# GEO Task DA-09-01a

## GEOSS Quality Assurance Strategy

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# Task Definition - Reference

- From the GEO web site:
  - http://www.earthobservations.org/
- In the section documents
  - The GEO Work Plan 2009 – 2011
  - Description of the task **DA-09-01: Data Management**
    - (page 8 of the document)

Identify and implement recommendations for best practices of Earth Observation data and information life cycle management. Improve data discovery, availability, near real-time access and traceability including data tagging for citation tracking.

  - This task is divided into two sub tasks:

# Task Definition – DA-09-01a

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, and including quality issues of derived information products. Develop a GEO data quality assurance strategy and implementation process, beginning with space-based observations and expanding to in-situ observations, taking account of existing associated GEOSS quality assurance work, and including the quality issues of Earth observation information products. A Quality Assurance framework for Earth Observation (QA4EO) has been developed and is now being implemented. As a consequence of implementation, it is proposed that GEOSS data set registration include associated quality assurance information to enable harmonization and interoperability, which during the transitional phase could be a voluntary self declaration of compliance with respect to QA4EO and/or at least its underlying principles.

# Motivation / Background

The Quality Assurance Framework for Earth Observation (QA4EO) provides the structure and guidance to enable individual organisations to document, in a consistent manner, the necessary evidence of compliance, thereby allowing those commissioning the work to assess its adequacy and "fitness for purpose". QA4EO-compliant processes would unequivocally assure data quality and would enable and encourage harmonisation across the whole GEO community.

# Task output

Widely implemented Quality Assurance Framework for Earth Observation (QA4EO) principles with sets of community approved, operational guidelines (including key and more community-specific guidelines) to assist implementation of QA4EO into specific domains throughout the GEOSS community. The fundamental principle of QA4EO is that all EO data and derived products have associated with it a documented and fully traceable quality indicator (QI).

# Activities

- The review and update of the QA4EO documentation is an ongoing process; the documents are seen as living documents that will be open to review and update at any point should the need arise.

- The QA4EO task team will be augmented to include representatives from other GEO tasks and all Societal Benefit Areas (SBAs). The team will provide a coordination role, monitor progress and provide a guidance, harmonisation and capacity building function.

- Outreach into the wider GEOSS community will be an ongoing process to ensure that QA4EO is applicable and relevant to all EO communities.

# Cross-cutting components: Architecture & Data

- QA4EO information and documentation is maintained on the QA4EO website at http://qa4eo.org/

- Compliance to QA4EO (or level of compliance) is now being requested of GEO data providers. This requires a declaration facilitated by completion of a questionnaire, which needs to be linked to any dataset for users to view.

# Cross-cutting components: Capacity Building

QA4EO provides the framework, tools and infrastructure to enable datasets to be harmonised and combined in a consistent and reliable manner, facilitating new global services using combined resources. The guidelines and best practices developed as part of this process, including the existing key guidelines, can and should be considered training and educational material to aid organisations in existing data producing nations, as well as those emerging, to produce high value data products to the GEO community efficiently and in a cost effective manner.

# Cross-cutting components: Science & Technology

- QA4EO and its operational guidelines represent the means to demonstrate the value and performance of the cutting edge in scientific and technological development within specific communities. Guidelines will be updated as new community-approved best practices emerge.

- All communities should be pro-active in providing updates to their best practices and so enabling QA4EO-approved best practices to be truly reflective and current guidelines.

# Cross-cutting components: User Engagement

The QA4EO process is very much user driven and user led. All users and user communities are welcome to contribute at any stage.

# Task Contributions

**Australia**

Share results on calibration/validation activities being undertaken at Geoscience Australia for EO missions using Australian test sites and participate in discussions on best practice approaches for calibration/validation processes.

**Germany: DLR RD-RE**

Member of CEOS WGCV, CalVal Expert for DLR missions

**Japan: JAXA**

To contribute implementing the GEOSS Data Quality Assurance through CEOS/WGCV.

# Task Contributions

## CEOS: BNSC/NPL

Develop radiometric standards for use in Earth Observation and develop a handbook. CEOS Reference Test Site Data Collaboration and Comparison. Benchmark mission coordination between TRUTHS and CLARREO missions - CLARREO early phase studies are progressing well supported by NASA and a dialogue has been established and being formalised with the UK, however, no resource has been identified as yet by UK or ESA to support the necessary study. The 2009 international cross-comparison of ground-based Cal-Val support techniques and instrumentation for both IR emitted radiance (SST) and VIS/SWIR reflected radiance (Land) were highly successful. Following the success of these first comparisons plans are being initiated for a similar effort to support Ocean Colour sensors, particularly for type 2 waters and to support the Ocean Colour virtual constellation.

# Task Contributions

## CEOS: ESA/USGS

Quality Assurance Framework for Earth Observation (QA4EO) Implementation. Develop Cal/Val Portal and post-launch Test Sites - work is now in progress to expand the catalogue to sites for other applications and other sensor domains and also to allow storage of associated satellite imagery by USGS. CEOS Reference Test Site Data Collaboration and Comparison. Organise a QA4EO workshops as necessary. Continue outreach activities into the wider GEO communities through publicity material and conference / meeting presentations. Special session on QA4EO a great success at IGARSS 09. Article on QA4EO a great success at IGARSS 09. Article on QA4EO published in the last GEO newsletter. A "QA4EO compliance" questionnaire is under discussion for inclusion in the requirements for data registration to GEO.

# Task Contributions

**CEOS: NOAA**

DOME C experiment. A common protocol has been established and support meteorological data has been obtained from researchers at the site base.

**EC**

EU-project *HYPOX* complying quality control of Hypox data.

**Russia: ROSCOSMOS/VNIIOFI**

Quality Assurance Framework for Earth Observation (QA4EO) implementation in the Russian Federation. Work on pre-flight and post-launch calibrations is aimed at ensuring the consistency of radiometric measurements, including the development and use of onboard fixed-point blackbodies.

# The DA-09-01a actions

- DA-09-01a_6: Ground-based Cal/Val Campaign (Fox)
- DA-09-01a_8: Cal/Val & Post-launch Test Sites (Chander / Burini)
- DA-09-01a_11: Reference Test Site Data Collaboration & Comparison (Fox / Chander / Cao)
- DA-09-01a_12: DOME-C Multi-sensor Experiment (Fox / Cao / Srivastava)
- DA-09-01a_13: QA4EO (Lecomte / Stensaas)