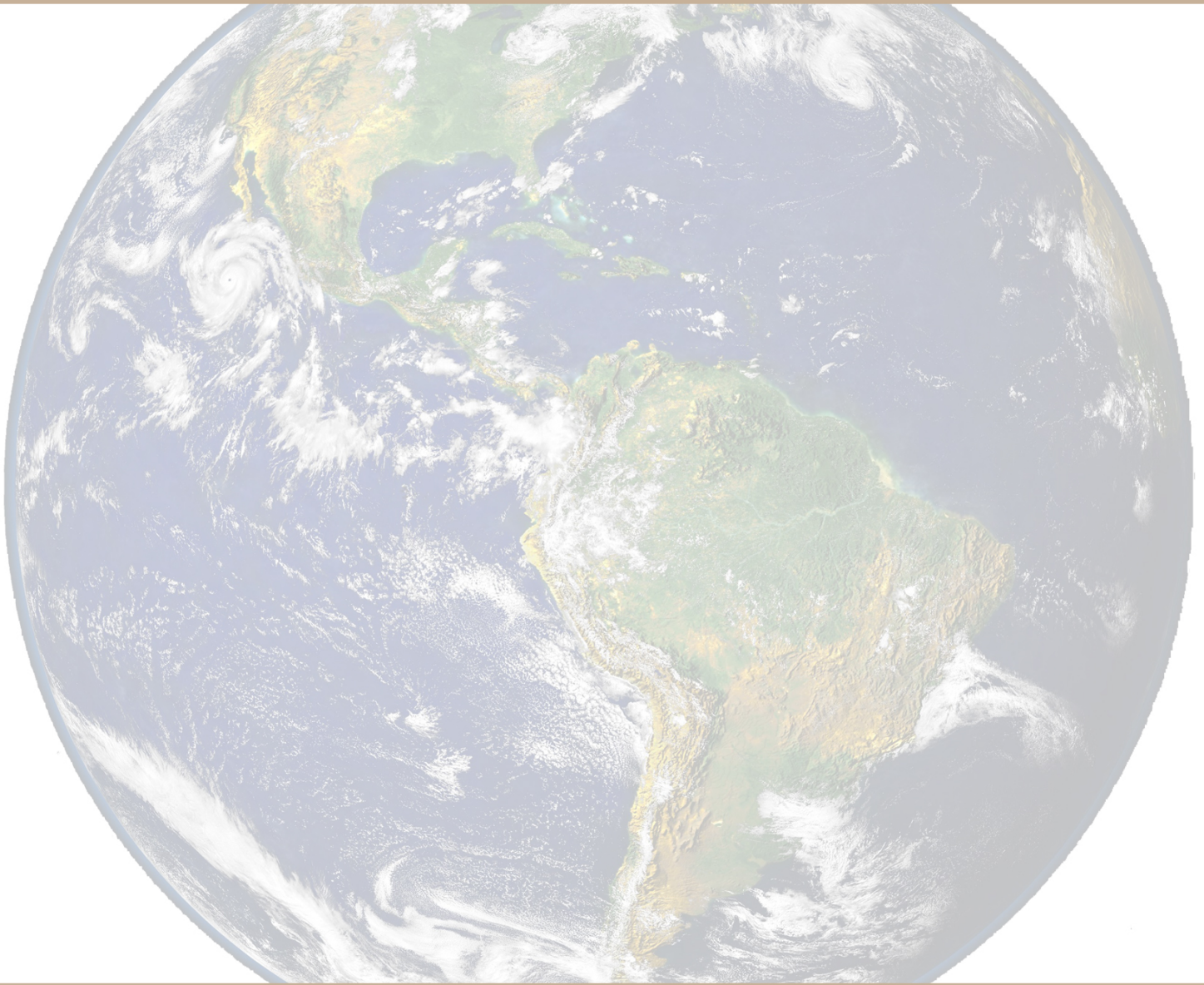


Committee on Earth Observation Satellites



Governance and Processes



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1 Introduction and Background

To ensure it remains a vital and relevant organization, the Committee on Earth Observation Satellites (CEOS) initiated a self-study in 2011 to revisit its mission and international role in light of the evolving nature of Earth observation initiatives and the changing needs of the Earth observation user community. As a result of this self-study, CEOS now employs three documents to guide and conduct its work: a *CEOS Strategic Guidance* document, which articulates the overarching long-term (7-10 years) purpose and goals of CEOS; this *CEOS Governance and Processes* document, which provides updated guidelines with regard to CEOS's structure and operations, and the processes CEOS employs to achieve its goals; and a three-year rolling *CEOS Work Plan*, which sets forth near-term actions to achieve the goals outlined in the *CEOS Strategic Guidance* document. Included in this *CEOS Governance and Processes* document are a schematic diagram with accompanying explanation of the current CEOS organizational structure, as well as sections addressing CEOS roles and responsibilities, the CEOS decision-making process, CEOS major meetings, and CEOS membership and participation.

2 Organizational Roles and Responsibilities

Figure 2-1 depicts the CEOS organizational structure, including the paths by which each CEOS entity reports to leadership. Secondary reporting paths reflect augmented leadership arrangements that are normally put in place at the discretion of the entity charged with primary leadership responsibility. A summary of the key roles and responsibilities of each CEOS organizational mechanism follows. The CEOS website (<https://ceos.org>) includes Terms of Reference for the CEOS organizational mechanisms (under the “Governing Documents” menu link). Annex 1 lists the Working Groups, Virtual Constellations, and Ad Hoc Teams.

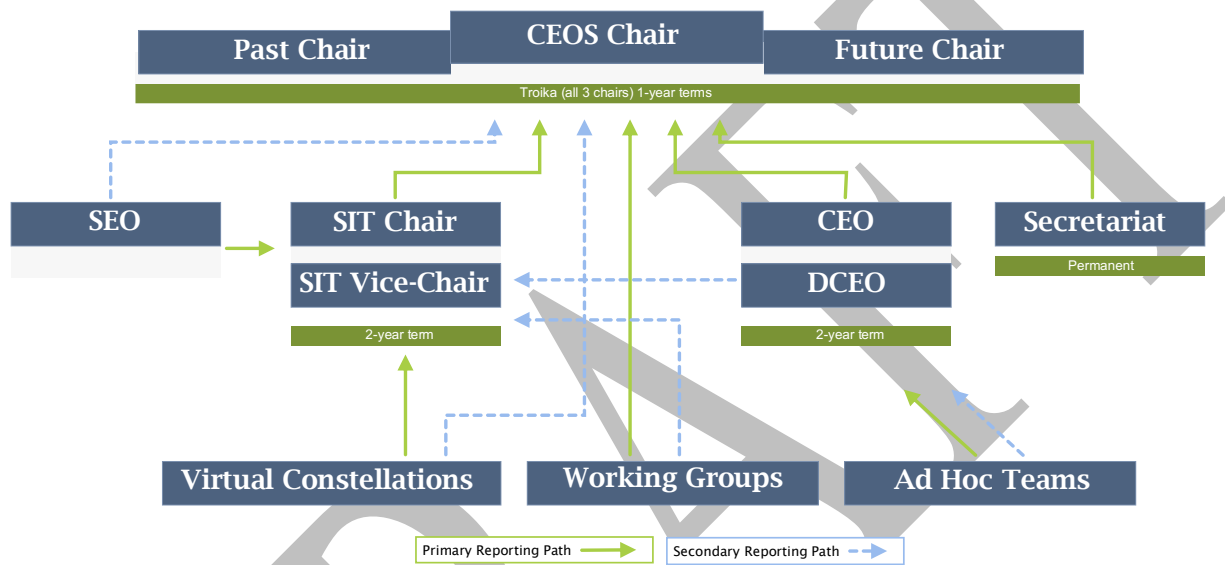


Figure 2-1. CEOS Organizational Structure (see last paragraph in section 2 for explanation of reporting paths for Ad Hoc Teams)

The **CEOS Chair** has the overarching responsibility for ensuring that the guidance and direction from the annual CEOS Plenary are appropriately reflected in CEOS's activities and collective strategic priorities. To assist the CEOS Chair in the execution of this responsibility, some major tasks, such as primary coordination of Virtual Constellation activities, are assigned to the Strategic Implementation Team (SIT) Chair, as reflected in the reporting paths shown in Figure 2-1. The CEOS Chair will be a senior space agency official who serves a one-year term and receives guidance from, and reports to, the CEOS Plenary. The term of the previously confirmed incoming CEOS Chair nominee begins at the conclusion of the CEOS Plenary.

In addition to organizing and chairing the CEOS Plenary, the CEOS Chair presides over the CEOS Secretariat (SEC) and the Troika, the latter consisting of the CEOS Chair, the immediate past CEOS Chair, and the incoming CEOS Chair. In addition, the CEOS Chair oversees the activities of the CEOS Executive Officer (CEO); the Deputy CEOS Executive Officer (DCEO), if one exists; and the Working Groups. The CEOS Chair is the primary interface for all external coordination. To promote leadership diversity, CEOS makes every effort to rotate the Chair responsibility amongst major geographic regions (the Americas, Europe/Africa, Asia/Pacific). The composition of the CEOS Chair team is at

the discretion of that Agency's CEOS Principal and will include expertise and resources to fulfill the range of activities and detailed responsibilities outlined in the CEOS Chair Terms of Reference.

The **SIT Chair** serves a two-year term and formally reports to the CEOS Chair. Biennially, the terms for previously confirmed SIT Chair and SIT Vice Chair nominees begin at the conclusion of the CEOS Plenary. In consultation with the CEOS Chair, the SIT Chair is responsible for the development and implementation of a harmonized planning process for CEOS activities in relation to CEOS strategic priorities, commitments to stakeholders, and the international user community.

The CEOS Chair typically delegates to the SIT Chair the technical implementation of the CEOS contributions to the Group on Earth Observations (GEO) Work Plan and leadership of the resultant interactions with the GEO Secretariat. From the perspective of internal technical coordination, the SIT Chair is responsible for the primary coordination of Virtual Constellation activities and supports the CEOS Chair in the coordination of Working Group activities. Also, through the chairing and organization of meetings of the Strategic Implementation Team, the SIT Chair is responsible for ensuring a structured debate on issues of strategic significance to CEOS.

The **CEOS Secretariat (SEC)**, chaired by the CEOS Chair, provides a forum for coordination between Plenary sessions and is maintained by: the European Space Agency (ESA); the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT); the National Aeronautics and Space Administration (NASA) and the National Oceanic and Atmospheric Administration (NOAA) of the United States; Japan's Ministry of Education, Culture, Sports, Science and Technology (MEXT); and the Japan Aerospace Exploration Agency (JAXA). To ensure the expeditious and smooth conduct of business, the immediate past and future CEOS Chairs are also included in the CEOS Secretariat. In addition, the Strategic Implementation Team (SIT) Chair, SIT Vice Chair, Working Group Chairs, CEOS Executive Officer (CEO), and CEOS Systems Engineering Office (SEO) are invited to participate in the SEC. Representatives from additional CEOS Agencies or other relevant organizations may participate in the Secretariat on a temporary basis at the invitation of the CEOS Chair, for a period not to exceed the term of the CEOS Chair.

The SEC meets on a monthly basis to review SEC and Plenary action items and assist in coordination of CEOS activities, both internally and externally. The SEC fulfills a key policy role by assisting the CEOS Chair and the SIT Chair in the formulation of CEOS position statements, coordinating external meeting attendance, and reviewing major meeting agendas, actions and minutes. In addition, SEC agencies maintain the *CEOS Earth Observation Handbook*, and publish the *CEOS Newsletter* and other outreach publications. Those in attendance are also given the opportunity to report on other relevant topics relating to the SIT, Working Groups, GEO, and other topics of interest. Meetings are typically conducted by teleconference but may be combined with major CEOS meetings to take advantage of face-to-face participation.

The **CEOS Executive Officer (CEO)** is detailed on a full-time basis, either as a direct-hire CEOS Agency employee (not a contractor) or a contractor secured via a direct contract between a sponsoring CEOS Agency and the contractor. The CEO is appointed by the CEOS Chair for a two-year term. Additionally, with the consent of the CEOS Chair and CEO, a CEOS Agency may also detail a Deputy CEO (DCEO) for the same term under the same conditions of hire as the CEO. The CEO reports to the CEOS Chair and to the CEOS SIT Chair, in areas where the CEOS Chair has delegated authority to the CEOS SIT. The CEO works closely with the CEOS Secretariat and leadership of CEOS Agencies, Working Groups, and Virtual Constellations. The activities of the CEO include development of the *CEOS Work Plan*, supporting discussions with the GEO Secretariat on CEOS contributions to the GEO Work Plan, advising CEOS leadership on prospects for continued/expanded internal and external cooperation, and action tracking.

The **CEOS Systems Engineering Office (SEO)** formally reports to the SIT Chair (its annual work plan is coordinated with the SIT Chair) but the SEO may also consider requests for work from the CEOS Chair. The focus of the SEO is on the provision of systems engineering leadership, typically through the provision of advice and support to the Virtual Constellations, Working Groups, and ad hoc mechanisms regarding system engineering methodologies and associated tools, thereby helping to ensure consistent approaches that strengthen plans and improve coordination and collaboration. This support includes the conduct of systems engineering assessments and special studies (e.g., gap analyses), as well as the provision of technical assistance to CEOS space data acquisition planning initiatives. The SEO also provides non-technical support to the CEOS organization for the CEOS website, mailing lists, and actions database (with inputs from the CEO); develops outreach materials; and maintains the historical records and archives of CEOS.

CEOS Working Groups are one of the two permanent working-level mechanisms for coordinating the assets of the CEOS Agencies (see Annex 1 for a list of the Working Groups). Working Groups typically address topics such as calibration/validation, data portals, capacity building, and common data processing standards that are shared across a wide range of Earth observation domains. As a consequence, their activities are intimately connected with, and complementary to, the work of the Virtual Constellations (see below). In this context, Working Groups are often viewed as "cross-cutting" mechanisms within CEOS. Furthermore, the activities of Working Groups are usually structured so as to respond to requirements from GEO and other internal and external organizations. Each Working Group is led by a Chair and a Vice Chair, with a two-year term for each position, served consecutively in the case of Vice Chair. Additional information on leadership requirements for the Working Groups is detailed in the *Working Group Process Paper*. The establishment of a new Working Group must be decided by CEOS Principals at the CEOS Plenary. Each CEOS Working Group's primary reporting path is to the CEOS Chair, with a secondary reporting path to the SIT Chair, if so delegated by the CEOS Chair.

The CEOS **Virtual Constellations** are the other permanent working-level mechanism for coordinating CEOS Agency assets. A CEOS Virtual Constellation typically consists of multiple space- and ground-based systems (potentially including related data delivery systems) that operate together in a coordinated manner to meet a common set of requirements in a well-defined thematic Earth observation domain. Although the Virtual Constellations mechanism, itself, is permanent, CEOS will establish, evaluate, and if necessary, disband individual Virtual Constellations (see Annex 1 for a list of the Virtual Constellations). The individual space and ground segments in a Virtual Constellation can belong to one owner or multiple owners. To achieve their objectives, Virtual Constellations make use of collaborative partnerships to address both current and emerging observational gaps and sustain the routine collection of critical observations, while maintaining the independence of individual Agency contributions and minimizing unnecessary duplication/overlaps. Each Virtual Constellation will have at least two and no more than three Co-Leads. Co-Leads shall be from any interested CEOS Member or Associate Agency and should be an active, engaged, and relevant contributor to the VC. Every two years, the Co-Leads will be reviewed by the Constellation membership with a decision to either maintain current leadership or transition to new leadership, as outlined in the *CEOS Virtual Constellation Process Paper*. It is recommended that only one VC Co-Lead change at one time. The establishment of a new Virtual Constellation must be decided by CEOS Principals at the CEOS SIT Meeting. Each CEOS Virtual Constellation's primary reporting path is to the SIT Chair, with a secondary reporting path to the CEOS Chair, if so delegated by the SIT Chair.

In the event that the permanent mechanisms described in the preceding paragraphs are judged to be insufficient for CEOS to undertake a particular activity, the capability exists for the Plenary to create Ad Hoc Teams. The Plenary assigns short-term objectives to each Ad Hoc Team and ensures that the *New Initiatives Process Paper* is properly referenced. Within two months of creation, the Ad Hoc Team will prepare defined objectives and appropriate path forward for meeting those objectives to include identifying needed resources. Each Ad Hoc Team will have an initial two-year term and will be required to report at the Plenary after completion of their first year on progress and expectation to meet objectives by the end of the two-year term. If the Ad Hoc Team is not able to demonstrate significant progress and agency support to accomplish the objectives within the two-year term, the Plenary may decide to disband the Ad Hoc Team after only one year. If it is clear that the objective of the Ad Hoc Team will exceed the initial two-year term, the Ad Hoc Team will either: identify an existing permanent mechanism for the activities of the Ad Hoc Team; recommend Plenary consider the creation of a new permanent mechanism; or request that Plenary grant a one-year extension of the Ad Hoc Team. It is expected that Ad Hoc Teams will be transitioned or disbanded within three years of creation. The primary reporting path for an Ad Hoc Team is either to the CEOS Chair or to the SIT Chair, as designated by the Plenary according to the purpose and function of the Ad Hoc Team.

3 Decision-Making Process

Consistency, effectiveness, and efficiency are the conditions for long-term organizational well-being. To assure a successful organization, CEOS must select the appropriate set of new activities to pursue and consistently meet its current commitments. CEOS requires a consistent and reliable mechanism to assist the organization in determining which new initiatives and projects to pursue, and to evaluate the course of its ongoing activities.

Technical decisions are usually driven by bottom-up criteria, but strategic and organizational matters, such as the assessment of new activities, typically require a top-down approach based on the long-term vision that CEOS captures in its *CEOS Strategic Guidance* document. The decision-making process described here reflects these different approaches and identifies the appropriate decision makers according to the nature of the decisions to be made.

Clearly delineated procedures for working together—well defined roles and responsibilities, and effective communication processes—are fundamental for the smooth functioning of the organization and help to minimize confusion and conflict during the decision-making process. It is important that each CEOS entity, such as the Plenary, SIT, Working Group (WG) or Virtual Constellation (VC), uses a reliable mechanism to make decisions.

To ensure proper consideration of the various issues of interest to internal and external CEOS stakeholders, CEOS has identified three categories of strategic and organizational activities. These categories are shown in Table 3-1 and represent activities concerning external interfaces, internal CEOS operations, and actions at the working level (e.g., WG and VC activities). For each activity category, Table 3-1 also shows example decisions, relevant reference documents, the decision maker, and the appropriate meeting where each decision is made. Principals are required to make decisions regarding activities that impact an external interface or internal CEOS operations. Decisions regarding activities that interface with external organizations require consideration by Principals at the CEOS Plenary meeting. Most other decisions requiring input from Principals can be made at either the Plenary or the SIT Meeting, depending on the topic. WG and VC leadership (WG Chairs and VC Co-leads) will make decisions regarding working-level WG or VC activities in consultation with the CEOS Chair (WGs) or SIT Chair (VCs). Working-level decisions will be made at WG and VC meetings. Additional details concerning decision criteria, the consideration of new activities, consideration of current activities, and a process for consensus decision making are described below.

Table 3-1. Summary of CEOS Decision Process

ACTIVITY CATEGORY		EXAMPLE DECISIONS	REFERENCE DOCUMENTS	DECISION MAKERS	DECISION MEETING
External Interface or “Outward facing”	Current:	– Evaluate need for GEO Societal Benefit Area Coordinators in CEOS	CEOS Strategic Guidance document	Principals	Plenary
	New:	– CEOS responses to GEO, Global Climate Observing System (GCOS), and United Nations Framework Convention on Climate Change (UNFCCC) – New CEOS-CGMS (Coordination Group for Meteorological Satellites) Working Group on Climate		Principals	Plenary
Internal	Current:	– Continue support to an ad hoc activity for another year	CEOS Strategic Guidance document, CEOS ToRs, and CEOS Work Plan	Principals	Plenary or SIT Meeting
	New:	– Establishment of a new Ad Hoc Team – Establishment of a new VC			
Working Level	Current:	– Termination of an activity in the current WG/VC Work Plan due to insufficient Agency support	WG and VC ToRs, VC Process Paper, and WG/VC Work Plans	WG/VC leadership (after appropriate consultation with CEOS Chair [WGs] or SIT Chair [VCs])	WG/VC meetings
	New:	– New data operability activity – New combined data product from two VC missions			

Decision Criteria

CEOS decisions regarding current or proposed activities shall be made on the basis of specific criteria including:

(a) Alignment with CEOS strategic goals – Activities must align to the goals defined in the reference documents pertaining to each activity category. Internal CEOS general, WG, VC, and ad hoc activities must also align with their respective organizational terms of reference, or other reference documents listed in Table 3-1. New activities, once approved, may be added to the relevant work plan, as needed.

(b) Benefit to internal and/or external stakeholders - Intended outcomes of the activity must have specific value to internal and/or external stakeholders (e.g., responding to stakeholder requirements). This value may not be monetary, but may be in the form of societal benefit. In the case of current activities, CEOS must evaluate the expected future benefit to stakeholders.

(c) Feasibility and Affordability – CEOS Agencies must possess the necessary personnel and fiscal resources to support an activity so it can fulfill its intended outcomes. Commitments of key supporting Agencies are required to ensure success. In the case of new activities, CEOS must consider its current priorities and commitments. In the case of current activities, CEOS must evaluate future feasibility and affordability in order to continue commitments for the activity.

Consideration of New Activities

The external or internal entity proposing a new activity should provide a written description of the activity to the CEOS Secretariat (SEC), which will act as a “clearinghouse” for proposals to CEOS, in accordance with the *New Initiatives Process Paper*. This written description should include a brief discussion of the activity and address in detail the elements needed to measure success, as defined in section 6 of the *CEOS Strategic Guidance* document. After analysis of the written description, the CEOS Secretariat will determine whether and how the activity should be further considered. All proposed CEOS activities must be sponsored by a CEOS entity. If the entity proposing the activity is external to CEOS, the Secretariat will suggest a CEOS internal entity to sponsor the activity. If the activity is proposed by an internal CEOS entity (e.g., a WG or VC), then it is the responsibility of that CEOS internal entity to sponsor the proposed activity. It is expected that new activities proposed to the SEC are significant in nature and require discussion and strategic evaluation by CEOS Principals. Decisions regarding new activities at the working level are made in forums such as WGs and VCs. If approved, such new activities would become part of the *CEOS Work Plan* (updated annually) and/or become part of a WG or VC Work Plan.

The CEOS sponsor of the new activity will prepare a presentation, in addition to the written activity description provided to the Secretariat, which will be sent to decision makers at least two weeks prior to the appropriate decision meeting. The CEOS sponsor will make a brief presentation on the proposed activity during the appropriate decision meeting. If the entity that proposed the new activity is external to CEOS, that entity is not required to make a presentation, but their presence at the decision meeting should be encouraged, so they can answer any direct questions, thus facilitating a full and clear understanding of the proposed activity. Decisions should be made at appropriate meetings by the decision makers identified in Table 3-1 above. Additional decision

meetings (perhaps teleconferences) may also be arranged to introduce additional flexibility, as long as all decision makers have the opportunity to participate.

Sufficient time should be reserved on the agenda of the meeting at which the decision will be made to discuss the proposed activity. This discussion should be led by the chair of the decision meeting and the CEOS sponsor and, if applicable, the external entity proposing the new activity. To ensure that sufficient emphasis is placed on decision making, meeting agendas should include a “decision-making session” to discuss all pending decisions, or clearly highlight the agenda items that are “for decision” rather than “for information.”

Consideration of Current Activities

CEOS must consistently monitor its current activities to assure they meet the decision criteria described above. Based on internal or external inputs, any CEOS entity may propose to terminate a current CEOS activity in cases where that activity no longer meets the criteria or the activity is completed. In addition, CEOS shall address its current activities as it prepares the *CEOS Work Plan*, which is updated annually at the start of the calendar year. Those activities no longer aligned with CEOS strategic goals and objectives, no longer of benefit to stakeholders, or no longer feasible or affordable, may be considered for termination at the appropriate meeting, as indicated in Table 3-1. In addition, WGs and VCs may decide to continue or terminate activities within their own work plans based on similar criteria. Ad Hoc Teams have a defined lifetime, and the Plenary reviews these groups annually, and approves them for continuation, termination, or transition to a permanent mechanism (see Annex 1 for list of Ad Hoc Teams).

Process for Consensus Decision Making

In an international, culturally diverse organization that is based on a best-effort principle, consensus decision making optimizes agreement and “buy-in” of Agencies, maximizing their commitment to deliver their best effort. CEOS decision making at all levels is based on this consensus principle. The primary elements of this decision process are a full discussion of the activity with a movement toward a decision that reflects a clear majority among those present. Such decisions do not require a formal vote, but rather recognition by the leader of the meeting (typically the CEOS Chair or SIT Chair) that a significant number of Agencies support the decision. The CEOS Chair or SIT Chair shall clarify and summarize the position of the group and attempt to resolve any strong objections before a decision is reached. In some cases, specific Agencies may choose not to support an activity due to their internal constraints, but the decision to support activities as a CEOS organization should not be constrained if sufficient support is available.

4 Major Meetings

CEOS major meetings are those that are not specific to a CEOS Working Group, CEOS Virtual Constellation or project supported by CEOS resources, and that are attended by the representatives of the various CEOS entities, including CEOS Principals and CEOS Contacts. These major meetings include: the CEOS Plenary, the SIT Meeting, the SIT Workshop, the CEOS-GEO Annual Consultative Meeting, the monthly CEOS Secretariat teleconference, and the Troika Meeting. Table 4-1 provides additional information for each major meeting regarding timing/frequency, attendance, objectives, and format.

This section contains a series of recommendations aimed at maximizing the efficiency of the major meetings. The recommendations address several aspects such as the meeting objectives, attendance, agendas, and format, and the frequency/timing of the meetings.

Table 4-1. CEOS Major Meetings Summary

MEETING AND CHAIR	TIME-FRAME	ATTENDANCE	MEETING OBJECTIVES AND FORMATS
CEOS Strategic Implementation Team (SIT) Meeting Chaired by: SIT Chair	March-April	Attendance by <ul style="list-style-type: none"> Mostly CEOS Principals, staffed by CEOS Contacts SIT Chair and SIT Chair Team, CEOS Chair and CEOS Chair Team, CEO, SEO, WG Chairs, VC Leads Supported by a few technical experts & scientists Preceded by optional side meetings	<ul style="list-style-type: none"> Focus on strategic guidance with regard to governance, stakeholders, and the accomplishment of deliverables and societal benefit contributions of the VCs and WGs Emphasis may vary depending on the CEOS SIT Chair leadership, but will be consistent with the overarching goals of the three-year <i>CEOS Work Plan</i> .
CEOS SIT Technical Workshop Chaired by: SIT Chair	September	Attendance by <ul style="list-style-type: none"> Mostly technical experts and scientists Few CEOS Principals (not required, depending on agenda/issues) SIT Chair and SIT Chair Team, CEOS Chair and CEOS Chair Team, CEO, SEO, WG Chairs, VC Leads Preceded by optional side meetings	<ul style="list-style-type: none"> Status of the <i>CEOS Work Plan</i> (Actions to be implemented) Prepare CEOS participation and outreach at ministerial-level and other major events at the end of the calendar year (e.g., GEO Plenary, UNFCCC Subsidiary Body for Scientific and Technological Advice COP). Prepare the necessary Information to make appropriate decisions at the CEOS Plenary
CEOS Plenary Chaired by: CEOS Chair	October-November (before GEO Plenary)	Attendance by <ul style="list-style-type: none"> Mostly CEOS Principals, staffed by CEOS Contacts. CEOS Chair and CEOS Chair Team, SIT Chair and SIT Chair Team, CEO, SEO, WG Chairs, VC Leads Few technical experts/scientists (depending on agenda/issues for which their support is needed) Preceded by optional side meetings	<ul style="list-style-type: none"> Focus on decisions to be made by Principals Emphasis may vary depending on the CEOS Chair leadership. Overlaps with the SIT Technical Workshop, especially for usual technical groups (VCs, WGs, and Ad Hoc Teams), should be avoided.
CEOS Secretariat Chaired by: CEOS Chair	Monthly	Mostly teleconferences, attendance by <ul style="list-style-type: none"> CEOS Secretariat participants, as defined in Section 2 Other participants, at the invitation of the CEOS Chair 	<ul style="list-style-type: none"> Status of CEOS Work Plan activities, stakeholder related business, and outreach
CEOS Troika Meeting Chaired by: CEOS Chair	As needed (often at SIT or Plenary Meetings)	Attendance by <ul style="list-style-type: none"> Current, prior year and future year CEOS Chairs CEO and SIT Chair are regularly invited to attend Others invited at the discretion of the CEOS Chair 	<ul style="list-style-type: none"> To allow CEOS leaders to exchange ideas and discuss important issues regarding current year achievements, and the direction, strategy, plans, and expectations for the following year.

Meeting Purpose, Goals and Objectives

While most CEOS major meetings have clearly defined goals and objectives that remain constant, those of both the CEOS Plenary and the SIT Meeting may vary from one year to the next. These two meetings are organized and led by two different teams: the CEOS Chair Team and SIT Chair Team. Past experience has demonstrated that the resources, fields of interest, competencies, and strengths of the CEOS Chair and SIT Chair Teams vary, and that, thanks to the dialog between the CEOS Chair and the SIT Chair, both teams may complement each other and ensure proper leadership of CEOS. Flexibility in the definition of the objectives for the Plenary and SIT Meetings allows both teams to adjust the objectives of their respective meetings to target CEOS needs and best benefit the organization. Imposing fixed and repetitive objectives independently of the teams in place might be counterproductive.

Some flexibility in fixing the SIT and Plenary meeting objectives is also necessary, as the status of some CEOS activities and CEOS entities may vary from one year to the next. In particular, before these two major meetings take place, both the CEOS Chair and the SIT Chair should reach out (e.g., through periodic meetings with Working Group Chairs and Virtual Constellation Co-Leads) and work carefully to understand the pressing issues so that they can effectively establish meeting objectives, design meeting agendas, and frame issues that require decisions.

Meeting Attendance

The profiles of the participants in the major meetings vary as depicted in Table 4-1. Meeting participation can be achieved by physically attending a meeting or by virtually attending via videoconference, teleconference, etc. The CEOS Principals are expected to participate in two meetings each year: the SIT meeting and the CEOS Plenary meeting. The main difficulties in ensuring the expected level of attendance at CEOS major meetings are mainly related to the meeting agenda and to the travel required to attend such meetings in person.

Many agencies face travel budget restrictions that prevent their representatives from physically attending the various CEOS major meetings. This issue is becoming even more critical with the increase in the number of CEOS entities holding meetings (e.g., Working Groups, Virtual Constellations, and Ad Hoc Teams) and the growing number of major initiatives supported by CEOS. In cases where the Principal is not able to attend, Agencies are encouraged to delegate attendance to CEOS Contacts.

The following two subsections (“Meeting Agendas” and “Meeting Format”) also suggest recommendations that may influence meeting attendance.

Meeting Agendas

The agenda of each meeting should be designed to reflect the meeting objectives, but also needs to take into account the profile and interests of the majority of the expected attendees. For example, to take advantage of the presence of CEOS Principals at the Plenary, the agenda should include discussion of issues that are more programmatic than technical and focus on decisions to be made instead of reporting. CEOS should take advantage of SIT and Plenary meetings as opportunities to make progress on issues of strategic relevance.

Careful development of the CEOS Plenary agenda should ensure that:

- The Plenary meeting shall focus on major matters that either require a decision or that, by their importance, need to be brought to the attention of the CEOS Principals (e.g., activities that require the commitment of CEOS Agency resources).
- The Plenary meeting shall not be used for technical reporting purposes; rather, it should focus on issues requiring decisions or guidance from CEOS Agencies, and the agenda should guarantee sufficient time for discussion.
- Technical topics might still be discussed in the presence of interested CEOS Principals during side meetings conducted in conjunction with the Plenary meetings. In particular, Plenary meetings may be preceded by a day of technical side meetings dedicated to the CEOS Working Groups, Virtual Constellations, and other key CEOS initiatives.
- There shall be as little redundancy as possible between the SIT Technical Workshop and the CEOS Plenary Meeting.

The CEOS Chair and SIT Chair should coordinate to ensure that either the CEOS Plenary or the SIT Meeting (not both) serves as an appropriate forum to invite external stakeholders to discuss a topic of interest for CEOS, while the other meeting should focus on issues and matters internal to CEOS.

Meeting Format

Physically attending all major meetings (except CEOS Secretariat teleconferences) may cause financial difficulties for some agencies. Each meeting should be organized to include the appropriate technological infrastructure (videoconference, teleconference, etc.) to allow remote participation (virtual meeting access), in addition to physical participation. Remote participation shall be compatible with the meeting objectives and goals.

The reporting at the various major meetings shall be minimized and targeted to the meeting objectives, avoiding out-of-scope reporting and allowing sufficient time for discussion. Whenever possible, the meeting organizer shall prepare a report template. The use of a template shall help limit the length of the reporting and guide the content of the presentations. If needed, reporters can supplement oral reports with detailed written reports, posters, or backup slides, which will not be examined during the meeting, but will be provided to participants for external review.

To reach consensus before the end of each major meeting, the respective meeting chair shall take care to avoid lengthy and unproductive discussions. If discussion time is exceeded and meeting participants are not reaching consensus, the Chair should adequately moderate the debate and control the time needed for each discussion, and ask the respective Agency representatives to work on the issue outside the meeting.

Meeting Frequency and Timing

The frequency and timing of the major meetings are designed to reflect the current CEOS objectives; in particular, the major meetings are synchronized with the GEO Plenary meetings and the major meetings of other CEOS stakeholders, such as the United Nations Framework Convention on Climate Change (UNFCCC)/Conference of the Parties (COP). As the CEOS objectives evolve, the objectives, frequency and timing of the major CEOS meetings shall be re-assessed.

Occasionally, the period between the CEOS Plenary and the SIT meeting may introduce counterproductive delays for specific matters that cannot wait for a decision to be taken at a major meeting. For those specific matters, it shall be possible to organize ad hoc meetings with the participation of the relevant decision makers. Such meetings could be held either as virtual meetings or side meetings in conjunction with other scheduled meetings (which may not necessarily be CEOS meetings) to reduce participants' travel costs.

5 Membership and Participation

Active Members and Associates (see Annex 2 for a chronological record of CEOS membership) shape CEOS: they take turns providing leadership for the Plenary, SIT, Working Groups, and Virtual Constellations and they serve as the engine that powers and sustains CEOS activities and as a source for ideas for new initiatives. In the context of CEOS, people, energy, and ideas matter. The challenge for CEOS is to maximize the engagement and participation of its Members and Associates by demonstrating the benefits of involvement. Such benefit may be in the form of collaborative missions and data systems and participation in global initiatives for societal benefit.

A best-effort organization like CEOS needs a mass of consistently active Members and Associates to ensure that key activities have sufficient human resources and that there is a seamless transition of leadership at all levels. Given the dynamic nature of membership and participation, routine contact with and among CEOS Agencies will always be a challenge. This challenge can be addressed through maintaining active primary and secondary contacts wherever possible, and by ensuring that contacts exist within the working levels, as well, so that there are always multiple routes for correspondence with any given Member or Associate. To address this issue, the CEO and SEO will work under direction of the CEOS Chair and SIT Chair to periodically confirm contact information with Members and Associates. In addition, participant lists for key meetings should be obtained by the meeting organizer and provided to the CEO and SEO.

CEOS should be viewed as a place where organizations can gather to accomplish specific goals that are relevant to them, with no pressure to participate in activities that are of less interest or for which they do not have resources. As CEOS initiates and further implements activities, Members and Associates may choose to participate or not participate, depending on their interest in particular activities. In choosing new activities to undertake, CEOS should consider whether its portfolio of activities includes not only those that are of interest to the most active CEOS Members, but also includes activities of value and interest to a wide range of CEOS Agencies.

Some Members and Associates are active in Working Groups and other working-level interactions and activities, but are not active at the Plenary level. It is important that CEOS recognize and value the contributions of Members and Associates that participate at the working level, but that may not participate as extensively in Plenary or SIT Meetings. The status of Members and Associates can also change over time. Associates may determine that they qualify to become Members or conversely Members may determine that they wish to become Associates. In cases where a Member or Associate is truly inactive, CEOS leadership will contact such Agencies on an individual, one-on-one basis to encourage them to re-engage with CEOS. CEOS leadership shall maintain awareness of emerging international groups capable of qualifying for CEOS membership, and make an effort to engage them in CEOS activities.

Lack of resources to attend meetings and participate in activities is a known challenge for some Members and Associates. Travel funds are chronically limited, and smaller organizations also have limited human resources to devote to the business of an organization like CEOS. CEOS conducts monthly Secretariat meetings via teleconference; leverages its in-person major meetings through the inclusion of Virtual Constellation, Working Group and other side meetings; and works to ensure the possibility of virtual, internet-based participation in its Plenary and SIT Meetings. CEOS will

continue to examine ways to increase the use of telecommunications technology and leverage other internal and external meetings to maximize the efficient use of resources.

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Annex 1: Working Groups, Virtual Constellations, and Ad Hoc Teams

The CEOS Working Groups, Virtual Constellations, and Ad Hoc Teams, as of August 2021, are listed below. A current listing of these technical groups can be found on the CEOS website (<https://ceos.org>); click on “About CEOS” and select the “Organization” link.

Working Groups:

Calibration and Validation
Capacity Building and Data Democracy
Climate (joint with CGMS)
Disasters
Information Systems and Services

Virtual Constellations:

Atmospheric Composition
Land Surface Imaging
Ocean Colour Radiometry
Ocean Surface Topography
Ocean Surface Vector Wind
Precipitation
Sea Surface Temperature

Ad Hoc Teams (year of activity in parentheses):

CEOS Carbon Task Force (2008 - 2014)
Ad Hoc Space Data Coordination Group for the Global Forest Observation Initiative (2011 - 2019)
Ad Hoc Working Group on GEOGLAM (2012 - 2019)
Land Surface Imaging Study Group (2013 - 2015)
Water Strategy Implementation Study Team (2014 - 2016)
Carbon Strategy Implementation Study Team (2014 - 2015)
Future Data Architecture Ad Hoc Team (2015 - 2018)
Non-Meteorological Applications of Next-generation Geostationary Satellites Ad Hoc Team (2015 - 2016)
Sustainable Development Goals Ad Hoc Team (2016 - present)
Coastal Observations, Applications, Services, and Tools Ad Hoc Team (2020 - present)

Annex 2: CEOS Membership

A chronological record of CEOS membership, as of August 2021, is shown below. For an alphabetical list of current CEOS Agencies, including their Principals and Contacts, see the CEOS website (<https://ceos.org>) under the “Agencies” menu link.

AGENCY NAME	AGENCY ACRONYM	HEADQUARTERS LOCATION	MEMBERSHIP TYPE	YEAR OF ACCEPTANCE
Centre National d'Etudes Spatiales	CNES	France	Member	1984
Canadian Space Agency	CSA	Canada	Member	1984
European Space Agency	ESA	France	Member	1984
Instituto Nacional de Pesquisas Espaciais	INPE	Brazil	Member	1984
Indian Space Research Organisation	ISRO	India	Member	1984
Japan Aerospace Exploration Agency ¹	JAXA	Japan	Member	1984
National Aeronautics and Space Administration	NASA	USA	Member	1984
National Oceanic and Atmospheric Administration	NOAA	USA	Member	1984
Agenzia Spaziale Italiana	ASI	Italy	Member	1986
Deutsches Zentrum für Luft- und Raumfahrt ²	DLR	Germany	Member	1986
United Kingdom Space Agency ³	UKSA	United Kingdom	Member	1986
Commonwealth Scientific and Industrial Research Organisation	CSIRO	Australia	Member	1989
European Organisation for the Exploitation of Meteorological Satellites	EUMETSAT	Germany	Member	1989
Canada Centre for Mapping and Earth Observation (CCMEO) ⁴	CCMEO	Canada	Associate	1990
Norwegian Space Agency ⁵	NOSA	Norway	Associate	1990

¹ JAXA was formed in 2003 as the merger of Japan's Institute of Space and Astronautical Science (ISAS), the National Aerospace Laboratory of Japan (NAL) and the National Space Development Agency of Japan (NASDA).

² Formed in 1997 after the merger with the Deutsche Agentur für Raumfahrtangelegenheiten (DARA).

³ UKSA was established in 2010 to replace the British National Space Centre (BNSC).

⁴ Previously the Canada Centre for Remote Sensing (CCRS).

⁵ Renamed in 2019, formerly the Norwegian Space Centre (NSC).

AGENCY NAME	AGENCY ACRONYM	HEADQUARTERS LOCATION	MEMBERSHIP TYPE	YEAR OF ACCEPTANCE
Intergovernmental Oceanographic Commission	IOC	France	Associate	1991
International Science Council ⁶	ISC	France	Associate	1991
Swedish National Space Agency ⁷	SNSA	Sweden	Associate	1991
World Climate Research Programme	WCRP	Switzerland	Associate	1991
World Meteorological Organization	WMO	Switzerland	Associate	1991
Belgian Science Policy Office ⁸	BELSPO	Belgium	Associate	1992
Global Climate Observing System	GCOS	Switzerland	Associate	1992
Global Ocean Observing System	GOOS	France	Associate	1992
Russian Federal Service for Hydrometeorology and Environmental Monitoring ⁹	Roshydromet	Russia	Member	1992
Roscosmos State Corporation for Space Activities ¹⁰	Roscosmos	Russia	Member	1992
United Nations Environment Programme	UNEP	Kenya	Associate	1992
China Academy of Space Technology	CAST	China	Member	1993
National Remote Sensing Center of China	NRSCC	China	Member	1993
State Space Agency of Ukraine ¹¹	SSAU	Ukraine	Member	1993
European Commission ¹²	EC	Belgium	Member	1994
United Nations Food and Agriculture Organization	FAO	Italy	Associate	1994
United Nations Office for Outer Space Affairs	UNOOSA	Austria	Associate	1994

⁶ ISC was formed in 2018 as the merger of the International Council for Science (ICSU) and the International Social Science Council (ISSC).

⁷ Renamed in 2018, formerly the Swedish National Space Board (SNSB).

⁸ Previously the Belgian Office of Science and Technology (BOST).

⁹ Previously ROSKOMGIDROMET (now the Russian Hydrological Survey, RHS).

¹⁰ Renamed in 1992, formerly the Russian Federal Space Agency.

¹¹ Renamed in 2010, formerly the National Space Agency of Ukraine (NSAU).

¹² Renamed in 2007 after the signing of the Lisbon Treaty, previously the Commission of the European Communities (CEC).

AGENCY NAME	AGENCY ACRONYM	HEADQUARTERS LOCATION	MEMBERSHIP TYPE	YEAR OF ACCEPTANCE
United Nations Economic and Social Commission for Asia and the Pacific	ESCAP	Thailand	Associate	1997
Global Terrestrial Observing System	GTOS	Italy	Associate	1997
International Society for Photogrammetry and Remote Sensing	ISPRS	United Kingdom	Associate	1998
South African Council for Scientific and Industrial Research/Satellite Applications Centre	CSIR/SAC	South Africa	Associate	1998
Comisión Nacional de Actividades Espaciales	CONAE	Argentina	Member	1999
International Ocean Colour Coordinating Group	IOCCG	Canada	Associate	2000
United States Geological Survey	USGS	USA	Member	2000
Geo-Informatics and Space Technology Development Agency	GISTDA	Thailand	Member	2001
Korea Aerospace Research Institute	KARI	Republic of Korea	Member	2001
United Nations Educational, Scientific and Cultural Organization	UNESCO	France	Associate	2002
National Space Research and Development Agency	NASRDA	Nigeria	Member	2004
TÜBİTAK Space Technologies Research Institute	TUBITAK UZAY	Turkey	Member	2006
Centro para Desarrollo Tecnológico Industrial	CDTI	Spain	Member	2007
China Center for Resources Satellite Data and Applications	CRESDA	China	Member	2007
National Satellite Meteorological Center/China Meteorological Administration	NSMC/CMA	China	Member	2010
South African National Space Agency	SANSA	South Africa	Member	2010
Global Geodetic Observing System	GGOS	Italy	Associate	2011
Netherlands Space Office	NSO	Netherlands	Member	2011
Earth System Science Organization	ESSO	India	Associate	2012

AGENCY NAME	AGENCY ACRONYM	HEADQUARTERS LOCATION	MEMBERSHIP TYPE	YEAR OF ACCEPTANCE
Vietnam Academy of Science and Technology / Vietnam National Space Center	VAST/VNSC	Vietnam	Member	2013
Geoscience Australia	GA	Australia	Associate	2013
Agencia Espacial Mexicana	AEM	Mexico	Associate	2015
Agence Gabonaise d'Etudes et d'Observations Spatiales	AGEOS	Gabon	Associate	2015
Bureau of Meteorology	BOM	Australia	Associate	2015
Malaysian Space Agency ¹³	MYSA	Malaysia	Associate	2016
Korea Meteorological Administration	KMA	Republic of Korea	Member	2016
National Institute of Environmental Research	NIER	Republic of Korea	Member	2018
United Arab Emirates Space Agency	UAESA	United Arab Emirates	Member	2018
Polska Agencja Kosmiczna	POLSA	Poland	Associate	2020

This CEOS Governance and Processes document can be amended or modified only after review and careful consideration by the CEOS Agencies. This review should also examine other CEOS guiding documents that will be affected by the amendment or modification to ensure that all of the guiding documents are consistent and mutually supporting. The specific amendments or modifications must be reviewed at a CEOS SIT Meeting and approved at the subsequent CEOS Plenary.

¹³ MYSA was formed in 2019 as the merger of the Malaysian Remote Sensing Agency (MRSA) and the National Space Agency (ANGKASA).