

MINUTES and ACTIONS

34th CEOS STRATEGIC IMPLEMENTATION TEAM MEETING (SIT-34)

FINAL v1.0

2-4 April 2019, Miami, FL, USA

Main discussion points and outcomes from the 34th CEOS SIT Meeting:

- VNNSC is advancing the **CEOS Chair Mekong Initiative** for Vietnam but asked for CEOS support to secure additional data over the other countries targeted by the initiative (Laos, Cambodia, Thailand).
- In general, developments in technology have started to increase the **emphasis of the VCs on data integration, interoperability, and uptake** in addition to their traditional focus on assuring observational continuity.
- The SIT Chair presented the concept of a new **Working Group on Information Provision** (WGIP, or similar name) was discussed, and the formation of a SIT Chair Team-led study team to bring a recommended way forward to the SIT Technical Workshop (TW) was agreed.
- The SIT Chair presented the concept of a CEOS reorganization into **piloting thematically blended Virtual Constellations (VCs), starting with the oceans VCs** was discussed, and the formation of a SIT Chair Team-led study team to bring a recommended way forward to SIT TW was agreed.
- The proposed **way forward for current Ad Hoc Teams (GEOGLAM, SDCG, SDG)** was presented and discussed, and will be considered on a case-by-case basis, in the context of discussions on the possible new Working Group.
- SIT-34 **acknowledged the resolution on the implementation of the architecture for climate monitoring from space**, which will be before the 18th WMO Congress.
- Several agencies offered to support the CEOS SEO in the **evaluation of GEO-AWS credit grants** forwarded to CEOS for feedback by the GEO Secretariat (*i.e.*, related to CEOS Data Cube effort).
- Progress on the **CEOS Analysis Ready Data (ARD) Strategy** was reviewed, and an action to present a next draft at SIT TW was taken.
- Links between CEOS's efforts to **increase accessibility and usability of satellite data in support of GEO** were discussed, including the potential to highlight this at GEO Week 2019, possibly through a video presentation.
- The Sustainable Development Goal *ad hoc Team* (AHT) proposed a **streamlined approach focusing on three SDG Indicators** (6.1.1, 11.3.1, and 15.3.1) as a start, by working directly with existing CEOS bodies while continuing its global engagement and outreach. CEOS Agencies were asked if they were able to support these three indicators to inform the SDG AHT.
- **WGClimate implemented a GHG Monitoring Task Team** that develops the implementation roadmap and undertakes the CEOS Carbon Strategy coordination.
- The change in **WGClimate Vice Chair from USGS to DLR was discussed and agreed** to occur on 1 June 2019. In CEOS, this decision will be through virtual endorsement. In CGMS, the decision will be presented for formal endorsement at its May Plenary meeting.
- **CEOS needs to identify a CEOS Executive Officer (CEO)** to begin in October 2019 and a **Deputy CEO (DCEO)** who can begin as soon as possible.
- **ESA announced they are willing to serve as SIT Vice Chair 2020-2021 and as SIT Chair in 2022-2023.**
- Ongoing agency interest in **analysis ready satellite data provision for the coastal domain** was discussed, as was the potential for a fruitful workshop on coastal observation coordination.



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1. Welcome and Opening Remarks

Steve Volz (SIT Chair, NOAA) welcomed participants to the 34th meeting of the CEOS Strategic Implementation Team (SIT) and to Miami, on behalf of NOAA, and [reviewed](#) the meeting at a glance.

Participants introduced themselves, their affiliations and CEOS roles in a *tour de table*.

2019 CEOS Chair Remarks

Pham Anh Tuan (VAST-VNSC, CEOS Chair) thanked the SIT Chair Team for organizing SIT-34, reminded the dates for the 2019 CEOS Plenary (14-16 October, Hanoi), and noted that VNSC held a workshop on their CEOS Chair Initiative in February. Lam Dao Nguyen provided an update on the 2019 CEOS Chair Initiative:

- VNSC held a side meeting just before SIT-34 to provide a status update for the Mekong River Initiative, which focuses on four countries in the Mekong Basin (Cambodia, Laos, Thailand and Vietnam); and,
- Currently they have the desired data for Vietnam, but they need assistance from CEOS Agencies to secure data for the other countries.

Keynote Presentation – Satellite Data for the Oceans

Joe Sienkiewicz (NOAA Ocean Prediction Center) [presented](#) an overview of work on oceans and data integration, not as a NOAA Oceans expert, but as a user that draws on a number of datasets to ensure safety of life at sea:

- The routine provision of increasingly detailed products (spatially, temporally), as well as advancing numerical models are providing challenges in data interpretation and presentation of products that can quickly be converted to information to inform decisions.
- As the data integration and interoperability increases, and forecaster comfort and familiarity with new data streams grows, they are able to extract additional information and value from the data being provided. This is shown in the example of QuikSCAT.
- Data visualization, display, and interactivity improvements have been a challenge, but when it is done well, it can greatly increase the value extracted from the data.

A brief discussion followed.

- Joe noted that at times decisions may be made on one data point, though this increases uncertainty, which presents challenges (*e.g.*, initiation of forecasting of an individual tropical storm). This is mitigated by the integration of multiple sensors to validate data and determine dependencies (for example, wind, SST, rain).
- Steve Volz noted that managing greatly increased data volumes presents new challenges for users.

SIT Chair 2018-2019 Priorities and SIT-34 Objectives

Steve Volz (SIT Chair, NOAA) [reviewed](#) the SIT Chair Priorities for 2018-2019, to which SIT-34 will contribute:

- Working Group and Virtual Constellation (VC) continuity, sustainability, and outputs;
- LEO/GEO combination products and data processing capabilities;
- CEOS relationships with CGMS, GEO, and WMO; and,
- Support to initiatives undertaken by CEOS Chairs in 2018 and 2019.

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Steve Volz described the SIT-34 agenda structure highlighting the following topics:

- Discussion on restructuring CEOS Virtual Constellations and the suggested creation of a new Working Group (on Information Provision), with a view to ensuring tangible outcomes from, and sustainable commitment to, the CEOS VCs and WGs.
- Critical assessment results of the Virtual Constellations (VCs); ensuring a greater interoperability between the datasets from several satellites/agencies, producing tangible outputs from VCs and WGs and maximizing value of VC and WG outputs (e.g., ECVs and SDGs). He also noted that mission and objectives of VCs might have changed since the very beginning when they were focusing on gaps.
- Defining the way forward for current *ad hoc* Teams (AHTs) by either transitioning these to structures that nurture sustained activities, evolving into a “permanent *ad hoc*” team, or closing out the current AHTs. In addition, discussing the *ad hoc* structure, and establishing a process defining guidance on the lifecycle of *ad hoc* Teams.
- Potential changes to CEOS governance, processes, and organization resulting from discussions on VCs and AHTs and the formal processes CEOS will mandate for them.



Strategic Directions and Partnerships for CEOS Discussion Paper
21 March 2018

- Ensuring tangible outcomes from, and sustainable commitment to, our VCs and WGs
- Maximizing the value of VC and WG output for CEOS objectives (e.g., ECVs and SDGs) and for individual CEOS Agency objectives
- Ensuring the necessary support for our existing thematic teams to flourish and to deliver
- Clearer overall CEOS observing system assessment and desired observing strategies – and known contribution from each CEOS Entity
- AHTs to reflect and report on group trajectory and lifecycle, taking into account the outlook and evolution of long-term sustained operations and expectations levied on CEOS and Member Agency participation.

Concept Paper for Restructuring CEOS Virtual Constellations and Creation of a New Working Group - 28 March 2019

- **Propose two concepts to evolve the CEOS organization and ensure CEOS continues to provide benefit to its members and remains relevant to our external partners and international community:**
 - Establish a new Working Group focused on *Information Provision*
 - Consider broader, thematic-based Virtual Constellations organized around land, ocean, and atmosphere themes

Kerry Sawyer (SIT Chair Team, NOAA) highlighted minor changes to the agenda and Steve Volz called for additional updates or additions to the agenda, and none were raised.

Status of Action Items

Kerry Sawyer (SIT Chair Team, NOAA) [summarized](#) the status of 13 actions from last year’s Plenary, SIT Technical Workshop (TW), and SIT-33:

- CEOS-32-03 (CEOS letter to CNES regarding Space Climate Observatory [SCO]): this action was closed based on discussions and reviews, and the letter was issued;
- Eight actions from CEOS Plenary remain open and have been highlighted in the SIT-34 agenda; and,
- There will be a push on recruitment for key CEOS leadership roles, in particular the CEO/DCEO, and the 2021 CEOS Chair.

2. Organizational Matters

Session Introduction

Steve Volz (SIT Chair, NOAA) [introduced](#) the session by highlighting key questions on how existing CEOS structures position CEOS to support agency objectives, how agency commitments support the continued

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success of CEOS, and CEOS leadership status and succession. Steve challenged SIT-34 participants to consider how to eliminate the TBDs in the Leadership succession chart before the SIT TW, in order to come to Plenary with a clear path forward on leadership of all key CEOS entities.

Sustainability Discussion Part One

Steve Volz (SIT Chair, NOAA) [introduced](#) the discussion around organizational sustainability including of VCs, WGs, and AHTs. To facilitate discussion, Steve introduced the topics in four parts, starting with the matter of the rotation of Virtual Constellation Co-leads:

- Four VCs were established in 2006-2007 to address issues around observational continuity and gaps, as well as coordination around products and data streams;
- Developments in technology and capability, as well as availability of multiple missions, have started to move the emphasis of the VCs towards data integration and interoperability;
- Based on GEO Mexico Ministerial Declaration, GEO has changed its focus from a 'system of systems' approach to an application service delivery to users focus - which means expectation for CEOS focus to shift to the development and presentation of integrated information products;
- The 2018 Virtual Constellation (VC) and Working Group (WG) Questionnaires prepared for SIT-33 provided useful feedback which forms part of the basis of the proposed way forward, including around resources, visibility, challenges in scaling, influence on agency planning, thematic engagement, and sustained and enhanced satellite observations; and,
- The response to the proposal to rotate VC leadership every two years, with no term limits (CEOS-32-12) was generally positive, where two of the VCs responded with suggested term lengths up to three years.

A discussion followed.

- The proposal by the SIT Chair is for 2-3 year VC Co-Lead terms, with no restrictions on renewal (*i.e.*, leads may re-nominate). This will provide regular review points. Steve Labahn (USGS) noted that LSI-VC prefers to implement three-year terms for its three co-Leads to avoid multiple leads rotating out at the same time.
- Josef Aschbacher (ESA) noted that this proposal presents an opportunity to consider whether the current CEOS organization is fit-for-purpose to meet the challenges and problems we have today in Earth observation. Ten years ago, we were concerned that observations would not be continued but now we have a different problem: plenty of observations, both public and commercial, that are not being fully utilized. The issues are certainly different, and perhaps CEOS must evolve its structure to reflect this. Josef cautioned against siloed nature of the current VC, WG, and AHT configuration, and hoped we could integrate them better to exploit the synergies in particular with respect to the users/customers and harmonize efforts in order for CEOS to function better.
- Ivan Petiteville (ESA) suggested that any distillation of VC scope would require suitable representation from the different thematic areas, which are proposed to be combined.
- The timeline for endorsement of the rotation proposal would be to bring the proposal to the SIT TW, and then for endorsement at CEOS Plenary.
- Steve Labahn noted that the challenge of scaling is not unique to the VCs, and likely applies to groups across CEOS.

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- Alain Ratier (EUMETSAT) noted that an applications focus is good, but we need to retain a focus on efficiency. He suggested that a prototyping approach might help to ease the transition process, and ensure an optimal solution, and suggested Oceans as a potential prototype. He also noted that we need to be careful with the thematic connections we draw (*e.g.*, precipitation and atmospheric chemistry are not necessarily compatible). Alain also supported leadership rotation.
- Sandra Cauffman (NASA) noted that ensuring resource capacity and agency management support for individuals to take on workload and participate is key to the success of any reconfiguration.
- Mauro Facchini (COM) welcomed the effort and noted that during the EC's term as Chair of CEOS, they proposed an optimization of the organization and stressed the importance for CEOS to ensure a clear presentation and interface to the outside world. A simplified interface could help in this regard.
- Kerry Sawyer (SIT Chair Team, NOAA) noted that two VCs have three co-Leads, and the remainder have two co-Leads.
- Ivan noted that integration across the oceans VCs would need to consider the different working approaches amongst oceans VCs, by nominating Leads that are capable to talk to the various different scientific communities.
- Steven Hosford (CEO, ESA) asked Ken Casey (SST-VC Co-Lead, NOAA) about how he would approach the teaming question, and Ken stressed the need for a clear value proposition around CEOS participation for all participants (*e.g.*, CEOS, thematic communities).
- Adam Lewis (SIT Vice Chair Team, GA) noted that the best efforts nature of CEOS means that activities depend on willing contributors to underpin any solution. He also noted that the approach of LSI-VC to have three Co-Leads is to address load sharing and this has proven effective in the past allowing Co-Leads to rely on each other in response to demands in workload.
- Mark Dowell (COM) raised the issue of reporting to CEOS Secretariat, noting that the WGs have the opportunity to report at all meetings including during the monthly CEOS SEC teleconferences, where the VCs do not, and this contributes to a greater sense of engagement for the WGs than for the VCs.

Discussions continued after the following two presentations.

CEOS Work Plan 2019-2021

Steven Hosford (CEO, ESA/CNES) provided a [report](#) on the CEOS Work Plan in three parts: a final report on the achievements against work described in the 2018-2020 Work Plan; a report on the development of the 2019-2021 Work Plan and; some lessons learned and messages to those who contribute to the development of the work plan (*i.e.*, the majority of people present).

- **Good progress overall in 2018:** of 105 open deliverables, 43 were *Completed*, 31 are *On Track* and 31 are *Delayed*. Of the 69 deliverables/tasks due in 2018, 41 were Completed and 28 Delayed. Some deliverables are multi-year endeavors.
- **Development of 2019-2021 WP:**
 - Some changes to the structure have been implemented, the three WG's (WGCapD, WGISS and WGCV) deliverables included in the "Capacity Building, Data access, Availability and Quality" section have been split out into three sections and CEOS Services section has been added. This latter section will cover recurrent CEOS Service type activities, which will no longer be counted in the progress indicators.

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- The key stats are: 103 open deliverables (including seven CEOS Services) (91 in 2018, 88 in 2017); 76 deliverables to be closed in 2019 (69 in 2018); 42 newly created in 2019 (29 in 2018); ~28 open 2018 deliverables had completion data pushed back (29 in 2017).
- The CEOS 2019-2021 Work Plan was submitted to Principals on 14th March and virtual endorsement was completed on 22nd March. This is three weeks earlier than in 2018, despite the lack of availability of many contributors in January.
- **Lessons learned and messages:**
 - The CEOS WP is **defined** by CEOS Entity leads. CEO provides **support**.
 - It provides a **work-planning tool** for all levels of CEOS and should be considered as an aid by CEOS Entity leads to monitor and highlight important work and achievements.
 - An upgrade of the www.ceos-deliverables.org database tool is underway with the SEO. The objective is to make it easier to use for CEOS entity leads and ensure it is an effective **work management tool** and **not a reporting burden**.
 - There are two main phases of work on the WP. November to February for the development of the annual WP and September for reporting of progress ahead of plenary. A WP Progress Report to Plenary is written based on the information available on 1st October
 - Deliverables should not be modified significantly from one Work Plan to the next – only minor changes should be needed.
 - **Closing deliverables should be rigorous:** Deliverables should be made available via the CEOS document management system when they are closed. If nothing is delivered, some explanation/description should be provided.



A brief discussion followed.

- Josef highlighted the amount of work required by the CEO to assemble this information, and that we require a CEO/DCEO to succeed Steven Hosford when his term ends.
- Jenn Lacey (USGS) stressed the importance of one-year deliverables, but asked if there was a way to define longer-term ambitions while leaving details and the due date unassigned. Steven indicated that longer-term objectives and aspirations could always be written into the narrative/text in the Work Plan that introduces the deliverables tables for each CEOS entity. Steven noted they are also proposing this year the possibility to “freeze” deliverables that have been defined but no longer have resources attributed. This was in part also to address the LSI request to define longer-term deliverables with no resources immediately available.



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- Jonathon Ross (SIT Vice Chair Team, GA) agreed that an indication of long-term directions and aspirations in the Work Plan would be helpful and recommended that the resource status of activities be identified because that may also provide agencies an opportunity to see where they may best contribute.

The final version of the 2019-2021 Work Plan will be available on the CEOS website by 12th April.

CEOS Resource Allocation

Kerry (SIT Chair Team, NOAA) [reviewed](#) the state of CEOS resources, key contributors, leadership, and gaps, issues, and open positions.

- Eighteen CEOS Agencies are ‘key contributors’ based on agency leadership roles since 2009, archives, and the 2018 VC and WG questionnaires.
- Kerry showed how the number of CEOS Lead Roles has changed over the years from a low of 32 in 2010 to a high of 45 in 2016. The number of CEOS Lead Roles currently is 42.
- Kerry encouraged all agencies that are not identified to consider how to commit to leadership roles in the various CEOS entities.
- We are seeking nominees for Vice Chairs in a number of Working Groups as of October 2019: WGDisasters, WGISS, and WGCapD.
- We are seeking a DCEO (ASAP) and a plan for CEO continuity from CEOS Plenary.

SIT-34-01	CEOS VC Co-Leads, WG Chairs/Vice Chairs	All CEOS Virtual Constellation Co-Leads, Working Group Chairs and Vice Chairs, and <i>Ad Hoc</i> Team Co-Leads to provide updated content and information for the CEOS website to CEOS SEO, with a cc to the CEO.	30 June 2019
<i>Rationale: Information on CEOS website is not current.</i>			

Sustainability Discussion Part One (Continued)

The sustainability discussion continued with the remaining three parts. Steve Volz stressed again that the *Concept Paper for Restructuring CEOS Virtual Constellations and Creation of a New Working Group* as [circulated](#) is for discussion, and not for decision. He then summarized the proposal for a merged structure for Virtual Constellations. VCs will continue to coordinate closely with thematic international science teams. Requests from user community for ready-to-use information are increasing. Still the continuity of measurements has to be ensured. We need to continue to assess potential gaps and address several different measurement technologies that may not exist today.

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Virtual Constellations: A Proposal for Consideration

Propose for discussion and consideration a restructure of the CEOS Virtual Constellations:

- Merge the four current ocean-related VCs into a single Ocean VC focused on creating an integrated and coordinated multi-variable picture of oceans.
- Merge AC-VC and P-VC into an **Atmosphere VC**.
- LSI-VC already follows this model, looking at a "family" of variables for integrated picture of the land, and is proposed to become the **Land VC**.

Context:

- This approach could better enable CEOS to support the community and user needs that draw on products and information from across different existing VCs.
- The global satellite observing system has expanded significantly over the past 10+ years, and the selection of satellites has been informed in part by CEOS VC reports and assessments.
- Proliferation of satellite systems have significantly lowered the risk of gaps in major satellite measurements, and increases the resiliency of the integrated global observing system to address measurement continuity risks.
- VCs will continue to coordinate closely with thematic international science teams.
- Demands by users for ready-to-use information drawing on multiple measurements and observations continues to increase.

Possible Merged Structure for CEOS VCs

Steve noted the proposal:

- Presents an opportunity for CEOS Agencies to understand how agencies are using the datasets of other agencies in an integrated manner, including possibly bringing the concept of CEOS Analysis Ready Data for Land (CARD4L) to oceans data sets;
- Would reduce the number of stand-alone CEOS structures; and,
- Promotes cross-platform / cross- technology information continuity.

Steve Volz summarized the proposal for a merged structure for AHTs, which includes two aspects.

- A two-year initiation cycle for standing up new AHTs, which would require only change to language in the CEOS Terms of Reference and Governance and Processes; and,
- Establishment of a new Working Group focused on Information Provision and user engagement. This WG would work closely with GEO and be the interface between GEO and CEOS. The WG also requires SEO support to coordinate a common systems engineering process such as the creation of a template for new activities so that we do not have to start from scratch when new activities are proposed.

Ad Hoc Teams A Proposal

Propose a two-year initiation cycle for standing up new AHTs. The two-year initial cycle will allow for defining the objective, evaluating the merit and value of the objectives, and determining the appropriate path forward for continued support within CEOS. All other aspects of the AHT reporting process will remain, including annual reporting at Plenary.

History and Context:

- The CEOS Ad Hoc Team process has been successful and productive.
- CEOS has used the AHT process, or variations of it, to consider how best to support emerging needs and apply new capabilities where a permanent CEOS mechanism does not exist.
- To date, CEOS has initiated as many as nine activities since 2008 to consider emerging needs.
- Of these, at least four have been dispositioned, three into existing CEOS Working Groups, and twice with the creation of new groups, WGClimate (2010) and WGDisasters (2013).

New Working Group A Proposal

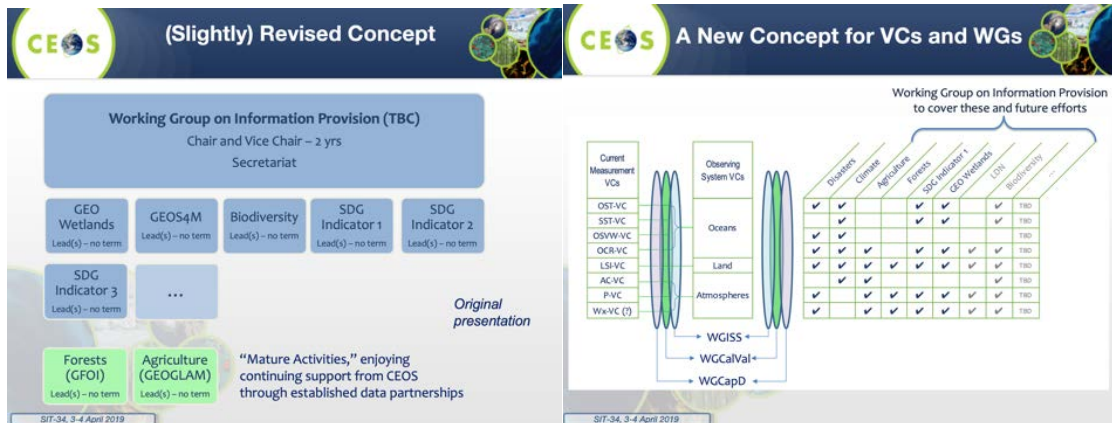
Establish a new Working Group focused on *Information Provision*, to coordinate all activities related to user outreach and applications (e.g., forests, agriculture, freshwater, land degradation, urban, biodiversity, and more in the future).

Context:

- All three existing AHTs focus on external user information and service delivery, in a class with the existing Working Groups on Disasters and Climate.
- Expansion of such focused groups reflects the growing demand by the global community for specific, refined information products from CEOS and CEOS Agencies for operational decision-making.
- The SDCG for GFOI and GEOGLAM activities are mature, externally focused activities relying on sustained delivery of CEOS data and information to meet user needs.

Steve Volz noted the difference in maturity across the various activities, which would be included in the new Working Group. For example, GFOI and GEOGLAM are mature, while Biodiversity and Wetlands would require nurturing. He suggested the proposal could be revised to address activities at different stages, e.g., "mature activities" with established support and partnerships.

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A discussion followed on the VC merging, *ad hoc* teams and user needs, and new Working Group proposals.

- Paul DiGiacomo (NOAA) was supportive of the proposed framework, particularly the addition of the new WG with the caveat that the observations that the VCs are providing be transferred to the WG. He also asked about the inclusion of cryosphere, and presumed this would go under oceans and land.
- Jay Al-Saadi (AC-VC Co-Lead, NASA) noted that AC-VC has functioned tactically with self-prioritized needs in order to keep a realistic scope, which then determines the participants and engages with existing observing systems. He indicated that the VC never intended to cover all atmospheric observations. It has prioritized to focus on observational gaps for which it has the resources and which are not being addressed by other groups. The merger with P-VC would be forced for AC-VC, and create operational difficulties. He also asked what would be unique about a CEOS atmosphere VC, and suggested CEOS risks losing the focused, lower overhead VC model and slipping toward a "Working Group" type of arrangement and increased formality.
- Ken Casey (SST-VC Co-Lead, NOAA) cautioned that merging the Ocean VCs may actually drive a wedge between CEOS and the international science teams because it introduces an extra layer of bureaucracy. He recommended to modify the proposal to reinvigorate VCs and to clarify the value proposition that VCs bring, channeling those into a possibly coastal themed WG. He also noted that CEOS is based on willing contributions, and the proposal does not clearly address how the proposed structure will increase the number of willing contributors.
- Josef Aschbacher (ESA) noted that with more satellites/missions and more data, but not more staff, a streamlining of structures and work activities would help ESA engage and support CEOS. ESA considers CEOS to have excellent value and quality but there are limits to resources and he fully supports the effort to streamline.
- Josef wondered whether CEOS WGs, VCs and AHTs address the right questions. How space agencies address the big challenges? He noted the emerging role of 'New Space' (smallsats, AI, ...) that could improve our responses to those challenges. We need to determine how these activities (and missions) interact with the missions and activities of CEOS Agencies. They could be seen as integral, complementary, or competitive, and this is a discussion that CEOS needs to consider. In the wider context, how are collective observations from government institutions and new space addressing global concerns?

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- Sandra Cauffman (NASA) asked about the initial two-year period for AHTs, and how much they are expected to have formed before they are created. Steve Volz noted that the expectation is that they have a plan to resolve themselves into something else, though this may take more than a year. Kerry noted that in the past, AHTs have formed without much pre-consideration to address key and pressing challenges, *e.g.*, the SDG AHT.
- Craig Larlee (GEO Secretariat) indicated that GEO supports the creation of a new Working Group as a clear entry point for GEO to have discussion with CEOS on expected future requirements.
- Selma Charchali (CNES) asked how Chairs of the proposed new WG would handle the inbound requests foreseen.
- Marc Paganini (SDG AHT Co-Lead, ESA) noted that from an SDG perspective, they had thought of a similar approach to the CEOS Carbon Strategy. If the SDG coordination was included in this WG, it would be the only crosscutting activity in the WG. Marc indicated that this new WG would need to be flexible enough to provide a home to some activities (like LDN and biodiversity) without a strong and demanding structure. He liked the idea overall, but he wanted to make sure this identifies and clarifies where the work of CEOS stops and the work of GEO begins.
- Brad Doorn (GEOGLAM AHWG Co-Lead, NASA) noted that GEOGLAM became an *ad hoc* Working Group (AHWG) with the primary goal of engaging and communicating with the space agencies on behalf of the agricultural community to gain access to existing data, not requesting new observations. This was driven by feedback from the community that the thematic connection to agencies was not strong.
- Ken Casey noted that the proposed WG could also accommodate a Coastal group that could link with the relevant VCs.
- Steve noted the active contributions to the debate from all present and thanked them for their thoughts and suggestions. He asked all to think over the content and come back to continue the discussion during the second part of the “Sustainability Discussion” scheduled for the next day.

3. Partnerships

Session Introduction

Steve Volz (SIT Chair, NOAA) highlighted the questions that the SIT Chair Team has been studying around how CEOS currently interacts with its strategic partners (GEO, GCOS, and WMO) and how we might continue to develop these engagements:

- How are our partners progressing in CEOS-related efforts?
- Are there opportunities for enhanced collaboration?
- How does CEOS engage with the current and future GEO Work Programme?
- What is our community doing to prepare for the upcoming 2019 GEO Week, including the ministerial?

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GCOS Update

Carolin Richter (GCOS) remotely [presented](#) an update on GCOS activities.

- A recent Ocean Observing Systems Review looked at a number of topics (*e.g.*, Ocean Heat, Freshwater Storage, Air-Sea Fluxes, Boundary Currents), and OceanObs'19 white papers on these topics are planned.
- Improvements to the quality of observations are being promoted via the likes of the GCOS Surface Reference Network (GSRN), the GCOS Upper-Air Network Task Team (GUAN TT), and around radar and lightning observations for climate.
- Satellite monitoring of forests for REDD+ is key for “Supporting Emissions and Mitigations.”
- GCOS has worked to identify monitoring needs to support implementation of Paris Agreement and Global Stocktake.
- A report on the outcome of the Joint GCOS/WCRP Panels Meeting which had been held 18-22 March 2019 in Marrakesh. This joint meeting focused on panel work plans until 2023 including a possible conference on climate observations at the end of 2021, in partnership between GCOS, GOOS, Copernicus and the joint CEOS/CGMS WGClimate, the update of the 2015 Status Report and of the 2016 Implementation Plan until 2022, activities to support climate services and improving monitoring of the Earth cycles (Energy, Water, Carbon); observations in support of adaptation; and interface issues, such as air sea fluxes and land-ocean fluxes.

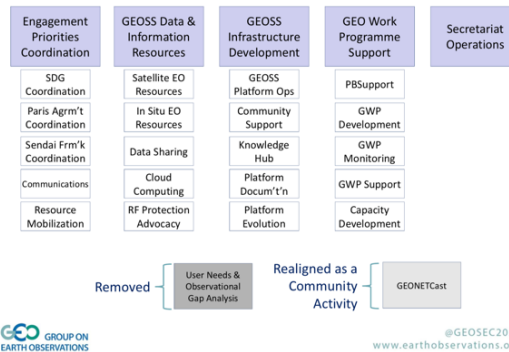
Group on Earth Observations (GEO) Update

Craig Larlee (GEO Secretariat) [reported](#).

- The GEO Work Plan update for 2020-2022: with revised guidance for Implementation Plans; revised criteria for GEO Flagships, Initiatives and Community Activities; and a review process that builds on the lessons from 2016.
- The Results-Oriented GEOSS, which is much bigger than the GEO Knowledge Hub concept, is for provision of a single virtual location to discover, access, and apply the knowledge and results developed in the GEO Work Programme. The expectation is to move towards cloud-based data platforms and access to multi-satellite data. Target users are Earth observation (EO) specialists (intermediate users), particularly in developing countries. It requires the collaboration of Work Programme activities to identify which resources should be included. The alpha version is scheduled for July 2020.
- GEOSEC has the following requests of CEOS:
 - **2020-2022 GEO Work Programme:** Participate in the review of Implementation Plans involving satellite data. Identify any gaps in between expectations of GEO Work Programme activities and current provision by space agencies/CEOS. Check feasibility of what is proposed.
 - **GEO-AWS Cloud Credits Programme:** Advise GEO on the technical feasibility of the proposals.
 - **Strategy for a Results-Oriented GEOSS:** Share experience on how users can seamlessly access multi-satellite data and cloud processing platforms to truly benefit from the resources in the Knowledge Hub? GEO needs CEOS expertise and capabilities to realize this part of the Strategy.



GEO Foundational Tasks
Draft Structure for 2020-2022 (in development)



CEOS Engagement with GEO

Steven Hosford (CEO, ESA/CNES) [opened the presentation](#) reviewing past interactions and engagement of CEOS with GEO. In the past (circa 2008) the links between CEOS and the GEO Work Programme were very clear and tightly linked, CEOS SIT meetings reviewed contributions by Agencies, CEOS Entities, and SBA leads to specific GEO Tasks. More recently, CEOS work has not been organized with the same tight links to the GEO Work Programme and, when CEOS Entities are asked to identify how their work feeds into the GEO Work Programme, only a small number of direct links are identified. This state of affairs clearly does not accurately reflect the contributions of CEOS to GEO.

Kerry Sawyer (SIT Chair Team, NOAA) briefly [summarized](#) CEOS Connections to GEO 2017-2019 Work Programme. Kerry also reported on the actions and outcomes from the February CEOS-GEO Bilateral Meeting, noting the offer of GEO Secretariat to facilitate a slot for CEOS at the GEO-XVI Plenary to highlight how Earth observations can help countries address needs by measuring and showing change related to a few SDGs.

A brief discussion followed.

- Brian Killough (CEOS SEO, NASA) noted the potential opportunity for CEOS to speak at GEO Plenary, and CEOS should consider how to make the most of any opportunity offered. Brian recommended that CEOS consider preparing a video instead of a presentation, pending discussions with the Australian Government Summit Task Force/Ministerial Summit Working Group (MinWG). He would be happy to lead a group to help prepare.
- Mirko Albani (WGISS Chair, ESA) informed all of the fruitful discussions on the implementation on the Knowledge Hub that took place in the Tuesday side meeting. Mirko also requested that WGISS participate in the GEOSS Infrastructure Development Foundation Task/Implementation Coordination Task Force.
- John Remedios (UKSA) suggested CEOS use the GEO Work Programme Symposium in May to help identify disconnects between CEOS and GEO activities, and to understand how EO data is used in GEO.

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SIT-34-02	SEO in consultation with CEOS SEC	Establish a working team to scope and develop content for the proposed CEOS presence at GEO-XVI Plenary.	30 April 2019
	<i>Rationale: A managed response is necessary to take up this opportunity and ensure broader CEOS interests are taken into consideration.</i>		
SIT-34-03	WGISS	Identify a WGISS representative to participate on the GEOSS Infrastructure Development Foundation Task/Implementation Coordination Task Force	15 May 2019
	<i>Rationale: GEOSS Infrastructure Development Foundational Task has significant relevance to the work of WGISS.</i>		

GEO Amazon Credits

Brian Killough (SEO, NASA) [reported](#).

- Amazon Web Services (AWS) has offered \$1.5M USD of cloud credits to GEO to allow developing countries access to cloud services to support hosting, processing and analysis of EO data for sustainable development.
- Project proposals are due to GEO by 12th April with the credits being awarded 1st June for a 3-year period. The evaluation panel includes the GEO Secretariat Director, the GEO Senior Scientist, and three GEO Programme Board members.
- GEO requested that CEOS conduct a technical evaluation of the proposals prior to selection and offer an analysis of issues and concerns regarding satellite data provision, and Open Data Cube installation and operation. The SEO will take the lead on this task, with support from CEOS Agencies desired and welcome.
- The SEO has been engaged in a number of global projects that require Sentinel-1 and Sentinel-2 Analysis Ready Data (ARD). These include the Africa Regional Data Cube (ARDC), numerous country-level data cube prototypes and the future DE-Africa. Sentinel-1 and Sentinel-2 level-1 archive downloads are challenging due to significant data volumes. SEO would prefer to use cloud computing for ARD creation and storage of data.
- SEO will lead a task to develop a prototype Sentinel “data pipeline” to efficiently and effectively produce ARD and make it available on AWS. The SEO has been in contact with ESA (Steven Hosford and Albrecht Schmidt) to discuss implementation options and connections with DIAS as well as European commercial options.

A brief discussion followed.

- Adam Lewis (SIT Vice Chair Team, GA) volunteered GA to contribute to the GEO AWS grant screening group on behalf of CEOS, and he acknowledged the strong work of the CEOS SEO on shepherding this opportunity.
- Josef Aschbacher (ESA) confirmed that Albrecht Schmidt would remain the principal interface for the issue of S1 and S2 ARD.
- Steve Labahn (USGS) noted that USGS is planning to provide Landsat data to cloud environments and the African Regional Data Cube and would therefore like to participate in the CEOS review team.

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- Paul DiGiacomo (NOAA) expressed interest in engaging in this activity from an oceans perspective, and more broadly from the Blue Planet perspective.
- Mauro Facchini (COM) noted some concern within Europe around Copernicus data benefitting and increasing the profile of companies outside Europe, and this could present a long-term risk to the open data policy. Brian noted that this was a part of his motivation in engaging European industry in his activities related to Sentinel data. Josef stressed that the data policy discussion is ongoing in Europe, and CEOS and its activities should be mindful.
- Adam noted that other providers could match offer Amazon’s grant program contribution in order to promote uptake.
- Mark Dowell (COM) noted the Sentinel-2 global mosaic activity already offers access to the Level-2 data over pan-European areas, and global coverage begins this week.
- Jonathon Ross (SIT Vice Chair Team, GA) noted the underlying size of the datasets involved, and the importance of sustaining follow-up to efforts such as the Global Data Flows study and Future Data Architectures (FDA).

GEO-XVI Plenary and Ministerial

Jonathon Ross (SIT Vice Chair Team, GA) [presented](#).

- The GEO-XVI Plenary and Ministerial will take place November 6-8, 2019 in Canberra, Australia.
- There is a need to demonstrate the return on investment in EO to ministers at the GEO Ministerial. It is also important that the community address the GEO priorities: the SDGs, the Paris Agreement, and the Sendai Framework.
- The focus of GEO Ministerial Industry Track will be around ensuring EO drives productivity and growth across the economy. The track will aim to bring GEO and industry together, and try to address real barriers to full spectrum engagement, and will focus on space, spatial, and tech, in part inspired by the kinds of companies on display at ESA Phi week (<https://phiweek.esa.int/NikalWebsitePortal/esa-eo-phi-week-2019/phiweek/>).
- There will be fewer but higher profile side events (12) in order to focus attention. This will mean that the selection process will be more competitive.
- The Ministerial summit will focus on shaping and scaling GEO’s future, and linkages to global and regional economic cooperation frameworks (*e.g.*, G20, ASEAN). Ministerial invitations have been issued, and Jonathon would welcome efforts by CEOS members within government to promote engagement from their governments.
- Jonathon noted that they expect to be able to display videos around the GEO meeting site, which would be an opportunity for CEOS to spread its message.

A brief discussion followed.

- Brian Killough (SEO, NASA) agreed that the impact of technological advances should be reflected in the CEOS materials without getting too far into the details.
- Christine Bognar (NASA) raised the topic of coordination of CEOS representation, and suggested sharing the slides and materials with the incoming 2020 CEOS Chair, ISRO (ISRO did not have a representative at SIT-34 who could comment).

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- Adam Lewis (LSI-VC Co-Lead, GA) noted that digital platforms are the next step in enabling the uptake of EO data, and CEOS needs to find a way to communicate the broader benefits and the anticipated evolution.
- Alex Held (SIT Vice Chair, CSIRO) noted CSIRO will be supporting the industry track and welcomes collaboration.
- Steve Volz (SIT Chair, NOAA) supported the idea of the video, and noted it would be useful for agencies that have GEO ExCom representatives advocate for a CEOS slot on the agenda. He suggested that while the focus should be on impact, CEOS Agency hardware should feature.

SIT-34-04	CEOS Agencies	Submit proposals to SEO for possible CEOS video to be shown at the GEO-XVI Plenary.	25 May 2019
	<i>Rationale: Opportunity for CEOS to showcase satellites and hardware to the GEO community.</i>		

SIT-34-05	CEOS Agencies	Submit ideas to Jonathon Ross, Steven Hosford, and Kerry Sawyer for possible CEOS side event at the GEO-XVI Plenary.	25 May 2019
	<i>Rationale: CEOS is the space coordination arm of GEO and thus has a role to represent the significant contributions of CEOS Agencies to GEO.</i>		

GEO-LEO Activities Update

Mitch Goldberg (NOAA) [presented](#):

- He recalled the heritage of this topic within CEOS (CSIRO CEOS Chair Study on Non-Meteorological Applications (2016); NOAA SIT Chair Priority (2018 – 2019) with CGMS lead on Flood Mapping Pilot; and now the CSIRO/GA SIT Chair Proposed Priority (2020-2021).
- High spatial and temporal resolution models can benefit from the new geostationary sensors being launched by CEOS Agencies.
- The CGMS flood pilot combined GEO and LEO data in the context of the flood-mapping constellation. Eight cases were looked at from May to Sep 2018, and GEO data enabled rapid cloud filtering. Results will be reported to CGMS and SIT TW.
- He proposed to explore the possibility of future projects combining for instance Sentinel-1 radar with GEO/LEO optical /IR, noting that CEOS WG Disasters could be involved. Mark Dowell recalled that Copernicus EMS relies on several satellites sources to deal with both fires and floods.
- Discussions will be held with JMA or other regional national meteorological and hydrological services (NMHS) on how to implement the flood pilot for the Asian region.
- Alex Held (SIT Vice Chair, CSIRO) proposed to select a pilot site in the southern Pacific Ocean that was visible by both Himawari-8 and GOES-16 that included both marine and some land observations to show overlap and allow for comparison of data.

SIT-34-06	NOAA/SIT Chair Team	To coordinate with WGDisasters, WGCapD, and CSIRO on possible evolution of GEO-LEO pilot	June 2019
	<i>Rationale: Coordination of the GEO-LEO effort.</i>		

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World Meteorological Organization (WMO) Update

Werner Balogh (WMO Space Programme) [presented](#), reviewing the history of the WMO Space Programme and the WMO Integrated Global Observing System (WIGOS).

- The Rolling Review of Requirements was set up to analyze the requirements of the application areas, and compare against the current and planned space segment capabilities.
- Access to Satellite Data and Products is considered, including via the Direct Broadcast Network (DBNet). Capacity Development is also addressed.
- WMO Governance and Constitutional Body Reform is underway and will support the expanding role of WMO in addressing weather, climate, water and environment (Earth System Approach).
- The Vision for WIGOS in 2040 is being finalized and will be presented to the 18th World Meteorological Congress (Cg-18).
- A workshop on the WMO role in the architecture for climate monitoring from space was held in February 2019, including participation from CEOS members and other entities. The workshop resulted in the drafting of a resolution (be [found here](#)) on the implementation of the architecture for climate monitoring from space, which will be before WMO Members at Cg-18. The resolution was reviewed by WGClimate at [WGClimate-10](#) held a few weeks ago, and was presented to SIT-34 for acknowledgement and was acknowledged.

Werner summarized several potential areas for CEOS cooperation.

1. *Continue implementing Architecture for Climate Monitoring from Space – acknowledge resolution*
2. *Enhance CEOS involvement with Rolling Requirements Review process, towards implementing Vision for WIGOS in 2040*
3. *Enhance partnership with CEOS in selected application areas: Agricultural applications (GEOGLAM); Hydrological Applications; and, Polar and High-Mountain Regions.*
4. *Work towards integration of CEOS data management activities with WIS 2.0*

A brief discussion followed.

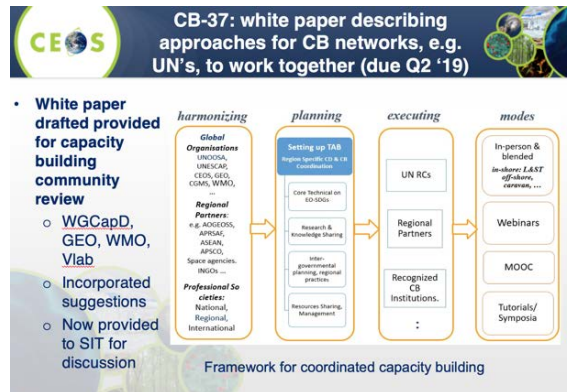
- Jörg Schulz (WGClimate Chair, EUMETSAT) thanked WMO for sharing the Cg-18 resolution with CEOS, and for seeking comment from WGClimate.

Capacity Building and Data Democracy (WGCapD)

Nancy Searby (WGCapD Vice Chair, NASA) [presented](#).

- WGCapD has 17 deliverables in the Work Plan, with 12 due in 2019 and 5 in 2020.
- Three deliverables were completed in 2018 (CB-20 - AmeriGEOSS Week in person training; CB-26 - AfriGEOSS Symposium in person training; CB-19 - SDG Awareness webinar).
- A framework white paper has been completed by WGCapD (see below) which intends to bring together various capacity building networks.

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- WGCapD members include CNES, DLR, ESA, INPE, ISRO, NASA, and VNSC. ROSCOSMOS has sent a letter to formally join CEOS WGCapD and identified members.
- WGCapD is looking for a new Vice Chair.
- In response to a question from Adam Lewis (LSI-VC Co-Lead, GA), Nancy suggested that the WG could help LSI-VC deliver training on CARD4L.

4. Observations for End Users

Session Introduction

Steve Volz (SIT Chair, NOAA) [introduced](#) the session, noting the key questions to address around whether we are currently meeting user needs, areas of commonality for collaboration, and whether we can move forward with a proposal for engagement tools and approaches. He briefly reviewed CEOS leadership succession for WGClimate and WGDisasters.

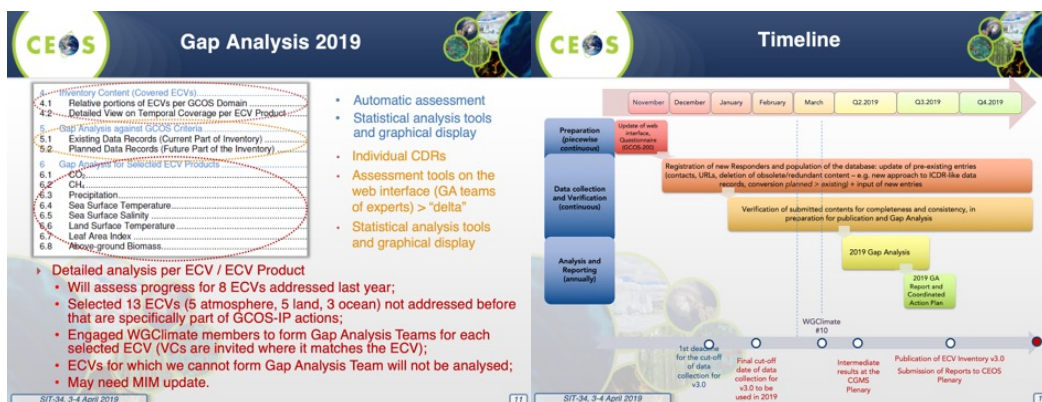
Observations for Climate

Jörg Schulz (WGClimate Chair, EUMETSAT) [presented](#).

- Joint meetings with GCOS and WCRP DAC were held to promote further discussion with GCOS on requirements setting for various applications, and advocate that GCOS remains “the single voice” for requirements towards space agencies including those for WCRP applications. Otherwise, WGClimate may end up with several frameworks to support, which would complicate the task.
- WGClimate #10 saw cross representation from WGCV, WGISS, AC-VC, and CEO, UNFCCC, WCRP, C3S and addressed several major topics including: leadership; GHG Monitoring (CEOS-32-05); WMO Congress resolution; ECV Inventory update, gap analysis, and coordinated action plan (several work plan actions).
- WGClimate #11 will likely take place in September 2019 prior to the SIT TW, which will be held in Fairbanks, Alaska.
- WGClimate underlined its appreciation to John Dwyer (USGS) for his long-lasting, fruitful and excellent support to the Working Group and would have welcomed him becoming the Chair. DLR (Albrecht von Bergen) has now been nominated, and DLR confirms support, to become WGClimate Vice Chair and could start as early as June 2019, subject to CEOS and CGMS endorsement. Following DLR’s Chair term, the next Chair (and preceding that, Vice Chair) will be sought from an operational CGMS Agency as per the established convention. A call to agencies will be published around the CEOS 33rd Plenary.

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- The internal implementation of GHG Monitoring activity focuses on not duplicating structures and activities of contributing CEOS and CGMS entities. The structure and balance of the internal implementation should reflect this. A task team was established for the implementation, led by Mark Dowell, with Albrecht von Barga (incoming Vice Chair) as the deputy. The development of the implementation roadmap is ongoing and will be presented to the SIT TWS in September and CEOS Plenary in October (with a draft to be presented at CGMS-47 in May). The links to GEO-Carbon are currently unclear given the changes in leadership/activity in GEO Secretariat.
- As of the cut-off date for V3.0 of the ECV inventory in early 2019, the ECV Inventory had 1394 records (976 inherited and 418 new), and this activity corresponds to the implementation of CEOS Work Plan actions CMRS-17, -20, and -21. There were approximately 200 responders, with more than 60 new registrations. This has resulted in an increase of contributions for some agencies, in particular those from Asia. A detailed gap analysis will be performed per ECV / ECV Product which will assess progress for the 8 ECVs examined in detail in the V2.0 gap analysis and, in addition, will focus on 13 newly selected ECVs (5 atmosphere, 5 land, 3 ocean) that were not addressed before but are specifically identified within GCOS-IP actions. At WGClimate #10, members were engaged to form gap analysis teams for each selected ECV (VCs are invited to contribute where their focus areas coincide with particular ECVs) and good continuity with the V2.0 gap analysis teams was secured. ECVs for which we cannot form Gap Analysis Team cannot be analyzed in depth. A MIM update may be needed in order to progress the 2019 gap analysis. The plan is to release V3.0 of the Gap Analysis Report and Coordination Action Plan, and V3.0 of the ECV inventory, prior to the CEOS plenary.
- A CEOS/CGMS statement was delivered to SBSTA-49 in Katowice, Poland in December 2018, including an extra report, and contributions to the SBSTA Chair report, although there was no agreed outcome from SBSTA-49 on Systematic Observations because of lack of agreement on text related to the IPCC 1.5 degree report.
- An updated CEOS/CGMS statement may be needed for SBSTA-50 and, if so, the updated statement would be presented to CGMS-47 (19-24 May) for endorsement, and a virtual CEOS endorsement would be sought via the CEOS Secretariat.
- SBSTA-51 will be held in December 2019, and the group will prepare a statement to be endorsed at CEOS-33 Plenary (CMRS – 22).



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A brief discussion on the WGClimate leadership followed.

- Jenn Lacey (USGS) thanked Jörg for acknowledging John Dwyer’s contributions as WGClimate Vice Chair. USGS supports the early leadership change of the WGClimate. Sandra Cauffman (NASA) noted that NASA also supports the nomination of DLR.
- Steve Volz noted that given the extraordinary circumstances, SIT could endorse DLR as the acting WGClimate Vice Chair, which can then be endorsed at CGMS, and then be endorsed formally at CEOS Plenary.
- Alain Ratier (EUMETSAT) and Josef Aschbacher (ESA) supported this proposed solution.

The initial SIT decision to endorse DLR (Albrecht von Barga) as the acting WGClimate Vice Chair as of 1 June, and pursue formal endorsement at CGMS and CEOS Plenaries was revised during the Day One Recap. SIT-34 participants agreed that a virtual CEOS Plenary endorsement of DLR as WGClimate Vice Chair be organized together with endorsement by CGMS Agencies at CGMS-47 so that Albrecht would be the official WGClimate Vice Chair as of 1 June 2019 and John Dwyer would be duly relieved of the Vice Chair role with effect from 1 June onwards.

SIT-34-07	CEO	Prepare an email to request virtual endorsement of Albrecht von Barga to assume duties of WGClimate Vice Chair as of 1 June 2019 pending CGMS approval at the May CGMS-47.	1 May 2019
<i>Rationale: Secure continuity in leadership of WGClimate.</i>			

Further discussion followed.

- Alain Ratier (EUMETSAT) asked about how many agencies contribute for the first time to the ECV Inventory and Jörg noted KMA has contributions for the first time and that JAXA and JMA had greatly increased the number of records.
- Mark Dowell (COM) noted the opportunity in June to go back to the conclusions of SBSTA-49, and suggested that we might want to attempt to put in a dedicated conclusion recalling the AC-VC white paper.
- Mark also noted that the deputy lead of the GHG task team within WGClimate would always be the Vice Chair of WGClimate. He also noted that, while there is a focus on the GHG activity, the CEOS Carbon Strategy coordination is still being undertaken. This was not reported by Jörg due to lack of time, but should be addressed at Plenary.

Space Climate Observatory

Selma Cherchali (CNES) [presented](#), providing an update on the Space Climate Observatory (SCO).

- The objectives of SCO include supporting observations of climate change and its impacts, coordination of EO at regional, national and local level, including *in situ* data, research, modelling, and provide a joint Observatory.
- CEOS and its agencies may best contribute to SCO’s objectives around data access, including making use of multi-source data through support to integration and interoperability. WGClimate can also support in particular around the uptake of ECVs.
- In the case of CNES, they will represent France within the SCO. Future CEOS engagement with SCO will take place via the WGClimate Chair as governance structures develop.

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- Many countries are facing crucial lack of observations, and space observations are key data to monitor climate change impacts and SCO is proposed to bridge the gap between science and society and focus on Pillar 3 of the Climate Architecture.
- She recalled that the new date for the signature of the SCO Joint Declaration of Interest, is 24-27 August 2019, at time of G7 in Biarritz, France, and it will be followed by the establishment of the SCO Steering Committee.

Selma presented a list of SCO connection with CEOS activities through WGClimate, WGISS, WGCapD, WGDisasters, AHT SDG:

- *Enhance the added value of Earth Observations to provide the right information for Climate Change impacts.*
- *Provide feedback to CEOS and CEOS Agencies on requirements for space-based Earth Observations in strong relationship with GCOS and facilitate the collaboration across all the agencies in addressing those requirements.*
- *Collaborate with CEOS in developing the tools and environment needed to expand the use of satellite data.*

A brief discussion followed.

- Steve Volz (SIT Chair, NOAA) thanked Selma for adapting the SCO interface to CEOS to be more streamlined, and he noted that from his perspective there is more overlap between SCO and GEO.
- Josef Aschbacher (ESA) noted that overall carbon is a high-profile issue, which has been receiving a lot of attention in Europe.
- Pham Anh Tuan (CEOS Chair, VNSC) confirmed that VNSC would like to contribute to SCO, and noted links to the CEOS Chair Mekong Initiative.
- Alex Held (SIT Vice Chair Team, CSIRO) noted that they are discussing pilots and collaboration in the Pacific around sustainable issues and climate change impacts.

Atmospheric Composition Virtual Constellation (AC-VC)

Jay Al-Saadi (AC-VC Co-Lead, NASA) and David Crisp (NASA) [presented](#).

- The related CEOS Work Plan tasks are: Contribute to CMRS-25 (implementation of GHG monitoring system); VC-2, Ozone dataset validation/harmonization [Q4 2020]; VC-3, Air Quality (AQ) Constellation Coordination [Q1/2019]. A document on validation needs for the AQ Constellation will be presented for endorsement 6/2019 during AC-VC-15.
- Air Quality: The “AQ Constellation validation needs” document recommendations for implementation will be presented to the SIT TW and the CEOS Plenary.
- Ozone: the subgroup continues activities to produce/assess total ozone ECVs and considering ozone vertical profiles.
- AC-VC #15 in June will discuss AC-VC deliverables needed by 2021 to demonstrate that satellites can support the 2023 stocktake and deliverables needed by ~2021 to prepare a future purpose-built, operational constellation to support future stocktakes.

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- All space agencies currently engaged in AC-VC focus topics are active, participating in the annual AC-VC meeting and during other meetings of opportunity (*e.g.*, AGU/EGU, mission team meetings).
- The AC-VC proposal for leadership cycle is for no set term limits, but includes a dedicated discussion of leadership rotation during the annual AC-VC meeting. This allows flexibility to adapt to new focus activities being undertaken. They would encourage a “Vice Chair” period (*e.g.*, 6-12 months) to aid succession and consider expanding to three co-Chairs, given the geostationary perspective. The group has no concerns with participation, and Korea’s NIER has been particularly active since joining CEOS last year, in particular in the area of air quality (AQ).
- AQ deliverable VC-3 is anticipated to be complete by June - evolving from a white paper to a proposed implementation phase (to be further discussed during AC-VC#15 in June 2019).
- Ozone deliverable VC-2 may evolve to a more specific activity on profile O3 prior to the next CEOS Three-Year Work Plan (to be further discussed during AC-VC#15 in June 2019).
- AC-VC members are supporting WGClimate and WGCV to respond to CEOS-32-05 (way forward on CEOS-CGMS coordination on GHG monitoring).

Observations for Disasters

Simona Zoffoli (WGDisasters Chair, ASI) [presented](#), referring the group to the [CEOS website](#) for the presentations from their most recent WGDisasters meeting.

- Simona summarized progress on a number of DIS actions (10, 12, 15, 16, 18, 20, 21). WGDisasters has no open SIT and Plenary actions, and is coordinating with NOAA and WGCapD on the flood monitoring initiative for GEO-LEO (see session 3, item 3.7).
- The group has started the practice of inviting other WGs to WGDisasters meetings, including remote participation of WGISS Chair the WG Disasters #10, a joint session (by telecon) with WGCapD at WGDisasters #11, and sharing on deliverables of mutual interest. WGCapD will consider WGDisasters collaboration in their next CEOS Work Plan.
- The group is reviewing its Terms of Reference (ToR) and Disaster Risk Management (DRM) observation strategy (consider new themes such as coastal risk, climate change impacts, cascading risk, risk vs hazard), with draft ToR planned for discussion at the next SIT TW. New contributing agencies are invited with possible topics including: gap analysis; demonstrate methodologies, techniques and tools; data contribution (i.e. L-band SAR, high resolution DEM, high-resolution radar and optical data); and, capacity building and awareness raising.
- Simona noted that the WG is consolidating cooperation with the Disasters Charter on how to share WGDisasters data with Charter Project Managers (PMs)

A brief discussion followed.

- John Remedios (UKSA) noted the importance of rapid response and inter-agency coordination in the overall disaster response, and noted past confusion with Disasters Charter response to the flooding in Mozambique.
- Adam Lewis (SIT Vice Chair Team, GA) noted the Copernicus EMS is quite mature and effective system to provide data in disasters and asked how the WG adds value to the community. GA might want to engage with the WGDisasters, but needs to know how the WG is moving forward with the mature capabilities of EMS. Simona noted that WGDisasters has always focused on the parts of the Disaster

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Risk Management Cycle that are not covered by the Charter and the Emergency Response part of the Copernicus EMS. This means, for example, working on hazards including less mature science products or, alternatively, the recovery phase and bringing these products toward a more operational usage. It is legitimate in this context to revisit the ToR of the group after more than five years of existence.

Recap of Day 1

Steve Volz [reviewed](#) the outcomes from the day 1 discussions.

- **WGClimate leadership:** Kerry Sawyer (SIT Chair Team, NOAA) noted it was agreed yesterday that SIT endorse Albrecht as acting Vice Chair pending formal endorsement at CEOS Plenary. However, overnight it was agreed that CEOS leadership would execute a virtual CEOS Plenary endorsement through the CEOS process, which will allow for formal endorsement of the change with effect from 1 June (assuming endorsement at the CGMS-47 Plenary). There were no objections to the proposal.

Observations for Agriculture

Brad Doorn (GEOGLAM AHWG Co-Lead, NASA) [presented](#).

- GEOGLAM's G20 mandate has been renewed and strengthened, and the relationship with AMIS is strong – economists are increasingly seeing value of EO. The biggest challenge for GEOGLAM is controlling growth, and it is starting to touch on the Paris Agreement, Sendai, and the SDGs.
- Dense, moderate-high resolution optical time series (usually requested as NDVI) is the core of GEOGLAM requirements, though the need for integrated products (*e.g.*, radar, temperature, from other VCs, *in situ*) is growing. Effort has been put in to ensure that the requirements are traceable, and CEOS Agencies are responding well to the observables.
- The GEOGLAM *ad hoc* Working Group (AHWG) is preparing a response to GEOGLAM updated requirements to be endorsed at next CEOS Plenary, and CEOS space agency requests for feedback will be initiated. Responses to these requests - even if just confirmation that agency work is ongoing - will be useful.
- The GEOGLAM AHWG was created to coordinate space agency contributions and access to data for the agricultural community.
- The GEOGLAM community values the relationship with CEOS, including recognition of the engagement by CEOS Principals. Brad reviewed the five potential options for the way forward for the AHWG: 1) transition to LSI-VC; 2) transition to another existing Working Group; 3) transition to a new GEOGLAM Working Group; 4) termination of the group; or, 5) continuing as an AHWG. He noted that only the first three were considered as viable options.

A brief discussion followed.

- Adam Lewis (LSI-VC Co-Lead, GA) noted that the growth in GEOGLAM is good as it represents investment from other parties and is a proof of success. Steve Volz (SIT Chair, NOAA) agreed, and noted the challenge of managing that growth.
- Sandra Cauffman (NASA) recognized GEOGLAM as a success story and noted the value of GEOGLAM as a way for space agencies to show the value of Earth observations for societal benefit.

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Observations for Forests

Osamu Ochiai (GFOI Lead for CEOS, JAXA), [presented](#).

- GFOI has continued momentum in attracting major forest donors for coordination and efficiency in using structured and IPCC-compliant methods to guide national forest monitoring systems. There is growing adoption of GFOI tools: Methods and Guidance Documentation; REDD Compass (reddcompass.org); GFOI Tools Inventory (CALM maturity index).
- The development of the new, broader GFOI ‘Data Component’ is less clear. FAO and World Bank are co-Leads, and the Data Component Manager role is vacant with both FAO and WB interested. CEOS remains the lead of the Space Data Component.
- The GFOI Leads Team agreed to submit an Implementation Plan to the GEO Work Programme 2020-2022 to ensure that GFOI is considered a GEO Initiative.
- GFOI Plenary will take place next week in Mozambique where CEOS will report on Space Data and Platform developments (Landsat Collection 2, Copernicus Global Land Service & Sentinel-2 L2A Global production).
- Germany (GIZ) has recently joined as a GFOI Co-Lead.

Stephen Ward (SDCG Secretariat) added:

- SDCG is regrouping and refocusing to reflect GFOI Phase 2 activities with a new work plan.
- The continued focus is on the core business of assuring data suitable for annual national forest monitoring system (NFMS) reporting but with emphasis on data access, formats, and ARD.
- CEOS Agencies are making a substantial investment (\$4.5Bn) in launch of missions relevant to the measurement of above ground biomass from 2018 to 2024, and there is a strong interest in biomass from sectors related to carbon emissions and forests.
- Substantial technical work has been undertaken in WGCV-LPV (CEOS Biomass Protocol) in ensuring these datasets are fit for purpose.
- SDCG recently hosted a ‘Biomass Day’ which brought together CEOS Agencies and groups to explore the proposition of **“accelerating the policy relevance of CEOS agency biomass datasets”** using GFOI and convention frameworks
- The World Bank is keen to collaborate on capacity building in GFOI for understanding and application of biomass data.

A brief discussion followed.

- Jörg Schulz (WGClimate Chair, EUMETSAT) noted both the ECV Inventory gap analysis on the Biomass ECV, and also the ECV Biomass requirements, could be useful references. Stephen noted that the driver for GFOI is national reporting on short timescales and not climate data records, though SDCG has looked at ESA’s CCI Biomass.
- Marc Paganini (SDG AHT Co-Lead, ESA) noted that ESA funds the Land Cover Project Office, at the Wageningen University (GFOI R&D component).

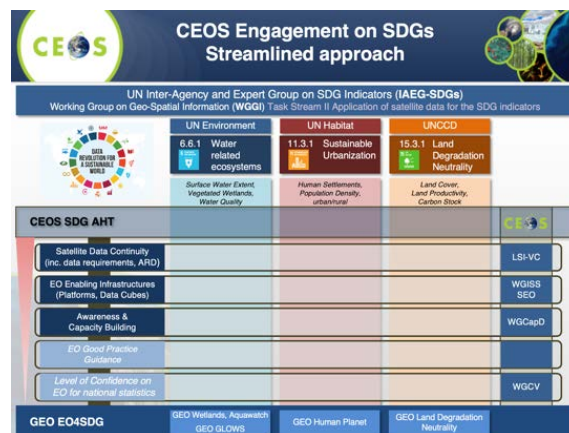
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- John Remedios (UKSA) welcomed the focus on biomass, and noted there is a lot of ongoing work (*e.g.*, ESA CCI, ESA DUE, Globbiomass). He noted the significant uncertainty in measurements, and Stephen noted that approaches to reduce uncertainty is the focus of the WGCV LPV CEOS Biomass Protocol.
- Mark Dowell (COM) noted the Copernicus land service mosaic has now gone global. He questioned whether the group’s work (SDCG) is a space data coordination task, given the supply growth, or whether another title might be a better fit.
- Adam Lewis (LSI-VC Co-Lead, GA) noted that LSI-VC will be looking to what the next CARD products will be, and SDCG could produce some candidates.
- Nancy Searby (WGCapD Vice Chair, NASA) asked about the capacity building needs, and noted that NASA/SERVIR is writing an addendum to the MGD. Brad Doorn (GEOGLAM AHWG Co-Lead, NASA) noted that GEOGLAM has created a capacity building group, which could be an example. Stephen noted that there is a substantial capacity building effort co-Lead by SilvaCarbon, World Bank and FAO, and so contributions from WGCapD would need to have clear value.
- Alex Held (SIT Vice Chair, CSIRO) asked if the CEOS Biomass Protocol focuses only on forests, or whether it could be relevant to rangelands. It was noted that the protocol purports to cover ‘woody biomass’.

Observations for SDGs

Marc Paganini (SDG AHT Co-Lead, ESA) and Alex Held (SDG Co-Lead, CSIRO) [presented](#).

- The SDG coordination activity has produced a number of tangible outputs (*e.g.*, an EO Handbook, representation at the UN High Level Political Forum, EO for SDGs in scientific journals, recognition of CEOS by the UN system). The activity has played a valuable role in raising the profile of the actual and potential contributions of EO to the progression towards SDGs.
- At the 32nd CEOS Plenary, Principals recognized the achievements of the SDG AHT and asked the group to provide options on a way forward at SIT-34 (CEOS-32-11).
- Marc reviewed the progress of the SDG-related CEOS Work Plan (2019-2021) tasks, and reviewed the status of actions which include cataloguing CEOS agency engagement (complete), assessment of the contribution of EO, plan engagement on SDGs, analysis of SDG-related requirements, development of Data Cube algorithms related to SDGs (ongoing), and work on training and capacity building. He also summarized solutions to explore against the challenges that are emerging.



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- He stated that WGGI (Working Group on Geospatial Information of the Inter-agency and Expert Group on Sustainable Development Goal Indicators) should be the primary body of interest for SDG AHT.
- One of the major difficulties for space agencies is that National Statistical Offices still do not trust the EO products because of lack of knowledge in quality/accuracy.
- Following the WGGI work and other criteria, the group decided to streamline CEOS Engagement on SDGs, focusing first on three SDG indicators (6.6.1– Water-related Ecosystems, 11.3.1 – Ratio of land consumption rate to population growth rate, 15.3.1 – Proportion of land that is degraded over total land area), looking at satellite data continuity, EO enabling infrastructure, awareness and capacity building, develop good practice guidelines, and assessing accuracy (with WGCV) in order to increase confidence in satellite data for non-EO experts and statisticians users.
- Marc reviewed the options for the way forward for the group: cease CEOS efforts and transfer work to GEO; continue as an AHT and serve only as a PoC; become a CEOS Working Group; or, create a crosscutting ‘CEOS SDG Strategy’ similar to the Carbon Strategy. Based on the recent proposal from SIT Chair, the two viable options are considered to be either a dedicated CEOS Working Group, or a new SDG Sub-group within a new Working Group on Information Provision (WGIP, or similar). But, noting the mechanics of such will need to be clarified to encompass both a coordination effort on SDG and space agencies, and drive a technical focus on specific indicators in relation with existing CEOS bodies.

A brief discussion followed.

- Adam Lewis (SIT Vice Chair Team, GA) welcomed the linkages to other CEOS groups in the presentation, and this points to a lightweight coordination function.
- Cindy Ong (WGCV Chair, CSIRO) asked for clarification about the meaning of the “level of confidence” for EO in national SDG statistics. Marc noted that there may be a contribution from WGCV, though this will require an assessment of the full value chain from satellite to data product. The objective is to build confidence in the accuracy of the final products.
- Sandra Cauffman (NASA) encouraged the group to progress activities well in time to deliver a Plenary outcome.
- John Remedios (UKSA) asked about engagement with the UN Global Platform, and Marc noted that one of the activities is to engage this activity. He noted that the Global Platform is not focused on data processing, and that there are a number of actors to work with (*e.g.*, GEE, AWS, commercial sector). Jonathon Ross (SIT Vice Chair Team, GA) noted that the expectation that all data will reside in the platform is likely unrealistic.
- Mauro Facchini (COM) recognized that the interface with statistical offices is the hardest piece of the value chain to manage. The Commission had one success (ocean acidification), and this was because there were no other observational options available.
- Jonathon noted Australian efforts to work internally on SDG Indicators, but the opportunity to work multilaterally could also be very valuable.
- Ivan Petiteville (ESA) suggested that it is now time to ask CEOS Agencies whether they are ready and able to support one, two, three, any or all of Indicators the SDG AHT is focusing on to move forward.

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SIT-34-08	CEOS Agencies	Any agency that is ready and able to support one, two, three, any or all of the 6.6.1, 11.3.1, and 15.3.1 Indicators are asked to indicate interest to the Co-Leads of the SDG AHT.	1 July 2019
	<i>Rationale: Demonstrate Agency support to the SDGs.</i>		

5. Data

Session Introduction

Steve Volz (SIT Chair, NOAA) [reviewed](#) the plans for the Data session.

Working Group on Information Systems and Services (WGISS)

Mirko Albani (WGISS Chair, ESA) [presented](#).

- Data discovery and access is seeking to extend access to cover not just data but also tools. The WGISS Connected Data Assets Infrastructure (CDA) seeks to provide a single-entry point for external clients to discover/access CEOS Agencies data, and data are available through the GEO infrastructure.
- A number of outputs are planned around Future Data Architectures (FDA), including the development of architecture functional blocks.
- The WGISS Carbon Community Portal is now open to the wider community for feedback, and links to the Mekong Initiative are being followed.
- Specific sessions on technology (*e.g.*, SSO, AI/ML) are planned for the next WGISS meeting, and user needs workshops are also planned.
- Publication of discovery and access to Best Practices and Guidelines developed by CEOS on the CEOS website is being coordinated along with the SEO.
- WGISS is working to maximize synergies across other WGs, as well as VCs, AHTs, and the SEO. The group is also cooperating with GSICS and GEO.
- Activity within the WG is strong, with healthy participation (average 20 people), though they are also reaching out to other agencies (*e.g.*, GISTDA, VNVC/VAST, ASI, CSA, CCMEQ). The group requires a Vice Chair from CEOS Plenary.

Working Group on Calibration and Validation (WGCV)

Cindy Ong (WGCV Chair, CSIRO) [presented](#).

- The *CEOS Biomass Protocol* is in development by the LPV subgroup: this is a community-driven good practices guidebook for EO biomass product validation. External review expected in summer 2019.
- The *Global Surface Albedo Product Validation Best Practices Protocol* is complete and ready to be endorsed at the WGCV-45 in July in Perth, Australia.
- WGCV is working on a list of reference standards for the validation of CO₂ and CH₄ (and CO, N₂O) products suitable for use in inter-comparison of multiple GHG missions.
- WGCV is supporting LSI-VC on the CARD4L Product Alignment Assessment Process through peer-review of products generated by data providers adopting these standards.

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- Future work is planned in relation to SAR Radiometric Calibration and Geolocation Supersites. WGCV will produce a standards and requirements document for a multi-mission SAR image Cal/Val supersite including the characterization of targets and sites. This Cal/Val supersite may include a virtual array of active radar and passive calibration devices.
- Cindy noted the sustained involvement in WGCV and its Sub-groups from multiple CEOS Agencies.

Analysis Ready Data (ARD)

Adam Lewis (LSI-VC Co-Lead, SIT Vice Chair Team, GA) [presented](#).

- CEOS specifications for ARD can simplify data handling and uptake by users, and help address changing expectations around ‘big data’ systems and cloud storage and computing. In response, LSI-VC has developed Product Family Specifications (PFS) for the CEOS Analysis Ready Data for Land (CARD4L) set of products.
- This comes against the backdrop of significant changes in the broader context, including an increasing number of short life small satellites with relatively poor geometric and radiometric quality and limited calibration generating large data volumes, and the emergence of AI and Machine Learning.
- At 32nd Plenary, an action was agreed to develop a CEOS ARD Strategy with objectives including: ensure competitive performance of public EO program data and information; meet the changing user expectations; support the increasing interaction with machines; define, produce, apply, and promote ARD; ensure effective engagement of the three key stakeholders (*e.g.*, data producers, data distributors, and data users); manage expectations of stakeholders; establish priorities for follow on; and, ensure appropriate organizational responsibilities across the CEOS structure.
- The next step is for the SIT Vice Chair to flesh out the Strategy for discussion at TWS and presentation at Plenary.
- VCs, WGs, and AHTs and all are encouraged to provide a reply to the short questionnaire that has already been provided to them.

A brief discussion followed.

- Kerry Sawyer (SIT Chair Team, NOAA) suggested that we extend the deadline for feedback to the ARD survey, and Steve Labahn (USGS) suggested that we close the action but that LSI-VC will always welcome feedback on ARD. It was agreed to close the action.

SIT-34-09	SIT Vice Chair Team	Bring revised Analysis Ready Data (ARD) Strategy to SIT TW for discussion, with a view to a final version for endorsement at CEOS Plenary.	2019 SIT Technical Workshop
	<i>Rationale: Broaden the ARD Strategy beyond Land.</i>		

Land Surface Imaging Virtual Constellation (LSI-VC)

Adam Lewis (LSI-VC Co-Lead, GA) [presented](#).

- The objectives of LSI-VC include harmonization of future mission and existing mission acquisition plans, and promoting the efficient use of very large land surface imaging datasets.
- Plenary action 32-09 has been progressed, and found that not having data in an analysis-ready format (*e.g.*, CARD4L) makes the data preparation steps so time intensive that the operational utility of some products is reduced. The LSI-VC is awaiting further guidance from CSIRO and NOAA on next steps.

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- Plenary action 32-13 has progressed a coordinated way forward for LSI-VC, SDCG, and GEOGLAM AHWG, and the resulting proposals remain on the table for the moment.
- Work Plan tasks are progressing around data uptake trials, CEOS tool improvements, moderate resolution interoperability, and tools.
- LSI-VC ToR were revised to introduce the idea of Lead/ leadership rotation.
- Synergies with SEO, WGCV, and WGISS are being developed.
- The first three CARD4L PFS were agreed by LSI-VC in February 2019. Adam asked that SIT recognize this milestone as an example of the value of CEOS coordination in this area, and that agencies pursue the development of CARD4L compliant data products.

A brief discussion followed.

- Ken Casey (SST-VC Co-Lead, NOAA) asked about the level of interoperability that the three PFS might enable, and Adam noted that each family represents a measurement and CARD4L specifics where and when they were taken. Ken asked about the underlying formats, and Adam noted that this is one of the future directions is to investigate formats (*e.g.*, COGs, STAC).
- Steve Labahn noted that the PFS structure is nearly identical, and parameters are quite similar across the PFS. Ken noted similar work in the Sea Surface Temperature (SST) domain, which addresses format and metadata formats and he has an interest in coordination.
- Steve Volz asked about the degree to which extension across other domains (*e.g.*, oceans) has been pursued, and Adam noted that the group has started this discussion with other VCs.
- Alex Held (SIT Vice Chair, CSIRO) asked about private sector adoption of the CARD4L standards, and Adam noted that Planet has held a workshop and are planning another in August on this topic.

6. Oceans and Water Cycle

Session Introduction

Steve Volz (SIT Chair, NOAA) [reviewed](#) the session objectives, in particular to stimulate the collaboration on water and ocean VCs.

Ocean Colour Radiometry Virtual Constellation (OCR-VC)

Paul DiGiacomo (NOAA) [presented](#) on behalf of the OCR-VC Co-Leads, who could not attend nor participate remotely.

- A recent focus has been on the development of the Essential Ocean Variables (EOVs) with GOOS and IOCCP, as well as advocacy for consistency between OCR ECV and EOVS.
- The development of the Ocean Colour System Vicarious Calibration (OC-SVC) addresses a critical need in support of interoperability and leveraging investment across agencies.
- The group has worked on climate dataset provision, including working with the ESA Ocean Colour Climate Change Initiative (OC-CCI+).
- OCR-VC can support several socio-economic applications such as coastal management and fisheries.
- OCR-VC will engage at the upcoming IOCCG workshop in South Korea.

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- All IOCCG/OCR-VC agencies are actively engaged in the VC (including NOAA, CSA, JAXA, KIOST, SIO, ESA, NASA, EC CMEMS, EUMETSAT).

A brief discussion followed.

- Nancy Searby (WGCapD Vice Chair, NASA) asked about who at the IOCCG South Korean workshop the group will be dealing with in terms of capacity building, and Paul DiGiacomo noted that this builds on 10 years of efforts from IOCCG.

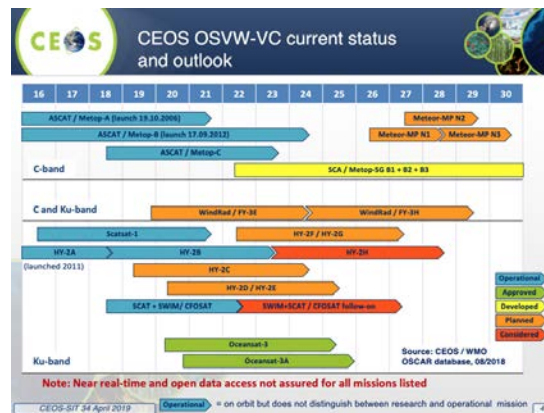
Ocean Surface Topography Virtual Constellation (OST-VC)

OST-VC did not attend or present, but did provide a [presentation](#) following the meeting.

Ocean Surface Vector Wind Virtual Constellation (OSVW-VC)

Paul Chang (OSVW-VC Co-Lead, NOAA) [presented](#).

- Currently, the OSVW constellation is anchored by the scatterometer missions of EUMETSAT and ISRO, with a large number of upcoming Chinese scatterometer missions (see below).



- Status of the constellation missions was reviewed. The basic VC requirement is for at least three scatterometers in orbits designed to roughly meet WMO requirements (observations every 6 hours) and one instrument in a non-sun-synchronous orbit for sampling the diurnal cycle, better mid-latitude sampling and inter-calibration.
- There are ongoing discussions within the IOVWST on the quality assessment of data products and wind retrievals.
- OSVW is exploring more synergy with WGCV on document Cal/Val standards in coordination with IOVWST.

A brief discussion followed.

- Steve Volz (SIT Chair, NOAA) noted the time of day cluster chart, and in particular, the overlapping Chinese missions. He noted the need for Chinese agency engagement, and Paul noted that past efforts to engage China haven't succeeded, but recently progress has been made at the working level as well as bilaterally (e.g., with EUMETSAT).
- Steven Hosford (CEO, ESA/CNES) asked if it would be possible to assess the impact of a better spread of the missions and Paul noted that some assessment is possible, and even less than a three-hour difference can have an impact.

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- Alain Ratier (EUMETSAT) noted there have been significant efforts to coordinate observations with ISRO and this has led to some optimization in the spread of measurements. He also noted that EUMETSAT has a bilateral agreement with CMA involving exchange of data but this does not allow for distribution of data beyond EUMETSAT member states.
- Steve suggested that VCs have a role to play in adapting to new and changing data streams as they come online. This includes multiple variable datasets that we have, and Paul agreed that we want to make the most of everything we have.

Sea Surface Temperature Virtual Constellation (SST-VC)

Ken Casey (SST-VC Co-Lead, NOAA) [presented](#).

- Ken indicated his interest in conversations on coastal strategy and proposed Oceans VC merger because it is not entirely clear what CEOS wants from the ocean side of the house.
- Efforts are underway to develop a report on the next generation SST constellation. This will address on-orbit, measurement methods (MW and IR, GEO and Polar), fiducial reference measurements, and data management systems. This is referenced in VC-19, finalization is in progress, and publication is expected in late 2019.
- On COVERAGE (COV-4, 5, 6), SST-VC has agreed to serve as “responsible CEOS entity”, while the COVERAGE team will manage reporting directly to CEOS.
- Feedback from SST-VC on ARD was provided (CEOS-32-06).
- The SST-VC has chosen to focus on a narrow set of priorities, though the group is now looking for next focuses and contribution to CEOS. The group continues to be vibrant, and they continue to bring in new members. It would help if there were a well-defined CEOS Ocean strategy. It is not clear what CEOS wants from Ocean VCs.
- The group is trying to promote the production of GHRSSST compliant datasets, and management support is valuable to help progress.
- Ken supported the VC leadership rotation, and he is happy to hand over the Co-Lead role when his term is finished in line with the SST-VC Implementation Plan.

A brief discussion followed.

- Steve Volz (SIT Chair, NOAA) asked if there were likely to be others in the SST-VC to step up in the rotating leadership, and Ken felt that there would be a few interested though this would need to be confirmed at their next VC meeting.
- Steve asked about the composition of the group membership, and Ken noted that in addition to the data providers, the user perspective is useful. CEOS can help with promoting community integration, including by defining tasks that optimize integration and impact.
- Jenn Lacey (USGS) noted a similar action on Chinese engagement, and this could be broadened across other groups.

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COVERAGE

Eric Lindstrom (COVERAGE, NASA) [presented remotely](#).

- COVERAGE is an effort to be crosscutting across the four CEOS Ocean VCs (SST, OST, OCR, OSVW) and GEO projects (MBON, Blue Planet, GOOS). The objective is to develop a data rich technology platform for more seamless delivery of analysis ready ocean data, and to leverage open source software and cloud architectures.
- The approach has been phased, and Phase A (scoping) has been completed. The COVERAGE team is transitioning to Phase B, which will feature the development of a prototype, which is being initiated.
- The prototype will explore the potential hosting of a COVERAGE “Nexus” node with target European datasets from CMEMS within WEKEO cloud environment (EUMETSAT).

A brief discussion followed.

- Steve Volz (SIT Chair, NOAA) asked about the membership of the COVERAGE Advisory Board, and Eric noted membership includes STVA, OST-VC, Blue Planet (Paul DiGiacomo), Andy Mitchell, Australian representatives (Tim Moltmann), the Sargasso Sea Commission, SST-VC, and others. This group represents both data providers and users.
- Craig Larlee (GEO Secretariat) asked if proposing COVERAGE within the GEO context had been considered, and Eric noted the focus has been on using existing resources within CEOS and leveraging the MBON and Blue Planet Initiatives. Craig noted that with the 2020 2022 GEO Work Programme open, there may be an opportunity to have this included.
- Adam Lewis (SIT Vice Chair Team, GA) noted the concept of COVERAGE is good, but within Australia, these kinds of integrated efforts have struggled with cross-community ownership, and showing the benefit is key to overcoming resistance.
- Jonathon Ross (SIT Vice Chair Team, GA) questioned whether COVERAGE really belongs in the GEO Work Programme because COVERAGE is something that CEOS is doing to support GEO.

SIT-34-10	SIT Vice Chair Team	Follow up with COVERAGE via email on question about strategy to deal with potential resistance from community and the need to demonstrate use cases that show the benefit to communities before getting over any resistance.	15 May 2019
	<i>Rationale: Difficulty with remote participation for discussion.</i>		

Observations for Coasts

Paul DiGiacomo (NOAA) [presented](#).

- Paul recalled the IGOS Coastal Theme report from 2006.
- Paul suggested CEOS initiate an *(ad-hoc) coastal observing and applications team* under the auspices of GEO Blue Planet, bringing together interested data providers (e.g., CEOS Agencies) and users (e.g., UN Environment, Future Earth Coasts). This AHT would revisit and update the coastal observing requirements previously articulated in the IGOS Coastal Theme Report and produce an associated CEOS Coastal Strategy Assessment to enhance coordination across the land-sea boundary.
- He also proposed targeted demonstration project/s for CEOS and Blue Planet focusing on flooding, water quality, eutrophication, HABs, and/or other ecosystem impacts, addressing coastal urban

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regions, deltaic/estuarine, and heavily impacted (natural/anthropogenic) regions in both developed and developing areas (e.g., Puerto Rico, Vietnam, Great Barrier Reef, Chesapeake Bay).

- Paul proposed that a detailed prospectus for these efforts be prepared and submitted for consideration by next SIT TW (Sep 2019) and 33rd CEOS Plenary (Oct 2019).

A brief discussion followed.

- Adam Lewis (SIT Vice Chair Team, GA) noted that coordination between the ocean and land communities have struggled over coordination of the coastal zones (coastal zones have been fought over and neglected by both ocean and land communities). He suggested a workshop to explore what has been done before pushing on with plans to combine efforts (e.g., an *ad hoc* Team) and indicated GA would support a workshop. In Australia, the entire coastal intertidal zone has been mapped, with elevation models created and the identification of different ecosystems such as mangroves. This work demonstrated the immense potential of marine and land communities to collaborate.
- CSIRO approached ESA to see if ESA was interested to co-organize the workshop. Josef replied that the topic is interesting but we should first know what we want to do, what needs to be done, before talking about the creation of any new CEOS entity.
- Ivan Petiteville (ESA) noted coastal zones contain real tangible challenges for many countries, particularly island nations, and suggested identifying and assessing common needs to help inform the way forward and possible structure within CEOS.
- Mark Dowell (COM) noted the active user and scientific communities focused on coastal zone, but a lack of systematic uptake of EO data streams. Paul noted that this has been an issue in the past, but in the last 5-10 years, we appear to have turned a corner. He suggested that quantifying and accepting the uncertainties has been key. The emergence and integration of Sentinel-2, as well as Sentinel-1 and RADARSAT data has also been key.
- Werner Balogh (WMO) noted GCOS action G-32 and work on satellite-derived bathymetry and better altimetric observations over coasts, and whether this activity would be covered. Paul agreed this could be an opportunity.
- Simona Zoffoli (WGDisasters Chair, ASI) noted the links to WGDisasters, and the WG is considering expanding its activities to address coastal regions. They are open to discuss this. Paul noted that the intention is to avoid duplication of efforts.
- Marc Paganini (SDG AHT Co-Lead, ESA) noted the link to SDGs, including indicator 14.1.1 (Index of coastal eutrophication and floating plastic debris density) for which there is no current method for countries to implement (Tier III).

SIT-34-11	CEOS Blue Planet Expert	Work with interested CEOS entities to bring forward ideas for an <i>ad hoc</i> coastal observing and applications team under the auspices of the GEO Blue Planet, and targeted demonstration projects focusing on flooding, water quality, eutrophication, harmful algal blooms, and/or other ecosystem impacts.	2019 SIT Technical Workshop
	<i>Rationale: Proposal for Coastal Strategy and ways to revisit coastal observing requirements. Might be need to first plan and undertake a Scoping Workshop.</i>		

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Precipitation Virtual Constellation (P-VC)

Gail Skofronick-Jackson (P-VC Co-Lead, NASA) [presented](#) remotely, and noted that Chris Kidd is attending in person and can follow-up, if required.

- Gail has succeeded Steve Neeck/NASA as Co-Lead.
- Precipitation is crosscutting (*e.g.*, atmosphere, disasters, agriculture, freshwater), though there currently are not relationships with the related groups within CEOS. It is also not clear how this translates to a thematically consolidated set of VCs.
- Updates on CEOS Work Plan tasks whose status has recently changed (VC-17 and VC-18) were reported, and the new task VC-44 was reviewed.
- Discussions are underway to include a third Co-Lead from EUMETSAT.

A brief discussion followed.

- Steve Volz (SIT Chair, NOAA) suggested it may be worth considering assessing the fragility of observation continuity in terms of the impact of the loss of specific satellites, and what gaps might be foreseen.
- Sandra Cauffman (NASA) noted that the implementation of the U.S. Decadal Survey missions should be considered in assessing measurement continuity.

Observations for Water

Paul DiGiacomo (NOAA) [presented](#).

- The number of water initiatives of different scopes makes this a confusing space for coordination: GEOGLOWS Water Initiative for GEO; AquaWatch Water Quality Initiative for GEO; and, Blue Planet: Oceans and Coasts Initiative for GEO. This is in addition to the CEOS Water actions.
- GEO Blue Planet is expanding its secretariat and has a new 2020-2022 Implementation Plan being drafted. Activities include:
 - Multi-Hazard Information and Forecasting System for the Wider Caribbean;
 - Early Warning System for Marine Flooding in Reef-lined Islands;
 - Marine Debris Working Group;
 - Library of ocean observation use cases; and,
 - Oceanscape (web-based information portal).
- There is a crucial need for CEOS water (inland, estuarine and marine) observations to support monitoring and forecasting activities for GEO and broader international user communities (*e.g.*, SDGs). The opportunity and need exists for greatly enhanced CEOS engagement.

A brief discussion followed:

- Steve Volz (SIT Chair, NOAA) highlighted the importance of understanding the differences between the various water-related initiatives being discussed, and in particular, how this impacts how CEOS Agencies support these various initiatives. He raised the issue on if we need a permanent structure to address these various activities and to identify how they are different and unique.

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Freshwater from Space

Alex Held (SIT Vice Chair, CSIRO) [presented](#).

- The objective is a better understanding by space agencies of water observation needs, seeking to address the lack of coherent dialogue among water EO communities.
- The *Water from Space Workshop* was held in Q4 2018 with the support of CSIRO, CEO, CNES.
- Major outcomes and needs were identified in a number of areas:
 - Snow Water Equivalent, Thermal Sensing of Surface Water, long term future continuity for Soil Moisture observations
 - Global Validation of derived EO products
 - Need for a systematic approach to other “essential water cycle variables (EWCVs)”
 - Need to work closely on needs assessment with GEO (GEOGLOWS, AquaWatch, GEO-Wetlands), UN SDGs, Paris Agreement, Sendai, SEEA, GCOS, GEO IGWCO, GEWEX, IPBES, etc.
- The suggested target is a report on a “Space-based Constellation Architecture for Monitoring Freshwater Resources and Quality”, addressing:
 - Priorities for freshwater-related EO measurements, spatial resolutions, frequency, timeliness, long time records, NRT delivery, etc. based on global needs assessment;
 - Identification of major gaps in observation versus integrative science and understanding of water cycle variables and processes;
 - New observational concepts (new missions/sensors/etc.);
 - Close coordination with CEOS WGs and VCs: Cal/Val, disasters, climate, LSI, Precipitation;
 - Improving the understanding and assessment of existing observations and products, and development/refinement of new technologies;
 - Establishing ‘Supersites’ (like WG Disasters) for freshwater observation/coordination for EO data Cal/Val and testbed for hydrological data integration and model development;
 - Working with GEO initiatives to establish nested scale approaches for observing and studying the water cycle and assessing data products from local to global;
 - Identifying links to key SDG Indicators related to water; and,
 - Providing guidance to CEOS on priorities around international collaboration, satellites complementarities, infrastructure, *in situ* networks, models, field & airborne experiments for Cal/Val.

A brief discussion followed.

- Steve Volz (SIT Chair, NOAA) asked if the freshwater workshop led to a consensus and prioritization of needs. Alex noted the workshop was the beginning of the discussion, and needs to be followed-up with the objective of focusing on priorities. There were a number of items in the list that are not related to CEOS. (*e.g.*, modelling, monitoring community interests). Alex also noted that GEO’s activities (*e.g.*, GEOGLOWS, Blue Planet, coastal zone) need to be addressed.

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- Selma Cherchali (CNES) proposed a co-located follow-up workshop with GEOGLOWS focused on key measurements and gaps.
- Brad Doorn (GEOGLAM AHWG Co-Lead, NASA) noted that a number of the freshwater observation requirements will be addressed by GEOGLAM and disasters.
- Steve noted that we currently have a rich observing system, but there are still risks, especially in considering how to address future needs and identifying projected gaps of existing constellations.
- Selma added that CNES has done freshwater studies at the national scale, and are currently planning the next study, which may provide useful inputs for CEOS.
- Steven Hosford (CEO, ESA/CNES) noted similarities with the GHG process, and whether the freshwater effort could move forward with a similar process.
- Josef Aschbacher (ESA) said that it would be interesting to see what is planned in relation to water and what is already in place to identify whether gaps exist.
- Steve noted there is a fundamental difference in user demand between the water and carbon communities, where the user community for water is much more diverse and larger with a wide variety of needs.

7. Organizational Matters – Part II

Revisit CEOS Agency Data Policies

Brian Killough (CEOS SEO, NASA) [presented](#).

- Free and open data is a core mission of CEOS and is providing benefits around the world. With the increasing availability of deeper time series, the release of historical datasets presents potential value for our user communities (*e.g.*, time series applications, calibration-validation activities).
- As reported by the CEOS MIM database, CEOS has 169 missions and 425 instruments in operation (see graphic below). 275 instruments have an open data policy (65%) and 150 instruments (35%) have restricted or unknown data policies. Data policies for all CEOS missions and instruments can be found at: www.ceos-datapolicy.org.
- Brian put forward the suggestion that: *CEOS Agencies should consider release of archived satellite data (over a given age) as these data could be considered a "public good" and may be useful for time series applications and calibration-validation activities.*

Steve Volz (SIT Chair, NOAA) suggested that this issue could be raised at GEO Ministerial and with Ministers prior. Selma Cherchali (CNES) noted that the SPOT global archive is being processed and made available through the SPOT World Heritage programme.

Organizational Issues Discussion Session

Steve Volz (SIT Chair, NOAA) [opened](#) the topic with the questions:

- Reflecting on our discussion throughout SIT 34, are we satisfied with our current organizational structure?
- If not, what are the appropriate next steps for our group to ensure mission success?
- What proposal do we want to bring forward to CEOS Plenary for endorsement?

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The discussion aimed to address CEOS Plenary actions 32-12, 32-15, 32-11, 32-13, in that order.

32-12: VC Leadership Rotation

CEOS-32-12 VC Leadership Rotation				
VC	# of Leads	Term	Process	Other
SST-VC	2	3 yr	Nominated by Principal; offset changes to ensure continuity	Rotate leadership through SST interested parties
P-VC	2 (+1)	In line with length of mission	Restricted to Agencies with satellites	TRMM lived for 20 yrs!
AC-VC	2 (+1)	No term, but annual review	Annual review and re-validation of leadership	Very interested and active community
LSI-VC	3	No term, but annual review	Nominated by Principal; Annual review and re-validation of leadership	
OCR-VC	2		No recommendations	
OSW-VC	3	Open to the concept of terms and review		Three Co-Leads share the workload
OST-VC			No response and no presentation	
Proposal:	at least 2, no more than 3	2 yrs, with no term limits	Minimum biannual review, with leadership open to all interested CEOS members; offset changes to ensure continuity	Agency commitment

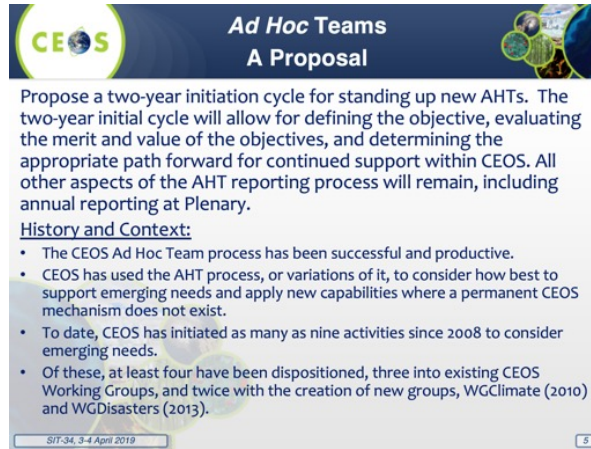
SIT-34, 3-4 April 2019

A discussion followed.

- Jenn Lacey (USGS) asked if the 2-3 year terms are agency or individual, and Steve Volz suggested they would be individual but Agencies would still need to endorse the individual. There is no term limit, *i.e.*, you can be reelected.
- Kerry Sawyer (SIT Chair Team, NOAA) noted that WG Chairs are agency commitments, and Vs Co-Leads are individual commitments, meaning that an Agency commits to provide a WG Chair for four years whereas a VC Co-Lead is an individual, representing the Agency but not committed to fulfill the leadership role. If a VC Co-Lead rotates out, by choice or by necessity, the Agency of that Co-Lead is not committed to providing an Agency replacement. If by chance a WG Chair is not able to fulfill their commitment, by choice or other extenuating circumstances, the Agency of that Chair is committed to provide an Agency replacement.
- Alain Ratier (EUMETSAT) suggested the need to engage with CEOS Agencies other than satellite operators, and include entities with experience of satellite observations and/or the products (which would include Members and Associates).

SIT-34-12	SIT Chair Team	Draft and distribute the proposed language for the proposed VC leadership rotation, which will identify at least 2, no more than 3 Co-Leads, with Co-Leads from any interested CEOS Member or Associate for a two-year, staggered term. Co-Leads can reapply for position.	Circulated: 30 June 2019 For discussion: 2019 SIT Technical Workshop
	<i>Rationale: Detail the proposal for VC leadership rotation.</i>		

32-15: AHT Initiation Cycle



Steve Volz reviewed the proposal for a two-year initiation cycle for standing up new *ad hoc* Teams.

A discussion followed.

- Adam Lewis (SIT Vice Chair Team, GA) noted that this process locks in heuristics around the formation of AHT, *which* detracts from the flexibility they intended to provide. Steve noted that there is some overhead necessary with AHT.
- Josef Aschbacher (ESA) suggested the need to define the criteria to close an AHT. Steve noted that when we draft the language, this should be included. Josef suggested a review of the work of the AHT should be included in order to justify any decisions around AHT continuity. Kerry Sawyer (SIT Chair Team, NOAA) noted that this is the purpose of Plenary’s annual review of AHTs.
- Christine Bognar (NASA) asked about how this would impact the renewal of AHTs at Plenary, and Steve noted the annual Plenary review would still be required.
- Jenn Lacey (USGS) asked what would happen with approvals after the two years, and Steve Volz clarified these would be annual, if approved for continuation.

SIT-34-13	SIT Chair Team	Draft and distribute the proposed language for the proposed <i>ad hoc</i> Team (AHT) initiation cycle for standing up new AHTs. The two-year initial cycle will allow for defining the objective, evaluating the merit and value of the objectives, and determining the appropriate path forward for continued support within CEOS. Language should include AHT closure process.	Circulated: 30 June 2019 For discussion: 2019 SIT Technical Workshop
<i>Rationale: Detail the proposal for ad hoc team review.</i>			

32-11: Current Ad Hoc Lifecycle Options

Steve Volz reviewed the proposals from SDGs AHT, GEOGLAM, and SDCG, noting that the SDCG for GFOI did not provide a proposed way forward to SIT-34. He concluded, based on discussions during SIT-34, that we do not have an agreed upon recommendation for Forest or Agriculture because the current entities represent rather mature activities with continuing support from CEOS through established data partnerships. These two entities started as an idea where communities wanted to interact more effectively with CEOS Agencies on access to data and other issues; we learned how to change how we gather our data, and how their communities use our data. We need to figure out now how to evolve the

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relationship with this established connection. Do we affiliate them with an existing VC, continue as AHTs, or create a more permanent mechanism such as a permanent team or within a Working Group that can ensure consistent data assessment processing.

Steve noted that the SDCG proposal at 32nd Plenary was to become a sub-group within LSI-VC. Steve stated that as NOAA Principal, he was uncomfortable with folding SDCG for GFOI and GEOGLAM AHWG under a VC.

Ad Hoc Lifecycle Potential Options with preliminary review

- **Transition GEOGLAM Ad-Hoc Working Group activities to LSI-VC**
 - o VC not structured to address robust user interactions - ToR in Review
 - o LSI-VC reporting different from GEOGLAM AHWG - ToR in Review
 - o LSI-VC coordination and co-meetings provide efficiencies
 - o LSI-VC observations currently cover a majority of GEOGLAM needs
- **Transition GEOGLAM Ad-Hoc Working Group to another existing or new Working Group**
 - o No current WG that could absorb GEOGLAM activities without significant reorganization
 - o Recently proposed WG structure still in review
- **Transition GEOGLAM Ad-Hoc Working Group to stand-alone GEOGLAM Working Group**
 - o Significant effort needed by space agencies to support a new WG
 - o Significant current and potential redundancies with other thematic activities
 - o GEOGLAM has growing interactions with SDG's, Sendai, Paris

Future outlook of the CEOS activities on SDGs

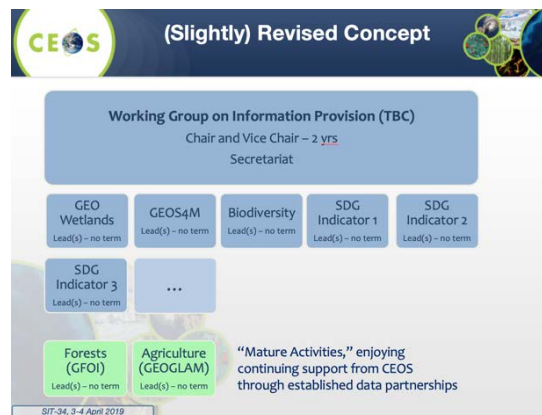
2 VIABLE OPTIONS, 1 DECISION

- "Graduate" and become a **CEOS Working Group** with a new work plan, governance system and reporting mechanisms, and therefore more sustained efforts and support (= commitment) from CEOS and WG/VC members to implement it
- Create a cross-cutting **"SDG Sub group"** within the **new proposed Working Group on Information Provision**, to coordinate all CEOS activities related to SDG, while remaining the CEOS point of contact for external stakeholders.

ROAD MAP TO PLENARY

- Ensure a **common vision with CEOS SIT**.
- **Engage CEOS Bodies** (VCs, WGs and SEO) in the new CEOS plan of work on SDGs, according to the new SDG engagement streamlining.
- Mobilise a **critical mass of agencies' participation** and secure resources commitment.
- Select the **most adequate option for the AHT SDG evolution** and review the team's governance & leadership accordingly.
- **Comply with CEOS processes**, and work with CEOS SIT to fulfill the requirements before SIT TW (to be ready for decision at Plenary)

Steve presented the proposal for a Working Group on Information Provision (WGIP) in the *Concept Paper* circulated the week prior to SIT-34 and updated during the meeting to focus on SDGs and up and coming areas. He stressed that the name was just a working title but did state the WGIP would help serve as a point of contact for external user groups wishing to engage with CEOS. The proposed way forward would be to form a Study Team to investigate the proposal or the creation of a new Working Group for discussion at SIT TW and CEOS Plenary.



A discussion followed.

- Adam Lewis (LSI-VC Co-Lead, GA) noted that the LSI-VC is starting to mature into the requirements gathering space, and there is a lot of synergy being developed there. The WGIP would seem to replace that LSI-VC activity. It is not clear what the future trajectory for LSI-VC would be if WGIP stepped into this role.

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- Osamu Ochiai (GFOI Lead for CEOS, JAXA) noted that SDCG has also discussed how it could be merged into LSI-VC. He noted that the WGIP option has not been discussed with SDCG Co-Chairs (ESA, USGS, UKSA), and the impacts of this proposal need to be discussed.
- Mark Dowell (COM) noted the issue of agency involvement (*e.g.*, in SDG AHT), and whether a standing Working Group would help promote involvement.
- Josef Aschbacher (ESA) noted that an objective of the NOAA SIT Chair term was to look into efficiency of the organization and see what improvements can be made to streamline. He senses that the proposed Working Group could do this, but broader consultation is required with the groups impacted and the agencies that are investing in their activities. The challenge will be to complete this before Plenary. Josef suggested having a small 'tiger team' to investigate, define options, and present back to TW and Plenary. ESA (Ivan) is a volunteer to join that team. He does not think we are in a position to decide today.
- Marc Paganini (SDG AHT Co-Lead, ESA) agreed that the time for consultation has been short. He noted that the box for SDGs has disappeared from the revised WGIP proposal. He also noted that the communications to the UN system needs to be coordinated, and so an interface role would need to remain. They started with Indicators, but have ambitions to move beyond Indicators. There could be sub-activities related to LDN, water, coastal, etc. Marc favors the offline discussion, and is happy to participate in the 'tiger team'.
- Lawrence Friedl (NASA) noted that initially the SDG focus is just the three Indicators. How far off the inclusion of other Indicators needs to be considered. He noted all this assumes that necessary resources can be attracted. He also noted that inclusion of the GFOI and GEOGLAM groups could help the group gain early wins/momentum for WGIP.
- Adam noted that, as an organization, logical structures will always be in tension with best efforts arrangements, and the activities that are supported will be the ones where Principals choose to put their resources. This discussion is a reflection of the challenge to reconcile these two views. If WGIP is to be investigated, agencies who might lead it should be engaged in the formulation, or it will never eventuate.
- Brad Doorn (GEOGLAM AHWG Co-Lead, NASA) noted that in 2012 when the GEOGLAM AHWG was formed, if something like the WGIP had existed, GEOGLAM AHWG would have likely formed under that group. He noted the GEOGLAM group is very pragmatic, and there are efficiencies with GFOI and LSI-VC so it makes sense to meet with those groups annually. He wants to ensure the momentum is preserved. It is critical that the CEOS Principals get behind whatever solution is selected, and support from the Principals is part of the motivation to move on from the current AHWG configuration. A permanent position for the AHWG would make things more comfortable for the agricultural community.
- Steve Volz noted that, as a Principal, he sees the objective for NOAA to find an efficient and effective way to define broad user needs. He has seen struggles within GEO of gathering user needs (satellite and *in situ*), and he sees the WGIP as a way to channel and leverage agency resources to address this general problem. This works well with NOAA's broader mission to leverage its past and current data archives. He sees the potential role of WGIP to make the disciplined approach to application / users more consistent.

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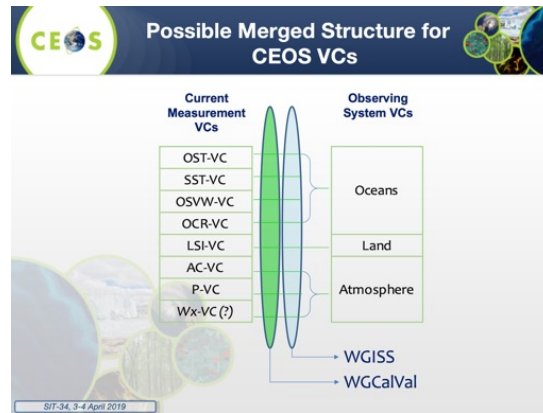
- Marc noted that for the first two years, the SDG AHT was in an exploratory mode, and after two years, they were able to come with something more concrete. He is now confident that agencies will support the three Indicators they have identified.
- Steve Volz reiterated that we are not asking for decision and suggested that SIT endorse the recommendation by Josef to establish a study team that will include substantial consultation with impacted groups and agencies and report back at the SIT TW to assess if this still has the support of the agencies.
- Sandra Cauffman (NASA) supported Josef’s proposal, and NASA will provide representation on the study team.
- Jenn Lacey (USGS) agreed and confirmed that USGS will also participate in the study team.
- Steve noted the proposed role of WGIP is to take the questions users are trying to answer and translate these into observational needs to which a satellite agency can respond. The group would serve emerging and not well-formed user communities that might not be aware of how to engage with CEOS but would not circumvent existing expert channels. The WGIP is intended to be the interface between GEO and other activities that may not yet have an identified need.
- Jonathon Ross (SIT Vice Chair Team, GA) noted that the WGIP would require a Chair and Vice-Chair, and Steve Volz noted that without a definition of the group it would be hard to ask for volunteers.
- Astrid Koch (COM) noted that we could ask which agency would be willing to support which Indicator.
- Steve Labahn (USGS) suggested drafting a one-page ToR for the study team.

SIT-34-14	SIT Chair Team	Draft a one-page Charter for the proposed new Working Group study team.	1 May 2019
	<i>Rationale: Define the scope of the study team.</i>		

SIT-34-15	SIT Chair Team	SIT Chair Team to lead a study team to look at the proposed concept for a new Working Group and draft a recommended way forward.	SIT TW
	<i>Rationale: Come back to SIT TW with a proposal to take forward to CEOS Plenary for endorsement.</i>		

32-13: Merged Structure for CEOS VCs

Steve Volz reviewed the proposed thematic merger of the VCs, and suggested the way forward would be to look at the oceans VCs as a trial to help assess the benefits and impacts of merging the oceans VCs together. The recommendation from the SIT Chair Team is to look at the oceans first, and present an analysis and recommendation going forward on the merger, and what should be brought to Plenary.



A discussion followed.

- Sandra Cauffman (NASA) noted that from their standpoint, they need to include their oceans staff in the conversation in order to assess how this will impact at the working level. The result should be informed by all the stakeholders - not just those present at SIT-34.
- Paul DiGiacomo (NOAA) noted as a VC Co-Lead emeritus, he concurs with the recommendation, and that he is happy to support it in the coming months. He suggested a 'WGObservations' with three domains (e.g., land, oceans, atmosphere) in order to address the issues of consistency in contributions, bringing together the oceans but as a part of a broader WG on Observations.
- Alain Ratier (EUMETSAT) noted that we would need to assess the benefits and added-value from such a convergence, and we need to do this in a consultative way. He supports the proposal in principle.
- Ken Casey (SST-VC Co-Lead, NOAA) noted that the proposal is incomplete as a basis for the study. Connections to science communities, as well as to the new WGIP would need to be defined in order to be complete. The WGIP could create a draw / need for oceans observations. He would like to see the proposal evaluated in the broader context. Steve Volz acknowledged this, but stressed the need to keep the effort focused and suggested that WGISS and WGCVal should also be engaged.

SIT-34-16	SIT Chair Team	Draft a Charter for the pilot of oceans VC merger study team.	1 May 2019
	<i>Rationale: Define the scope of the study team.</i>		

SIT-34-17	SIT Chair Team	SIT Chair Team to lead a study team to look at the proposed pilot of oceans VC merger and draft an appropriate way forward for the VC based on the study team Charter.	SIT TW
	<i>Rationale: Come back to SIT TW with a proposal to take forward to CEOS Plenary for endorsement.</i>		

8. AOB, Review of Main Points/Actions, Closing Remarks

2020-2021 SIT Chair Proposed Priorities

Alex Held (SIT Vice Chair, CSIRO) [presented](#).

- The incoming SIT Chair will ensure effective progress on existing work and propose and promote a broader CEOS ARD strategy.

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- Carbon observations including biomass: the 2018 AC-VC report will have enduring impact and marks a milestone in cooperation towards anthropogenic emissions monitoring. SIT Chair will ensure the next steps are supported and the necessary actions expedited within the CEOS Work Plan. The high profile of this activity will be sustained during the term. JAXA (and other agencies) highlighted importance of space agency connection to the Convention processes, through IPCC, SBSTA etc. This should be progressed and scope for support to Global Stocktakes and National Inventories explored, through the integration of all work CEOS is doing in support of the Convention (i.e. GFOI, GHG monitoring, Systematic Observations).
- Other SIT Chair priorities include:
 - o SDGs: SIT Chair will seek to expedite progress in a small number of priority Indicators for demonstration of the value of EO for SDG Indicators;
 - o Inland Freshwater quality and quantity: Will take stock of the planned CEOS workshop, of the progress in GEOGLOWS, of the recommendations in the March 2018 CEOS Report, and explore a way forward, including in support of SDG requirements; and,
 - o GEO-LEO: Will take stock of the GEO-LEO progress achieved under NOAA and explore next steps.
- Alex noted future planned meeting dates:
 - o CEOS SIT-35: 31 March - 2 April 2020 in Hobart, Australia; and,
 - o CEOS 2020 SIT TW: 8 - 10 September 2020 in Zagreb, Croatia.

Plans for 2019 SIT TW

Albert DeGarmo, (SIT Chair Team, NOAA) reported that the SIT TW will take place 9-12 September at the University of Alaska, Fairbanks.

Plans for Now until September

Steve Volz noted the dates for CEOS Plenary and GEO Plenary and Ministerial, and expects this will be a topic for the TW.

- **CEOS Plenary:** 14-16 October, Hanoi, Vietnam
- **GEO Plenary and Ministerial:** 4-9 November, Canberra, Australia

The dates for other key upcoming meetings were [reviewed](#).

Jenn Lacey (USGS) confirmed that the next joint LSI-VC / GEOGLAM / SDCG meetings will be held 4-6 September in Anchorage, Alaska.

Review of SIT-34 Actions

Steve Volz reviewed the [slides summarizing](#) the main actions from SIT-34.

A brief discussion followed.

- Mirko Albani (WGISS Chair, ESA) noted that he will discuss WGISS engagement in the GEO Foundational Task Team with Rob Woodcock.
- **3.4:** Steve Volz encouraged CEOS Agencies to reach out through their governments to encourage CEOS representation at GEO Plenary.

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- **3.5:** Brian Killough (CEOS SEO, NASA) would welcome suggestions on who could review the AWS Grant applications passed to CEOS by GEO for feedback. Decision on the grants is planned by mid-May.
- **3.6:** It was agreed that SIT members should make suggestions for themes for a GEO Plenary/Ministerial side event, noting the criteria presented by Jonathon Ross (SIT Vice Chair Team, GA). *i.e.*, integration of EO into the digital economy, and that side events are organized by multiple Participating Organizations and/or countries.
- **4.2:** The plan for virtual endorsement of DLR/Albrecht von Barga as WGClimate Vice Chair was confirmed.
- **7.2:** Adam Lewis (SIT Vice Chair Team, GA) suggested consistency including a reference to CARD4L implementation in the recommendation to consider historical archive release.

SIT Chair Closing Remarks

Steve Volz closed the meeting.

Sandra Cauffman (NASA) thanked Steve Volz and the SIT Chair team for the meeting, as well as the rest of the delegations who travelled from so far.

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List of Participants

Organization	Participant	Organization	Participant
ASI	Simona Zoffoli	NASA	Dave Jarrett
CNES	Selma Cherchali	NASA	Wenying Su
COM	Astrid-Christina Koch	NASA	Nancy Searby
COM	Mauro Facchini	NASA	Chris Kidd
COM	Mark Dowell	NASA	Lauren Childs-Gleason
CONAE	Raul Kulichevsky	NASA	Kimberly Hurst
CSA	Paul Briand	NASA	Lawrence Friedl
CSIRO	Alex Held	NASA	David Borges
CSIRO	Flora Kerblat	NASA	Andrew Molthan
CSIRO	Cindy Ong	NASA	<i>Eric Lindstrom (GTM)</i>
ESA	Josef Aschbacher	NASA	<i>Gail Skofronick-Jackson (GTM)</i>
ESA	Ivan Petiteville	NASA	<i>Jorge Vazquez (GTM)</i>
ESA	Marc Paganini	NOAA	Steve Volz
ESA	Mirko Albani	NOAA	Kerry Sawyer
EUMETSAT	Alain Ratier	NOAA	Paul DiGiacomo
EUMETSAT	Paul Counet	NOAA	Ken Casey
EUMETSAT	Robert Husband	NOAA	Albert DeGarmo
EUMETSAT	Jörg Schulz	NOAA	Paul Chang
EUMETSAT	<i>Ewa Kwiatkowska (GTM)</i>	NOAA	Charles Wooldridge
GA	Adam Lewis	NOAA	Mitch Goldberg
GA	Trevor Dhu	NOAA	Joe Sienkiewicz
GA	Jonathon Ross	NOAA	<i>Kevin Gallo (GTM)</i>



Organization	Participant	Organization	Participant
GCOS	<i>Carolin Richter (GTM)</i>	NOAA	<i>Jeff Privette (GTM)</i>
GEO Secretariat	Craig Larlee	NOAA/Symbios	Stephen Ward
JAXA	Naoto Matsuura	NOAA/Symbios	George Dyke
JAXA	Osamu Ochiai	UKSA/NCEO	John Remedios
JAXA	Hitoshi Tsuruma	UNOOSA	<i>Luc St-Pierre (GTM)</i>
JAXA/RESTEC	Masatoshi Kamei	USGS	Jenn Lacey
NASA	Sandra Cauffman	USGS	Tim Stryker
NASA	Christine Bognar	USGS	Steve Labahn
NASA	Brad Doorn	VNSC	Pham Anh Tuan
NASA	David Crisp	VNSC	Lam Dao Nguyen
NASA	Brian Killough	VNSC	Sean Lam
NASA	Jay Al-Saadi	WMO	Werner Balogh
NASA	Andrew Mitchell	US DoS	Fernando Echavarria

**GTM - joined via GoToMeeting*

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Record of Actions from CEOS SIT-34

No.	Actionee	Action	Due date
SIT-34-01	CEOS VC Co-Leads, WG Chairs/Vice Chairs	All CEOS Virtual Constellation Co-Leads, Working Group Chairs and Vice Chairs, and <i>Ad Hoc</i> Team Co-Leads to provide updated content and information for the CEOS website to CEOS SEO, with a cc to the CEO.	30 June 2019
	<i>Rationale: Information on CEOS website is not current.</i>		
SIT-34-02	SEO in consultation with CEOS SEC	Establish a working team to scope and develop content for the proposed CEOS presence at GEO-XVI Plenary.	30 April 2019
	<i>Rationale: A managed response is necessary to take up this opportunity and ensure broader CEOS interests are taken into consideration.</i>		
SIT-34-03	WGISS	Identify a WGISS representative to participate on the GEOSS Infrastructure Development Foundation Task/Implementation Coordination Task Force.	15 May 2019
	<i>Rationale: GEOSS Infrastructure Development Foundational Task has significant relevance to the work of WGISS.</i>		
SIT-34-04	CEOS Agencies	Submit proposals to SEO for possible CEOS video to be shown at the GEO-XVI Plenary.	25 May 2019
	<i>Rationale: Opportunity for CEOS to showcase satellites and hardware to the GEO community.</i>		
SIT-34-05	CEOS Agencies	Submit ideas to Jonathon Ross, Steven Hosford, and Kerry Sawyer for possible CEOS side event at the GEO-XVI Plenary.	25 May 2019
	<i>Rationale: CEOS is the space coordination arm of GEO and thus has a role to represent the significant contributions of CEOS Agencies to GEO.</i>		
SIT-34-06	NOAA/SIT Chair Team	To coordinate with WGDisasters, WGCapD, and CSIRO on possible evolution of GEO-LEO pilot.	June 2019
	<i>Rationale: Coordination of the GEO-LEO effort.</i>		
SIT-34-07	CEO	Prepare an email to request virtual endorsement of Albrecht von Barga to assume duties of WGClimate Vice Chair as of 1 June 2019 pending CGMS approval at the May CGMS-47.	1 May 2019
	<i>Rationale: Secure continuity in leadership of WGClimate.</i>		
SIT-34-08	CEOS Agencies	Any agency that is ready and able to support one, two, three, any or all of the 6.6.1, 11.3.1, and 15.3.1 Indicators are asked to indicate interest to the Co-Leads of the SDG AHT.	1 July 2019
	<i>Rationale: Demonstrate Agency support to the SDGs.</i>		
SIT-34-09	SIT Vice Chair Team	Bring revised Analysis Ready Data (ARD) Strategy to SIT TW for discussion, with a view to a final version for endorsement at CEOS Plenary.	2019 SIT Technical Workshop
	<i>Rationale: Broaden the ARD Strategy beyond Land.</i>		
SIT-34-10	SIT Vice Chair Team	Follow up with COVERAGE via email on question about strategy to deal with potential resistance from community and the need to demonstrate use cases that show the benefit to communities before getting over any resistance.	15 May 2019
	<i>Rationale: Difficulty with remote participation for discussion.</i>		
SIT-34-11	CEOS Blue Planet Expert	Work with interested CEOS entities to bring forward ideas for an <i>ad hoc</i> coastal observing and applications team under the auspices of the GEO Blue Planet, and targeted demonstration projects focusing on flooding, water quality, eutrophication, harmful algal blooms, and/or other ecosystem impacts.	2019 SIT Technical Workshop

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	<i>Rationale: Proposal for Coastal Strategy and ways to revisit coastal observing requirements. Might need to first plan and undertake a Scoping Workshop.</i>		
SIT-34-12	SIT Chair Team	Draft and distribute the proposed language for the proposed VC leadership rotation, which will identify at least 2, no more than 3 Co-Leads, with Co-Leads from any interested CEOS Member or Associate for a two-year, staggered term. Co-Leads can reapply for position.	Circulated: 30 June 2019 For discussion: 2019 SIT Technical Workshop
	<i>Rationale: Detail the proposal for VC leadership rotation.</i>		
SIT-34-13	SIT Chair Team	Draft and distribute the proposed language for the proposed <i>ad hoc</i> Team (AHT) initiation cycle for standing up new AHTs. The two-year initial cycle will allow for defining the objective, evaluating the merit and value of the objectives, and determining the appropriate path forward for continued support within CEOS. Language should include AHT closure process.	Circulated: 30 June 2019 For discussion: 2019 SIT Technical Workshop
	<i>Rationale: Detail the proposal for ad hoc team review.</i>		
SIT-34-14	SIT Chair Team	Draft a one-page Charter for the proposed new Working Group study team.	1 May 2019
	<i>Rationale: Define the scope of the study team.</i>		
SIT-34-15	SIT Chair Team	SIT Chair Team to lead a study team to look at the proposed concept for a new Working Group and draft a recommended way forward.	2019 SIT Technical Workshop
	<i>Rationale: Come back to SIT TW with a proposal to take forward to CEOS Plenary for endorsement.</i>		
SIT-34-16	SIT Chair Team	Draft a Charter for the pilot of oceans VC merger study team.	1 May 2019
	<i>Rationale: Define the scope of the study team.</i>		
SIT-34-17	SIT Chair Team	SIT Chair Team to lead a study team to look at the proposed pilot of oceans VC merger and draft a recommended way forward for the VC based on the study team Charter.	2019 SIT Technical Workshop
	<i>Rationale: Come back to SIT TW with a proposal to take forward to CEOS Plenary for endorsement.</i>		