GEO – CEOS Workshop on Quality Assurance of Calibration and Validation Processes

- Establishing an Operational Framework

Introduction

Changyong Cao (NOAA), Chair
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CEOS/WGCV

May 6-8, 2008

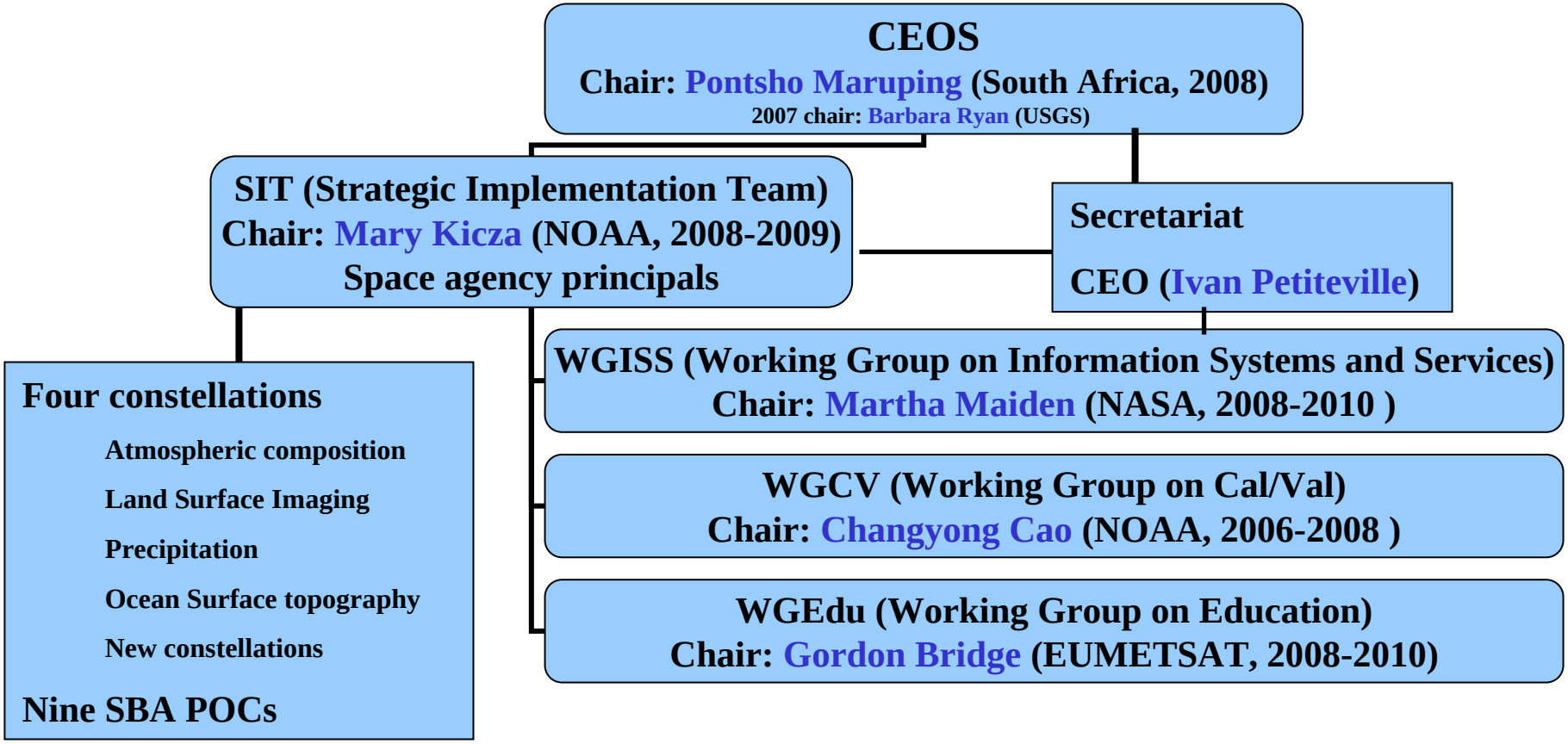
GEOSS/GEO and CEOS

- "The Group on Earth Observations (GEO) is coordinating international efforts to build a Global Earth Observation System of Systems (GEOSS). This emerging public infrastructure is interconnecting a diverse and growing array of instruments and systems for monitoring and forecasting changes in the global environment" – *GEO website http://earthobservations.org.*

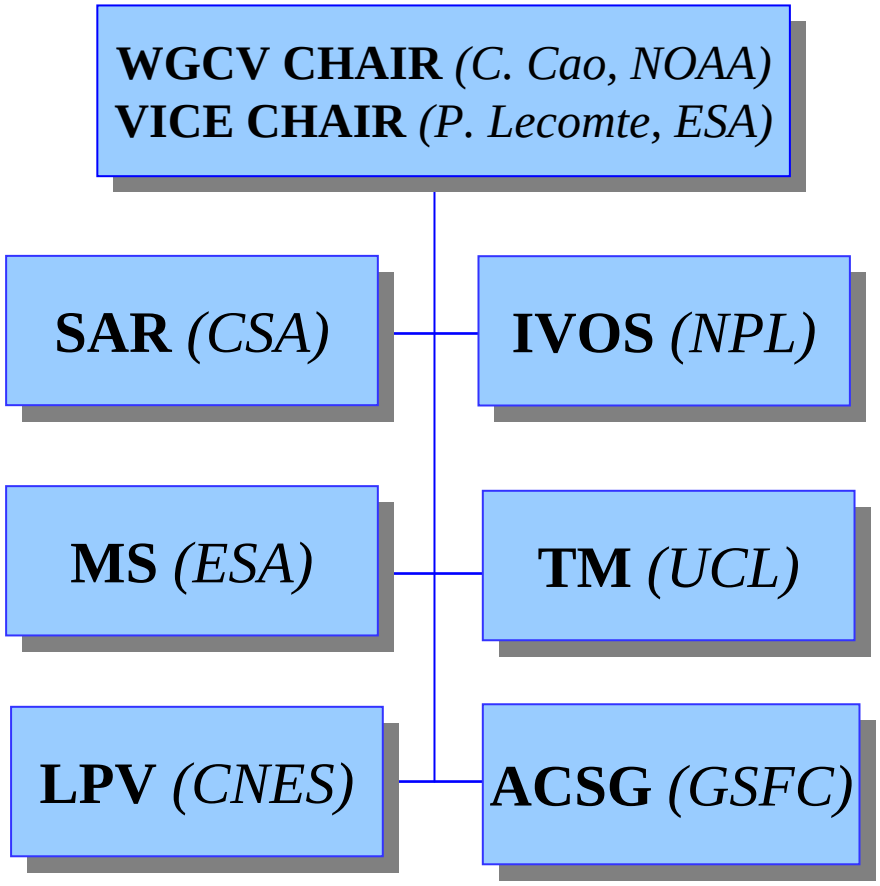
- GEO was launched in 2002 in response to calls for action by the World Summit on Sustainable Development and by the G8 (Group of Eight) leading industrialized countries. Led by director *Prof. Jose Achache*, GEO is headquartered in Geneva.

- Established in 1984, CEOS (Committee on Earth Observation Satellites) is recognized as the major international forum for the coordination of Earth observation satellite programs and for interaction of these programs with users of satellite data worldwide. In its partnership with GEO, CEOS has become the space-based component of GEOSS, and the "space arm" of GEO.

Current CEOS Structure



CEOS WGCV Structure



Atmospheric Composition (ACSG)
Chair Dr. B. Bojkov, GSFC
Vice Chair Dr. J-C. Lambert, IASB/BIRA

Infrared Visible Optical Sensors (IVOS)
Chair Dr. N. Fox, NPL/BNSC

Land Product Validation (LPV)
Chair Dr. F. Baret, INRA/CNES
Vice Chair Dr. S. Garrigues

Microwave Sensors
Chair C. Buck, ESA

Synthetic Aperture Radar (SAR)
Chair Dr. S. Srivastava, CSA

Terrain Mapping (TM)
Chair Prof. J. Peter Muller, UCL/BNSC

WGCV holds meetings every 6-9 months. WGCV28 was held in conjunction with WGISS25 in Sanya, China in Feb. 2008. WGCV29 will be held in Avignon, France, Sept. 30-Oct. 3, 2008

GEOSS and Data Quality Assurance

- *The success of GEOSS will depend on data and information providers accepting and implementing a set of interoperability arrangements, including technical specifications for collecting, processing, storing, and disseminating shared data, metadata, and products. (-- from the GEOSS 10 yr. Implementation plan)*

- A critical element of interoperability is **Data Quality Assurance**, because: *Data accessible ≠ Data usable*

- Cal/Val is critical to data quality assurance and data usability.

- This also raises the visibility of cal/val to a very high level. *

GEOSS Data Quality Assurance Strategy

From the GEO 2007-2009 Work Plan(page 25)

- GEO Task DA-06-02: “This task is led by CEOS and IEEE”

- “Develop a GEO data quality assurance strategy, beginning with space-based observations and evaluating expansion to in-situ observations, taking account of existing work in this area”.

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This task is fundamental and cross-cutting for GEOSS

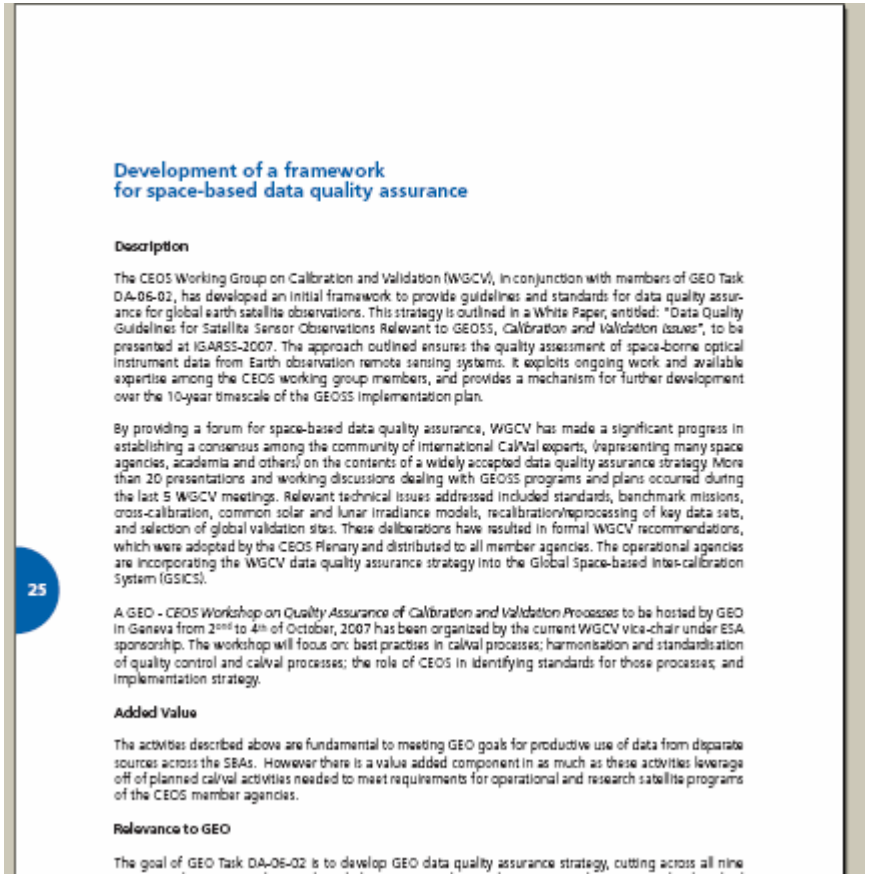
Note the GEO is currently revising the workplan and welcomes input.

The Previous Workshop in Geneva

- The previous workshop was held in Geneva Oct 2-4, 2007 (sponsored by ESA and GEO).
- GEO Director Prof. Achache delivered opening remarks to nearly 50 participants.
- Focused on developing the guiding principles.
- Participants reached consensus that cal/val and quality assurance should be incorporated into satellite programs.
- CEOS endorsed guidelines will be issued and implemented by the space agencies.
- Established the CEOS cal/val portal http://calvalportal.ceos.org.

GEOSS Early Achievements

- **Our joint effort with GEO on data quality assurance was recognized as one of the early achievements at the Cape Town Ministerial Summit in 2007.**
- **Among the "First 100 Steps to GEOSS" (http://earthobservations.org).**



Development of a framework for space-based data quality assurance

Description

The CEOS Working Group on Calibration and Validation (WGCV), in conjunction with members of GEO Task DA-06-02, has developed an initial framework to provide guidelines and standards for data quality assurance for global earth satellite observations. This strategy is outlined in a White Paper, entitled: "Data Quality Guidelines for Satellite Sensor Observations Relevant to GEOSS, *Calibration and Validation Issues*", to be presented at IGARSS-2007. The approach outlined ensures the quality assessment of space-borne optical instrument data from Earth observation remote sensing systems. It exploits ongoing work and available expertise among the CEOS working group members, and provides a mechanism for further development over the 10-year timescale of the GEOSS implementation plan.

By providing a forum for space-based data quality assurance, WGCV has made a significant progress in establishing a consensus among the community of international Cal/Val experts, (representing many space agencies, academia and others) on the contents of a widely accepted data quality assurance strategy. More than 20 presentations and working discussions dealing with GEOSS programs and plans occurred during the last 5 WGCV meetings. Relevant technical issues addressed included standards, benchmark missions, cross-calibration, common solar and lunar irradiance models, recalibration/reprocessing of key data sets, and selection of global validation sites. These deliberations have resulted in formal WGCV recommendations, which were adopted by the CEOS Plenary and distributed to all member agencies. The operational agencies are incorporating the WGCV data quality assurance strategy into the Global Space-based Inter-calibration System (GSICS).

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A GEO - *CEOS Workshop on Quality Assurance of Calibration and Validation Processes* to be hosted by GEO in Geneva from 2nd to 4th of October, 2007 has been organized by the current WGCV vice-chair under ESA sponsorship. The workshop will focus on: best practices in cal/val processes; harmonisation and standardisation of quality control and cal/val processes; the role of CEOS in identifying standards for those processes; and implementation strategy.

Added Value

The activities described above are fundamental to meeting GEO goals for productive use of data from disparate sources across the SBAs. However there is a value added component in as much as these activities leverage off of planned cal/val activities needed to meet requirements for operational and research satellite programs of the CEOS member agencies.

Relevance to GEO

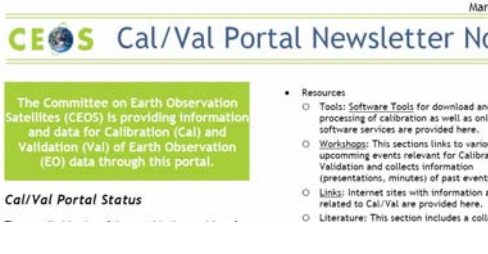
The goal of GEO Task DA-06-02 is to develop GEO data quality assurance strategy, cutting across all nine

WGCV 2008 Activities
Supporting DA-06-02

Continue leading GEO DA-06-02: Data quality assurance strategy for GEOSS

- GEO-CEOS Workshop, May 6-8, 2008, Gaithersburg, MD
  - Organized by ESA; Hosted by NIST/NOAA/NASA
  - Endorsed by the CEOS/SIT Chair and GEO Director

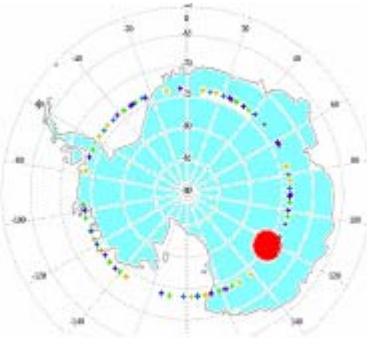
- Quality Control & Cal/Val Processes Best Practices & Guidelines
  - Draft workplan document developed (email attachment)
  - Further development of the cal/val portal and cal/val sites



- Radiometric reference standard handbook

WGCV 2008 Activities

Supporting DA-06-02


Dome C, Antarctica

- Dome C calibration campaign

  (multi-platform/sensor/agency/wavelength/frequency)

  - Sensors involved so far: MODIS, AVHRR (1981-2007), Hyperion, SPOT, ATSR, and AMSR-E. More to add in the winter of 2008-2009 by IVOS.
  - Standard calibration procedure being developed, and calibration transfer studies in progress
  - Paper to be presented at IGARSS08 in July

- 2009-2010 ground based cal/val campaign (by IVOS)

- Benchmark mission coordination (Climate). CLARREO & TRUTHS (BNSC/NPL and NASA).

Major progress will be reported to the CEOS/SIT22, CEOS Plenary, and possibly, the GEO summit. *

Thank you for your participation

and

enjoy the workshop !