



Committee on Earth Observation Satellites
<http://www.ceos.org>

NEWSLETTER

August 2012

No. 39

Dr. Michael H. Freilich, *CEOS Strategic Implementation Team Chair, NASA*

Dear CEOS Colleagues,

We are making CEOS history, first with the 25-year CEOS Self Study completed in 2011, and now, with the strategic implementation that began at SIT-27.

At SIT-27, we spoke candidly about the voluntary nature of our organization and the findings of the Membership and Participation Team. The action for us as an organization is to broaden member agency involvement in CEOS activities, Virtual Constellations, Working Groups, and to focus on capacity development within CEOS. Let's set our sights on doing better what we do well by planning for a future of greater participation and shared responsibility. Our members and associates have different strengths and preferences, but that should not deter CEOS from its collective trajectory.

The voluntary framework that brings us together for societal benefit also requires Structure and Governance to project CEOS into the future. In La Jolla, we explored our varied understanding of how CEOS functions now and the relation with GEO. This

continuing dialogue—as participative as possible—will help to model the three guiding documents that will be our road map for the next 10-12 years. By 2022, some and possibly all of the societal benefit areas we assist will depend more urgently and more holistically on the CEOS we are refining today.

The Self Study has shown us the way, and I thank all of you for supporting the need for this self-assessment of CEOS as an organization. We must continue to identify and accomplish essential business outcomes as we did at SIT-27. Our Virtual Constellations and Working Groups are making known what they need; we are listening; and now, it is up to all of us to translate into action how we address both the broad and specific issues they are communicating to us.

We also have within CEOS, new ideas for different approaches; we have many years of CEOS and GEO institutional memory and civil space knowledge; and we have an increasing societal need for the coordination and data products we provide. Our CEOS Executive Officer, Deputy

Executive Officer, and Systems Engineering Officer play key roles in maintaining and projecting the CEOS identity internally and externally. The refinements being discussed will bring more clarity to the roles and responsibilities for individuals who will hold these executive positions in the future and for member agencies that will become CEOS Chair, Strategic Implementation Team Chair (SIT Chair), and SIT Vice Chair.

I know that our Chair, Kiran Kumar, joins me in thanking all of you for the time and effort you are devoting to telling us what you need, what is working, what needs to change, and how we can help. We thank CNES for the support it is already providing as SIT Vice Chair, and we greatly appreciate the sustained efforts CSA is making as the Incoming Chair to prepare for the implementation of CEOS guiding documents that are in development now.

Finally, I commend our Virtual Constellations and Working Groups for their purpose-driven coordination and collaboration. At the end the day, in every time zone across the globe, this is the main reason for our existence.



SIT-27 at Scripps Institution of Oceanography, March 26-30, 2012, La Jolla, California, U.S.A.

CEOS and GEO : a vital partnership for Earth observation

Prof. José Achache,

outgoing GEO Secretariat Director



Ms. Barbara Ryan,

incoming GEO Secretariat Director

Back in 2007, when one of us was serving as CEOS Chair (Barbara) and the other as GEO Secretariat Director (José), we contributed a co-authored article to the August issue of the CEOS Newsletter entitled “CEOS and GEO: a Long-term Partnership.” Today, as we look back over the past five years, we can draw great satisfaction from the progress that has been achieved by the strong GEO-CEOS relationship. At the same time, we recognize that CEOS and GEO must strive to do much more if we are to achieve our common goals over the next five years and beyond.

The willingness and ability of CEOS to engage in the GEO Work Plan Tasks has been critical to the advances we have made so far in building GEOSS. The impact of CEOS on GEOSS implementation has increased with each new multi-year Work Plan, and this CEOS leadership has been widely recognized throughout the GEO community. At the same time, CEOS has greatly benefited from the establishment of GEO and the political profile and strategic guidance that GEO has brought to Earth observation.

Importantly for GEO, a number of CEOS members have taken the lead on ensuring full and open access to Earth observation data. The announcement at the 2007 Cape Town Ministerial that the China Brazil Earth Resources Satellite Programme (CBERS) was launching a new Earth observation service to provide state-of-the-art images of the planet to end-users throughout Africa – free of charge – was a particularly dramatic step. The Cape Town announcement by the United States that it would start providing full and open access to the Landsat archives, an action that has resulted in more than 8 million downloads to date, was a further convincing demonstration of the space

community’s leadership in this area.

Other vital CEOS contributions have included the support provided to the Global Forest Observation Initiative (GFOI) and the Global Agriculture Monitoring initiative (GEOGLAM). The ad hoc team recently established by CEOS to advance the planning of space-based observations that will be required by GEOGLAM will soon start work on defining user requirements in close collaboration with the Agriculture Task Leads. For GFOI, CEOS has been working to secure the interoperability of the necessary optical and radar (SAR) sensors and to ensure the long-term continuity and availability of satellite data.

Building on past success

While the CEOS space agencies have already worked hard to make these and other essential investments in GEOSS, there is no getting around one hard fact: the demand for space-based observations will continue to grow dramatically. Without increased and sustained contributions from CEOS, the international community’s ability to monitor the health of the planet will not keep up with the growing need for this kind of information.

While recognizing the challenge that this poses to CEOS, we strongly urge space agencies to accept the need to ramp up their contributions to GEOSS even further. Making this possible will require additional measures to reduce the costs of space-based observations and to keep the workload at a manageable level. Fortunately, CEOS has already proven itself adept at the two most important strategies for achieving this: data sharing and mission coordination.

Keeping up the momentum on data sharing is absolutely vital. Space

agencies will need to build on the Cape Town breakthroughs. With these inspiring examples to guide us, all agencies should explore how to strengthen their contributions of data. For our political masters, the message is clear: assuring full and open access to space data is the best way to save money by making it possible for all countries to draw on the data provided by the world’s space agencies.

Closely related to this is the need to maintain and strengthen the coordination of Earth observation missions. With the pressures on national budgets unlikely to ease in the future, it is more vital than ever that all countries work together to ensure sustained and comprehensive coverage of all major Earth systems.

By demonstrating continued progress in the areas of data sharing and coordination, CEOS can serve as a model and inspiration for the non-space Earth observation community. Developing an international coordination mechanism such as that of CEOS for *in situ* observations is one of GEO’s greatest challenges in the years ahead, and one that we are committed to tackling. This will provide further savings, as coordinated *in situ* observations are critical for complementing and validating space-based data.

The prospect of growing demand for greater contributions from CEOS may at first sight be intimidating. But through careful management, increased coordination and data sharing, we have full confidence in the ability of CEOS to continue its core mission of advancing GEOSS and thus providing invaluable societal benefits to all nations. We are confident that the long-term GEO-CEOS partnership that we wrote about in 2007 will continue to thrive and serve as a major foundation of GEO’s success.

The Space Data Coordination Group (SDCG)

*Mr. Stephen Ward, Mr. John Faundeen,
Mr. Frank Martin Seifert, Mr. Ake Rosenqvist*

The establishment of GEO and GEOSS recognised that national and regional agencies with responsibility for delivering Earth observations may have to do more with fewer resources in the future, and that efficiencies through international coordination are essential. GEO represents the best vehicle available to the observations community for the promotion of its capabilities and their societal benefits, and this needs to be recognised and supported if its full potential as a coordination and advocacy body is to be realised. As the final years of the original 10-year implementation plan loom over the horizon, continued recognition and support of funding governments for GEO will be dependent on clear demonstrations of its potential to deliver significant outcomes in support of societal needs and the efficiencies of the coordination that it promises. We take this to mean significant and high profile outcomes for significant challenges – recognised as priorities by many GEO member governments. These outcomes would be tangible results, such as new global/national application systems, datasets and information products, of obvious societal significance – which political leaders and decision makers can understand and promote as consequences of their policies and investments.

There are a number of candidate initiatives that the GEO and CEOS communities might choose to prioritise with a view to such outcomes, and which tick all the boxes in terms of their significance and potential. The Global Forest Observations Initiative (GFOI) is the most mature of the GEO-led activities seeking to establish a sustained framework for coordination of EO data providers - in support of the development of national forest information systems, such that countries can participate in related climate treaties and carbon market mechanisms. Others include GEOGLAM (Global Agricultural Monitoring) which is developing in response to G-20 concerns around food security and price volatility. Disaster risk reduction (Supersites), biodiversity (GEOBON), carbon and water observing systems (via the relevant GEO strategies) are further challenging topics.

CEOS has been a lead partner in the definition and development of GFOI from the outset, supporting its origins as the GEO Forest Carbon Tracking task – recognising the fundamental importance of sustained global coverage of forested areas by satellite. Participating CEOS agencies have been working together to demonstrate the political resolve and technical capability to undertake coordinated acquisition strategies and guarantee the necessary coverage wall-to-wall on national scales since 2009. The GEO Plenary VIII approved in November 2011 the establishment of GFOI, as an operational forest observation programme - taking the national-scale FCT efforts to a global level.

Recognising the need for a long-term view of the sustained coverage coordination demanded by GFOI, and to establish the foundations for a standing framework for coordination of satellites that are able to contribute to the on-going needs, CEOS approved a GFOI/FCT data strategy in late 2011 and the establishment of the Space Data Coordination Group (SDCG) for its further definition and implementation. The first year of the SDCG efforts is focused on the specification of a baseline, coordinated global data acquisition strategy centred around a number of 'core data streams' that can be used free-of-charge for GFOI purposes. The challenge is made all the harder by the losses of ALOS, Landsat 5, and Envisat, and the SDCG work will include active outreach to governments willing to supplement core data stream coverage with contributions of data from capable Public-Private Partnership or commercial systems.

It was always anticipated that the SDCG role might be expanded in the future – recognising the need for tangible outputs from GEO - and the associated demands anticipated of CEOS and its agencies in support of data coordination and delivery. It hasn't taken long for this expansion to be forthcoming. The SIT-27 meeting in March 2012 called upon the SDCG to support the specification of a global acquisition strategy for GEOGLAM, recognising the importance of the opportunity to demonstrate the value of

GEO and CEOS to G-20 governments and the central role of satellite data. SDCG co-leads (ESA, NSC, USGS) willingly agreed to accommodate the request in planning their work programme for 2012 onward.

The 1st meeting of the SDCG, hosted by CSA in March 2012, was a solid start to what we all hope will be a new era of focused coordination of our observing assets in support of societal needs. We had representatives from 11 CEOS space agencies (CNES, CONAE, CRESDA, CSA, DLR, ESA, INPE, JAXA, NASA, NSC, USGS) including all providers of the core data streams, and a highly constructive dialogue showed promise that the SDCG can be an important tool in our drive to support tangible outcomes from CEOS, and from GEO.

We trust that the SDCG will serve an important function in moving the community towards an emphasis on substantial deliverables within the GEOSS framework. But it remains important for CEOS to consider the resourcing and responsibilities around actual delivery of data or applications. The scope of SDCG has been carefully defined so far to be limited to acquisitions – the banking of data that is known to be essential in future. Further effort will be needed to assemble, validate, process and supply those data for their application – and this means manpower and funding that is yet to be identified. The GFOI framework is addressing this challenge by harnessing the existing donor programmes of the leads like Australia, Norway and the US to cover the production and delivery costs associated with demonstrator products for their partner countries. Similar arrangements will be necessary if CEOS and GEO are to move beyond the virtual coordination and into delivery of results and this must be addressed in planning future strategies and structures. The SDCG welcomes participation of all space agencies willing to support their coordinated acquisition strategies – anticipating that the new focus for coordinated acquisitions that the group provides will be increasingly required in support of tangible outcomes for CEOS and GEO.

The CEOS Sea Surface Temperature Virtual Constellation (SST-VC)

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The key space and in situ measurement capabilities providing Sea Surface Temperature (SST) measurements are extensive and are used by a large number of CEOS Agencies and applications. Mesoscale resolving SST measurements are a fundamental inputs to accurate numerical weather and ocean prediction systems and is a key essential climate variable within the framework of the Global Climate Observing System (GCOS). The mature Group for High Resolution SST (GHRSSST) activities have, over the last 12 years, made a real tangible difference to the way that SST are provided, documented and used through the development and implementation of consensus community approach. This has resulted in a significant increase

in user uptake and engagement of CEOS Agency products. The CEOS SST-Virtual Constellation (SST-VC) leverages GHRSSST organizational and data management structures by connecting the existing GHRSSST operations with the CEOS collaborative infrastructure.

The aim of the CEOS SST-VC is:

To ensure the best quality sea surface temperature data for applications in short, medium, and decadal time scales in the most cost effective and efficient manner through international collaboration and scientific innovation.

The first CEOS SST-VC meeting took place on 6-7th June 2012 in room 203 at Sanjo Conference Hall, the University

of Tokyo - Hongo Campus, Tokyo, Japan, kindly hosted by JAXA. The meeting was held in conjunction with the 13th GHRSSST Science Team workshop to ensure good coordination.

The expected outcomes of the SST-VC include continued support to an extensive user community with established and functional systems and services, stronger CEOS Agency SST activities through better synergy and communication; value for money to CEOS Agencies by capitalising on the already committed investments made to GHRSSST; and reduced duplication of coordinating activities.

While much has been achieved through the activities of GHRSSST, there is more to do in order to optimize and take full advantage of the SST virtual constellation to further benefit society. The purpose of the CEOS SST-VC is not to duplicate or to replace the activities of GHRSSST but rather, to ensure effective communication and coordination between CEOS Agencies on practical issues related to SST using GHRSSST as the 'implementation' of the CEOS SST-VC. At the highest level, it provides a means for CEOS to present to GHRSSST its needs and requirements, and for GHRSSST to present its needs directly to the global community of Space Agencies. In addition, there are several thematic connections between GHRSSST and CEOS that take place at the working group level. The SST-VC, with GHRSSST as the implementation mechanism, is delivering real coordination in space-based Earth observations for societal benefit through the prioritized CEOS SST-VC activities.

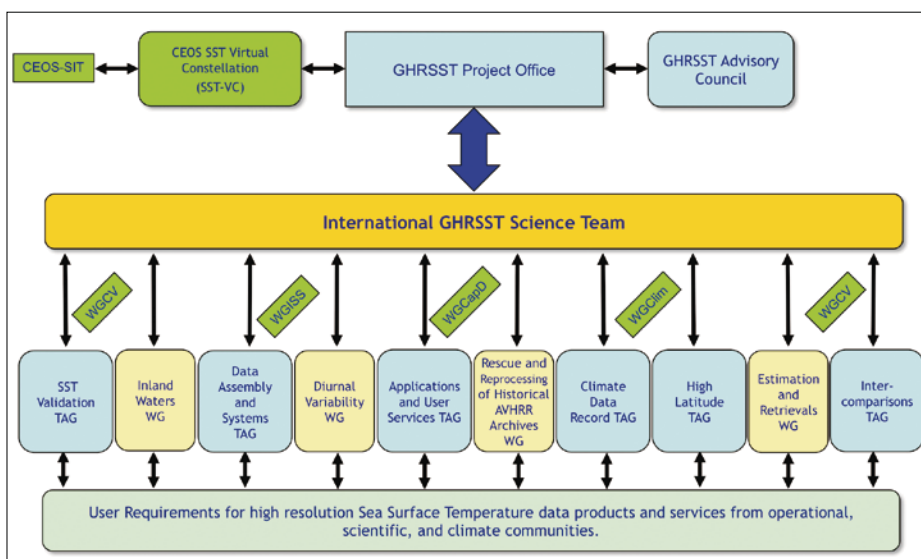


Figure 1. Currently active GHRSSST structures and proposed interface to the SST-VC. Standing Technical Advisory Groups (TAG) and task oriented Working Groups (WG) are highlighted. The mapping of GHRSSST structures to CEOS structures are shown as green boxes: this is where CEOS SST-VC ↔ GHRSSST interactions are expected to take place building effectively on functional heritage and minimising duplication of activities.

An important connection is the focus on SST for climate, working with GCOS and CEOS WGClimate. The SST-VC/GHRSSST partnership working with WGClimate is helping to pilot the CEOS

Working Group on Capacity Building and Data Democracy (WGCapD)

Ms. Hilcéa Ferreira,
INPE (Brazil), WGCapD Chair



Mr. Jacob Sutherland,
NOAA (USA), WGCapD Vice-Chair

We had a very fruitful kick-off meeting in Ilhabela, Brazil, from 29 February to 02 March, with 16 very engaged participants from CEOS Agencies, GEO Secretariat and Secure World Foundation, plus 6 virtual attendees. We had the opportunity to get acquainted with ongoing activities and initiatives, in the field of capacity building, of individual agencies and organizations and brainstorm about the group's medium and long term goals. Activities presented ranged from an E-learning course to webinars to activities concentrated on the

sustainable use of space. Agencies presented a number of ongoing educational initiatives with different target audiences, including final users, college educators, secondary school students and elementary school students.

All participants agreed that it would be important to have an **Overarching Strategy** with the objective of minimizing the chance of duplicating current capacity building efforts within GEO and helping to establish synergies and determine possible gaps.

The WGCapD plans to build upon

the CEOS Data Democracy Initiative in an effort to increase the capacity of institutions in less developed countries for effective use of Earth Observation data for the benefit of society and to achieve sustainable development.

Pursuing Data Democracy and working on the synergies among projects presented, the following initiatives shall be carried out:

- DEM Development Project including SRTM data release
- Development of an International Online Certificate Program in Remote Sensing
- Integration of GEONetCab project website with the GEO web portal and CEOS WGCapD website

There was also a consensus that the group would need an **Outreach Strategy** including the Updating of CEOS website, preparation of a Training Calendar and, somehow, spreading the word about the WG through presentations at events WG members are already attending.

We are excited to begin our work together as part of a coalition of agencies and organizations looking to build capacity in the use of Earth observations for the benefit of humanity.



WGCapD Photo

(continued from page 4)

climate architecture. For example: the GHRSSST Climate Data Record Technical Advisory Group (CDR-TAG) is coordinating with the GCOS SST/SI WG and many members are actively involved in ECV activities; a SST-ECV framework is being developed to address the inputs and requirements of many organisations; a reanalysis activity and inter-comparison work is underway; and a concerted effort is being made

to federate the SST user/producers and deliver consensus recommendations to CEOS and GCOS.

The CEOS SST-VC has adopted a lean and efficient approach, consistent with the view of CEOS, which builds on existing activities and services in order to maintain coordination of SST activities and provide value for money. Currently ESA, NASA, NOAA, CSIRO,

JAXA and EUMETSAT play prominent roles in the SST-VC: we prioritise the inclusion of other "SST Agencies" in SST-VC activities. Your support is now requested and we encourage Agency representatives to join the CEOS SST-VC to better coordinate and develop the virtual constellation. See <https://www.ghrsst.org/documents/q/category/ceos-sea-surface-temperature-virtual-constellation/> for more information.

Defining an Architecture for Climate Monitoring from Space : a joint activity with CGMS and WMO

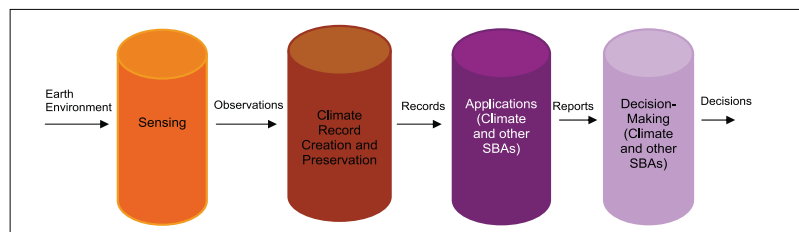
Dr. Mark Dowell, EC/JRC

In January 2011, very shortly after the endorsement of the CEOS working group on Climate, the Global Climate Observing System (GCOS) and WMO Space Programme hosted a workshop titled, “Continuity and Architecture Requirements for Climate Monitoring – First Workshop on Space-based Architecture for Climate”. This workshop, attended by both policy-level and technical experts, proposed the establishment of a Writing Team, comprised of representatives from CEOS, CGMS and WMO, to develop a strategy document for an architecture for climate monitoring from space. This report has been developed over the last year and a final version can be found on the CEOS WGClimate website.

This report focuses on satellite observations for climate monitoring from space, and the need for an international architecture that ensures delivery of these observations over the time frames required for analysis of the Earth’s climate system. The report outlines a strategy for such an architecture – a strategy that is intentionally high-level, conceptual and inclusive, so that broad consensus can be reached, and all relevant entities can identify their potential contributions. The strategy, however, is not sufficient, in and of itself, and therefore first presents a logical architecture that represents an initial step in the development of a physical architecture – an end-to-end system – capable of delivering the necessary observations for climate monitoring from space.

The intended audiences include space agencies, their political and budget authorities, their international coordinating mechanisms, and national and/or international programmes and organizations with climate-related mandates.

The architecture proposed, calls for a constellation of research and operational satellites, broad, open data-sharing policies and contingency planning. It includes agreements that are essential for bringing the same continuity to long-term and sustained climate observations



Main Components of a Logical View

that we, today, have for weather observations. The task of climate monitoring, however, has requirements that must extend beyond the capabilities of one-time research missions and operational satellite systems in existence today. This report, therefore, identifies an important activity for research and operational agencies to undertake, which is to develop a joint framework for stewardship of climate information. Climate record processing requires a sustained expert understanding of both new and legacy climate sensors as well as a sustained web of support activities, including a significant effort on calibration and validation, research to reduce uncertainties, establish “community reference standards,” and collaborative product assessment and intercomparison. The sustained involvement of both research and operational agencies is a prerequisite for success.

Some significant aspects evidenced in the report include: In general, current observing systems have not been primarily designed with a climate perspective, therefore, inventories are needed to document the contributions of current and planned observing systems for climate purposes,

Requirements on mission continuity and contingency need improvement through international collaboration of space agencies,

Sustained Climate Data Record (CDR) programs will provide an avenue to replace heritage algorithms and data sets with improved versions once they are successfully demonstrated, validated and available, and there is an imperative for further and wider coordination among all stakeholders in order to ensure traceability along harmonized practices.

The report also identifies a way forward, and it is based on this roadmap that WGClimate together with colleagues from CGMS and WMO are now embarking on the next steps of this initiative. These include designing a physical architecture that captures the current and planned implementation strategies on an Essential Climate Variable (ECV)-by-ECV basis. This is to be achieved through the creation of an ECV Inventory, which was envisaged since the inception of WGClimate, to provide a detailed overview of current and planned capability. CEOS and CGMS Agencies will be completing a detailed questionnaire at the product level over the next six months which will form the basis for an initial rendition of this Inventory.

This Inventory will then be used for a variety of uses both internal and external to CEOS. Some initial instances of known uses of the Inventory include:

- Describing the current and planned monitoring capability on an ECV basis (this will allow more systematic space agency response to processes such as the response to the GCOS IP and reporting to UNFCCC SBSTA, both as a whole and for individual agencies or groups of agencies (i.e. nations or EU));
- The combined perspective of the logical and physical views will enable the definition of an optimum “macroscale” space system configuration and its components;
- The identification of gaps and shortfalls at ECV/product level;
- The formulation of a coordinated action plan to address such gaps and shortfalls;
- The triggering of medium-term activities needed to sustain the long-term implementation of the architecture.

Working Group on Information Systems and Services (WGISS)

The Working Group on Information Systems and Services (WGISS) had its 33rd meeting during April 23-27 in Tokyo. It was my first meeting as the chair and I am very happy to report that the meeting was successful. Following are some meeting highlights.

WGISS welcomed the new vice-chair, Mr. Richard Moreno (CNES), a new participant from Netherland Space Office, and two representatives from CWIC data partner AOE/CAS. Attendance was near 40 including those who attended virtually, thanks to great job of WGISS Infrastructure Service Project (WISP).

Towards a structure for more agile and proactive reactions and responses, we agreed to modify the current WGISS structure. Up to the 33rd meeting, WGISS mainly consisted of a chair, a vice-chair, two subgroups, eight interest groups and four projects which are located under one of the subgroups. At the 33rd meeting, WGISS agreed to eliminate the subgroups and to close and merge some interest groups to avoid duplication. As a result, WGISS currently has a chair, a vice-chair, three interest groups and four projects. WGISS also discussed the SIT-27 action "Working Group Chairs and Virtual Constellation Leads to develop a short paper brainstorming ideas on improved communication among groups

in support of more integrated CEOS objectives". As the first step to this action, WGISS agreed to set up a new "Virtual Constellation Interest Group" which will be the POC on the WGISS side for WGISS-VC coordination. This interest group will start its activity after the lead is identified. WGISS is waiting for volunteers to fill in this position.

Regarding technical topics, each interest group and project reported its status and plans; the activities are progressing very well. Here are some updates:

- CWIC (CEOS WGISS Integrated Catalogue) Client Partner Guide and Data Partner Guide documents were completed and posted on the CWIC web page (<http://wgiss.ceos.org/cwic>) as a response to the last CEOS Plenary meeting action. CCRS announced that their agency client now offers access to CWIC accessible satellite data. JAXA announced the initiation of a CWIC prototype activity and will offer search to over 16 million satellite products (granules). NASA announced that their near real time data currently offered through their LANCE system will be accessible through CWIC soon. AOE (China) announced that CRESDA will become a CWIC data partner this summer. The LSI Portal project announced plans to provide access to CWIC. In 2012, CWIC begins moving



Ms. Satoko Horiyama Miura,
JAXA (Japan), WGISS Chair

from prototype to pre-operational and is working on integration with GEO.

- GA.4.Disasters (GEOSS Architecture for Disasters and Risk Assessments) is planning to contribute to GEO Architecture Implementation Pilot (AIP-5).
- During the Data Stewardship Interest Group session, WGISS agreed to endorse "The CEOS WGISS Data Management Statement document (for Earth Observation Satellite Data)". This becomes one of the achievements for GEO 2012-2015 Workplan Component IN-02-C1.
- Several interest groups were merged into the new Technology Exploration Interest Group which aims to discuss any web-related technologies.
- The International Directory Network (IDN), the Atmospheric Composition (AC) portal and the Water Portal are being well operated and enhancements are on-going.

In order to prepare effectively for future meetings, WGISS needs guidance from SIT and/or Plenary on any specific areas on which we should focus. As requested at the 27th SIT meeting, WGISS continues to seek additional participation and funding. WGISS is always open to any CEOS members or associates and would like to request from CEOS principals continuous and stronger support in order to accomplish CEOS core business assigned to WGISS.



WGISS-33 participants in Tokyo, April, 2012

Working Group on Calibration and Validation (WGCV)

The 34th CEOS WGCV plenary meeting was held on February 6-10, 2012 at the Customs House in Brisbane, Australia. The meeting was hosted by the Commonwealth Scientific and Industrial Research Organization (CSIRO) in collaboration with the Department of Innovation, Industry, Science and Research (DIISR) Space Policy Unit, the Terrestrial Ecosystem Research Network (TERN), Geoscience Australia (GA), and the Bureau of Meteorology (BoM).

The WGCV greatly appreciates the strong contributions and active participation by the Australian representatives and encourages



WGCV IVOS participants at the USGS EROS, May, 2012

expanding this relationship into the future. Some of the key areas of future interest included: Continued participation within CEOS WGCV and its six subgroups; Provide support for long term, sustained calibration and validation test and monitoring sites and establish an operational cal/val network in Australia; including the southern hemisphere geometric, spatial resolution, and radiometric gain test sites, land product validation sites, SAR calibration test methods and test sites, ocean system calibration and product validation efforts, and terrain mapping and elevation test and characterization efforts. To see the extensive minutes and presentations from the meeting, as well as the final draft of the WGCV 5-year plan completed at the meeting, go to the WGCV 34th Plenary Website.

On May 8-10, 2012, the U. S. Geological Survey (USGS) Earth

Mr. Gregory L. Stensaas,
US Geological Survey,
WGCV Chair



Resources Observation and Science (EROS) Center, together with the South Dakota State University (SDSU) hosted a three-day meeting for the Infrared and Visible Optical Sensors (IVOS) subgroup. The IVOS 34 meeting was very well attended by representatives over eight countries. The main objective of the meeting was to discuss the IVOS work plan, review subgroup missions and terms, finalize CEOS reference standard test sites, review actions and progress on key comparisons, discuss pre-flight calibration strategies, develop recommendations to the CEOS WGCV, discuss the QA4EO and ensure that the processes being established are "fit for purpose" for all stakeholders in all countries and agencies. The agenda also included discussion on existing and potential contributions from CEOS Working Group on Climate (WGC) and Land Surface Imaging (LSI) constellation to the CEOS IVOS.

Meeting Calendar

As of July 2012

Activities	2012					
	July	August	September	October	November	December
CEOS Plenary					▲ 24-26 26th Plenary Bangalore, India	
CEOS SIT (Strategic Implementation Team)			▲ 11-12 SIT Workshop Washington DC, USA			
CEOS VCs and CEOS TFs (Virtual Constellations and Task Forces)			▲ 13-14 SDCG-2 Meeting Washington DC, USA			
CEOS WGISS (Working Group on Information Systems & Services)				▲ 24-28 WGISS-34 and WGCV-35 Joint Meeting Hyderabad, India		
CEOS WGCV (Working Group on Calibration and Validation)						
CEOS WGCapD (Working Group on Capacity Building and Data Democracy)						
CEOS WGClimate (Working Group on Climate)						
GEO related Activities (Group on Earth Observations)					▲ 19-23 GEO-IX Plenary Iguazu Falls, Brazil	△ 12 CEOS-GEO Planning Meeting
Others	▲ 14-21 COSPAR 2012 Mysore, India ▲ 16-20 WCRP Joint Scientific Committee Meeting Beijing, China ▲ 22-27 IGARSS 2012 Munich, Germany			▲ 1-5 IAC 2012 Naples, Italy	▲ 5-9 CGMS-40 Lugano, Switzerland	▲ 26-12/7 UNFCCC COP-18 CMP-18 Doha, Qatar

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

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