CEOS Self-Study Report:

Topical Team on Roles and Responsibilities

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# INTRODUCTION

## Context and Overall Objective

The CEOS Self Study results to date have illustrated that CEOS has reached a point where agencies might re-consider their participation, because:

* CEOS has become unbalanced with an overly complicated structure, and its core activities increasingly overshadowed by *ad hoc* initiatives;
* It is becoming increasingly difficult for some agencies to engage meaningfully with the diverse range of activities/initiatives, as well as to commit the appropriate level of resources.

So, in order to maximise the benefits accruing to agencies from CEOS participation, and to provide motivation for continuing engagement, there is a compelling need to:

- re-connect with CEOS's essential business/core activities;

- set priorities and align the CEOS mechanisms accordingly (VCs, WGs, etc.);

- cease activities which no longer correspond to priorities.

This is the over-riding context for the work and associated objectives of this Topical Team.

## Structure of the Document

The document is structured as follows:

- Section 1: this Introduction;

- Section 2: summarises the main input material;

- Section 3: analyses the main issues and presents options and recommendations;

- Section 4: provides a summary of the issues and associated recommendations/options;

- Section 5: presents the main conclusions.

# INPUT MATERIAL

The inputs for the deliberations of the Topical Team have come from a number of sources, principally:

- The guidance from the SIT Technical Workshop in September 2012 and SIT-27 in March 2012;

- The CEOS Self-Study Synthesis Report.

## Guidance from the SIT Technical Workshop and SIT-27

At the SIT technical workshop in September 2012, the objective of this Topical Team was given as:

*"Identify the main responsibilities of the CEO, DCEO, SEO, Working Groups, Virtual Constellations, and SBA Coordinators, using the information gathered in the CEOS Self-Study and Annexes, and to highlight areas where responsibility is a) unclear, b) overlapping, or c) where there are important areas where no one has responsibility; and to develop a suite of options for addressing unclear areas, overlaps, and gaps."*

In terms of the allocation of responsibilities for core functions, the suggested starting point for the Topical Team was the result of SIT-27 in March 2012 which arrived at certain conclusions regarding CEOS top-level activities (further described in section 3.2).

## The CEOS Self-Study Synthesis Report

Relevant information for the work of the Topical Team can also be found in the CEOS Self-Study Synthesis Report, and the following extracts were felt to be of particular significance:

*"The most common issues articulated included confusion regarding leadership structure and responsibilities, and the sense that the overall structure of CEOS has become extremely complicated and difficult to navigate."*

*"CEOS has grown as its scope has grown, and it now finds itself with two governing bodies, multiple working groups, virtual constellations and societal benefit areas, the lateral and vertical connections among which are not clearly defined or managed."*

*"There is general confusion regarding lines of authority, leadership and divisions of responsibilities among the CEOS Chair, the SIT Chair, the CEO, DCEO and Secretariat."*

*"It would be appropriate, as part of a strategic planning effort, for CEOS to explicitly identify the organisational functions it now needs, and to consider what structural elements would be required to support those functions."*

*"However, the work of the CEOS Working Groups and SBA teams suffers from a lack of a coherent list of priorities from GEO and CEOS leadership."*

*"Working Groups and SBA Teams have often formulated their own priorities, with little executive guidance on their annual work, and with minimal Agency resource allocation for their initiatives."*

*"The data strongly suggests that there is a lack of common understanding regarding the roles, activities, and performance of the SBA Teams, as distinct from other structural components of the organisation, ..."*

*"Part of the problem may be the lack of written record for some of these sub-groups. While searching for documentation regarding the various sub-groups within CEOS for use by the CSS, it was observed that some key CEOS structural components do not have defining terms of reference, or that the terms of reference are out of date and do not reflect the changes that have occurred in response to the organisational demands placed upon CEOS by external organisations like GEO."*

Based on the various observations in this CSS Synthesis Report, a number of findings and recommendations were made.

In particular, 5 recommendations were made concerning the:

a) Update of roles and responsibilities for the CEO and other leadership positions;

b) Identification of organisational functions, and modifications to the leadership structure, organisational elements and connections as needed to support these functions and documentation of the updated roles in ToRs;

c) Definition of documentation needs and associated allocation of responsibilities/resources;

d) Better alignment of efforts and resources of WGs, SBA teams and VCs with overall CEOS objectives;

e) Development of clearly-articulated and published goals/objectives for SBA coordinators.

# ANALYSIS OF ISSUES

Based on the input material identified in section 2, together with the experiences and observations of the members of the Topical Team and the discussions at the 26th CEOS Plenary, it was decided to organise the analysis of the issues according to the following main topics:

- Implications of the Conclusions of SIT-27;

- Consistency/Coherence of CEOS Mechanisms;

- Other Issues.

Depending on the results of the various analyses, options are presented to address the identified issues or, in straightforward situations, simple recommendations are made. Where options are identified, they should be interpreted as indicative rather than exhaustive, with the expectation that, during discussions, variations on these options could be constructed to arrive at the most appropriate solution to address the particular issue.

In the situation where options are presented, and the Topical Team has a preferred solution, this is indicated by green highlighting.

There was also some debate within the Topical Team about the relationship between CEOS and external entities, with two possible classes of relationship being identified; "Peer-to-Peer" and Customer relationships (*e.g.,* CGMS and GEO respectively). The underlying reason for this discussion was a debate as to the need for specific modalities to govern these two types of external interaction. After consideration, it was decided that this was not an urgent priority for the Topical Team at this stage - although a specific case of "Peer-to-Peer" interactions is addressed in section 3.2.5

## Implications of the Conclusions of SIT-27

In terms of the assignment of responsibilities, the main conclusions of SIT-27 are summarised in the following table.

|  |  |  |  |
| --- | --- | --- | --- |
| 1. Substantive space-borne coordination, scientific, and user-focused activities | | 2. Top-level strategy development and guidance | |
| Responsible | Participates | Responsible | Participates |
| **SIT Chair** | **WGs, VCs, SEO, CEO/DCEO, special teams like CTF, SDCG, and others** | **CEOS Chair** | **Troika, SEC, Plenary, SIT Chair, WGs and VCs (to distil messages up to CEOS leadership) and CEO/DCEO** |
| 3. Internal CEOS coordination | | 4. External CEOS coordination | |
| Responsible | Participates | Responsible | Participates |
| **CEOS Chair** | **SEC (with support from CEO/DCEO, SEO), Plenary, SIT Chair** | **CEOS Chair** | **SEC (with support from CEO/DCEO), Plenary, SIT Chair, VCs and WGs** |

**Table 1: SIT-27 View on the Assignment of Responsibilities for Top-Level Activities**

Firstly, it was noted that these SIT-27 conclusions probably need to be viewed in the context of the VCs reporting to the SIT Chair and the WGs + SBA Coordinators reporting to the CEOS Chair; rather than as appears in the organisational chart currently available on the CEOS website - which depicts only the SEO reporting to the SIT Chair (with all other mechanisms reporting to the CEOS Chair).

Even with this assumption, the reporting lines for the mechanisms associated with "Substantive Space-borne Coordination, Scientific and User-focused Activities" are divided between the CEOS Chair and the SIT Chair, which does not seem consistent with Table 1.

A number of options were identified to address this issue, which are summarised in the following table.

|  |  |  |
| --- | --- | --- |
| **Option** | **Option Description** | **Advantages/Drawbacks** |
| **A** | Divide substantive space-borne coordination into 2 parts:   * thematic space-borne coordination (i.e. within VCs) * generic space-borne coordination (i.e. across VCs) and generally involving WG activities   Then apportion responsibility for thematic space-borne coordination to the SIT Chair and generic space-borne coordination to the CEOS Chair | * consistent with current (assumed) reporting lines (i.e. SIT<>VCs and CEOS Chair<>WGs) * maintains a substantive role for CEOS Chair (load-sharing) * possibly complex interface between CEOS and SIT Chairs |
| **B** | Move the reporting line of the Working Groups from CEOS Chair to SIT Chair, leaving other arrangements unchanged | * consistent with the conclusions of SIT-27 * simplifies the interface between CEOS and SIT Chairs * less balanced load-sharing (compared to Option A) |
| **C** | Make more use of the permanent CEOS Secretariat. For example CEOS SEC could be used to obtain urgent "Plenary level" decisions that need to be taken in advance of the Plenary (this option could be viewed as complementary to the other options - i.e. not exclusive). If this option is pursued consideration should be given to expanding CEOS SEC participation to include a more balanced regional representation. | * CEOS SEC holds monthly telecons and has proved quite successful in facilitating CEOS activities |

**Table 2: [R.1]: Options to Address Reporting Line Inconsistencies**

Within the Topical Team there was no consensus as to the preferred main option (*i.e.* Option A versus Option B). Option B is the only option that is fully consistent with the conclusions of SIT-27. Whereas Option A involves a somewhat complex division of responsibilities between CEOS and SIT Chairs but results in a more balanced load-sharing. Option C is different in the sense that it could be adopted as a complement to either of the other two options, and there was a consensus within the Topical Team that this should be pursued independent of whether Option A or B is selected.

## Consistency/Coherence of CEOS Mechanisms

This section examines the mutual consistency and coherence of the various CEOS permanent mechanisms (i.e. CEOS Chair, SIT Chair, WGs, VCs, CEO, DCEO, SEO) and *ad hoc* mechanisms. In addition and where relevant, their consistency and coherence is examined with respect to external entities - see ANNEX I for a brief description of these mechanisms.

Before analysing the current status, and in recognition of the shortfalls in terms of documenting the current baseline for CEOS roles and responsibilities, the Topical Team briefly summarised its understanding of the status quo, which is given in tabular form in ANNEX II.

In terms of the consistency and coherence of CEOS mechanisms, a number of potential issues were identified, including:

* Role of Virtual Constellations (see section 3.2.1);
* Role of CEOS SBA Coordinators (see section 3.2.2);
* Roles of WGISS and WGCV (see section 3.2.3);
* Role of WGCapD (see section 3.2.4);
* Relationship between WGClimate and “Peer” organisations (see section 3.2.5);
* Treatment of *Ad Hoc* Initiatives (see section 3.2.6);
* Role of SDCG for GFOI (see section 3.2.7); and
* Absence of Terms of Reference for key CEOS leadership positions (CEO/DCEO, SEO, Secretariat) - see section 3.2.8.

As a prelude to an in-depth consideration of these CEOS mechanisms, some thought was given to CEOS's overall objectives, and whether it was possible to "parse" the CEOS objectives into internal CEOS-specific objectives, and external customer-related objectives.

The underlying intent behind this discussion was to determine whether there was a standalone rationale for CEOS, or if it is dependent on external customers (*e.g.,* GEO, UNFCCC...) to drive the agenda of its activities.

It was concluded that it was not straightforward to categorise CEOS objectives as being "internal" or "external", but there was the feeling that the internal objectives could be grouped around themes such as standardisation, Cal/Val and harmonisation of infrastructure (possibly related to the work of WGCV and WGISS).

On the other hand, "external" objectives, which can be directly traced to the requirements of external customers, were somewhat easier to identify (*e.g.,* the objectives of WGClimate directly respond to GCOS requirements).

It was felt that the "added value" of CEOS is most evident when it responds to such external requirements, and the availability of a suitable set of external requirements should be considered as a pre-requisite for the formation of most CEOS mechanisms (both permanent and *ad hoc* mechanisms). It was also noted that, where external requirements are under construction, care needs to be taken to ensure that CEOS' primary role is one of responding to requirements, rather than formulating such requirements.

It was considered that Virtual Constellations, in particular, should always aim to have an externally-validated user requirements set against which their coordination activities are aligned/referenced. Furthermore, this requirements reference should not be purely focused on the GCOS requirements, as Constellations were formed to respond to other requirements (the GCOS requirements should provide a different and complementary viewpoint - and this is one of the rationales for creating WGClimate).

GFOI and GEOGLAM were identified as two examples of *ad hoc* activities that respond to externally-validated requirements (through GEO).

**[R.2]: It is recommended that the terms of reference of all VCs, WGs and *ad hoc* initiatives be reviewed to verify that they all respond to an externally validated set of requirements, and that this requirements baseline is identified in their terms of reference. If this is not the case, an action should be initiated to clarify the requirements basis.**

### Role of Virtual Constellations

The Virtual Constellations are seen as one of the biggest assets of CEOS, and the primary mechanism for the coordination of space assets. It was felt that there was scope for enhancing their contribution by harmonising the methodology adopted across the various Virtual Constellations.

For example, the Virtual Constellations address a variety of tasks which are of relevance to existing transversal activities traditionally covered by the CEOS WGs. Whilst it is recognised that this is a natural consequence of their domain-specific competence on those issues, it is necessary to document these to ensure the necessary communication with the relevant CEOS WG, *e.g*.:

1. On **capacity building and training**: several VCs have explicit objectives in their implementation plan's addressing capacity building (*e.g.*, OCR-VC and SST-VC), these communities undertake periodic training in their domains and see this as a fundamental component in ensuring appropriate use of the datasets. Additionally, the OSVW-VC was established explicitly to address a specific capacity building issue (targeted at Southern Hemisphere users), and whilst this VC is now addressing other issues as well, this still remains a fundamental component of it's on-going activities.
2. On **calibration and validation**: in view of the nature of the topics requiring inter-agency coordination on domain-specific issues, cal/val emerges as a recurrent activity to be systematically addressed by VCs. As in point "1" above there are examples where this is identified as a specific objective in the VC Implementation Plans. In the case of OCR-VC once this VC started its activities in 2010, coordination on cal/val effort was identified as the main priority through consultation with the broader scientific and user community. This resulted in the recently distributed report (*INSITU-OCR White-paper*) which documents recommendations for OCR data cal/val. These activities should be encouraged and should be undertaken in coordination with the respective WGCV sub-group (in the case of OCR this was in fact undertaken with WGCV/IVOS).
3. On **information systems and data-portals**: the dialogue in this area seems more mature as, some of the VCs do in fact already have (or are considering) dedicated data portals, and discussions have already been undertaken with, or initiated by, WGISS.

**[R.3]: In order to promote a more systematic approach across the various VCs, it is recommended that the ToRs of all VCs are updated with a common format and structure that includes:**

**a) A statement of need/mission statement, vision, and objectives;**

**b) Measures of success;**

**c) Overview of externally-validated requirements baseline to which the VC responds with reference to a detailed user requirements document;**

**d) Proposed organisational structure of the VC;**

**e) Harmonised term lengths for Chairs/Co-Chairs;**

**f) Provision for the development of a 3-year Implementation Plan that *i.a.* addresses transversal activities such as i) capacity building and training, ii) calibration and validation and iii) information systems and portal usage (to be regularly updated and subject to SIT and Plenary approval).**

**For completeness, it is further recommended that a more exhaustive analysis of VC contributions to transversal activities (e.g. Cal/Val & capacity building) should be undertaken involving both the VC Co- leads and the WG Chairs.**

### Role of CEOS SBA Coordinators

The CEOS Societal Benefit Area Coordinators were created in 2007 to:

- improve the CEOS contributions to GEO’s nine identified Societal Benefit Areas;

- play a key role in the definition of the CEOS Actions in support of GEO;

- monitor the execution of the Actions and ensure accurate reporting to both CEOS and GEO.

There are currently seven CEOS SBA Coordinators: Agriculture, Biodiversity, Disasters, Ecosystems, Energy, Health, and Water.

The Topical Team was, in general, unconvinced about the benefits of retaining the role of CEOS SBA Coordinators, because:

a) The number/complexity of actions that drove the introduction of SBA Coordinators has been greatly reduced/simplified due to the change in methodology within the GEO Work Plan, and any residual activities could easily be re-assigned to other mechanisms;

b) The mechanism makes CEOS look perhaps overly GEO-focussed.

The Topical Team concluded that the role of SBA Coordinator introduces complication, rather than clarity, to the CEOS organisational structure without an outweighing benefit, and thus, it is proposed to generally suppress this role within CEOS. In this respect, it is also recalled that one of the main messages from CSS Synthesis Report was the overly complicated nature of the CEOS structure; with a particular concern being the CEOS SBA Coordinator mechanism.

It is conceivable that, in isolated cases, it may not be appropriate/feasible to reassign some SBA Coordinator roles (which are defined by on-going GEO Work Plan Tasks and priority actions). However, there should be a presumption of suppression of the SBA Coordinator role unless it can be proved that there is no appropriate CEOS mechanism to assign the relevant GEO Work Plan actions. It is also noted that two SBA Coordinator roles have already been suppressed (Weather and Climate).

Three options were identified to address this issue, which are summarised in the following table.

|  |  |  |
| --- | --- | --- |
| **Option** | **Option Description** | **Advantages/Drawbacks** |
| **A** | Completely suppress the role of SBA Coordinator and re-assign any relevant actions to existing CEOS mechanisms or individual agencies (or groups of agencies). | * simplicity and clarity * may be some (very limited) actions that cannot be appropriately re-assigned |
| **B** | Generally suppress the role of SBA Coordinator and only allow retention of the role in carefully justified cases (with the presumption being suppression). When re-allocating SBA Coordinator activities, coherence with the ToRs of the various CEOS mechanisms shall be maintained (*e.g.* updates arising from the re-allocation of Climate SBA activities to WGClimate). | * simpler and clearer than the status quo * more complex than full suppression |
| **C** | Leave "as is" | * overly complex organisational structure that is not justified by the benefits |

**Table 3: [R.4]: Options to Address Role of CEOS SBA Coordinator**

### Roles of WGISS and WGCV

A number of issues were identified concerning relationship between WGISS, WGCV and other CEOS mechanisms including the:

- potential duplications between WGISS and SEO;

- possible duplication between WGISS, Disasters SBA Coordinator and *ad hoc* WG on DRM;

- perceived de-coupling of WGISS and WGCV from Plenary.

#### Potential Duplication Between WGISS and SEO

At first glance, it would seem that there is the potential for duplication as both these mechanisms have what appears to be a systems engineering focus and a delineation of responsibilities is necessary to ensure the two entities are synergistic and not duplicative.

In order to assess if there is an issue in this area, the role and objectives of the two mechanisms are briefly summarised.

Summary of WGISS Role and Objectives

WGISS is a computer science focused group, predominantly consisting of Data System Managers from various CEOS Agencies, which provides information systems support. It was established at the 9th CEOS Plenary in October 1995 as a successor to the Working Group on Data (WGD) and the Interim Working Group on International Network Services (WGINS). The WGD was established to facilitate the use of data from Earth observation missions by coordinating and standardising aspects of data management.

WGISS aims to stimulate, coordinate, and monitor the development of the systems and services which manage and supply the data and information from participating organisations' missions. WGISS aims to assist CEOS participants, as data providers, to maintain efficient support to diverse users worldwide for easy access and application of that data. WGISS addresses in particular the description, access, retrieval, archiving, long-term preservation, discovery, utilization, and maintenance of space borne Earth observation data and supporting ancillary and auxiliary data and information, enabling improved operability and interconnectivity of information systems and services.

WGISS places emphasis on the use of demonstration projects involving user groups to solve interoperability issues associated with the achievement of global services. WGISS has developed a number of tools, standards, and services to assist access to and use of Earth observation data resources available online.

Summary of SEO Role and Objectives

The CEOS Systems Engineering Office (SEO) was established in April 2007 to facilitate the development of CEOS space constellation plans. The SEO provides systems engineering leadership, provides a framework for coherent architecture plans, and provides decision support tools for trade studies and the assessment of execution options to maximize the probability of their implementation. Whilst the CEOS Constellations and Working Groups are diverse and have multiple goals, selected commonality and a consistent systems analysis approach will strengthen plans and improve coordination and collaboration toward the realization of a Global Earth Observation System of Systems (GEOSS). To date, the SEO technical efforts include requirements definition, constellation assessment, gap analyses, and future architecture development. In addition, the SEO fosters communications among CEOS partners by coordinating and participating in CEOS Constellation Workshops and Working Group meetings, developing tools for file sharing and action item tracking, developing visualization products for educating the global Earth Observation community about CEOS, and supporting the content development and management of the CEOS website.

The SEO is funded and staffed solely by NASA engineers that have a space systems background. The SEO is able to communicate well with scientists within CEOS, as well as computer science engineers and CEOS management, thus providing a unique service to "bridge the gap" when necessary. In addition, the space systems engineering background of the SEO provides a unique perspective when performing analyses, solving problems, and working in coordination with the Working Groups and Constellations. The office is small but sufficient to meet the needs of CEOS at this time.

Assessment

Based on the available information, the roles of WGISS and SEO seem to be sufficiently distinct in that WGISS focuses on the ground segment infrastructure required to support access to Earth Observation data, whereas the SEO concentrates on the space segment aspects. As a result the Topical Team did not identify the need for any changes in this area.

#### Possible Duplication Between WGISS, Disasters SBA Coordinator and *ad hoc* WG on DRM

On the basis of the current CEOS organisation, and leaving aside the possible suppression of the SBA Coordinators role, addressed in section 3.3.2.2, there appears to be duplication in the area of disasters. CEOS has a very successful CEOS Disaster SBA Coordinator and Team that was established in 2008. WGISS, as of 2011, has been engaged in the successful WGISS GA.4.Disasters Project. Furthermore, also in 2011 at the 25th CEOS Plenary in Lucca, a new *ad hoc* initiative was proposed, the *ad hoc* Working Group on Disaster Risk Management, which further complicates CEOS landscape in the area of disasters.

The Disaster SBA Coordinator’s main role is to focus on specific actions that support the Disaster Tasks and Components in the 2012-2015 GEO Work Plan. The Disaster SBA Coordinator and team are heavily engaged in performing gap analyses for disaster management, pilot projects for flood, and identifying other satellite data needs for other disaster-related activities like the Geohazards Supersites and Natural Laboratories initiative, validation of data for Global Earthquake Model. The Disaster SBA team is also improving coordination between the various CEOS disaster-related entities.

The purpose of the WGISS GEOSS Architecture for the Use of Satellites for Disaster Management and Risk Assessment (GA.4.Disasters) project is to address the use of satellites, sensors, models, and associated data products to support disaster response and risk assessment. The GA.4.Disasters proposal was approved by WGISS as a new project at WGISS-31 in June 2011. Members will identify potential resources and prototype developments to address the needs of the disasters and risk assessment societal benefit area and leverage the capabilities of WGISS participating Agencies. WGISS GA.4.Disasters will evaluate existing and proposed disaster response and risk assessment processes as a point of departure in evolving the architecture descriptions. Key proof-of-concept prototypes will be implemented to refine the architecture, capture lessons learned and recommend standards for web service and system interfaces. WGISS GA.4.Disasters is collaborating with CEOS Disasters SBA and the GEOSS AIP-5 Disaster Management team on common use cases and activity diagrams.

The *ad hoc* Working Group on Disaster Risk Management top objectives are to increase and strengthen the contribution of EO satellites to the various phases of disaster risk management through a series of coordinated enlarged actions and to raise the awareness of politicians, decision-makers, and major stakeholders on the benefits of using satellite EO in all phases of DRM. The DRM WG will do this by improving the coordination between EO satellite observations and take appropriate actions aiming at better distributing EO satellite data and fostering its use by the DRM users. The DRM WG is clarifying synergy with CEOS Disaster SBA team actions and is currently preparing a DRM Implementation Plan and global observation strategy focusing on three disaster types: volcanoes, earthquakes, and floods.

The DRM team is currently determining which aspects of the WGISS GA.4.Disasters project and the SBA CEOS Actions are relevant to the implementation plan and strategy. It is likely that a great deal of the WGISS work and the SBA gap analysis will be utilized to support the DRM actions.

So it would appear that CEOS has three separate and distinct disaster entities, with significant synergy and overlap between them. Bearing in mind the strong messages in the CSS Synthesis Report about the over-complicated and confusing structure of CEOS, the area of Disasters is an obvious candidate for rationalisation, and some potential options are outlined in the following table.

|  |  |  |
| --- | --- | --- |
| **Option** | **Option Description** | **Advantages/Drawbacks** |
| **A** | Embed all of the existing CEOS Disaster activities within just one of the existing three mechanisms addressing Disasters and suppress the other two activities/mechanisms | * simplicity and clarity |
| **B** | Suppress the CEOS Disaster SBA Coordinator, the *ad hoc* Working Group on DRM and the Disaster activities within WGISS, and transfer all activities to a new WG on Disasters | * simplicity and clarity |
| **C** | Leave "as is" | * overly complex organisational structure that is not justified by the benefits, and does not respond to the criticisms in the CSS Synthesis Report |

**Table 4: [R.5]: Options to Rationalise Treatment of Disasters**

#### Perceived Decoupling of WGISS and WGCV from Plenary

The Topical Team had the feeling that both WGISS and WGCV appear to be decoupled from Plenary and SIT and, in some cases, seem to have built up internal structures that mimic those at the top level in CEOS (*e.g.*, Plenaries and sub-groups). This viewpoint is also fully consistent with the findings documented in the CSS Synthesis Report.

It was felt that this perception was unhealthy and should not continue. Specifically, the Topical Team felt that the mandates and *modus operandi* of both these groups should be thoroughly examined/adjusted, and where necessary a re-connection made between the WGCV, WGISS, and Plenary.

To make a start in addressing this situation, the Topical Team feels it is necessary for Plenary to re-visit/re-affirm the expectations and role of both WGISS and WGCV, and to provide appropriate guidance. This discussion should not take place at the level of the Work Plan as this level of detail is not appropriate for debate in the Plenary. Instead the material should be more synthetic and should describe the main lines of activity and objectives that, if endorsed by Plenary, will subsequently be embedded in the related Work Plans.

Examples of the type of activities where the involvement of Working Groups could be debated at the level of Plenary are:

a) Potential involvement of **WGISS** in:

* GA.4 Disasters Project;
* Water Portal Project;
* CEOS Data Catalogue Initiatives;
* International Directory Network(IDN) IG;
* Data Stewardship Interest Group (DSIG);
* Technology Exploration Interest Group.

b) Potential involvement of **WGCV** in:

* QA4EO;
* DOME C Experiment;
* Cal/Val Portal and Post-Launch Test Sites (reference standards);
* Radiometric Standards;
* Benchmark Mission Coordination;
* Ground Based Cal/Val Campaign;
* Reference Test Site Data Collaboration and Comparison.

**[R.6]: It is recommended that WGISS and WGCV present annually their proposed main lines of activity to SIT and Plenary for endorsement (partitioned into "Standing" activities and "Project" activities). The activities endorsed by SIT and Plenary shall then be embedded within the relevant Work Plans, to be updated on an annual basis.**

### Role of WGCapD

WGEdu, the predecessor to WGCapD, was created in 1999 but participation in, and Agency support for, the WG waned to such an extent that in 2009/2010 the Working Group essentially vanished.

The Topical Team addressed the potential issue of duplication with respect to internal and external activities with its successor WGCapD.

Based on the report to the Bangalore Plenary, the 3-year objectives of WGCapD are:

- Improved access to global DEM developed on a country-by-country basis;

- Development of a remote-sensing E-learning course;

- Support to GEO 2012-2015 Work Plan Task ID-02.

Concerning the external relationship with GEO, there are two components to ID-02 and CEOS is named in both; one with INPE with the contact point, and one with NOAA as the contact point. In this context, the Topical Team understands an investigation is underway to identify the capacity building activities that are consistent with the mandate of CEOS so that the potential duplications and overlaps between WGCapD and GEO capacity building activities can be assessed and streamlined. It is also understood that an inventory of Capacity Building capabilities/initiatives is under construction in collaboration with GEO.

In terms of the relationship with other CEOS activities, it was noted that capacity building is sometimes already embedded in some VCs (*e.g.,* OSVW, SST, OCR – see section 3.2.1) and other Working Groups (*e.g.*, WGISS). It was felt that including capacity building activities within topical areas, such as VCs, was very appropriate as it engages the relevant expertise within a synergistic context. However, as a result, it does mean that responsibility for capacity building within CEOS is distributed amongst a number of entities, and there is the potential for duplication. To minimise some of the risk of internal duplication, a systematic cataloguing of capacity building activities within the VCs is proposed as part of recommendation **[R.3]**.

In view of the on-going actions, aimed at clarifying the respective roles of WGCapD and GEO, and the internal clarifications associated with recommendation **[R.3]**, the Topical Team decided on balance not to make a specific recommendation in this area, although there was a wide range of strongly-held opinions on this subject.

### Relationship between WGClimate and "Peer" Organisations

WGClimate is dependent on a number of external linkages (*e.g.*, CGMS, WMO, SCOPE-CM.....). To date, due to a spirit of cooperation and shared participation in groups, the current working arrangements have proved to be extremely effective. However, shared participation cannot be relied upon to achieve convergence in the longer term.

Looking to the future, the space community at large would also increasingly benefit from having a consolidated approach for the further development of the climate monitoring architecture. It is anticipated that this will become particularly important as the Global Framework for Climate Services matures.

To achieve this formal convergence, and following discussions at the 26th CEOS Plenary and CGMS-40, steps are underway, to investigate the possibility of a joint CGMS/CEOS approach in this area, and this is currently the subject of a dialogue between the SIT Chair and the CGMS Secretariat. This process is currently being dealt with at the level of SIT chair and CGMS secretariat and, on the assumption that this action will bear fruit, no recommendations are offered in this area.

### Treatment of *Ad Hoc* Initiatives

There was some discussion about the unregulated nature of CEOS *ad hoc* activities which, according to the CEOS ToRs, are supposed to be limited in life to one year (unless explicitly extended by Plenary). There was a feeling that these activities are overshadowing the core CEOS business as they take up considerable time on Plenary, Secretariat, and SIT agendas (see ANNEX I for the current list of *ad hoc* activities). In the future, there could be merit in strictly adhering to the provisions in the CEOS ToRs limiting their lifetime. There was also a perception that some agencies viewed the role of CEOS or SIT Chair as a means of introducing their own favoured *ad hoc* initiatives into CEOS. In the same vein it was noted that some agencies seem to be "serial offenders" in the promotion of *ad hoc* activities that seem to be almost solely driven by their Agency objectives, and they should be encouraged to adopt a more disciplined approach. This was felt to be particularly important in view of the imbalance in qualification requirements between, for example, a VC and an *ad hoc* activity - in the latter case the qualification requirements are minimal, whilst in the former the hurdles are fairly onerous. It was recognised that a balance needed to be struck in order to maintain relevance, but there seems to be the trend towards the establishment of quasi-permanent *ad hoc* entities that float about amongst the permanent mechanisms.

There was also a strong feeling that not enough use was being made of the permanent CEOS mechanisms and the default reaction, when a new challenge emerged, was to bolt on a new *ad hoc* mechanism instead of making best-use of what already exists.

**[R.8]: It is recommended that Plenary exercises stricter discipline on the handling of *ad hoc* initiatives through better use of standing CEOS mechanisms and adherence to a lifetime of one year. Furthermore it is recommended that transparent criteria are used for the selection of *ad hoc* activities.**

### Role of SDCG for GFOI

Although the SDCG is an *ad hoc* mechanism created at the 25th CEOS Plenary in Lucca to organise satellite observations of forested areas, its continued existence seems to point towards a need that is more appropriately treated by a permanent mechanism. Furthermore, there appears to be a potential overlap with the work of the CEOS Land Surface Imaging Virtual Constellation (LSI VC).

The fundamental mission of the LSI VC is to promote the efficient, effective, and comprehensive collection, distribution, and application of space-acquired image data of the global land surface, especially to meet societal needs of the global population. One of the key objectives of the LSI VC is to enhance user access to mid-resolution LSI satellite data, and for CEOS Agencies that currently operate mid-resolution LSI systems to actively seek ways to cooperate more fully in operating their mid-resolution LSI satellite systems and acquisition of mid-resolution satellite data.

In 2009, the GEO Secretariat requested that CEOS Agencies support the GEO Forest Carbon Tracking (FCT) by coordinating satellite acquisitions. CEOS responded with the CEOS Communiqué on Forest and Carbon Monitoring which stated “CEOS will undertake the necessary coordination of its Member agencies to address the space data requirements of the GEO effort, to ensure that satellite Earth observations serve an appropriate role in coordination with in-situ observations to support the implementation of this task.” The activities were first directed to the LSI VC but it was quickly realized that the mandate of the FCT data acquisition was much broader than SAR and optical observations that were being collected by the LSI VC. In 2011, the FCT was transitioning into the Global Forest Observations Initiative (GFOI), a more operational initiative than FCT which was focused on demonstrations. GFOI needed a more formal mechanism to ensure continued acquisition and dissemination of SAR and optical data and to recognise the central role of space data in securing engagement of key forested countries. A proposal was put forward to the 25th CEOS Plenary for a reinforced and formal coordination group to be established by CEOS in anticipation of an immediate requirement for its functions in support of GFOI. The *ad hoc* WG on Space Data Coordination of GFOI was agreed. The CEOS Data Strategy, as a matter of principle, focuses on the coordination of data made available for GFOI purposes on a free of charge basis.

The SDCG for GFOI has been very successful in steps taken to coordinate satellite data acquisition and the desire to broaden the mandate of the SDCG has been proposed. In February 2013, the SDCG will entertain the idea of addressing data acquisitions from space agencies for agricultural monitoring. Other opportunities include data acquisitions from space for Polar regions.

Considering that one of the key objectives of CEOS is to serve as a focal point for international coordination of space-related Earth observation activities, it seems a natural progression for the development of a CEOS entity that could coordinate and facilitate the dissemination of satellite data to relevant users and to ensure there is no overlap/duplication/or possible abuse of resources for support of key global and societal initiatives.

On the assumption that a long-term need exists for the work of the SDCG, then there are a number of possibilities to institutionalise its work within a permanent mechanism, which are illustrated in Table 4.

|  |  |  |
| --- | --- | --- |
| **Option** | **Option Description** | **Advantages/Drawbacks** |
| **A** | Adjust the ToRs of the LSI VC to include the work of the SDCG | * Makes use of an existing mechanism * Activities broader than current LSI VC mandate |
| **B** | Adjust the ToRs of WGISS to include the work of the SDCG | * Makes use of an existing mechanism * Activities not fully consistent with current WGISS mandate, but it has been suggested that these should anyway be re-visited as part of another recommendation |
| **C** | Create a new permanent mechanism to carry out the work of the SDCG | * Tailored mechanism to reflect need * Creation of an additional mechanism |
| **D** | Subsume the work of the SDCG within the beneficiary projects (i.e. GEOGLAM and GFOI) | * Reduces number of mechanisms * May not reflect long-term need |
| **E** | Leave "as is" | * May not reflect long-term need |

**Table 5: [R.8]: Options to Address Role of SDCG**

### Absence of Terms of Reference for key CEOS leadership positions (CEO/DCEO, SEO, Secretariat)

Another of the key recommendations from the CSS Synthesis report was the need to update of roles and responsibilities for the CEO and other leadership positions. The CEO, and Deputy CEO, SEO, and Secretariat have been carrying out their responsibilities in the absence of any formal ToR or list of responsibilities. Although descriptions of activities have been prepared (see Annex II), there is still a need to codify the roles and responsibilities of the key leadership positions within CEOS.

**[R.9]: It is recommended that ToRs for key CEOS leadership roles be developed and updated as appropriate.**

## Other Issues

This section addresses issues that are considered "small-scale" in nature, or fall within the domain of other Topical Teams.

### Role of Plenary (Item for "Meetings" Topical Team)

As noted in the CSS Synthesis Report, there is a need to change the way Plenary relates to its subsidiary mechanisms. In particular, Plenary needs to take a more top-down role by tasking subsidiary mechanisms with specific priorities, rather than the current approach of endorsing a menu of activities and priorities proposed by the subsidiary mechanisms.

Re-thinking the modalities of Plenary is essential if leadership of CEOS activities is to be regained by Plenary.

**[R.10]: It is recommended that the modalities of Plenary be adjusted to ensure that there is a better integration, in terms of guidance and feedback, of CEOS subsidiary bodies. This dialogue needs to be at level that is consistent with engaging the attention of decision-makers (*i.e.*, not asking for feedback on Work Plans/Implementation Plans, but requesting endorsement of headline activities/initiatives that will be subsequently reflected in Work Plans/Implementation Plans) - see also related recommendation [R.6]**

### Criteria for Starting and Ending New Activities (Item for "Decision-Making" Topical Team)

As noted previously, the multiplicity and seemingly unregulated nature of CEOS's *ad hoc* activities is a major cause for concern amongst a number of agencies.

**[R11]: To better regulate CEOS *ad hoc* activities it is recommended that:**

**a) *Ad hoc* activities should be systematically terminated after one year (unless a specific exemption has been obtained from Plenary - which should be the exception);**

**b) Clear criteria should be established for starting and ending *ad hoc* activities, with the aim of:**

**- reducing the overall number of such activities;**

**- confining such activities to CEOS priority areas (as endorsed by Plenary);**

**- ensuring appropriate resources are available.**

**c) Once agreed, these criteria should be applied to existing CEOS activities to assess if some activities should/could already be closed.**

### CEOS Chair/SIT Chair Choreography ("Meetings" Topical Team)

It was suggested that there could be merit in delaying the CEOS Chair rotation until the northern hemisphere Spring. The Topical Team discussed the objectives of Plenary and noted that currently, Plenary is planned for October/November annually in order for CEOS entities to report out on activities accomplished during the year and to prepare for the GEO Plenary and UNFCCC COP and SBSTA meetings. If we are to reassess the objectives of Plenary, and focus more on using Plenary to provide guidance on how CEOS should prioritize activities, there may be merit in planning the Plenary to occur after the GEO Plenary and UNFCCC so that Plenary can focus CEOS activities on the outcomes of those meetings. No firm conclusions were drawn and it was felt that the pros and cons should be further explored.

**[R.12]: It is recommended that the "Meetings" Topical Team assess whether the CEOS Plenary should be moved to the northern hemisphere Spring. When considering a possible change, it should be borne in mind that CGMS has decided, as from 2013, to move its annual plenary to the northern hemisphere spring and future annual GEO plenaries are likely to take place in the first part of the year.**

### Documentation

It was clarified that the Work Plan is the appropriate repository for CEOS or SIT Chair priorities and that, in the new documentation structure, there would still only be one "executable" document driving CEOS day-to-day activities (*i.e.* still the Work Plan). The Topical Team discussed the pros and cons of the proposed three document structure of CEOS and were unclear as to the exact benefits of preparing strategic guidance, mid-term guidance, and annual guidance as there may be multiple annual updates required which can take the focus away from activities and instead focus on planning (it was noted that the annual updates of the GEO Work Plans diverts valuable resources away from accomplishing the Tasks and Components to the update of the Tasks and Components). This issue will be borne in mind during the review process for this new documentation structure.

It was also noted that within CEOS there is a dire need for a document management system as there appears to be no reliable repository, from which the current CEOS documentation baseline can be extracted. It is understood that this is currently being addressed by the CEOS Chair (CSA) and so no specific recommendation is offered in this area.

### CEOS Data Exchange Principles

It was suggested that this "heritage item" amongst the CEOS documentation should be subsumed within the context of the GEO Data Sharing Principles.

**[R.13]: It is recommended that a statement be included in the Strategic Guidance Document along the lines of: “CEOS promotes the full and open data sharing policies as described in the GEO Data Sharing Principles".**

### Organisational Chart on CEOS Website

The organisational chart on the CEOS website was felt to be of dubious value, and inconsistent with the conclusions of La Jolla concerning the respective responsibilities of SIT and CEOS Chairs. This chart will eventually need to be updated to reflect the CSS decisions taken at the 2013 Plenary. In particular it was noted that the main entities involved in substantive space-based coordination are the VCs, WGClimate and WGCV, but according to the CEOS website all these entities report to the CEOS Chair. Given this uncertainty some care will be needed when overlaying the implications of the La Jolla conclusions onto the CEOS structure.

**[R.14]: It is recommended that once the CSSII initiative has been completed the organisational chart on the CEOS website be updated to reflect the agreements reached.**

# SUMMARY OF OPTIONS/RECOMMENDATIONS

| **ID** | **OPTIONS/RECOMMENDATIONS** |
| --- | --- |
| **[R.1]** | **Options to Address Reporting Line Inconsistencies**   |  |  |  | | --- | --- | --- | | **Option** | **Option Description** | **Advantages/Drawbacks** | | **A** | Divide substantive space-borne coordination into 2 parts:   * thematic space-borne coordination (i.e. within VCs) * generic space-borne coordination (i.e. across VCs) and generally involving WG activities   Then apportion responsibility for thematic space-borne coordination to the SIT Chair and generic space-borne coordination to the CEOS Chair | * consistent with current (assumed) reporting lines (i.e. SIT<>VCs and CEOS Chair<>WGs) * maintains a substantive role for CEOS Chair (load-sharing) * possibly complex interface between CEOS and SIT Chairs | | **B** | Move the reporting line of the Working Groups from CEOS Chair to SIT Chair, leaving other arrangements unchanged | * consistent with the conclusions of SIT-27 * simplifies the interface between CEOS and SIT Chairs * less balanced load-sharing (compared to Option A) | | **C** | Make more use of the permanent CEOS Secretariat. For example CEOS SEC could be used to obtain urgent "Plenary level" decisions that need to be taken in advance of the Plenary (this option could be viewed as complementary to the other options - i.e. not exclusive). If this option is pursued consideration should be given to expanding CEOS SEC participation to include a more balanced regional representation. | * CEOS SEC holds monthly telecons and has proved quite successful in facilitating CEOS activities | |
| **[R.2]** | **It is recommended that the terms of reference of all VCs, WGs and *ad hoc* initiatives be reviewed to verify that they all respond to an externally validated set of requirements, and that this requirements baseline is identified in their terms of reference. If this is not the case, an action should be initiated to clarify the requirements basis.** |
| **[R.3]** | **In order to promote a more systematic approach across the various VCs, it is recommended that the ToRs of all VCs are updated with a common format and structure that includes:**  **a) A statement of need/mission statement, vision, and objectives;**  **b) Measures of success;**  **c) Overview of externally-validated requirements baseline to which the VC responds with reference to a detailed user requirements document;**  **d) Proposed organisational structure of the VC;**  **e) Harmonised term lengths for Chairs/Co-Chairs;**  **f) Provision for the development of a 3-year Implementation Plan that *i.a.* addresses transversal activities such as i) capacity building and training, ii) calibration and validation and iii) information systems and portal usage (to be regularly updated and subject to SIT and Plenary approval).**  **For completeness, it is further recommended that a more exhaustive analysis of VC contributions to transversal activities (e.g. Cal/Val & capacity building) should be undertaken involving both the VC Co-leads and the WG Chairs.** |
| **[R.4]** | **Options to Address Role of CEOS SBA Coordinator**   |  |  |  | | --- | --- | --- | | **Option** | **Option Description** | **Advantages/Drawbacks** | | **A** | Completely suppress the role of SBA Coordinator and re-assign any relevant actions to existing CEOS mechanisms or individual agencies (or groups of agencies). | * simplicity and clarity * may be some (very limited) actions that cannot be appropriately re-assigned | | **B** | Generally suppress the role of SBA Coordinator and only allow retention of the role in carefully justified cases (with the presumption being suppression). When re-allocating SBA Coordinator activities coherence with the ToRs of the various CEOS mechanisms shall be maintained (*e.g.* updates arising from the re-allocation of Climate SBA activities to WGClimate). | * simpler and clearer than the status quo * more complex than full suppression | | **C** | Leave "as is" | * overly complex organisational structure that is not justified by the benefits | |
| **[R.5]** | **Options to Rationalise Treatment of Disasters**   |  |  |  | | --- | --- | --- | | **Option** | **Option Description** | **Advantages/Drawbacks** | | **A** | Embed all of the existing CEOS Disaster activities within just one of the existing three mechanisms addressing Disasters and suppress the other two activities/mechanisms | * simplicity and clarity | | **B** | Suppress the CEOS Disaster SBA Coordinator, the *ad hoc* Working Group on DRM and the Disaster activities within WGISS, and transfer all activities to a new WG on Disasters | * simplicity and clarity | | **C** | Leave "as is" | * overly complex organisational structure that is not justified by the benefits, and does not respond to the criticisms in the CSS Synthesis Report | |
| **[R.6]** | **It is recommended that WGISS and WGCV present annually their proposed main lines of activity to SIT and Plenary for endorsement (partitioned into "Standing" activities and "Project" activities). The activities endorsed by SIT and Plenary shall then be embedded within the relevant Work Plans, to be updated on an annual basis.** |
| **[R.7]** | **It is recommended that Plenary exercises stricter discipline on the handling of *ad hoc* initiatives through better use of standing CEOS mechanisms and adherence to a lifetime of one year. Furthermore it is recommended that transparent criteria are used for the selection of *ad hoc* activities.** |
| **[R.8]** | **Options to Address Role of SDCG for GFOI**   |  |  |  | | --- | --- | --- | | **Option** | **Option Description** | **Advantages/Drawbacks** | | **A** | Adjust the ToRs of the LSI VC to include the work of the SDCG | * Makes use of an existing mechanism * Activities broader than current LSI VC mandate | | **B** | Adjust the ToRs of WGISS to include the work of the SDCG | * Makes use of an existing mechanism * Activities not fully consistent with current WGISS mandate, but it has been suggested that these should anyway be re-visited as part of another recommendation | | **C** | Create a new permanent mechanism to carry out the work of the SDCG | * Tailored mechanism to reflect need * Creation of an additional mechanism | | **D** | Subsume the work of the SDCG within the beneficiary projects (i.e. GEOGLAM and GFOI) | * Reduces number of mechanisms * May not reflect long-term need | | **E** | Leave "as is" | * May not reflect long-term need | |
| **[R.9]** | **It is recommended that ToRs for key CEOS leadership roles be developed and updated as appropriate.** |
| **[R.10]** | **It is recommended that the modalities of Plenary be adjusted to ensure that there is a better integration, in terms of guidance and feedback, of CEOS subsidiary bodies. This dialogue needs to be at level that is consistent with engaging the attention of decision-makers (i.e. not asking for feedback on Work Plans/**  **Implementation Plans, but requesting endorsement of headline activities/initiatives that will be subsequently reflected in Work Plans/Implementation Plans) - see also related recommendation [R.6]** |
| **[R.11]** | **To better regulate CEOS *ad hoc* activities it is recommended that:**  **a) *Ad hoc* activities should be systematically terminated after one year (unless a specific exemption has been obtained from Plenary - which should be the exception);**  **b) Clear criteria should be established for starting and ending *ad hoc* activities, with the aim of:**  **- reducing the overall number of such activities;**  **- confining such activities to CEOS priority areas (as endorsed by Plenary);**  **- ensuring appropriate resources are available.**  **c) Once agreed, these criteria should be applied to existing CEOS activities to assess if some activities should/could already be closed.** |
| **[R.12]** | **It is recommended that the "Meetings" Topical Team assess whether the CEOS Plenary should be moved**  **to the northern hemisphere Spring. When considering a possible change, it should be borne in mind that CGMS has decided, as from 2013, to move its annual plenary to the northern hemisphere spring and future annual GEO plenaries are likely to take place in the first part of the year.** |
| **[R.13]** | **It is recommended that a statement be included in the Strategic Guidance Document along the lines of: “CEOS promotes the full and open data sharing policies as described in the GEO Data Sharing Principles".** |
| **[R.14]** | **It is recommended that once the CSSII initiative has been completed the organisational chart on the CEOS website be updated to reflect the agreements reached.** |

# CONCLUSIONS

CEOS is at a crossroads with a number of agencies questioning the relevance and suitability of its labyrinthine structures and processes for the current challenges. The CSSII is one manifestation of this situation, with this initiative providing a unique opportunity to address the long-standing shortfalls in the CEOS organisational structure and mechanisms.

A significant amount of effort has already been invested by many agencies in the CSSII, particularly in the systematic exposure of the issues via participation in the questionnaire process, the results of which are captured in the CSSII Synthesis Report.

It is this Synthesis Report that has inspired the work of the Topical Team, and all the recommendations for the way forward have direct traceability to this Report.

The uniqueness of this opportunity is particularly noteworthy, as the chance to make a meaningful and structured improvement to the way CEOS functions is unlikely to present itself again in the foreseeable future.

It is against this backdrop that the Topical Team presents its recommendations to the wider CEOS community.

When considering the way forward, the Topical Team strongly hopes that an ambitious and far-sighted approach will be adopted that rejects a minimalistic "patching up" in favour of structural decisions that will stand the test of time.

Only with such an approach can CEOS ensure its continuing relevance as an international coordination mechanism and thereby secure the long-term support of CEOS Agencies.

**ANNEX I: Brief Description of CEOS Mechanisms**

|  |  |
| --- | --- |
| **Committee on Earth Observation Satellites** | **1984** |
| Established in 1984 at the request of the Economic Summit of Industrialised Nations Working Group (G7), as the international forum for Earth observing space agencies. CEOS contributes the space component of the Global Earth Observation System of Systems (GEOSS) and supports key stakeholders with a wide range of Earth observation data, products, and expertise. Focal point for international coordination of space-related Earth Observation (EO) activities; Optimize benefits through cooperation of members in mission planning and in development of compatible data products, formats, services, applications, and policies. | |
| **CEOS Secretariat** | **1984** |
| A permanent Secretariat provides most of the coordination between plenary sessions and is maintained by: the European Space Agency (ESA), jointly with the European Organization for the Exploitation of Meteorological Satellites (EUMETSAT); the National Aeronautics and Space Administration (NASA), jointly with the National Oceanic and Atmospheric Administration (NOAA) of the United States; and the Ministry of Education, Culture, Sports, Science and Technology (MEXT) jointly with the Japan Aerospace Exploration Agency (JAXA).  The CEOS Secretariat is chaired by the current CEOS host agency in support of the Plenary. In addition, to ensure the expeditious conduct of business, the past and the forthcoming CEOS chair are included in the CEOS Secretariat. The Secretariat prepares and distributes the minutes for the Plenary meetings, serves as a point-of-contact for external organizations interacting with CEOS, maintains and updates the CEOS database on space and ground segment activities, produces other periodic publications such as the CEOS Newsletter and Annual Report, ensures communications among members between meetings, reports at each Plenary session on its activities and the status of action items from previous Plenary meetings and perform other tasks as assigned by the CEOS Plenary. The Plenary guides the work of the Secretariat, with CEOS Member points-of-contact serving as a steering committee in between Plenary sessions. | |
| **CEOS Strategic Implementation Team (SIT)** | **1996** |
| Created to advance the involvement of CEOS in the development of the Integrated Global Observing System (IGOS). Comprised of CEOS Member Agency executives with the authority to support high priority initiatives, the SIT’s objective is to define, characterize, and develop the vision for CEOS participation in GEO. In particular, the SIT strengthens CEOS linkages to GEOSS, playing a central role in the coordination of existing and future missions of CEOS agencies.   * SIT Chair Key Responsibilities   + Lead CEOS interaction with GEO/GEOSS and strengthen linkages to GEO and GEOSS   + Lead CEOS Virtual Constellation for GEO development and implementation activities   + Assist CEOS interaction with GEO Committees | |
| **CEOS Executive Officer (CEO)** | **2006** |
| The CEO ensures the efficient conduct of the CEOS activities in support to GEO. The CEO reports to the CEOS Chair and in areas where the CEOS Chair has delegated authority to the SIT, will report to the SIT Chair. The CEO provides the necessary support to the CEOS Chair and SIT Chair for defining the most appropriate strategies aiming at improving the CEOS contribution to GEO.  The CEO works in close liaison with the GEO Secretariat in Geneva on the definition of the CEOS contribution to GEO. For the definition and execution of the CEOS actions in support to GEO, the CEO works closely with the Virtual Constellation Teams, the SBA Teams and the CEOS Working Groups. | |
| **CEOS Systems Engineering Office (SEO)** | **2007** |
| The SEO facilitates the development of CEOS space constellation plans. The SEO provides systems engineering leadership, provides a framework for a coherent science and engineering plan, and provides decision support tools for trade studies and the assessment of execution options to maximize the probability of their implementation. While the CEOS Constellation Teams and Working Groups are diverse and have multiple goals, selected commonality and a consistent systems analysis approach will strengthen plans and improve coordination and collaboration toward the realization of a Global Earth Observation System of Systems (GEOSS). | |
| **Virtual Constellations for GEO** | **2006** |
| CEOS Virtual Constellations for GEO demonstrate the value of collaborative partnerships in addressing key observational gaps and bridging multiple GEO Societal Benefit Areas while maintaining the independence of individual contributions.  CEOS Virtual Constellations harmonize and maximize efforts among space agencies to deploy Earth observation (EO) missions as part of GEOSS, address emerging data gaps, avoid overlap among observing systems, and make maximum use of existing assets. A Virtual Constellation consists of multiple satellites, ground systems, and related data delivery systems mobilized in a coordinated manner for greater efficiency.  Seven Constellations currently exist: Atmospheric Composition, Land Surface Imaging, Ocean Colour Radiometry, Ocean Surface Topography, Ocean Surface Vector Wind, Precipitation, and Sea Surface Temperature. | |
| **Working Groups (Standing)** |  |
| CEOS Working Groups enhance coordination and cooperation among CEOS agencies in specific topical areas with broad international benefit. | |
| **Working Group on Information Systems and Services (WGISS)** | **1995/1984** |
| WGISS was established at the 9th CEOS Plenary in October 1995 as a successor to the Working Group on Data (WGD) and the Interim Working Group on International Network Services (WGINS). The WGD was established in 1989, to facilitate the use of data from Earth observation missions by coordinating and standardizing aspects of data management.  WGISS provides data and information services to enhance the access and use of Earth observation data while employing common guidelines for effective interoperability. WGISS enables Earth observation data and information best practices and services to be more accessible and usable to data providers and data users worldwide through international coordination. WGISS also enhances the complementarity, interoperability, and standardization of Earth observation data and information management and services with other types of geospatial data such as *in situ* data. | |
| **Working Group on Calibration and Validation (WGCV)** | **1990** |
| Formerly the *ad hoc* Sensor Calibration and Validation WG. The WGCV promotes the calibration of satellite sensors and validation of their data, to enable reliable comparison and synergistic use of information across global Earth observing systems. WGCV provides a forum for the exchange of information on calibration and validation, coordination, and cooperative activities. The WGCV promotes the international exchange of technical information and documentation, joint experiments, and the sharing of facilities, expertise, and resources. | |
| **Working Group on Climate (WGClimate)** | **2010** |
| Formerly the *ad hoc* group on climate; coordinates interagency climate monitoring activities by facilitating the development and use of satellite-derived Essential Climate Variable (ECV) data records. The WGClimate ensures the coherence of climate product generation supported by space agencies, including other relevant international activities. The WGClimate also contributes to the review of compliance of satellite missions and products with the GCOS Climate Monitoring Principles. The WGClimate just recently subsumed the activities of the CEOS Climate SBA Coordinator. | |
| **Working Group on Capacity Building and Data Democracy (WGCapD)** | **2011** |
| Formerly the *ad hoc* WG on Earth Observation Education and Training; established as formal WGEdu in 1999; was reintroduced in 2011 as the Working Group on Capacity Building and Data Democracy. The WGCapD will build upon the CEOS Data Democracy Initiative in an effort to increase the capacity of institutions in less developed countries for effective use of Earth observation for the benefit of society and to achieve sustainable development. The WGCapD focuses on unifying CEOS efforts toward providing wider and easier access to Earth observation data/software tools and provide intensive capacity building, education, and training to end users. | |
| **CEOS SBA Coordinators** | **2007** |
| Created in 2007 to improve the CEOS contribution to GEO; play a key role in the definition of the CEOS actions in support of GEO; monitor the execution of the actions and ensure accurate reporting to both CEOS and GEO. There are currently seven CEOS SBA Coordinators: Agriculture, Biodiversity, Disasters, Ecosystems, Energy, Health, Water. Some of the SBA Coordinators have been more active than others. | |
| **Working Groups (*ad hoc*)** |  |
| CEOS *ad hoc* Working Groups are established on a temporary basis to investigate specific areas of interest, cooperation, and coordination and report at subsequent Plenary meetings. Continuation of each *ad hoc* Working Group requires confirmation at each Plenary session. | |
| **CEOS Carbon Task Force (CTF)** | **2008** |
| With the advent of the new technical means to provide satellite-derived greenhouse gas monitoring and measurement, CEOS Member Agencies are cooperating to support enhanced global access to GHG data, its related applications, and its continued future supply. The CTF will ensure the necessary integration and coordination of satellite-related support to several key CEOS carbon initiatives, including Forest Carbon Tracking and the Global Monitoring of Greenhouse Gases from Space. The CTF is also coordinating the CEOS response to the GEO Carbon Strategy, known as the CEOS Strategy for Carbon Observations from Space, expected in early 2013. | |
| **Space Data Coordination Group (SDCG) for GFOI** | **2011** |
| The CEOS data strategy for GFOI is to build a living, global archive of spatio-temporally consistent data for each sensor type that responds to GFOI information requirements. The SDCG, developed in 2011, will support the coordinated acquisition planning of all relevant Earth observing missions supporting GFOI and FCT, beginning with the development of a Global Baseline Acquisition Strategy that will be continuously refined as new missions become operational. | |
| **Disaster Risk Management (DRM) *ad hoc* Working Group** | **2011** |
| The *ad hoc* Working Group on Disaster Risk Management top objectives are to increase and strengthen the contribution of EO satellites to the various phases of disaster risk management through a series of coordinated enlarged actions and to raise the awareness of politicians, decision-makers, and major stakeholders on the benefits of using satellite EO in all phases of DRM. The DRM WG will do this by improving the coordination between EO satellite observations and take appropriate actions aiming at better distributing EO satellite data and fostering its use by the DRM users. The DRM WG is clarifying synergy with CEOS Disaster SBA team actions and is currently preparing a DRM Implementation Plan and global observation strategy focusing on three disaster types: volcanoes, earthquakes, and flash floods. | |
| **GEO Global Agricultural Monitoring *ad hoc* Working Group** | **2011** |
| In 2011, CEOS, in observer status, participated in the G20 GEOGLAM meeting. A number of questions were raised with respect to possible CEOS contributions to the GEOGLAM initiative and in order to adequately address those questions, an *ad hoc* Working Group on GEOGLAM was created at the 25th CEOS Plenary. The main objective of the group is to research the development of the space-based component for agricultural monitoring, a major component being the space data coordination activity to address the significant and sustained coverage needs anticipated of GEOGLAM. | |

**ANNEX II: Estimated Status Quo of CEOS Roles and Responsibilities**

| **Summary of Roles and Responsibilities: Strategic Development, Coordination and Communication** | | | |
| --- | --- | --- | --- |
| **Main Function** | **Activity** | **Lead** | **Support** |
| **Top-level Strategy Development and Guidance** | Identify strategic priorities to be reflected in plans and meeting agendas | CEOS Chair | Troika, SIT Chair, CEO, CEOS SEC, WGs and VCs |
| Update CEOS Work Plan to capture CEOS Chair strategic priorities | CEO | CEOS Chair, Troika, SIT Chair, CEO, CEOS SEC, WGs and VCs |
| Align CEOS activities with requirements of "Customer" organisations (document?) | CEO | CEOS Chair, Troika, SIT Chair, CEO, CEOS SEC, WGs and VCs |
| Prepare draft Plenary agenda | CEOS Chair | Troika, SIT Chair, CEO, CEOS SEC |
| Chair Plenary | CEOS Chair | CEO |
| **Internal CEOS Coordination** | Chair CEOS SEC telecon/meeting | CEOS Chair | CEOS SEC, CEO, SEO, Plenary, SIT |
| **External CEOS Coordination** | Decide on CEOS representation in international fora | CEOS Chair[[1]](#footnote-1)  SIT Chair[[2]](#footnote-2) | CEOS SEC, CEO, SEO, Plenary, SIT, VCs, WGs |
| **Substantive Space-borne Coordination** | Identify SIT Chair priorities to be reflected in plans and meeting agendas (which document?) | SIT Chair | Troika, CEOS Chair, CEO, CEOS SEC, WGs and VCs |
| Thematic coordination of space-based observations (including preparation of Imp. Plans and Progress Reports) | VCs, WGClimate, SBA Coordinators |  |
| **Capacity Building** | Increase the capacity of institutions in less developed countries to utilise Earth Observations | WGCBDD | CEO, SEO, VCs, WGs |
| **Calibration/Validation** | Promotion of best practice in the calibration and validation of Earth Observations | WGCV | CEO, SEO, VCs, WGs |
| **System Engineering** | Provide system engineering support to the Virtual Constellation Teams and the Working Groups | SEO |  |
| Enhance interoperability and standardisation of data, information management and services | WGISS | CEO, SEO, VCs, WGs |
| **External Communication** | Prepare CEOS Newsletter | JAXA (prepare)  CEOS Chair (approve) | CEOS Chair, Troika, SIT Chair, CEO, CEOS SEC, WGs and VCs |
| Prepare a year-end report on CEOS accomplishments | CEO (prepare)  CEOS Chair (approve) | Troika, SIT Chair, CEO, CEOS SEC, WGs and VCs |
| Prepare "ad hoc" fliers to support CEOS representation at external events | SEO, CEO (prepare)  CEOS Chair (approve) | Troika, SIT Chair, CEO, CEOS SEC, WGs and VCs |

1. For all issues relating to general coordination and/or items of strategic significance [↑](#footnote-ref-1)
2. For routine issues relating to routine space-based coordination, scientific and user-focused activities [↑](#footnote-ref-2)