on Copernicus: Reinhard Schulte-Braucks – European Commission (EC)

Reinhard reported that six programme milestones had been reached (the sixth only occurring in last few days) which were: (i) securing of the €4.3Bn budget for 2014-2020; (ii) adoption of a full, free and open access policy to data; (iii) the successful launch of Sentinel 1A; (iv) the adoption by the European Parliament for the legal basis for the Programme; (v) the first image presented to the press; (vi) the signing over of the ESA component of the budget to allow ESA to implement the programme for the next 7 years. A similar agreement will be made with EUMETSAT for their element of the budget next week (Sentinel 4+5 instruments are flown on EUMETSAT satellites).

By 2020 there will be eight Sentinel satellites in orbit providing data for Copernicus Services, although it is acknowledged that the Sentinels will not provide all the data required so there is a budget to purchase data from "cooperating missions". The objectives of the six Sentinels were reviewed along with the predicted time scales for launch and the expected availability of data. Discussions on the dissemination of data were currently being reviewed as the Sentinels are expected to be downloading ~8TB of data per day which cannot be accommodated by the Web. Therefore, there are two options being considered, that of web mirroring which will require a high bandwidth connection or cloud computing ('hosted computing' - it is hoped that Space Agencies from EU Member States will also contribute) but this will need the Copernicus core ground segment to be upgraded. The internal circulation network has been established, connecting the various ground stations and the servers, which will be connected to the dissemination network, with internet access for everybody. The Copernicus Service providers, who will be paid to provide more user-friendly data, will have privileged data access and will be encouraged to use cloud computing. There are six Copernicus Services: Land Monitoring; Marine Monitoring; Atmosphere Monitoring; Emergency Management (which could provide complementary support to WGDisasters activities on Disasters Risk Reduction); Security and Climate Change (in the process of being established). Reinhard concluded his presentation by showing Sentinel-1A data and the first Sentinel-1A sea-ice chart.

The Chair congratulated Europe on entering into a new era in space and opened the floor for questions. Mike Freilich (NASA) asked for clarification as to what, and from whom, non-Sentinel data would be purchased, and did this include both the private and the public sectors? Reinhard said it included both. At present, the high-resolution data for Emergency Management is being purchased from national as well as commercial missions. Mike agreed that in the case of Emergency Management the data was time-critical, and he was more concerned with the routine purchasing of national data as this went against GEO principles of free and open access. Reinhard explained that it was unlikely that routine data would be purchased from national sources and that the data budget would not support this in the longer term. It would be up to the Space Agencies to consider any policy change. Volker Liebig (ESA) explained that the high resolution data providers operated in the commercial sector and this was an area where the data would need to be purchased to maintain the market. Nobuyoshi Fujimoto (JAXA) asked about the data policy with respect to the Security Service and how this is managed. Reinhard explained that this service was concerned with Civil Security and not Military Security (the data is not of high enough resolution for this purpose). However, sometimes there are instances where the field of surveillance overlaps with military activities, and maps of such areas have been provided to the Red Cross and other similar organisations for humanitarian reasons (e.g. evacuation from around the theatre of battle). Otherwise, for example, it includes activities such as land and marine border monitoring.

With no further questions, the Chair closed the discussions on this agenda item.

11. Agenda Item 11: Status of the GEO Implementation Plan 2015 WG activities (Barbara Ryan) and Agenda Item 12: Discussions on further CEOS engagement in the development of the GEO Strategy (Implementation) Plan 2025 (CEOS Chair)

Barbara placed the activity in perspective by explaining that this was the development of the Strategic Plan (SP) 2016-2025 for Implementing GEOSS, and is a direct response to a request from Ministers at the 2014 Summit where the Implementation Plan (IP) Working Group (IPWG) was mandated to prepare an Implementation Plan for the next decade. As a Strategic Plan it will also look at the function/actions of GEO and take into consideration lessons learned over the past 9 years. The draft document will respect the “2014 GEO Ministerial Declaration” and the “Vision for GEO 2025” (CEOS participated in the team that created the document) adopted by the GEO-X Plenary. The draft Strategic Plan, currently out for review, will be presented at GEO-XI Plenary (Geneva) for discussion and guidance.

The report will focus on three main functions of GEO through 2016-2025 to: (i) advocate for the value of Earth observations as the foundation of environmental information; (ii) engage with stakeholder communities to address everyday societal challenges, and (iii) deliver critical data, information and knowledge to inform decision-makers. The IPWG will identify specific objectives for each of the areas and then insert targets and deliverables for 2016-2025. It is at this point that the inherent monitoring difficulties identified and discussed earlier will hopefully be corrected. The GEO Strategic plan will follow the following layout; Introduction; Purpose, Scope and Strategic Objectives; Areas of Action / Core Function; targets and Deliverables for 2016-2015; Management; Governance – it is at this point that the letter sent from CEOS referring to engagement of Participating Organisations will be discussed; Resources through 2015; and Getting to Action. Barbara then explained what is new in the IPWG Proposal. She encouraged all CEOS entities, and in particular the CEOS delegation attending the GEO-XI Plenary, to read the Draft Document 6 as there are enough “hooks” in it to make substantial changes as we approach the next decade, and to steer away from some of the more bureaucratic functions that have perhaps held GEO back.

The Chair thanked Barbara for the presentation, noting that it provided a fresh perspective, and also recalled that the Implementation Plan had now become the Strategic Plan. During the discussions, the Chair proposed that there should be clarification on the questions raised in the CEOS letter to GEO, i.e.: (i) Involvement of CEOS in the Governance framework of GEO, and (ii) The integration of *in situ* and satellite data. The topic was then opened for questions and comments.

Chu Ishida (JAXA) asked for clarification on the changes to the use of GEO/GEOSS and Implementation Plan versus Strategic Plan. Barbara explained that after many external interviews there was confusion in the community on the use of the terminology between GEO/GEOSS so clarification was needed, and GEO refers to the community whilst GEOSS refers to the end product. With regard to Implementation Plan versus Strategic Plan, although the team was tasked with producing an Implementation Plan, they felt that they needed to go further back to review the GEO strategy and therefore it was “back to basics” and more than just an Implementation Plan, hence the change of name to Strategic Plan. Brent Smith (NOAA) asked about the questions raised by Chair concerning the CEOS letter to GEO and the CEOS role in the GEO Governance structure. Barbara replied that she believes the door is open for CEOS to have a role in GEO Governance and that the letter sent by CEOS has been circulated. The IPWG has supported this request by allowing for this possibility within the governance section of the Strategic Plan. Whilst CEOS representation in this matter is important, the pressure should be channelled through GEO Members to ensure maximum influence in the debate. The Chair felt that CEOS was a special case and should not be viewed as just the proliferation of another Participating Organisation, particularly as CEOS represents the cross-cutting activities of the international Space Agencies. Barbara responded by saying that Participating Organisations are only allowed membership if they can respond to specific GEO Tasks which give value to their membership, and all Participating Organisations have something to offer. The Chair asked about the planning following the forthcoming GEO Plenary, and the lead up to the GEO Ministerial to be held next year. Barbara responded that the inputs and comments collect by the IPWG would be assessed, and much of it incorporated into the Strategic Plan. The timelines are tight and it is unknown if there will be a further opportunity to respond to the next version which is planned to be presented to the next GEO Ministerial. Regarding the venue, Barbara clarified that France is considering hosting the next GEO Ministerial Summit and, if not, Brussels. Russia is not being considered at the moment. From a timing perspective, the GEO Ministerial is likely to take place in either late 2015, or early 2016.

Stephen Briggs (ESA) complimented the IPWG outline plan and said that it appeared to address all the issues, whilst still being open to further input, which is important from a CEOS perspective. However GEO underestimates the contribution of Participating Organisations which contribute about 50% towards activities. Therefore it is not unreasonable to expect some representation in the Governance of GEO, but the form of representation will need careful consideration. It should also not come as a surprise to GEO if the Governing Bodies of some Participating Organisations, that commit large resources to GEO, recognise that they have no say in the running of the organisation and begin to reconsider their future support. With regard to the discussion on the Societal Benefit Areas (SBAs) within the document, the current set of SBAs is good, but not perfect, and could be improved. GEO needs to look more at what is needed, as opposed to reorganising what is already available. Therefore, reorganising the SBA structure in a more coherent way will help improve the overall structure and mechanisms within GEO. Brent Smith (NOAA) noted that the AfriGEOSS initiative does contain Participating Organisations in the governing body, which is a step forward. In addition, with regard to *in situ*, CEOS did have the Integrated Global Observing Strategy (IGOS) which was passed over to GEO and included both *in situ* and space data, so *in situ* was a key constituent piece of the IGOS Themes that were transferred to GEO ownership, becoming GEO Communities of Practice at the 2007 GEO Plenary in Cape Town. Stephen Briggs picked up on Brent’s point about some initiatives

such as GFOI and GEOGLAM having Participating Organisations in their Steering Committees and said this works very well. GEO should not introduce a system that stops such informal arrangements from happening. Klaus Schmidt (DLR), at the invitation of the Chair, raised the question about CEOS involvement in the coordination of *in situ* observations. The Chair responded by explaining that, as far as he was aware, CEOS has no intention of coordinating *in situ* observations, and reopening the discussions from 2007/2008 when Barbara was CEOS Chair, during which it was agreed that CEOS would remain true to its roots and concentrate on the coordination of the EO space community. Notwithstanding the critical importance of *in situ* observations, the Plenary reaffirmed this position, noting that *in situ* observations would still be considered within specific CEOS projects e.g., Supersite monitoring and Calibration/Validation but there would not be a general undertaking of coordinating *in situ* observations within CEOS.

In summation, the Chair noted that as a result of the discussion certain key messages need to be conveyed to the GEO-XI Plenary, which were captured in the following action.

28-02	<p>CEO, in consultation with the CEOS Chair and CEOS Agencies, to develop written and verbal interventions for the GEO-XI Plenary that will:</p> <ul style="list-style-type: none"> i) Emphasise the overarching role of CEOS in coordinating international cooperation on space-based Earth observing systems for GEO; ii) Reaffirm the very successful CEOS contributions to GEO to date, based on the sustained investments of CEOS Agencies; iii) Emphasise the need for a formalised level of CEOS participation in the GEO Governance framework that reflects its unique role and the scale of its contributions; and iv) Underscore the CEOS position that any revised SBA structure accurately reflects the full range of global community needs, and provide a vehicle for the structured and coherent collection of GEOSS requirements. 	GEO-XI
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13. Report on the CEOS/CGMS WGClimate including SBSTA-41 Preparations: John Bates - Chair of CEOS-CGMS WGClimate

John presented a summary of the Working Group activities, reviewing the main 2014 accomplishments with respect to the CEOS Work Plan and the Terms of Reference of the group. John focused on clarifying the Roles and Responsibilities in the flow of requirements to products and services; the setting up of Action Groups for ECV assessment and for defining the ECV Gap analysis process, and applying the Architecture in the context of Climate Services.

John noted that the Working Group is seeking nominations for the Vice-Chair position which will be vacant as of November 2015 (nominations to be provided to John Bates or Pascal Lecomte). John also made reference to the successful 2014 Climate Symposium (reported under agenda item 28) and to the forthcoming "Our Common Future under Climate Change" Conference leading into COP-21 in Paris (discussed further under agenda item 29).

The Chair thanked John for the presentation and commented on the good Work Plan that is structured across the various pillars of the Architecture.

Carolin Richter (GCOS) noted that the establishment of the joint Working Group has greatly facilitated cooperation across the space agencies, CGMS and GCOS and the initiative is highly appreciated. Barbara Ryan (GEO) remarked that in the presentation John referred to a holistic view and a system maturity matrix, and wondered if there was any reference in the architecture to Agriculture, Energy, Water, etc. John responded by saying that it is important to fully understand user requirements rather than addressing specific areas. The Chair

agreed that it was important to align outputs to topics and not the other way around. Stephen Briggs (GCOS/ESA) explained that such a discussion had taken place at the last GCOS Steering Committee Meeting where it was concluded that the current list of ECVs is quite extensive and would cover more requirements than they were currently applied to, and that it was a matter of communication as to how to use them more effectively, rather than define a new set of ECVs. The Chair agreed.

14. Report on WGISS: Richard Moreno - Chair WGISS

Richard (WGISS Chair) reported on the status of WGISS activities during the year focusing on: the Interoperability Interest Group; the Technology Exploitation Group; Data Stewardship Interest Group; GEO and the Recovery Observation infrastructure Project.

The Interoperability Group has made progress on the CEOS OpenSearch (common data interface standard for discovery and access to data shared by all CEOS/WGISS agencies). Work continues on incorporating the datasets of CEOS Agencies within the International Directory Network (IDN).

The Technology Exploitation Group has been established to provide a forum to discuss and monitor current and evolving software technologies. The Group has developed a white paper summarising past WGISS meeting discussions on technologies such as Big Data, Cloud Computing, Semantics and Virtualisation. In addition, the Group is developing webpages promoting resources from WGISS Agencies, and on Open Source software.

The Data Stewardship Interest Group (DSIG) focuses on: Long-Term Archive Strategies; Data Formats; Data Preservation; Data Lifecycle concepts and Archive Media. It has started to draft best-practices/recommendations on Preservation Workflow and Persistent Identifiers, and is updating the Purge Alert procedure and mailing list.

Concerning GEO, WGISS participates in the Data Management Principles Task force which will be reporting at the GEO-XI Plenary, and is working on the IN-02-C1 Component - Advances in Life-cycle Data Management Task Sheet, which WGISS will review for better clarity.

WGISS is also responsible for the Recovery Observatory Infrastructure Project (provision of data 3-5 years post-disaster) in support to WGDisasters. Richard then gave an overview of activities explaining the progress on development of the Roadmap: Version 1 - basic and useable was available now, with version 2 to be completed by July 2015.

The Chair thanked Richard for his report and noted that good progress was being made in all areas.

15. Report on WGCV: Satish Srivastava - Chair WGCV

Satish (WGCV Chair) reported on the status of WGCV activities during the year focussing on: Previous CEOS Plenary Actions and Work Plan Deliverables; the WGCV Annual Meeting and the WGCV Vice-Chair Nomination.

Concerning the CEOS Work Plan 2014-2016, WGCV has 12 deliverables within the themes of "Capacity Building, Data Access, Availability and Quality" and a progress status was provided for these deliverables. With regard to the CEOS Action 27-21: "WGCV to develop detailed plans for the way forward on the SST Comparison Campaign and SST Operation Validation Project by SIT-29, a set of deliverables were defined and incorporated into the CEOS Work Plan and the action was closed at SIT-29.

A review of the various WGCV meetings was presented along with a timetable of past and future meetings, with a focus on the recent successful CEOS WGCV Meeting #38 held at College Park, Maryland, USA (Sept/Oct 2014). The main features of the meeting were described, including the thematic sessions and the interactions with other CEOS working groups and the virtual constellation teams. Satish also informed CEOS that WGCV was proposing a session at the ISRSE-36 in Berlin, Germany on 11-15 May.

Finally the WGCV Chair requested the endorsement of Dr Kurtis Thome (NASA) for the position of WGCV Vice-Chair for 2014-2016 term.

In his final meeting as Chair of WGCV, Satish took the opportunity to thank everyone for their support during his tenure and wished the Group well under its new leadership.

The Chair thanked Satish for a very comprehensive report and expressed appreciation for WGCV efforts to impart information and understanding across the Virtual Constellations.

The Plenary endorsed Dr Kurtis Thome of NASA as Vice-Chair of the WGCV and welcomed the WGCV incoming Chair, Albrecht von Barga of DLR.

Plenary Decision: Dr. Kurtis Thome (NASA) was confirmed as the Vice-Chair of the WGCV for two years (through to the 2016 CEOS Plenary), followed by two years as WGCV Chair (through to the 2018 CEOS Plenary).

On behalf of CEOS, the Chair thanked Satish for his contributions both as Vice-Chair and Chair of WGCV.

16 Report on WGCapD: Eric Wood - Chair WGCapD

Eric (WGCapD Chair) gave a comprehensive report on the status of WGCapD activities during the year including: SIT Actions and Work Plan Deliverables; the WGCapD 3rd Annual Meeting; Activities for 2014-2015; GEO; support to VCs and WGs; and the SRTM-2 data release. WGCapD was also aware that progress would continue on inward facing interaction and provide support to other CEOS Working Groups and Virtual Constellations as it has with external activities.

Eric began by reviewing the SIT-29 and SIT Technical Workshop Actions as well as the CEOS 2014-2016 Work Plan deliverables, and the associated activities.

Eric then summarised the results of the 3rd Annual WGCapD Meeting hosted by ISRO and held in Dehradun (April 2014) and was pleased to report that USGS had agreed that he would remain Chair of WGCapD for the rest of the nominal Chair term, finishing at the end of 2015 (following Jacob Sutherland's early departure). The next (4th) WGCapD annual meeting is to be held in Pretoria, South Africa hosted by SANSA (18-20 March 2015).

Eric described the interactions with/support to other VCs and WGs by WGCapD and reported on (NASA) Shuttle Radar Topography Mission (SRTM-2) data access, reminding CEOS of the successful WGCapD SRTM DEM Workshop of 2013 held in Kenya, and explaining the ongoing efforts in encouraging NGA to release SRTM-2 data. This has now been agreed and the data is currently being released in a regionally staged fashion, as announced as part of President Obama's speech at the UN Climate Summit (Sept 2014). WGCapD plans to hold future SRTM workshops to coincide with the regional release of the data and expect global 30m data coverage by the end of 2015.

A review of GEO participation was presented in relation to “GEO Capacity Building” (Task ID-02) drawing CEOS Plenary attention to the WGCapD supported AfriGEOSS Side Event planned for GEO Plenary. WGCapD is continuing to participate in the development of the GEONETCAB (GEOCAB) Portal, where CEOS efforts were duly noted in a letter from Barbara Ryan in July 2014.

The Chair thanked Eric for his presentation and summarised that it was good that WGCapD plans to work more closely with the other VCs/WGs in the future, and that they recognise the benefits of working closely with Capacity Building activities in GEO.

17 Report on WGDisasters: Ivan Petiteville - Chair WGDisasters

Ivan (WGDisasters Chair) reported on the status of the main WGDisasters activities during the year focussing on: Floods, Seismic Risks and Volcano Pilots; Geohazards Supersites; the Recovery Observatory, and Preparations for the 3rd UN World Conference on Disaster Risk Reduction (WCDDR – March 2015, Japan).

Ivan reported on the significant progress of the Pilot projects since their approval, as well as the proposal for a future landslides Pilot project. It was highlighted that there was good end-user participation in the Floods Pilot, and participation by Volcanic Ash Advisory Centres (VAAC) around the globe in the Volcanoes pilot. Both Volcanoes and Seismic Risk Pilots have some objectives that feature in the “GEO Supersites”. In addition, WGDisasters would ask for CEOS approval for:

- Acceptance of New Zealand Volcanoes as a permanent Supersite and commit data resources;
- Acceptance of Ecuadorian Volcanoes as a permanent Supersite and commit data resources.

The two new proposed Supersites were presented, highlighting the request for commitment of data resources from CEOS Agencies. In addition, WGDisasters asked that CEOS request that the Data Coordination Team inform the relevant Point of Contact for the Supersite of this decision, as well as the procedures for ordering and accessing the data.

Ivan continued by presenting the draft proposal for the Southeast Asia Natural Laboratory for Geohazards, including the setting up of Papua New Guinea for seismic and volcanic monitoring. The four scientific objectives would be: (i) Volcano early warning; (ii) Eruption monitoring; (iii) Rapid earthquake information, and (iv) Geodetic monitoring of strain accumulation. Participation by WGDisasters is being considered, a large amount of optical and radar satellite data will be requested (comparable with GFOI) and a voluntary commitment will be looked for at 2015 WCDRR. WGDisasters will assess the proposal after it has been consolidated, and in particular the WG will verify that the requested support to the Southeast Asia Natural Laboratory for Geohazards does not affect the on-going and already planned activities of the Pilots.

The Recovery Observatory (RO) is progressing well (see WGISS update regarding the implementation of the infrastructure) and there has been a meeting with Stakeholders (UNDP, World Bank, Red Cross, UNOSAT, UNISDR) to develop institutional relationships, and to engage them in the RO triggering process.

Preparations for participation in WCDRR and HFA2 are progressing with CEOS participation in the preparatory WCDRR meetings, and preparations for active participation for the meeting in March 2015. Ivan also reported about preparations for HFA2.

Concerning outreach activities and internal working group organisation, two posts remain vacant: (i) Liaison to the User Community; (ii) GEO Disaster Task Coordinator. Mark Paese

(NOAA) nominated Kerry Sawyer for the latter position once her term as CEO role ends on 1st December 2014. The Plenary was asked to consider this proposal.

The Chair thanked Ivan for his report and observed that the new Working Group was proceeding well. There were two decisions to be made concerning the Supersites, and it was agreed at the 2013 CEOS Plenary in Montreal that such decisions need to be taken at Plenary.

Concerning the proposed New Zealand Supersite, it was noted that some data has already been committed and finalisation of data commitments from CNES, JAXA and NASA is awaited, but there did not appear to be any problems. The criteria to accept a Supersite were agreed to have been met.

Concerning the proposed Ecuadorian Supersite, it was noted that some data has already been committed and finalisation of data commitments from JAXA and NASA is awaited, but again there did not appear to be any problems. The criteria to accept a Supersite were also agreed to have been met in this case.

Chu Ishida commented that JAXA would need to look at the benefits to their agency before committing support to a new Supersite but, in principle, could agree. The Chair noted that this was business as usual and accepted the statement in this vein.

Plenary Decision: the proposal for two new Geohazard Permanent Supersites ("New Zealand Volcanoes" and "Ecuadorian Volcanoes") was endorsed.

Whilst not requiring a decision at this Plenary, an indication of support will be needed by March 2015 WCDRR for the South East Asia National Laboratory for Geohazards. Therefore, the Chair suggested, and in agreement with the WGDisasters Chair, that a proposal similar to that for the Supersites should be circulated to CEOS Principals in January 2015 for a decision. This approach was agreed by Plenary.

Plenary Decision: To follow a written procedure for endorsing the proposed "South-East Asia Natural Laboratory for Geohazards", subject to commitment by CEOS Agencies to contribute relevant datasets (proposal expected Jan 2015).

Mark Paese (NOAA) then nominated Kerry Sawyer for the vacant role of GEO Disaster Task Coordinator following her term as CEO. The CEOS and WGDisasters Chairs thanked NOAA and, on behalf of CEOS, congratulated Kerry on her new role.

Plenary Decision: To endorse the nomination of Kerry Sawyer (NOAA) as the GEO Disasters Task Coordinator.

18 Synthesis of VC Issues: Pascale Ultré-Guérard - SIT Chair

Pascale presented a synthesis of VC issues covering: VC-WG interactions (steps to improve interaction/coordination); Training, Awareness and Capacity Building; Coordination for Climate; Data Access; examples of VC Successes and Examples of VC Issues.

Pascale explained the mechanism of SIT interactions with the VCs, involving two rounds of teleconferences a year (January & July) strategically placed for feedback to the March SIT meeting and the September SIT Technical Workshop, including the VC-WG day. Based on the teleconferences and the VC-WG Day, several actions had been defined that would help

to form the basis of future development of the groups. Pascale then presented examples of Virtual Constellation success stories, highlighting how the Ocean Surface Topography (OST) VC fulfils user needs (inter-calibration of the missions enabling extraction of the available signal from all the missions and thereby providing an accurate combined product) and the role of the Atmospheric Composition VC in international collaborative activities to improve preparation for, and capabilities of, planned air quality missions.

The presentation concluded with an example of VC issues and the approach to addressing them. For example, the AC-VC has identified a future gap in limb sounding data following the loss of the current instruments. Although new instruments are scheduled for 2021, this would not be soon enough and would lead to a loss of continuity, so the AC-VC is organising an awareness meeting on limb sounding.

The Chair thanked Pascale for the presentation and opened the floor for questions and comments. Mike Freilich (NASA) pointed out, as a matter of clarification, that the SAGE III instrument in the timeline of Atmospheric Composition Limb Sounding Spectrometry Missions Table, flying on the International Space Station, should not be discounted as a low quality instrument, it was specifically designed to fly on the ISS and to take advantage of the orbit.

The Chair noted that the discussions confirm the value of the Virtual Constellations, as well as the need for interactions between the various groups, and welcomed the role of the SIT Chair in fostering these interactions.

19 Position Paper and Recommended Way forward for the Land Surface Imaging (LSI-VC): Thomas Cecere -USGS

Tom gave an overview of the situation to date and informed the Plenary about the results of the review carried out by J Ross (GA), T Cecere (USGS) and S Labahn (USGS) that was presented at the SIT Technical Workshop. It is apparent that there is an increasing demand for CEOS support for Land Surface Imaging (LSI), but it is also apparent that this is a large area to cover and careful consideration is needed to identify the appropriate mechanism for meeting this demand. Tom presented the review findings together with the options, considering both top-down and bottom-up perspectives. A diverse set of CEOS Agencies provided responses to four identified options for the way forward, and the main conclusions of this survey are:

Option 1: Maintain the Status Quo – *Seen as an undesirable strategic move*

Option 2: End-to-End VC (from mission design to the delivery of end user tailored products and capacity building) – *Seen as not feasible to resource*

Option 3: Space Segment VC (mission data acquisition coordination & coordination of “fundamental” data products) *an emphasis on space segment coordination was well supported (aligned to other initiatives, feasible to resource, benefits internally and externally, transition pathway for some tasks currently located in ‘ad hoc’ teams)*

Option 4: Multiple VCs (centred around instrument types) – *multiple VCs were seen as strategically logical but practically too difficult, introducing additional stovepipes to overcome*

It was, therefore requested that the Plenary endorse the following recommendations:

Recommendation 1: Agree that the LSI-VC terms of reference be refocused towards Space Segment asset coordination and optimisation.

Recommendation 2: Agree the LSI-VC ‘ramp up’ phase focus on:

- Offering support to data coordination teams
- Identifying opportunities for optimisation
- Analysing and reporting conflicts
- Points to come to for advice and guidance
- The four actions notionally flagged for LSI-VC by the CEOS Carbon Observations from Space Implementation Study Team
- Together with WGISS, looking into long term architectures for distribution/processing of data

Furthermore, Tom proposed the following next steps:

- Today: Clarify initial participants; Identify leadership for LSI-VC.
- Next few weeks: Open discussions with existing data coordination teams to identify desired support.
- Open discussions with WGISS/WGCapD/SEO on data distribution/processing architectures.
- For SIT-30: Prepare revised LSI-VC draft terms of reference, in line with recommended focus, for discussion.

The Chair thanked Tom for the presentation and agreed that the solution was not an easy one, and CEOS would need to refer back to its governance arrangements. It would seem that re-formulating the LSI Terms of Reference and a future presentation to SIT could be the way forward. At this point the Chair opened the topic for comments and questions, together with indications from Agencies as to their support for the way forward in terms of developing Terms of Reference and a Work Plan to be submitted for endorsement at SIT-30 (March/April 2015).

Mike Freilich (NASA) noted that we have a situation in which at least two or four nations are fielding space-based, pseudo-operational, land-observing systems: ESA (Sentinel-2A), USGS/NASA (Landsat), India, China, etc. Yet, we have a case in which the value of the system is recognised but we are not actively coordinating; we may end up with unnecessary duplication and not fully exploit the contributions of individual nations. To be blunt, individual nations may not want to coordinate. And what about the users who would benefit from a coordinated set of observations”?

In the subsequent discussions, Australia, USGS, NASA, CNES and in principle the EC (needed time to consider the commitment) agreed to participate in the Land Surfaces Imaging VC. The Chair also agreed, at the suggestion of DLR, that a letter be sent from the CEOS Chair to CEOS Agencies asking for their commitment, recognising that some agencies were not represented at the Plenary. Furthermore, it was agreed that the "Space Segment Coordination" option was the only viable way forward for the LSI-VC at this stage.

Plenary Decision: To endorse the “Space Segment Coordination” option for a LSI-VC, and to task the LSI-VC with preparing a draft Implementation Plan for review in advance of, and discussion at, SIT-30.

28-03	CEOS Chair to send a letter to CEOS Agencies inviting nominations for participation in the LSI-VC, and including a description of the preparatory activities to reconstitute the LSI-VC (see Plenary Action 28-04), with a due date for receipt of nominations of 15th November 2015.	5th November 2015
28-04	The LSI-VC, led by Tom Cecere (USGS), to prepare a draft Implementation Plan, based on the "Space Segment Coordination" option and including a proposed update to the LSI-VC ToRs, for review prior to, and discussion at, SIT-30.	SIT-30

20 Report on SDGC/GFOI: Stephen Briggs & Stephen Ward - ESA

Stephen Briggs set the scene by reminding CEOS of the GFOI objectives:

- To foster sustained availability of satellite and ground observations in support of national forest information systems
- To support countries in the use for their national forest information systems

Stephen also noted that the co-leads of the GEO Task (SB-03) are Australia (DOTE), Norway (NSC), USA (USGS), FAO and CEOS (ESA).

Stephen illustrated the good progress made in data coverage achieved in the timeframe 2013-2014, and described the timeline leading to an expected operational phase in 2016 and beyond. Stephen explained that GFOI operates under five programme pillars; Methods and Guidance Documentation (Australia lead); Coordination of satellite data supply (CEOS lead); R&D on technical challenges (GFOI Office lead); Capacity Building (U.S. lead); and Country engagement (extremely important to get a Country to buy into the work). As an overview to 2014, he reported that V1 of the Methods and Guidance document (MGD) has been developed (MGD V2 is under development) and the Global Baseline Acquisitions is going according to plan, the R&D Plan is in development, and capacity building and in-country development continues at a steady pace. For the future, it is proposed to move the GFOI office to FAO and this is expected to increase coordination and cooperation. A series of co-located GFOI component meetings will take place in Sydney the week of 2nd March 2015, in conjunction with an SDCG meeting, and will focus on outreach and country engagement.

Stephen Ward presented the SDCG and GFOI Space Data Component update, and explained the role of the CEOS ad hoc Space Data Coordination Group which was set up in 2011 to support GFOI with the coordination of satellite data acquisition. The data can provide forest measurement information and support for Greenhouse Gas (GHG) reporting and independent verification. The group meets twice a year.

Stephen explained the structure of the SDCG, paying particular attention to the Co-Chairs and sponsorship of ESA, NSC and USGS because, as of December 2014, NSC will step down as a Co-Chair, and as of 2015, the individual representing the USGS co-chair will be retiring. This will leave a capacity gap which SDCG needs to address. Stephen also explained that the CEOS Data Strategy for GFOI has three core elements: Element 1 - a coordinated global acquisition Strategy; Element 2 - coordinated strategies for national space data services; and Element 3 - data supply for GFOI R&D activities. The target for 2015 is to add another 17 countries, with the expectation that full global coverage will be achieved by 2016. The presentation included a timeline of current and future satellite instrument availability. Stephen noted that the space data services strategy was endorsed at SIT-29 and the R&D plan is being developed through a series of consultation meetings with stakeholders. The SDCG 3-year work plan is under development and will be presented to SIT-30.

Stephen noted some issues and concerns in the areas of: the need to consolidate the model for in-country delivery via FAO and the World Bank and continuity of leadership with the loss of NSC and USGS Co-Chairs. Stephen also requested the continuation of the ad hoc team for SDCG for GFOI for a further year.

The Chair commented that he felt this was a good area for CEOS engagement and also an example of a good project, albeit noting that there were some issues to be addressed. The need for nominations to fill the future vacancy of the Co-Chair was very important and the Chair asked for any nominations, noting that this request will be followed up in a letter to Agencies from the CEOS Chair. He emphasised that this activity is important for COP and therefore should be addressed. With respect to the continuation of the SDCG for GFOI ad hoc team, the Chair asked for any objections and, noting none, confirmed the extension of

the ad hoc team by a further year and proposed to include this confirmation in the letter seeking for Co-Chair nominations.

28-05	CEOS Chair to send a letter to CEOS Agencies seeking nominations for the upcoming vacant position of Co-Chair of the SDCG for GFOI	15th November 2014
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Klaus Schmidt (DLR) proposed a vote of thanks to Norway for their past support, and in particular to Per Erik for his work, which was echoed by the Chair and the Plenary Participants.

21 CEOS Support to GEOGLAM: Brian Killough - SEO

Brian opened his report by referring to the nominated candidates for co-leadership of the ad hoc group for GEOGLAM and asked for CEOS endorsement of NASA (Brad Dorn) and CNES (Selma Cherchali) to serve in this role.

With regard to GEOGLAM Governance, Brian noted that the Steering Committee is still undergoing formation and is expected to be established in a similar manner to GFOI, containing a small group of high-level members. Some preliminary discussions having taken place and it has also been suggested to include a CEOS representative (possibly Brian or the CEOS SIT Chair). Both the Programme Coordination Group and the Implementation Group exist. The Implementation Group met recently allowing up-to-date information to be included in this presentation. Another point to note is that a USDA GEOGLAM office has just been established.

The CEOS Ad Hoc Working Group on GEOGLAM was also given the task to consider a name change to better define its activities and it was suggested that it be renamed the SDGC for GEOGLAM (analogous to GFOI) but this was thought confusing, and so it is proposed to keep the name "as is" but ensure that "CEOS" is added to the title of the group. The working arrangements of the group will remain the same, as these have proved effective.

GEOGLAM embraces a diverse set of projects and these have recently expanded from pasture land to include rangeland. The main output of GEOGLAM is the provision of content to the AMIS Market Monitor which provides crop information around the world. GEOGLAM currently supplies qualitative indices on crop health (NDVI data) and eventually this will become quantitative so that crop variability can be identified, which will affect the price on the market.

Brian described the successful Asia-Rice project (rice-mapping along the Mekong Delta, using Radarsat data) and made reference to JECAM (the R&D support to GEOGLAM) who met recently to assess and formulate their future plans with GEOGLAM. The GEOGLAM Implementation Group also met recently and formulated a mandate for GEOGLAM – "to increase coordination among projects, foster transparency and provide a framework for project Implementation". Furthermore this group provided the following set of recommendations to CEOS:

- Develop a strategy to engage non-CEOS space agencies: commercial and non-traditional (e.g. Planet Labs, Skybox)
- Most data coordination in Development Phase will be for JECAM & SIGMA in the near-term (it is the operational research & development arm)
- Archival data search (via COVE) & data access confirmed as a priority for 2015 and beyond – interest in baseline datasets!

Brian went on to describe the CEOS GEOGLAM Acquisition Strategy which has been divided into a new, simplified, phasing structure: Development Phase (current) and Operational Phase (future). Plans for 2015 include expansion of the existing pilot projects, integrating new missions into COVE, completing two data services prototype projects and

investigate common data sharing. GEOGLAM also seeks to obtain archived metadata to allow historic crop monitoring for baseline data sets (e.g. crop type and calendars).

Concerning the Data Service Prototypes and the Data Request Process, Brian noted that the plan is to test data services prototypes and report lessons learnt; define JECAM data requests to CEOS Agencies; finalise a Common Data Sharing Strategy for JECAM and report on the progress of new missions.

In conclusion, on behalf of the renamed CEOS GEOGLAM, Brian asked CEOS to:

- Endorse the CEOS Acquisition Strategy for GEOGLAM (circulated previously)
- Endorse the proposed (and nominated) Co-leads
- Endorse a CEOS candidate for the GEOGLAM Steering Committee (Brian Killough)

The Chair thanked Brian for a comprehensive report and noted that three decisions were requested. Following a brief discussion the Plenary responded affirmatively to the first 2 items and deferred a decision on the third item.

Plenary Decision: The CEOS Acquisition Strategy for GEOGLAM, Phase 2 (Assessment and Expansion) was endorsed.

Plenary Decision: NASA (Dr. Brad Doorn) and CNES (Selma Cherchali) were confirmed as co-leads for CEOS Ad Hoc Working Group on GEOGLAM.

Plenary Decision: The decision on CEOS representation on the GEOGLAM Steering Committee was deferred until the Governance arrangements are in place, with expectation that this could be revisited at the SIT in March/April 2015.

22 Report on the Carbon Strategy Implementation Study Team: Stephen Briggs - ESA

Stephen provided an overview of the origins of the Carbon Study through to the current position. An electronic copy of the CEOS Strategy for Carbon Observations from Space, completed in March 2014, was provided to CEOS delegates with the report and contains 42 actions. At SIT-29, the CEOS Strategy for Carbon Observations from Space was endorsed, and a proposed Carbon Strategy Implementation Study Team (CSIST) was set up to propose an implementation approach for the 42 actions. These actions were embedded in a spreadsheet, categorised, and provisionally associated to a relevant CEOS entity for implementation. At present, 11 actions have been identified for further effort, the spreadsheet has been updated, and a report has been circulated to CEOS for consideration.

The main options for the allocation of responsibility for the coordination of the implementation of the associated Carbon actions are:

- WGClimate (specifically a sub-group of WGClimate - i.e. Action 38 of the Strategy)
- SIT Chair

Bearing in mind the current high workload of WGClimate, and its consequent reluctance to take on further responsibilities, Stephen proposed that the SIT Chair take on responsibility for the coordination of the implementation of the actions (including the eight actions allocated to the SIT) and report on progress at SIT-30.

The Chair thanked Stephen for his report, noting the proposal for the SIT Chair to take on responsibility for the coordination of action implementation, and also understanding the need for actionees to commit, on a best efforts basis, to implement their assigned actions. With this latter point in mind, the Chair first opened the floor to the WG Chairs and VC Co-Leads to understand whether they could manage the proposed assignment of actions. Based on the responses, there was in principle acceptance by WGs of the assigned actions, although noting WGISS had requested clarification on the specific actions allocated to them. Further confirmation was required from the VCs (AC-VC agreed by proxy), and the LSI-VC would also require further investigation at SIT-30. With this context in mind the Plenary agreed the following way forward.

Plenary Decision: To endorse the proposed approach for the implementation of the CEOS Carbon Strategy, involving the SIT Chair in an overall coordination role and for the implementation of some actions, and VCs and WGs for the implementation of specific actions. The integration of these actions into the various work plans will be assessed, together with the overall schedule, at SIT-30.

28-06	SIT Chair in conjunction with the relevant WGs and VCs, to determine by SIT-30 whether appropriate implementation arrangements are in place for all actions associated with the CEOS Strategy for Carbon Observations from Space	SIT-30
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23 CEOS Response to the GEOSS Water Strategy: Chu Ishida - JAXA

Chu described the Water Strategy sequence of events since the agreement at the 26th CEOS Plenary to participate in the development of the GEOSS Water Strategy Report, and following the agreement at the 2014 SIT Technical Workshop to set up a small Water Strategy Implementation Study Team. Concerning the background, Chu explained that the Integrated Global Water Cycle Observations (IGWCO) report was published by IGOS-P just prior to IGOS being transferred to GEO, and subsequently became the GEOSS Water Strategy. This report identifies a number of priority areas, including:

1. Enhancing user engagement
2. Expanding data acquisition strategies
3. Advancing satellite data acquisitions
4. Strengthening *in situ* data acquisition
5. Encouraging and conducting research and product development
6. Facilitating data sharing and common standards
7. Expanding Capacity development

In response to the GEOSS Water Strategy, a GEOSS Water Implementation Plan (WIP) is being prepared and CEOS Agencies have been invited to provide inputs. NASA, JAXA and NOAA provided inputs by the deadline of 15th October 2014 to the GEO IGWCO Chairman Rick Lawford who, by 31st December 2014, will have completed a first draft of the WIP. This WIP will be finalised in January 2015 and submitted to GEO and CEOS.

The Chair thanked Chu for his report and summarised the expected decisions. Some CEOS Agencies were confused as to the proposed schedule and questioned how, and what, a proposed study team would deliver, and against what reference. The CEO responded that the Community of Practice anticipated presenting the Water Implementation Plan to the GEO Plenary at the end of 2015, but this may not be possible.

Following these discussions the following way forward was agreed.

Plenary Decision: To confirm that the GEOSS Water Strategy is a relevant guidance document for CEOS activities in this area and, based on an expression of interest of CEOS Agencies, to establish an Initial Study Team to define the potential CEOS contribution to the implementation of the Strategy for review in advance of, and discussion at, SIT-30.

28-07	CEOS Chair to inform the GEO IGWCO Chair that: i) CEOS considers that the GEO Water Strategy is a relevant guidance document for CEOS activities, ii) based on the first expression of interest of CEOS Agencies, CEOS is establishing a Water Strategy Implementation Study Team to define its potential contribution to the implementation of the Strategy	15 th November 2014
28-08	CEOS Chair, with the support of the CEO, to develop Terms of Reference for a Water Strategy Implementation Study Team and, once available, write to CEOS Agencies to solicit nominations for participation in this Study Team	2 nd December 2014

It was also noted that NOAA, USGS and CSIRO have all submitted nominations to participate in the study team (in addition to the participation noted by Chu) and these should be taken into account when forming the study team.

24 Proposal for a CEOS Data Applications Report: Chu Ishida - JAXA

At a side meeting in the fringes of the 27th CEOS Plenary in Montreal a “CEOS Applications Round Table” was held where several CEOS Agencies expressed interest in collaborating on Earth Observation Applications. Based on this interest, JAXA proposed to establish a small group of interested CEOS Agencies and convened a side meeting at the 2014 SIT Technical Workshop to discuss the concept. Following these discussions JAXA proposed to that CEOS develop a Special Report on Data Applications (working title: Applications of Earth Observations from Space - Serving Humanity, Society and Industry) as one of its Chair initiatives, and to also produce a summary brochure for the 2015 CEOS Plenary.

The report will be targeted at government policymakers, international organisations and institutions such as the World Bank and the Asian Development Bank. The report will emphasise the importance of EO satellites, provide evidence to support the funding of the next generation of satellites, and look at successful partnerships, mechanisms and programmes from around the world.

An outline contents list has been developed with three main headings; (1) Introduction; (2) Satellite Earth Observations and (3) EO Applications (Public use, Industrial use, Science and Research). In conclusion, Chu presented a timeline of proposed meetings to take this forward within the framework of JAXA's period of tenure as CEOS Chair.

The Chair thanked Chu for his presentation and opened the topic for discussion. There were several interventions supporting such an activity (e.g. CNES, NSO, GEO, EUMETSAT, DLR) and it was emphasised that, for it to be successful, there needs to be broad community participation, with a structured approach that balances policy with applications.

On the assumption that these comments and guidance would be reflected in the approach, the Chair concluded that this activity had CEOS support. It was also noted that the schedule should foresee a review at the September SIT Workshop prior to publication at the Plenary.

Plenary Decision: To support the proposal of JAXA to develop a *CEOS Data Applications Report*, with contributions from CEOS Agencies, for final review at the SIT Technical Workshop in September 2015 and publication at the 29th CEOS Plenary.

28-09	CEOS Chair to deliver the draft structure of the planned <i>CEOS Data Applications Report</i> to CEOS Agencies	5 th November 2014
28-10	CEOS Agencies to deliver abstracts for contributions to the planned <i>CEOS Data Applications Report</i> to the CEOS Chair, together with nominations for participation in the editorial team	30 th November 2014

25 CEOS Systems Engineering Office (SEO) Report: Brian Killough - SEO

Brian introduced the SEO team and summarised the support that had been provided in the last year which included: development of the new CEOS website; maintenance of the CEOS mailing lists; development of outreach materials; support to COVE testing and data acquisition analysis for GFOI and GEOGLAM; support to WGCapD and GFOI training and capacity building; support to WGClimate (ECV inventory); MIM database (with ESA); Disasters (gap analysis) and Carbon task force (gap analysis).

For the coming year, support will continue for GEOGLAM and GFOI, development of Data Service Prototypes for cloud based storage, development of a common Space Data Management System Tool, enhancement of COVE, enhancement of the Coverage Analyser Tool, upkeep of the Data Policy Portal and MIMS, and outreach activities.

The Chair thanked Brian for this report and the support provided by the Systems Engineering Office, which was very valuable for CEOS, and postponed questions and comments on this item until after the next agenda item.

26 CEOS MIM Database and EO Handbook: Ivan Petiteville - ESA

Ivan presented a report on: 2014 database update cycle; 2014 enhancements; and, 2015 planned activities. With respect to the 2014 update, this was now complete and available online. Ivan provided an overview of CEOS Agency response and the number of new missions and instruments, along with launch and instrument expectations for the next 15 years, as well as a breakdown by instrument type and measurement domains. In addition, Ivan provided web usage figures, and a location usage map.

With the objective of improving the quality of information, a task to cross reference the MIM database against external EO databases such as the WMO OSCAR database has been undertaken. This will help to unify information across the databases and avoid duplication of effort. Support has also been provided to the SEO on the ECV inventory development.

A special Edition of the EO Handbook will be produced for the WCDRR in Sendai, Japan on 14-15 March 2015. The next annual CEOS database update will begin in April 2015. Work will continue to import the ECV inventory and consideration will be given to produce a climate-themed EO Handbook.

The CEOS Chair thanked Ivan and opened this topic, as well as the SEO report, for comments and questions. GEO and WMO noted their support for the MIM database and the cross referencing to OSCAR (WMO).

In summarising, the Chair observed that he could see benefits for both CEOS and WMO in continuing this database comparison exercise, as long as there was an awareness that the requirements for both databases were different.

27. CEOS Preparations for Key GEO Meetings: Kerry Sawyer - CEO

Representation at GEO Plenary (Geneva)

Chu Ishida (JAXA/CEOS Chair Team) has agreed to lead the CEOS delegation, supported by Kerry Sawyer (alternate head of delegation), Brian Killough (SEO), Marie-Josée Bourassa

(CSA/incoming CEO), Brent Smith (NOAA), and Jane Olwoch (SANSO). Steven Hosford will be attending as a member of France's delegation as well as Ivan Petiteville on the ESA delegation. Other CEOS Agencies will have participants as part of National delegations including DLR for the German delegation. Further attendees, who would like to be a member of the CEOS delegation, should inform Kerry, along with national representatives (to maximise possible CEOS representation).

Plenary Decision: The CEOS delegation to the GEO-XI Plenary will be led by Chu Ishida (JAXA).

The Chair observed that there will be both a written statement and verbal interventions, and CEOS Agencies will need to be well-versed in the CEOS position. The draft statement will be circulated for comment prior to the GEO Plenary, and it is therefore important that CEOS (Kerry) is aware of all CEOS participation.

Participation in the Ministerial Working Group

One nomination (Brent Smith) has been received to participate in this group. Brent noted that CEOS had benefited from having two representatives to the 2010 GEO Ministerial WG, thus it would be good to have a second representative. The Chair agreed that it would be helpful to include a representative from the Chair Team although JAXA had indicated that they were unable to commit at this point in time.

Plenary Decision: CEOS will be represented in the GEO 2015 Ministerial Working Group by Brent Smith + a CEOS or SIT Chair Team Representative (TBC).

28. Main Outcomes from the Climate Symposium: Alain Ratier - EUMETSAT

Alain introduced an overview of the Climate Symposium which was organised by EUMETSAT and WCRP and attracted some 500 participants from 50 countries. The full proceedings can be found online with the programme being structured around the 6 "Grand Science Challenges" of WCRP, with these challenges placed in the context of the 5th Assessment Report of the IPCC presented in the Opening Session by Thomas Stocker (IPCC Vice-Chair). Dedicated sessions on each Grand Challenge addressed the specific need for, and role of, Climate Observations from Space.

Round table discussions were held involving high-level representatives from the Energy, Transport and Insurance sectors, addressing the needs of decision-makers for climate information

CEOS Agencies had the possibility to present showcases using the NASA Hyperwall, kindly provided by NASA. ESA, NASA, JAXA, JMA, NSC, EUMETSAT and NOAA made use of this opportunity.

In addition, a CEOS Climate brochure was prepared and released during the Symposium (included in Plenary welcome packs).

The Symposium concluded with:

- a presentation of the findings of each Grand Challenge session
- an introduction of the Architecture for climate monitoring from space by John Bates
- a final round table, moderated by GCOS, where representatives of operational and research space agencies and of the European Commission had the opportunity to offer a preliminary response

Some provisional outcomes of the Symposium include:

- Consensus that the thermodynamic aspects of the Grand Challenges are generally better understood than the dynamic aspects: circulation is a common uncertainty across several Grand Challenges
- The broad range of needs and priorities formulated by the research community for space-based observations can only be fulfilled through international cooperation, in particular through the Architecture for Climate Monitoring from Space coordinated by the CEOS-CGMS WGClimate
- Links between Grand Challenges and their needs/ priorities for space-based observations and Climate Data Records should be further developed
- Grand Challenges need to be more explicitly traced to associated Societal Benefits which could support decisions on the funding of new observation systems
- The unique potential of the combination of multi-satellite operational programmes and research missions was highlighted, noting that:
 - The continuation of the high-precision ocean altimetry measurements, expected from the Sentinel-6/Jason-CS mission, is a top priority for several Grand Challenges
 - Some research missions (e.g. GRACE, Active atmospheric sounding, GPM...) need to be continued beyond one single satellite to consolidate understanding of key climate processes or brought to operational status

A consolidated set of outcomes from the Climate Symposium will be formulated by the Symposium Science Programme Committee and then made available. In the meantime, a method of conveying the most relevant outcomes to COP-21 will need to be considered.

The Chair opened the topic for discussion. John Bates congratulated EUMETSAT on organising an excellent meeting. Stephen Briggs agreed, and raised three points: (i) Space agencies need to be able to respond more rapidly to satisfy requirements coming from the community, (ii) There is a need for long-term continuity of some research missions and this has to be addressed, and (iii) There is a critical observational need for a follow-on to the GRACE mission, particularly given the importance of precipitation in the energy cycle.

The SIT Chair noted that there will be a Scientific Conference in Paris next year (see agenda item 29) and the outcomes of the Climate Symposium could be fed into this conference. Following the request for “agencies to be more responsive,” Mike Freilich pointed out that turnaround times and sustainable measurements are a perception of the user - affected by resource management. Sustainable long-term research missions can only be achieved through key decision-making associated with funding cycles.

Plenary Decision: The outcomes of the 2014 Climate Symposium in Darmstadt will be fed into the Scientific Conference preceding COP 21: *"Our Common Future under Climate Change"* planned for July 2015.

29. CEOS Preparations for SBSTA/COP

CEOS Preparation for SBSTA-41: John Bates

John explained that in 2012 CEOS was invited to make a presentation to SBSTA-37 and this had been well received. As a consequence, CEOS has since been invited to provide annual updates and will have a representative attend SBSTA-41 in Lima, Peru from 1-6 December 2014. The content of the report was provided to UNFCCC on 7 October 2014 and includes a written summary of CEOS-CGMS climate activities, and an update on the CEOS-CGMS WGClimate, including its work plan and a summary of the Architecture for Climate Monitoring Report. It also includes a summary of the CEOS Strategy for Carbon

Observations from Space. A one-page summary of the report will be presented by the CEOS Chair National Delegation (Japan) at the opening session. Chu Ishida confirmed that this had been agreed, and that the draft summary is currently being reviewed.

The Chair supported this approach and recognised the need to interact through national delegations.

Plenary Decision: To support JAXA's arrangements for a presentation of the CEOS report and associated statement at SBSTA-41 through the Japanese delegation, and to encourage other CEOS Agencies to work through their national delegations to support the CEOS Statement at SBSTA-41.

CEOS Preparation for COP-21: Pascale Ultré-Guérard - SIT Chair

In the lead up to COP-21, a Scientific Conference "Our Common Future under Climate Change" will take place on 7-10 July 2015 at UNESCO in Paris. Pascale presented the timeline for associated activities noting that more information is available on the Conference Website. CNES is a partner in the conference and a number of sessions will be dedicated to contributions from space and CEOS Agencies, as well as the CEOS-CGMS WGClimate, will be invited to participate. In addition, there will be side events during COP-21 itself, and CNES intends to have a booth, re-use of the one made for the Paris Air Show in June, and will invite the WGClimate to contribute.

The Chair thanked Pascale and opened the floor for comment. Volker Liebig (ESA) recognised the importance of COP and offered ESA support.

The Chair noted that this was a major opportunity and CEOS Members are invited to designate a point of contact to the SIT Chair to support the COP-21 preparations.

30. CEOS Preparations for the World Conference on Disaster Risk Reduction: Chu Ishida - JAXA

Chu Ishida gave an in-depth report on the preparations for the WCDRR, noting that following the 27th CEOS Plenary a WCDRR Task Team (WTT) was established to prepare for CEOS participation in the WCDRR and HFA2. At SIT-29 the WTT implementation plan was endorsed, and the WTT produced two documents: (i) CEOS Main Strategic Messages, and (ii) Space Agencies' Commitments. Regional platform and Preparatory Committee meetings were attended by CEOS Agencies and the GEO Secretariat. At the 6th Asian Ministerial Conference on DRR in Bangkok JAXA (ADRC & ESCAP) organised a pre-consultation event "Satellite data and Information to supplement regional and national DRR systems to assist local communities at risk". In planning for the WCDRR working session UNOOSA/GEO/CEOS produced a concept note "Earth observations to support national and local disaster reduction initiatives" and MEXT/JAXA produced "Earth observation in DRR". It is hoped that the host country will be invited to exhibit at the main venue but, if this does not happen, a backup exhibition booth has been reserved at a public exhibition site. A special edition of the CEOS handbook will be published for the occasion.

The pre-zero draft of the post 2015 HFA2 has been released for review and contains several articles of relevance to CEOS. Concerning the next steps: special accreditation is being sought to allow CEOS to participate in the 2nd PrepCOM, at which the content of the draft zero of the HFA2 will be negotiated; a concept note needs to be developed for the WCDRR working session; and exhibition opportunities explored and the development of the WCDRR edition of EO handbook 2015.

The Chair thanked Chu for his report and acknowledged JAXA's very active participation in preparing for this event. Ivan Petiteville (WGDisasters) commented that beneath all the niceties, it is important to ensure that the importance of EO data from space gets mentioned

in the conference declaration, and the HFA2 document is the area where CEOS delegations should lobby their national delegations.

The Chair agreed that in any UN context it was important for national delegations to be briefed beforehand with key CEOS messages, and queried whether any short strategic messages had been prepared. It was confirmed that such messages have been prepared, discussed, and adjusted to match the political context, and distributed to all COS Agencies at the time of the SIT Technical Workshop (mid-September 2014).

31. Finalisation of the Tromsø Statement: Alain Ratier - CEOS Chair

Based on inputs received from CSA, NASA, CMA, NSO, NOAA, JAXA, EUMETSAT, SEO, on the draft Tromsø statement presented under agenda item 5, a revised version incorporating these comments was presented.

Following incorporation of a final set of comments, the Plenary endorsed the Tromsø Statement attached as Annex I of these minutes.

32. CEOS Information Management: Kim Holloway - SEO

Kim Holloway reported on the CEOS information management and gave an overview of refurbishment of the CEOS website. Kim explained that the website is being reorganised and restructured to make it more user-friendly for external visitors, and provided a walk-through of some of the new features and appearance of the website pages. New features include: online meeting registration; document management and the CEOS Work Plan and deliverables - tracking tool. A beta version is expected to be available by 2015. CEOS can now be found on "Facebook" and "Twitter", adding major new external interfaces with the outside world, and thereby increasing outreach significantly. However to maintain interest through these social media channels there is a need for a corresponding engagement strategy.

The Chair thanked Kim for her presentation and opened the topic for discussion. Ivan Petiteville (WGDisasters) commented that it is important to ensure that content is appropriate to the audience. Kerry Sawyer (CEO) indicated that Kim/SEO will not be responsible for creating the content. Instead, each Working Group and Virtual Constellation will be asked to provide a point of contact to work with Kim to update the relevant content for the website. Kim would provide an editorial review to ensure that information is appropriate.

Kerry also indicated that almost 30 CEOS slogans were submitted for review and the website strategy team was going to cull the list to approximately five slogans, which would be shared with the CEOS Secretariat, WGs, and VCs for final vote and selection.

33. Report on Finalisation of CEOS Self Study: Kerry Sawyer - CEO

Kerry recalled that as CEOS did not have a "tactical" process document for CEOS Working Groups or new CEOS Initiatives, at the 27th CEOS Plenary it was decided that process papers would be prepared for CEOS Working Groups and new CEOS Initiatives, for incorporation in the set of CEOS governance documentation. At SIT-29, both of these new papers were endorsed during a "Plenary Session" and these documents can now take their place alongside the other governance documents endorsed at the 27th CEOS Plenary in November 2013.

The Chair thanked the CEO and noted that these documents now closed the loop following the discussions at the last Plenary on the topic.

34. CEO/DCEO Transitional Arrangements: Paul Counet - CEOS Chair Team

Paul presented the arrangements for the CEO/DCEO transition and explained that, following discussions with CSA, GA and NOAA, the following transition timeline had been agreed:

- On 1st December 2014:
 - Mrs Marie-Josée Bourassa (CSA) will take over the position of CEO
 - Mr Jonathon Ross (GA) will become DCEO
 - Ms Kerry Ann Sawyer (NOAA) will act as “Assistant to the CEO and DCEO” to ensure a smooth transition until the end of the SIT-30 Meeting in April 2015
- At the 2015 CEOS Plenary 2015, when JAXA will finish its CEOS Chair term and CSIRO take over the CEOS chairmanship:
 - Mr Jonathon Ross (GA) will become CEO
 - Mrs Marie-Josée Bourassa (CSA) will become DCEO

This latter arrangement will last until CEOS Plenary 2016. GA has indicated that it may be possible for Jonathon Ross to continue in post beyond the 2016 CEOS Plenary, but this is subject to confirmation.

The Plenary endorsed this proposal and the Chair thanked all three agencies for their support, and congratulated the candidates.

Plenary Decision: The proposed arrangements for the CEOS Executive Officer (CEO) and CEOS Deputy Executive Officer (DCEO) were endorsed.

The Chair proposed a special vote of thanks to Kerry Sawyer, the outgoing CEOS Executive Officer, for her outstanding support and commitment to CEOS over many years.

In response Kerry thanked CEOS Agencies for their support, and for the privilege of being CEO.

35. SIT Vice Chair-Chair Nomination: Pascale Ultré-Guérard - SIT Chair

The SIT Chair recalled that at SIT-28 a call for nominations for the vacant position of SIT Vice-Chair but there had been no response. Thereafter, SIT Chair, CNES initiated bilateral discussions with several Agencies. These resulted in a letter from ESA offering the nomination of Stephen Briggs for the role of SIT Vice-Chair. This proposal was presented to the SIT Technical Workshop in September and Plenary is now invited to endorse Stephen Briggs as SIT Vice-Chair, succeeding CNES as SIT Chair in November 2015.

Stephen Briggs thanked CEOS and gave a short perspective on future activities.

The Chair thanked ESA for their support and, seeing no objections, welcomed Stephen Briggs as CEOS SIT Vice-Chair.

Plenary Decision: To welcome and endorse the proposal for ESA to assume the role of SIT Vice-Chair (through to the 2015 CEOS Plenary) and to become SIT Chair for two years immediately after the 29th CEOS Plenary in Kyoto in November 2015.

36. Extension of Mandates of Ad Hoc Teams: Kerry Sawyer - CEO

Following a presentation by Kerry, and taking note of relevant discussions under previous agenda items, the Plenary decided on the way forward for the extension (or otherwise) of the CEOS Ad Hoc Teams.

Plenary Decision: the mandates of the Ad Hoc Space Data Coordination Group for GFOI and the CEOS Ad Hoc Working Group on GEOGLAM are extended by one year.

Plenary Decision: the Carbon Strategy Implementation Study Team (CSIST) has successfully completed its mandate and is dissolved.

Plenary Decision: the Water Strategy Implementation Study Team (WSIST) is created

37. Plenary Decision and Action Wrap-up: Alain Ratier - CEOS Chair

The preliminary list of decisions and actions were reviewed and comments provided. The resultant actions and decisions are distributed within the minutes and, for convenience, consolidated lists of the decisions and actions are given in ANNEXES II and III respectively.

38. Reports from CEOS Agencies on New (Emerging Initiatives with Potential for CEOS Cooperation

A number of agencies provided updates on their missions and activities, with only summary information included in the minutes (presentations are available on the CEOS Plenary website).

ESA (Volker Liebig)

Volker reported on the current status of the Copernicus programme from an ESA perspective and the successful launch of Sentinel 1A, the timeline of future Sentinel launches and an overview of the Copernicus Services Component. Volker also provided an update on: i) SWARM which measures the Earth's Magnetic Field, ii) SMOS which measures soil moisture and ocean salinity - and has been extended to 2017, and iii) CryoSat, the Ice Mission which has also been extended to 2017. Volker concluded with an update on the ESA Climate Change Initiative (CCI).

NASA (Mike Freilich)

Mike reported on the successful launches of the GPM Core Observatory on 28th February 2014, and OCO-2 on 2nd July 2014. He continued with a report on the successful installation of NASA's RapidScat wind watcher on the International Space Station on 29-30 September and gave an overview of upcoming NASA launches.

EUMETSAT (Alain Ratier)

Alain reported on the EUMETSAT's satellite programmes including third partly missions and future programmes. An update on the planned launches of MSG-4, Jason-3, Sentinel-3 and Metop-C was also provided.

NSMC/CMA (Wei Caiying)

Wei described the current in-orbit satellite constellation, including FY-3C which is a new generation of polar orbiting operational satellite with 12 instruments. Wei explained that there

is an on-going collaboration to improve assimilation of FY-3C data in NWP models. Wei also provided an update on future Launches, including FY-2g scheduled for launch in December 2014.

DLR (Klaus Schmidt)

Klaus informed CEOS about the current status of TanDEM-X DEM mission, as well as the EnMap Hyperspectral mission. Klaus also reminded CEOS agencies about the ISRSE 2015 to be held in Berlin in May 2015, and the deadline for abstracts of 9 November 2014.

ROSCOSMOS (Valery Zaichko)

Valery reported on the current Russian Federal Space Programme and the development of the new Russian Federal Space Programme 2015-2025 with an update on “Developments of the Russian Space Systems for Earth Remote Sensing”. The presentation included an overview of the Russian Remote Sensing Orbital Constellation and current and future Earth observing Satellites. The presentation noted the free data access policy for all data with a resolution in excess of 30m, with all data below this being made available on commercial terms. Finally, the presentation summarised the Russian contributions to the CEOS Working Groups.

UK Space Agency (Catherine Mealy-Jones)

Catherine provided an update on current activities, covering 5 areas: (i) Refreshing the UK Space Strategy with a focus on increasing economic growth and scientific excellence, from which a “Space Growth Action Plan” has been developed (ii) Recommendations flowing out of the refreshed strategy that are directly applicable to EO activities – development of a climate centre (recognising UK expertise in this area) (iii) Space for a smarter government initiative – promoting the use of space within government (iv) Continuing the development of the Harwell Campus – the Space Gateway providing a focus for UK space activities, and (v) UK participation in CEOS, and the plan to ramp up involvement in the future.

39. AOB

39.1 Announcement of 4th Workshop of the International Radio Occultation Group (IROWG-4)

Paul Counet informed Plenary that the next CGMS “International Radio Occultation Working Group” workshop (IROWG-4) will be hosted at the Bureau of Meteorology (<http://www.bom.gov.au/>) and the Centre for Australian Weather and Climate Research (<http://www.cawcr.gov.au/>) in Melbourne, Victoria, Australia from 16th to 22nd of April 2015.

39.2 EU Satellite Centre (SatCen) as a Potential CEOS Associate Member (Pascal Legai)

Pascal Legai, presented the role of the EU SatCen in support of the decision-making actions of the EU through the provision of products and services from space assets, with a focus on image analysis, highlighting possible areas of contribution to CEOS as an Associate member. An overview of the structure of EU SatCen was also provided together with an analysis of the areas where its own aims and objectives were aligned with those of CEOS, with likely resultant mutual benefits.

The Chair thanked Pascal for the presentation and encouraged any questions to be pursued off-line with CEOS Members, noting that the presentation would remain posted on the CEOS website.

40. JAXA Priorities and Expected Outcomes for 2015: Shizuo Yamamoto - JAXA

The incoming Chair, Shizuo Yamamoto (JAXA), presented the JAXA priorities for their tenure as CEOS Chair, comparing the CEOS at its inception in 1984 to its status 30 years later, emphasising technological advances introduced over three decades. Shizuo Yamamoto noted that Japan is very pleased to be chairing CEOS for the third time, and presented a slide portraying the structure of the current community from Decision Makers to User Needs versus Technological Readiness, and how all these viewpoints fit together. JAXA sees CEOS as a very important element in the overall picture, having grown in stature over the years and addressing many of humanity's needs.

Over the coming year JAXA will focus on:

- Building upon the CEOS self-study outcomes for clear targets, responsibilities and deliverables
- Reinforcing EO mission coordination to support GEOSS implementation
- Strengthening inter-linkages amongst WGs and VCs
- Positioning the role of satellites within major international frameworks

In presenting the JAXA priorities, Shizuo Yamamoto stressed that the overall goal in all areas was to maximise CEOS outcomes, highlighting the three priority areas for JAXA as: (1) providing evidence of the value and benefit of EO data to governments and international organisations in order to secure support for the funding of programmes (the Report on Data Applications will contribute to this objective); (2) Disasters – positioning the role of EO in WCDRR/HFA2 which is "a once in a decade" opportunity to place EO data in the mainstream of Disaster Risk reduction (DRR), and (3) Oceans – promoting space-ocean alliances and ocean information services in cooperation with major ocean institutes and other stakeholders. Shizuo Yamamoto proceeded to give further examples of supporting activities in these areas.

A calendar of the more significant international meetings to be held during the year was provided, together with an overview of the latest and future Japanese satellite launches.

Finally, JAXA introduced CEOS Team for the year was presented, and it was announced that the next CEOS Plenary would be held in Kyoto, Japan on 5-6 Nov 2015.

41. Chair Handover and Closing Remarks: Alain Ratier - CEOS Chair

The out-going CEOS Chair, Alain Ratier, welcomed the incoming CEOS Chair and wished JAXA every success with its chairmanship.

The 28th CEOS Plenary was then adjourned.

ANNEX I: TROMSØ STATEMENT



The Tromsø Statement

(October, 2014)

We, the assembled participants of the 28th Plenary meeting of the Committee on Earth Observation Satellites (CEOS), taking place in Tromsø, Norway, on 29 and 30 October, 2014:

Building upon our collective commitments to coordinate our Earth observation satellite missions in response to needs expressed by the United Nations Framework Convention on Climate Change (UNFCCC), the UN Office for Disaster Risk Reduction (UNISDR - International Strategy for Disaster Reduction), UN Conventions on Biodiversity and Desertification, the intergovernmental Group on Earth Observations (GEO), the Global Climate Observing System (GCOS), World Meteorological Organization (WMO) Programmes, the Group of 20 (G20), the Food and Agriculture Organization (FAO), and other stakeholders;

Confirming our Primary Mission to ensure international coordination of civil space-based Earth observations programs and promote exchange of data to optimise societal benefit and inform decision making for securing a prosperous and sustainable future for humankind; and

Recognising that the successful development of the space-based segment of the Global Earth Observation System of Systems, and of global observing systems operated under the auspices of United Nations' Agencies is the result of large and sustained investments made by CEOS Agencies; and

Noting the relevance of coordinated space-based observations for the key strategic events that will take place in 2015, including the 21st meeting of the UNFCCC Conference Of the Parties (COP-21) in France, the 3rd UN World Conference on Disaster Risk Reduction (WCDRR) in Japan and the GEO Ministerial Summit;

Declare that: we have agreed to continue to enhance our cooperation to respond effectively to Earth Observation users' needs, and have stressed our commitment to:

- Monitoring climate from space through the coordinated planning, production, improvement and availability of space-based climate data records on a global scale. This is a direct response to the GCOS Implementation Plan, as requested by the UNFCCC Subsidiary Body on Scientific and Technological Advice (SBSTA);
- Supporting Disaster Risk Management in the context of both the Millennium Development Goals and the post-2015 Hyogo Framework for Action and enhancing our contribution of space-based Earth observations in support of Disaster Risk Reduction;
- Continuing to enhance the provision of space-based Earth observations for GEO, whilst maximising the benefits of such observations through their integration with in situ data, and participating in GEO governance arrangements that reflect the widespread CEOS involvement in, and contributions to, GEO Global Initiatives (such as GFOI, GEOGLAM, AfriGEOSS, Blue Planet and the Carbon and Water Strategies), projects and tasks;
- Pursuing a coordinated approach to the CEOS contributions for the COP-21, the 3rd World Conference on Disaster Risk Reduction and the 2015 GEO Ministerial.

In addition, CEOS will continue to promote data democracy, address user needs for observations, data quality assessment, data discovery and access, and capacity building through its Virtual Constellations, Working Groups and Ad Hoc Teams, and will work with its network of Associates, including UN organisations, to enhance stakeholder engagement in CEOS activities.

ANNEX II: LIST OF DECISIONS

The 28th CEOS Plenary decided:

1. To endorse the nomination of Dr. Kurtis Thome (NASA) as the Vice-Chair of the WGCV for two years (through to the 2016 CEOS Plenary), followed by two years as WGCV Chair (through to the 2018 CEOS Plenary);
2. To endorse two new Geohazard Permanent Supersites ("New Zealand Volcanoes" and "Ecuadorian Volcanoes");
3. To follow a written procedure for endorsing the proposed "South-East Asia Natural Laboratory for Geohazards", subject to commitment of CEOS agencies to contribute relevant datasets (proposal expected Jan 2015);
4. To endorse the nomination of Kerry Sawyer (NOAA) as the GEO Disasters Task Coordinator;
5. To endorse the "Space Segment Coordination" option for a LSI-VC, and to task the LSI-VC with preparing a draft Implementation Plan for review in advance of, and discussion at, SIT-30;
6. To endorse the CEOS Acquisition Strategy for GEOGLAM, Phase 2 (Assessment and Expansion);
7. To confirm NASA (Dr. Brad Doorn) and CNES (Selma Cherchali) as co-leads for CEOS Ad Hoc Working Group on GEOGLAM;
8. To defer the decision on CEOS representation on the GEOGLAM Steering Committee decision until the Governance arrangements are in place, with expectation that this could be revisited at SIT-30 in March/April 2015;
9. To endorse the proposed approach for the implementation of the CEOS Carbon Strategy, involving the SIT Chair in an overall coordination role and for the implementation of some actions, and VCs and WGs for the implementation of specific actions. The integration of these actions into the various work plans will be assessed, together with the overall schedule, at SIT-30;
10. To confirm that the GEO Water Strategy is a relevant guidance document for CEOS activities in this area and, based on an expression of interest of CEOS Agencies, to establish an Initial Study Team to define the potential CEOS contribution to the implementation of the Strategy for review in advance of, and discussion at, SIT-30;
11. To support the proposal of JAXA to develop a *CEOS Data Applications Report*, with contributions from CEOS agencies, for final review at the SIT Technical Workshop in September 2015 and publication at the 29th CEOS Plenary;
12. To confirm that the CEOS delegation to the GEO-XI Plenary will be led by Chu Ishida (JAXA);
13. That CEOS will be represented in the GEO 2015 Ministerial Working Group by Brent Smith + a CEOS or SIT Chair Team Representative (TBC);
14. That the outcomes of the 2014 Climate Symposium in Darmstadt will be fed into the Scientific Conference preceding COP 21: *"Our Common Future under Climate Change"* planned for July 2015;
15. To support JAXA's arrangements for a presentation of the CEOS report and associated statement at SBSTA-41 through the Japanese delegation and to encourage other CEOS Agencies to work through their national delegations to support the CEOS Statement at SBSTA-41.
16. To endorse the proposed arrangements for the CEOS Executive Officer (CEO) and CEOS Deputy Executive Officer (DCEO) presented by CEOS Chair, and described under agenda item 34;
17. To welcome and endorse the proposal for ESA to assume the role of SIT Vice-Chair (through to the 2015 CEOS Plenary) and to become SIT Chair for two years immediately after the 29th CEOS Plenary in Kyoto in November 2015;
18. To extend by one year the mandates of the Ad Hoc Space Data Coordination Group for GFOI and the CEOS Ad Hoc Working Group on GEOGLAM;
19. That the Carbon Strategy Implementation Study Team (CSIST) had successfully completed its mandate and is dissolved;
20. To create a Water Strategy Implementation Study Team (WSIST).

ANNEX III: LIST OF ACTIONS

No.	Action	Due date
28-01	CEOS SIT Chair to discuss with the GEO Secretariat the need to ensure that the very successful CEOS contributions to GEO Task IN-01 are accurately reflected in the GEOSS evaluation process that GEO communicates to ministers and national policy-makers at its Plenary.	GEO-XI
28-02	CEO, in consultation with the CEOS Chair and CEOS Agencies, to develop written and verbal interventions for the GEO-XI Plenary that will: i) Emphasise the overarching role of CEOS in coordinating international cooperation on space-based Earth observing systems for GEO; ii) Reaffirm the very successful CEOS contributions to GEO to date, based on the sustained investments of CEOS Agencies; iii) Emphasise the need for a formalised level of CEOS participation in the GEO Governance framework that reflects its unique role and the scale of its contributions; and iv) Underscore the CEOS position that any revised SBA structure accurately reflects the full range of global community needs, and provide a vehicle for the structured and coherent collection of GEOSS requirements.	GEO-XI
28-03	CEOS Chair to send a letter to CEOS Agencies inviting nominations for participation in the LSI VC, and including a description of the preparatory activities to reconstitute the LSI VC (see Plenary Action 28-04), with a due date for receipt of nominations of 15 th November 2015.	5 th November 2015
28-04	The LSI-VC, led by Tom Cecere (USGS), to prepare a draft Implementation Plan, based on the "Space Segment Coordination" option and including a proposed update to the LSI-VC ToRs, for review prior to, and discussion at, SIT-30.	SIT-30
28-05	CEOS Chair to send a letter to CEOS Agencies seeking nominations for the upcoming vacant position of Co-Chair of the SDCG for GFOI	15 th November 2014
28-06	SIT Chair in conjunction with the relevant WGs and VCs, to determine by SIT-30 whether appropriate implementation arrangements are in place for all actions associated with the CEOS Strategy for Carbon Observations from Space	SIT-30
28-07	CEOS Chair to inform the GEO IGWCO Chair that: i) CEOS considers that the GEO Water Strategy is a relevant guidance document for CEOS activities, ii) based on the first expression of interest of CEOS Agencies, CEOS is establishing a Water Strategy Implementation Study Team to define its potential contribution to the implementation of the Strategy	15 th November 2014
28-08	CEOS Chair, with the support of the CEO, to develop Terms of Reference for a Water Strategy Implementation Study Team and, once available, write to CEOS Agencies to solicit nominations for participation in this Study Team	2 nd December 2014
28-09	CEOS Chair to deliver the draft structure of the planned <i>CEOS Data Applications Report</i> to CEOS Agencies	5 th November 2014
28-10	CEOS Agencies to deliver abstracts for contributions to the planned <i>CEOS Data Applications Report</i> to the CEOS Chair, together with nominations for participation in the editorial team	30 th November 2014

ANNEX IV: LIST OF PARTICIPANTS

CEOS-28 LIST OF PARTICIPANTS		
First name	Last name	Organisation
Laura Giulia Maria	Candela	ASI
Sveva	Lacovoni	ASI
Marie-Josée	Bourassa	CSA
Eric	Laliberté	CSA
Satish	Srivastava	CSA/WGCV
Kerry Ann	Sawyer	CEOS CEO
Brian	Killough	CEOS SEO
George	Dyke	CEOS Incoming Chair team
Stephen	Ward	CEOS Incoming Chair Team
Jean-Louis	Fellous	CNES
Steven	Hosford	CNES
Mireille	Paulin	CNES
Pascale	Ultré-Guérard	CNES
Richard	Moreno	CNES / WGISS
Arnold	Dekker	CSIRO
Andre (Alex)	Held	CSIRO
Albrecht	von Bargaen	DLR/WGCV
Klaus	Schmidt	DLR
Josef	Aschbacher	ESA
Simonetta	Cheli	ESA
Pascal	Lecomte	ESA
Volker	Liebig	ESA
Ivan	Petiteville	ESA/WGDisasters
Stephen	Briggs	ESA/GCOS
Paul	Counet	EUMETSAT
Robert	Husband	EUMETSAT
Alain	Ratier	EUMETSAT
Anne	Taube	EUMETSAT
Mark	Churchyard	EUMETSAT
Reinhard	Schulte-Braucks	European Commission
Astrid Christina	Koch	European Commission
Sergio	Albani	European Union Satellite Centre
Pascal	Legai	European Union Satellite Centre
Carolin	Richter	GCOS
Osamu	Ochiai	GEO Secretariat
Barbara J.	Ryan	GEO Secretariat
Robert	Samors	GEO Secretariat (Virtual Participant)
André	Obregón	GEO Secretariat (Virtual Participant)
Francesco	Gaetani	GEO Secretariat (Virtual Participant)
Espen	Volden	GEO Secretariat (Virtual Participant)

CEOS-28 LIST OF PARTICIPANTS

First name	Last name	Organisation
Adam	Lewis	GA
Jonathon	Ross	GA
Hilcéa	Ferreira	INPE(Virtual Participant)
Nobuyoshi	Fujimoto	JAXA
Chu	Ishida	JAXA
Naoko	Matsuo	JAXA
Shizuo	Yamamoto	JAXA
Masatoshi	Kamei	JAXA/RESTEC
Baard	Fjukstad	MET Norway
Jens	Sunde	MET Norway
Christine	Bognar	NASA
Yonsook	Enloe	NASA
Michael	Freilich	NASA
Matthew	Koeppe	NASA
Andrew	Mitchell	NASA
Kim	Holloway	NASA (SSAI)
Joost	Carpay	Netherlands Space Office
John	Bates	NOAA/WGClimate
(David) Brent	Smith	NOAA
Mark	Paese	NOAA
Einar-Arne	Herland	NSC
Ann-Lisbeth	Ruud	NSC
Bo	Andersen	NSC
Per Erik	Skrovseth	NSC
Jinlong	Fan	NSMC/CMA
Caiying	Wei	NSMC/CMA
Jiashen	Zhang	NSMC/CMA
Tamara	Ganina	Research Centre for Earth Operative Monitoring Joint Stock Company "Russian Space Systems"
Nikolay	Novikov	Roscosmos
Valery	Zaichko	Roscosmos
Petrus	Hyvönen	SSC
Fernando	Echavarria	U.S. Department of State
Beth	Greenaway	UK Space Agency
Catherine	Mealing-Jones	UK Space Agency
Alyssa	Whitcraft	University of Maryland
Thomas	Cecere	USGS
Steve	Labahn	USGS
Eric	Wood	USGS/WGCapD
Anh Tuan	Pham	Vietnam National Satellite Centre
Lars Peter	Riishojgaard	WMO