7th Framework Programme
ENV.2010.4.1.2-2
Integrating new data visualisation approaches of earth Systems into GEOSS development

QUAlity aware VIualisation for the Global Earth Observation system of systems

Deliverable D8.6
GEO tasks (STC, SIF and UIC) participation results

Version 1.0

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1. Abstract

2. Introduction
The interest in participating in the GEO process and work plan of the project team started before the beginning of the project. Members of the coordinator team went to the Washington DC GEO Plenary in December 2010 and attended to several preparatory meeting there. The aim to influence the GEO work plan was cited several times in the project proposal an was transposed into the project description of work. By that time the coordinator was involved in regular discussions of the S&T and the ADC committee and the SIF.

During the first year of the project a new work plan was introduce changing the governance of GEO and defining a new structure of board in GEOSS. This deliverable still contains in the title the old naming for these boards but contributions exposed in this deliverable refer both to the old structure and to the new one. Also, initial contacts done by the coordinator and the UK partners with the QA4EO team (mainly in the 2011 UK workshop) did not fructified due to a long period of inactivity. The creation of the DDQ served to reengage the activities in that direction.

The deliverable reviews the participation in the GEO work plan symposiums, GEO plenaries, GEO tasks, QA4EO, DDQ and SIF. This deliverable does not include the participation in the AIP4, 5, 6 editions (the OGC contribution to the GEO work plan) that has been collected in D8.3 First annual report on AIP participation (AIP4-5) and D8.4 Second annual report on AIP participation (AIP6). There are also other activities conducted in different fronts that had impact in the GEO work plan but are not directly done inside it that have been collected in D1.8 Cooperation with other relevant projects and initiatives (final report).

3. Activities of Participation
3.1 Participation in GEO work plan symposiums

Members of GeoViQua attended in some of the GEO Work Plan symposium both in Ankara 2011, Geneva 2012 and Geneva 2013. GeoViQua coordinator made some interventions when data quality issues where raised by others. Contribution of the project to the work plan where included in S&T committee first and in ID03 later.
3.2 GEO plenaries

Each year, GEO celebrates a plenary meeting. GeoViQua has ensured its presence in all of them to be sure that the project is connected to GEO.

3.2.1 GEO VIII plenary. istambul (2011)

GeoViQua was present in the GEO VIII plenary exhibition by means of 3 things: the first GEO label questionnaire dissemination, a poster in the European Commission booth and a presentation in the speaker corner.

3.2.2 GEO IX plenary. Brazil (2012)
GeoViQua was also present in the GEO IX plenary exhibition as poster in the European Commission booth and a presentation in the speaker corner. In particular, the session VII was chaired by Stefano Nativi, (CNR-IIA), and GeoViQua was presented with the EGIDA (The GEOSS S&T Stakeholder Network: A spin-off of the EGIDA Project (Hans-Peter Plag, IEEE)) and the EarthServer project (Adding Big Earth Data Analytics to GEOSS (Peter Baumann, Jacobs University / rasdaman GmbH)). The title of the GeoViQua presentation was: Advances in disclosing GEOSS data quality and made by Ivette Serral (CREAF).

GeoViQua has developed the Q-Rubric tool, an extension on the NOAA former’s version

- An XSLT tool that convert XML punctuation page.
- Analyses every ISO quality metadata information and rates it by presence/absence (attributing one point when metadata exists, but not penalizing if information is missing).
- Help users to evaluate how many metadata elements related to data quality are provided.
- Adds two new information groups related to ISO quality: Quality and Usage.
- GEOSS representation style has been applied to the original Rubric tables.

Figure 3 GeoViQua poster and presentation slide in the GEO XI plenary.

3.2.3 GEO X plenary and ministerial. Geneva (January 2014)

3.2.3.1 ID-03 and GeoViQua booth

To guarantee maximum visibility, GeoViQua sponsored a small booth that had ID-03 and GeoViQua presence at 50%. In the booth, posters about GeoViQua outcomes and the Users Requirements registry where exposed as to contribution to ID-03 to the GEO Work plan. Also a flat TV screen shown a video about GeoViQua activities. Also as a way to get the attention of the public, a luminous poster was created with LED arrays and an automatic USB sequencer that alternatively illuminated the facets and definitions of a big GEO label following a light pattern. The booth was well attended and GEO label stickers and GeoViQua outcomes leaflet were given. Some people got one of the 30 GeoViQua-GEO label umbrellas that the project prepared for selected guests.
GeoViQua was also present in the GEO IX plenary exhibition as poster in the European Commission booth and a presentation in the speaker corner. This is the detailed agenda for session III.

**SESSION III** (Moderator: Michel Schouppe, EC-DG RTD)

- [The GEOSS Discovery and Access Broker](#) (Stefano Nativi, CNR-IIA)
- [Full and Open Access GEOSS: Are we there yet?](#) (Max Craglia, EC-JRC)
- [GEOWOW-enhanced data discovery, access and exploitation: a proposed future for GEOSS](#) (Roberto Cossu)
- [GeoViQua: Quality information easy and accessible for GEOSS producers and users](#) (Joan Maso, CREAT)

Joan Masó (CREAF) also chaired the last session (Session V) on presentations in the speakers’ corner. A GeoViQua poster was also shown in the speakers corner.
3.2.3.3 GeoViQua Workshop: Tutorial on quality models and tools for GEOSS common infrastructure (14th January 2014, 9-11h)

This practical workshop was divided in 4 parts:
- How the GeoViQua achievements improve the search on geoinformation;
- What is the quality model behind;
- How GeoViQua is applied in example scenarios and which are the new components for the GEOSS common infrastructure.

After attending this workshop, GEOSS users could understand the different quality indications used in the geo information, better read provenance information, compare metadata records, use the GEO label as a visual indication of the metadata completeness, read and contribute with user feedback, see the pixel level data quality mixed with data values in an standard way, etc. As a GEOSS data producer, after attending this workshop, users were able to document their dataset level quality with GeoNetwork, publish their pixel level quality data as a WMS service or you feature level quality as a KML files, setup a user feedback system, attach a GEOlabel to your data, etc.

Program:
- Normal portal and what is NOT there (CREAF)
- New GEOSS Portal (very practical)
  - GEO Portal integration (52N)
  - Metadata editor (GeoNetwork plug-in), GEO label (ASTON)
  - Provenance developments’, MD Comparison & star plots, Rubric (CREAF)
  - Tutorial about User Feedback system (S&T + FRAUN)
  - WMS-Q+KML-Q
- DAB-Q-Demo for quality enable search. Alternative interfaces (CNR)
• Quality models for GEOSS (Some introduction on the bases)
  o Introduction slides about the model. Tutorial about Quality Model (ASTON)
  o UncertML QualityML and Quality parameterization examples (UAB)
• GeoViQua scenarios
  o Agriculture policy control (UAB)
  o Global Carbon (CEA)
  o Sensor web prospective (52N)
• Enhanced quality enable GEOSS Common Infrastructure
  o Introduction on the GeoViQua architecture (CREAF)
  o Catalogues DAB-Q (CNR)
  o User Feedback system (S&T + FRAUN)
  o GEO label services (ASTON+52N)
  o Tutorial about WMS-Q (UREAD + CEA)
  o KML-Q (FRAUN)
  o GECAaaS and QI generator (ASTON+S&T)

Compilation of slides used in the workshop:
http://twiki.grumets.uab.es/twiki/pub/GeoViQua/GEOWeek2014/GeoViQua_workshop.pptx

Geoportal presentation slides, links to the shown pages:

More information can be found here:
http://twiki.grumets.uab.es/twiki/bin/view/GeoViQua/GEOWeek2014
Figure 8: Announcement of the tutorial workshop in the GEO-X Plenary in Geneva.

3.2.3.4 GeoViQua Final internal plenary meeting.

By invitation of the EC and the GEO Sec GeoViQua could have its internal final meeting in same the venue. This way EC project officers had the opportunity to attend to this warp up project meeting.

3.3 Coordination and outreach activities GEO components and tasks

3.3.1 2009-2011 Work Plan

The old work plan had 4 committees and GeoViQua started to work with the STC and the ADC committee until they were substituted by the new ones. Main collaboration was done with the STC where the task of designing the GEO label lived.

3.3.2 2012-2015 Work Plan

The 2012-2015 Work Plan differs from the 2009-2011 Work Plan in four main ways:

- It derives directly from the GEOSS Strategic Targets;
- It groups Tasks into three thematic parts (rather than two as before);
- It features a streamlined number of Tasks; and (iv) it proposes an improved Work Plan management structure (see GEO-VIII Document 21).

The Work Plan has been organized into three major parts to match the key objectives outlined by the GEO-VII Plenary and to provide a clear overview of GEO activities.
Part 1 on “Infrastructure” features the physical cross-cutting components of an operational and sustainable GEOSS, including interoperable observing, modelling and dissemination systems.

Part 2 on “Institutions and Development” describes “GEO at work” and the community’s efforts to ensure that GEOSS is sustainable, relevant and widely used; it focuses on reinforcing data sharing, resource mobilization, capacity development, user engagement and science and technology integration.

Part 3 on “Information for Societal Benefits” focuses on information, tools, and end-to-end systems that should be available through GEOSS to support decision-making across the nine Societal Benefit Areas.

The new structure of the GEO Tasks is the following:

**INFRASTRUCTURE**
- IN-01 Earth Observing Systems
- IN-02 Earth Data Sets
- IN-03 GEOSS Common Infrastructure
- IN-04 GEOSS Communication Networks
- IN-05 GEOSS Design and Interoperability

**INSTITUTIONS AND DEVELOPMENT**
- ID-01 Advancing GEOSS Data Sharing Principles
- ID-02 Developing Institutional and Individual Capacity
- ID-03 Science and Technology in GEOSS
- ID-04 Building a User-Driven GEOSS
- ID-05 Catalyzing Resources for GEOSS Implementation

**INFORMATION FOR SOCIETAL BENEFITS**
- SB-01 Oceans and Society: Blue Planet
- SB-02 Global Land Cover
- SB-03 Global Forest Observation
- SB-04 Global Urban Observation and Information
- SB-05 Impact Assessment of Human Activities

**AGRICULTURE**
- AG-01 Global Agricultural Monitoring and Early Warning

**BIODIVERSITY**
- BI-01 Global Biodiversity Observation (GEO BON)

**CLIMATE**
- CL-01 Climate Information for Adaptation
- CL-02 Global Carbon Observation and Analysis
DISASTERS
DI-01 Informing Risk Management and Disaster Reduction

ECOSYSTEMS
EC-01 Global Ecosystem Monitoring

ENERGY
EN-01 Energy and Geo-Resources Management

HEALTH
HE-01 Tools and Information for Health Decision-Making
HE-02 Tracking Pollutants

WATER
WA-01 Integrated Water Information (incl. Floods and Droughts)

WEATHER
WE-01 High-Impact Weather Prediction and Information

GeoViQua collaborates in the following components and tasks:

3.3.2.1 INSTITUTIONS AND DEVELOPMENT Task
More information about all these tasks on:
http://www.earthobservations.org/docshow.php?id=129

3.3.2.2 ID-01 Advancing GEOSS Data Sharing Principles, C1 Advancing GEOSS Data Sharing Principles

- In the GEO Work Plan Symposium 2012, Robert Chen (bchen@ciesin.columbia.edu) presented the existence of a new sub-activity: "Documentation and Data Quality"
  - Develop recommendations on data documentation and Data Quality.
  - Sub-activity leaders: G.Withee (US) (gwithee@msn.com), D. Halpern (COSPAR) (david.halpern@jpl.nasa.gov)
  - This will be a no technical discussion

3.3.2.3 ID-02 Developing Institutional and Individual Capacity, C1 Institutional Development

- QA4EO is part of the activities in ID-02: Developing Institutional an Individual Capacity
  - Sub-activity relevant people (nigel.fox@npl.co.uk;stensaas@usgs.gov;dave.smith@stfc.ac.uk;D.Cornford@aston.ac.uk)
3.3.2.4 ID-03 Science and Technology in GEOSS, C1 Engaging the Science and Technology (S&T) Community in GEOSS Implementation

Sub-Activity 2.2 GEO Label
GeoViQua is actively participating in ID-03. GeoViQua is committed to ID-03 with the development of the GEO Label

Sub-Activity 2.1 GEOSS citation standard
In GeoViQua Producer Quality model includes a way to cite publications that talk about data. This is the inverse problem but it is deeply related to the GEOSS citation standard.

Sub-Activity 3.2 Inform organizations about GEO and GEOSS
We have been working on resurfacing the GEO Spain national initiatives. We also have pushing for creating a S&T section on it.

Sub-Activity 3.3 Establish a dialog and foster cooperation between GEO and major university networks
We have also done that at the Spanish national level in EGIDA.

Sub-Activity 4.1 Organizing Special Sessions and Side Events

Sub-Activity 5.1 Enhancing registration of relevant scientific data sets (Roadmap Activity 2e)
All pilot cases in GeoviQua will be registered in CSR and we will stimulate this process in GeoViQua advisory board.

Sub-Activity 5.4 The GEOSS Science and Technology Stakeholder Network
He have participated in previous meetings and we what to continue collaborate on this.

3.3.2.5 INFRASTRUCTURE Task
More information about all these tasks on:
http://www.earthobservations.org/docshow.php?id=129

3.3.2.6 IN-01 Earth Observing Systems

- In the GEO Work Plan Symposium 2012, Lawrence Friedl (lfriedl@nasa.gov)
  - the idea of "Crowd sourcing for consumer-site metrics of data quality"
    - It is just an idea (no development, no pilot) but it was well accepted by the people in the room
3.3.2.7 IN-05: GEOSS Design and Interoperability, C1 GEOSS Design and Interoperability

- Manage the evolutionary technical architecture (design) of GEOSS and contributed Earth observation data and service resources. Promote GEOSS interoperability principles. Enable a sustainable GEOSS of value to the user – supporting the development of the GEOSS Common Infrastructure (GCI) and GEOSS communication networks for the access to, and use of, Earth observations and related services.

3.3.2.8 Co-lead in EC-01-C1 Ecosystem

Recently Joan Masó from CREAF has been nominated as co-chair of this group and started to exercise its responsibilities.

3.3.3 Collaboration with the Documentation and Data Quality GEOSS Subgroup

The Documentation and Data Quality (DDQ) Subgroup of the Data Sharing Working Group (DSWG) promotes comprehensive documentation on data quality, including accuracy, stability, precision, spatial and temporal sampling characteristics, error characteristics, timeliness, completeness, reproducibility, calibration, accessibility, stability traceable to international standards, and reproprocessing.

Objectives

The DDQ Subgroup works towards the establishment of universal principles for optimal data quality management and utilization, including: definition of concepts, tools and systems, and capacity building.

The DDQ Subgroup is committed to expanding, maximizing and providing comprehensive documentation of data quality, including traceability, provenance, uncertainty, and fit for purpose to allow a broader use and understanding of Earth observations.

The DDQ Subgroup will coordinate with GEO entities in related areas of data assurance and data quality such as GEO Infrastructure and Implementation Groups.

Activities/Deliverables

1) Prepare a draft Principles and Management document on GEOSS guidelines for Documentation and Data Quality

2) Prepare a draft Roadmap document on how the DDQ Subgroup will work with GEO and other initiatives, such as QA4EO through IN-02-C1 and GeoViQua, to realize documentation of data quality for GEOSS.

3) Identify processes, tools and standards that support and enable superior documentation for data quality.

Work Practices
The DDQ Subgroup will conduct its business through regular conference calls and web meetings/emails and will convene a face-to-face meeting as appropriate.

### 3.3.3.1 GEO DDQ twiki

The Twiki of the DDQ group is hosted by CREF at this URL: [http://twiki.geoviqua.org/twiki/bin/view/GEO_DDQ/WebHome](http://twiki.geoviqua.org/twiki/bin/view/GEO_DDQ/WebHome). It provides to the DDQ only web presence and way to expose rapidly new content related to the DDQ regular activities.

![GEO DDQ twiki main page](image)

**Figure 9: GEO DDQ twiki main page**

### 3.3.3.2 DDQ Achievements:

The main achievement where GeoViQua had an active participation from ASTON and CREF partners is the release of the “Principles and Management document on GEOSS guidelines” that can be found at [http://www.earthobservations.org/documents/dsp/GEOSS_Data_Quality_Guidelines.pdf](http://www.earthobservations.org/documents/dsp/GEOSS_Data_Quality_Guidelines.pdf)

### 3.3.4 QA4EO

QA4EO has been endorsed by CEOS as a contribution to facilitate the GEO vision for a Global Earth Observation System of Systems (GEOSS). The aim of GEOSS is to deliver comprehensive and timely knowledge / information products worldwide to meet the needs of its nine “societal benefit areas”. This can only be achieved through the synergistic use of data derived from a variety of sources (satellite, airborne and in situ) and the coordination of the resources and efforts of the GEO members.
3.3.4.1 QA4EO Workshop on Providing Harmonised Quality Information in Earth Observation Data by 2015

GeoViQua participated in the 2011 - QA4EO Workshop on 'Providing Harmonised Quality Information in Earth Observation Data by 2015', Harwell, UK (18th - 20th October).

![Figure 10: Important participation in the last QA4EO meeting in the UK](image)

Participants can be found here:
http://www.qa4eo.org/docs/workshop_harwell11/QA4EO%20Workshop%20Participants_v2.0.pdf

Agenda and links to presentations:

**Tues 18 Oct**

*Morning - Setting the scene*

- [GEO and QA4EO (Yasukini Okubo, GEO)](http://www.qa4eo.org/docs/workshop_harwell11/QA4EO%20Workshop%20Participants_v2.0.pdf) (Yasukini Okubo, GEO) - 1.5Mb pdf
- [US Environment Protection Agency perspectives (Gary Foley, EPA)](http://www.qa4eo.org/docs/workshop_harwell11/QA4EO%20Workshop%20Participants_v2.0.pdf) (Gary Foley, EPA) - 0.5Mb pdf
- [IEEE and QA4EO (Irwin Alber, IEEE)](http://www.qa4eo.org/docs/workshop_harwell11/QA4EO%20Workshop%20Participants_v2.0.pdf) (Irwin Alber, IEEE) - 0.8Mb pdf
- [Status of QA4EO activities (Nigel Fox, NPL)](http://www.qa4eo.org/docs/workshop_harwell11/QA4EO%20Workshop%20Participants_v2.0.pdf) (Nigel Fox, NPL) - 2.2Mb pdf
- [QA4EO and long term data preservation (Bojan Bojkov, ESA)](http://www.qa4eo.org/docs/workshop_harwell11/QA4EO%20Workshop%20Participants_v2.0.pdf) (Bojan Bojkov, ESA) - 2.1Mb pdf
• Metadata model - experience of preserving diverse information as well as data (Charlotte Pascoe, CEDA UK) - 1.2Mb pdf

Afternoon - Case study 1: Forest Carbon Tracking

• Overview of requirements for FCT (Giovanni Rum, GEO) - 1.5Mb pdf
• The Role of Satellite Data in GEO-FCT (Shaun Quegan, Centre for Terrestrial Carbon Dynamics, University of Sheffield) - 1.7Mb pdf
• Dynamic modelling of the carbon cycle in forests: Data needs and uncertainty quantification (Marcel van Oijen, Centre for Ecology & Hydrology, Edinburgh) - 3.9Mb pdf

Wed 19 Oct

Morning - Case study 2: Atmosphere & Climate Change

• Remote sensing Level 2+ data quality: NASA overview (Greg Leptoukh, NASA) - 1.5Mb pdf
• Quality Indicators in GSICS Satellite Inter-Calibration Products (Jerome Lafeuille, WMO) - 2.0Mb pdf
• QA4EO and the Remote Sensing of Atmospheric Composition (Jean Christopher Lambert, BIRA) - 2.6Mb pdf
• Confronting Climate Models with Earth Observation Data (Peter Braesicke, University of Cambridge) - 5.0Mb pdf
• Quality and the GMES Atmospheric Service (Anne De Rudder, BIRA) - 1.1Mb pdf

Afternoon - Case study 3: Biodiversity

• Overview of Quality Requirements in Global Biodiversity Monitoring (Samy Gaiji, GBIF) - 9.3Mb pdf
• Land Cover Validation (Joanne Nightingale, NASA) - 3.3Mb pdf
• Impact of Uncertainty on the Digital Observatory of Protected Areas, including eHabitat (Jon Olaf Skoien, JRC, ISPRA) - 3.8Mb pdf
• Robustness of Systematic Conservation Planning Tools to Different Types of Error and Especially to Multiple Interacting Uncertainties (Lucy Bastin, University of Aston) - 5.4Mb pdf

Thurs 20 Oct

Way forward: Developing a strategy & roadmap. Developing a strategy and roadmap - 0.1Mb pdf

More information: http://www.qa4eo.org/workshops/harwell-2011/

Also porters were exposed during the break.

This group has been dormant for a period of 1.5 year but now some resources had been spending in improve the website and restart regular activity.
3.3.4.2 GEOSS Future Products Workshop (March 26-28, 2013 at NOAA Science Centre)

GeoViQua participated in the future of GEOSS workshop in Silver Spring (Washington DC area) last 2013.

This workshop provided a unique opportunity to learn how GEOSS as a platform makes all sorts of sensor and model data available in an interoperable manner. Data streaming from in-situ and remote sensing sensors (Sensor Web), models (Model Web) offers a huge potential to generate a wide portfolio of on-demand and near real time products. This multi-day workshop will feature: invited speakers and contributed positions; breakout sessions to exchange views and provide proposed approaches; with summaries posted on the web.

To meet the GEO aim of achieving interoperability of existing and new systems that provide essential environmental observations and information, this workshop builds on prior GEO activities including: the GCI Architecture Workshop in 2008, SIF Interoperability Workshops, GEO Sensor Web Workshops; and initiates similar discussions for the GEOSS Model Web. In the GEO Work Plan these activities are elements of GEO Task IN-05 "GEOSS Design and Interoperability”.

Agenda (and link to the sessions):

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<td>George Percivall, OGC</td>
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<td><strong>2. Current GEOSS Architectures.</strong> What exists and what is hindering progress</td>
<td>Martin Yapur, NOAA  Kathy Fontaine, NASA</td>
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<td><strong>3. Sensor Web.</strong> Observations for forecasts, on-demand</td>
<td>Karen Moe, NASA</td>
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<td><strong>4. Model Web.</strong> Vision and current frameworks</td>
<td>Stefano Nativi, CNR</td>
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<td><strong>5. Interoperability and Resource Discovery.</strong> Linked data, brokers, unique identifiers</td>
<td>Steve Browdy, IEEE &amp; OMS Tech</td>
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<td><strong>6. Discussion on the Way forward</strong></td>
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<td><strong>7. Wrap-up and planning.</strong></td>
<td>George Percivall, OGC</td>
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GeoViQua participated in the Session 5: “Interoperability and Resource Discovery - Linked data, brokers, unique identifiers”, organized by the Standards and Interoperability Forum (SIF). Chair: Steve Browdy, IEEE & OMS Tech

This session looked into areas of promise with respect to multidisciplinary interoperability of, discovery of, and access to Earth observation resources. Linked data, unique identifiers, and brokering will be discussed generally and with regards to Model Web and Sensor Web efforts. There will also be discussions of semantics as it applies to the presentations, a discussion of authentication and single sign-on as it applies to accessing data and examples of operational networks, such as Polar Data Network.

- **Introduction and Agenda.** Steve Browdy, IEEE, OMS Tech
- **Vision on GEOSS Evolution: Towards a GEOSS for all stakeholders.** Roberto Cossu, ESA and GEOWOW
- **Linked Data: Another strategy for discovery and access.** William Sonntag, US EPA
- **Unique Identifiers within Systems of Systems.** Joan Maso, GeoViQua (CREAF)
- **Brokering for Multi-Disciplinary Interoperability: An EarthCube perspective.** Siri Jodha Singh Khalsa, Univ. Colorado
- **Authentication, Single Sign-On, and User Management for GEOSS.** Steve Browdy, IEEE, OMS Tech
- **Summary.** Steve Browdy, IEEE, OMS Tech
- **Libre Planet.** Tommy Heath
- **Discussion.** Rapporteur Report – Andrew Mitchell, NASA

![Metadata for Resources in GEOSS](image)

Figure 11 GeoViQua presentation about the identification problem of geospatial elements.
3.4 SIF participation

The SIF was formed to facilitate the interchange of information and the development of recommendations for standards and interoperability in GEOSS. The SIF also oversees a key component of the GEOSS Common Infrastructure (GCI), the Standards and Interoperability Registry (SIR). The purpose of the SIF is to provide advice, expertise and impartial guidance on issues relating to standards and interoperability for GEOSS. Our primary goal is to enable ever greater degrees of interoperability among GEOSS-contributed resources through facilitation, technical analysis, advocacy and education. The SIF is composed of experts nominated by GEO Members and Participating Organizations, and supported by subject matter experts from around the globe.

More information on the GEOSS registries can be found at the GEOSS Resources Registry System. The SIF also manages the development and publication of a series of GEOSS Tutorials. These tutorials are meant to assist GEOSS users and GEOSS providers in understanding how to publish, register, discover, access, and use GEOSS resources. The tutorials are published at the GEOSS Best Practices Wiki. More information on the SIF can be found at the Standards and Interoperability Registry home.

GeoViQua coordinator has been regularly attending the biweekly teleconferences that the SIF maintains and has also taken care that all relevant standards for data quality were present in the SIR. We took the initiative to register the ones that were not present.

3.4.1 SIF twiki

The SIF twiki is hosted at CREAT (http://twiki.geoviqua.org/twiki/bin/view/GEO_SIF). It provides to the SIF a complement to the SIF website. The website is more static but contains the SIR. The twiki provides a way to expose rapidly new content related to the SIF regular activities or to create content collectively. All active members of the SIF have an account on the SIF twiki with writing rights.
3.4.2 SIF activities

Participation in the AGU 2012

GeoViQua coordinator conducted a study about the usage of the standards registered in the SIR that were actually used in the clearinghouse. The results of this study were published in a poster entitled *Achieving Interoperability in GEOSS- How Close we are* (see the right hand side of the figure) that was presented by David Archur in the AGU 2012 in San Francisco.
GEO Label inclusion in the SIF

Technically, the GEO Label is a graphical representation of the metadata completeness and a way to access different aspects of the description of a dataset (drill-down capability) elaborated both by the producer and for the dataset users. The purpose is to act as a decision support mechanism in geospatial data selection. The Standards and Interoperability Forum (SIF) has participated and has monitored the user-centred design approach, followed by GeoViQua (www.geoviqua.org), to develop a GEO label that makes more likely that will garner user acceptance when deployed. To this end, the Aston University (as a contribution to GeoViQua) have thus far conducted 3 user studies to (1) identify the informational aspects of geospatial datasets upon which users rely when assessing dataset quality and trustworthiness, (2) elicit initial user views on the concept of a GEO label and its potential role as a solution to the stated problem, and (3), evaluate prototype label visualizations. For more information visit: www.geolabel.info.

The GEO label can be created automatically by a web service. It uses a RESTful API that allows sending a producer metadata URL and a user feedback items collection URL and retrieving an image SVG of a PNG format. For more information visit: www.geolabel.net. The service is currently hosted in a server cluster in CREAF (Barcelona). The SIF has also
collected information about the GEO label that is available at http://twiki.geoviqua.org/twiki/bin/view/GEO_SIF/SifGeoLabel

The SIF considers that the methodology to design the GEO label was accurate and in line with the former Science and Technology Committee initial aims. The SIF has reviewed the architecture of the GEO label service, and founds it conformance with the GEOSS general architecture principles and design. The GEO label service is able to retrieve metadata directly from the Discovery and Access Broker and the GEO label can be easy integrated into the GEOSS Portal (with java portlet modifications already done by 52North). These capabilities were live demonstrated in the last GEO-X Ministerial Week with replicas of the GEOSS Common Infrastructure components.

The SIF considers that the GEO label is an important contribution to the data discovery phase and recommends its adoption into the GEOSS Common Infrastructure. To this purpose, the SIF and 52North are willing to technically assist in the integration process.

The SIF has addressed a letter to the GEO IIB to recommend the adoption of the GEO label for the GEO community.

4. Conclusions
GeoViQua has been in constant collaboration with the GEO tasks and boards both in the old and the new work plan in GEOSS. Some groups had been more receptive than others to the GeoViQua work. For example, the SIF has always been listening to the GeoViQua activities as well as some thematic SBA. The presence of CNR and ESA representatives in both the IIB and the IDB has also helped in this direction. The EC officers have coincided with GeoViQua members (mostly with the coordinator) in several occasions (In particular Alan Edwards and Vojko Bratina) and were able to collect information on the progress of the project. This was one of the reasons that the project did not require a Mid-term face to face revision in Brussels.

The project members had no intention to quit their participation in GEOSS by the end of the GeoViQua project. On the contrary, the project conducted a workshop in the last GEO-X plenary and Ministerial in Geneva (as well as the internal project meeting). There was remarkable interest by some members of the GeoViQua community and the coordinator continues its contacts with the GEO work plan as a way to introduced some of the GeoViQua components. Main efforts are focussed on the acceptance of the DAB-Q, the WMS-Q, the User feedback System and the GEO label proposal in the GCI and its visibility in the GEOSS portal.