



Open Geospatial Consortium: Open Standards, Programs, Processes

**enviroGRIDS Final Meeting &
Black Sea Day Celebration
Batumi, 30th Oct – 01. Nov 2012**



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The presentation is about...



- **... why interoperability & open standards matter**
- **... OGC as organisation**
- **... the importance of communication**



What is it all about?

Making your treasures accessible & re-usable



Standards and Interoperability

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.

Benefits of Standardization



- German DIN Study: Standards promote worldwide trade, encouraging rationalization, quality assurance and environmental protection, as well as improving security and communication. Standards have a greater effect on economic growth than patents or licences.
- „Economic Benefits of Standardization“
- Benefits to German economy of 17 billion Euros in 2010!

NIST GCR 04-867



U.S. Department of Commerce
Technology Administration
National Institute of Standards and Technology

Advanced Technology Program
Information Technology and Electronics Office
Gaithersburg, Maryland 20899

Cost Analysis of Inadequate Interoperability in the U.S. Capital Facilities Industry

Michael P. Galleher, Alan C. O'Connor, John L. Dettbarn, Jr., and Linda T. Gilday



2004 NIST report: “. . . the annual cost of waste due to inadequate interoperability among computer-aided design, engineering, and software systems in the construction industry to be \$15.8 billion <in the US alone>.”



Why
→ **interoperability?**
→ **open standards?**

Source:



Source:

[illegible]

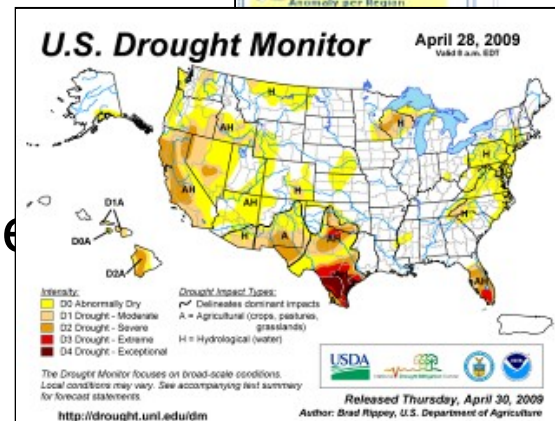
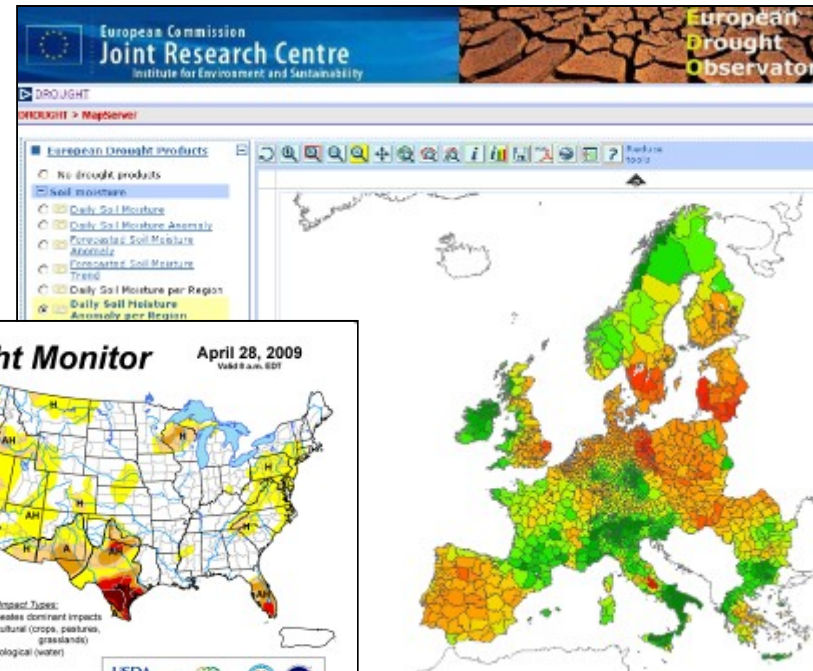
© 2012 Open Geospatial Consortium – 8

Improving Knowledge Sharing and Transfer



We are addressing critical issues, that need cooperation:

- Growth in urban centers and coastal areas
- Climate Change, Environmental Monitoring
- Water Resource availability and quality
- Emergency planning, preparedness & response
- Aviation Safety
...and many more



<http://www.ogcnetwork.net/pub/ogcnetwork/GEOSS/AIP3/index.html>

Standards Development is not easy!



Picture by Athina Trakas

- Requires understanding of differences
- Requires cooperation on a global basis
- Requires consensus by many organizations
- Requires give and take
- Requires certified, repeatable process

... and does not exist in isolation

Alliance Partners: Critical Resource for Advancing Standards



... and others

<http://www.opengeospatial.org/ogc/alliancepartners>

Why Open Standards?



- **Prevents a single, self-interested party from controlling a standard**
- **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.**

„What OGC brings to the table is...everyone has confidence we won't take advantage of the format or change it in a way that will harm anyone”

**Michael Weiss-Malik,
Google KML product
manager**



**Standards are
like parachutes:
they work best
when they're
open.** Mary Mc Rae, OASIS*

* "Minds, like parachutes, function better when open, but, like fists, they strike harder when closed." — L.E. Modesitt, Jr., *American Author* (1943 --)

Source picture: <http://www.all-hd-wallpapers.com/wallpapers/sports/425236.jpg>

What is an OGC Standard?

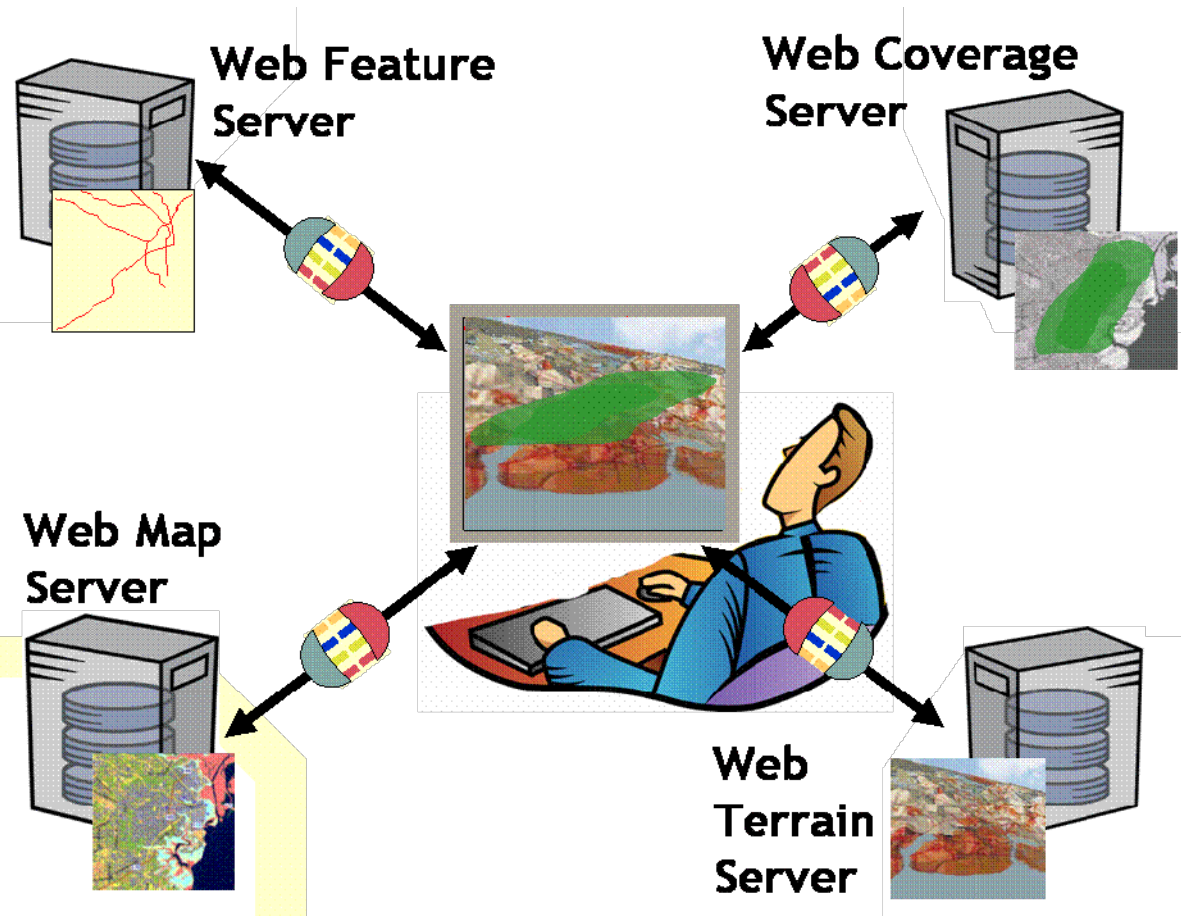


- A document, established by consensus, approved by the OGC membership (balance of interest, all members have an equal vote)
- Provides, rules, guidelines or characteristics
- Implementable in software
- Open standards does not mean open source software (Free Software). OGC/OSGeo Paper on Open Source Software and Open Standards: http://wiki.osgeo.org/wiki/Open_Source_and_Open_Standards
- OGC standards are **Open Standards**
 - Freely and publicly available
 - No license fees
 - Vendor neutral

„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**

Geo* and Location* on the Web



Just as http:// is the dial tone of the World Wide Web, and html / xml are the standard encodings, the geospatial web is enabled by OGC standards.

Major OGC Standards

<http://www.opengeospatial.org/standards>

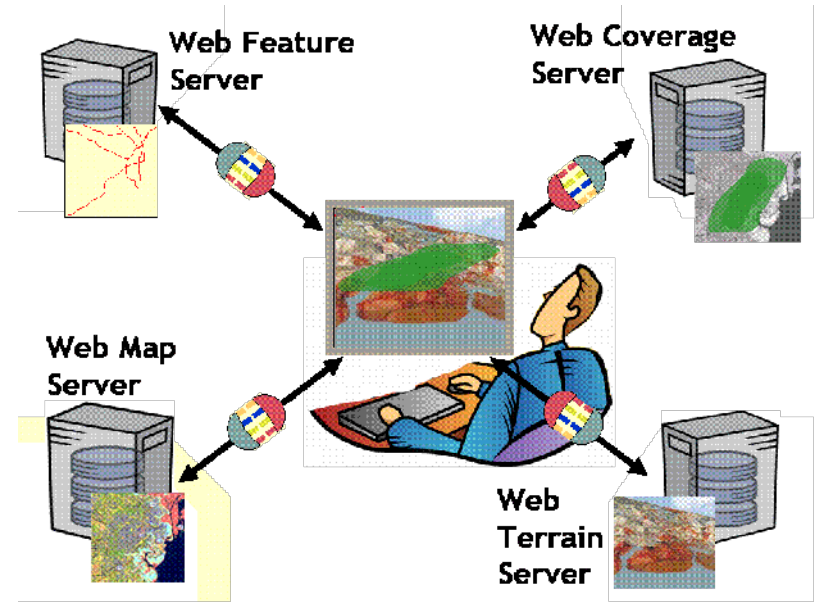


Some examples

- **Web Map Servers (WMS)**
- **Web Feature Servers (WFS)**
- **Web Coverage Servers (WCS)**

As well as the:

- **KML (formerly Keyhole Markup Language)**
- **Web Map Context (WMC)**
- **Geography Markup Language (GML)**





Some facts about the OGC



<http://www.youtube.com/ogcvideo>

→ more videos on OGC's Youtube Channel:
<http://www.youtube.com/user/ogcvideo/videos>

OGC at a glance



- Founded in 1994, not for profit, consensus based and voluntary
- 475+ member organisations (industry, government, academia) (Oct. 2012) <http://www.opengeospatial.org/ogc/members>
- 23 staff members
- 30+ adopted OGC Standards (some are ISO Standards) <http://www.opengeospatial.org/standards>
- Several hundred software products, implementing OGC Standards <http://www.opengeospatial.org/resource/products>
- Broad user community worldwide, many policy positions for NSDI based on OGC standards
- Cooperation with other standards organisations and foundations, ISO/TC 211, OSGeo, W3C, OASIS and others <http://www.opengeospatial.org/ogc/alliancepartners>



So what does OGC do?



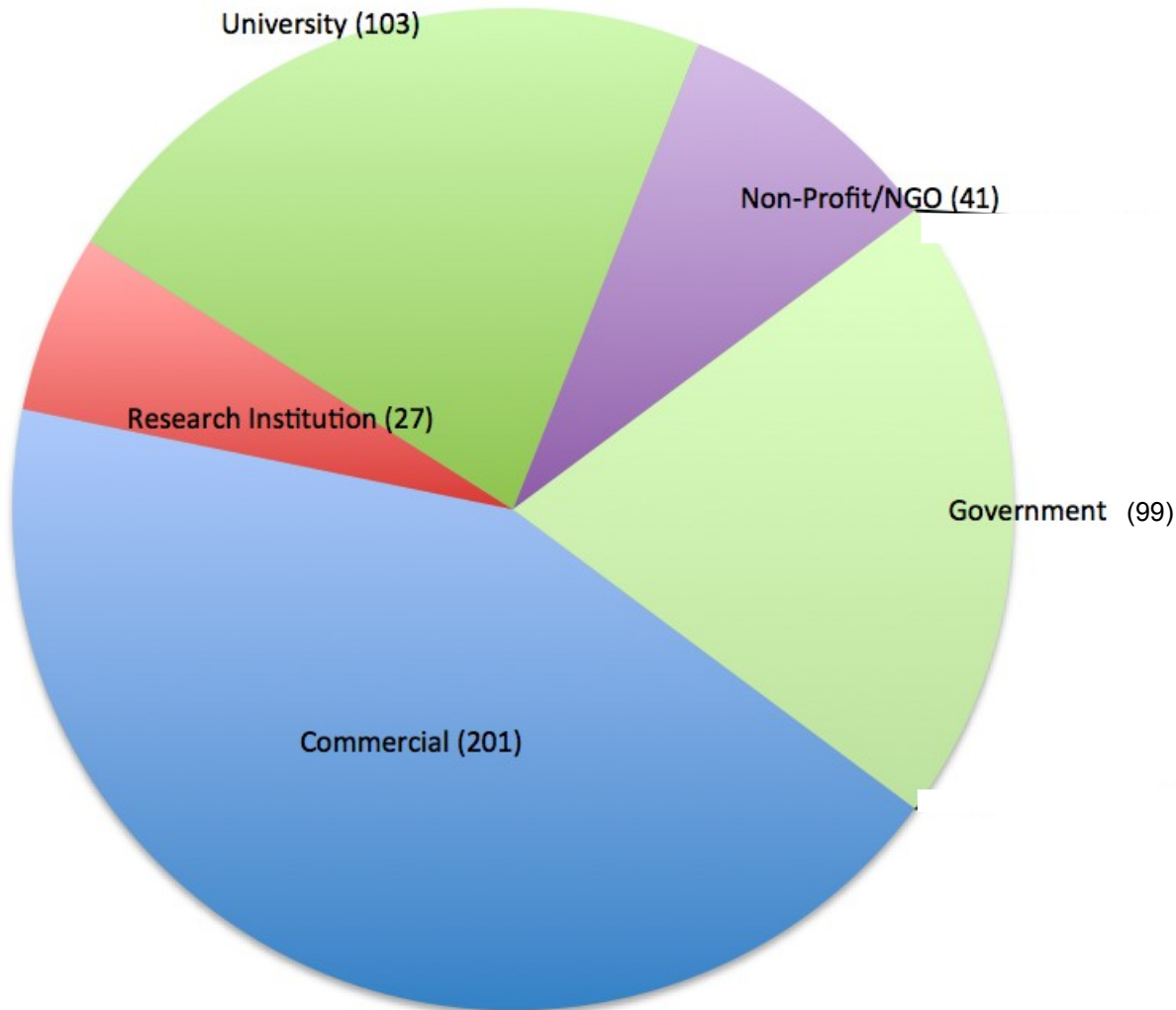
The Vision

Achieve the full societal, economic and scientific benefits of integrating location resources into commercial, institutional and organisational processes worldwide.

The Mission

To serve as a global forum for
and lead the development, promotion and harmonization of
open and freely available geospatial standards.

OGC membership



Africa (4)
Asia Pacific (72)
Europe (210)
Middle East (8)
North America (176)
South America (3)

European OGC Members (examples)

<http://www.opengeospatial.org/ogc/members/report/?sortby=%27country%27>



Austria (8)

- AIT Austrian Institute of Technology
- City of Vienna
- EOX IT Services GmbH
- Frequentis AG
- Salzburg University
- Technical University of Vienna
- UN Geographic Information WG
- Wikitude GmbH

Bulgaria (1)

- URSIT Ltd.

Croatia (1)

- Državna geodetska uprava (State Geodetic Admin, Croatia)

Hungary (1)

- Károly Róbert Főiskola

Czech Republic (2)

- HELP SERVICE - REMOTE SENSING
- Masaryk University

Greece (3)

- Ktimatologio SA
- Nat'l & Kapodistrian University Athens
- Dimitris Kotzinos

Poland (1)

- Polish Association for Spatial Information

Romania (1)

- National Meteorological Administration

Serbia (1)

- University of Novi Sad, Fac. Technical Sciences

Turkey (1)

- Netcad Ulusal CAD&GIS



and



**...is about
Standards**

**...is about Free and
Open Source Software**

**OGC/OSGeo Paper on Open Source Software & Open Standards:
http://wiki.osgeo.org/wiki/Open_Source_and_Open_Standards**

Memorandum of Understanding

http://wiki.osgeo.org/wiki/OSGeo_signs_Memorandum_of_Understanding_with_OGC

Open Source Geospatial Foundation

- Free and Open Source Software
- The Open Source Geospatial Foundation (OSGeo)
<http://www.osgeo.org/>

Open Geospatial Consortium

- Standards Development
- The Open Geospatial Consortium (OGC)
<http://www.opengeospatial.org/>

- The OGC is a not-for-profit organization founded in 1994, and comprised of industry, government and academic members dedicated to **advancing interoperability** among IT systems that process geo-referenced information.
- The OSGeo is a not-for-profit organization founded in 2006 whose mission is to support and promote the collaborative **development of open source geospatial technologies and data**.
- The Parties wish to make sure that open standards are made **freely available** to the global public; **unencumbered** by patents or other Intellectual Property claims that may diminish their usefulness.
- The Parties wish to memorialize their understanding regarding certain **joint activities** in which they plan to engage.

(Excerpt from the Memorandum of Understanding)

OGC/OSGeo Paper on Open Source Software & Open Standards:
http://wiki.osgeo.org/wiki/Open_Source_and_Open_Standards



OGC in use some examples

OGC standards and Policy

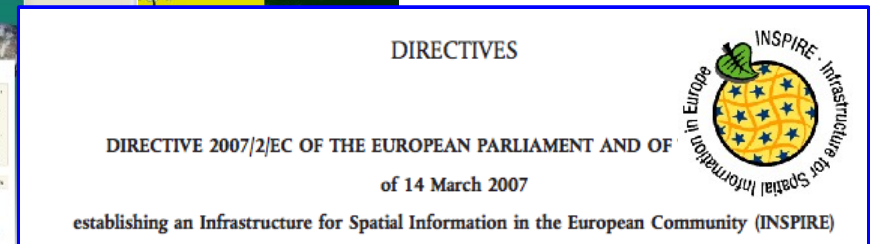
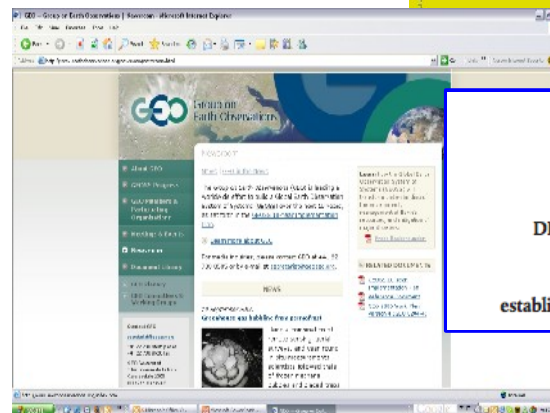
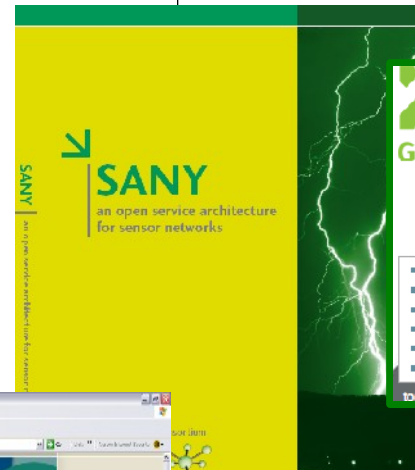
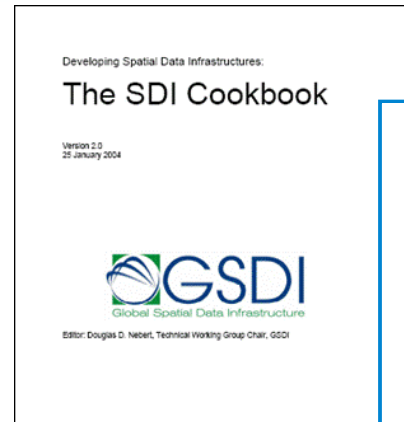
A close-up photograph of a document. A green highlighter pen is positioned diagonally across the frame, with its tip pointing towards the bottom right. The word 'policy' is printed in a serif font and is highlighted with a bright yellow marker. Other words like 'member', 'statement', and 'government' are visible but blurred in the background.

pol·icy

OGC standards and policy

<http://www.opengeospatial.org/ogc/quotes>

- Global Earth Observation System of Systems (GEOSS)
- GSDI and UNSDI
- European Environment Agency
- European INSPIRE Directive
- GeoConnections Canada
- National legislation, e.g. the Netherlands, UK Ordnance Survey
- NATO C3
- and many more...



OGC and INSPIRE (1)



- Many OGC members are involved in the INSPIRE process and vice-versa (e.g. INSPIRE Legally Mandated Organisations (LMO), INSPIRE Spatial Data Interest Communities (SDIC), IOC Task Force).
- Cooperation with the Joint Research Center (JRC) and other EU agencies.
- **S. Schmitz (GDI-DE): INSPIRE View Service = OGC Standard + X**
- OGC Market Report „Open Standards in INSPIRE“
<http://www.opengeospatial.org/pressroom/marketreport/inspire>



The screenshot shows the OGC website header with the logo "OGC" and the tagline "Making location count." on the left. On the right, there are three links: "XLink FAQ", "INSPIRE", and "What is the OGC?". Below this is a navigation bar with links: "Home", "Standards", "Programs", "Participate", "News & Events", "About OGC", and "Member Login". A search bar is located on the right side of the navigation bar. In the bottom left corner, there is a "News & Events" section with a link to "OGC Blog". The main content area displays the title "OGC Market Report: Open Standards and INSPIRE".

Hydrology Domain Working Group

<http://www.opengeospatial.org/projects/groups/hydrologydwg>



Provide a venue and mechanism for seeking technical and institutional solutions to the challenge of describing and exchanging data describing the state and location of water resources, both above and below the ground surface. Coordination with WMO.



Building Experience with Water Resources



Hydrology DWG



OGC®

The **Hydrology Domain Working Group** is a **Joint Working Group** of the World Meteorological Organisation (WMO) and the OGC

The purpose of the Hydrology DWG is to provide a venue and mechanism for seeking technical and institutional solutions to the challenge of describing and exchanging data describing the state and location of water resources, both above and below the ground surface. The path to adoption will be through OGC papers and standards, advanced to ISO where appropriate, and also through the World Meteorological Organization's (WMO) and its Commission for Hydrology (CHy) and Information Systems (WIS) activities.

While CHy has the recognized mandate to publish and promote standards in this area, OGC contributes to the process with its resources and experience in guiding collaborative development among disparate participants in a rapidly evolving technological environment. The OGC Hydrology DWG will provide a means of developing candidate standards for adoption by CHy as appropriate.

The Hydro DWG is open to both member and non member participation and is intended to be a public forum for communication, and both the [email list](#) and the wiki are open to interested parties.

Co:Chairs: David Lemon (CSIRO), Ilya Zaslavsky (SDSC) and Ulrich Looser (GRDC)

→ <http://www.opengeospatial.org/projects/groups/hydrologydwg>

Hydrology DWG activities



- **Water Information Services Concept Development**, sponsored by the Consortium of Universities for the Advancement of Hydrologic Science, Inc. (CUAHSI), completed in 2011, report is anticipated to serve as starting point to define future IP Initiatives.
- **Water Interoperability Experiments** (Groundwater and Surface Water IEs provided key inputs into the development of WaterML 2.0 which is nearly complete, Forecasting IE will provide key inputs, e.g., change requests, into WaterML.
- **OGC WaterML 2.0 Standard** for data exchange of time series and sample observations (Community wide international encoding standard, adoption by OGC anticipated in 2012, WMO adoption anticipated).

→ http://external.opengis.org/twiki_public/HydrologyDWG/WebHome



“Once you have understood how much open standards can underpin environmental policies, you keep trying to convince others. This is exactly what we at IOEau have been doing for years now in France and in other nations. I really enjoy taking part in this movement and will continue planting open standards seeds wherever I can.”

Sylvain Grellet (IOEau)

<http://www.opengeospatial.org/blog/1667>

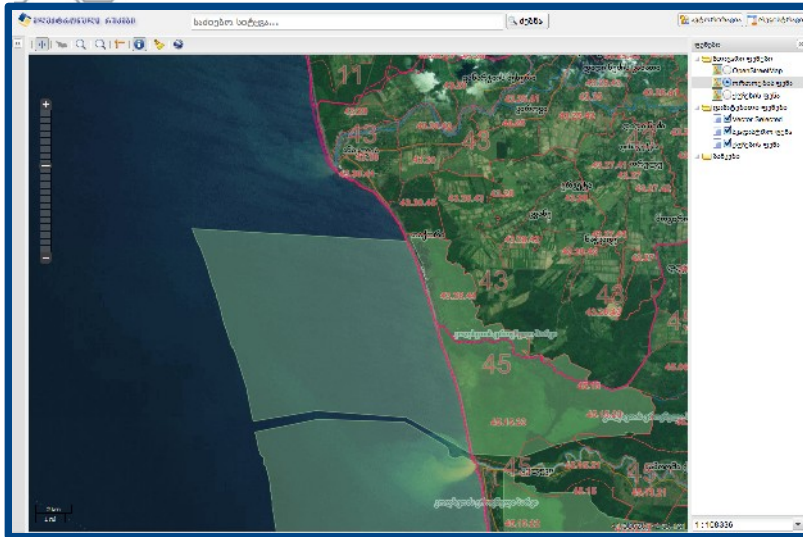


Guidance document n.º 9

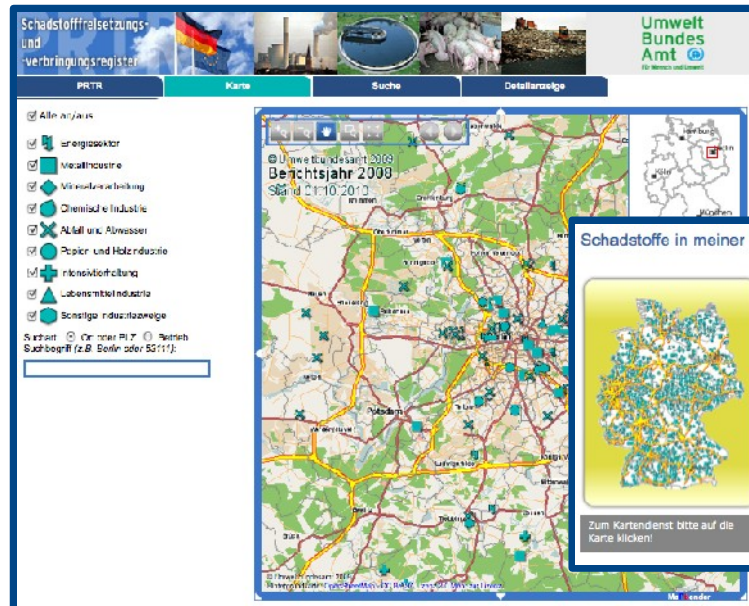
**Implementing the Geographical Information
System Elements (GIS) of the Water Framework
Directive**

... mentions various OGC standards.
[http://circa.europa.eu/Public/irc/env/wfd/library?
l=/framework_directive/guidance_documents](http://circa.europa.eu/Public/irc/env/wfd/library?l=/framework_directive/guidance_documents)

Examples



Screenshot from National Agency of Public Registry, Georgia - <http://maps.napr.gov.ge/>



PRTR-Germany (Pollutant Release and Transfer Register) <http://www.prtr.bund.de>

Schadstoffe in meiner Nachbarschaft?



Der erfolgreiche Start des Schadstoffregisters am 03.06.09 in Berlin hat es gezeigt - viele haben darauf gewartet, nun endlich mehr Informationen zu den Emissionen aus Industriebetrieben zu erhalten!

Über die Karten "Karte" und "Suche" können Sie gezielt die Betriebe suchen, die Sie interessieren - und finden! Wählen Sie hierzu die Kartenwerkzeuge oder die jeweiligen Suchfelder aus.

Außerdem stellen wir Ihnen aktuelle Informationen und Auswertungen der Daten zur Verfügung.

PRTR - kurz und knapp

Zum Kartendienst bitte auf die Karte klicken!

Health: EO2Heaven

<http://www.eo2heaven.org/>



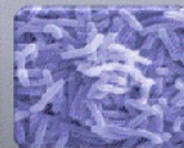
EO2HEAVEN (Earth Observation and Environmental Modelling for the Mitigation of Health Risks) contributes to a better understanding of the complex relationships between environmental changes and their impact on human health.



Case Study 1: Saxony/Germany
Environmental effects on allergies and cardiovascular diseases



Case Study 2: Durban/ South Africa
The relationship between industrial pollutant exposure and adverse respiratory effects

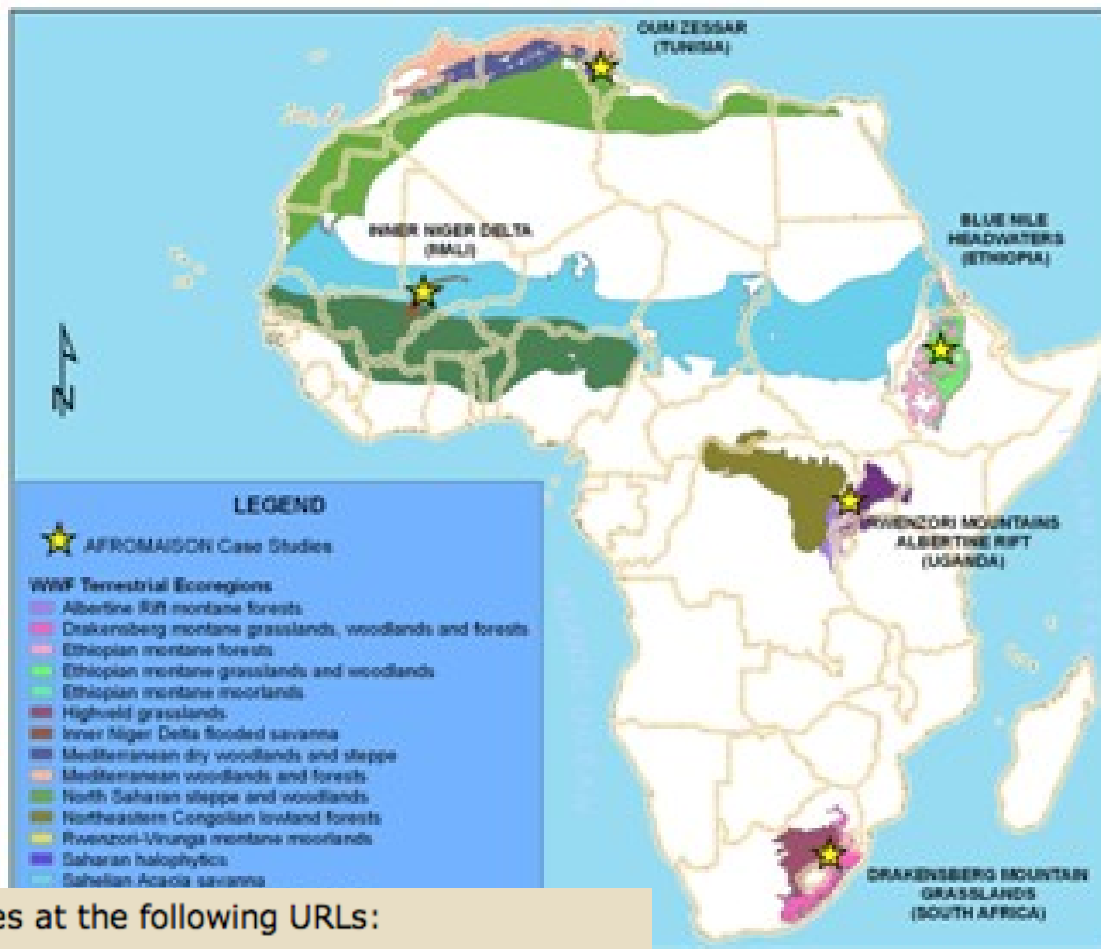


Case Study 3: Cholera / Uganda
Investigating the impact of environmental and climatic variables on cholera outbreaks

Example: AFROMAISON Project



Africa at meso-scale:
Adaptive and integrated
tools and strategies on
natural resources
management
(<http://www.afromaison.net/>)



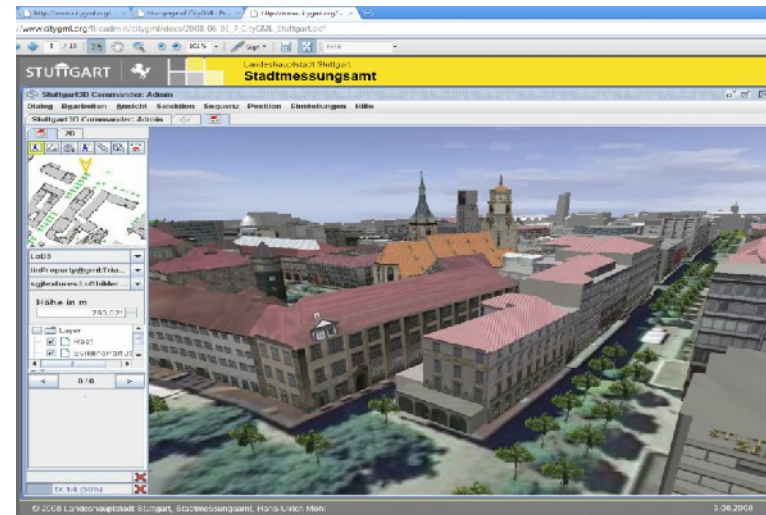
Users can access AfroMaison catalog and services at the following URLs:

- AfroMaison WMS: <http://afromaison.grid.unep.ch:8080/geoserver/ows?>
- AfroMaison WFS: <http://afromaison.grid.unep.ch:8080/geoserver/ows?>
- AfroMaison WCS: <http://afromaison.grid.unep.ch:8080/geoserver/ows?>
- AfroMaison metadata catalog: <http://afromaison.grid.unep.ch:8080/geonetwork/>
- AfroMaison CSW: <http://afromaison.grid.unep.ch:8080/geonetwork/srv/cvw?>
- AfroMaison broker: <http://afromaison.grid.unep.ch:8080/gi-cat/gi-portal/index.jsp>

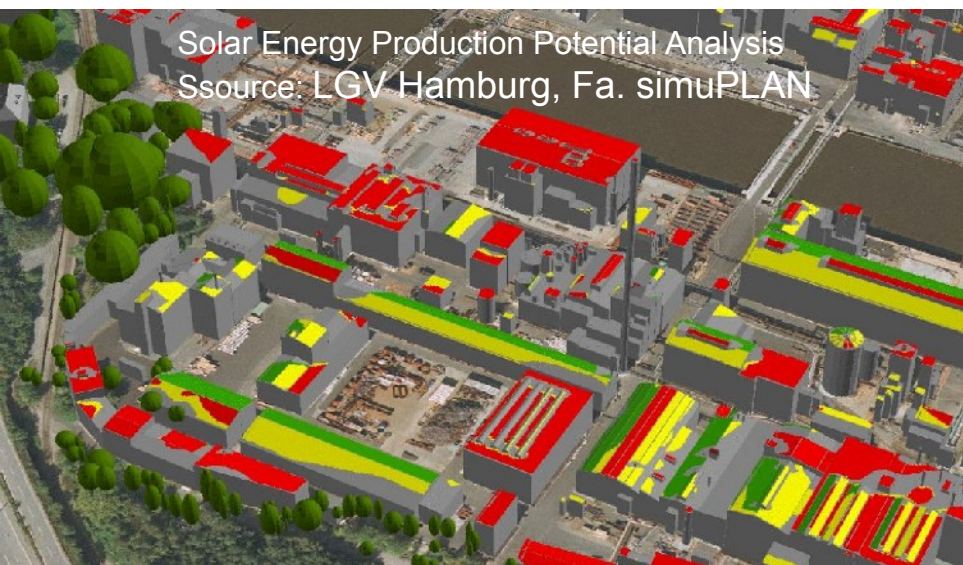
Example: CityGML – 3D Urban Models



Urban Planning / Operations
Emergency Mgt / Response
Transportation / Routing / Logistics
Indoor navigation
Retail Site analysis
Sustainable / Green Communities
City Services Management
Noise abatement
Telecommunications placement
Many other uses...



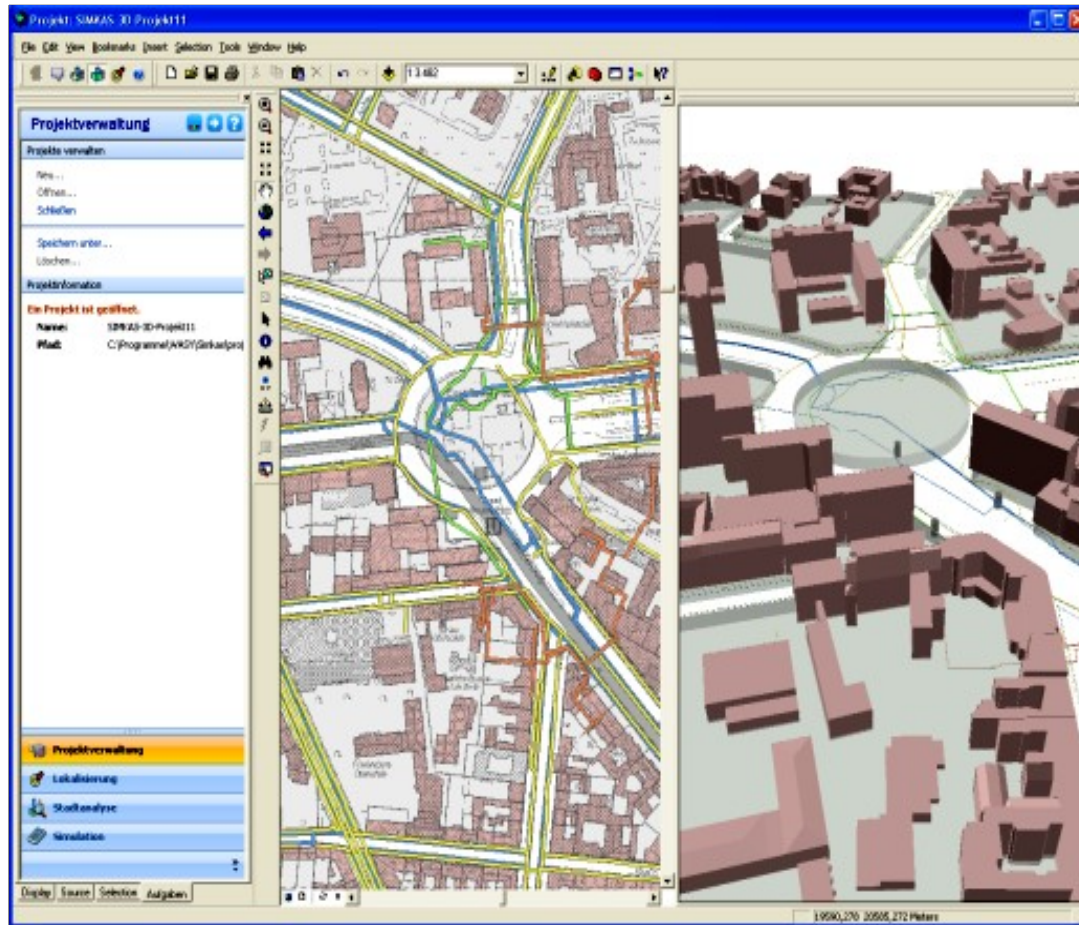
Source: Thomas Kolbe, Berlin TU



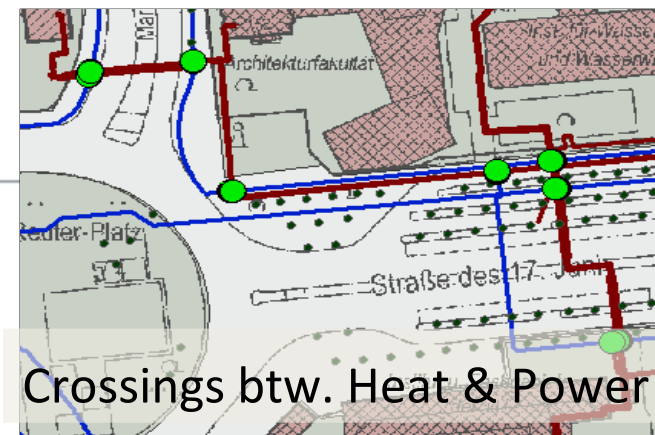
Solar Energy Production Potential Analysis
Source: LGV Hamburg, Fa. simuPLAN



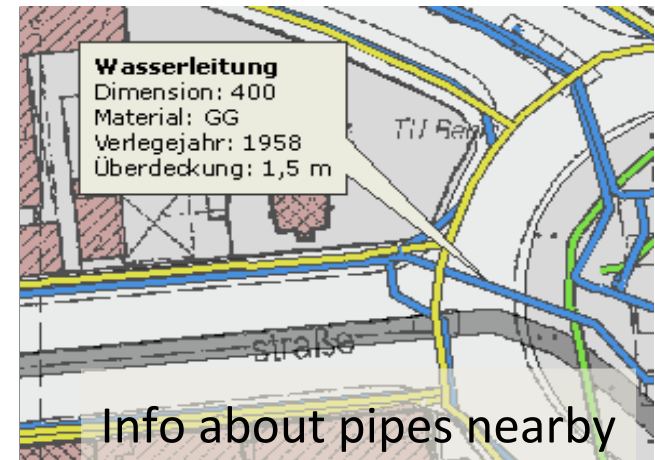
2D / 3D Analysis and Simulation of Utility Networks



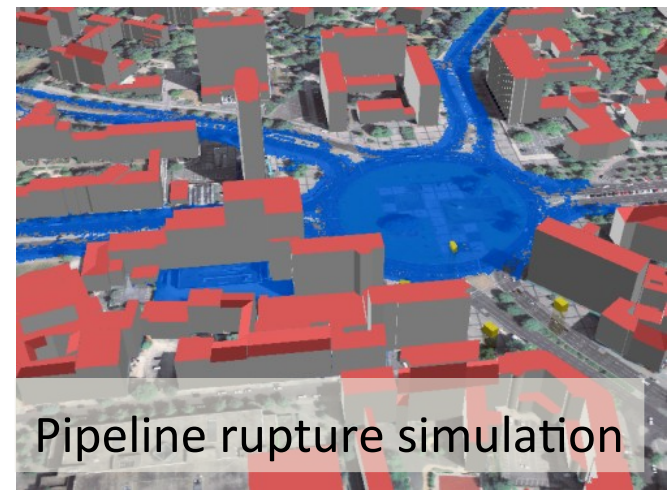
Source: DHI-WASY GmbH, SIMKAS-3D project partner



Crossings btw. Heat & Power

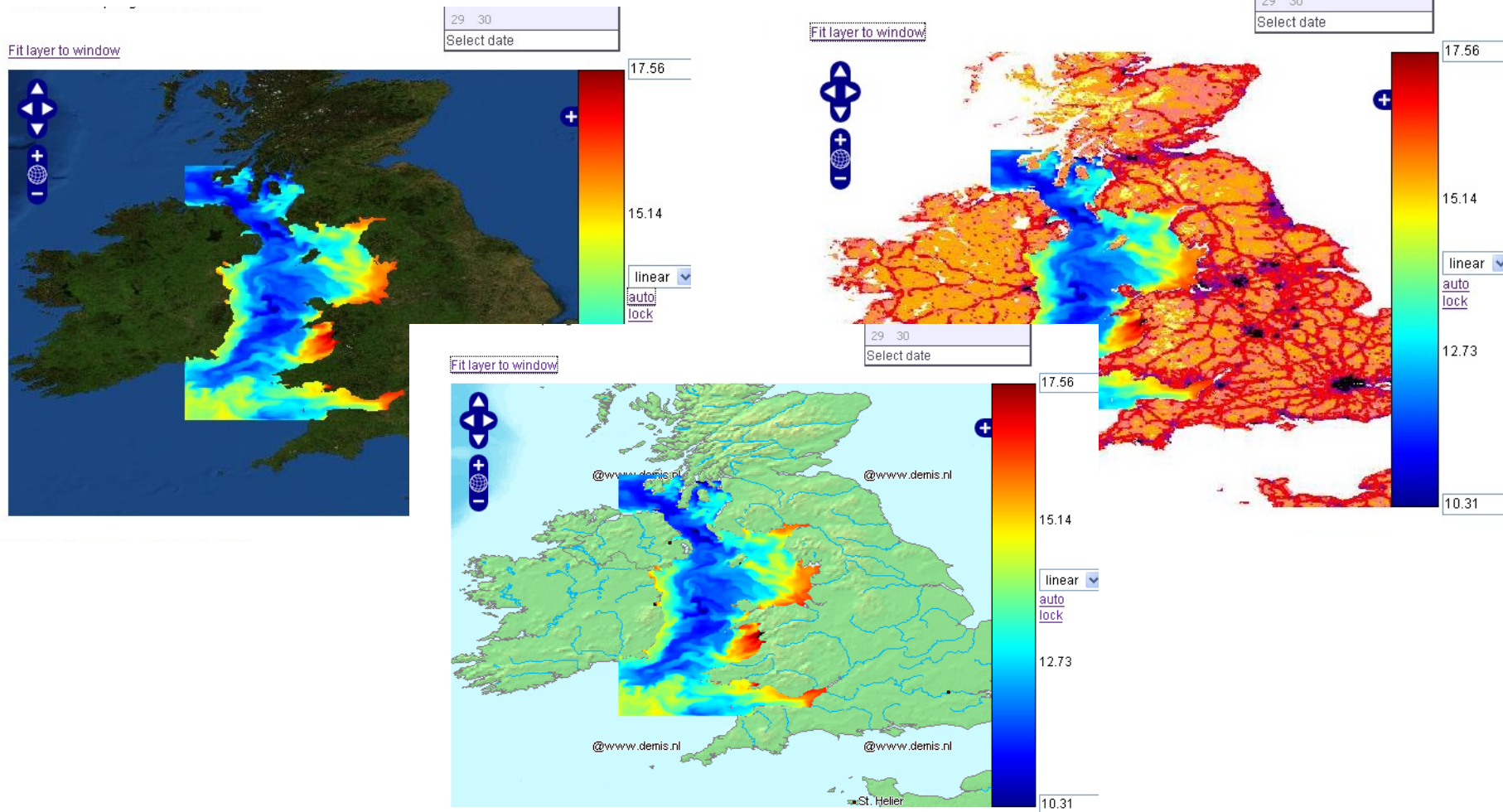


Info about pipes nearby



Pipeline rupture simulation

WMS interoperability in the portal Met Office UK & University of Reading



Thanks to Jon Blower (Uni Reading)

http://www.ogcnetwork.net/system/files/EGU_GeoStandards_7_Blower_0.pdf

Communication & Participation

How does OGC work?



Picture by
Athina Trakas

Avenues for Public Input



- **OGC Network**

<http://www.ogcnetwork.net/>

- **General Requests (for Information, for Comment, for Participation)**

<http://www.opengeospatial.org/standards/requests>

- **Change Requests and New Requirements**

<http://www.opengeospatial.org/standards/cr>

http://portal.opengeospatial.org/public_ogc/change_request.php

- **Contact us**

<http://www.opengeospatial.org/contact>

Adjusted membership fee



To better allow organizations from all over the world to participate in our process, we have adjusted our membership fees. That gives certain categories of organizations discounts based on their country of registration.

More information at:

<http://www.opengeospatial.org/pressroom/pressreleases/1389>

<http://www.opengeospatial.org/ogc/join/levels#bottom>

OGC Activities Driven by Community Needs



Education & Research



Sustainable Development

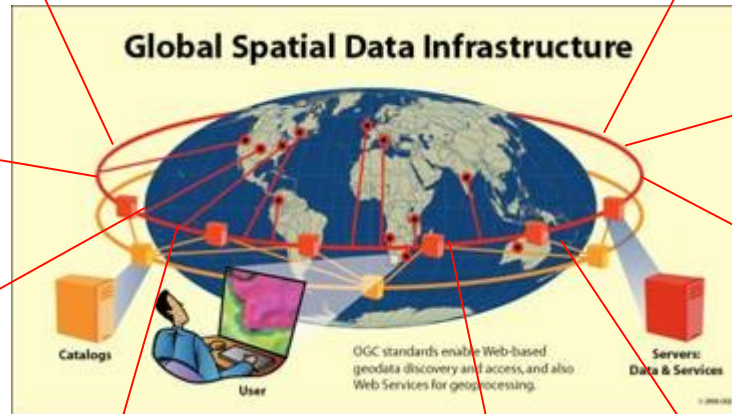
Health



Defence



Emergency Services,
Disaster Management



E -Government



Energy



Consumer Services,
Real Time
Information



Geosciences:
land, sea, air information



... lead to Domain Working Groups

<http://www.opengeospatial.org/projects/groups/wg>

Domain Working Groups

Domain Working Groups (DWG or WG) provide a forum for discussion of key interoperability requirements and issues, discussion and review of implementation specifications, and presentations on key technology areas relevant to solving geospatial interoperability issues.

Name	Lead **
3DIM DWG (3DIM DWG)	Scott Simmons, CACI International Inc.
Architecture DWG (Arch DWG)	Doug Nebert, US Geological Survey (USGS)
Aviation DWG (Aviation DWG)	Navin Vembar, FAA System Operations Airspace and ATM Office
Catalog DWG (Cat DWG)	Doug Nebert, US Geological Survey (USGS)
Coordinate Reference System DWG (CRS DWG)	Victor Minor, Blue Marble Geographics
Coverages DWG (Cover DWG)	Peter Baumann, FORWISS (Bavarian Research Centre for Knowledge Based Systems)
Data Preservation DWG (PreservDWG)	Steve Morris, North Carolina State University
Data Quality DWG (DQ DWG)	Matt Beare, 1Spatial Group Ltd.
Decision Support DWG (DS DWG)	Stan Tillman, Intergraph Corporation
Defense and Intelligence DWG (D and I DWG)	Lucio Colaiacono, European Union Satellite Centre
Earth Systems Science DWG (ESS WG)	Phillip Dibner, Ecosystem Research
Emergency & Disaster Management DWG (EDM DWG)	Lewis Leinenweber, SE Solutions, Inc.
Geo Rights Management (GeoRM) DWG (GeoRM DWG)	Roland Wagner, BHT-Berlin (Beuth Hochschule für Technik Berlin)
GeoBI DWG (GeoBI DWG)	Raj R. Singh, Open Geospatial Consortium, Inc.
Geography Markup Language (GML) DWG (GML DWG)	Ron Lake, Galdos Systems Inc.
Geometry DWG (GeometryDWG)	John Herring, Oracle USA
Geosemantics DWG (Semantics)	Joshua Lieberman, Deloitte Financial Advisory Services, LLP
Hydrology DWG (Hydrology DWG)	David Lemon, CSIRO
Location Services DWG (LS DWG)	Marwa Mabrouk, Esri
Mass Market DWG (MassMarket DWG)	Ed Parsons, Google
Metadata DWG (Metadata DWG)	David Danko, Esri
Meteorology & Oceanography DWG (Met Ocean DWG)	Chris Little, UK Met Office

... provide a
forum for
discussion of
key inter-
operability
requirements
and issues
(...)

... and Standards Working Groups

<http://www.opengeospatial.org/projects/groups/swg>

Standards Working Groups

Standards Working Groups (SWG) have specific charter of working on a candidate standard prior to approval as an OGC standard or on making revisions to an existing OGC standard.

Name	Lead **
ARML 2.0 SWG (ARML 2.0 SWG)	Martin Lechner, Wikitude GmbH.
Catalogue Services 3.0 SWG (Cat 3.0 SWG)	Doug Nebert, US Geological Survey (USGS)
CF-NetCDF 1.0 SWG (CF-NetCDF1.0SWG)	Ben Domenico, University Corporation for Atmospheric Research (UCAR)
CityGML SWG (CityGML SWG)	Carsten Roensdorf, Ordnance Survey
ebRIM AP of CSW SWG (ebRIM AP of CSW)	Frédéric Houbie, Intergraph Corporation
ebXML RegRep SWG (ebXMLRegRepSWG)	Frédéric Houbie, Intergraph Corporation
GeoAPI 3.0 SWG (GeoAPI 3.0 SWG)	Martin Desruisseaux, GEOMATYS
Geographic Linkage Service 1.0 SWG (GLS 1.0 SWG)	Peter Schut, GeoConnections - Natural Resources Canada
GeoServices Rest SWG (GServRestSWG)	Satish Sankaran, Esri
GeoSPARQL SWG (GeoSPARQL SWG)	Carl Reed III, Open Geospatial Consortium, Inc.
GeoSynchronization 1.0 SWG (Geosync SWG)	Panagiotis (Peter) A. Vretanos, Cubesys
GeoXACML SWG (GeoXACML SWG)	Jan Herrmann, Technische Universität München, Dept. of Informatics
GML 3.3 SWG (GML 3.3 SWG)	Clemens Portele, interactive instruments GmbH
GMLJP2 1.1 SWG (GMLJP2-1.1SWG)	Lucio Colaiaicomo, European Union Satellite Centre
IndoorGML SWG (IndoorGML SWG)	Ki-Joune Li, Pusan National University
KML 2.3 SWG (KML SWG)	David Burggraf, Galdos Systems Inc.
O&M 2.0 SWG (OM 2.0 SWG)	Simon Cox, CSIRO
OLS 1.3 SWG (OLS 1.3 SWG)	Carl Stephen Smyth, MAGIC Services Corporation
Open GeoSMS SWG (Open GeoSMS SWG)	Kuo-Yu Chuang, Industrial Technology Research Institute
Ordering Services for Earth Observation Products SWG (order-eo1.0.swg)	Daniele Marchionni, European Space Agency (ESA)
OWS Common 1.2 SWG (OWSCommon1.2SWG)	James Greenwood, SeiCorp, Inc.
OWS Context SWG (OWScontextSWG)	David Wesloh, US National Geospatial-Intelligence Agency (NGA)

... work on
candidate
OGC
standards
prior to
approval,
make
revisions to
existing OGC
standard.

What does a membership offer?



- Once an OGC member, your staff can join relevant working groups
 - Standards WG - <http://www.opengeospatial.org/projects/groups/swg>
 - Domain WG - <http://www.opengeospatial.org/projects/groups/wg>
- Participate in the mailing-list that are of relevance for you
- Participate in teleconferences
- **Exchange information, requirements, questions with colleagues and a network of experts (which might face the same issues as you do)**
- **Get new ideas how to approach your challenges**



Summarizing

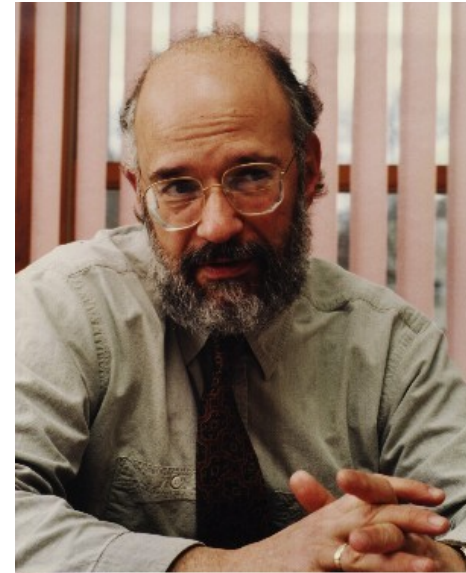


- Lack of interoperability is lowering value of data
- OGC standards enable the geospatial web
- need for cross boundary & cross community communication, cooperation and data sharing
- OGC → membership & huge, international network of colleagues and experts
- communication is key

Some last thoughts...

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

David Schell
Founder OGC



Really last thoughts...



→ **Contribute, cooperate – and avoid „consuming attitude“**

→ **Don't re-invent the wheel: benefit from other's experiences – share your own!**

„The conventional view serves to protect us from the painful job of thinking“ (*John Kenneth Galbraith, economist*)



**Thank you for your attention
... and questions?**

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