Data Quality Guidelines:

Facilitating Data (product) providers in demonstrating "quality" & performance characteristics in consistent and transparent manner

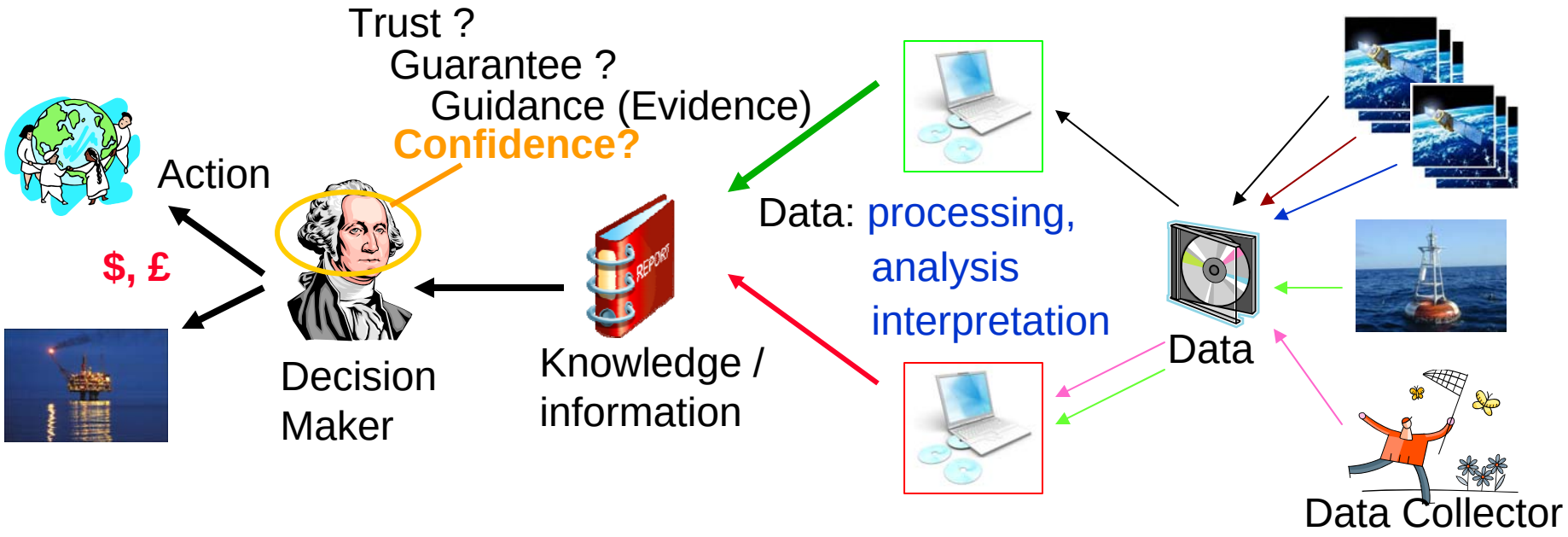
Allowing:

Users (customers) to assess suitability for their application "fitness for purpose" at "face-value"

GEO

CEOS

Why Data QA?



- Process / Effort only needs to be “fit for purpose” – criticality of decision
    - *Consider ALL potential decisions / uses*
- Does NOT necessarily require High accuracy only knowledge of what it is?
- Supplier provides information & Evidence of “quality” in an understandable manner
- “User” (Customer) assesses suitability for their application

GEO QA4EO A QUALITY ASSURANCE FRAMEWORK FOR EARTH OBSERVATION CEOS

Data Quality

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 reference standards. This requires all steps in the data and product delivery chain (collection, archiving, processing and dissemination) to be documented with evidence of their traceability.

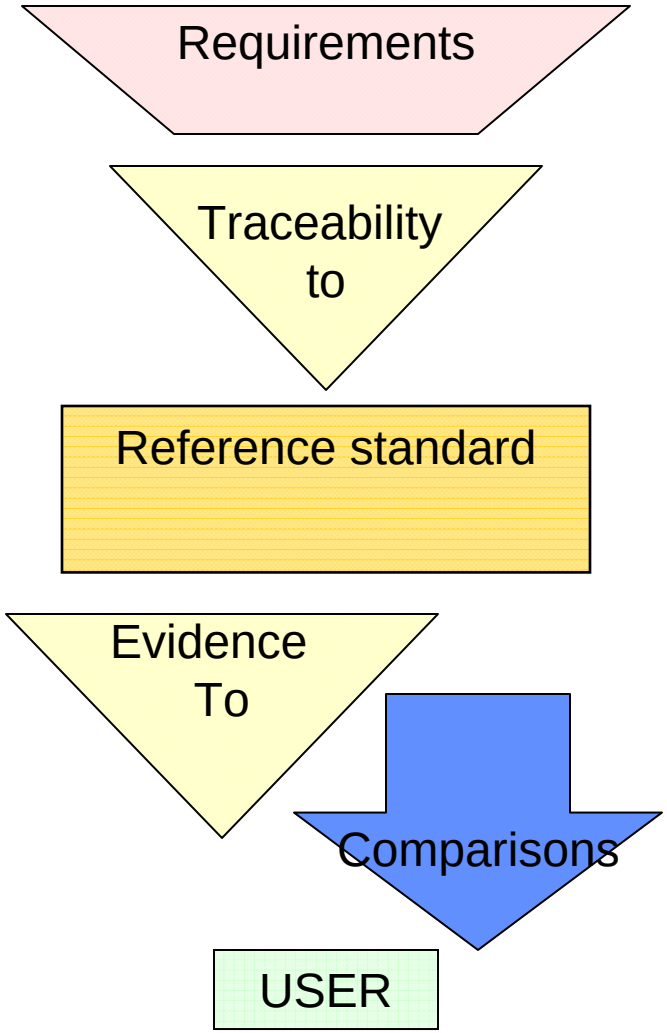
Traceability: ***property of a measurement result whereby the result can be related to a reference through a documented unbroken chain of calibrations, each contributing to the measurement uncertainty*** **(ISO guide 99:2007)**

Note: A RESULT has NO MEANING without an associated UNCERTAINTY

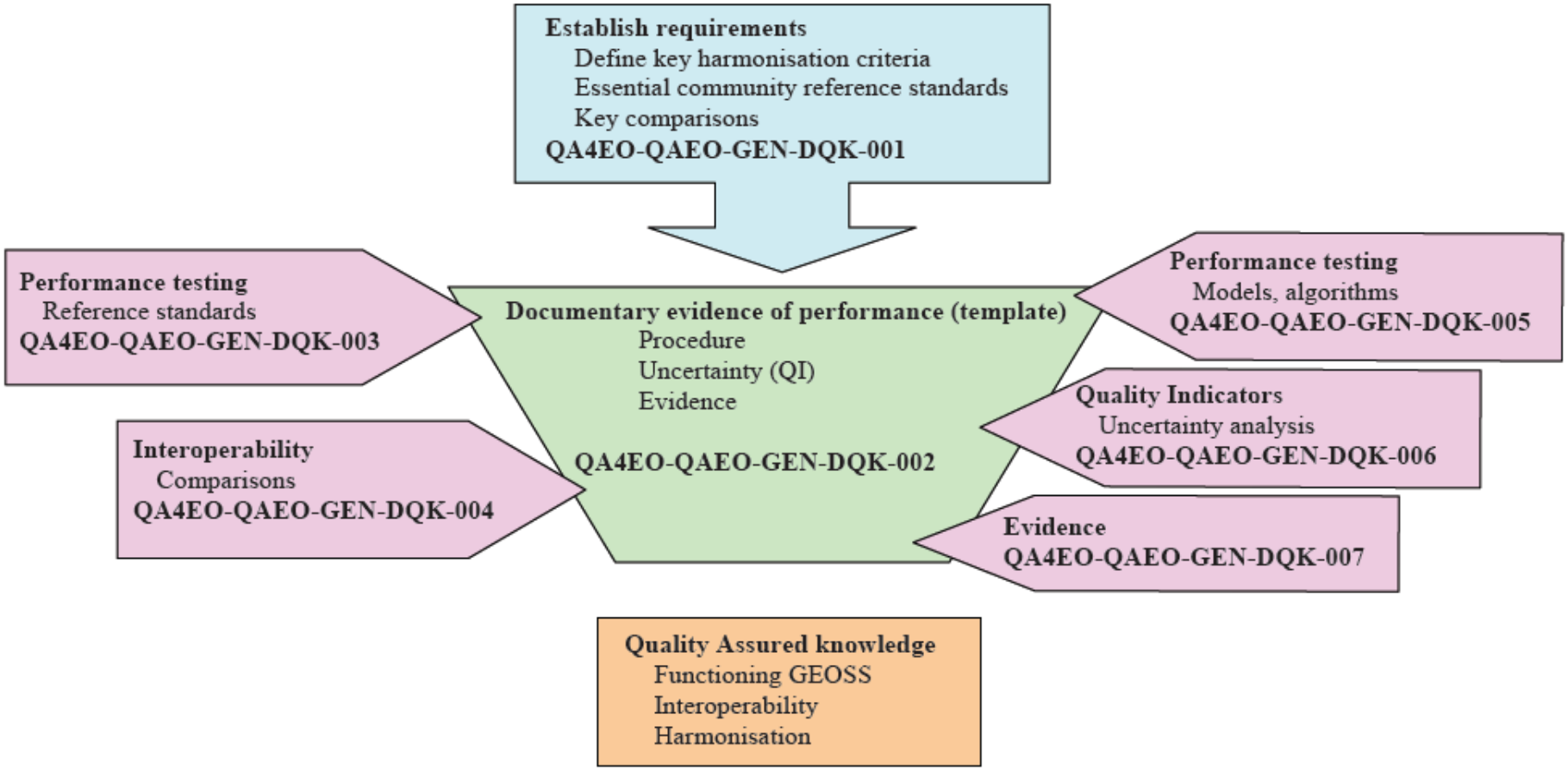
QA4EO Key- Guidelines:

- **are intended to be generic in scope to cover all EO data-related activities**
- **Provide guidance (and indicative templates) on how to establish a QI and the means to obtain and document associated evidence.**
- **Encourage / anticipate community specific interpretations**
- **Need to be supplemented by community/organisation specific "best practises" or "procedures" (operational in nature).**

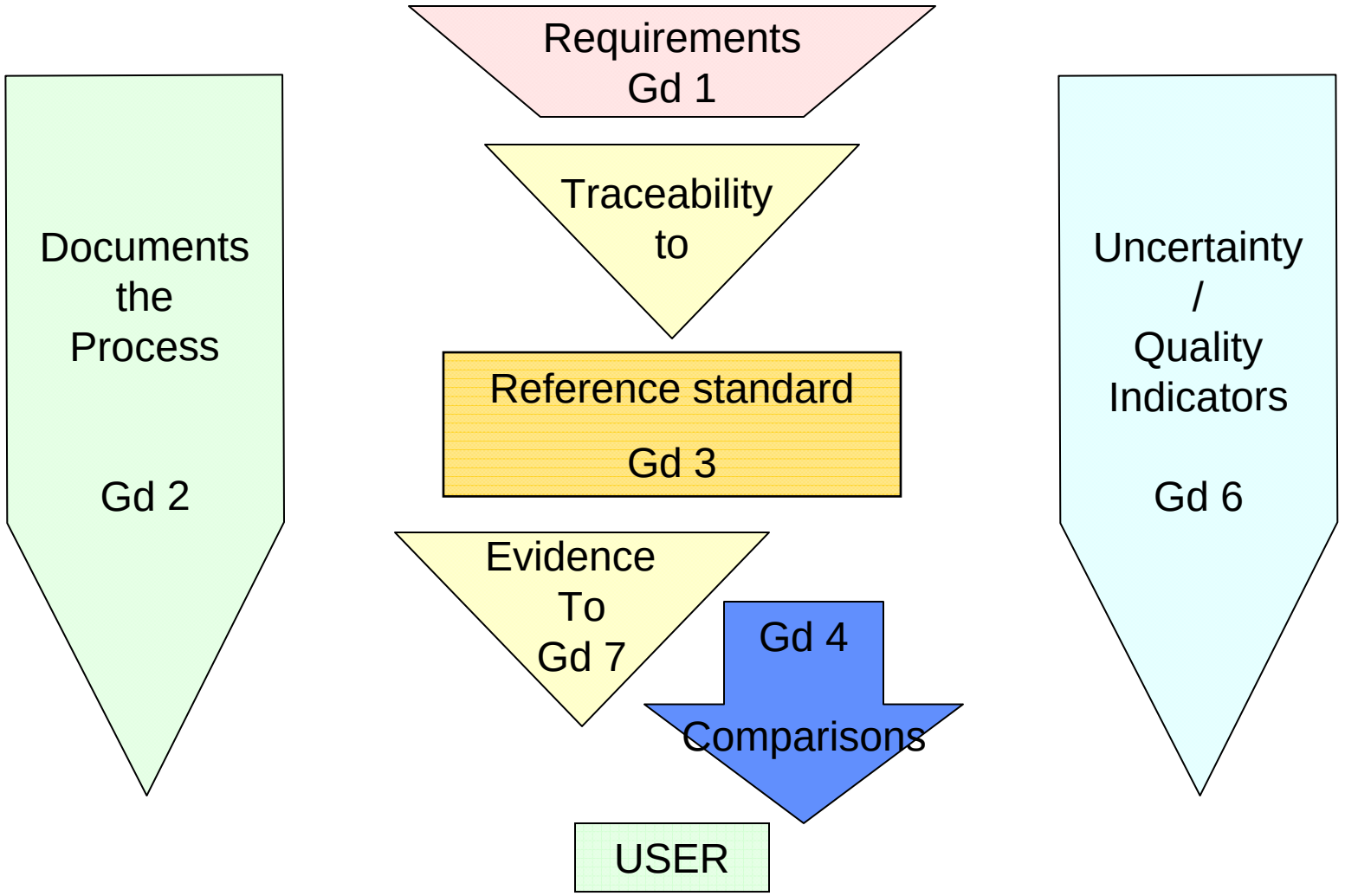
Guideline aims



Data Quality Guidelines : Establishing Traceability



Guideline aims



Data Policy

The data must be freely and readily available / accessible / useable in an unencumbered manner for the good of the GEOSS community, for both current and future users. This necessitates that all Cal/Val data and associated support information (metadata, processing methodologies, Quality Assurance, etc.) is associated with the means to effectively implement a Quality Indicator.
In return, the data provider must be consistently acknowledged.

Guidelines are based on the adoption of existing "best" and commonly used practises

- **Common metadata content and its linkage with data sets**
- **Domain harmonised formats for Cal/Val data exchange**
- **"code of practise" for Cal/Val data providers & users**

Communication and Education

'Interoperability requires all stakeholders to have a clear understanding of the adequacy of the information that they are accessing and using for their specific application, i.e. its "fitness for purpose".
The evidence for this clarity will be accessible and fully traceable to its origins.
The traceability and interoperability process must be understandable by any appropriately trained individual throughout GEOSS and efforts must be made to encourage the wider usage of information and facilitate the training of GEOSS users.'

- **Dictionary of terminology**
- **Maintenance / evolution & utilisation of Cal/Val Portals for all EO sensor domains**

A QUALITY ASSURANCE FRAMEWORK FOR EARTH OBSERVATION

QA4EO within the WMO Global Space-based Inter-Calibration System (GSICS)

Mitch Goldberg, Jerome Lafeuille, Fuzhong Weng and *Robert Iacovazzi, Jr.*

QA4EO Meeting

Antalya, Turkey

September 29 – October 1, 2009

GSICS Objectives

- To improve the use of global observations from operational satellite instruments for weather, climate and environmental applications by means of careful instrument performance analysis, inter-calibration, and validation with reference sites
- To enable re-calibration of archived satellite data for the purpose of creating stable long-term climate data sets
- To encourage pre-launch instrument tests that are traceable to SI standards and that help demonstrate instrument specifications are met

History of Quality Assurance Within GSICS

As earnest work began to create the first GSICS product, the question arose of a product “stamp of approval”.

History of Quality Assurance Within GSICS

This led GSICS Coordination Center to draft a *GSICS Procedure for Product Acceptance* (GPPA), the role of which is to:

Define and document:

- Scope of product within the GSICS product portfolio
- Theoretical basis, and implementation and distribution strategy, of product
- Product Quality (uncertainty, quality indicators, etc)

GPPA Leads to Three Product Distribution Modes:

1) **Rejection Mode** - Not distributed as a GSICS product

2) **Demonstration Mode** - Favorable potential GSICS product implemented on an experimental basis without Executive Panel approval

3) **Full Acceptance Mode** - Final product acceptance given by the GSICS Executive Panels

History of Quality Assurance Within GSICS

GSICS Procedure for Product Acceptance guidelines were based on:

- Knowledge gained through interactions with the CEOS Working Group on Calibration/Validation (WGCV) as its members collaborated on GEO Task DA-06-02 (GEOSS Quality Assurance Strategy- now DA-09-01a)
- Strengths of the different GSICS members
- Structure of the GSICS organization
- Current GSICS capabilities

GSICS is developing its quality assurance procedures in coordination with its first products – the GSICS GEO-LEO and LEO-LEO Corrections