

CEOS Executive Officer Status Report on 2017-2019 CEOS Work Plan Implementation

Area	ID	Title	Activity	Status	Status comment
Agriculture	AGRI-04	CEOS Strategic Response to GEOGLAM Requirements	The CEOS Strategic Response to GEOGLAM Requirements identifies how CEOS Agencies will coordinate their relevant Earth observing satellite systems to acquire data to support information requirements arising from GEOGLAM. Annual updates to this document include the addition of new mission datasets, updates to primary and contributing datasets, updates to sampling approaches, adjustments to the strategy that improve GEOGLAM coverage, and updates to country coverage.	Material Delay	The delay is not cause for alarm. The new requirements are still under development by GEOGLAM to take on board learnings from research projects, and the CEOS deadline was defined relative to the date foreshadowed by GEOGLAM at the time. The requirements process is well structured to support a CEOS response.
Agriculture	AGRI-08	Vietnam Data Services Prototype	Complete initial deployment of a Vietnam Data Cube with a particular emphasis on data interoperability (optical and radar) and agriculture applications including rice crop monitoring.	On track	A solid team has been established under the framework of CEOS Data Cube, with good engagement from the Viet Nam side.
Agriculture	AGRI-09	RAPP (Rangelands) Data Cube Demonstrations and Application Testing	Complete a Data Cube demonstration for one or more test sites to support RAPP (rangelands). This demo will explore steps for data cube creation at local test sites and explore applications targeted toward rangelands agriculture (fractional cover, custom cloud-free mosaics, NDVI anomaly).	On track	As per AGRI-09.
Biodiversity	BON-04	Increase the visibility of remote sensing for biodiversity related applications	CEOS will continue to initiate and participate in symposia to maintain a community base for biodiversity and conservation remote sensing, focusing on EBVs and exploring links to other CEOS activities.	On track	CEOS is active in the EBV community, including providing input to a recent workshop organised at the University of Twente.

CEOS Executive Officer Status Report on 2017-2019 CEOS Work Plan Implementation

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Biodiversity	BON-05	Develop improved descriptions of candidate remotely sensed EBVs and their sub-variables	EBVs, both those for which remote sensing can play a role and those for which it cannot, are still under development. The GEO BON Ecosystem Structure and Ecosystem Function working groups in particular are focused largely on development of the remote sensing EBVs and they will make recommendations to the broader biodiversity community.	On track	A recent workshop in the Netherlands considered EBVs in detail. The scale of potential remotely sensed EBVs is considerable but there is still a need to clarify what 'essential' biodiversity variables may look like.
BluePlanet	BP-01	Development, compilation and distribution of ocean variables into collocated, synergistic datasets and associated work packages supporting Blue Planet services	Leveraging suitable activities, such as the proposed COVERAGE initiative, there will be coordinated development, compilation and distribution of ocean variables and facilitated access to collocated, synergistic datasets with fit-for-purpose latency, quality, coverage and information content. The four ocean VCs (in coordination with Blue Planet Steering Committee) will support the sustainment, continuation, and harmonization of (essential) physical, biological and biogeochemical ocean variables.	On track	CEOS remains an active contributor to BP. Outcomes from the COVERAGE activities, which will support BP among other activities, will support this objective in a concrete way. NOAA has accepted an invitation to serve on the COVERAGE Advisory Board, to provide ocean colour expertise on behalf of the OCR-VC. EUMETSAT has also nominated a representative to COVERAGE. The Blue Planet Scientific Coordinator is also working with the COVERAGE team to engage them in a user-driven pilot project in the Caribbean.
BluePlanet	BP-02	Support the 3rd Blue Planet Symposium	CEOS will support and coordinate activities for the 3rd Blue Planet Symposium, which comes at an important time in the early stages of the second decade of GEO.	Completed	A successful BP Symposium was held in College Park Maryland in 2017 with strong attendance.
BluePlanet	BP-03	Paper on CEOS involvement in Blue Planet governance structures	A brief position paper will be delivered for SIT-32 to help coordinate and decide upon appropriate long-term CEOS representation in Blue Planet governance structures (Advisory Board et al.)	Completed	CEOS involvement in Blue Planet Governance has now been clarified.

CEOS Executive Officer Status Report on 2017-2019 CEOS Work Plan Implementation

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BluePlanet	BP-04	CEOS Action Plan for GEO Blue Planet Initiative Components Implementation Plan	Building upon the GEO Blue Planet Initiative Implementation Plan (September 2016) and the 3rd Blue Planet Symposium (June 2017), coordinate efforts across the CEOS Ocean VCs and develop action plan for CEOS contributions to Blue Planet activities.	On track	The GEO Blue Planet Implementation Plan will soon be updated following recommendations from the 3rd Symposium Report and strategic guidance from the Blue Planet Advisory Board and Steering Committees (which have now been fully instituted). This updated implementation plan (new Strategic Plan with annual work plans) is anticipated in January 2018. Once finalized, P. DiGiacomo (NOAA), working in coordination with the Blue Planet Scientific Coordinator (E. Smail/UMD), will work with appropriate CEOS VCs/WGs/Ad hoc teams (especially SDG) to develop the corresponding CEOS action plan. Target delivery is April 2018 (by next SIT meeting).
Carbon	CARB-04	CEOS Delivery of Coordinated Land Surface Observations for GFOI Countries	CEOS will acquire coordinated land surface observations for GFOI countries in accordance with the endorsed strategies.	Completed	Agencies continue to provide access to land surface observations to support forest monitoring regimes. A recent press release by GFOI noted that a major milestone - sufficient global data to enable all countries to report - had been reached.
Carbon	CARB-05	Updated Global Baseline Data Acquisition Strategy for GFOI and Strategy for Satellite Data in Support of GFOI R	Element-1 (data acquisition strategy), Element-2 (data services) and Element-3 (R&D) will require annual updates to reflect changes in space data assets and national implementation plans. It is expected that GFOI will reach full operational capability after 2017.	Completed	GFOI has achieved global baseline space data coverage. Promotional activities are underway.
Carbon	CARB-12	White paper on a carbon observation constellation	White paper on coordinated detailed planning/preparation of a constellation of instruments to measure CO2 and CH4 from space.	On track	Update presented at SIT Technical Workshop, including table of contents and development process.

CEOS Executive Officer Status Report on 2017-2019 CEOS Work Plan Implementation

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Carbon	CARB-13	Assessment of Terrestrial Carbon Strategy variables	In support of the CEOS Carbon Strategy, LSI-VC will analyze validated land carbon observation requirements and identify the gaps in and opportunities for optimization across CEOS Agency missions. This work will leverage GEOGLAM requirements 'matrix' as a framework.	On track	A good start has been made in engaging with GEOGLAM to discuss the requirements gathering progress, however the initial target date is not realistic at this stage.
Carbon	CARB-14	Extraction of ECV gap-analysis outcomes for carbon-relevant ECVs	Analyze the output of the WGClimate ECV Gap Analysis for those variables where there is overlap with those identified in the CEOS Carbon Strategy, i.e. a meta gap analysis for carbon relevant ECVs	Completed	Presented at SIT Tech Workshop 2017.
Carbon	CARB-15	Carbon data portal	Implement a carbon data portal to facilitate the discoverability and accessibility of ECV products and space-borne CDRs. The portal is designed with a service-oriented architecture and follows the principles outlined by the GEOSS Community Portal white paper. The portal will seamlessly access data both in CWIC and FedEO to provide necessary data and services to the carbon science community of both CEOS and GEOSS.	Material Delay	WGISS has been leading this activity, leveraging the CWIC/FedEO/OpenSearch standards to provide a customised portal. Initial discussions are underway, but as WGISS noted at SIT Technical Workshop 2017 "development of a Carbon Portal is likely a multi-year effort, the teams will begin with a demonstration project focused on delivering selected products of value to the carbon community."
Carbon	CARB-16	Cal/val and production of biomass products from CEOS missions	Development of a coordinated cal/val strategy across NASA and ESA biomass missions that rationalizes protocols, data sharing, and the establishment of ground-based carbon super-sites.	On track	Writing team formed, and structured agreed. Draft expected in 2018.

CEOS Executive Officer Status Report on 2017-2019 CEOS Work Plan Implementation

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Carbon	CARB-17	Engaging with IPCC inventories and promoting satellite EO	The 2006 IPCC Guidelines for National GHG Inventories currently indicates that satellite data has limitations in spatial, vertical and temporal resolution. However, the IPCC Guidelines will be updated and released in 2019, and update of verification guidance with respect to atmospheric measurement and new datasets is expected. This creates the possibility that the update will include use of GHG observation data from satellites.	On track	Workshops to discuss the process and approach for CEOS participation recently held in the margins of the SIT Technical Workshop, with strong participation from Agencies.
Carbon	CARB-18	Colombia Data Cube Prototype for Forest Mapping and Carbon Stock Assessments	The SEO initiated a Data Cube prototype in Colombia in 2016. This project will demonstrate an end-to-end approach for Carbon stock assessments of forests to support UNFCCC reporting. Coordination with FAO and the GFOI Office will be essential.	On track	SEO has had excellent engagement from Colombia on this project.
Carbon	CARB-19	Land products validation listing and framework	Summarize current list of validated land data products relevant to Carbon Strategy, documenting validation framework and protocols and providing guidance for online platform for intercomparison of terrestrial carbon products.	Completed	Listing of products has been established. WGCV's Land Product Validation team has established a framework with the aim of independent validation and consistent uncertainty reporting across products as main output. Five sub-tasks underway within the context of the framework.
Capacity Building	CB-04	Contribute to Capacity Building Portal (Geocab Portal)	Populate the GEO Capacity Building Portal. This portal aims at increasing the awareness of the Capacity Building Inventory across CEOS and GEO. See GEONetCab site at http://www.geocab.org/).	On track	Through WGCapD, CEOS continues to provide contributions to the portal. There are ongoing discussions about the future of the portal within GEO, to which CEOS is contributing.

CEOS Executive Officer Status Report on 2017-2019 CEOS Work Plan Implementation

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Capacity Building	CB-10	CEOS Database Update Survey and Release of Online Version	CEOS Agencies to provide resources to support their responses to the update survey issued in the April-May timeframe; release of the updated CEOS Database will be online prior to the annual CEOS Plenary Meeting.	Completed	To be presented at CEOS Plenary.
Capacity Building	CB-11	Build awareness and demonstrate the value of EO applications through major conferences	WGCapD members will target major Earth observation and other relevant conferences and workshops, engaging and providing training sessions for academic and other user communities. For example, WGCapD will actively participate in the Public Health and EO Workshop to be held in Montreal in June 2017. This will help clarify the linkage between environment, climate, society and public health and EO data.	On track	CEOS has been well represented at major conferences in 2017 including IGARSS, IAC, ISRSE, GEOSS-AP, GEO Plenary etc.
Capacity Building	CB-12	Build awareness of new CEOS missions and datasets	Within the context of support to CEOS/GEO projects, using webinars, the CEOS Website, newsletters, mailing list server, social media, etc. to improve access to new CEOS Agency missions and datasets.	On track	A range of promotional approaches are used, including the CEOS website, presentations at conferences, briefings to user communities, etc
Capacity Building	CB-13	Develop and/or deliver webinars for users in developing countries	Webinars will provide information and training on advanced satellite Earth observation topics, such as data access/availability, data processing, and more. A SAR webinar is planned for Q3/Q4 2017.	On track	Webinars require a long-term resource commitment from agencies. A forward strategy, which clearly mobilises the required resources, will be necessary.

CEOS Executive Officer Status Report on 2017-2019 CEOS Work Plan Implementation

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Capacity Building	CB-15	Updated good practices guidance document for in-person and online training and capacity building	The WGCapD developed a good practices guidance document highlighting key points, areas of consideration, suggestions, and good practices for online and in-person capacity building meant as a resource for other CEOS Working Groups and Virtual Constellations. The WGCapD plans to add more content to this report.	Completed	An initial best practices document has been developed and is use within WGCapD. Ongoing review is proposed and the document will continue to evolve and mature.
Capacity Building	CB-17	SAR Training Workshops	The WGCapD will deliver two SAR Training Workshops in 2017: one in Gabon (February, 2017) and one in Pretoria (May, 2017). The WGCapD plans to continue providing SAR workshops (on data access, awareness, processing, and applications) to users in developing countries as long as CEOS Agencies continue to release more SAR data.	Completed	Succesful SAR training workshops were delivered in Africa Gabon, Zambia and South Africa.
Capacity Building	CB-19	Promote the role of space-based EO in meeting the challenges of the 2030 Agenda for Sustainable Development	WGCapD is participating in the CEOS SDG Ad Hoc Team which will support GEO in promoting use of EO to track progress towards, and achieve, the Global Sustainable Development Goals (SDGs).	On track	WGCapD continues to support the CEOS SDG Ad-Hoc Team. As this evolves, it will be important that WGCapD is leveraged to support specific pilot projects.

CEOS Executive Officer Status Report on 2017-2019 CEOS Work Plan Implementation

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Capacity Building	CB-20	Provide CB support to regional and thematic GEO initiatives	Includes ongoing support to AfriGEOSS, additional support to AmeriGEOSS and engagement with Asia-Oceania (AO) GEOSS initiative. This would also include other GEO initiatives e.g. with WMO, CGMS, and WGClimate on essential climate variables (ECVs) and with the CEOS Ad Hoc Working Group on GEOGLAM.	On track	This activity is expected to ramp up over coming years, although ongoing attention is needed to facilitate dialog between WGCapD and the relevant initiatives to find 'win win' activities.
Capacity Building	CB-21	Explore future options for providing portal-based access to capacity building and training resources	Conduct a study of existing and potential new approaches to collect, coordinate, and synergize available capacity building and training resources related to satellite Earth observations, e.g. GEOCAB, VLab training calendar and methods, and other alternate approaches.	Completed	Implemented by developing digital repository with learning center portal with the function of disseminating all training resources and education materials
Capacity Building	CB-22	Provide capacity building support to WGCV activities	Collaborate with WGCV to develop materials to promote e.g. QA4EO, LandNet, optical and SAR calibration/validation. The 2017 meeting of the WGCapD will be a key event in defining specific priorities.	Completed	Request transmitted to WGCV and no support requested. Liaison with WGISS is functioning well.

CEOS Executive Officer Status Report on 2017-2019 CEOS Work Plan Implementation

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Climate Monitoring	CMRS-12	Establishment of a WGClimate Website	The website will provide the single authoritative location for Joint CEOS/CGMS WGClimate related information including the Climate Monitoring Architecture definition and the ECV Inventory, and will be used as the working area for members from both CGMS and CEOS. This will include development of enhanced tools to increase the efficiency and utility of the ECV Inventory.	Completed	Website is available at climatemonitoring.info and contains member listing, overview of activities and objectives, and document library.
Climate Monitoring	CMRS-13	Development and Promotion of Case Studies	Previous work, supervised by the EC JRC and WMO, has already produced WMO 1192 Case Studies for Establishing an Architecture for Climate Monitoring from Space. The possibility exists for further involvement by an expanded team. The output of previous and potential future work is to be supported by the dedicated Joint CEOS/CGMS WGClimate website.	Material Delay	Agreed at September 2017 WGClimate meeting that new case studies would be drafted for the 2019 WMO Congress. This item should be re-baselined in the updated work plan.
Climate Monitoring	CMRS-14	Collection, incorporation and quality control of new & updated information from data providers.	For the purposes of this iteration, the set of questionnaires using for data collection during the first iteration will be re-used. The announcement of the process to request updates to the inventory records was made at the 29th CEOS Plenary Meeting.	Material Delay	The sheer volume of responses - a good sign - has required significantly more work from the WGClimate team.

CEOS Executive Officer Status Report on 2017-2019 CEOS Work Plan Implementation

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Climate Monitoring	CMRS-15	Gap Analysis	Several teams will perform the cycle 2 gap analysis in parallel, with the work organized by thematic area. To ensure consistency of approach across the full inventory, the gap analysis work of the individual teams will be overseen/coordinated by ESA and USGS.	Material Delay	See CMRS-14.
Climate Monitoring	CMRS-16	Action Plan	The action plan will identified agreed actions that CEOS and CGMS Members and Associates intend to take to address priority gaps. The action plan will be endorsed and released to the CEOS community at CEOS-31 in Rapid City.	Material Delay	See CMRS-14.
Climate Monitoring	CMRS-17	Collection, incorporation and quality control of new & updated information from data providers.	It is expected that the third iteration will enhance the questionnaire, and potentially the inventory structure, to accommodate for example: The new GCOS IP (expected to be available at the end of 2016); any requirements stemming from C3S; and experiences from applicable projects.	Not started	At this stage the new cycle could still commence on time, although given delays for CMRS-14 this may be pushed back.
Climate Monitoring	CMRS-19	Joint CEOS/CGMS Response to the New GCOS IP	The new GCOS IP is expected to be available at the end of 2016, but it is not clear at the moment if this delivery will include an updated Satellite Supplement. Assuming the GCOS IP delivery will include the Satellite Supplement, this will mean that a response to the new GCOS IP will be required by the end of 2017. Reflecting the partnership, this document will be developed jointly by CEOS and CGMS.	On track	This document will be delivered by the end of 2017, consistent with submission timeframes defined by GCOS/UNFCCC.

CEOS Executive Officer Status Report on 2017-2019 CEOS Work Plan Implementation

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Climate Monitoring	CMRS-20	Gap Analysis	Several teams will perform the cycle 3 gap analysis in parallel, with the work organized by thematic area. To ensure consistency of approach across the full inventory, the gap analysis work of the individual teams will be undertaken in a coordinated manner.	Not started	See CMRS-17.
Climate Monitoring	CMRS-21	Action Plan	The action plan will identify agreed actions that CEOS and CGMS Members and Associates intend to take to address priority gaps. The action plan will be endorsed and released to the CEOS community at a suitable meeting.	Not started	See CMRS-17.
COVERAGE	COV-01	Collaborative framework for COVERAGE	Determine priority application for COVERAGE via stakeholders engagement and compile use cases/requirements	On track	The COVERAGE team have been consulting key stakeholders to design the collaborative framework.
COVERAGE	COV-02	COVERAGE use cases & focal pilot application	Determine priority application for COVERAGE via stakeholders engagement and compile use cases/requirements	On track	Initial set of use cases for COVERAGE system captured based on consultations MBON and Sargasso Sea Commission. Work is underway to clarify interfaces for acquiring requisite data to support next stage.
COVERAGE	COV-03	COVERAGE Project Implementation Plan	Develop detailed project implementation plan and schedule	On track	Project officially kicks-off October 2017 (Phase A), with the detailed COVERAGE project implementation plan to be developed during this phase. To support this, a COVERAGE workshop proposal is under development in collaboration with Sargasso Sea Commission.
COVERAGE	COV-04	COVERAGE Phase I prototype system	Development of prototype COVERAGE system demonstrating core functionality for limited datasets	Not started	This work is scheduled to begin in May, 2018

CEOS Executive Officer Status Report on 2017-2019 CEOS Work Plan Implementation

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Calibration and Validation	CV-01	Update of general WGCV website to enhance better communication across CEOS and users	Re-organization of WGCV website concept which includes on one side the entry to the CEOS portal, the CEOS CalVal portal, and the different subgroup web-sites in order to achieve a better outreach and communication strategy.	Material Delay	Discussed at May 2017 WGCV Meeting. Scheduled to be completed Q3 2018.
Calibration and Validation	CV-03	Workshop on state of the art for pre-flight calibration techniques	Hold an open-invitation workshop to discuss and promote best practices on pre-flight and onboard calibration of sensors, initially focusing on optical.	On track	Date, location and draft agenda for a pre-launch calibration workshop scheduled for delivery end of February 2018.
Calibration and Validation	CV-09	Radiometric Calibration Network (RADCALNET)	Establish an automated network via a multi-agency project, including coordination infrastructure, and land-based test-sites for post-launch traceable calibration of sensor radiometric gain, initially for <50 m resolution sensors. Progress will follow the developed project plan.	On track	RADCALNET establishment is proceeding well, with consideration now being given to further efforts and expansion.
Calibration and Validation	CV-13	Intercomparison of atmospheric correction models	The WGCV task team "Atmospheric correction" will carry out several comparison measures between models and report about their findings including recommendations with respect to EO applications.	On track	The Atmospheric Comparison Exercise is proceeding according to its workplan.
Calibration and Validation	CV-14	Report on application of approaches for cloud masking	The WGCV task team "Cloud masking" will research different cloud masking approaches for different sensors and spectral areas in order to deliver a report about their findings including recommendations for the applications of cloud masking in EO applications.	Material Delay	Cloud masking study has been delayed due to the lead of the study switching organizations.

CEOS Executive Officer Status Report on 2017-2019 CEOS Work Plan Implementation

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Calibration and Validation	CV-15	L1 top-of-atmosphere interoperability	Develop an initial recommendation of a community reference in collaboration with GSICS.	On track	Preparatory discussions undertaken at a recent calibration workshop at ESA ESIRIN. A more targeted workshop will be held in October 2017.
Calibration and Validation	CV-16	Report on outcomes from GSICS/CEOS reference Solar Spectrum evaluation	Cooperation through a series of virtual meetings to evaluate recent advances to recommend a solar spectra for GSICS and CEOS to ensure interoperability.	On track	A solar spectrum was accepted during the May WGCV meeting. Activity now underway to formalise the description and distribute information on the spectrum.
Data	DATA-02	Full representation of CEOS Agency datasets in the IDN and accessible via supported WGISS standards	As the IDN contains OpenSearch endpoints for data access and is also the link with GCI, it is essential that all CEOS Agencies keep information on the data up-to-date in the IDN.	On track	Updates continue to be made to the IDN.
Data	DATA-08	Improve WGISS Interoperability Standards Architecture	Consolidation of current CWIC/FedEO/IDN overall architecture to address identified issues including duplicate datasets holdings	Completed	Now transitions to ongoing activity with incremental improvements made to standards, and increased adoption of those standards by agencies.
Data	DATA-09	ECVs/CDRs Discovery and Access through WGISS Systems	Facilitate discoverability and accessibility of ECV Products and space-borne CDRs relevant for the CEOS Carbon Action via WGISS Interoperability Systems & Standards (FedEO/CWIC/IDN, OpenSearch).	Material Delay	Once WGClimate has completed their (meta) gap-analysis across the Carbon ECVC, WGISS will begin the longer objective of data discoverability and access.
Data	DATA-10	Reference model for data stewardship planning and implementation	Consolidate a reference model that provides guidelines and recommendations for the preservation and improvement of data including a roadmap for scientific data stewardship improvement.	Completed	The document has been developed by the Long-Term Data Preservation Working Group.

CEOS Executive Officer Status Report on 2017-2019 CEOS Work Plan Implementation

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Data	DATA-11	Technology Exploration webinars and workshops	WGISS will host at least one workshop annually to serve as a forum for exchange of technical information and lessons-learned experience about current, trending and future software technologies, services and other Internet-related software technologies.	On track	A successful series of webinars have been held with good attendance. Topics have included cloud computing, data cubes, etc.
Data	DATA-12	CEOS data holdings reported in GEO	Provide support to GEO in their efforts of reconciling metrics of CEOS data holdings provided through WGISS interoperable standards and systems.	On track	CEOS Agency data holdings are highly visible through GEO systems. Implementation of open standards (CWIC, FedEO, OpenSearch, etc) streamlines this process. Ideally more CEOS Agencies would implement compliant interfaces more quickly, leveraging the advice and support available through WGISS.
Disasters	DIS-10	Implementation of Data Acquisition Plan in support to DRM pilots and data coordination for GNSL supersites	Potential proposals for new GSNL activities (i.e. new permanent & event Supersites) aiming at expanding the objectives of the current pilots will be assessed by the Data Coordination Team and the various pilot teams in due time. The assessment will be done following the procedures endorsed by CEOS.	On track	WGDisasters continues to provide access to data to support pilot activities and endorsed supersites.

CEOS Executive Officer Status Report on 2017-2019 CEOS Work Plan Implementation

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Disasters	DIS-12	Report on survey of donors for post-2017 operation of a Recovery Observatory	WGDisasters will develop a survey of initial results of the Recovery Observatory from the perspective of institutional donors, and include outlooks on possible inclusion of additional hazards and the sustainability of Recovery Observatory activities for 2017 onwards. The survey will commence nine months after the triggering of the Recovery Observatory.	Completed	To be presented at CEOS Plenary.
Disasters	DIS-13	Report on Follow-on Actions to DRM Pilots	The DRM Pilots are expected to provide important insights into where, and how, Earth observations from space can support the disaster risk reduction community. A report will be prepared to summarize the learnings from these pilots, and to recommend pathways forward. In particular the report will focus on the elements necessary to the sustainability of operational solutions post 2017.	On track	WGDisasters has prepared a detailed report, which will be tabled and presented at CEOS Plenary.

CEOS Executive Officer Status Report on 2017-2019 CEOS Work Plan Implementation

Area	ID	Title	Activity	Status	Status comment
Disasters	DIS-15	Support for GEODARMA Identification of Major Hazards and DRR Issues for Each Selected Region	GEO-DARMA will seek independent identification of disaster risk management priorities at regional level (e.g. most prevalent hazards and most severe impact; hurdles in implementing effective DRR and resilience measures in the region) by authoritative regional institutions, in line with the priorities from the Sendai Framework for Disaster Risk Reduction 2015-2030. This task will require the active support of major stakeholders in the field of disaster risk management at global, regional and national levels in order to implement a series of pilot projects.	On track	The GEODARMA steering committee has met and is addressing this issue. A detailed updated will be provided at Plenary.
Future Data Architectures	FDA-01	Papers and workshops to facilitate strategic discussion of the way forward on future data architectures	In 2017, the extended Ad Hoc Team on Future Data Architectures will develop the necessary material to enable CEOS Agencies to discuss, and agree on, the way forward on the FDA topic at the 31st CEOS Plenary Meeting. Interim discussions/workshops will be undertaken at the SIT-32 meeting and 2017 SIT Technical Workshop to ensure CEOS Agencies are engaged throughout 2017.	On track	To be presented at CEOS Plenary.

CEOS Executive Officer Status Report on 2017-2019 CEOS Work Plan Implementation

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Future Data Architectures	FDA-02	Collaborative development of CEOS Data Cube technology	CEOS Agencies will develop the CEOS Data Cube as a piece of re-usable and customizable open source technology that lowers the barriers to use of satellite Earth observation data. Activity will be undertaken in accordance with the CEOS Data Cube Work Plan.	On track	The Open Data Cube technology, which supports the CEOS Data Cube Initiative, is now an established open source community with relevant procedures and governance structures in place. Ongoing effort is required to ensure new contributors are integrated into the community and start to commit new functionality.
Future Data Architectures	FDA-03	CEOS Data Cube technology governance strategy	A governance strategy will be developed aimed at supporting the CEOS Data Cube to become an inclusive, collaborative, open source project including encouraging contributions from additional CEOS Agencies (e.g. to include data from their missions) and inviting contributions from the broader EO community (e.g. to contribute tools and applications) via GEO.	Completed	See FDA-02.
Future Data Architectures	FDA-04	Regional pilot installations of the CEOS Data Cube technology	Regional pilots will generate lessons learnt on how the CEOS Data Cube technology performs in particular contexts (for example High Performance Computing vs cloud, sophisticated vs new users). Where possible, regional pilots will provide evidence of potential value towards GEO strategic priorities (e.g. GEO Flagships/Initiatives).	On track	The target of 20 instances of the Open Data Cube is on track, with a spread of projects across geographic regions. Ongoing engagement with financial institutions, donor programmes, and country reps will be key in making these instances sustainable.

CEOS Executive Officer Status Report on 2017-2019 CEOS Work Plan Implementation

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Future Data Architectures	FDA-05	Promote awareness of the CEOS Data Cube technology	With growing interest in the CEOS Data Cube technology, WGCapD will identify required CB material to support rollout of the technology. Materials will range from basic introductions to information relevant to decision makers.	On track	The CEOS Data Cube and Open Data Cube websites provide visibility. Presentations and workshops at many major conferences and events. Further material will be developed over coming months, with a user focus, and more contributions to WGCapD are encouraged to support this.
Future Data Architectures	FDA-06	Technical best practices relating to future data architectures opportunities	WGISS will ensure necessary structures are established to enable sharing of lessons learned and practices relating to the exploitation of the technical opportunities identified in the interim FDA report. WGISS will present at least one 'best practice' document for endorsement at the 31st CEOS Plenary Meeting.	On track	WGISS has requested a small extension on this item (to Q2 2018), pending finalisation of the FDA strategy which identifies the key areas for which new structures are required.
Future Data Architectures	FDA-07	Product Specifications in accordance with the CARD4L Framework	CEOS Analysis Ready Data for Land (CARD4L) will be satellite data that have been processed to a minimum set of requirements and organized into a form that allows immediate analysis with a minimum of additional user effort, and interoperability both through time and with other datasets.	On track	Draft specifications have been developed for three key CARD4L products, and are currently undergoing technical review within the LSI-VC community. Engagement from agencies has been good. Although the Q4 deadline will not be met, it is not anticipated to slip beyond Q1 2018 for the first set of specifications (Surface Reflectance, Surface Temperature and Radar Backscatter).
Organisational Issues	ORG-07	Refreshed Terms of Reference for Working Groups	As a result of the updated Governing Documents, work is required to reformat/translate existing Terms of Reference into the new structure to ensure consistency. A status update will be provided by each Working Group at SIT-32.	Material Delay	A number of WGs have achieved this goal. Others have not been in a position to focus on this as a priority. The Incoming CEO and SIT Chair, as part of their planned 'refresh' of documents, may wish to carry this over.

CEOS Executive Officer Status Report on 2017-2019 CEOS Work Plan Implementation

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Outreach	OUT-01	CEOS awareness and promotional material delivered at key meetings	The CEOS calendar will be used to confirm CEOS representation at key international and stakeholder meetings, as updated throughout the three-year term.	On track	CEOS has been well represented at major conferences in 2017 including IGARSS, IAC, ISRSE, GEOSS-AP, GEO Plenary etc.
Outreach	OUT-02	CEOS Newsletter	Call for information input in December and June; newsletters released in February and August.	Completed	CEOS newsletters have been produced and distributed as per schedule.
Polar	POL-01	Annual Status Report	Facilitate communication between PSTG and CEOS through provision of an annual status report on polar activities and develop a formal collaboration approach with PSTG.	On track	Annual update was provided by the Polar expert in early 2017, with another expected in early 2018.
Sustainable Development Goals	SDG-01	CEOS engagement with the 2030 Agenda for Sustainable Development	The CEOS Ad Hoc Team on Sustainable Development Goals, established at the 30th CEOS Plenary Meeting, will act as a single point of contact between CEOS Agencies and various GEOled activities relevant to the Sustainable Development Goal (SDG) agenda.	On track	The SDG AHT continues to provide support for the broader GEO activity EO4SDGs. CEOS Agencies also continue to engage national governments (including statistical offices) in discussions on use of satellite EO.
Virtual Constellations	VC-02	Total ozone dataset validation and harmonization	Production of peer-reviewed papers on nadir profile intercomparisons and of long term (1979-now) combined total ozone data sets.	Completed	Action can be considered closed for Level 1 and 2 products. Work on higher-level products is required and is ongoing.
Virtual Constellations	VC-03	Air quality constellation coordination	Prepare document on validation needs for the AQ Constellation.	Material Delay	Through this activity AC-VC will prepare a document on "Geophysical Validation Needs for the AQ Constellation". Draft anticipated Q3 2017 and final document Q2 2018.

CEOS Executive Officer Status Report on 2017-2019 CEOS Work Plan Implementation

Area	ID	Title	Activity	Status	Status comment
Virtual Constellations	VC-09	Implementation of the International Network for Sensor InTercomparison and Uncertainty Assessment for Ocean Colour Radiometry (INSITU-OCR)	Implementation of the International Network for Sensor InTercomparison and Uncertainty Assessment for Ocean Colour Radiometry (INSITUOCR), including recommendations of the INSITUOCR White Paper (www.ioccg.org/groups/INSITUOCR_White-Paper.pdf) and establishment of the INSITU-OCR Secretariat (EUMETSAT, NASA and NOAA). Implementation is following a modular approach.	On track	INSITU-OCR is moving forward nicely, following a modular approach, several agencies are offering resources. The IOCCG is providing a coordinating officer. To avoid confusion and association with “in situ data” the INSITU-OCR has been renamed. It is now the “Ocean Colour Radiometry- Implementation Team (OCR-IT). As of mid-October 2017, EUMETSAT will support a dedicated OCR-IT officer to address OCR-IT activities.
Virtual Constellations	VC-14	Vision for an OSVW Constellation	White Paper describing and justifying the oceanography and climate requirements for an OSVW constellation. The International Ocean Vector Winds Science Team (IOVWST) meeting held in 2016 strongly recommended: at least three scatterometers in orbits designed to roughly meet the WMO requirements; and one instrument in a non-sunsynchronous orbit to help with the diurnal cycle, better sampling at mid-latitudes, and to improve inter-calibration. It has been proposed that a User Requirements Document be developed. An interim report will be presented to CEOS at SIT-31, and a more in-depth analysis will be prepared for the next IOVWST meeting to be held in Q2 2017.	Material Delay	No document prepared for SIT TW or CEOS Plenary.

CEOS Executive Officer Status Report on 2017-2019 CEOS Work Plan Implementation

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Virtual Constellations	VC-15	OSVW Standards and Metrics	Standards and metrics for OSVW services and products, including standard Cal/Val methods. Cal/Val methods will be addressed by the IOVWST Climate Working Group.	Not started	Many issues not well understood.
Virtual Constellations	VC-17	Support to ECV precipitation parameters	Precipitation ECV support: Provide the CEOS Response to GCOS Action A-8; ensure continuity of satellite precipitation products through five deliverables.	On track	The GPM satellite constellation has been stable in its observational capabilities. The GPM Core Observatory completed the NASA End of Prime Mission (EOPM)
Virtual Constellations	VC-18	Programs for improvement of global precipitation products	Precipitation products (with respect to algorithm development, outputs, and user requirements) using multi-satellite and multi-agency data through coordination between Precipitation Virtual Constellation (P-VC) partners.	On track	A substantial suite of activities is improving global precipitation products, and further details are available in the ceos-deliverables.org database under the relevant item.
Virtual Constellations	VC-19	Documented plan for the SST Virtual Constellation	Building on Donlon, et al (2010) Successes and Challenges for the Modern Sea Surface Temperature Observing System, the SST-VC will describe and justify the requirements and design for the modern virtual constellation for SST. This description of an optimal SST constellation will prove useful to CEOS Agencies in planning and implementing a globally coordinated and cost-effective observing capability for SST.	Material Delay	Delayed earlier in 2017 but activity has recommenced.

CEOS Executive Officer Status Report on 2017-2019 CEOS Work Plan Implementation

Area	ID	Title	Activity	Status	Status comment
Virtual Constellations	VC-26	Pilot approaches to conducting integrated assessments of gaps/opportunities in asset usage	Investigate approaches for conducting integrated requirements assessments. These shall include gap/assessments, mission suitability and data access/availability.	Completed	LSI-VC has examined how the process used by GEOGLAM can be adopted to other purposes. Use of tools such as COVE to automate/streamline the process has been considered, and although such tools will help significant expert analysis is still required.
Virtual Constellations	VC-27	Develop a roadmap for the routine production of intercomparable ARD	Building on agreed specifications of CARD4L products, LSI-VC will develop a roadmap for how interested CEOS Agency missions and programs can start processing land surface imaging data with geometrically and radiometrically intercomparable surface reflectance, surface temperature, and analogous radar products.	On track	ARD has been a major focus of the group. Ratification of Product Family Specifications is a key next step (under way). A number of agencies have presented their initial plans for production of ARD.
Virtual Constellations	VC-29	Framework for moderate resolution land sensor interoperability	The framework to be developed will be generally applicable and address factors including radiometry, geometry, data formats, browse information, metadata, data access, metrics and reporting.	On track	This Chair initiative will be presented at Plenary.
Virtual Constellations	VC-30	Interoperability case study for Landsat and Sentinel-2	The framework for moderate resolution land sensor interoperability (refer VC-29) will be applied to the Landsat and Sentinel-2 missions.	On track	The case study of Harmonised Landsat/Sentinel-2 (HLS) will be presented as part of the presentation on VC-29.

CEOS Executive Officer Status Report on 2017-2019 CEOS Work Plan Implementation

Area	ID	Title	Activity	Status	Status comment
Water	WAT-03	Feasibility study on satellite missions/instruments focused on water quality measurements	This study will assess the benefits and technological difficulties of designing a hyperspectral satellite mission focused on inland, estuarine, deltaic and near coastal waters. It will also examine the potential of establishing threshold and baseline observation requirements for sensors suitable for water quality applications.	On track	To be presented at CEOS Plenary for information, with a final endorsement proposed at SIT.
Water	WAT-04	Updates on implementation of the CEOS Strategy for Water Observations from Space, including consideration of required adjustments based on activity in GEO	CEOS, through the SIT Chair, will continue to monitor progress on GEO water-related activities. The SIT Chair will also engage with GEO to determine when, and if, the strategy should be revisited. Regular updates will be provided at SIT meetings.	On track	CEOS and GEO continue ongoing dialogue on how CEOS can best support water-related activities in GEO. Clarity around GEO activities such as BluePlanet, GEOGLOWS, AquaWatch, etc is helping but more work is required before an updated long-term CEOS strategy can be developed.
Water	WAT-06	Response to satellite-related aspects of the GEO AquaWatch Initiative Implementation Plan	CEOS support for the implementation of the GEO AquaWatch (monitoring and forecasting of water quality of inland and coastal waters) community activity is crucial, as satellite observations are an integral component. AquaWatch will be submitted as a formal GEO Initiative in 2017.	Material Delay	AquaWatch is now an approved GEO Initiative. An IOCCG working group is preparing a report on "Earth Observations in Support of Global Water Quality Monitoring". This report should be finalized by mid-2018. A draft plan identifying actions will be submitted for review at the April 2018 SIT meeting, with discussion as to how CEOS could/should formally respond.