Cal/Val Portal

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Summary

1. CEOS Cal/Val Portal
    a. News and Status
    b. Plans for the future
    c. Tools
        - GECA
        - OLIVE
        - DIMITRI
        - VICASEOSS
2. LTDP

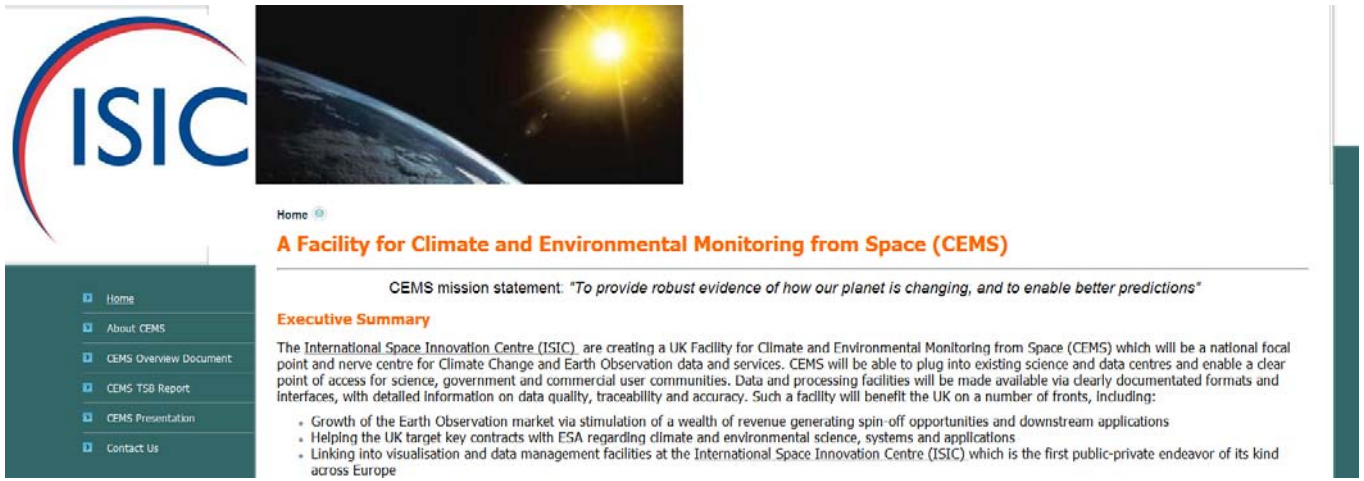
Cal/Val Portal – News and Status

- **2004**: Need for a Portal identified during the 18th Plenary Meeting of CEOS WGCV, November 2004
- **2006**: First Implementation
- **2009**: System Upgrade to web 2.0
- **2010**: Upgrade Completed
- **2011**: New Tools design and integration started (GECA, OLIVE)
- **Today**: System maintenance and new tools testing (DIMITRI)

...TOMORROW?

Cal/Val Portal: Plans for the Future

1. Integration of GECA and testing (phase in)
2. System upgrade (more storage is needed!!)
3. Migration to CEMS (Climate and Environmental Monitoring from Space)
4. OLIVE operations
5. Integration of DIMITRI



Cal/Val Portal: Main Topics

1. Information on **Sensors** – Links to documentation and tools.
2. Information on **Cal/Val Sites** – e.g. Climatological data over Landnet Sites
3. **Document Library** on Cal/Val – Methodologies, Guidelines and Reports
4. **Cal/Val Events and Campaign -** Reports, Image Gallery and Blogs
    a. Ex: Cal/Val Workshop for Sentinel3 report, preparatory Symposium for Sentinel-2
5. **Tools –** 6s configuration file interface, COVE (not directly hosted), OLIVE (testing phase) and GECA (testing phase)
6. **QA4EO –** Guidelines and Document Repository
7. **Data Access –** Access to Cal/Val Data → Reference Data
8. **Cal/Val Wiki and Forum –** Collaborative tools for Cal/Val Topics
9. **IVOS –** Information on IVOS, VICASEOSS and collaborative tools.

Cal/Val Portal: Test Sites

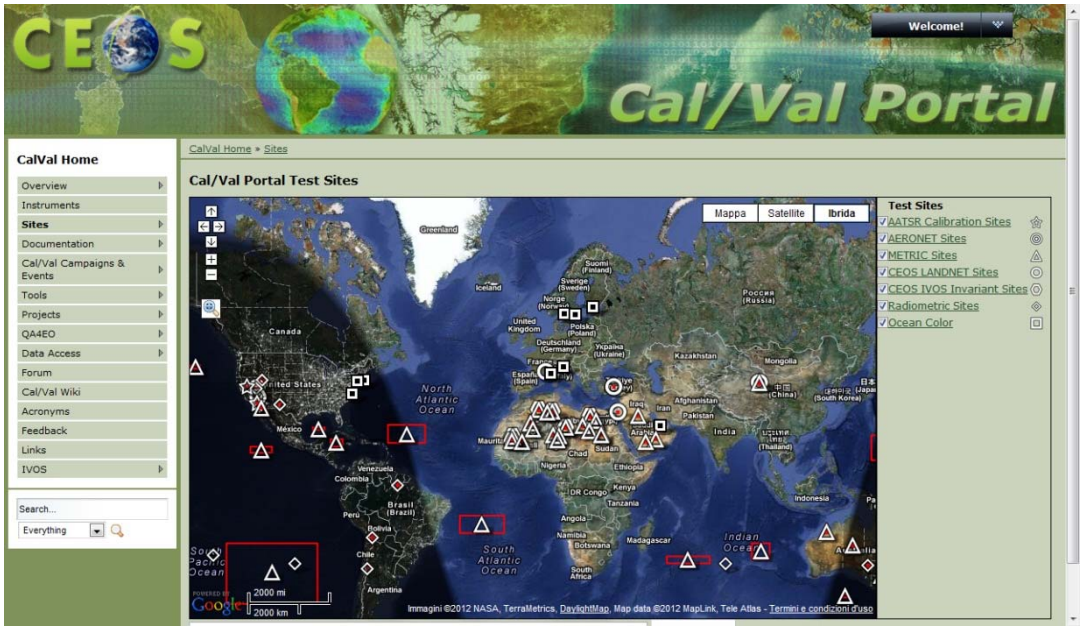
1. LANDNET SITE – Documentation and Information organised per site
2. Other sites: Organised per domain, more information to be added (on going) → need support/point of contact per domain
3. Documentation on Methodologies, Site Characterisation, Climatology and Reports

Ex: LANDSAT data over LANDNET site.

Collaboration USGS.

One site used as Demonstration.

Activities on-going



Cal/Val Portal: GECA

Generic **E**nvironment for **C**al/Val **A**nalysis (Webserver + Open Source Toolkit)**:**

- Access to Satellite Data (Envisat and ERS series)
- Access to Correlative Data
- Satellite/Correlative Cross Search
- Access to auxiliary data
- Best Practise analysis functions
- Data filtering and processing
- Automatic Report Generation

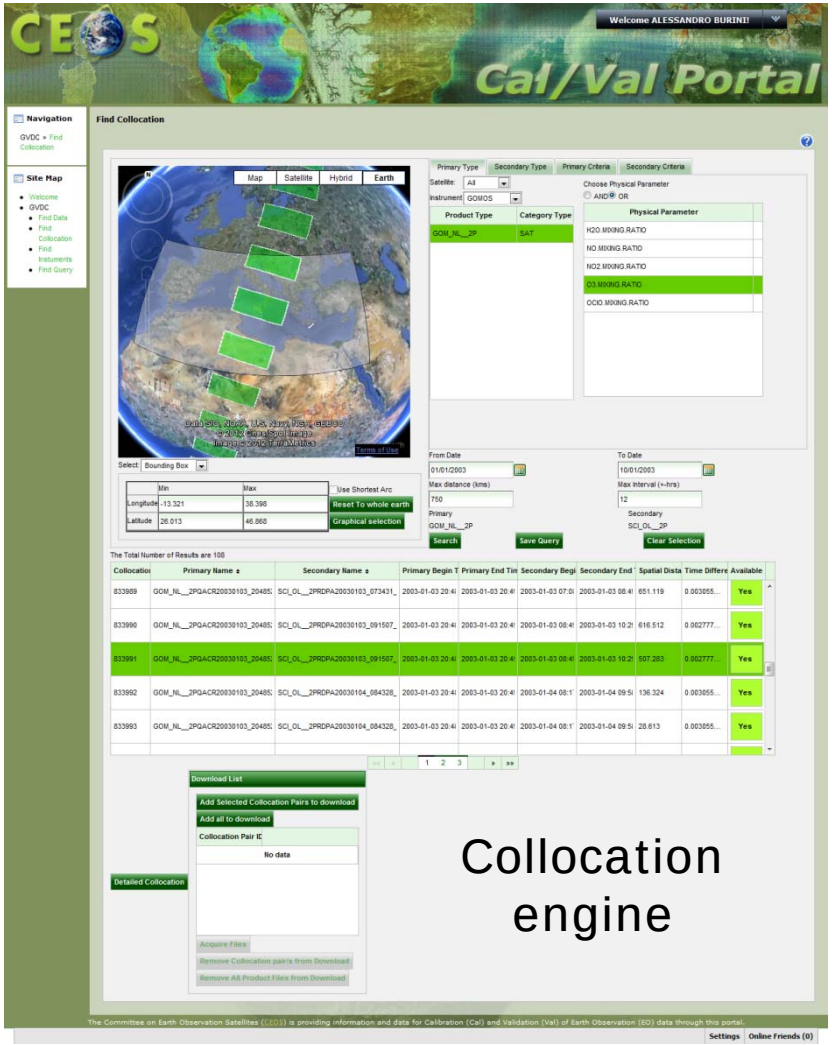
Other activities:

Harmonisation on Metadata (via GEOMS, Generic EO Metadata Standard)

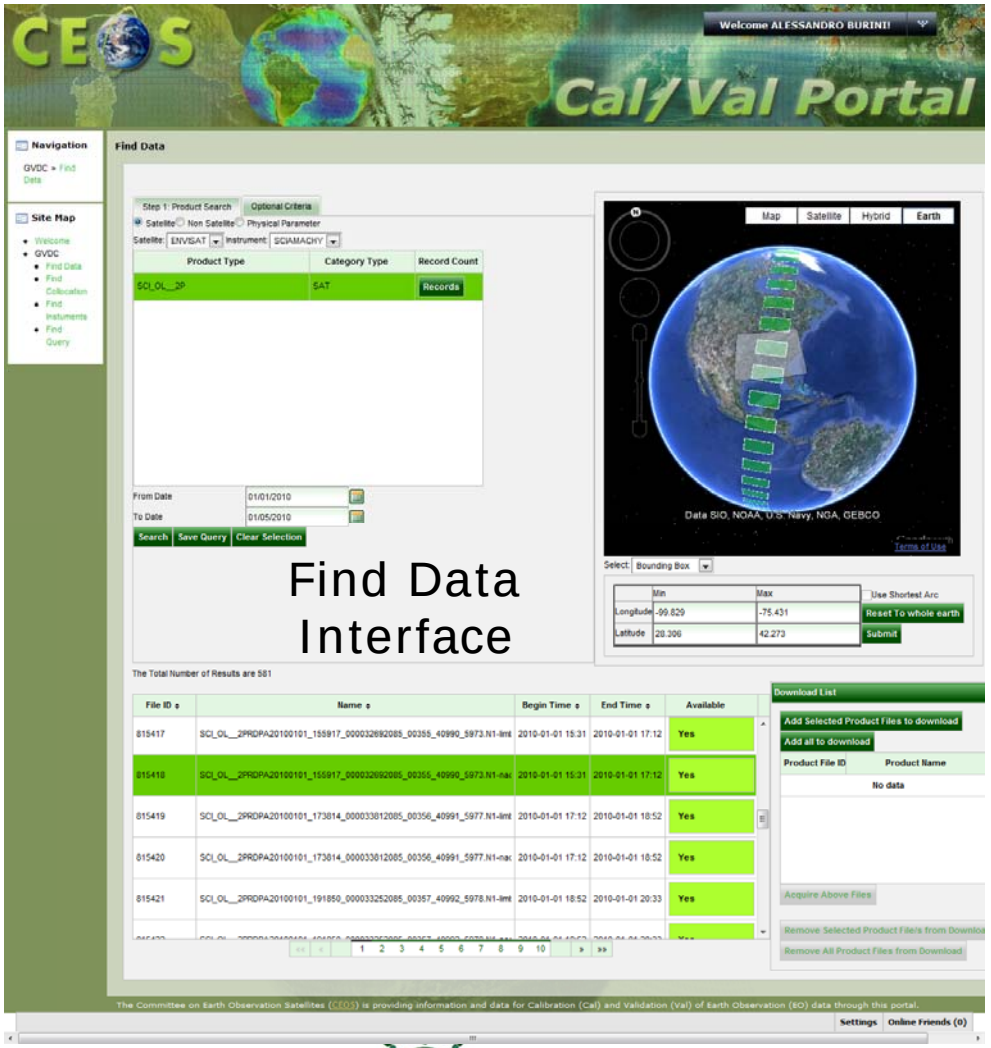
Support to Data Centres

geca
generic environment for cal/val analysis

GECA: User Interface



Collocation engine

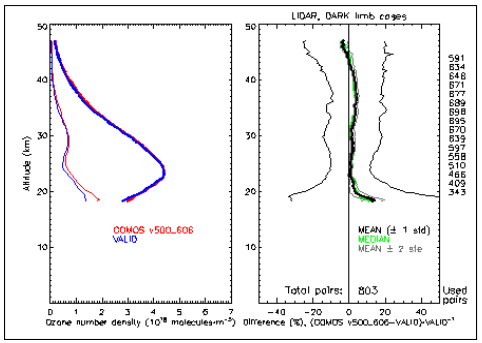


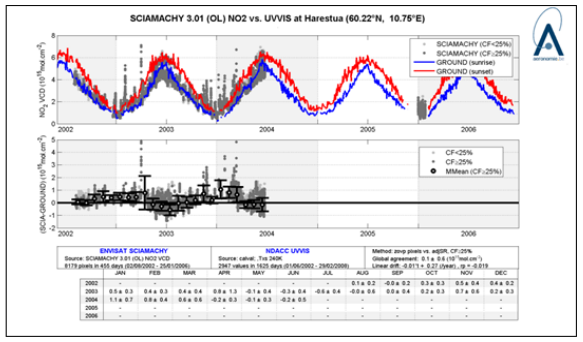
Find Data Interface

geca
generic environment for cal/val analysis

GECA: from the users' point of view

1. Through GECA, it is possible to :
    a. Access to data (satellite / correlative)
    b. Inter-compare Satellite to satellite – satellite to in-situ data
    c. Co-locate Satellite /satellite / in –situ data
    d. re-grid, scale and plot data
    e. Schedule queries
    f. Run collocation on your dataset by means of the Open Source Toolkit



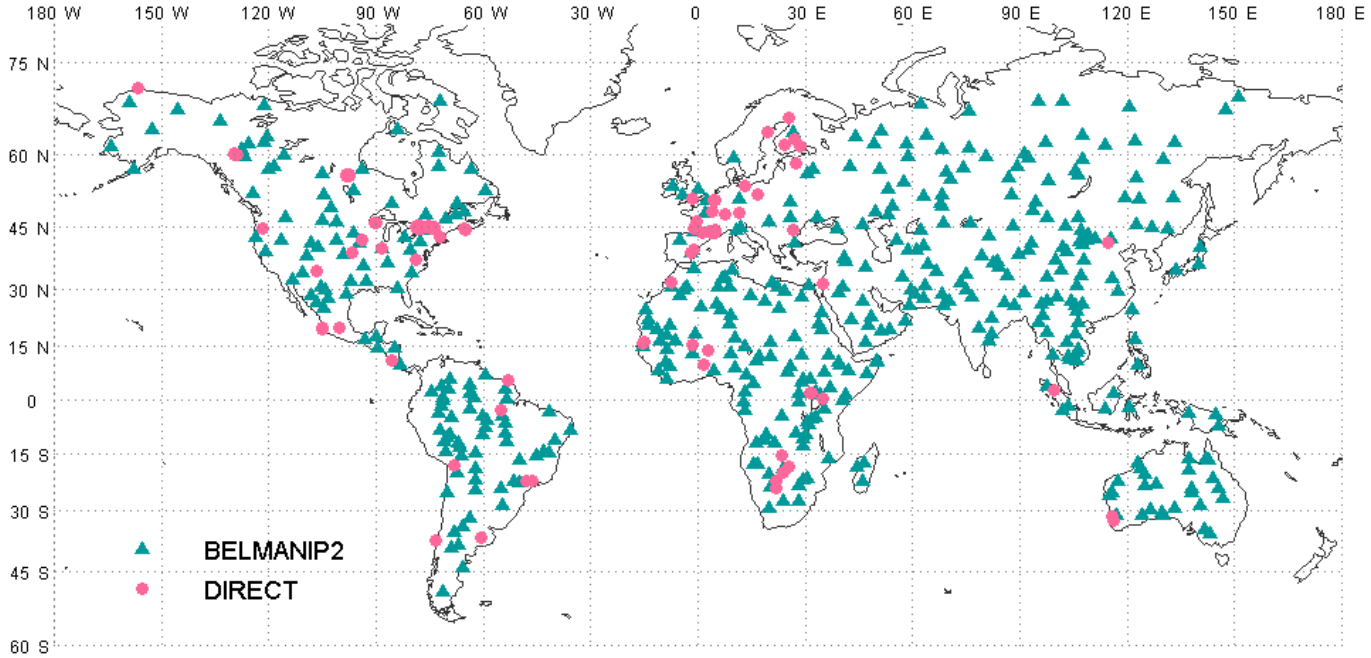


OLIVE: On Line Validation Excercise

OLIVE is a web tool to validate **LAI, fAPAR, fCOVER** over a fixed list of sites (**BELMANIP2** and **DIRECT)**

BELMANIP2: 445 sites that represent the biome proportion of the Earth surface (49x49km²)

DIRECT: 113 ground validation campaigns that fulfill CEOS/LPV protocols (3x3km²)



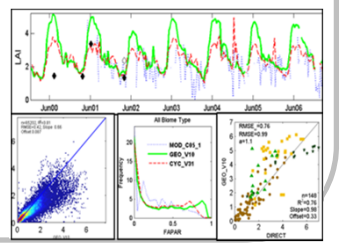
The OLIVE concept

Information to the scientific community

- ✓ Validation exercise content description (CEOS/LPV framework)
- ✓ Available product description
- ✓ Datasets description
- ✓ Available Validation Results

Validation Exercise (private or public mode)

- ✓ Evaluate a new product
- ✓ Inter-comparison between products
- ✓ Validation against ground measurements
- ✓ Validation Report



Scientific community contribution

- ✓ Add new product
- ✓ Add new ground validation site criterions defined by CEOS/LPV

OLIVE Scientific Contribution

1. Add new product
    a. Producers are invited to add their products to the existing database
        – 49x49km² extracts over BELMANIP2 and DIRECT sites must be uploaded on OLIVE web site in a standard format (csv header, binary file for data, xls file for metatdata)
    b. They can keep them private, run some validation exercises and make them available to the scientific community when they are satisfied with the results

2. Propose ground validation measurements
    a. The site must fulfill criterions defined by CEOS/LPV
    b. The user must document the site & associated measurements
    c. A review is performed by the CEOS/LPV subgroup
    d. The site is included in OLIVE if approved by CEOS

DIMITRI development: status

- The DIMITRI database population is nearly completed:

Sites	Sensors	Years
Amazon forest BOUSSOLE Dome-C Libya-4 South Indian Ocean South Pacific Ocean Tuz Golu Uyuni	AATSR ATSR-2 MERIS MODIS-A Polder-3 VGT 2	2002 to 2012

- The development of the tool is completed: data ingestion, cloud screening, methodologies for the radiometric intercomparison of sensor and GUI.
- Only minor debugging excepted before the final acceptance (July 2012)
- Public release of the database and code through the Cal/Val portal in late summer 2012
- Final meeting in September 2012

Reference: Kent C., Bouvet M., Barker B., DIMITRI: the Database for Imaging Multi-Spectral Instruments and Tools for Radiometric Intercomparison, submitted to TGARS special issue (2012)

IVOS WG4: status

Objective:

WG4 aims at intercomparing the results of methodologies making use of pseudo-invariant sites

Members:

CNES, ESA, RAL and VITO. Supported by ARGANS, ACRI and ONERA

Methodologies:

- Long term drift monitoring from RAL
- CNES pseudo-invariant site methodology
- Govaerts' TOA signal simulation methodology
- DIMITRI matching geometry methodology

IVOS WG4: status

Timeline:

- October 2011 (Harwell, UK): KO. The approach is agreed: a reference dataset of L1b extraction should be generated from both SADE and DIMITRI (see next slide)
- February 2012 (CNES HQ, France): First results of application of the vicarious calibration methodologies presented based on a preliminary version of the reference dataset
- April 2012: updated version of reference dataset released
- End May 2012 (teleconf) to discuss (re)application of vicarious calibration methodologies to the updated reference dataset
- End June 2012 (ESRIN?): final meeting => TN describing the work carried out in the WG4

IVOS WG4: the reference dataset

- A reference dataset has been produced by ARGANS, CNES and RAL, consisting of extractions in the CNES SADE format, from 3 sites, 5 sensors and over 4 consecutive years.
- The common reference dataset consists of the mean, and standard deviation, TOA reflectance extracted from sensor observations, and consists only of cloud screened data.
- Viewing and Solar geometries for each sensor observation are provided
- Where available, corresponding Wind speed, Ozone, Pressure and Water Vapour values are provided for each sensor observation. Sources are ECMWF and NCEP.

Sites	Sensors	Years
Libya-4 Niger-2 Dome-C	Polder-3 AATSR MERIS VGT 2* MODIS-A	2006 2007 2008 2009

** Currently, only data from 2009 is available for VGT 2 over Dome-C*

IVOS WG4: the reference dataset

ARGANS (DIMITRI)

- Provided data for all sensors over Libya-4 and Dome-C:
- MERIS data corrected for SMILE effect; latest RAL calibrations applied to AATSR; includes VITO correction of VGT-2 reflectances
- Data cloud screened using published algorithms as well as visual inspection; only completely clear sky observations included
- Meteorological data taken from satellite L1b products

CNES (SADE)

- Provided MERIS, MODIS-A, PARASOL and VGT-2 data over Niger-2 (and Libya-4 for comparison with DIMITRI dataset):
- MERIS data taken from METRIC extractions, PARASOL and VGT-2 data processed at CNES
- Cloudy or suspect pixels removed from sensor observation averages
- Meteorological data taken from NCEP

RAL

- Provided AATSR data over Niger-2:
- Utilized latest RAL calibrations coefficients
- Meteorological data taken from ECMWF

Approx # Products	AATSR	MERIS	MODIS	PARASOL	VGT-2
Libya-4	122	384	880	265	740
Dome-C	299	626	1032	157	102
Niger-2	241	379	783	374	881

Long Term Preservation of Earth Observation Data: status and next steps

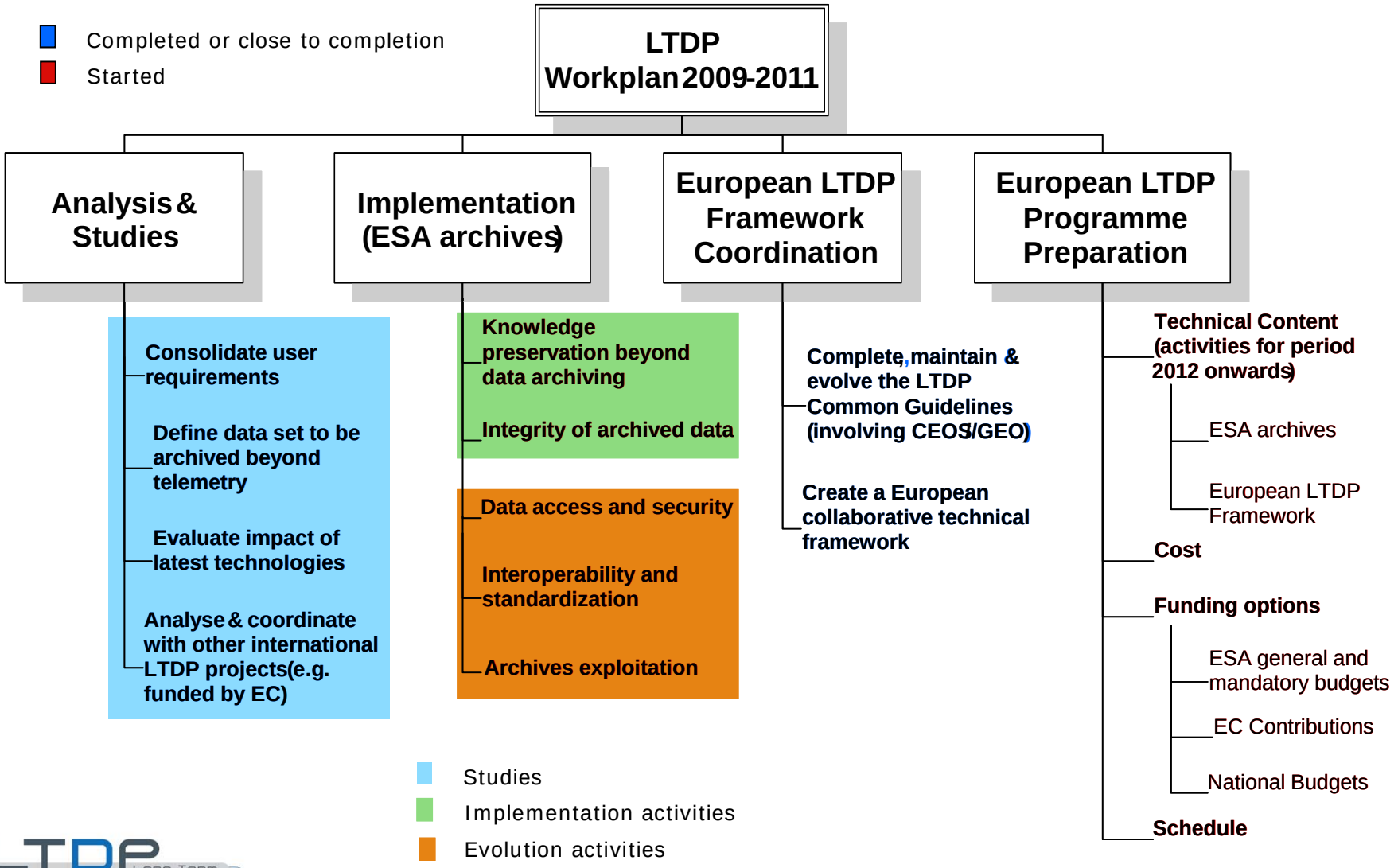
ESA LTDP EO Preliminary programme

- Approved in 2008 for the period 2008-2012.

- Main activities:
  - Implementation of essential actions in ESA facilities focusing on data preservation and enhancement of data access.
  - Consolidation and promotion of “LTDP Guidelines” and “Preserved Data Set Content” in Europe and within CEOS and GEO.
    - Application to ESA missions.
  - Coordination of LTDP activities, with the involvement of all European data owners and archive holders, to set-up of the European EO LTDP Framework.

- QA4EO/LTDP activities: GSP (General Studies Programme) study on Quality for EO Framework (QA4EO) impacts on LTDP started in Q3 2011.

ESA EO LTDP Preparatory Programme 2009-2012 Work Plan



ESA LTDP Programme 2013-2017

- Presented for approval at ESA CMIN in November 2012.
- Objective to guarantee long term preservation, access and exploitation of data, and associated knowledge, generated by ESA and ESA-managed Third Party missions in ALL fields of space Science and in particular:
  - Scientific data generated by payloads and instruments onboard **space platforms** (e.g. spacecrafts, ISS) **today not preserved systematically.**
  - Enabling and supporting ESA's and European Exploitation Programmes and activities requiring long term data series (e.g. Climate Change Initiative) or the utilization of old data holdings in the long term (e.g. in astronomy for change detection in stars, pre-ISS missions in Life & Physical Sciences) and to support new missions.
  - In coordination with other space science data owners in Europe aiming at coherently preserve all European data and associated knowledge.
  - Committing to the long-term scientific return on ESA programmes initial investments.

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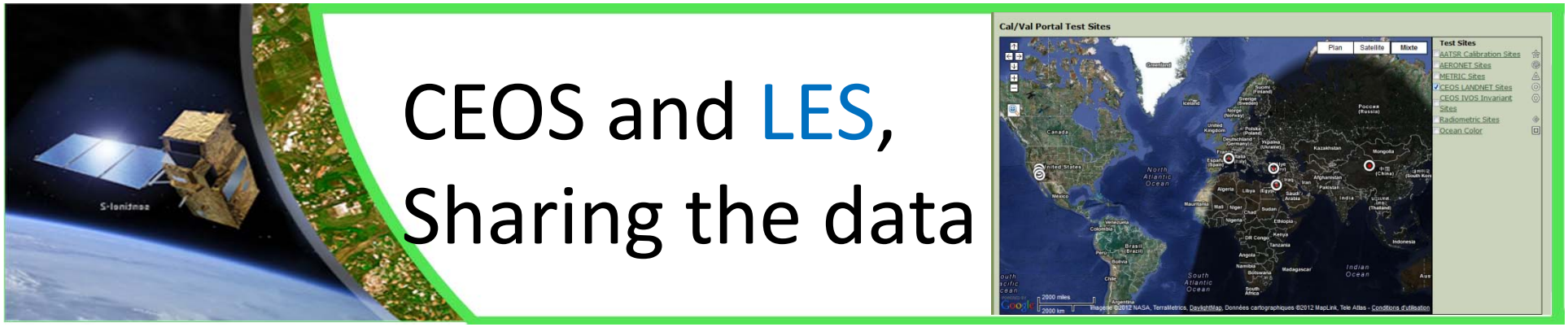
European Space Agency



CEOS and LES, Sharing the data

- The CEOS should be the forum to propose to exchange data for vicarious calibration purposes with:
  - (i) A site to put in the different pieces of information. The calval portal is an opportunity.
  - (ii) A monthly bulletin to inform in advance about the field campaigns.
  - (iii) An agreement on the content of in situ database (content, format,…).
  - (iv) The generation of a satellite data base over test sites.
  - (v) A maintained web site for this in situ and satellite sensors data base (Again the calval portal?)

IVOS Vicarious calibration

LANDNET

- Can we build a network ?
- We would need in-situ DB (information, content, format)
- Data Policy ?
- Satellite data extracted
- Tools

Non equipped sites

- Various methodologies, best practises
- Various scope (inter-temporal, inter-band, relative, absolute)
- Data extracted
- Tools