Location, Interoperability and Open Standards
Input from the OGC

Third meeting of the
Task Force on Access to Information under the Aarhus Convention
Geneva, SWITZERLAND – 03.-05. December 2014

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Slides prepared by Gregory Guiliani & Athina Trakas
Open Geospatial Consortium (OGC)

The presentation is about ...

- … interoperability and open standards
- … the work of the Open Geospatial Consortium
- … practical examples:
  - the GEO/GEOSS and AIP (as an examples for PPP)
  - the enviroGRIDS project
  - UNEP's Global Risk Data Platform

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What is it all about?

Use and Re-Use of location information

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Geospatial and location standards for:

- Aviation
- Built Environment & 3D
- Defense & Intelligence
- Emergency Response & Disaster Management
- Geosciences & Environment
- Government & SDI
- Energy & Utilities
- Law Enforcement / Public Safety
- Mobile Internet & LBS
- Sensor Webs
- University & Research


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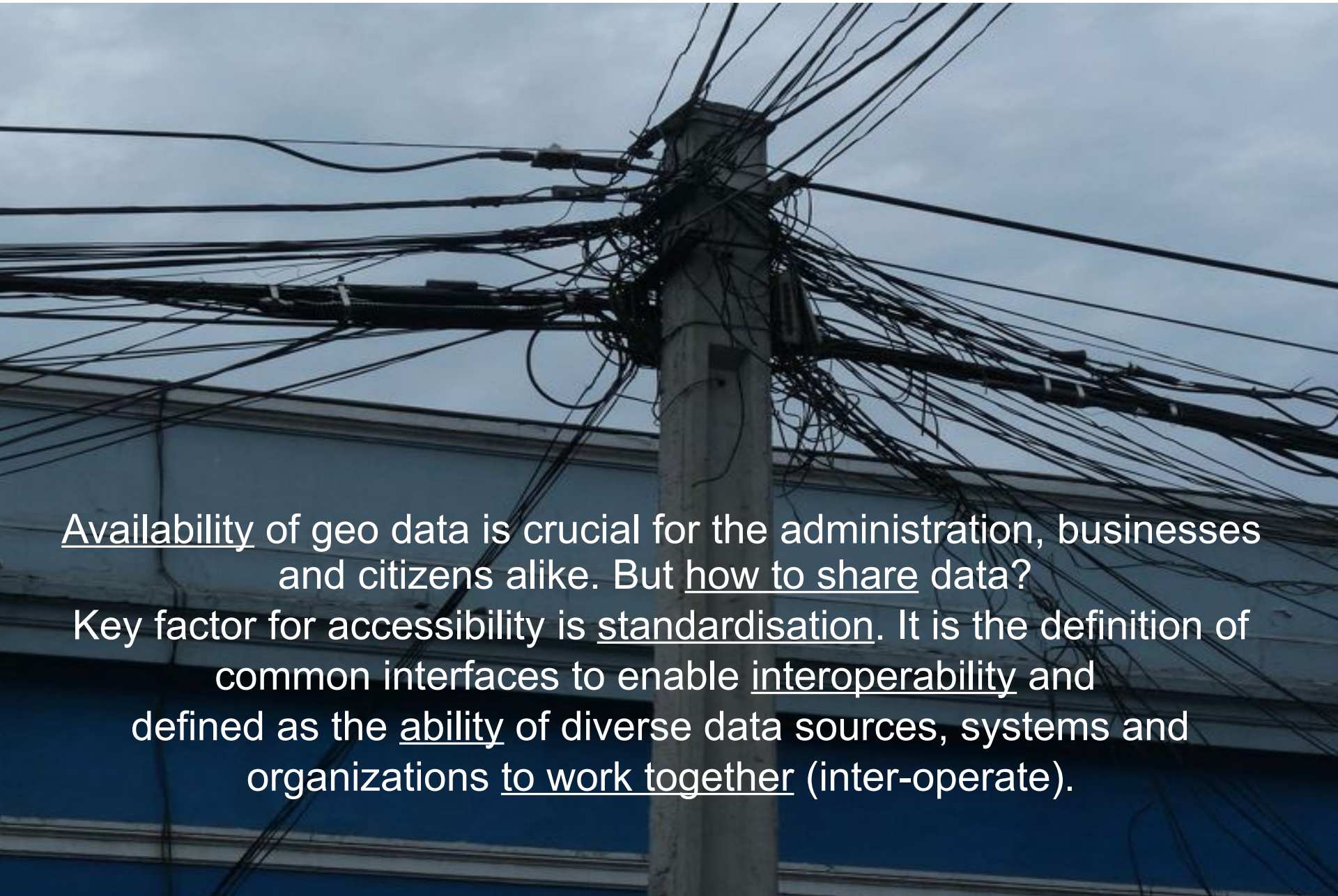
Mobile Internet & LBS
Sensor Webs
University & Research
40+ Standards
500+ Members
consensus based
Alliance Partnerships
Earth Observation
Analysis
Crowdsourcing
Navigation
CAD
BIM
Open Source
Proximity
Global
GIS
Spatial Policy
Open
Points of
Sensor Web
Geoweb
Geosemantics
Shared Understanding
Share
Open Data
Information Integration
Time
Planning
Geosynchronization
SDI
Indoor/Outdoor
Metadata
Climate
GPS
Weather
Time

Interoperability through Open Standards - a fundamental Goal



Availability of geo data is crucial for the administration, businesses and citizens alike. But how to share data?
Key factor for accessibility is standardisation. It is the definition of common interfaces to enable interoperability and defined as the ability of diverse data sources, systems and organizations to work together (inter-operate).

Standards enable Interoperability...

- … for sharing and transforming geoinformation into knowledge
- … to use and re-use PSI (public sector information)

***Open* Standards**

- **Lower systems and life-cycle costs**
- **Encourage market competition**
  - Choose based on functionality desired
  - Avoid “lock in” to a proprietary architecture
- **Stimulates innovation beyond the standard by companies that seek to differentiate themselves.**

„People want the government to be transparent, so why shouldn't the technology be?”

Jim Willis, Director of e-Government at theRhode Island Secretary of State Office

Source: Open Standards, Open Source, and Open Innovation: Harnessing the Benefits of Openness, April 2006. Committee For Economic Development. www.ced.org

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OGC standards...

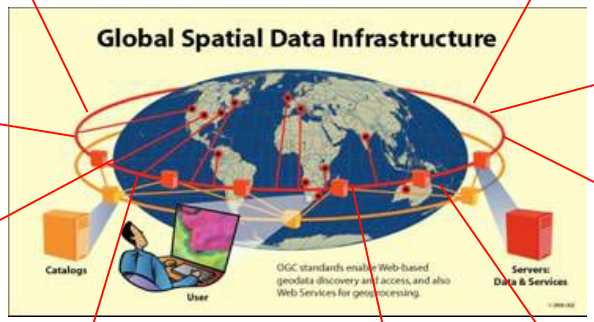
… are driven and influenced by community needs

Education & Research

Sustainable Development, Environment

Health

Defence



Emergency Services, Disaster Management

E -Government

Energy

Consumer Services, Real Time Information

Geosciences: land, sea, air information

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Influenced by changing Technology

- Web 2.0, IPV6
- The Cloud
- Earth Browser Systems
- Mobile Applications
- Geolocated devices & sensors, IoT
- Mass / Consumer Market
- Social Networking
- Crowd Sourcing
- and many more...

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and influenced by ...

- **Policy** – addressing the wide variation in policy worldwide related to information -sharing, -access and use, -funding, -privacy, etc.
- **Language** – not just spoken and written language but: Semantics, vocabularies, content models, ontologies
- **Members, public input, regional requirements,** – and many more

Source: http://www.bayside.vic.gov.au/policy.jpg

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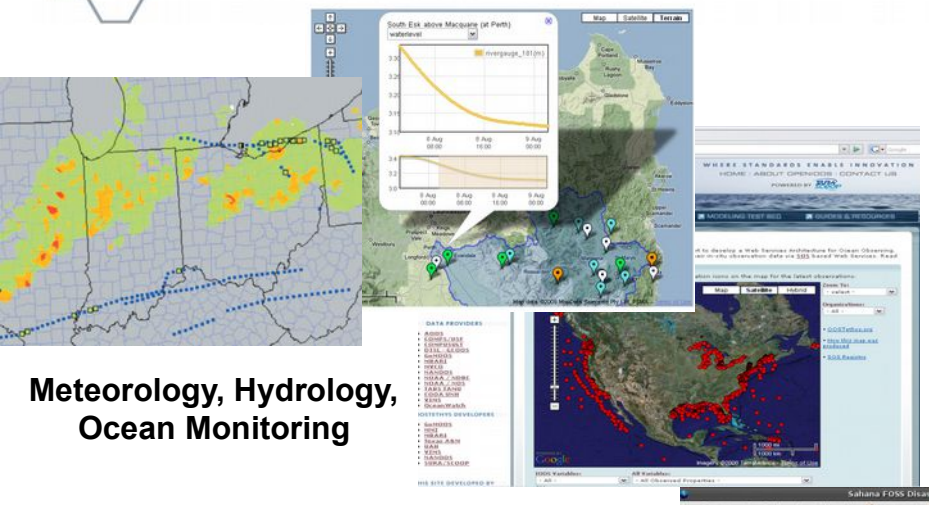
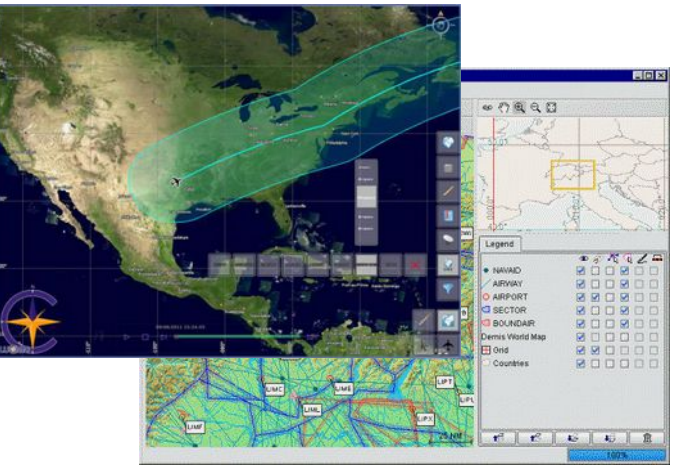
Standards-based solutions promote improved decision making

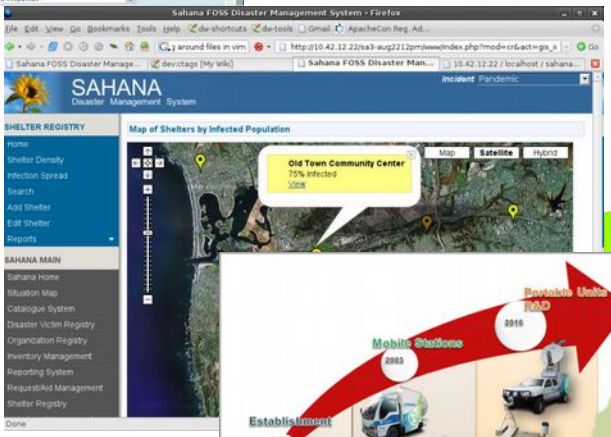


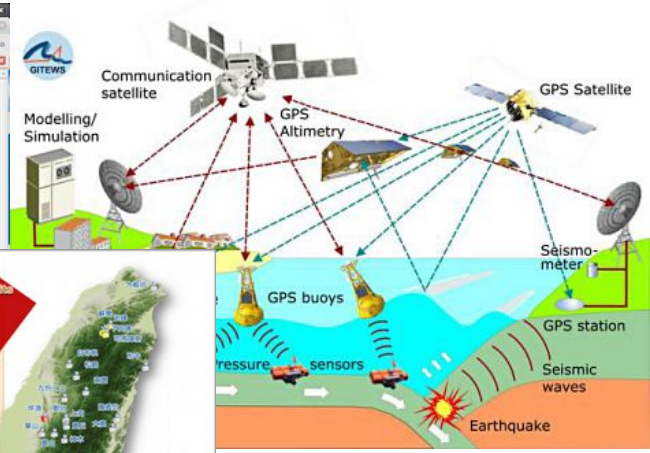
Meteorology, Hydrology, Ocean Monitoring

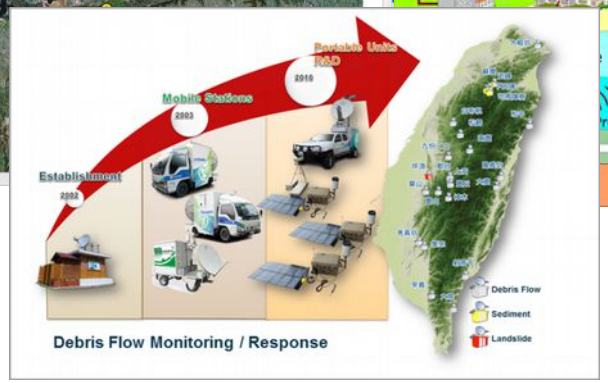
Emergency Real-time Alert or Update



Aviation Flight Information / Safety







Debris Flow Monitoring / Response

Emergency / Disaster Management

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Developing useful standards is not easy!

→ Requires understanding of differences & requirements

→ Requires cooperation & expertise on a global basis

→ Requires consensus by many organizations

→ Requires give & take

→ Requires agreements & repeatable processes

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Use cases and examples

Example: GEOSS Architecture Implementation Pilot

The **OGC** is a participating organisation in the Group on Earth Observation (GEO) and **leads the GEOSS Architecture Implementation Pilot (AIP)** using the OGC Interoperability Program policy and procedures. AIP is part of Task IN-05 in the GEO Work Plan.

The GEOSS AIP develops and deploys new process & infrastructure components for the GEOSS Common Infrastructure (GCI) and the broader GEOSS architecture.

AIP is an agile and evolutionary development process, that proves the maturity of the infrastructure components.

Need to establish a good set of standards and results that show web access to EO data.

The process was initiated in 2007.

→ **http://www.opengeospatial.org/projects/initiatives/geoss/ogc**

→ **http://www.ogcnetwork.net/AIpilot**

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GEO GROUP ON EARTH OBSERVATIONS

AIP-7 – Shifting Focus

AIP-6 focus was on the development of interoperable services, development and piloting of new processes and infrastructure components for the GCI.

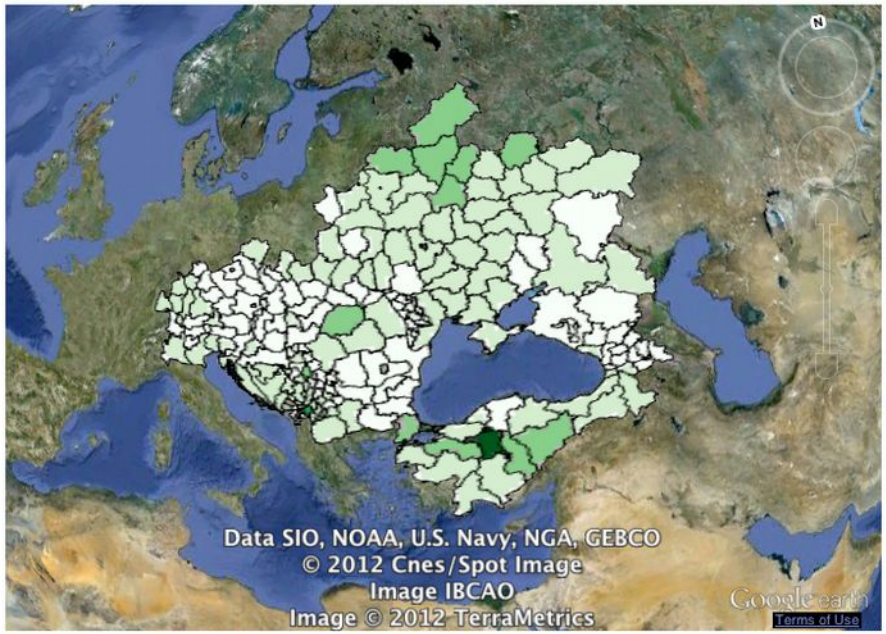
GEO-X plenary: suggestion to shift focus to the use of the GCI

AIP-7 now focuses on ‘Key App’ development showing the use o of GEOSS Datasets:

- Mobile of Browser based
- Demonstrate the value of standards-based access to EO data & services registered with GEOSS

EnviroGRIDS portal: http://portal.envirogrids.net

With 30 partners distributed in 15 countries, the enviroGRIDS project is contributing to the Global Earth Observation System of Systems (GEOSS) by promoting the use of web-based services to share and process large amounts of key environmental information in the Black Sea catchment (2.2 mio. km2, 24 countries, 160 million inhabitants). The main aim of the project is to assess water resource in the past, the present and the future, according to different development scenarios. The objective is also to develop datasets that are compatible with the European INSPIRE Directive on spatial data sharing across Europe. The data and metadata gathered and produced on the Black Sea catchment will be distributed through the enviroGRIDS geoportal. The challenge is to convince and help regional data holders to make available their data and metadata to a larger audience in order to improve our capacity to assess the sustainability and vulnerability of the environment.



Components

1. URM: allows users to search, discover, and access data sets in the Black Sea catchment.
2. Greenland: generation and execution of workflows, based on satellite images.
3. gSWAT: allows the user to calibration the SWAT models
4. eGLE: implements both the user interaction tools and the components supporting the development, execution and the management of the teaching materials.
5. BASHYT: is a Collaborative Working Environment (CWE) on the web, that relies on complex "phisically based" hydrological models and web-GIS technologies to support decision makers, through a user-friendly Web interface, in the field of sustainable water resources management.

Supported by the EU FP7 enviroGRIDS: http://www.envirogrids.net project.

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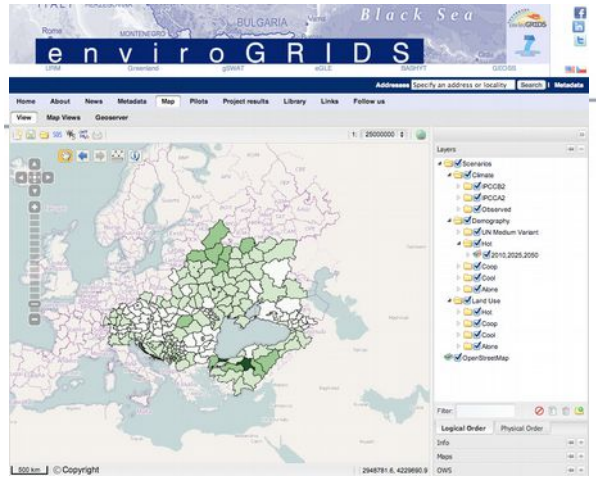
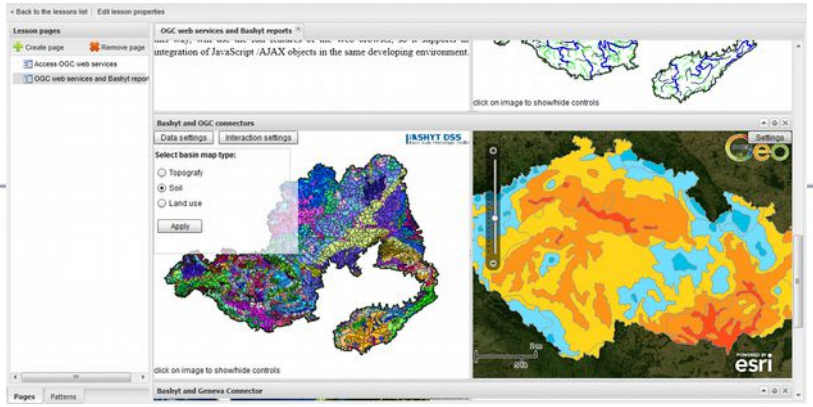
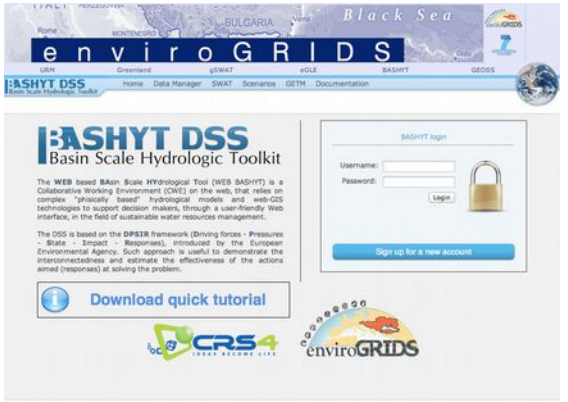


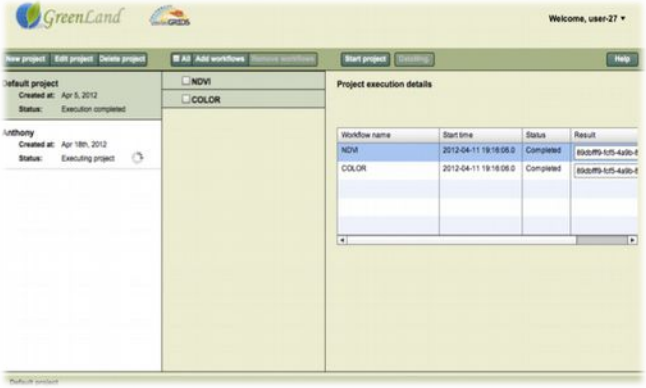
URM
Geospatial data management



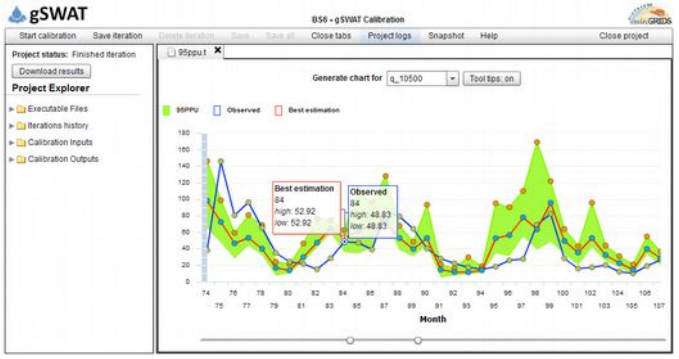
EGLE
e-learning platform



BASHYT
Decision Support Tool



GreenLand
Remote Sensing Processing



GSWAT
Hydrological modelling

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The Global Risk Data Platform is a repository of maps, raw data and OGC web services for disaster related information. It aggregates and integrates data from several third party sources.

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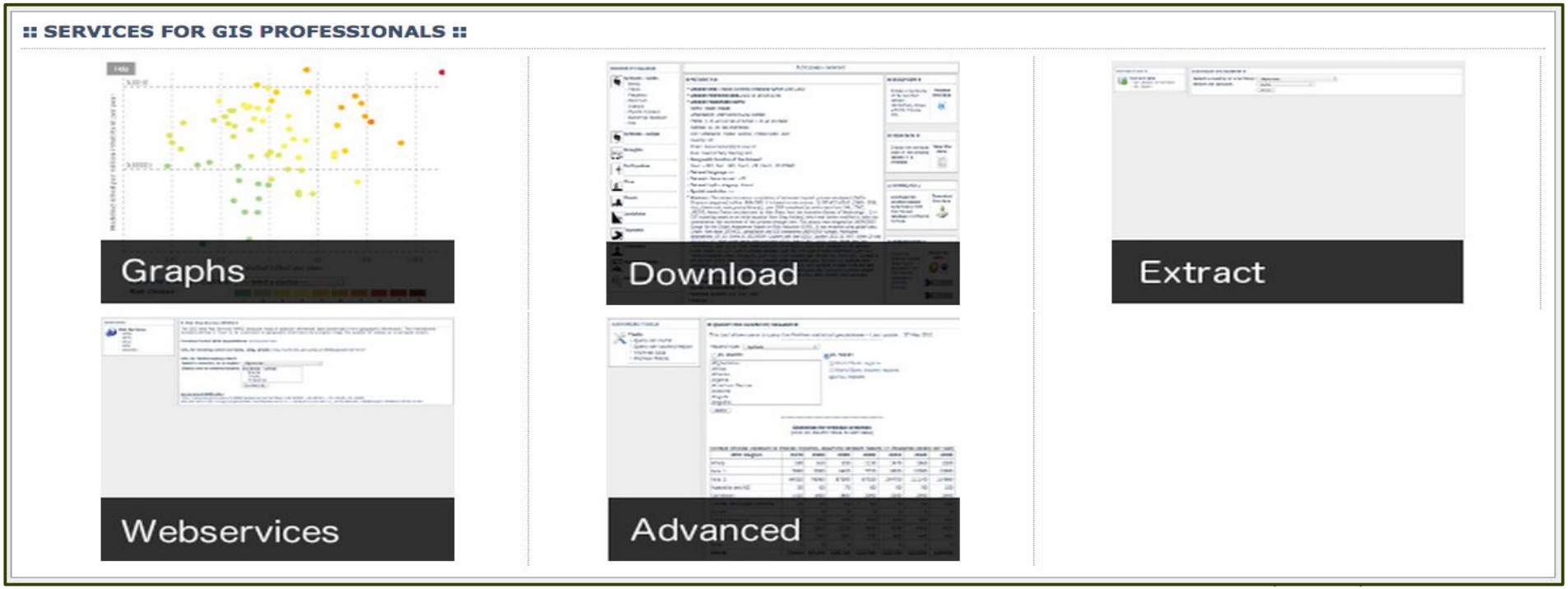
UNEP's Global Risk Data Platform

- has evolved following all standards for Spatial Data Infrastructures (SDI)
- provides all the webservices in compliance with the Open Geospatial Consortium (OGC).
- allows the visualisation of data on natural hazards, exposure (both human and economical) and risk.



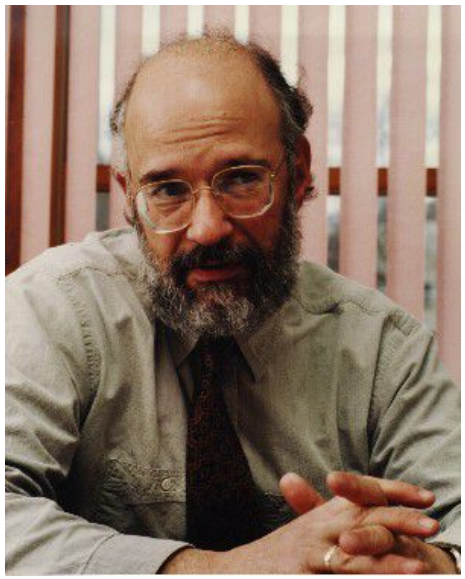
Summarizing

→ avoid re-inventing the wheel, duplication of work and efforts
→ interoperability & open standards help to sustain investments
→ cooperation on international level is key to success

Some last thoughts...

"Interoperability seems to be about the integration of information. What it's really about is the coordination of organizational behaviour."

David Schell,
Chairman Emeritus OGC Board
and Founder OGC



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Thank you for your attention
Questions? Get involved!

Athina Trakas

Director European Service
Open Geospatial Consortium

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Download the presentation at
https://portal.opengeospatial.org/files/?artifact_id=61446

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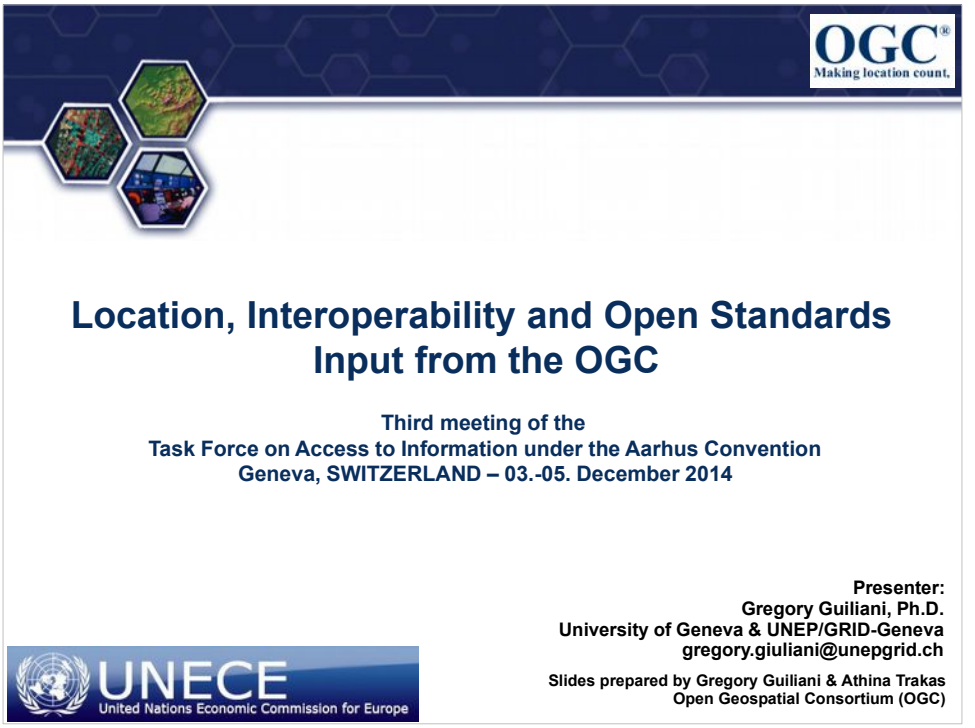

Dear ladies and gentlemen.

My name is Gregory Giuliani and I work at the University of Geneva & the UNEP/GRID-Geneva- We are a member in the Open Geospatial Consortium and are actively participating in the OGC working groups and are using OGC standards in various projects. Today I will talk on behalf of Athina Trakas, OGC's Director for European Services. She sends her regards and regrets to not beeing able to be here in person.

The presentation is about ...

- … interoperability and open standards
- … the work of the Open Geospatial Consortium
- … practical examples:
  - the GEO/GEOSS and AIP (as an examples for PPP)
  - the enviroGRIDS project
  - UNEP's Global Risk Data Platform

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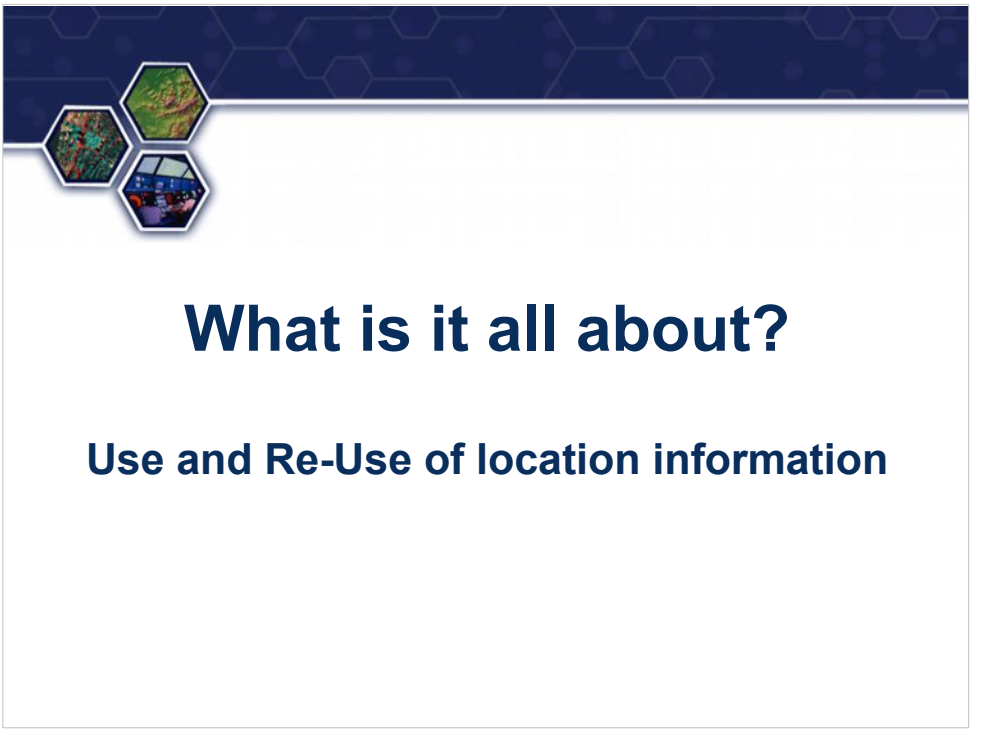
It is an honour for us to speak this morning about the work that is been undertaken by the OGC, give an insight into interoperability and open standards and close the presentation with a few examples underpinned by OGC standards.



So, what is it all about?

We are all dealing with location data and location information. Location is essential to address societal, environmental and economic issues. And as you all know location information and technologies underpin governance, business and citizen decisions

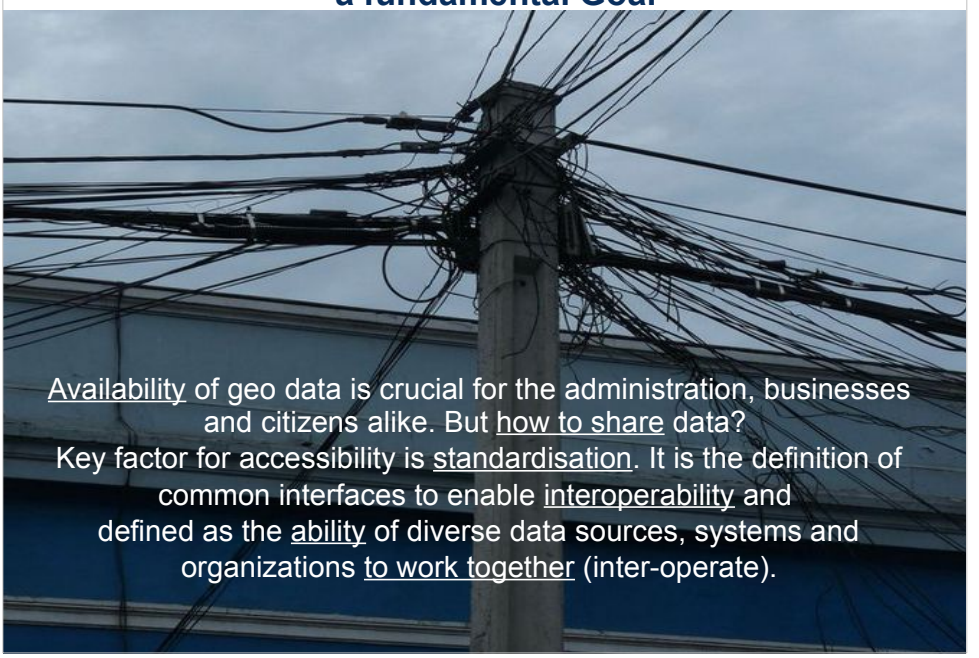
Now, the ability to access, fuse and apply diverse data sources is critical to situational awareness. And by addressing critical interoperability issues that need cooperation across domains (interdisciplinary) like weather forecasts, water management and also aviation safety and civil protection we are improving knowledge sharing and transfer.

Arriving at technical interoperability through a consensus process -- That is the work of the OGC. Here you can see a list of focus domains and communities of interest our members are addressing in the various working groups.

At the time of OGC's founding in 1994 users of Geographical Information Systems were unable to easily share and exploit geospatial information between GIS software technologies from different vendors. This was when the OGC was founded as a not for profit international and consensus based industry consortium. The purpose of the OGC is to develop publicly available interface standards. Currently we have over 40+ open standards that have been developed by our members.

Membership has been growing in a sustainable pace and the currently 506 member organisation come from industry, government agencies and public administration, the academic and research sector as well as non-governmental organisations of various kinds. But we don't want to re-invent the wheel and therefore the OGC cooperates with other standards bodies. The OGC brings in 1) its expertise and leadership on location to help broader IT standards process any location information consistently, and 2) expertise in innovative standards processes for development, testing and certification of standards.

Interoperability through Open Standards - a fundamental Goal



As I explained so far the availability and accessibility of geo data is crucial for administrations, businesses and citizens alike. But how to share data?

One key factor in making geospatial information and data accessible is standardization. It is the definition of common interfaces and terminology between heterogeneous systems to enable interoperability.

Standards enable Interoperability...

- … for sharing and transforming geoinformation into knowledge
- … to use and re-use PSI (public sector information)

***Open* Standards**

- **Lower systems and life-cycle costs**
- **Encourage market competition**
  - Choose based on functionality desired
  - Avoid “lock in” to a proprietary architecture
- **Stimulates innovation beyond the standard by companies that seek to differentiate themselves.**

„People want the government to be transparent, so why shouldn't the technology be?”

Jim Willis, Director of e-Government at theRhode Island Secretary of State Office

Source: Open Standards, Open Source, and Open Innovation: Harnessing the Benefits of Openness, April 2006. Committee For Economic Development. www.ced.org

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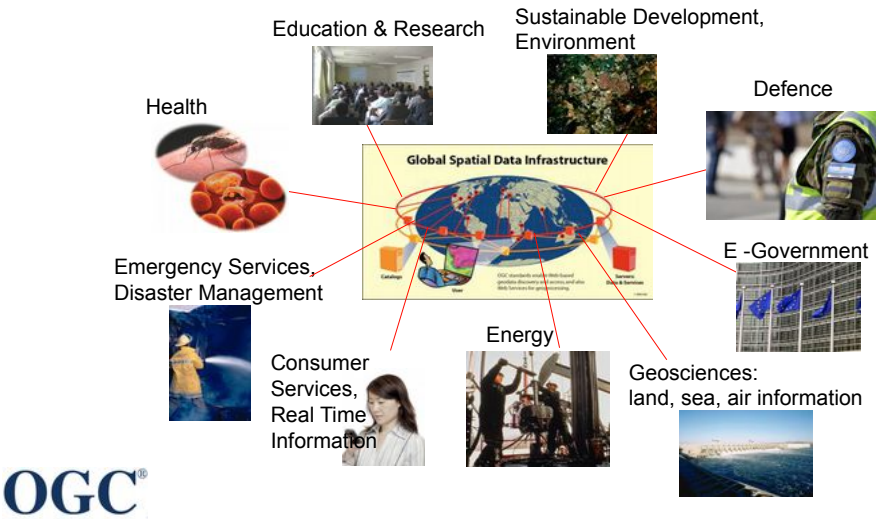
This is our main focus, interoperability, defined as the ability of diverse systems and organisations to work together (inter-operate). It's crucial for sharing and transforming location information into knowledge and to use and re-use Public Sector Information.

This gives users the opportunity to save time, reduce cost, increase flexibility, protect assets and – lives.

Open Standards additionally avoid in systems and architectures a „lock in“ to a proprietary set up.

OGC standards...

… are driven and influenced by community needs



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All OGC activities, the decision to develop a particular standard is driven by community needs and brought into the process by our members.

Influenced by changing Technology

- Web 2.0, IPV6
- The Cloud
- Earth Browser Systems
- Mobile Applications
- Geolocated devices & sensors, IoT
- Mass / Consumer Market
- Social Networking
- Crowd Sourcing
- and many more...

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Of course the standards developement is also influenced by changing technologies. Take just sensors as an example: number of Internet-connected devices will reach between 50 and 60 billion by the end of the decade – many of them connected to the internet and all of them are sensing phenomena somewhere and somewhen….

(((Therefore the OGC has developed a suite of Sensor Web Enabelement standards to access, process and integrate sensor data into web maps. The OGC also has various standardisation activities underway to exploit data as part of the Internet of Things))).

and influenced by ...

- **Policy** – addressing the wide variation in policy worldwide related to information -sharing, -access and use, -funding, -privacy, etc.
- **Language** – not just spoken and written language but: Semantics, vocabularies, content models, ontologies
- **Members, public input, regional requirements,** – and many more

Source: http://www.bayside.vic.gov.au/policy.jpg

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This is also the reason why we have a broad user community world wide and why many policy positions on geoinformation on local, national and international level are underpinned by OGC standards. Policy positions influence also our standards development.

There is a plethora of standards-based solutions available (applications and many software product, open source and proprietary) promoting and supporting improved decision making. Just like the examples shown in this slide.

Developing useful standards is not easy!

→ Requires understanding of differences & requirements

→ Requires cooperation & expertise on a global basis

→ Requires consensus by many organizations

→ Requires give & take

→ Requires agreements & repeatable processes

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But: developing useful standards is not an easy task. It requires various actions like understading differences and requirements – so please talk about your needs! Additionally cooperation on a global basis is a pre-condition for success, as is the consensus based on the input from many organisations.

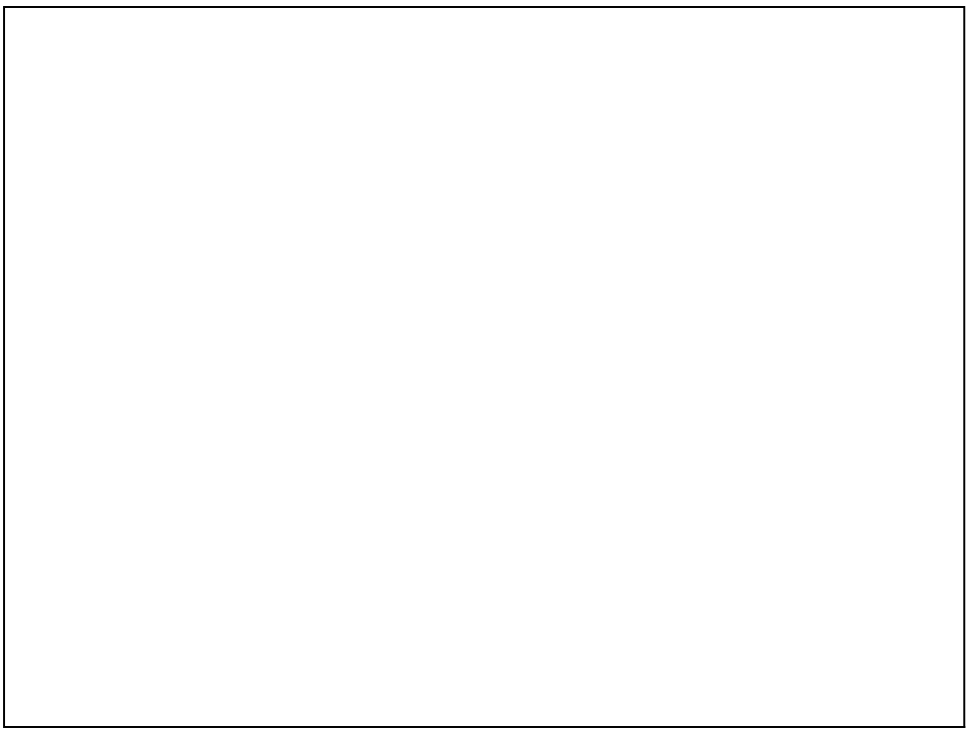
And if you benefit from using standards and the experience and expertise from others, share your own. Last but not least an understandable and repeatable process additionally helps in developing useful standards.

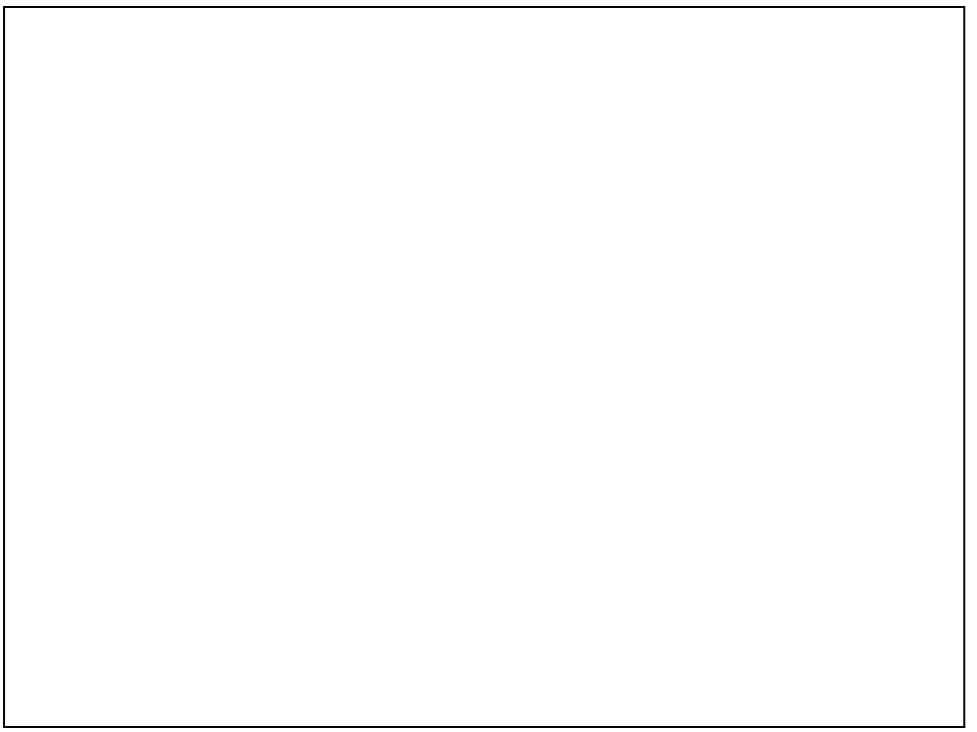
Use cases and examples

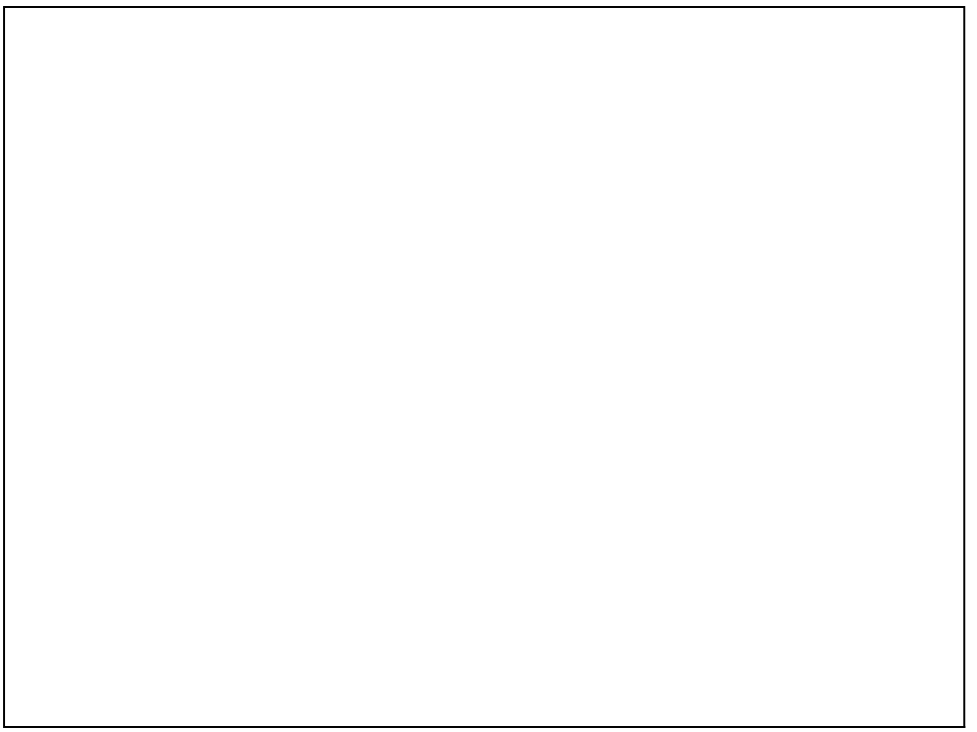
We learned in the first section, that interoperability and standardisation are crucial to help address a diversity of complex societal challenges.

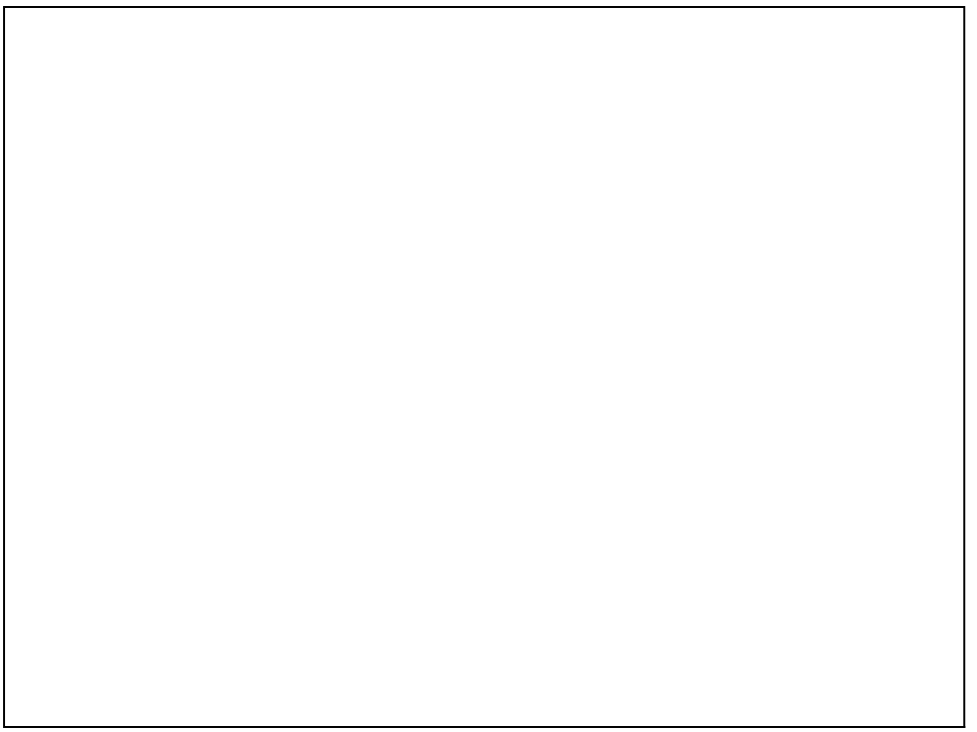
This is valid not only when talking about environmental aspects, but also in areas like innovation, energy, food and agricultur or infrastructure – just to name a few.

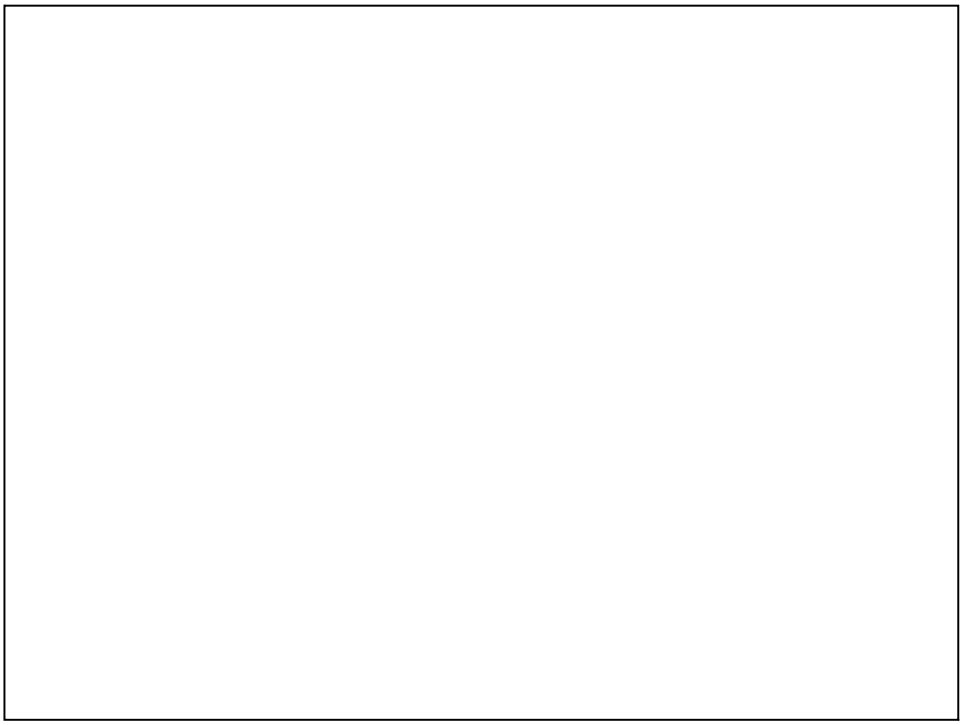
In the last part of the presentation I will provide some examples that show how the OGC, its standards and its members work together to address environmental and societal challenges. I explained why interoperability and standards are important in today's interdependent world and why participation in an international standards development organisations is important and beneficial for the participants and the community. Now let me please show to you how these mentioned aspects are put into use.

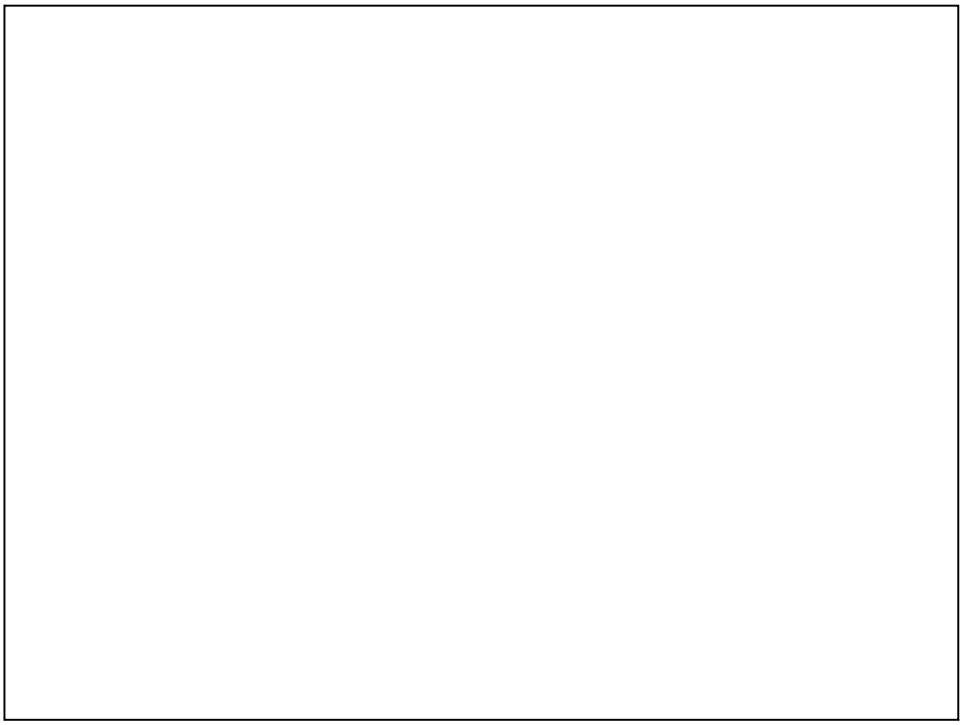


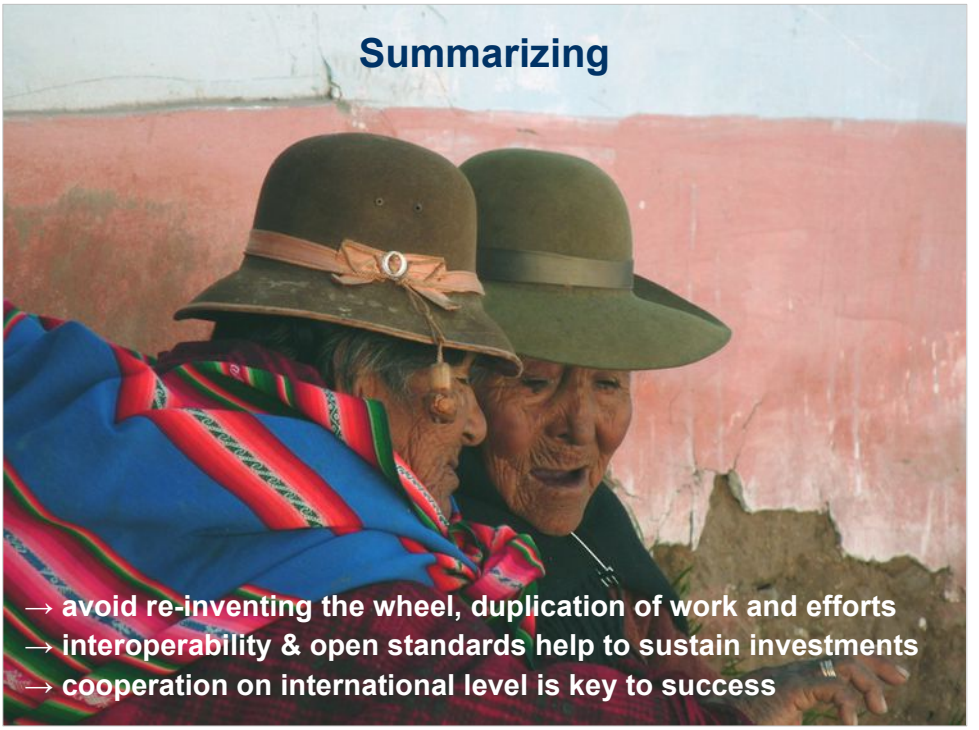












Now let me summarize my presentation:
I explained, that sharing data is important. And if you need to share data, why not also share your experiences and build on existing ones → avoid re-inventing the wheel and duplication of work, efforts and resources.

The technology evolution will continue at a fast, unpredictable and disruptive pace → interoperability and using open standards can help also to sustain investments.

And as I showed we live in important times for leveraging location information for improved decision making → cooperation on international level is key to success.

Some last thoughts...

“Interoperability seems to be about the integration of information. What it's really about is the coordination of organizational behaviour.”

David Schell,
Chairman Emeritus OGC Board
and Founder OGC

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Closing let me please add a quote from David Schell, OGC's founder and Chairman Emeritus of the OGC Board of Directors. He says: „Interoperability seems to be about the integration of information. What it's really about is the coordination of organisational behaviour.”