

QA4EO Task Team

QA4EO Secretariat Marie-Claire Greening t: +44 (0) 1730 267548 marie-claire@greeningconsulting.co.uk

Quality Assurance Framework for Earth Observation:

Facilitating Applicability

in the

GEOSS Architecture Implementation Pilot – Phase 3 (AIP-3)

Kickoff Response Due Date: 3 March 2010

Points of Contact:

Giuseppe Ottavianelli
European Space Agency
Data Quality and Algorithms
Management Office
Giuseppe.Ottavianelli@esa.int
Tel: +39 - 06 94 180 484
Email:

Gregory L. Stensaas US Geological Survey (USGS) Center for Earth Resources Observation and Science stensaas@usgs.gov Te: +1 (605) 594-2569 Pascal Lecomte European Space Agency Head of the ESA Climate Office Pascal.Lecomte@esa.int Tel +44 1235567920

Table Of Contents

1	0\	verview	3
2	Pr	oposed Contributions	3
	2.1	Societal Benefit Area Alignment and Support	3
	2.2	Component and Service Contributions	4
	2.3	Architecture and Interoperability Arrangement Development	4
3	De	escription of Responding Organization	4

QA4EO Response to the GEOSS AIP-3 CFP

1 Overview

In the framework of the efforts to implement an operational GEOSS architecture and establish agreed Interoperability Arrangements, it is necessary to support the application of the Quality Assurance Framework for Earth Observation (QA4EO) developed to achieve harmonisation and facilitate interoperability between data type and sources.

With the understanding that measurements/processes are only significant if their "quality" is specified, the established QA4EO guidelines specify that all data and derived products must have associated with them a Quality Indicator (QI) based on documented quantitative assessment of its traceability to community agreed (ideally SI) reference standards

2 **Proposed Contributions**

The QA4EO Task Team is proposing to provide the needed guidance to any GEOSS element or SBA that needs to improve its data quality assurance strategy in the framework of AIP. Specifically, the QA4EO Task Team will provide:

- a questionnaire that can be used by any interested entity for the tailoring of QA4EO
- general guidance and know-how on specific matters to support the SBAs.
- recommendations for GEOSS Interoperability Arrangements

2.1 Societal Benefit Area Alignment and Support

The figure below show the range of applicability of QA4EO with respect to GEOSS.



disasters, health, energy, climate, water, weather, ecosystems, agriculture, biodiversity

Clearly, QA4EO represents a keystone assuring the success of QA4EO. For this reason, it is necessary to provide generalized support toward the different SBAs and other GEOSS elements.

The proposed participation of the QA4EO Task Team will eventually show how to effectively apply QA4EO from both the data provider and data user perspective.

A questionnaire that can be used by any interested entity for the tailoring of QA4EO for their activities will be produced and distributed.

2.2 Component and Service Contributions

The QA4EO Task Team will provide general guidance and know-how on specific matters to support the SBAs. It will point the interested parties to the correct documents, allowing the correct implementation of QA4EO for the overall success of GEOSS.

The QA4EO Task Team will not focus on a single scenario, but any activity performed could be used as case studies useful as examples for future activities, striving to achieve complete QA4EO compliant processes.

2.3 Architecture and Interoperability Arrangement Development

The QA4EO Task team will provide recommendations for the GEOSS Architecture and Interoperability Arrangements. The concept of a Quality Flag is also being investigated.

It is foreseen that the QA4EO Task Team could interact with the Standards and Interoperability Forum (SIF) and GEOSS Standards Registry to assist AIP participants with understanding interoperability objectives with respect to particular standards or special arrangements.

The QA4EO task Team will review the possibility to integrate the guidelines within the GEOSS Best Practice Wiki (BPW) so that what is believed to be a best practice can be recorded for others to benefit from as they decide to participate in GEOSS.

3 Description of Responding Organization

The Group on Earth Observations (GEO; http://earthobservations.org/) was founded in 2003 following calls for action from the World Summit on Sustainable Development and the G8 of leading industrialised countries. These high-level meetings recognised that international collaboration is essential to exploit the growing potential of Earth Observations to support decision making in an increasingly complex and environmentally stressed world.

GEO is a voluntary partnership of governments and international organisations that provides a framework for the coordination of effort and strategies to address common goals. In 2005 it launched a ten-year implementation plan to establish its visionary goal of a Global Earth Observation System of Systems. The key objective of GEOSS is to

deliver comprehensive and timely "knowledge information products" worldwide to meet the needs of its nine Societal Benefit Areas (SBAs).

This will be achieved through the synergistic use of data. Data may be derived from a variety of sources (satellite, airborne and in situ) at all scales – global, regional and local – through the coordinated resources and efforts of the GEO members. As this is a voluntary process, "adaptor plugs" must be developed to accept all (properly documented) data. GEOSS aims to allow the provision of, and the access to, the Right Information, in the Right Format, at the Right Time, to the Right People, to Make the Right Decisions.

GEO identified the need 'to develop a GEO data quality assurance strategy, beginning with space-based observations and evaluating expansion to in situ observation, taking account of existing work in the area' (GEO task DA-06-02 [2], now DA-09-01).

Calibration and validation (Cal/Val) is critical to data quality assurance (QA) and therefore data usability. The Committee on Earth Observation Satellites (CEOS)'s Working Group on Calibration and Validation (WGCV), in partnership with the Institute of Electrical and Electronics Engineers (IEEE), were therefore natural leads to carry out this task for space-based observations. By taking a generic approach and building on broad-based, non EO-specific QA best practices that utilise, amongst others, the expertise of the national standards laboratories of the UK and USA, these organisations sought to encompass the needs of the wider GEO community in a single QA framework. That framework is evolving to take account of the needs of the SBAs and to involve the wider community in the evolution and implementation of QA4EO into GEOSS.

The international cal/val community established an international QA framework to facilitate harmonisation and interoperability of EO data, derived products and the various tools and assets required to achieve them. The principles and operational details were debated with representatives at the GEO/CEOS workshop on quality assurance of calibration and validation processes: Guiding Principles, held in Geneva in October 2007, and its subsequent workshop partner, Establishing an Operational Framework, held in Gaithersburg in May 2008.

The QA4EO workshop on Facilitating Implementation, held in Antalya, Turkey, chaired by GEO and organized by Global Space-Based Inter-Calibration System (GSICS), in September 2009, broadened the scope for QA4EO by involving representatives from a range of SBA communities in the process.