CEOS WG on Calibration & Validation – An Overview

Albrecht von Bargen (DLR e.V.)

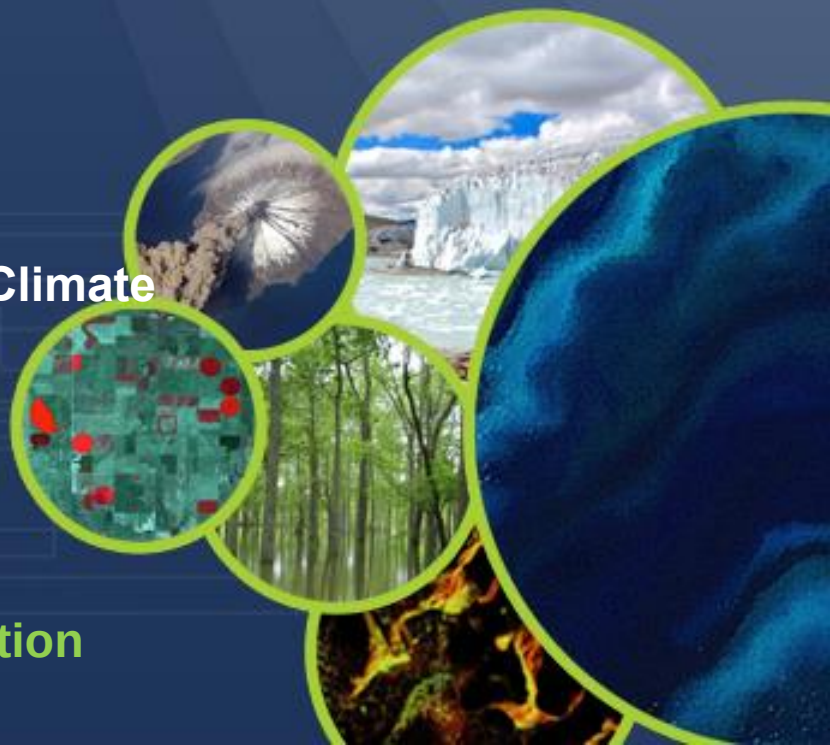
Chair CEOS-WGCV

Agenda Item 7

5th Meeting of Joint CEOS-CGMS WG on Climate

Geneva, Switzerland

March 25 - 27, 2015



Working Group on Calibration and Validation

Motivation

- To enhance the communication between both Working Groups
- To have a (continuous) process between both Working Groups identifying
  - Interactions
  - Differentiations
  - Synergetic
- What you like to expect from WG Cal/Val, you can initiate in the WG Cal/Val for your benefit
- There is not necessarily an immediate must to define common activities, but continuous communication/information will help to identify concrete support from WGCV or activities with WGCV (in the future)

Objectives of the Working Group Cal/Val

The CEOS **Working Group on Calibration & Validation** (WGCV) Mission is to ensure long-term confidence in the accuracy and quality of Earth Observation data and products and provide a forum for the exchange of information about calibration and validation, coordination, and cooperative activities.

Calibration is the process of quantitatively defining a system's responses to known, controlled signal inputs.

Validation is the process of assessing, by independent means, the quality of the data products derived from the system outputs

Note: This includes also Quality Assurance aspects (QA4EO -> QA4ECV)

Remark: Aspects of (Sensor) Inter-calibration is subject to GSICS but basic questions are common and collaboration is in a process of enhanced set-up

WGCV Organization

- Six sub-groups open to science / user communites:
  - Optical Imager (IVOS): workshops / campaigns related to radiometry (biannual), but also network projects (RADCALNET)
  - Microwave / Radar (MWSG): regional workshops (Asia)
  - Synthetic Aperture Radar (SAR): Annual workshops
  - Atmospheric Composition (ACSG): cross-cutting approach (s. below)
  - Land Product Validation (LPV): see presentation of G. Schaepman
  - Terrain Mapping (TMSG): Digital Elevation Models
- Web-page: http://calvalportal.ceos.org with links to sub-group pages

- Classical work approach: break-down along the sub-groups

- Transition state to add a task related approach for future activities (sub-groups with green acronyms)

Motivation for a new task approach (Outcome of a workshop in February this year)

- Relationship to applications in Earth Observation
- Most future activities are thought to be carried out in collaboration between several sub-groups and (potentially) in cooperation with the other VCs and WGs (and entities outside CEOS)
- Scientific / user needs / questions are more “fundamental” to the whole WGCV, sometimes whole CEOS community

- Task approach with pre-phase to submit an implementation plan including clear definition of goal, deliverables, milestones, restricted to a maximum of 2 years schedule. Pre-phase carried out by a core team. There is also a need for a “Go” by the WGCV.

- Three activities identified and in pre-phase (atmospheric correction, cloud masking, digital elevation models)

Additional themes

- Application of QA4EO in terms of definition of protocols, methods, etc.
- Set-up of structured cooperation with GSICS
- Step-wise cooperation with other CEOS entities
  - Continues communication with other CEOS entities
  - Special session during WGCV plenary
  - Identification of concrete activities (with manageable horizon!)
  - Next WGCV plenary: Session with IOCCG / VC-OCR
- Deliverables in the CEOS work plan are also a small hint about the variety of the activities in WGCV

Current Challenges

- The benefit for CEOS is when WGCV is an expert support for other CEOS VCs and WGs
- Working Group on Cal/Val is a “service” which means an usage request of a service leads finally to a - sometimes - additional effort in WGCV
- Find a minimum structure to include activities requested by entities from outside the Working Group with an appropriate reaction mechanism
- Set-up of cooperation with Virtual Constellations and Working Groups
- Understanding full chain of calibration/characterization from sensor design, on-ground characterization, in-flight/on-board calibration (Planned workshop in concept iteration)

Primary focus which can be useful for WG on Climate

- Calibration methods including references, uncertainty estimates + protocols
- Validation methods including uncertainty estimates for both, sensor-derived geo-physical parameters and validation references (+ protocols)
- Classification in terms of maturity (non-exclusive: no qualification stamp!) for methods and also for Earth Observation applications
- Interface to GSICS: Sensor inter-calibration

Interface (region) with WG Climate:

- **Transition from single sensor records to long-term data records (L1, L2)**