

The GEO-Label: a Service for Data Users and a Tool for Facilitating Societal Benefits of Earth Observations

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The GEO-Label: a Service for Data Users and a Tool for Facilitating Societal Benefits of Earth Observations

- The GEO Label: A Introduction
- Goals of Data Labeling
- Basic Facets of a Label
- A Multi-Faceted Label: A Proposal

THE GEO LABEL: AN INTRODUCTION

Science and Technology Road Map of the Group on Earth Observations (GEO):

*Activity 2: Encourage relevant scientists and technical experts to contribute to GEOSS in a truly participatory way. That will result in two levels of activities, i.e. by **creating an environment that is generally attractive for scientists and technical experts**, and by specifically targeting relevant groups:*

*2. (Roadmap 2b) Establishing a “GEO label”. Develop a concept for a “GEO label” **related to the scientific relevance, quality, acceptance and societal needs** for activities in support of GEOSS as an **attractive incentive** for involvement of the S&T communities. A draft concept will be proposed in early 2010 liaising with existing major Earth observation data providers.*

Related to:

- scientific relevance,***
- quality,***
- acceptance and***
- societal needs***

Provide:

- attractive incentive***

THE GEO LABEL: AN INTRODUCTION

Questions:

- How to measure scientific relevance, quality, acceptance and societal needs and how to display the results?
- What is "an attractive incentive for involvement of the S&T communities"?

Should a GEO Label be restricted to be "an attractive incentive for involvement of the S&T communities"?

Or Should a GEO Label promote, support, ease the utilization of the societal benefits of GEOSS?

What should be the role of a GEO Label in a "user-driven GEOSS¹"?

What would user of GEOSS want most from a GEO Label?

1) *GEOSS: Global Earth Observation System of Systems*

GOALS OF DATA LABELING

Motivation:

- Modern societies depend on geo-referenced data sets and services
- large economic potential in value-added chain from provider to end user
- improved accessibility to data/services (Google Earth, GIS, GEOSS ...)
- rapid development of tools for integration of data from various sources
- for many applications, limited access to off-the-shelf, easy-to-use products.

Information on quality, trustworthiness, useability, origin, usage of geo-referenced data sets is needed

Current situation:

- no consistent way of assessing "quality" of data sets and services
- no easy-to-understand information for users on quality
- no reliable information on the fit-for-usage, applicability, and reliability
- no certification of data sets and services where needed;
- limited traceability (product → data, provider → end user)
- lack of credit for data and service providers.

Side track: Some attempts have been made ...



Data are the common wealth of humanity — *Adama Samassekou*
Convener of the UN World Summit on the Information Society

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[PIC Badging](#)

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Welcome to the Polar Information Commons (PIC):

Establishing the Framework for the Long-term Stewardship of Polar Data and Information

The polar regions are changing rapidly with dramatic global effect. Wise use of resources, astute management of our environment, improved decision support, and effective international cooperation on natural resource and geopolitical issues require a deeper understanding of, and an ability to predict change and its impact. Understanding and knowledge are built on data and information, yet polar information is scattered and scarce as well as temporally and spatially sporadic.

We are inspired by the Antarctic Treaty of 1959 that established the Antarctic as a global commons to generate greater scientific understanding. Correspondingly, we assert that data and information about the polar regions are themselves "public goods" that should be shared ethically and with minimal constraint.

We envision a Polar Information Commons (PIC) as a shared virtual resource mirroring the geographic commons. The PIC would serve as an open, virtual repository for vital scientific data and information, and would provide a shared, community-based cyber-infrastructure fostering innovation, improved scientific understanding, and encourage participation in research, education, planning, and management in the polar regions.

The PIC builds on the legacy of the International Polar Year and we seek active participation and ideas from



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Launch the application if you are a return user, or read below for a quick introduction to what it can do for you.

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Polar Information Commons Rights and Badging API

The badging tool uses the PIC API to help you create badges for your data. See the [Polar Information Commons Rights and Badging API](#) guide for more information.

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PIC Rights and Badging Tool

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Waiver ?

License Requiring Attribution ?

Briefly Describe Your Data ?

** Indicates a required field*

Title ?

*** URL ?**

*** Territory ?**

AFGHANISTAN

*** Creator ?**



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GOALS OF DATA LABELING

Design, Concept, Implementation, and Success of a Label depends on the goals, and these goals need to be well-defined and widely accepted.

Cavets:

A label requires time to get accepted; once established the key characteristics can not be changed.

A label should be associated with all geo-referenced data and services, not a specific aspect.

Successful labels are strong, unique in their field, authoritative (not self-assigned or based on voluntary assessments)

There are many ways a label can fail.

GOALS OF DATA LABELING

Community/Area	Impacts
Science and Technology	<p><u>attractive</u> incentive for involvement of S&T communities:</p> <ul style="list-style-type: none">- <u>recognition</u> for contributions (citation);- <u>enable</u> credits for providers (attribution);- <u>support</u> forward traceability (usage).
Users	<p><u>inform</u> users:</p> <ul style="list-style-type: none">- <u>increase</u> trustworthiness;- <u>characterize</u> quality;- <u>characterize</u> applicability;- <u>ensure</u> backward traceability (data sources).
Data Sharing	<p><u>promote</u> data sharing:</p> <ul style="list-style-type: none">- <u>communicate</u> data availability and conditions;- <u>support</u> backward traceability (data source).
Providers	<p><u>inform</u> providers (and their funders):</p> <ul style="list-style-type: none">- <u>provide</u> information on relevance (meeting user needs);- <u>provide</u> information on usage;- <u>provide</u> user feedback on applicability

BASIC FACETS OF A LABEL

- Quality
- User acceptance
- Societal Relevance

Quality:

- not straight-forward
- depends on intended usage.

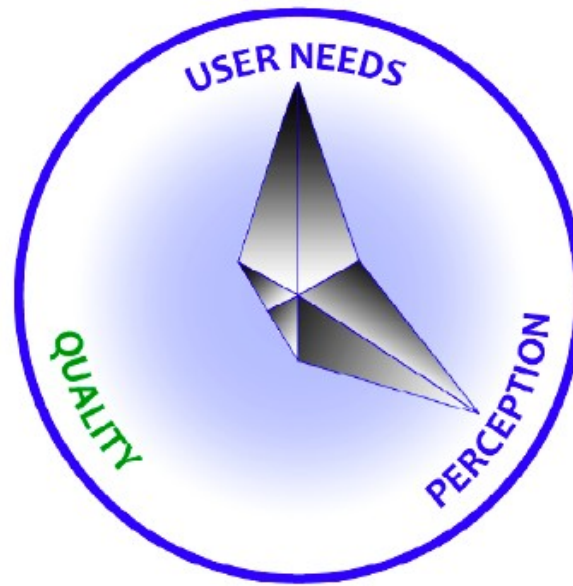
User acceptance:

- subjective
- based on rating of perceived quality, applicability, availability, ...
- accounts for usage

Societal relevance:

- objective measure based on (partly subjective) assessments
- database of user needs and requirements

A MULTI-FACETED LABEL: A PROPOSAL



Quality:

- based on quality standards developed by GEO components

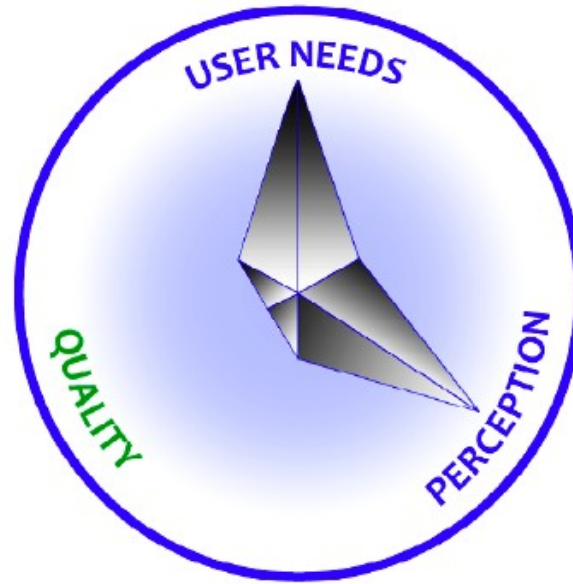
User acceptance (Perception):

- GEOSS-wide user rating system

Societal relevance (User Needs):

- GEOSS User Requirement Registry (URR)

A MULTI-FACETED LABEL: A PROPOSAL

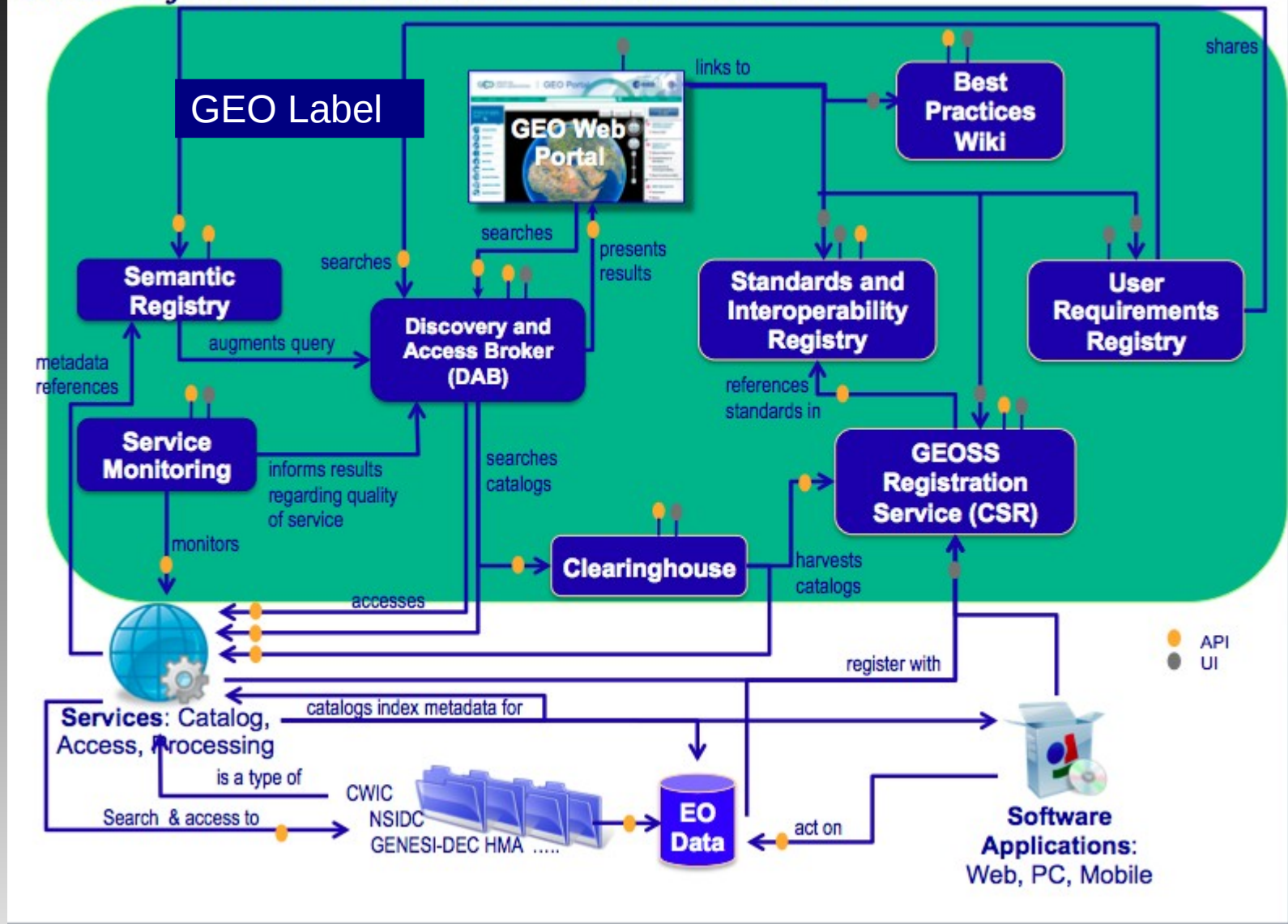


Implementation:

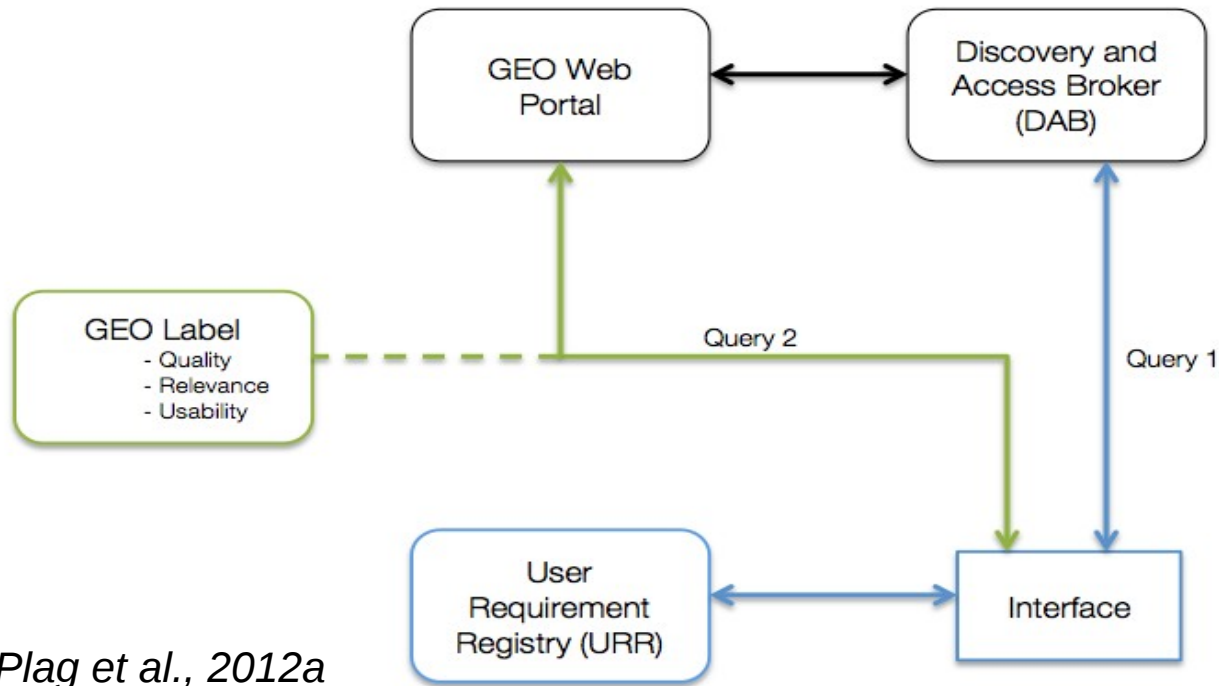
- electronic, dynamic tag
- web-based association with data sets and services
- dynamically updated when accessed
- will allow tracking of usage (support data citation statistics)

A MULTI-FACETED LABEL: A PROPOSAL

GEOSS Infrastructure interactions VERSION GCI2-4B



A MULTI-FACETED LABEL: A PROPOSAL



Plag et al., 2012a

Relevance:

For URR entries:

$$\hat{r}^{\text{glob}}(A) = \sum_{i=1}^{L_A} w_i \cdot \hat{r}_i^{\text{glob}}, \quad (6)$$

L_A : number of entries E_i that are targets in the links with entry A being the source;

w_i : weight of the link between A and E_i ;

r_i^{glob} : global relevance of E_i .

For external datasets or products:

$$r^{\text{glob}}(B) = \sum_{i=1}^{K_B} \hat{r}_i^{\text{glob}}, \quad (7)$$

K_B : number of requirement entries R_i that are met by dataset or product B ;

r_i^{glob} : global relevance of requirements R_i .

Plag et al., 2012b

Questions?