

CEOS NEWSLETTER

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SIT Chair Report and summary of SIT-30

Pascale Ultré-Guéraud, CNES

After a period of necessary introspection during the CEOS Self Study led by NASA as former SIT chair culminating in the adoption of a set of reference documents for CEOS, over the first half of 2015 CEOS has been resolutely focused on its external environment and this is to continue in what is an exceptional year for relations with external stakeholders. The decadal UN World Conference on Disaster Risk Reduction (WCDRR) which took place in March, a GEO ministerial in November and a major UNFCCC COP meeting occurring in December in Paris all require significant CEOS engagement to highlight space's added value. Through CEOS Chair JAXA's guidance the success of the WCDRR, where this community referenced the critical role of space in managing the impact of disasters for the first time, is set to be matched during each of these events over the coming months.

Early April's 30th meeting of the Strategic Implementation Team which was held at CNES headquarters in Paris gave us a timely opportunity to review the WCDRR conference and provide feedback for the preparation of the major conferences to come. Both the GEO ministerial and COP21 were discussed in detail with a particular focus on feedback on the IPWG's GEO Strategic Plan and messages on space contributions to climate studies. In addition, the terms of reference of the revitalised Land Surface Imaging Virtual Constellation were endorsed with the Implementation Plan to be reviewed at the SIT Technical Workshop. Preparations were also made at this meeting for various CEOS outreach activities including a series of "Faces of CEOS interviews" and

on Climate including the CEOS Climate Roundtable which took place on 17th June during the Paris Air Show at Le Bourget (see photo).

The sustained interaction between CEOS leadership and the Virtual Constellations and Working Groups initiated during NASA's SIT leadership period continues to bear fruit. Again this year, the SIT Technical Workshop will be the opportunity to have all Virtual Constellation and Working Groups present and focused during a one day meeting in which the principal theme is improving our mutual understanding of how these twelve structures operate and the benefits that can be distilled from reinforcing

links between them. The long-term benefits will only come through this consistent effort in developing the dialogue among the VC & WGs and maintaining the link with CEOS leadership.

We would like to remind you of the upcoming SIT Technical Workshop which will take place on the 17th and 18th September at Eumetsat's premises in Darmstadt, Germany. Over and above the now traditional VC & WG day to be held on 16th September, and the discussions on external stakeholders and ad-hoc activities, the CEOS response to the GEO Water Strategy will be discussed. Willkommen in Darmstadt!



LSI-VC

Land Surface Imaging Virtual Constellation (LSI-VC) Study Team comprised of members from CNES, CSA, EC, ESA, GA, INPE, JAXA, NASA and the USGS are in the process of completing their task to submit a Terms of Reference and LSI-VC Implementation Plan to the CEOS Secretariat for review by CEOS agencies and endorsement either at the SIT Technical Workshop in Darmstadt, Germany in September 2015 or at the CEOS Plenary in Kyoto, Japan in November 2015. The work of the Study

Team has been to provide a new focus to the LSI-VC, better positioning this activity to address important issues of the future – such as optimizing the use of CEOS agency assets to maximize global coverage and to minimize important data gaps and making it easier for users to interact with the vast amounts of collected data. To this end, the responsibility of the LSI-VC is to facilitate coordinated and optimized land surface imaging contributions from CEOS agencies to enable access to fundamental measurement products

in support of confirmed/validated requirements linked to adopted CEOS priorities. The LSI-VC is a CEOS working body and representatives should possess relevant qualifications in satellite data acquisition planning, and/or requirements analysis, and/or data pre-processing and distribution for their agency missions. In anticipation of favorable CEOS agency reviews and endorsement in November 2015, LSI-VC is requesting CEOS agency representative nominations to support the implementation efforts.

Thomas Cecere, USGS

Preparation to the GEO 2015 Ministerial Summit

The Twelfth Plenary Session of the Group on Earth Observations (GEO-XII), hosted by the Government of Mexico, will take place in Mexico City, from 11 to 12 November 2015. The GEO Mexico City Ministerial Summit will take place on 13 November 2015.

The Mexico City Summit will bring together Ministers of GEO Member countries and Heads of Participating Organizations to adopt the 2016-2025 GEO Strategic Plan, to provide guidance on future GEO activities that address global and regional challenges, and to renew their commitment to GEO and the importance of broad, open data sharing.

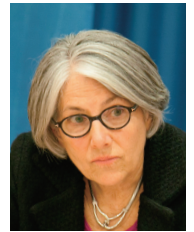
2015 is a milestone year for global efforts promoting sustainable development. The continuing improvement in our ability to generate decision-quality information from Earth observations will provide an essential foundation for success. Major international efforts are expected to produce outcomes this year that pave the way for action on the post-2015 Development Agenda (New York, September) and climate change (Paris, December). As shown by the results of the recent World Conference on Disaster Risk Reduction (WCDRR), the progress we make

to meet the objectives of these agendas depends on the information generated by coordinated Earth observations.

The process to develop the GEO Transitional Work Programme for 2016 was also begun earlier this year. The Work Programme is being developed in parallel with the new Strategic Plan in order to have the necessary implementation tools in place to ensure continuity of GEO actions moving forward. As explicitly recommended by the GEO Implementation Plan Working Group (IPWG), developers of the Strategic Plan, the 2016 Work Programme is transitional in nature. It will bridge the first and second GEO decades, and is designed to ensure continuation of current activities while defining new priority actions identified in the Strategic Plan and by the GEO community, as well as transitioning to several proposed new implementation mechanisms. The first "regular" Work Programme will be developed for 2017-2019.

In parallel with those planning activities, ongoing GEOSS development is still critical to GEO's core mission. There are now more than 174 million resources discoverable through the GEOSS Portal thanks to recently completed interoperability arrangements with

Barbara J Ryan,
GEO



the Global Biodiversity Information Facility (Switzerland), ESA Federated Earth Observation Pilot, Chile Geoportal, Geoscience Australia, and the National Institute of Geographic and Forest Information (France). In addition, new private sector partnerships were initiated with Blackbridge and Digital Globe to provide access to their catalogues.

Finally, during its 17th Congress held in Geneva in June, the World Meteorological Organization (WMO) adopted a new policy for international exchange of climate data and products to support the implementation of the Global Framework for Climate Services (GFCS), recognizing the value of climate data and products being made accessible on a free and unrestricted basis. GEO fully supported the draft resolution and worked with a number of its Members to advocate the importance of the proposed policy. While the resolution was modified during WMO deliberations, it still is a move in the right direction.

CEOS contribution for the next decade of GEO

The next decade of GEO

In 2014, the Ministers and Participants assembled at the GEO Ministerial Summit recognised the success of the first decade of the Group on Earth Observations, and agreed to extend it for another decade, from 2016 to 2025.

Ministers committed to "[improve] the effectiveness of GEO's actions, to broaden engagement and collaboration of stakeholders including decision-makers, and to sustain resources for ... continuous development and functioning [of the Global Earth Observation System of Systems]".

Ministers set an ambitious vision and called for a strategic plan describing how to make that vision a reality.

CEOS leadership has been actively contributing to the development of this plan, known as the GEO Strategic Plan 2016-2025. The next decade of GEO offers great potential for CEOS and its Agencies to see satellite Earth observations used to deliver high-impact solutions to big global and regional challenges like sustainable development and disaster risk reduction.

But this potential will only become reality if the new GEO Strategic Plan is correctly focused.

CEOS in the next decade of GEO

The relationship between CEOS and GEO is critical to both parties. CEOS is the recognized "space arm" of GEO, and seeks to ensure satellite Earth observations deliver impact and benefit. GEO provides a powerful

vehicle for ensuring these observations are visible, and can be transformed into information and decisions in the hands of end users.

Reflecting the critical importance of this relationship, CEOS involvement in GEO is significant. A large part of the CEOS *Work Plan* is directed towards supporting GEO. CEOS has been the biggest contributor of observational data to the GEOSS, provided leadership to major initiatives such as GFOI and GEOGLAM, and been active across many other GEO activities.

At the CEOS SIT-30 meeting, hosted by CNES in Paris in March this year, the assembled Agencies agreed unanimously that CEOS should continue as the "space arm" of GEO, and maintain its strong participation. However, the Agencies noted that certain critical issues must be addressed in the new GEO Strategic Plan if the full potential of the CEOS-GEO relationship in the next decade is to be reached.

CEOS leadership has been working to ensure these issues are addressed, with regular communication to the team within GEO developing the GEO Strategic Plan as well as to GEO Executive Committee Members. CEOS comments have been received positively in many cases, and have been taken into account in the various drafts of the document. However, it is the final document, not the drafts, that matters. Key issues that CEOS wishes to see addressed in the final version include:

1. The need to ensure the strong emphasis on GEO's power to convene and connect is retained, and that action to develop and harness that power is resourced sufficiently.

CEOS Executive Officer Team

2. The need for GEO to define authoritative and clearly prioritized user needs, data requirements and essential variables is given a central role in the future strategy.
3. The fact that GEO delivers only through the contributions of GEO Members, Participating Organizations and other contributors is emphasized and recognized.
4. The criticality of GEO proactively and formally partnering with UN agencies and programs, to ensure GEO can mobilize Earth observations to solve big global and regional challenges.
5. The need for clear mechanisms to engage investment/ development Banks, philanthropic and donor programmes, and the private sector. A lack of an effective strategy for engaging each of these groups, each of whom have different needs and capabilities to contribute, will hamstring GEO for the next ten years.

CEOS leadership will continue to lobby for these changes, right up until the GEO Plenary and Ministerial Summit, where we will be represented by the incoming CEOS Chair, Dr Alex Held of CSIRO.

We encourage you, as our Members, Associates, partners and stakeholders, to do the same. We invite you to work within your own national governments, to ensure these messages are communicated to those who can make a difference.

The right GEO Strategic Plan will help make both CEOS and GEO more effective.

Satellite Earth Observation and The Sendai Framework for Disaster Risk Reduction

Ivan Petiteville, ESA, WGDisasters Chair

In view of the increasing human and economic losses due to major disasters, many governments and major international organisations involved in disaster risk management (DRM) have recently significantly increased their efforts towards disaster risk reduction (DRR). Investing before the crisis is more effective, saves more lives, and reduces financial costs because prevention costs are a fraction of recovery costs. In the statement from the European Union to the 3rd UN World Conference on Disaster Risk reduction (WCDRR, March 14-18, 2015, Sendai, Japan), the European Commissioner Kristalina Georgieva recalled that for every €1 invested in disaster prevention, €4 to €7 are saved in disaster response.

With the same objective, since 2013, CEOS Agencies have coordinated space agencies' efforts and resources in order to improve their support to disaster risk reduction initiatives. This strategic long-term objective requires that space agencies work in close cooperation with relevant stakeholders (UN Agencies, World Bank, ..) and user communities at global, regional, national and local levels, to identify the most critical user needs and to establish a long-term, realistic, and feasible plan for a sustained and coordinated response to those needs.

The WCDRR Conference marks a major milestone in disaster management policy as the common focus between politicians and key stakeholders is now disaster

risk reduction.

No single group or organisation can address every aspect of DRR and obtain rapid results: capacities and resources are insufficient. Disasters are complex problems that demanding a collective response. Given the immense scope of the work to be accomplished, following Sendai, several initiatives and projects will be initiated. GEO-DARMA is one of those with its series of end-to-end projects based on the use of multiple sources of Earth Observation data and risk-related information to reduce risk. The GEO-DARMA initiative proposed by CEOS to the GEO Community will support the practical implementation of some critical elements of the Sendai Framework for Disaster Risk Reduction 2015-2030.

Several studies and R&D activities demonstrate that Earth observations (EO) could play an increasingly important role in making societies more resilient to natural hazards and more adaptive to climate change, and could contribute significantly to DRR. Ensuring high quality risk-related information to

support national and local decision makers requires the combined use of multiple sources and tools (satellite, airborne and in-situ EO measurements; socio-economic data; processing models; information products derived from EO measurements, ..) possible only through international cooperation.

GEO-DARMA will bring together relevant stakeholders from governments, intergovernmental organizations, the UN system, development banks and civil society. GEO-DARMA is characterized by strong involvement of the end user community. The initiative was recently presented for inclusion in the next GEO work plan and is expected to constitute a major contribution of the EO community to DRR efforts.



Floods in Sendai (Japan) after the 2011 Tōhoku earthquake and tsunami

CEOS engagement with the 2015 Paris Climate Conference (COP21)

John J Bates, NOAA, WGClimate Chair

The United Nations Framework Convention on Climate Change (UNFCCC) was adopted in 1992 as an outcome of the Rio Earth Summit. The convention set out a framework for limiting total atmospheric concentration of greenhouse gases at a level to avoid dangerous anthropogenic interference with the climate system, determined to be a global warming of 2°C. This convention has been implemented in annual Conference of the Parties (COP) meeting at which progress, particularly scientific and technical, is assessed.

The 21st COP meeting (COP-21) will take place this December in Paris. COP-21 is highly significant as the goal of the meeting is to achieve a legally binding and universal agreement on climate with the goal of avoiding dangerous anthropogenic interference. CEOS has had a formal role in COP since 2008 in reporting on space-based research and systematic observations to support the Convention, invited by the Subsidiary Body for Scientific and Technological Advice (SBSTA). CEOS reported to SBSTA at COP – 20 last December and was invited to report on progress again at COP – 21.

The working group on climate is preparing input on

two items for COP – 21. These include a summary of case studies using climate observations for decision support and progress on the ECV inventory assessment and gap analysis processes. The climate case studies report describes examples of the value of earth observation satellites in derived products for climate services to meet specific user needs recognized as important for decision-making in climate sensitive societal areas such as food security, water management, energy, and the health sector. This report helps demonstrate the linkage between architecture for climate monitoring from space in the emerging global framework for climate services. The update on the ECV inventory will outline progress made in applying assessment metrics and approaches to gap analysis. The Working Group on Climate is coordinating with the SSTA Secretariat on logistics for submission of this report.

Given the importance of COP-21, CEOS has decided to promote the activities of Space Agencies in climate monitoring, research, and services in additional ways beyond the formal reporting to SBSTA. We are preparing a special edition of the Earth Observation Handbook (EOHB) titled: "Satellite Earth Observations in support

of Climate Information Challenges". The document is composed of three parts: 1) Space data supporting climate information, 2) Key activities in space-based climate observations, and 3) Unique contributions from satellites in support of climate information. The intent is to have the EOHB Climate Edition complete by the end of August so that it can be distributed at several meetings leading up to COP-21, in addition to being a central contribution to COP-21 promotional activities by Space Agencies.



COP21 • CMP11
PARIS 2015
UN CLIMATE CHANGE CONFERENCE

The Importance of Earth Observations to Achieving the Sustainable Development Goals (SDGs)

The “Geneva Declaration” adopted during the Group on Earth Observations (GEO) Geneva Summit in 2014 stated the need to – “Establish a process to facilitate a seamless transition for GEO through 2025 ... in accordance with the agreed-upon principles and strategic objectives, taking into account commitments to the United Nations Sustainable Development themes”.

During the development of the “GEO Strategic Plan 2016-2025: GEOSS Implementation”, we have significantly engaged the community in this vein by following three opportunities.

On February 18th 2015, in Geneva, GEO convened a Roundtable that included representatives of several UN Organizations, Specialized Agencies, Programmes and Conventions to discuss how to strengthen GEO’s engagement with the United Nations. The overall objective of the roundtable was to reaffirm the value and improve the use of Earth observations in UN processes, with a special focus on the post-2015 development agenda.

On February 27th and April 22nd 2015, in New York, two Side Events were co-organized by GEO,

the UN-GGIM Secretariat and several countries to strengthen the dialogue between the Earth observation community and the national and international statistical community on how to tackle the challenge of developing a solid framework of indicators and monitoring for the post-2015 development period. CEOS was ably represented through NASA at the latter of these two events.

The United Nations has identified 17 Sustainable Development Goals (SDGs), to address challenges of economic and social development and environmental sustainability. For each of the Goals, Member States of the UN have identified multiple targets and are developing indicators that countries will use to track and report progress. To achieve the Goals, geospatial information and Earth observations can serve critical, insightful roles in monitoring targets, tracking progress, and helping nations make mid-course corrections toward achieving the agreed-upon Goals.

In the post-2015 era, Earth observation (EO) data from space, airborne, land and/or marine-based sources, collected consistently over time, should be considered as critical to creating an integrated framework for measuring and monitoring progress

Robert Samors,
GEO



Osamu Ochiai,
GEO Secretariat



as traditional household surveys, administrative and regulatory data sources. Earth observation information is already used in many areas, for example: to monitor crop growth for food security; inventory disaster damage; and monitor tree and forest cover for the Kyoto Protocol, but more can be done.

CEOS has already significantly contributed to each of these efforts having held strategic dialogues with the community, and by providing strong support to supply satellite-based data and information sources. Similar efforts are necessary in order to refine the SDG indicators as they are developed in early 2016.

Working Group on Disasters (WGDisasters)

After three years of intense preparation, CEOS WG Disasters actively participated in the 3rd UN World Conference on Disaster Risk reduction (WCDRR, March 14-18, 2015, Sendai, Japan), an event organized by the United Nations every ten years.

Over 6,500 delegates attended the intergovernmental and multi-stakeholder events and over 40,000 attended the public forum; 187 States were officially represented; over 25 Heads of State, Vice Presidents, and Heads of Government attended as well as 100 participants at ministerial level.

The Conference marks a major milestone in disaster management as the common focus between politicians and key stakeholders is now disaster risk reduction.

During the opening ceremony, the UN Secretary General recalled that “Six billion dollars allocated each year can result in savings of up to US\$360 billion by 2030”, asking for efforts to be broadened to all phases of disaster management and not solely on response. In echo to this call, Japanese Prime Minister Abe announced \$US 4 billion to support the implementation of an Early-Warning-System (EWS) using in particular satellite EO data. The French Foreign Minister, Laurent Fabius, incoming President of COP21, made an appeal for the creation of a worldwide early warning system for Climate Disasters.

The “Sendai Framework for Disaster Risk Reduction 2015–2030” agreed during the conference, contains two explicit references to satellite EO and several paragraphs

rely on the use of remote sensing data, thanks partly to the frequent iterations between CEOS WGDisasters, key governments and international organisations. In addition, WGDisasters co-organized three official work sessions, presented its activities in two events, held several informal meetings with key stakeholders (e.g. World Bank Global Facility for Disaster Reduction & Recovery (GFDRR), Copernicus Emergency Services, UNESCAP), distributed 1800 copies of the CEOS EO Handbook, welcomed WCDRR participants in two CEOS booths kindly hosted by JAXA, and provided a talk for a video e-course organised by UNITAR.

Regarding the other WG activities, the Floods, Seismic Hazards and Volcanoes pilots are progressing well. Processing satellite data delivered by various space agencies, non-CEOS members of the Pilot teams have produced outstanding useful information shared with local user communities such as the Civil Defense of Colombia and Volcano Observatories in Ecuador, Columbia and Chile. Following the dramatic earthquakes in Nepal (25 April and 12 May 2015), several CEOS Agencies have provided data to the scientists

Ivan Petiteville, ESA, WGDisasters Chair

and practitioners involved in both the CEOS Pilots and the Geohazards Supersites & National Laboratories initiative. Eventually major stakeholders (UNDP, UNOSAT and GFDRR – managed by World Bank) have joined the Recovery Observatory.

In the coming months, WGDisasters will work closely with key actors, governments and international organizations to address some of the Sendai framework priorities, benefitting in particular of the on-going activities in WGDisasters and in the various space agencies.



Participants in the 3rd UN World Conference on Disaster Risk Reduction (14-18 March 2015, Sendai, Japan)

Working Group on Climate (WGClimate)

John J Bates, NOAA, WGClimate Chair

The Global Climate Observing System (GCOS) has undertaken a periodic cycle of assessment of the adequacy of the observations and derived products for meeting requirements for monitoring climate and global change in support of the UN Framework Convention on Climate Change (UNFCCC). Following each assessment, GCOS has identified the needs for continuing, improving, and adding new observations and products which are then formulated into an implementation plan (IP). The CEOS-CGMS Working Group on Climate (WGClimate) is the body that responds to both the UNFCCC Subsidiary Body on Scientific and Technological Advice (UNFCCC-SBSTA) and GCOS by coordinating responses from Space Agencies on relevant actions.

The most recent cycle began in 2010 with the release of a GCOS implementation plan followed in 2011 with the release of a satellite supplement

with specific sampling, accuracy, and stability requirements. An initial response from CEOS was delivered as a report to GCOS and UNFCCC at SBSTA-37 in December 2012. To provide input to the GCOS 2015 status report on the observing system, WGClimate updated the 2012 document detailing progress on promised deliverables and responses to all 47 Space Agency actions identified in the GCOS 2010 IP. The full planning, formulation of deliverables, final update to actions and deliverables providing input to the GCOS 2015 status report is illustrated in Figure 1.

The 2015 Updates are added at the end of each of the 47 actions identified in the 2012 response. This provides the complete context for the updates. The responses were provided by subject matter experts and detail significant and important progress space-based observations have contributed to climate monitoring, research, and services. The final report is posted on the

CEOS web site.

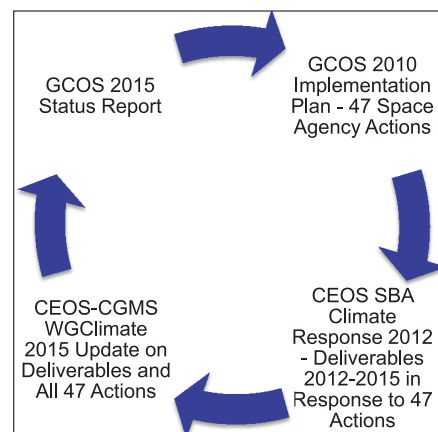


Figure 1. Cycle of Global Climate Observing System and CEOS-CGMS Working Group on Climate contributions.

Working Group on Information Systems and Services (WGISS)

The 39th WGISS meeting was hosted by Jaxa, in Tsukuba, Japan, from 11 May to 15 May, 2015. There were 38 participants, (including 19 remotely), from 15 agencies or institutions.

During this meeting, the main activities or subjects of discussions were:

- Relationship and work with the GEO. Including the participation to the task force "Data Management Principles"
- Datacube
 - Several technical presentations and discussions on the topic of datacube.
 - Discussions on the opportunity of WGISS to go further with the DataCube initiated by Geoscience Australia. The conclusion is that WGISS need clear use cases before proceeding.
- Data Management which was presented by several agencies/entities, including GEO.
- Technology Exploration, with a new focus on OpenDap and new presentations on the topic of cloud computing and big data
- Opensearch: the document "Opensearch best practices" is now finalized. CWIC data, or FedEO data are now accessible through opensearch.
- CWIC
 - EUMETSAT and ISRO are now operational data partner.
 - CWIC produced an opensearch developer's guide. This document will be

reviewed in order to be compliant with all opensearch implementations.

- Discussion on Recovery Observatory Infrastructure - a system to support the coordinated acquisition of Earth Observation data and its easy access for recovery after a disaster of an extreme magnitude.
- WGISS opensearch web page has been set up, and WGISS is actively working to add elements.
- Data stewardship Interest group
 - Proposed a procedure for data purge alert. This shall be endorsed at the CEOS level
 - Held a session of the topic of persistent identifier, and another one on the topic of preservation of software and documents at CEOS agencies. A new document "Persistent Identifier Best practice" will be issued.

The last version of the "Recovery Observatory Infrastructure" has been delivered to CEOS on

Richard Moreno,

CNES, WGISS Chair



July 2015. This will be used if the Recovery Observatory is triggered.

WGISS will work in 2015 with CEOS SEO on the subject of Data Cube which is an initiative of GeoScience Australia.

The 41st WGISS meeting will be hosted by UKSA, in Harwell, United Kingdom from 28 September to 02 October 2015. It is foreseen to hold a one day workshop dedicated to Copernicus.



Working Group on Capacity Building and Data Democracy (WGCapD)

The CEOS WGCapD annual meeting was organised and hosted by SANSO Earth Observation in Pretoria from the 18th to 20th of March 2015. WGCapD members and associates representing NASA, ESA, USGS, INPE, GEO, RCMRD, NOAA and UNOOSA attended the meeting.

In addition to the targeted discussions on the working group's activities, substantial amount of time was spent on developing the new strategy for the working group. The aim of the strategy is to streamline the working group's activities and consolidate them into clear workable activities that will demonstrate a strong link to CEOS' mission and vision.

, the WG also executed the first SRTM-2 training

workshop the following week (23-27 March 2015) at the SANSO Space Operations Centre in Hartebeesthoek. A similar workshop followed in May in Puebla, Mexico, hosted by the CRECTEALC/INAOE. The objective of the workshops was to build capacity in the recently released high resolution SRTM 30 meter DEM following on the heels of data released by the United States Government in 2014. In attendance at the South Africa workshop were 25 participants from Botswana, Lesotho, Madagascar, Namibia, South Africa, Swaziland and Zimbabwe. The Mexico workshop included 27 participants from 11 countries in Latin America and the Caribbean. Sponsors of the workshops included the Secure World Foundation (SWF), GEO, the Mesoamerican Centre for Theoretical Physics, as well as the hosts, SANSO, CRECTEALC, INAOE and the Benemérita Autonomous University of Puebla. The training focused on flood modelling as floods are the prevalent disasters within both regions.

WGCapD also held a very successful Disaster Management Webinar Series that introduced the use of remote sensing technology for

Disaster Management. The objectives of the online course were to understand the use of EO systems in Disaster Management, learn about data availability through the International Disaster Charter during a disaster, know how to utilize satellite data from different sources for DM, be able to determine which specific GIS capabilities and kinds of data are required to support emergency management work before, during and post disaster, and be able to support decision makers as advisors for role of space technology in DM. Successful execution of this webinar series was enabled by a team comprised of INPE, ISRO, NASA, USGS, University of Waterloo, International Space University, ESA, INAOE/CRECTEALC, CEOS CEO and CEOS SEO. In total (144) students from Africa, Asia, North and South America, Australia, Europe, Central America and the Caribbean, registered for the course, of which 46 representing 19 countries successfully completed the course.



Eric Wood,
USGS,
WGCapD Chair



Jane Olwoch,
SANSO,
WGCapD Co-Chair



Working Group on Calibration and Validation (WGCV)

Working Group on Calibration and Validation (WGCV) held a planning workshop hosted by ESA in February 2015 in Radebeul and the 39th Plenary Meeting in Berlin, Germany, from May 6 to 8, 2015 hosted by DLR. The two were used to improve steps for addressing future tasks. It is worth noting that WGCV welcomed two new members during the plenary and that many WGCV members remained in Berlin to present at the ISRSE Conference that included a special session on WGCV organized by the WGCV Chair.

A new task approach to complement the sub-groups, especially for cross-cutting themes, was the outcome of the meetings. Task activities encompass the use of atmospheric correction, cloud masking, and DEMs in Earth Observation applications. Collaboration with GSICS led to progress toward a structured cooperation such as what took place during a co-hosted meeting of the sub-groups for Atmospheric Composition of WGCV and UV Applications of GSICS in October 2014 in College Park, USA. A dedicated session for Ocean Colour Radiometry took place during the plenary that allowed an exchange of ideas about calibration with OCR-VC and IOCCG. It

opened the possibility of future cooperation with entities within and outside CEOS. Such dedicated sessions and invitations to Virtual Constellations and Working Groups will be followed in the future to deepen cooperation in areas of common interest.

A dedicated assessment of the Carbon action items has been started with the goal to translate these to fit within the WGCV work plan as appropriate. In terms of CEOS deliverables, many achievements were reported demonstrating the capability of WGCV.

Another milestone was a presentation about a refined metrics for validation of terrestrial products. The

perspective of a general metrics for validation has been initialized through dedicated implementation steps.

Presentations of past work and planned meetings for the fall (CEOS SAR conference, IVOS meeting, combined ACSG / GSICS meeting) by the different sub-groups demonstrated the vitality of the WG. Agency presentations showed how sub-group activities are complemented by the agencies on projects such as RADCALNET and fiducial reference measurements that will provide a substantial base for future Cal/Val activities.



The WGCV enjoys a traditional Berlin dinner as part of the 39th Plenary Meeting

Albrecht von Bargaen,
DLR, WGCV Chair



Global Forest Observation Initiative (GFOI)

The CEOS Space Data Coordination Group (SDCG) for GFOI continues to provide active support to the GEO flagship for forest monitoring. Since the beginning of 2015 a number of key GFOI events have taken place:

- A very successful meeting of the GFOI Components was held in Sydney, Australia, from March 2nd – 6th. The GFOI Component Meetings promoted discussion and interaction between the individual Components, country representatives and the GFOI Lead Team, resulting in a number of strategies for enhanced coordination and collaboration.
- ESA will support the GOCF-GOLD Land Cover Project Office in Wageningen, The Netherlands to lead the coordination of the GFOI R&D component to the end of 2016. This ensures sufficient capacity to manage the R&D programme and advance its coordination with the other GFOI Components.
- With CEOS' endorsement of the SDCG's Element 3 Plan: *Satellite Data in Support of R&D for GFOI*, a number of CEOS space agencies have commenced procedures for acquisition and provision of satellite data over the GFOI R&D Study Sites.
- ESA organised together with GOCF-GOLD and the World Bank a successful GFOI side event at UNFCCC's June meeting in Bonn, Germany. The event introduced new open access training materials of 14 modules for REDD+ monitoring and reporting.

- Norway's International Climate and Forest Initiative (NICFI) supported a GFOI Expert workshop on statistically rigorous estimation of biomass/emission factors and the integration of activity data and emission factor uncertainties in Oslo in June.
- The CEOS SEO continues to progress the pilot implementations of the GFOI Space Data Services, and is working closely with Geoscience Australia and CSIRO on the development of the Data Cube infrastructure. The SEO recently completed a full instance of a Data Cube in support of Kenya's SLEEK Program, comprising 3.6TB of Landsat 7 data (2000-2015).
- A Global Data Flows Study has been initiated by the SDCG to explore the future challenges around effective management of the increasing volumes of EO data – with specific reference to GFOI user scenarios – but the results should be of broader value and CSIRO as incoming CEOS Chair has indicated interest in further attention to this topic at the CEOS Plenary level. The Study Team includes representatives from EC, GA, NASA, ESA and USGS.
- Planning is underway for the 8th Meeting of the SDCG, to be held at DLR in Bonn, Germany, from the 23rd to

Stephen Briggs,

ESA,

CEOS Lead for GFOI



the 25th of September 2015. SDCG-8 will follow a BMZ-DLR international conference on MRV for REDD+. Wednesday 23rd September is dedicated to a commercial provider engagement session.

- Australia continues to support the provision of an interim GFOI Office while the arrangements for the move to FAO are finalised.

Stephen Briggs continues to serve as the CEOS Lead to GFOI but anticipates stepping down at the next GFOI Plenary in February 2016 at ESA ESRIN. The SDCG will work closely with Stephen and relevant CEOS agencies and leadership to ensure prudent succession planning is started soon.



GEO Global Agriculture Monitoring (GEOGLAM)

The CEOS Ad Hoc Working Group for GEOGLAM is in its third year of activity. Its early focus was on requirements development and building support for operational research and development activities, with its Data Acquisition Strategy endorsed at both the 2013 and 2014 CEOS Plenary sessions. The main priorities of the WG are presently: continuing to support data acquisition for the Joint Experiment on Crop Assessment and Monitoring (JECAM), Stimulating Innovation for the Global Monitoring of Agriculture (SIGMA), and Asia Rice Crop Estimation

& Monitoring (Asia-RiCE) activities, gaining access to archival data to generate baseline datasets (including crop type distribution and crop calendars), developing and prototyping a data dissemination and cloud-based computing system for single and multi-sensor data, and establishing relationships with commercial and non-traditional space agencies.

The JECAM initiative recently implemented the first generation of its "multi-user request form" (MURF), which allows multiple JECAM sites to access restricted space-based datasets. JECAM also released its annual report detailing data acquired, received, and utilized. In November 2015, JECAM and SIGMA will hold an annual meeting to review implementation progress. <http://www.jecam.org>, <http://www.geoglam-sigma.info>

The Asia-RiCE team is estimating rice crop planted area and growth status during the major 2015 Asian cropping season at technical demonstration sites using time series of SAR and VHR optical data provided by CEOS agencies. Asia-RiCE

Bradley D.

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NASA



members are also developing a consistent ground data collection methodology to better coordinate in situ and satellite acquisitions. The Asia-RiCE team provides monthly rice outlooks for four countries using agro-meteorological information derived in cooperation with the ASEAN Food Security Information System (AFSIS) project. <http://www.asia-rice.org>

The CEOS Systems Engineering Office is developing a number of tools for querying imagery databases and for processing both scene-based and pixel-based satellite data, all within the context of GEOGLAM priorities. This is of utmost importance, as data access and data availability are as crucial as data acquisition.

Finally, the GEOGLAM program is convening its first Advisory Committee at GEO Plenary in Mexico, November 2015. The CEOS Chair has accepted GEOGLAM's invitation as a member of the committee.



A Photo from the 2015 Asia-RiCE Team Meeting and Test Site in Agricultural Application Workshop, Council of Agriculture, Taipei, Taiwan, April 2015.

A Message from the CEOS Chair

**Shizuo
Yamamoto,**

JAXA,

2014-2015 CEOS Chair



Dear Devoted readers of the CEOS Newsletter

As the CEOS chairperson for 2015, it is my pleasure to host the 29th CEOS Plenary meeting in Kyoto, ancient capital and historic city of Japan. The meeting will be held on November 5th and 6th at the Kyoto International Conference Center. November is the best season to visit Kyoto and to enjoy its natural and man-made beauty.

Fifteen years have passed since we hosted the 21st century's first CEOS plenary, also in Kyoto. During these 15 years, the technology for Earth Observation has significantly improved and society accordingly has considerably higher expectations of our community.

I would like to emphasize that we are at a turning point, featured by

several key meetings such as the UN-WCDRR, GEO and UNFCCC COP21. CEOS Plenary is another of these crucial gatherings. I believe we will enjoy intensive discussions that will lead Earth observation to a better future.

I am grateful for your continued and active participation to this work.

Thank you very much

29th CEOS Plenary

Date : November 4-6, 2015
Venue : Kyoto International Conference Center, Kyoto, Japan
U R L : <http://ceos.org/meetings/29th-ceos-plenary/>

JAXA Symposium for data applications of earth observation satellites 2015

-Earth observation for decision-making in people's lives-

Date : November 2, 2015
Venue : TownHall, Roppongi Academyhills, Tokyo, Japan
U R L : http://www.pco-prime.com/jaxa_eo_symposium2015/ (*The webpage will open in September)



Meeting Calendar

As of August 2015

Activities	2015											
	July	August	September	October	November	December	January	February	March	April	May	June
CEOS Plenary and CEOS SIT (Strategic Implementation Team)			▲15-18 SIT-TWS & Side Meetings Darmstadt, Germany		▲4-6 CEOS 29th Plenary Kyoto, Japan							▲18-20 SIT-31 & Side Meetings Frascati, Italy
CEOS VCs and CEOS TFs (Virtual Constellations and Task Forces)		▲20-24 SST VC-4 & GHRSS-16 Noordwijk, The Netherlands										
CEOS WGs			▲8-10 WGDisasters-4 Frascati, Italy	▲28-10/2 WGISS-40 Oxford, England						▲7-9 CEOS-CGMS WGClimat-6 Paris, France		▲14-18 WGCV-40 Canberra, Australia
GEO related Activities (Group on Earth Observations)	▲7-8 34th GEO ExCom Genova, Switzerland		▲9-11 8th GEOSS-AP Symposium Beijing, China	▲23-25 SDCG-8 Bonn, Germany	▲9-13 GEO XII Plenary and Ministerial Mexico City, Mexico							
Others	▲26-31 IGARRS 2015 Milan, Italy			▲12-16 66th IAC Jerusalem, Israel	▲2 JAXA EO Symposium Tokyo, Japan	▲30-12/11 UNFCCC COP-21 & SBSTA-43 Paris, France				▲2-4 GCOS Conference, Global Climate Observation Paris, France		

▲: determined △: to be determined (Date, Host organization/Location) CEOS-related meetings are open only to designated participants.

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