

## MINUTES OF THE 26<sup>th</sup> CEOS SIT MEETING

24<sup>th</sup>-25<sup>th</sup> May 2011  
ESA ESRIN, Frascati

### 1 Welcome and Opening Remarks

Makoto Kajii welcomed the participants and thanked CEOS colleagues for their support in rescheduling the SIT-26 meeting at ESRIN, and specifically CEOS Chair (ASI), and ESA. He noted that many CEOS agencies provided Earth observation data to Japan under the International Charter for Space and Major Disasters, and thanked those agencies for their kind support.

Mr Kajii acknowledged the recent successful launch of ISRO's RESOURCESAT-2 satellite. Kiran Kumar Seelin reported that the satellite is currently in the commissioning phase, and is expected to be operational by the end of the month. He also mentioned the MEGHA-TROPIQUES mission still planned for launch by the end of 2011.

Enrico Saggese (CEOS Chair, ASI) welcomed the participants to Italy, and Frascati. He expressed sympathy for the victims of the Japanese earthquake, and hoped for a quick recovery. He reflected on the fragility of the Earth's environment, and noted that for the coming years ASI has pledged to dedicate 1/3<sup>rd</sup> of their resources to the development of remote sensing applications. He confirmed ASI's support to the Supersites, FCT and JECAM initiatives with COSMO-SkyMed. He noted that JAXA's commitment to ALOS-2 and ALOS-3 is a great demonstration of the determination of agencies around the world to continue important Earth observation activities. He expressed his commitment to making ASI's CEOS Chair term the start of a lasting relationship.

Stephen Briggs welcomed the participants to ESRIN on behalf of Volker Liebig. He expressed the sympathy for the victims of the Japanese earthquake, and noted ESA was happy to support by hosting the meeting.

Mr Kajii noted that this meeting is taking place at a critical time, with GEO progressing through the second half of its 10-year plan. He emphasized the four main objectives for the meeting.

1. Progress discussion on current priorities, namely CTF and FCT, as key components of the CEOS commitment to GEO.
2. Consider CEOS support to new GEO initiatives, in particular those that will lead to the development of new satellite data applications and societal benefits.
3. Discuss the way forward for the CEOS contribution to GEOSS Common Infrastructure (GCI), considering that CEOS is a key GCI contributor and data provider, and that the GCI is a critical component of the GEOSS 10-year plan.
4. Coordinate support to the newly established Working Group Climate, and in particular potential support roles for the CEOS Virtual Constellations.

The meeting participants introduced themselves.

### 2 Adoption of Agenda

Osamu Ochiai reviewed the agenda and it was adopted.

### 3 Action Status Review

Stephen Ward reviewed the status of the SIT and Plenary actions.

#### *Plenary Actions*

No.	Action	Status (Due Date)
24-1	CEOS Agencies encouraged to register their datasets and information resources with the GEOSS Common Infrastructure.	ONGOING (November 2010)
24-2	CEO to investigate the timeliness of data provided by CEOS agencies in response to activation of the Disaster Charter for the recent Pakistan floods, and report on any lessons learned.	COMPLETE REPORT DISTRIBUTED ON 3 MARCH 2011; BRIEF SUMMARY WAS PROVIDED AT SIT-26 (SIT-26) See below.
24-3	CEOS Chair to work with the SEO, outgoing and incoming CEO, and GEO Secretariat to study possibilities for rationalisation of the multiplicity of portals and tools provided by CEOS and its agencies (including the LSI portal and CWIC) in support of GEO objectives.	SEO STUDY REPORTS AT SIT-26 (SIT-26)
24-4	CEOS and SIT Chairs, aided by the CEO, to review and confirm current SBA Team Coordinators to check whether all are active or whether replacements are required. A related SIT-26 agenda item should be included.	REPORTED UNDER ITEM 5. COMPLETE (SIT-26)
24-5	CEOS Agencies encouraged to provide resources for populating the Data Democracy Portal datasets and training materials.	ONGOING (SIT-26)
24-6	CEOS Chair, in consultation with SIT Chair, WGClimate Chair and CTF Co-Chairs, to poll opinions on the best way forward organisationally for the ambitions expressed by the CEOS Carbon Task Force.	PLAN AGREED AND STATUS REPORT @ SIT-26 (November 2010) Now have a co-chair from NASA.
24-7	CEOS Agencies to review and comment to Mitch Goldberg on the draft CEOS Climate Action template.	COMPLETE @ DC WORKSHOP (November 2010)
24-8	CEOS Chair to arrange a response to the recent request for assistance in a peer review of CDRs and ECVs received from GCOS & WCRP.	COMPLETE (October 2010) Stefano noted that ASI has replied in writing to WCRP and GCOS confirming support of

No.	Action	Status (Due Date)
		<b>CEOS to GCOS and WCRP.</b>
24-9	<b>Mitch Goldberg, in coordination with WGClimate, to lead development of the CEOS Response to the 2010 GCOS Implementation Plan, and to support GCOS as required for the development of the GCOS IP Satellite Supplement. CEOS Agencies encouraged to supply suitable supporting experts.</b>	<b>ONGOING REPORT @ SIT-26 (October 2011)</b>
24-10	<b>CEOS Agencies with supporting missions are encouraged to respond to the request for support to JECAM. LSI will serve as the CEOS point of contact.</b>	<b>ONGOING USGS TO REPORT @ SIT-26 (December 2010)</b>
24-11	<b>CEOS Agencies encouraged to provide nominations to WGISS Chair for the WGISS Vice-Chair role in 2011-2013, continuing as WGISS Chair 2013-2015.</b>	<b>OPEN (23 May 2011) Pakorn Apaphant noted that nominations are open until Plenary.</b>
24-12	<b>CEOS Agencies encouraged to consider taking on responsibility for QA4EO secretariat and website maintenance.</b>	<b>OPEN INTERIM RESOURCES KEEPING WEBSITE RUNNING (August 2011) Greg Stensaas noted that WGCV is still looking for support.</b>
24-13	<b>WGCV will provide a list of CEOS endorsed reference sites over which CEOS Member Agencies should collect and provide information in order to facilitate interoperability and underpin internationally harmonised calibration/validation. The list will also include recommended resource requirements for active agency support of site instrumentation and maintenance.</b>	<b>WGCV TO REPORT @ SIT-26 (SIT-26) Greg Stensaas to report under the WGCV topic.</b>
24-14	<b>CEOS Agencies to respond to the 2011 call for programme updates in support of the annual update of the CEOS MIM database.</b>	<b>SURVEYS CIRCULATED IN EARLY MAY (May 2011)</b>
24-15	<b>CEOS Chair to liaise with GCOS on support for the COP-16 side event on observations, and to ensure synergy with the proposed CEOS side event.</b>	<b>COMPLETE (October 2010)</b>
24-16	<b>CEOS and SIT Chairs, in coordination with Climate SBA and WGClimate, to liaise with GCOS to plan coordination on the key GCOS documents and activities in 2011.</b>	<b>ONGOING – GCOS NOT REPRESENTED AT SIT-26 (November 2011)</b>
24-17	<b>CEOS Agencies to review the GEO Geohazards Supersites White Paper and to respond to the data requests therein (including the urgent requests for the GEO Ministerial).</b>	<b>COMPLETE CEO BRIEFLY REPORTED ON KEY DONORS</b>

No.	Action	Status (Due Date)
	<b>Incoming CEOS Chair and SIT Chair will ensure suitable coordination and interface.</b>	
24-18	<b>CEOS Agencies requested to support the coordinated FCT data acquisition strategy in 2011.</b>	<b>ONGOING (SIT-26)</b>
24-19	<b>CEOS Chair to seek guidance from GEO (GFOI Task Force) on future data coverage priorities – and how these might be driven by linkages with World Bank, UN-REDD, and Paris-Oslo (REDD+).</b>	<b>ONGOING (SIT-26)</b>
24-20	<b>CEOS Chair will request the GEO FCT Task to provide a status report on the development of products from data supplied to date and their exploitation by ND authorities.</b>	<b>COMPLETE SEE GEO-VII PD TEAM REPORT (SIT-26)</b>
24-21	<b>CEOS agencies to provide final comments on the proposed Terms of Reference for the standing Working Group on Climate and to respond to the expected request for representatives.</b>	<b>COMPLETE (30 November 2010)</b>
24-22	<b>CEOS Chair, in coordination with WG Chairs and CEOS SEC, to develop a proposal for CEOS Plenary 25 for how best to incorporate ambitions of the Data Democracy initiative within the CEOS structure.</b>	<b>ONGOING (CEOS Plenary 25)</b>
24-23	<b>CEOS Chair to contact CGMS and WMO to explore possibilities for closer coordination on radiofrequency matters and to bring a proposed way forward to SIT-26.</b>	<b>REPORT @ SIT-26 (SIT-26)</b>
24-24	<b>CEOS representatives to the GEO Ministerial Task Force to coordinate the conclusion of the CEOS inputs to the various GEO Summit related meetings.</b>	<b>COMPLETE (GEO-VII)</b>

**24-2:** Tim Stryker reported that the Charter did an internal study on the response to the floods in Pakistan, which included consultations with Pakistani authorities. Over a five-week period, more than 540 images were provided from 14 Charter-affiliated satellite missions. The review indicated that Charter activation was a successful one, which supported the efforts of Pakistani and other agencies involved in the response.

#### *SIT actions*

No.	Action	Status (Due date)
SIT 25-1	<b>CEOS Executive Officer to update the CEOS Implementation Plan (version 3).</b>	<b>COMPLETE (CEOS Plenary)</b>
SIT 25-2	<b>CEOS members and agencies to provide Takashi Moriyama with comments on the GEO Carbon Strategy Report. Takashi Moriyama</b>	<b>COMPLETE CEOS RESPONSE STRATEGY</b>

No.	Action	Status (Due date)
	will seek an extension to the comment period from the Carbon COP.	DISCUSSED AT SIT-26 (30 April 2010)
SIT 25-3	SIT Chair to invite CEOS agency participation in the CEOS Carbon Task Force.	COMPLETE JAXA, NASA, NOAA, WMO, GCOS, CNES, CSIRO, ESA, EUMETSAT, DLR, USGS & others represented (30 April 2010)
SIT 25-4	SEO to work with the Carbon Task Force leadership to establish a mailing list for the group.	COMPLETE MAINTAINED BY CO-CHAIRS (30 April 2010)
SIT 25-5	The CEOS Carbon Task Force to work with Brent Smith and Pakorn Apaphant on the development of the CEOS contribution to the GEO Ministerial Carbon Showcase.	COMPLETE VIDEO SHOWN IN BEIJING (30 April 2010)
SIT 25-6	The CEOS Carbon Task Force to provide the SEO with a review and feedback on the SEO's recent ACC gap analysis.	DISCUSSED IN DC WORKSHOP – WILL BECOME PART OF STRATEGY REPORT ANALYSIS 31 May 2010
SIT 25-7	SIT Chair, in cooperation with CEOS Chair, to work with the CEOS Carbon Task Force and key agency stakeholders to propose suitable organisational arrangements and scope for the way forward within CEOS on coordinated GHG observations.	COMPLETE CONSULTATION OCCURRED AROUND A STRATEGY DISCUSSION PAPER AND A 2-YEAR PLAN NOW IN PLACE – AGREED IN DC WORKSHOP FEB 2011 (CEOS Plenary)
SIT 25-8	GISTDA to provide an assessment of whether their HJ-1A data agreement with China would allow this data to be provided by CEOS in support of the GEO FCT Task.	COMPLETE GISTDA GROUND STATION DOES NOT RECEIVE HJ-1A DATA (31 May 2010)
SIT 25-9	CEOS agencies to undertake best efforts data acquisitions in support of the 2010 coverage requirements of the GEO FCT	COMPLETE RESULTS REPORTED AT SIT-26 (CEOS Plenary)
SIT 25-10	CEOS FCT participants, supported by CEOS Chair, to develop a CEOS Strategy Report on continuity and coverage plans year by year for 2010 – 2015 using public good data sources and identifying the role for high resolution data CEOS Plenary	BASIC STRATEGY PRESENTED AT SIT-26 (CEOS Plenary)
SIT 25-11	CEOS & SIT Chairs to initiate a short study among participating agencies to report to CEOS Plenary on the institutional arrangements for management of the CEOS role in supporting FCT future development and expansion	BASIC STRATEGY PRESENTED AT SIT-26 (CEOS Plenary)
SIT 25-12	FCT team to provide Mitch Goldberg a progress report on the CEOS FCT progress for submission to SBSTA.	COMPLETE (31 May 2010)
SIT 25-13	CSA to provide a 1-2 page report on recent developments in disaster early warning to be integrated into the CEOS report to SBSTA.	COMPLETE (14 May 2010)
SIT 25-14	Climate SBA Coordinator to liaise with SIT Chair to prepare CEOS groups and experts for the CEOS Response to the GCOS IP update –	ONGOING REPORTED AT SIT-26

No.	Action	Status (Due date)
	including the anticipated expert meeting on the Satellite Supplement.	(October 2010)
SIT 25-15	SIT discussed and approved in principle the creation of a group with the prime mandate to ensure the more coherent production of FCDR/ECVs among agencies in response to the defined needs of GCOS. SIT Chair to identify with CEOS Chair the appropriate procedure for implementing the group within CEOS, and identifying a Chair. And CEOS agencies to nominate representatives to SIT Chair - at the working level, among those responsible for the implementation of relevant programmes in their respective agencies.	COMPLETE - WGCLIMATE CEOS Plenary
SIT 25-16	CEOS LSI member agencies to provide USGS/Tom Holm information on their LSI point of contact (as applicable) and seek to ensure their POC's active involvement in future LSI Team meetings	1st July 2010
SIT 25-17	CEOS LSI leadership to recommend to GEO the use of all sources/types of FCT Task data collections for demonstration in agriculture research	31st July 2010
SIT 25-18	CEOS SIT Chair to coordinate with CEOS Chair and GISTDA and present the way forward on the CEOS High Profile Publication – noting the recommendation from SIT-25 that a 10 page limit be applied.	COMPLETE SEC-137
SIT 25-19	CEOS Agency MIM contacts asked to emphasise accurate and comprehensive instrument measurement capability data in their 2010 survey returns – in support of gap analysis and capability assessments.	COMPLETE June 2010

#### 4 Report on December CEOS-GEO Consultations and February CEOS-GEO Actions Workshop

Tim Stryker reported on recent CEOS-GEO consultations, and on 2011 priorities. Successful CEOS-GEO consultation meetings were held in December 2010, which led to productive review of actions at the CEOS-GEO Actions Workshop in February 2011. The updated CEOS-GEO actions and priorities were reflected in the CEOS 2011 Work Plan, with the highlights including

- efforts to improve space agency coordination on climate activities;
- alignment of the CEOS Virtual Constellations with GEOSS;
- sustaining progress on FCT, carbon from space, and Data Democracy;
- addressing emerging priorities like GCI, Geohazard Supersites, the Joint Experiments on Crop Assessment and Monitoring (JECAM), fresh water, and GEO BON; and
- outreach to key stakeholders like GEO, UNFCCC COP, SBSTA, G-8/G-20.

The objective was to have fewer, but more useful, CEOS-GEO actions defined for 2011. As a result, six actions from 2010 were closed and 25 continued, 16 new actions were created for 2011, with nine actions still undergoing review and classification. These actions are nearly evenly split between Category 1 and Category 2, and are divided into four categories: data provision; scientific and calibration/validation; programmatic; and, capacity building. CEOS actions can be tracked online at <http://ceos-actions.com>.

The CEOS-GEO Actions Workshop also worked to refine CEOS inputs to the development of the 2012-2015 GEO Work Plan. These inputs were provided to V.0 of the GEO 2012-2015 Work Plan, and were followed by good CEOS participation at the 2<sup>nd</sup> GEO Work Plan Symposium (4<sup>th</sup>-6<sup>th</sup> May 2011).

<b>SIT 26-1</b>	<b>CEOS agencies to urgently review draft Version 0 of the 2012-2015 GEO Work Plan, and send comments to the CEO for coordination.</b>	<b>COMPLETE</b> <b>(26 May 2011)</b>
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## 5 Review of the Role of CEOS SBA Coordinators

Tim Stryker reported that CEOS has established nine SBA Coordinators in support of GEO's Societal Benefit Areas, noting that there is currently no need for a Weather SBA coordinator and this role has not been filled.

<b>Agriculture</b>	Prasad Thenkabail <i>USGS</i>	<b>Disasters</b>	Guy Séguin <i>CSA</i>	<b>Health</b>	Murielle Lafaye <i>CNES</i>
<b>Biodiversity</b>	Martin Wegmann <i>DLR</i>	<b>Ecosystems</b>	Asanda Ntswana <i>CSIR</i>	<b>Water</b>	Osamu Ochiai <i>JAXA</i>
<b>Climate</b>	Mitch Goldberg <i>NOAA</i>	<b>Energy</b>	Richard Eckman <i>NASA</i>	<b>Transverse</b>	Ivan Petiteville <i>ESA</i>

Tim recently sent a questionnaire to each of the SBA Coordinators covering a number of topics including the frequency of internal and external interactions, current GEO Tasks and CEOS-GEO actions supported, participation in meetings, suggestions for improvement to the SBA structure, and an indication of planned continuation in the role. The survey identified several issues including the availability of resources, ability to participate in key meetings (i.e. SIT, Plenary), GEO Task activity levels and GEO Secretariat interactions, and team engagement.

Stefano Bruzzi noted that this is an important topic, and Tim and the NASA team agreed that it should be taken into account during the CEOS Self Study.

## 6 FCT/GFOI Report

### *FCT Status*

Per-Erik Skrovseth reported that the FCT National Demonstrator (ND) Summit-2, Science Data Summit-2 (SDS-2) and Space Data Coordination-4 (SDC-4) meetings were hosted by FAO and ESRIN in February 2011. These meetings were attended by more than 70 representatives covering 9 of the 10 NDs, and the SDS-2 meeting made a series of recommendations for CEOS:

- continuation of annual, dual-season wall-to-wall SAR coverage over the NDs;
- continuation of repetitive wall-to-wall optical coverage over the NDs, with the aim of generating one cloud free coverage per year;
- creation of dense ASAR/RADARSAT-2 time series over certain Verification Sites to simulate new-generation C-band satellite datasets; and
- progress on discussions with commercial providers for VHR data (optical and X-band).

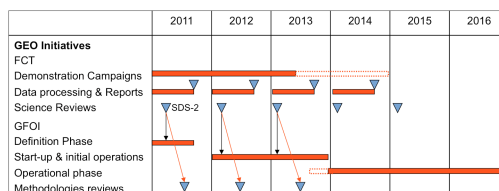
Follow-up meetings are currently being planned for early 2012, possibly hosted in an ND.

Per-Erik reported notable progress on product development since the SDS-1 meeting (May 2010), including progress towards integration of multiple satellite data sources and national scale applications.

The product development target for GEO-VIII is national scale wall-to-wall demonstration of Horizon 1 map products (i.e. forest cover and cover change, land and use cover and change).

The Global Forest Observation Initiative (GFOI) will build on FCT, focused on establishing an operational system. Once the FCT demonstration phase is complete, FCT will likely focus on R&D in support of GFOI.

### Schedule considerations



### GFOI Status

Stephen Briggs reported on behalf of the GFOI Task Force, noting that the Initiative is based on a rapidly evolving policy context, notably through the Paris-Oslo and UNFCCC processes on REDD+, and with COP-15 explicitly citing the need for national forest monitoring systems and for observations (Decision 4/CP.15).

The mission for GFOI will be to ensure sustained availability of satellite and ground observations in support of national forest systems, and support to countries using those observations in those systems. The Initiative will support the long-term observation needs of United Nations Framework Convention on Climate Change (UNFCCC), and will engage with other key users such as FAO and IPCC. It is important to emphasise that GFOI is not an attempt to impose systems on countries, but to support the development of national systems. A GFOI Implementation Plan will be presented at GEO-VIII Plenary for endorsement.

FCT was essentially a technical activity and that GFOI builds on this activity, working to create partnerships that are extremely complex, involving elements of government that are responsible for environmental, carbon and climate activities, rather than space activities.

A new full-time staff member will soon be appointed as a foundation for a Geneva-based GFOI Program Office, and it is expected that GFOI will launch with a major intergovernmental process in 2012, drawing on experience from weather (GOS) and oceans (GOOS).

Makoto Kajii noted that at GEO-VII, the US indicated that they would engage in GFOI, and Stephen noted that the US SilvaCarbon initiative has become very active in GFOI.

### 2010 Data Acquisitions Report and 2011 Data Acquisitions Status and Support

Frank Martin Seifert reported on 2011 data acquisition requirements in support of FCT. He noted that there are currently 10 NDs, with Nepal as a potential 11<sup>th</sup>, and that from 2011 the progressive inclusion of countries from UN REDD and World Bank Forest Carbon Partnership Facility (FCPF) is planned. There are currently 37 REDD Country Participants.

To date more than 116,000 scenes have been acquired by CEOS and the total area of FCT NDs is now more than 10 million square kilometres. It is important that CEOS continue to establish itself as a reliable coordinator of satellite data provision, especially as all the missions currently contributing to FCT are past their design life.

SIT 26-2

**CEOS agencies to undertake best efforts data acquisitions in support of the 2011 coverage requirements of the GEO FCT.**

During 2011



**25-10:** CEOS FCT participants, supported by CEOS Chair, to develop a CEOS Strategy Report on continuity and coverage plans year by year for 2010 – 2015 using public good data sources and identifying the role for high resolution data.

SIT-26: 24-25 May 2011, ESA ESRIN – Final V1.0

**25-11:** CEOS & SIT Chairs to initiate a short study among participating agencies to report to CEOS Plenary on the institutional arrangements for management of the CEOS role in supporting FCT future development and expansion.

Future objectives for the FCT Task include deeper integration with carbon models and progress towards emissions products; increased ND cooperation and capacity building; support to GFOI; and continuing to secure long term satellite acquisitions.

Mr Kajii asked how the FCT Task would adjust for the loss of ALOS. Frank Martin noted that several options are being considered including focusing on preparations for ALOS-2, and the potential of the SAOCOM mission.

*CEOS GFOI Data Strategy & Institutional Arrangements*

Mr Kajii noted that there are two actions from SIT-25 that are being addressed by this topic.



The proposed strategy is summarised in two supporting documents and contains three basic elements:

1. A baseline, coordinated global data acquisition strategy involving a small number of core public good data streams:
  - Default twice-annual wall-to-wall acquisitions of forested areas globally.
2. A coordinated national data acquisition strategy:
  - In response to national needs assessments, accommodating specific technical requirements, including intergovernmental arrangements, and a wider range of sources.
3. Data supply in support of FCT activities:
  - Science studies for GFOI, with ND coverage to be routine under 1 and 2 above.

Of the core data streams, only ENVISAT and Landsat missions are currently active, and based on current schedules, the rest of the core missions won't be at full capacity until 2014. In the interim, the execution of the data strategy is going to have to rely on considerable coordination and good will.

CEOS can expect strong representation and institutional links to GFOI, given the significance of the data contribution. The foundations for the CEOS contribution exist within the FCT activity, however the reinforcement and formalisation of the SDC group is proposed to cover the baseline, national, and FCT data activities. This group comprises those CEOS agencies contributing core and other data streams, with the proposed addition of the analytical skills of the SEO and LSI.

<b>SIT 26-3</b>	<b>CEOS agencies to review and feedback on the draft 'CEOS Strategy for Space Data Coverage and Continuity in Support of the GFOI and FCT Task'.</b>	<b>June 2011</b>
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Jörn Hoffmann noted that capacity exists globally to meet the data requirements of FCT/GFOI, but commercial options may be required. He also noted that *in situ* observations, as well as high resolution commercial data may be required to meet the evolving requirements and to sustain the system.

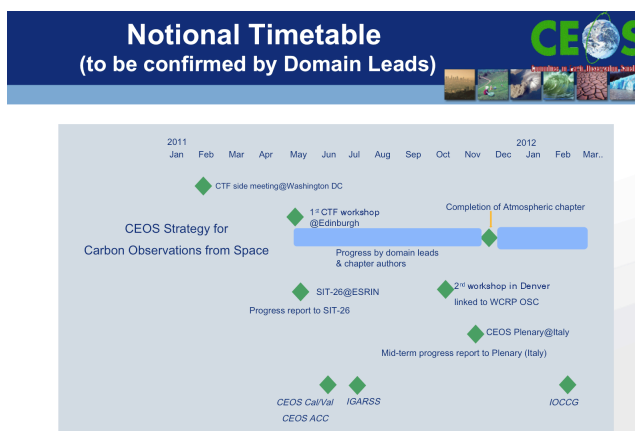
Yufeng Zhang noted that HJ-1A and HJ-1B may be able to make contributions. Stephen noted this further discussion would be welcome, with the stipulation that a minimum of 30m resolution is required.

## 7 CEOS Strategy for Carbon Observations from Space

Takashi Moriyama reported on recent activities in support of the development of the CEOS Strategy for Carbon Observations from Space, including a Carbon Task Force update, an overview of the 2011-2012 Work Plan, a summary of roles and responsibilities including the Domain Leads, and linkages to CEOS Response to GCOS IP.

The GEO Carbon Strategy was released at GEO-VII. Around the same time, the 2<sup>nd</sup> Carbon from Space Workshop was held, and concluded that CEOS should seek to develop a comprehensive response global carbon observation strategy. The CEOS Carbon Task Force (CTF) is developing the CEOS Carbon Strategy in response to these inputs.

The CTF is being co-chaired by Takashi and Diane Wickland (NASA), and, three domain leads have been designated to coordinate the development of the CEOS Strategy: Berrien Moore (Atmospheric, U. Oklahoma, USA); Christiane Schmullius (Terrestrial, U. Jena, Germany); and, Shuba Sathyendranath (Oceans, Plymouth Marine Laboratory, UK).



It is expected that the final CEOS Strategy report will contain six chapters: Executive Summary; Introduction/Context for Integrated Global Carbon Observations & Analysis System (IGCOAS); Land Domain; Ocean Domain; Atmosphere Domain; and, Integration. The plan is to complete report by the end of 2012, though the three domains are at different levels of maturity.

The Atmospheric domain is the most mature, with a number of pre-existing materials available. The target is to have a complete draft of the Atmospheric chapter just ahead of the AGU meeting in San Francisco in December 2011, and agree on a final release version in early 2012.

There are a few key messages to be considered in the report, including the need to increase the density of *in situ* observation networks (not specifically a CEOS responsibility), to develop further measurements of CO<sub>2</sub> from space, and to improve accessibility and standardisation of data. In addition, the CTF will work to identify gaps between the GCOS-IP and the GEO Carbon Strategy, and will work with the SEO on supporting mission gap analyses.

Brent Smith commended the work of the CTF, noting that a considerable amount of effort has gone in since the task force was setup, and that it appears as though these efforts are well connected to the GEO Carbon CoP.

Mark Dowell noted that it would be useful to have gap analyses performed for each of the three domains included in the Strategy.

Makoto Kajii requested that the CTF not limit its activities exclusively to the development of the CEOS Strategy, but also engage in other CEOS carbon activities including the Virtual Constellations. He also asked that the CTF co-chairs provide a status update at CEOS Plenary.

SIT 26-4

Carbon Task Force Co-Chairs to report progress to the CEOS Plenary.

CEOS Plenary

Ken Holmlund presented a brief summary of IASI CO/CO<sub>2</sub> compatibilities. He noted that IASI is flying on current and future Metop missions, and stressed that the sensor needs to be used in coordination with other instruments.

## 8 Report from GEO

José Achache (GEO SEC Director) reported that GEO is currently at the midpoint of its 10-year implementation plan, and since the Beijing Plenary and Ministerial, the focus has shifted to implementation.

He also reported that:

- GEO has received an increasing number of data requests, which may tax CEOS member and private sector resources;
- Increased requests for data may require CEOS to formulate an opinion on how to address access to commercial data;
- The role of the GEOSS Data CORE concept is closely related to data sharing;
- That the GEOSS Common Infrastructure (GCI) is being put in place to enable the discovery and access to, data, but that GEO is about adding value by producing products for end users;
- The main themes for GEO-VIII are currently being coordinated, and will likely highlight food security, JECAM, and GEO Supersites (earthquakes);
- More than 70 proposals have been received in response to the call for Decision Support Projects. They cover mainly 4 SBAs: water (55 %), agriculture (25%), health (17%) and energy (3%);
- A GEO Executive Committee working group is looking at post-2015 funding options and the operation of GEO SEC, including whether operational systems should be passed onto operational agencies or whether there are alternate models (i.e. private sector);
- One possible model would see GEO act as a coordination mechanism matching proposed systems with funding entities; and
- The 2012-2105 GEO Work Plan is now being formulated, and will be more target driven, with a number of Tasks streamlined, and improved management structures. Several drafts are planned, and culminate in a submission to GEO-VIII.

José highlighted the positive coordination between CEOS and GEO, stressing that GEO needs to maintain its cross-cutting coordination, with a focus on both space and *in situ* observations, and that it is building an integrated system for 9 SBAs, not separate systems for each. He also noted that CEOS agencies should be aware that GEO SEC is significantly resource constrained.

Stephen Briggs noted that CEOS does not have commercial data suppliers at the table, but the issue of how to deal with them needs to be addressed, for example in relation to FCT/GFOI. He noted that a coherent approach would help, but not going as far as having private sector partners present as has been discussed in the past. He also noted that considering the role of commercial providers is easier in response to specific initiatives, rather than generic ones.

Stephen also stressed the need for a coherent approach to the Rio+20 Conference (the UN Conference on Sustainable Development), stressing the many and significant achievements since Rio and Rio+10. He

noted that ESA is currently considering its approach to Rio+20, and other agencies will be doing the same. He also noted that any efforts should be directly linked to the four conventions of the conference.

<b>SIT 26-5</b>	<b>CEOS Chair to work with CEOS and GEO Secretariats to develop a planning process for CEOS inputs and outcomes in relation to Rio+20.</b>	<b>Through to June 2012</b>
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Brent Smith recalled that before Rio in 1992, the UK Government convened a meeting on space and environment and many CEOS agencies participated at that time. He expects multiple national frameworks in support of Rio+20, and so coordination between CEOS and GEO should be considered.

## 9 CEOS Support to Biodiversity Activities

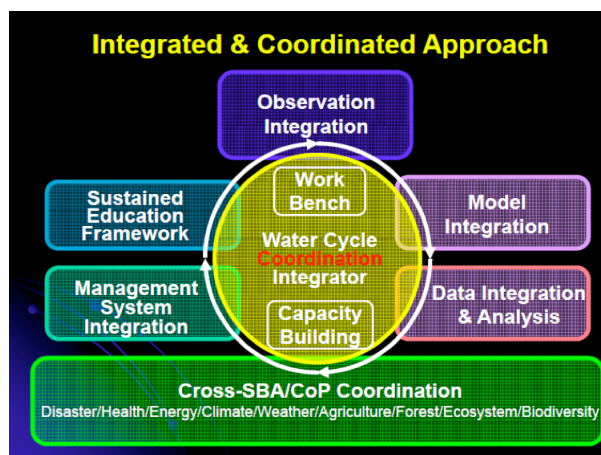
Tim Stryker reported that Martin Wegmann (DLR) has recently been identified as the CEOS Biodiversity SBA Coordinator. In March, Martin participated on behalf of CEOS in an international expert meeting on the “*Assessment of the Adequacy of Existing Observation Capabilities for the CBD 2020 Targets*” in Wageningen, the Netherlands.

The first priorities, to be completed by mid-2011, are to compile a list of remote sensing data currently being used by the biodiversity community, and to engage the GEO BON steering committee and introduce CEOS. By the end of 2011, the scope and participants for a larger meeting on the status and future remote sensing for biodiversity should be outlined, with a view to convening a meeting in early 2012.

## 10 CEOS Support to Water-related Activities

Douglas Cripe (GEO Secretariat) reported on behalf of Toshio Koike (Univ. of Tokyo/JAXA) and Rick Lawford (Chair, IGWCO) on possible CEOS support to water-related activities.

The Water Cycle Integrator (WCI) seeks an integrated approach to Water Cycle management, linking information from observations, models and data analysis, with SBAs, management systems, and an education framework.



It is hoped that a CEOS agency lead on two essential WCI components - the integration of satellite observations and data - can be identified. Additional, support for the organisation of regional water workshops in Asia, Africa (in conjunction with AWCI and AfWCCI), and possibly Latin America is also being sought.

<b>SIT 26-6</b>	<b>CEOS SIT Chair to identify a CEOS Agency to lead efforts on the integration of satellite observations and data in support of the Water Cycle Integrator initiative. CEOS agencies encouraged to support regional GEO Water Workshops currently in planning.</b>	<b>Ongoing in 2011</b>
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## 11 CEOS Support to the GEO Geohazard Supersites Initiative

Guy Seguin (CEOS Disasters SBA Coordinator) reported on the Supersites initiative, following up on CEOS Plenary action 24-17.



CEOS Agencies have reviewed the White Paper and have outstanding questions concerning:

- the criteria and process for selection of Geohazards sites; and
- specific data requirements for each site and instrument for both archival data and future tasking with associated prioritization and rationale for a given instrument.

The CEOS Supersites team plans to hold two meetings in 2011: in June to develop an understanding within CEOS on the needs and to identify what can be done; and, in September with the GEO community to prioritise requests and provide actionable guidance for future acquisitions. The team then expects to present a plan and progress report to CEOS and GEO Plenaries.

There was a short discussion on the science and potential operational dimensions of the Supersites initiative, and it was suggested that these discussions should be separated. Keeping this activity in the research domain allows some CEOS agencies to contribute, whereas if the system were operational, support would be more difficult.

<b>SIT 26-7</b>	<b>Guy Seguin to report to CEOS Plenary on progress towards the GEO Supersites initiative, including outcomes of the June coordination meeting and recommendations for the way forward.</b>	<b>CEOS Plenary</b>
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## 12 CEOS Support to the JECAM Initiative

Prasad Thenkabail reported on the JECAM initiative (GEO Task AG-07-03), noting that 12 initial test sites have been defined, but ultimately the goal is to work towards a global system. The initial project duration is 3 to 5 years.

A JECAM Space Data Coordination Meeting will be held 21<sup>st</sup>-23<sup>rd</sup> June in Ottawa, Canada, and Prasad requested that CEOS agencies consider participation. The meeting will review a pilot study from the SEO, and the JECAM Science Plan and user requirements.

<b>SIT 26-8</b>	<b>CEOS agencies encouraged to be represented in the JECAM Space Data Coordination meeting (21-23 June, Ottawa) and to establish points of contact for JECAM.</b>	<b>June 2011</b>
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Jörn Hoffmann asked why there are no sites in India or Africa, and Prasad noted that they are working to identify an Indian site.

Per-Erik Skrovseth noted that this is a demonstration of potential capability, but that a global service may have commercial and sovereignty implications that will complicate implementation. José Achache noted that the point is to get funding from G-20 countries to build this system, and that is where GEO would add value. He also noted that FAO has also proposed an integrated approach to this problem, AMIS (Agricultural Market Information Systems), and that the GEO initiative should be complementary.

Stephen Briggs noted that through GMES, ESA will support food security in Africa.

Makoto Kajii noted that monitoring does not always mean operational systems, and that the CEOS dialogue on how best to engage in JECAM should continue.

### 13 Task on Polar Ecosystems

Guy Seguin reported on a proposal by CSA to include a sub-Task on the monitoring of Arctic ecosystems within Task DS-13 (Global Ecosystems Monitoring) in the 2012-2015 GEO Work Plan. This activity would seek to coordinate the effective use of satellite-based Earth Observation information and tools for polar land and marine ecosystem monitoring.

A series of implementation milestones have been devised, including the development of an Arctic Ecosystem Monitoring Charter, a Science Plan, and the identification of current and potential implementation projects. This would build towards a series of workshops and a final symposium to consolidate progress and provide a way forward at the end of the third year.

Brent Smith referred to the IGOS Theme on Cryosphere and hoped that the GEO Task would be linking to existing initiatives (i.e. in WMO) and not duplicate effort.

<b>SIT 26-9</b>	<b>CEOS agencies to provide comments on the proposed new GEO Task on polar ecosystems, the CEOS role therein, and expressions of interest in participation and support.</b>	<b>June 2011</b>
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Stephen Briggs raised the general issue of the increasing number of new CEOS activities, stressing the need for prioritisation. There needs to be a coherent process for determining priorities amongst emerging activities.

Makoto Kajii agreed, noting that this is a relatively new issue for CEOS and the process needs to be refined. Michael Freilich also agreed, and suggested that this should be included in the CEOS Self-Study. He also noted that SIT may be the group to ultimately make decisions on CEOS priorities, but that the SIT meeting may not be the best mechanism. Ivan Petiteville added that the process should be a “light process”, and identify resources.

*After SIT-26, Ivan clarified by “light process” he was referring to one which is: in line with the CEOS Strategic priorities; allows for timely decisions (i.e. not introduced delays in the initiatives to be served); requires just the minimum documentation necessary for the CEOS Principals to take their decisions; does not block Agencies that volunteer to participate but at the same time does not force Agencies to participate; and, does not endanger the execution of on-going strategic activities by removing resources.*

Stefano Bruzzi added that CEOS can achieve a lot, but that a set of priorities and a timeline to tackle them is required. He suggested that this information should be made available to the community as a planning tool, and may also help to provide capacity information to those external organisations seeking CEOS support and engagement.

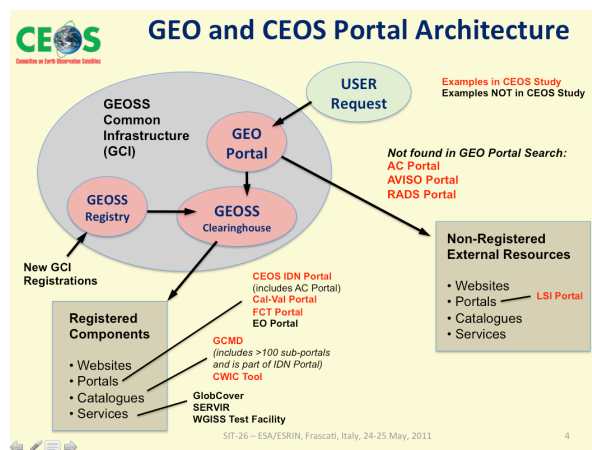
José Achache suggested that the problem is not with CEOS priorities but how much data can be provided. Stefano agreed in theory, but noted that in practice each agency has its own set of activities (with associated resources) that need to be adjusted to accept new priorities.

## 14 Portal Review Study Outcomes

Brian Killough provided a status update on the SEO's Portal Study, in progress per Plenary Action 24-3.



A small study team, including WGISS and several other groups, has conducted a preliminary study. The report will define two broad categories: community portals (i.e. VC portals, FCT); and, super portals (i.e. the GEO Web Portal, IDN).



Brian recommended that the study group continue its work, and that a final report be made at CEOS Plenary. He noted that between now and Plenary, the team will conduct in-depth interviews with community and GEO Web portal developers, and work with WGISS to coordinate the findings and recommendations. The report will likely contain a set of guidelines for CEOS community portals to improve navigation and effectiveness, and will also develop a set of recommendations for the GEO Web Portal (navigation) and the GCI registration process.

## 15 CEOS Contribution to GCI

### *CEOS International Directory Network (IDN)*

Pakorn Apaphant provided a summary of the CEOS International Directory Network (IDN), which is supported by NASA. The IDN is a gateway for data discovery, and in some cases access, and is the host of several CEOS portals, (i.e. LSI, Climate Diagnostics). The IDN represents a potential resource in support of the GCI, which should be further investigated.

### *CEOS Metadata Contribution to GCI*

Osamu Ochiai presented a proposal from the SIT Chair Team on how CEOS can contribute to the GCI. He noted that a CEOS Plenary action was defined to encourage CEOS agencies to contribute their datasets and information to the GCI, but that response had been sluggish to date.



He stressed that if CEOS agencies are committed to GEOSS implementation, they must provide strong support for GCI. One the key inputs to the GCI should be metadata, providing linkage and interoperability across agency data service systems. In addition to the IDN, he also noted that the CEOS MIM database provides information on agency data, products, and services. It was proposed that this metadata be made accessible through the GCI.

<b>SIT 26-10</b>	<b>WGISS, in coordination with SIT Chair, to enable CEOS IDN metadata accessibility via the GCI and to propose a plan for maintenance of this capability.</b>	<b>CEOS Plenary</b>
<b>SIT 26-11</b>	<b>CEOS agencies to register metadata describing available datasets made available to the GCI in the IDN.</b>	<b>CEOS Plenary</b>

## 16 GCI, DataCORE, EO Datasets, and “Sprint to Plenary”

Ivan Petiteville provided an overview and status of the current GCI, which includes a web portal, a clearinghouse, and several registries. Ivan summarised several weaknesses in the current GCI:

- only data and information discovery: no data access;
- limited remote catalogues searched by the clearinghouse;
- clearinghouse interface incompatible with heterogeneous EO information systems;
- low number of resources in clearinghouse (partly due to low resource registration); and
- lack of categorisation of information results.

The 15<sup>th</sup> GEO ADC meeting (Brazil, March 2011) decided to focus on significantly enhancing the GCI, with the objective of demonstrating those enhancements at GEO-VIII; this effort is referred to as the “Sprint to Plenary”. The initial focus will be on a list of critical parameters, and will attempt to reuse relevant existing projects like GENESI and EuroGEOSS.

After GEO-VIII, the focus will shift to the new EC FP7 Project, working on a consolidated GCI. This effort will be led by ESA, will be a follow-on from both EuroGEOSS and GENESI, and will achieve initial outcomes in the first half of 2012.

Ivan noted several specific requests for support from CEOS agencies (covered by actions SIT 26-10, 26-11, and 26-12):

- most relevant EO datasets to be registered in the GCI;
- corresponding catalogues to be interfaced to the GCI (one-stop-shop for data discovery); and
- corresponding on-line repositories to allow access to authorized users following data discovery.

<b>SIT 26-12</b>	<b>CEOS agencies encouraged to ensure datasets meeting DataCORE criteria are added to the GCI and corresponding product catalogues and repositories interfaced.</b>	<b>End June 2011</b>
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## 17 Report from GCOS

Makoto Kajii noted that GCOS had submitted a written report, and is planning attendance at CEOS Plenary.



## 18 CEOS Response to the GCOS IP and Updated GCOS Satellite Supplement

Mitch Goldberg provided a status update on the CEOS response to the GCOS IP and inputs to the updated GCOS Satellite Supplement.

The GCOS Satellite Supplement was written with the inputs of a number of CEOS members, and provides supplemental detail to the updated GCOS IP. The CEOS response to the GCOS IP reinforces the needs called out by the GCOS Satellite Supplement. The Satellite Supplement is still open for review until the end of June and he will invite CEOS agencies to comment on it.

<b>SIT 26-13</b>	<b>Mitch Goldberg to remind CEOS agencies of the public review period of the GCOS Satellite Supplement and to develop a consolidated commentary for GCOS.</b>	<b>30 June 2011</b>
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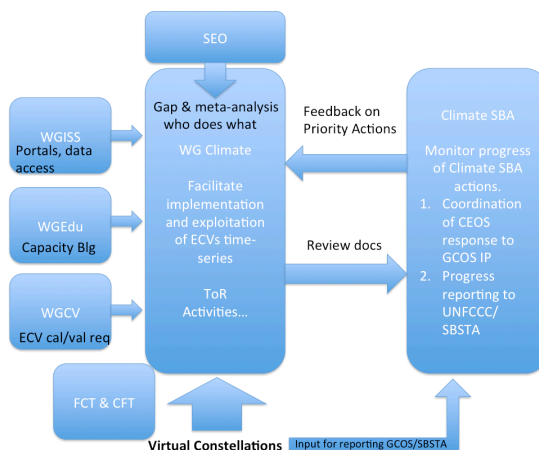
The CEOS response to the GCOS IP has to address 47 actions. These actions have been divided into three domains, and leads have been identified for each: Atmosphere (Goldberg); Oceans (Dowell); and, Terrestrial (Dwyer). The response is being coordinated with the CEOS Working Groups, Virtual Constellations, and external climate-related groups (i.e. SCOPE-CM, GSICS, WCRP, and CGMS). Subject matter experts for each action have been identified, and have been asked to develop a response via a common template, which WGClimate will also review and provide input to. The full CEOS response will then be developed from these templates, with the full report also being reviewed by WGClimate, and finalised by September 2012. The goal is to have 70% of the templates completed by November, and 100% completed by February.

Mitch proposed an all-day side meeting on the topic in conjunction with CEOS Plenary to bring the complete response team together.

## 19 Working Group on Climate

Mark Dowell reported on the background, 2011 plans, and expected outcomes for the Working Group on Climate, with the overall aim being to provide a coherent approach within CEOS to Climate activities. The mandate of WGClimate is to facilitate the implementation and exploitation of Essential Climate Variable (ECV) time series through coordination of existing and substantial CEOS agency activities.

Mark noted that specific decisions from COP-15 encourage CEOS to continue coordinating and supporting the implementation of the satellite elements of GCOS, and urges parties that support space agencies to enable implement actions in a coordinated manner.



The priorities for the first meeting of WGClimate include the formulation of a CEOS ECV Inventory, discussion of the Climate Monitoring Architecture, ECV by ECV analysis/assessment, and outreach and networking.

Several WGClimate-related documents should be expected including: a governance document; a 2-3 year work plan; and, a web presence. In addition, representation will be planned at relevant meetings, with a 2011 focus on those of WCRP/WOAP, GCOS, SCOPE-CM, and WMO.

José Achache noted that GEO believes that the focus should be on building GEOSS, rather than duplicating efforts within GEO and CEOS. He noted that a number of ‘essential variables’ are required across multiple communities, and a lot of these go well beyond the realm of climate and require much broader community inputs.

## 20 Continuity & Architecture Requirements for Climate Monitoring

### *Report on the Progress of Climate Architecture Writing Team*

Mark Dowell reported that the Climate Architecture Writing team agreed that a fully integrated climate architecture is needed. The lead from WMO is positive and commendable, and the general consensus is that this activity will eventually extend CL-09-02 and feed into the new 2012-2015 task (currently IN-02). The space agencies participating agreed that the GCOS Climate Monitoring Principles should be followed to the greatest extent possible, acknowledging that each agency will operate within its mandate.

The writing team has formed two groups – a writing group (4-5 from CEOS, 4-5 from CGMS, WMO Secretariat), and a review group (GEO SEC, GCOS, WCRP). The writing team met face-to-face in Geneva in March to discuss the approach, emphasising that this is a ‘badgeless’ activity.

The report will include case studies mapped onto the logical architecture, stewardship analysis, and an iterative effort to help the decision maker map their own policies onto the architecture. The architecture document is seen as a long-term document, which will be followed by a shorter-term implementation plan. A timeline for the development of the report was presented.

#### Timeline

- 15 April – Drafts of extended chapter outlines to be sent to Mark Dowell.
- 04 May – First draft of entire extended outline to be sent to Writing Team for review.
- 15 June – First draft of individual chapters to be sent to Mark.
- 30 June – Revised complete draft sent to Writing Team.
- 15 July – Writing team to provide feedback for second draft of report, including formatting of illustrations, graphics and insert boxes.
- 15 August – Report sent to review group.
- 5 September – Comments due on report from review group
- 12 September – Final report sent to CEOS and CGMS

SIT 26-14

**CEOS agencies encouraged to review and respond to the draft report of the Climate Architecture Writing Team (expected 12 Sept).**

Before CEOS Plenary

### *Discussion on the Way Forward for CEOS including Role of the Constellations*

Stephen Ward noted that the CEOS Virtual Constellations are emerging as a strong brand for CEOS, however, there is a recognition that they are just getting going and require further development. They represent a potential framework in support of the GEO Climate Architecture, and there is a need to ensure that the roles of Constellations and the WGClimate are clear. It was proposed to:

- establish CEOS role as co-lead within any resulting GEO Climate Architecture Task;
- confirm the roles and responsibilities within WGClimate and the VCs;
- trial the process ensuring WGClimate 2011 priorities include ECVs of relevance to VCs; and

- confirm CEOS capacities and schedules consistent with GEO Climate Architecture Task.

Stefano Bruzzi noted that ECVs, Climate Data Records (CDRs) and Virtual Constellations are obvious building blocks that can contribute to the GEO Climate Architecture. He noted that some transverse interactions need to be clarified, for example how Constellations serve SBAs. He also proposed that CEOS consider creating a multi-year CEOS Work Plan to ensure continuity of planning.

Brent Smith noted that Barbara Ryan is supportive of a broad approach to climate, and of the Climate Architecture being labelled as a GEO Task, but that there is some opposition to this within WMO. The writing team is suitably broad, and it is expected that it will refer to *in situ* observations as important. He also noted that US GEO, in consultation with Barbara, sent guidance to GEO ExCom to see a Climate Architecture Task undertaken in GEO and suggested that other CEOS agencies should consider having their national GEO Member representatives propose the same.

Pascale Ultré-Guérard stressed the important objective of ensuring mission continuity since this is far from guaranteed at present and requires political engagement. She noted that CNES is an R&D agency, but would like to see a push towards continuity.

Stan Wilson noted he isn't able to speak for all Constellation co-leads, but stressed that these are voluntary roles with little authority, and progress is made largely through good will. He also expressed concern about the numerous SBA interfaces, and suggested that the Constellation teams be consulted to see what they need.



Stephen Briggs noted that a GEO-led Climate Architecture is important, and CEOS fully supports this and is willing to co-lead. He agreed that a number of the climate-related ECVs are of interest to non-climate communities, but that climate is a starting point to address the wider suite of variables, and its prioritisation reflects government interests and funding trends. There is a recognition that this is an opportunity to consider the next phase of CEOS priorities, and there is an expectation that the approach to this activity will be addressed in the CEOS Self Study. It is also important that this activity not disrupt existing progress and recently formed initiatives.

Rob Koopman agreed that CEOS agency comments on the GEO Task would be welcomed.

## 21 CEOS Virtual Constellation Reports

### *Atmospheric Composition (ACC)*

Claus Zehner provided a summary of the recommendations from the Geostationary Air Quality White Paper, which was circulated to CEOS for comment in early March, and presented for endorsement at SIT-26. He noted that several countries and space agencies are currently planning to launch geostationary satellites in the 2017-2022 timeframe to obtain air quality measurements. In anticipation of this the ACC has written this position paper, which should not be viewed as an implementation plan. The paper's recommendations are broken down in the short and long term and the full paper can be downloaded from [http://www.ceos.org/images/ACC/AC\\_Geo\\_Position\\_Paper\\_v4.pdf](http://www.ceos.org/images/ACC/AC_Geo_Position_Paper_v4.pdf).

 <b>Geostationary AQ Constellation White Paper Recommendations</b>	 <b>Geostationary AQ Constellation White Paper Recommendations (2)</b>
<p><u>Near Term (1-3 years)</u></p> <ol style="list-style-type: none"> <li>1. CEOS agencies to coordinate one or two key people to be part of mission science or advisory teams with a focus on common science and collaborative data products.</li> <li>2. ACC to organize a workshop focused on air quality Observing System Simulation Experiments (OSSE) activities. CEOS to encourage and enable participation from relevant member agencies.</li> <li>3. ACC to coordinate an SBA value assessment of air quality observations leveraging recent GCOS and GEO UIC efforts.</li> </ol>	<p><u>Longer Term</u></p> <ol style="list-style-type: none"> <li>4. Agree on an open data policy for AQ-relevant data and support the establishment of common cal/val standards, working with WGCV.</li> <li>5. Organize an ACC workshop on AQ model intercomparison.</li> <li>6. Undertake best efforts to overlap AQ missions by at least one year.</li> <li>7. Support best use of complementary satellite measurements (e.g. meteorological geostationary satellites, polar orbiting satellites).</li> </ol>

He noted that agencies share common objectives for geostationary air quality measurements, but there are also regional and other differences that will have to be accounted for. There were no objections to the white paper's recommendations, and they were endorsed.

#### *Land Surface Imaging (LSI)*

Julio Dalge reported on the key on going activities related to LSI, including enhancements to the LSI portal, development of LSI mid-resolution optical guidelines, development of free-ware tools; and support to GEO FCT/GFOI and JECAM. He noted a request for support from SIT in finalising the results of the CEOS-GEO portal assessment to help better guide the development of the LSI portal.

#### *Ocean Color Radiometry (OCR)*

Mark Dowell presented a summary of recent OCR activities, noting the two current priorities:

- development of an inter-agency OCR Essential Climate Variable (ECV) implementation strategy and subsequent execution of this strategy to develop climate data records; and
- support to a concerted inter-agency effort on activities relating to sensor inter-comparison and uncertainty assessment of datasets required for the ECV generation, known as *The International Network for Sensor InTer-comparison and Uncertainty assessment for Ocean Colour Radiometry* (INSITU-OCR).

He noted that the ECV work was focusing on the establishment of an interagency science team lead by the IOCCG, and the setup of subsequent community consultation meetings on the long-term generation of climate records and sensor inter-comparison. He also noted that the community was planning to produce a white paper on INSITU-OCR in Q4 2011 or Q1 2012.

He noted that by CEOS Plenary, he and Hiroshi Murakami (JAXA) will rotate out as OCR co-leads, and Peter Regner (ESA) and Prakash Chauhan (ISRO) will rotate in, with Paula Bontempi (NASA) remaining a co-lead.

#### *Ocean Surface Topography (OST)*

Stan Wilson provided a summary of current OST activities and issues. He noted that the continuity of the climate record for sea level was dependant on the continued operations of Jason-1 and -2, and the launch of Jason-3. However, funding issues at NOAA appear likely to slip the launch of Jason-3 into 2014 or beyond. This funding issue is also impacting the ability of NOAA to contribute to the Phase B study of Jason-CS.

Cryosat-2 was launched in April 2010, though he noted that the OST is still awaiting operational products for the ice-free ocean. The launch of SARAL/AltiKa is planned for December 2011, and if Jason-1 is still operational at the end of SARAL's commissioning phase, it will be moved to a geodetic orbit. Timely access to data from HY-2A remains an issue, though one avenue to be pursued is through CNES as it is providing the DORIS instrument to fly on that mission.

Stan noted that he will be replaced as OST co-lead by Eric Lindstrom (NASA), with Francois Parisot (EUMETSAT) remaining as co-lead.

#### *Ocean Surface Vector Winds (OSVW)*

Stan provided a summary of current OSVW activities and issues, noting that timely access to Russian and Chinese scatterometer missions remains an issue. The issue may be resolved for China when CMA takes over Chinese scatterometry. Participants thanked ISRO for sharing data from OCEANSAT-2 (OSCAT) with NOAA, NASA, EUMETSAT, KNMI and ECMWF.

He also noted that harmonising orbits to optimise coverage is an issue, with ISRO, EUMETSAT, CMA, NASA, NOAA and operational users needing to optimize coverage among as many as three dual-frequency scatterometers in the 2016 timeframe.

Stan noted that he will be replaced as OSVW co-lead by Paul Chang (NOAA), with Hans Bonekamp (EUMETSAT), and BS Gohil (ISRO) remaining as co-leads.

Makoto Kajii noted that Stan will retire, and thanked him for his long service to the CEOS community.

### Precipitation (PC)

Chris Blackerby reported on behalf of Steve Neeck and Riko Oki, noting that the Constellation is currently:

- studying the availability of conical scanning microwave imagers (MI), including improved coordination with ROSHYDROMET;
- developing plans for PC data portal;
- working on CNES/ISRO Megha-Tropiques/GPM cooperation;
- exploring GPM cooperation with NOAA and INPE/AEB/GPM;
- progressing GPM implementation; and
- providing an update to a report on Space-system-based disaster management for UN COPUOS.

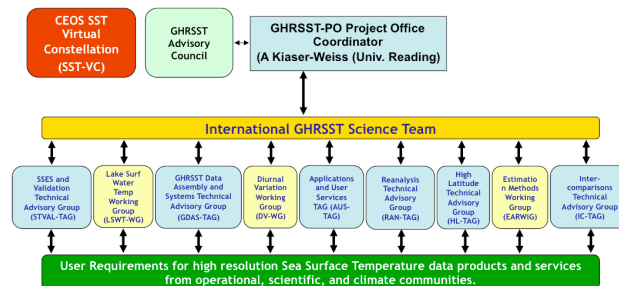
A draft of the 2011-2012 Precipitation Constellation Work Plan is in review, and is expected to be confirmed at the 4<sup>th</sup> CEOS PC Workshop in November 2011.

## 22 Sea Surface Temperature (SST) Virtual Constellation Proposal

Craig Donlon presented the Sea Surface Temperature (SST) Initial Proposal, noting that sea surface temperature is the first and longest global marine instrumental climate data record. Several CEOS Agencies have invested considerable resources in SST activities, and the objective of the SST Constellation would be to better coordinate those activities.

The SST Constellation will build on the Group for High Resolution SST (GHRSSST) framework. Using this approach, the CEOS SST-VC has instant access to a baseline SST Virtual Constellation system of systems, internationally agreed SST products, services and user outreach services, an initial consensus technical documentation for the Constellation, and a functional coordination mechanism active at the international level.

### CEOS will interface to GHRSSST activities using the GHRSSST Stakeholder Advisory Council



Following endorsement of the SST Initial Proposal, the team will plan to develop a Full Proposal document following the CEOS Constellations process. CEOS agencies are encouraged to consider attending the upcoming GHRSSST meeting at the University of Edinburgh, Scotland, 27<sup>th</sup> June to 1<sup>st</sup> July, with more details available at <http://www.ghrsst.org>.

Makoto Kajii thanked Craig for his excellent presentation, and the proposal was adopted unanimously. Mr Kajii noted that arrangements had been made with the CEOS Chair for a special SIT session to be held at CEOS Plenary to consider the SST Final Proposal, and requested that the SST team prepare accordingly.

<b>SIT 26-15</b>	<b>CEOS agencies invited to nominate representatives to the GHRSSST Advisory Council.</b>	<b>June 2011</b>
<b>SIT 26-16</b>	<b>SST VC leads to submit their Constellation proposal document in time for consideration during a SIT session at CEOS Plenary.</b>	<b>Before CEOS Plenary</b>

### 23 Brief reports from the CEOS Working Group Chairs

#### *WGCV*

Greg Stensaas provided a brief update on WGCV activities, noting that there was strong engagement from Russia at the recent WGCV-33 meeting hosted in Moscow, and that they want to continue and increase that in the future. Nominations for a new WGCV Vice Chair are open, with the role commencing WGCV-34, and a transition taking place ahead of WGCV-35.

<b>SIT 26-17</b>	<b>CEOS Agencies encouraged to provide nominations to WGCV Chair for the WGCV Vice-Chair, with the role commencing at WGCV-34 (February 2012, Australia), and transition to WGCV Chair at WGCV-35 (September 2012, TBD).</b>	<b>Before CEOS plenary</b>
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The WGCV 5-year work plan is currently under development, and will be presented at Plenary.

WGCV has supported GEO Task DA-09-01a (GEOSS Quality Assurance Strategy) by developing the QA4EO framework. This framework has been endorsed by CEOS Plenary, and the investigation of options for related support services and tools is being considered.

A QA4EO management board was proposed. This board would include broad membership from across the community, including from GEO SEC, WMO, FAO, GSICS, and a number of CEOS constituents such as the SBAs and Working Groups to address cross-cutting issues. Following issues raised by DLR, there was some reluctance from SIT to adopt the proposal without further details, and without understanding the drivers behind it, including an explanation of what capacity issues WGCV is facing and how the management board would address those issues.

Greg agreed to consult further with the community and present a refined proposal at SIT-27.

<b>SIT 26-18</b>	<b>WGCV Chair to prepare a detailed proposal to augment QA4EO capacity and requesting CEOS agency resources.</b>	<b>SIT-27</b>
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Greg also noted that:

- Additional support is required for the WGISS/WGCV showcases on Forest Carbon Tracking, Air Quality (Atmospheric Composition) and Elevation;
- Following up on SIT Action 24-13, that CEOS recommended Cal/Val sites and processes are available on the Cal/Val Portal, and that WGCV is requesting that that CEOS members begin and continue collection over these sites; and
- Support is recommended for calibration missions, such as Traceable Radiometry Underpinning Terrestrial-and Helio-Studies (TRUTHS) / Climate Absolute Radiance and Refractivity Observatory (CLARREO), in order to define accuracy benchmarks for climate quality data which requires improvement in accuracy and traceability.

<b>SIT 26-19</b>	<b>WGCV to provide a minimum instrumentation list and suggested activities for CEOS recommended instrument Cal/Val sites.</b>	<b>SIT-27</b>
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### *WGISS*

Pakorn Apaphant reported, noting that the WGISS-31 is upcoming the week of 13<sup>th</sup> June at EROS, Sioux Falls. WGISS is currently supporting a number of GEO activities including: Virtual Constellations; QA4EO; data and metadata product harmonisation; disaster management applications; long term preservation of Earth observation data; and integrated products for water management and research. It is also working on showcase activities relating to FCT, air quality, and digital elevation models.

Pakorn provided an overview of the CEOS WGISS Integrated Catalogue (CWIC). The catalogue aims to offer an inventory search access point for portals by translating and routing searches to CEOS agency inventory systems; it is not in itself a portal, but provides an interface between community portals and catalogue systems.

CWIC is a GEOSS infrastructure element in support of GEO Task DA-09-01b, and makes up part of the GCI. It represents an example of how to achieve the “system of systems” model of GEOSS through the use of standards-based virtualization techniques. The team met in November 2010, and agreed on basic capability for V1.0, with more capability to be developed iteratively in the 2011-2013 timeframe. A CWIC Workshop will be held 14<sup>th</sup>-15<sup>th</sup> June, in conjunction with the WGISS-31 meeting in Sioux Falls, and CEOS agency participation is encouraged.

*Note that WGClimate was reported under item 19, and WGEdu is reported under item 30.*

## **24 Proposal for the CEOS Self-Study**

Michael Freilich introduced the CEOS Self-Study, modelled on the academic self-study process, with the following objectives:

- to identify, articulate and evaluate CEOS successes and strengths in achieving real coordination in space-based Earth observations for societal benefit;
- to identify successes as well as areas for improvement; and
- to identify potential new CEOS initiatives for the next 5-7 years.

Patricia Jacobberger-Jellison provided an overview of the self-study process, which will include a Steering Committee, and three Study Teams: CEOS Executive Functions; Working Groups and SBAs, and; and, Constellations. The study is currently underway, with the aim of presenting findings at CEOS Plenary in November 2011.

The study will draw upon information from CEOS’s existing body of work (i.e. Implementation Plans, EO Handbooks, white papers, and other published materials). It will canvass the CEOS community and current and past CEOS leadership to extract themes, gaps and crosscutting issues. The focus will be on CEOS goals and objectives, important successes to date, opportunities for improvement, and new initiatives.

Ivan Petiteville noted that it is difficult to find CEOS documentation older than 3-4 years, and that much of this information is in the heads of CEOS participants. He also noted that how CEOS develops in 5-7 years will depend largely on how GEO develops. Michael agreed, but noted that there will be a need for coordination of Earth observation activities regardless of GEO’s plans, and that there is still a strong need to clarify CEOS activities even in the face of external uncertainty.



Stephen Briggs welcomed the study, noting that CEOS has changed a lot in the past few years and suggesting that the focus should be on the relatively recent history. Patricia noted that the goal of the study is to identify a future trajectory, not delve too far into history.

Stefano Bruzzi agreed that CEOS has changed drastically in the last few years, and noted that this is a good opportunity to study those changes and identify future challenges. He suggested that this has to be done on the assumption that GEO will exist, and that GEO, and other groups like GCOS, have provided a valuable external point of reference for CEOS.

<b>SIT 26-20</b>	<b>Incoming SIT Chair to manage execution of the CEOS Self Study and to deliver a report to CEOS Plenary.</b>	<b>CEOS Plenary</b>
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## 25 CEOS Input for the GEO Work Plan 2012-2015

Kerry Sawyer provided a summary of proposed CEOS inputs to the 2012-2015 GEO Work Plan. The process of CEOS consultation started in December 2010 with CEOS-GEO bi-lateral meetings. The Plan was discussed at the CEOS-GEO Workshop, and a CEOS proposal was submitted to GEO Secretariat 24<sup>th</sup> February. Based upon prior consultations with CEOS colleagues, Kerry summarized the CEO/DCEO-proposed recommendations to V.0 of the plan.

 <b>Proposed CEOS Recommendations (May 2011)</b>	 <b>Proposed CEOS Recommendations (May 2011) con't</b>
<ul style="list-style-type: none"> <li>• Definitions under each Task should be more well-developed</li> <li>• Involve CEOS experts in further definition and prioritization of Work Plan Deliverables</li> <li>• Reduce existing overlaps in management/coordination authorities for various Task, particularly those in Information Services</li> <li>• <b>Rename the proposed "management" boards as "implementation," "coordination," or "advisory" boards (to be discussed next)</b></li> <li>• Rename the proposed Information Services category of Tasks "Societal Benefits"</li> <li>• Appoint CEOS as Lead for IN-02 – <i>Earth Observing Systems</i> – and rewrite to refer to necessary climate architecture elements</li> <li>• Delete Task IN-05 – <i>Gap Analysis</i>; gap analyses should be implemented for all Infrastructure Tasks</li> </ul>	<ul style="list-style-type: none"> <li>• Delete ID-01 – <i>Data Sharing</i> – should be implemented in all Tasks based on the GEOSS Data Sharing Principles</li> <li>• Delete ID-05 – <i>Ensuring GEOSS Sustainability</i> – common objective of all GEO work</li> <li>• GEO should recognize existing governance structures for climate</li> <li>• Endorse the addition of DS-04 – <i>Ocean Monitoring, Forecasting, and Resources Management</i>; encourage the engagement of the OST, OSVW, OCR, and SST Constellations</li> <li>• <b>Any Other Recommendations? Need to provide them to CEO/DCEO as soon as possible</b></li> </ul>

V.1 of the Plan will be released for review by GEO Principals in late June, with comments due in September. V.2 will be released in September, reflecting comments from Principals and submitted to GEO-VIII for acceptance as a "living document".

Michael Freilich suggested that CEOS has three activities it should focus on:

- providing a forum for bilateral and multilateral coordination among willing agencies;
- providing an overview function to identify unnecessary duplication where possible; and
- providing an opportunity to focus and coordinate agencies to achieve larger objectives.

He noted that CEOS can spend a lot of time looking at new activities at the risk of spreading resources too thinly, and that a mechanism is needed to address the prioritisation of activities.

Rob Koopman added to Mike's list of CEOS activities, suggesting that CEOS has an outward looking role as a principal actor and stakeholder in a number of communities.

Stefano Bruzzi agreed that prioritisation should be addressed, and noted that the opportunity of the self-study should be taken to consider possible options. Guy Seguin also agreed, suggesting that SIT is the forum to develop a CEOS strategic plan based on a sense of priorities likely derived from the new GEO Work Plan.



Stephen Briggs suggested that CEOS has two sets of stimuli: internal (eg Constellations); and, external (eg GFOI). There is only so much of either stimuli that CEOS resources can bear, and as such there is a need to reinforce the internal organisation to help address and prioritise activities.

Brent Smith welcomed the discussion and sees some good ideas going around with CEOS having grown considerably in recent years and achieving recognition from likes of SBSTA for its role. He sees the way forward as a refinement of the things we have been doing well.

Makoto Kajii noted that CEOS is based on voluntary best efforts, and therefore SIT does not have a specific control function; if agencies want to collaborate this should only be encouraged.

## 26 CEOS Executive Involvement in GEO Task Leadership

Tim Stryker led a discussion on perspective CEOS executive involvement in GEO Task leadership. The main discussion points were:

- Rob Koopman noted that the intent of the GEO Work Plan is to have more structure and more high level visibly, and that the final structure will be decided at GEO-VIII;
- Stefano Bruzzi doesn't see the most senior CEOS representatives participating in the management board(s), citing the CEOS engagement in the ADC as a model;
- Ivan Petiteville stressed that based on his experience with ADC, it is important that CEOS agencies are represented in the management board(s) that will supervise the definition and execution of GEO Tasks in order to ensure that the space perspective is represented; and
- Michael Freilich stressed that resources need to be considered at some level, and that a plan without a budget cannot be expected to succeed.

It was agreed that CEOS needs to be engaged in the formulation of the new GEO Work Plan, and given that GEO works on a consensus basis, silence will be taken as consent.

<b>SIT 26-21</b>	<b>CEOS Chair, in consultation with CEOS SEC, to represent CEOS interests in the debate around formulation of the GEO working structures for the new WP.</b>	<b>Ongoing in 2011</b>
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## 27 High-level Meeting Engagement in 2011 and 2012

George Dyke reviewed the current opportunities for CEOS high-level engagement including: GEO Plenary; COP-17; SBSTA; Rio+20; and, the G-8/G-20. Brent Smith suggested that IAC/IAF be added to the list of events to be considered, with the IAC in Cape Town this October, and noting that 2012 will have a disaster theme and will be held in Naples, and that in 2013 it will be held in Beijing.

Stephen Briggs noted that Rio+20 planning needs to be initiated quickly. It is difficult to make an impact, but it is an extremely high profile event. Makoto Kajii suggested that CEOS should consider engagement at Rio+20, and that CEOS SEC coordinate this effort.

Frank Martin Seifert noted that ESA routinely attends SBSTA meetings, and will also attend COP-17, and they are pleased to distribute any CEOS materials at those meetings.

## 28 Report from COP-16 and Preparing for COP-17

Stefano Bruzzi reported, noting that COP-16 was successful based on the report, and noted efforts by Linda Moodie and support from INPE. He suggested that it would be appropriate that CEOS try and participate in COP-17 and COP-18.

Brent Smith suggested that if CEOS decides to pursue a side event for COP-17, that the effort should be coordinated with ESA or with other COP Members or Observers, having both organisations apply to maximise the chances of securing an event. Based on past experience, the CEOS Chair's Member Country will have to apply for the event on behalf of CEOS.

<b>SIT 26-22</b>	<b>CEOS Chair, in consultation with CEOS SEC, to explore options for CEOS presence and input at COP-17.</b>	<b>July 2011</b>
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## 29 Radiofrequency Matters

Stephen Ward led a discussion on radiofrequency matters, with the following main discussion points:

- Stephen noted that it was suggested at the last Plenary that CEOS seek a critical mass with CGMS and WMO to conclude a strategy;
- It was agreed at a February meeting with CGMS and WMO that coordination on a technical level is quite good, but this is not necessarily translating to success in guarding frequencies;
- The meeting also suggested resurrecting an old CEOS Plenary action to perform a cost-benefit analysis, which might provide some material to reinforce the space agency position;
- Tim Stryker noted that frequency coordination is dealt with by national delegations, which often have a large number of competing interests to deal with, and it is not clear what CEOS can contribute to these national processes; and
- Ken Holmlund agreed that the coordination process is largely done through national entities, but that they do need support from stakeholders.

Stephen acknowledged that there are a number of powerful industrial entities in play, but that CEOS SEC should try and take the issue forward to see what can be done.

## 30 Data Democracy

Julio Dalge provided a status report to provide the latest background on WGEdu and the Data Democracy initiative. He noted that INPE is involved in both WGEdu, and the CEOS and GEO Data Democracy Tasks in a number of capacities. He suggested that the WGEdu Terms of Reference (ToR) need to be revised, and outlined the main concerns that INPE currently has as WGEdu Co-Chair:

- More effective engagement of CEOS agencies in a way that one action managed collectively would replace individual actions;
- Better balance and cost sharing among CEOS agencies; and
- Increased number of potentially well-trained professionals, better outreach.

Stefano Bruzzi suggested that a small study team be established to look at the ToR for WGEdu, and meet to discuss the way forward at a side meeting in conjunction with the September SIT Workshop. The objective should be to propose new ToR for WGEdu at CEOS Plenary.

<b>SIT 26-23</b>	<b>CEOS Chair to establish and oversee a small study team charged with the drafting of terms of reference for a new WG - being a</b>	<b>For Sept 2011 workshop</b>
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	<b>merger of WGEdu and Data Democracy.</b>	
<b>SIT 26-24</b>	<b>CEOS Chair to invite Principals to be represented at a WGEdu / Data Democracy strategy planning meeting to be held in Washington in September around the SIT workshop.</b>	<b>June 2011</b>

### 31 MIM Status Report and Plans

Ivan Petiteville summarised the 2011 plans for the CEOS Missions, Instruments and Measurements (MIM) database which include: collaboration with SEO to expand MIM applications; improved mission and instrument data; and, on going discussions with WMO on the integration of additional product information. He also summarised a plan to review the quality of instrument-measurement information in collaboration with the CEOS Constellations.

The 2011 update survey is currently underway, and CEOS agencies are asked to submit their responses by the deadline of 10<sup>th</sup> June.

Guy Seguin asked how additional SAR-related parameters could be added to the MIM, and it was suggested that this discussion be taken up directly with the MIM team.

### 32 Agency Reports

#### *EUMETSAT*

Ken Holmund reported that Meteosat-6 was re-orbited in April after 17+ years of service, and that Meteosat-7 may last until the end of 2016 based on current projections. The second generation Meteosat-8 (MSG-1, backup and rapid scan) and -9 (MSG-2, primary) are both operational, and the launch of MSG-3 is expected in July-August 2012. Metop-A is fully operational, and Metop-B is planned for launch in April 2012. Six Meteosat Third Generation geostationary spacecraft have been approved (4 imaging satellites and 2 sounding satellites) with the program ramping up in February of this year, and an anticipated first launch in 2018.

#### *ISRO*

Kiran Kumar Seelin noted the recent launch of RESOURCESAT-2, which features increased performance of the LISS and AWIFS sensors. He also noted a number of upcoming ISRO launches including RISAT-1 (Q1 2011), INSAT-3D (end 2011), Megha-Tropiques (2012), and SARAL (2012).

#### *ESA*

Stephen Briggs reported that ERS-2 will be deorbited next month, ending 20 years of continuous ERS operations. The orbit of Envisat has been changed to extend its lifetime to the end of 2013, and possibly into 2014.

GOCE has completed its nominal two-year operations period (six uninterrupted global monitoring cycles), but has been extended and has used less fuel than expected. It has delivered the most accurate geoid to date.

SMOS operations are nominal, but unforeseen issues with radiofrequency interference have impacted the science outcomes. Many illegal RF sources have been identified and shut down.

CryoSat has been a good collaboration with NASA flying airborne radar altimetry, and has returned its first science. The results are quite spectacular, and are showing much more rapid changes in the polar ice cap than previously thought.

Three missions are in extended Phase A for the Earth Explorer 7 mission for selection in about a year's time, and two are under consideration for Earth Explorer 8. Meteosat Third Generation is underway, and an agreement is pending between EUMETSAT and ESA. The GLOBECOVER data sets (forests, fire, and landcover) have had over 60,000 downloads to date.

The GMES program is seeking approval from the EC on initial operations, the ground segment is being implemented, and Sentinel-1A, -2A, and -3A are scheduled for launch by the end of 2013.

Sentinel A and B satellites are fully supported for 2013-2015 launch, and in parallel C and D are being considered. It is expected that the functionality of these missions will be sustained, but the geometry may be reconfigured. A free and open data policy has been endorsed by ESA Council, and discussions are currently on going with EC and are likely to continue for another 18 months.

#### *JAXA*

Makoto Kajii reported that the GCOM missions (-W for water, and -C for climate) have the objective of delivering continuity of observations over 13 years starting from the first launch of GCOM-W1 in 2012.

He reported that the ALOS mission was terminated on 12<sup>th</sup> May after loss of electrical power after having served beyond its five year expected life, and acquiring 6.5Mn scenes of the Earth's surface. ALOS-2 is currently being developed for launch in summer 2013, and ALOS-3 is in Phase A, planned for launch in 2015.

#### *NASA*

Michael Freilich reviewed the status of the NASA flight program and budget. Presently, NASA has 13 Earth observation research satellites in operation. It has just completed its biennial review of missions. All missions continue to operate, and the corresponding budget has been allocated, though SOURCE, GRACE and CloudSat are experiencing battery issues; CloudSat to the extent that it is not returning science data.

The NASA FY12 budget allocation has dropped from FY11, but has held above FY10 levels, and strong support continues from the administration and Congress. Based on current allocations, the NASA Climate Initiative will proceed with schedule impacts to just two missions – CLARREO-1 and DESDynI. The GPM Core remains on track, but LEO GPM had to be cancelled.

SAC-D/Aquarius is due to be launched in early June, and has been a successful international collaboration with CONAE, ASI and CNES, and with contributions from Brazil and Canada, and one for which CEOS can claim some credit.

#### *NOAA*

Brent Smith provided an updated on NOAA's activities, noting that it has received an FY11 budget allocation slight less than its FY10 allocation, and \$1 billion less than requested. NOAA is working for a better funding allocation for FY12, but with lower funding levels the first JPSS launch will slip into early 2017. NOAA has been working with NASA to ensure an October 2011 launch of NPP, which has meant that JPSS-1 work has been slowed to survival levels, and JPSS-2 is on hold. Mary Kicza has personally briefed congressional staffers, and remains committed to securing the necessary funds.

Brent noted that Mary is interested in discussing a radio occultation Constellation with CEOS members, though does not currently have a formal proposal. He also noted that a U.S. National Earth Observations Task Force has been established among U.S. agencies and is considering how to address the transfer of EO programs from science to a long-term operational basis.

Brent, on behalf of NOAA and CEOS, thanked JAXA for their Chairmanship of CEOS, and again expressed condolences for the victims of the Japanese earthquake. He also thanked ASI and ESA for stepping up to host the meeting.

### 33 Wrap-up

Stephen Ward reviewed the action item table.

Makoto Kajii invited closing remarks from CEOS Principals:

- **CSA** Guy Seguin noted that Savi Sachdev will retire next month, and that Guy will be the CEOS point of contact until further notice;
- **CONAE** Conrado Varotto thanked everyone for the meeting, and hoped for a successful SAC-D/Aquarius launch;
- **CAST** Yufeng Zhang noted that CAST remains highly active in Chinese space activities, and hopes to continue and increase collaboration with CEOS;
- **DLR** Klaus Schmidt noted DLR was looking forward to the WGClimate meeting, and expressed DLR's commitment to the initiative;
- **ESA** Stephen Briggs thanked JAXA as SIT chair, and looks forward to the next meeting;
- **EUMETSAT** Robert Husband also noted they were looking forward to the WGClimate meeting, and was pleased to see it is well coordinated with the WMO climate architecture efforts;
- **GEO** Rob Koopman expressed appreciation for CEOS's leading contribution to the GEOSS;
- **ISRO** Kiran Kumar Seelin thanked Kajii-san as SIT Chair, and welcome the new SIT chair of Mike Frielich. ISRO welcomes the self study, and also pledged to put forward its best efforts as the incoming CEOS Chair;
- **NOAA** Brent Smith also noted that he was looking forward to the WGClimate meeting;
- **IOCCG** David Antoine thanked CEOS for the opportunity to join, and would be pleased to be involved again next year;
- **NSC** Per-Erik Skrovseth noted that good progress had been made with more work remaining;
- **USGS** Jean Parcher noted she was very impressed with dedication and collaboration taking place, and looks forward to the Self-Study and NASA's SIT chairmanship;
- **CEO** Tim Stryker noted that he looks forward to supporting the numerous initiatives discussed during the meeting;
- **NASA** Michael Freilich thanked everyone for their strong support of the self-study. He thanked Mr Kajii and JAXA for their strong leadership of the SIT, and for their many contributions to CEOS over the years. He thanked Kirin Kumar and ISRO for taking on the future leadership of CEOS, and thanked GEO for their strong partnership;
- **ASI** Stefano Bruzzi thanked all for participating, and noted that while CEOS has progressed a lot there is much to be done in the future;
- **JAXA** Makoto Kajii thanked ESA for hosting the meeting, and ASI for their hospitality. He expressed his appreciation to all CEOS members participating in this meeting for their contributions and collaboration. He noted that the self-study presents a good opportunity to look forward at the future of CEOS. He noted that he will remain on the job until CEOS Plenary, and that a SIT workshop is being planned for September, to be hosted by NASA.

The Chair closed the meeting and wished all participants a safe journey home.

**SIT-26 Attendees**

Organisation	Participant	Organisation	Participant
ASI	Enrico Saggese	GISTDA	Pakorn Apaphant
ASI	Stefano Bruzzi	INPE	Julio Dalge
ASI	Fabrizio Battazza	IOCCG	David Antoine
ASI	Laura Candela	ISRO	Kiran Kumar Seelin
ASI	Simona Di Ciaccio	ISRO	Rajeev Jaiswal
ASI	Simona Zoffoli	JAXA	Makoto Kajii
CAST	Yufeng Zhang	JAXA	Takao Akutsu
CNES	Pascale Ultré-Guérard	JAXA	Osamu Ochiai
CONAE	Conrado Varotto	JAXA	Tamotsu Igarashi
CONAE	Laura Frulla	JAXA	Takashi Moriyama
CSA	Guy Seguin	JAXA	Satomi Abe
DLR	Klaus Schmidt	JAXA/ASI	Stephen Ward
DLR	Albrecht von Bargaen	JAXA/ASI	George Dyke
DLR	Jörn Hoffmann	NASA	Michael Freilich
EC/JRC	Mark Dowell	NASA	Christopher Blackerby
ESA	Stephen Briggs	NASA	Christine Bognar
ESA	Simonetta Cheli	NASA	Patricia Jacobberger-Jellison
ESA	Ivan Petiteville	NASA	Eric Lindstrom
ESA	Pascal Lecomte	NASA (SEO)	Brian Killough
ESA	Jean Charles Bigot	NASA (SEO)	Kim Keith
ESA	Maurice Borgeaud	NOAA	John Bates
ESA	Craig Donlon	NOAA	Brent Smith
ESA	Regner Peter	NOAA	Mitch Goldberg
ESA	Frank Martin Seifert	NOAA	Paul Chang
ESA	Claus Zehner	NOAA	Stan Wilson
EUMETSAT	Kenneth Holmlund	NOAA (DCEO)	Kerry Sawyer
EUMETSAT	Joerg Schulz	NSC	Per-Erik Skrovseth
EUMETSAT	Robert Husband	NSC	Evie Merethe Hagen
GEO	José Achache	US Dept. of State	Fernando Echavarria
GEO	Douglas Cripe	USGS	Jean Parcher
GEO	Rob Koopman	USGS	Prasad Thenkabail
GEO	Humbulani Mudau	USGS	Greg Stensaas
GEO	Giovanni Rum	USGS	John Dwyer
GEO	Seonkyun Baek	USGS (CEO)	Tim Stryker