Harmonisation of Quality Information

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Future Trends

- **Future Earth Observation products/services envisage the fusion of data acquired by several sensors/platforms. At the same time a single satellite will answer the requirements of different end-users.** (e.g. multi-mission cooperation scenarios are foreseen in the GMES Data Access Portofolio – introduction of the concept of Data Set)

- Such product/services require *"...**a comprehensive understanding of the radiometric and geometric properties of each of the input data sets** forming the composite because misinterpretation of the modelled results can carry critical social, economic, and political implications."*

  (2004_Morain_ISPRS_WGCV_task_force)

Need to establish an harmonised framework for QC, QA and Cal/Val activities across missions and applications

…Previous Sessions

- **Have highlighted the great variability of**

ACTIVITIES & METHODOLOGIES

e.g. test sites, calibration (geometric, spectral and radiometric), pre- and post-launch, validation activities, image quality parameters, etc.

…applied to the various types of instruments: optical, SAR, RA, microwave radiometer, atmospheric instruments.

- **Have emphasized the need to**

  - Agree on compatible quality parameters/criteria/information
  - Establish a consensus on methodologies and best practice
  - Achieve more coordination across Cal/Val activities
  - Have the complete traceability of procedures
  - Agree on data access protocols and policies

*This applies to both the **Satellite data** and the **In-situ data** required for Calibration and Validation Activities*

Harmonisation Objectives

Establish a consensus on both **technical procedures** and **policies** that would:

- **Brings benefits**
  - increase confidence, reliability and effectiveness (quality of end product)
  - encourage the application of EO data (new business/market and services)
  - facilitate sharing and exchange
  - develop cooperation
  - assist interoperability
- **Without hurting research/competition**
  - investigating new methodologies/instruments (Cal/Val is an evolving discipline!)
  - avoid major administration costs

Focus Overview

- **This session will address harmonisation issues related to:**

  - Quality Information definition
  - Presentation of Quality Information to end-users
  - Information flow

  - Algorithms and procedures to derive QIs
  - CEOS endorsement

Session 4

Each process should be associated with

Uncertainty Estimation and Quality Information

Platform – Sensors – Calibration – Validation – Processing Auxiliary data

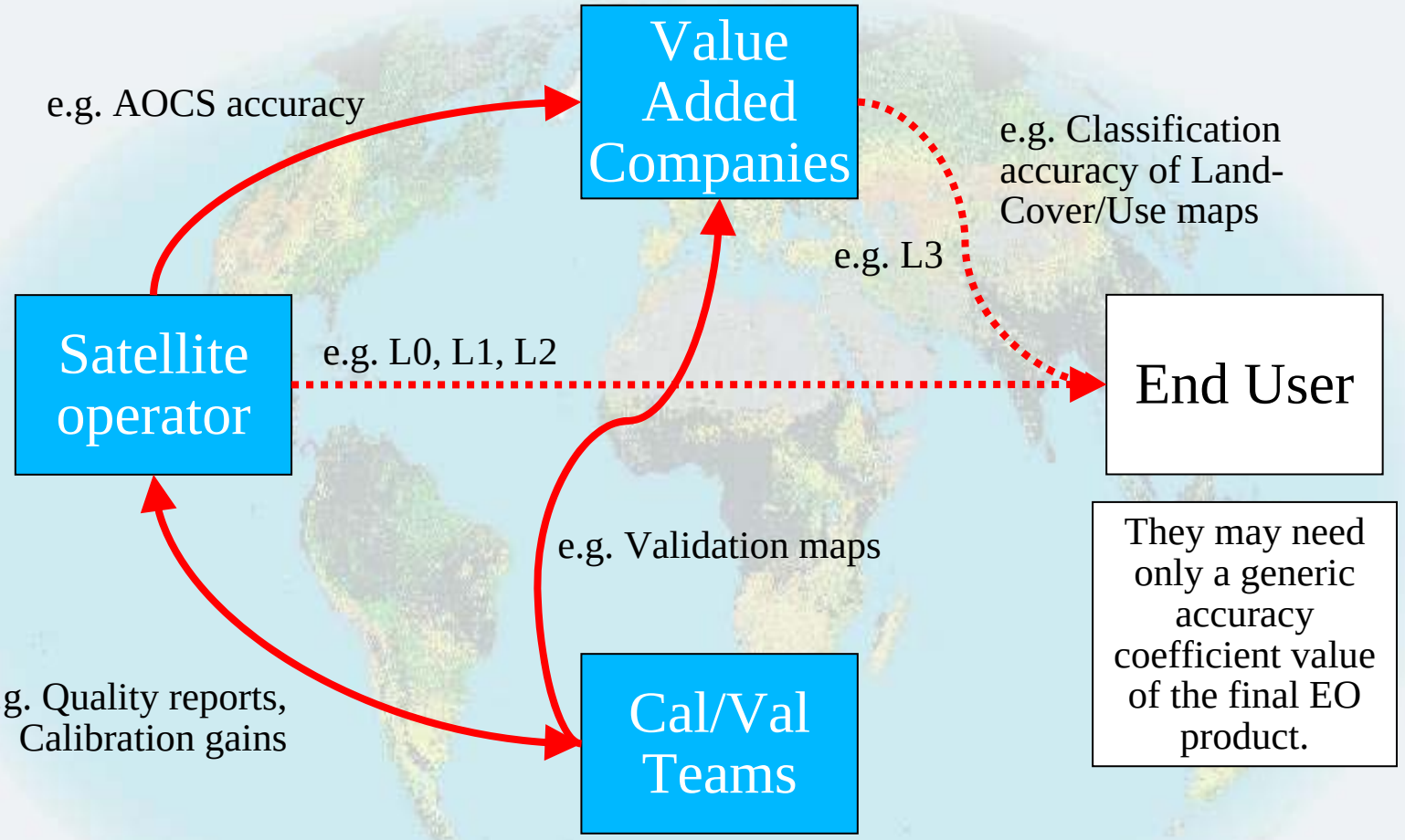
- **Quality Information cover both following aspects**
  - well defined quantities (definition, algorithm, …etc…) that you can find in a "dictionary"

    2005_NIST_terms_and_definitions

    2001_ESA_ASAR_quality_measurements_definition

  - coefficients giving more general information to the end user (e.g. confidence indices for level 3 products).

Information Flow



Entity that has to provide QPs related to its activities

QIs Information Flow.

(The measurement processes should follow harmonised procedures.)

EO data flow

This might be with or without QIs

Quality information

- It is important not only to harmonise the definition of the Quality Information but also the Procedure to derive these QI.

2001 ESA ASAR quality measurements definition

- Standard Definition of the QI

2004 Morain ISPRS WGCV task force

- With the growing number of products, challenges include data access and uniformity, product accuracy assessment, and under-standing the relationship between the multiple products.

2006 Morisette MODIS Global vegetation

- Standardisation of in-situ measurements (e.g. AERONET-OC)

2006 Zibordi AERONET

- Cross-Calibration of various sensors over a set of representative sites

2007 Chander IRSP6 Landsat comparison

2007 Weiss CYCLOPES validation

Improvements ?

- **Is there a need for improvement of the harmonisation of QI ?**
  - A QI is any information that is used to characterise a product or an information that is used to derive that product.
    - Platform information (e.g. attitude)
    - Sensor characteristics (e.g. Calibration, setting)
    - Processing parameters (e.g. Auxiliary Data)
    - Single Sensor Error Statistic
- **What would be the strategy to implement such harmonisation of QI ?**

Information Flow ?

- **Does the information flow have to be harmonised as well ? And how ?**
  - Is Each data provider (either Satellite Operator, Cal/Val Team or Value Added Company) responsible for providing QIs ?
  - Shall QIs necessarily go to the End User, or only be kept for demonstrating the Quality of the products and for traceability ?

Accountability ?

- **Would this establish a sort of "accountability chain" (with or without an actual legal framework) ?**
  - Is Each element in the chain (Satellite operator to Value Added Company) responsible for the Quality Assurance of its own processes or only the last one for the complete chain ?

Harmonisation ?

- **What level of Harmonisation, if any, is required in QC and QA methodologies ?**
  - Is there a need for an Harmonisation of the QC and QA methodologies ?
  - Is there only a need for an Harmonisation of QC and QA output (Quality Information) ?
- **Is there a need for an Harmonisation of Cal/Val methodologies ?**
  - Harmonisation of the “recipes” to derive or produce a measurement
- **In this context of Harmonisation, is CEOS guidelines enough or is there a need for:**
  - **a CEOS endorsement**
  - **a CEOS certification**
    - **How could this CEOS endorsement or certification be implemented?**