



EUGENE Water Workshop

Data sharing / data architecture and infrastructure

German Federal Institute of Hydrology (BfG), Koblenz, Germany
11./12. May 2010

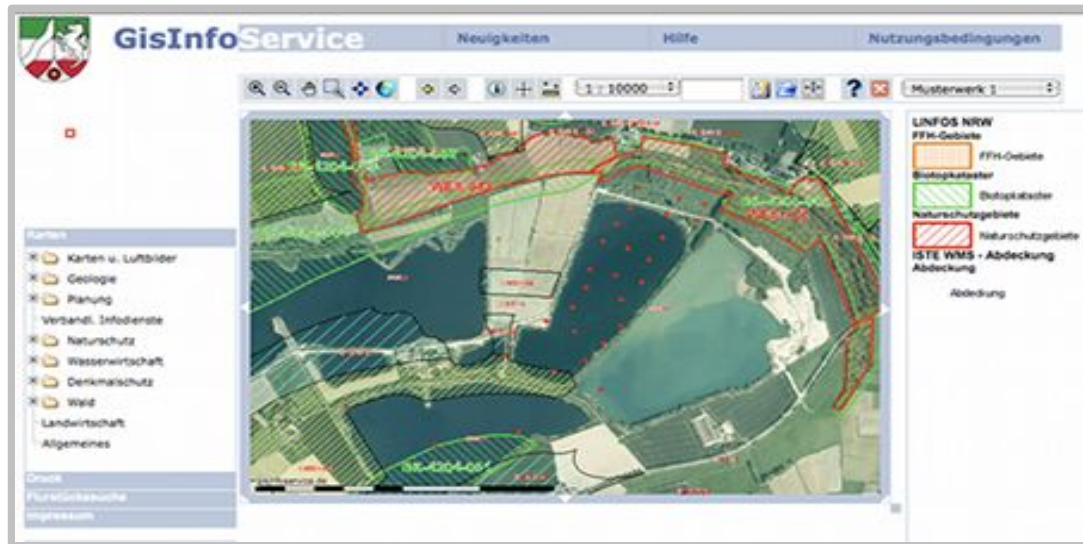
David Arctur, PhD
Director, Interoperability Programs

Athina Trakas
Director, European Services

What is the OGC?



The Open Geospatial Consortium, Inc. (OGC) is a non-profit, international voluntary consensus standards organization that is leading the development of standards for geospatial and location based services.



GisInfoService

German Information platform for the mining industry

<http://www.gisinfoservice.de/>

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The great thing about standards is (responses to a very unofficial web poll)



- **‘...is that they hold the first true glimmer of light for the spirit of the world wide web. They are the gate to a road to a massive interconnected web of information available to anyone regardless of location, time, ability, device, software, or circumstances.’**
- **“...that they are our last, best hope to make the web what it was meant to be: a world-wide source of information, accessible to all, and not controlled by any single entity”**
- **“...it's half the cost and twice the fun”**
- **“...is the way they taste”**

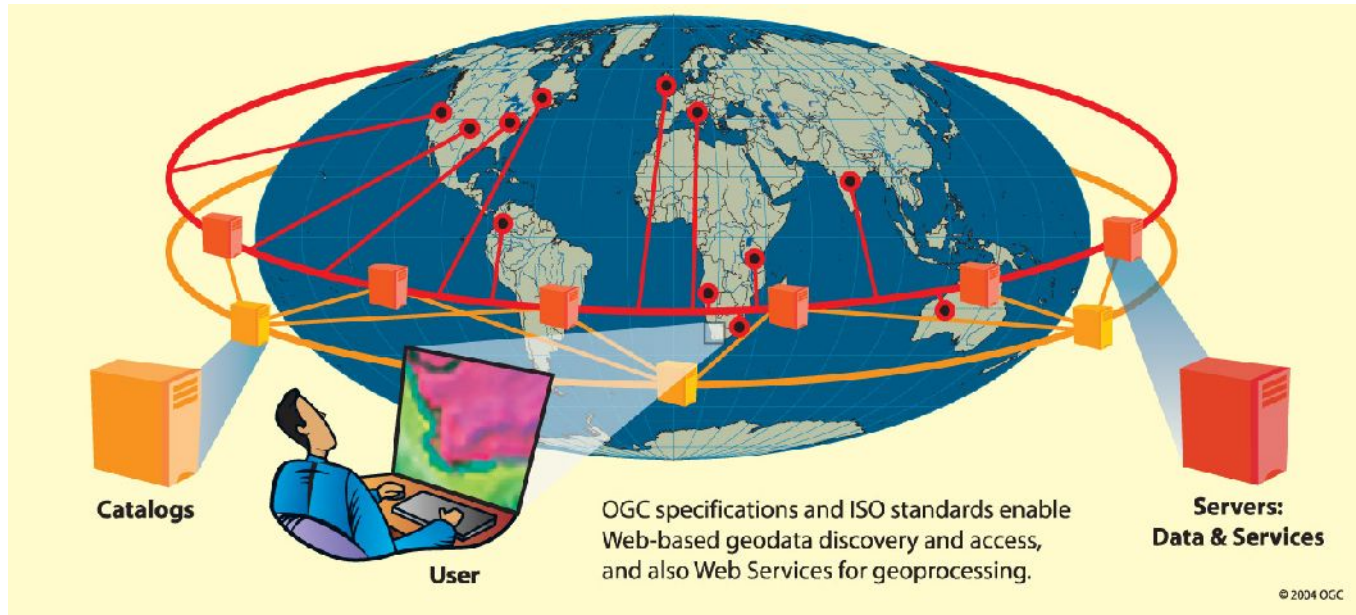
Source: Andy Clarke, http://www.stuffandnonsense.co.uk/archives/the_best_thing_about_standards.html

The OGC Mission



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

...



What is an OGC Standard?



- A document, established by consensus
- Approved by the OGC Membership
- Provides, for common and repeated use, rules, guidelines or characteristics
- Achieves maximum interoperability in its given context
- Implementable in software
- OGC standards are *Open Standards*
 - Freely and publicly available
 - No license fees
 - Vendor neutral

Why Open Standards?



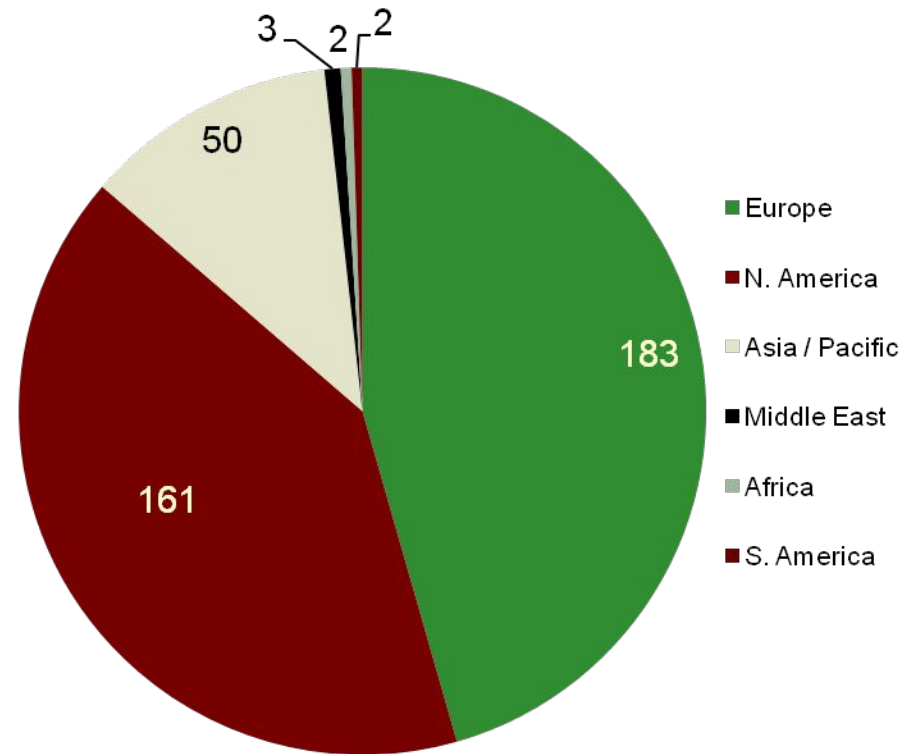
- Rapidly mobilize new capabilities – plug and play
- Lower systems costs
- Encourage market competition
 - Choose based on functionality desired
 - Avoid “lock in” to a proprietary architecture
- Decisions to share information and services become policy decisions

OGC Snapshot



- **An International Voluntary Consensus Standards Organization, founded in 1994.**
- **401 members and growing**
- **30+ implementation standards**
- **Hundreds of product implementations in the market**
- **Broad user community implementation worldwide**
- **Alliances and collaborative activities with many other SDO's**
- **Some OGC WG are registred SDICs.**

OGC Membership Distribution
By Region

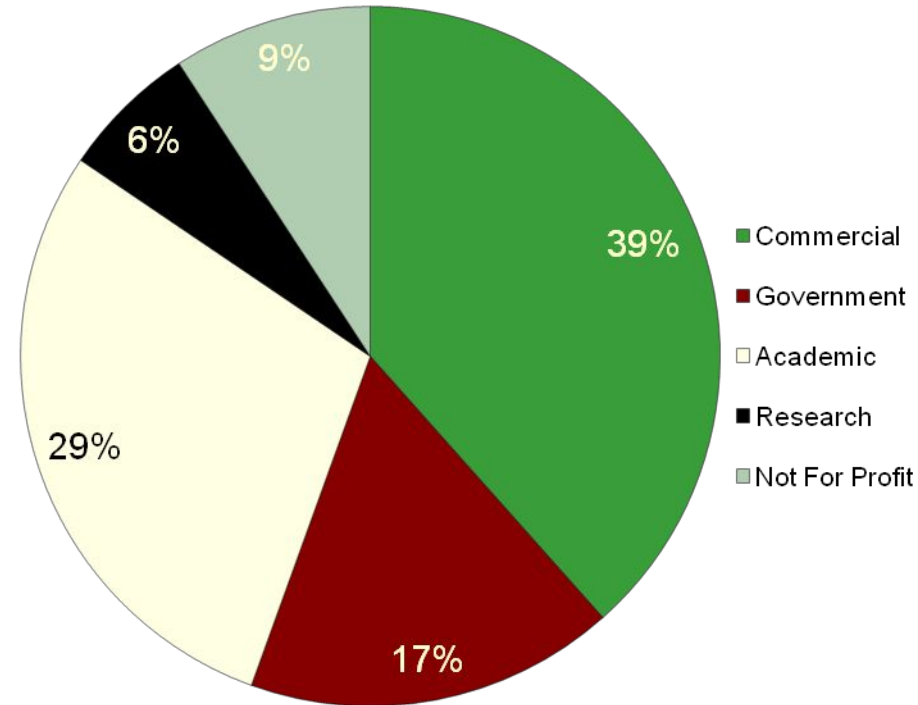


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**OGC Membership Distribution
By Type**



OGC at a Glance - Partners and Network



OGC®

And many more...

OGC-WMO Relationship



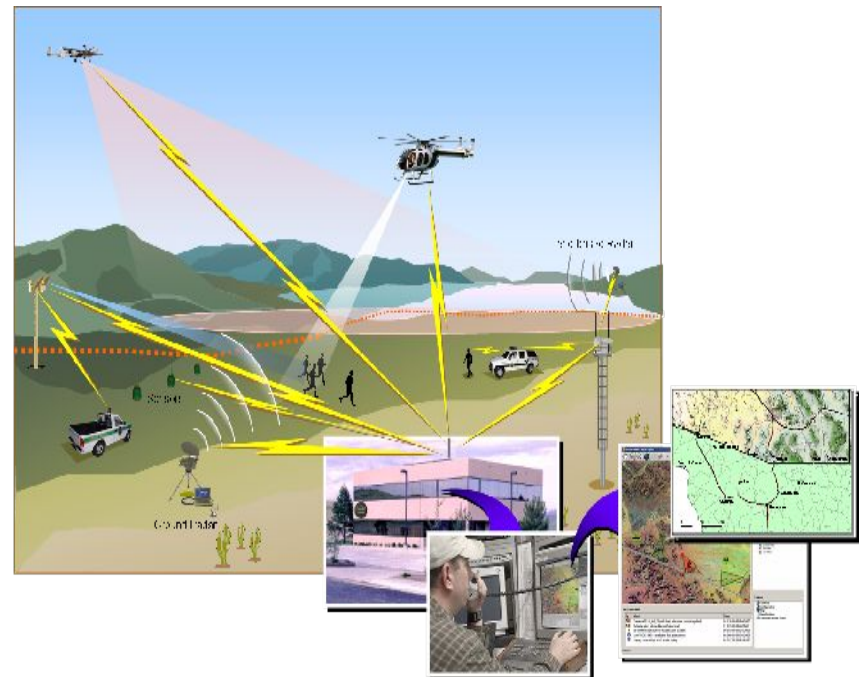
- MoU signed November 2009
- Experts are being selected for liaison between WMO ET's and OGC WG's (CBS and CHy delegates to OGC; IPET-MDI liaison; others TBD)
- DRAFT Text For Inclusion In The General Summary Of Executive Council EC-LXII
 - Development And Implementation Of The New WMO Information System (WIS)
 - 3.5.2.4** CBS concluded that WMO would benefit from closer cooperation with the Open Geospatial Consortium (OGC) that develops standards for web access to geospatial information. A Memorandum of Understanding (MoU)¹ between WMO and OGC was signed in November 2009. The WMO/OGC Memorandum of Understanding is instrumental in providing the mechanism for the co-ordination between the activities carried out by OGC and WMO with a view to developing the use of ISO/OGC standards for the WIS. The Council noted with satisfaction that the arrangements for the coordination of these activities involved several Technical Commissions. The Council invited all Technical Commissions to join their efforts in these activities, in particular with a view to developing a WMO conceptual model of data representation and a WMO core profile of the ISO 19100 standards for data and metadata. (underline added)
 - (1) See WMO/OGC Memorandum of Understanding (MoU)
ftp://ftp.wmo.int/In-box/To-www/DM/20091123_OGC_WMO_MOU.pdf

Interoperability allows a Common Reality



“What we are doing is facilitating a common picture of reality for different organizations which have different views of the reality, the disaster, the catastrophe, that they all have to deal with collectively.”

David Schell
CEO and Chairman
OGC



Interoperability allows a Common Reality



Defense & Intelligence



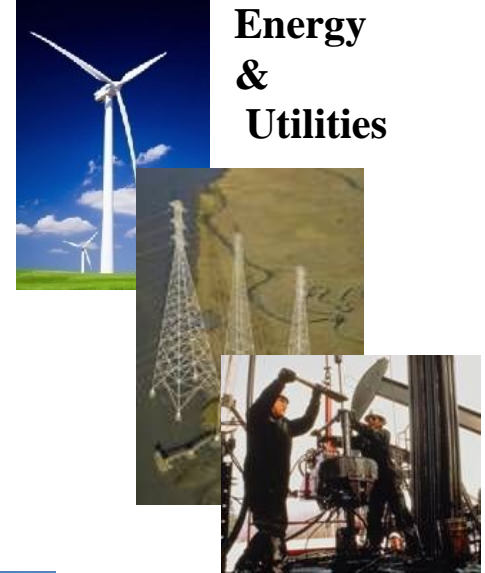
Research & Education



Sustainable Development



Energy & Utilities



Consumer Services / Mass Market



Geosciences



Security / Public Safety



Aviation



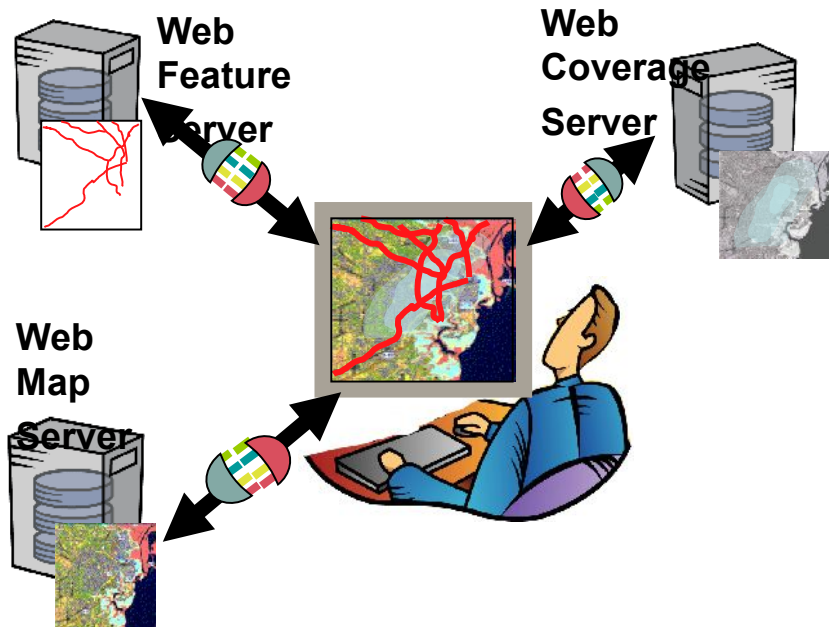
E -Government



What are OGC Web Services (OWS)



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:



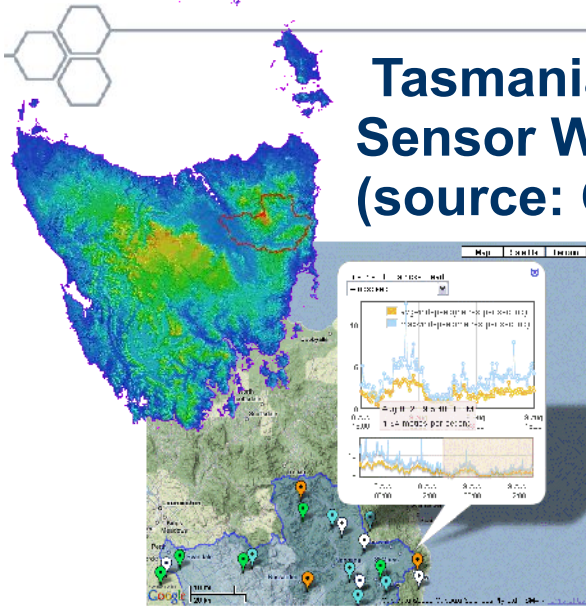
- Web Map Service (WMS)
- Web Feature Service (WFS)
- Web Coverage Service (WCS)
- Catalogue (CSW)
- Geography Markup Language (GML)
- Web Map Context (WMC)
- OGC KML
- Sensor Web Enablement (SWE)
- Others...

Relevant to geospatial information applications:

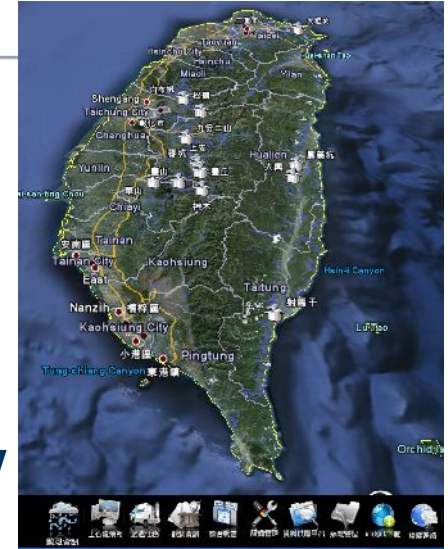
Critical Infrastructure, Environment, Weather, Climate, Water, Homeland Security, Defense & Intelligence, SmartGrids and others

Examples

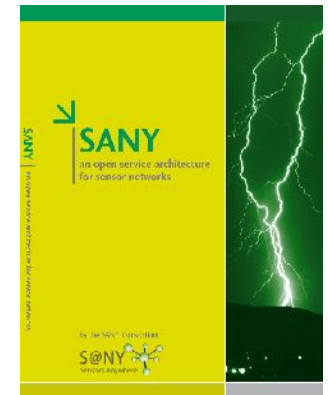
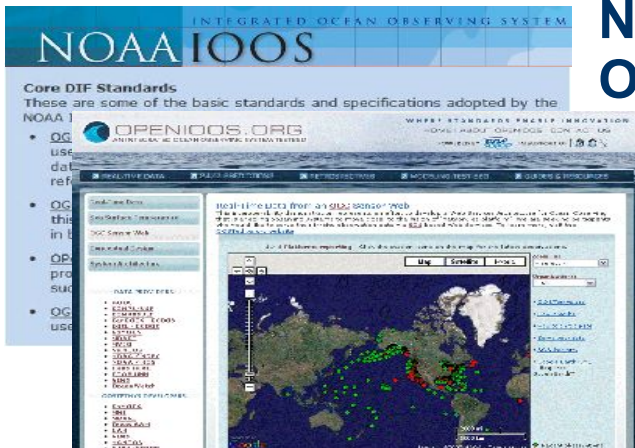
Tasmanian Hydrological Sensor Web Project (source: CSIRO)



Taiwanese Debris Flow Monitoring



NOAA IOOS: Integrated Ocean Observation System



SANY: Open Standards based Sensor Web Architecture

OGC's Approach to Advancing Interoperability

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



- ***Interoperability Program (IP)***

a global, innovative, hands-on prototyping and testing program designed to accelerate interface development and validation, and bring interoperability to the market.

Rapid Interface Development

Standards Setting

- ***Specification Development Program***

Consensus processes similar to other Industry consortia (World Wide Web Consortium etc.)

- ***Outreach and Community Adoption Program***

- Education and training, encourage take up of OGC standards, business development, communications programs

Market Adoption

OGC Reference Model (ORM)

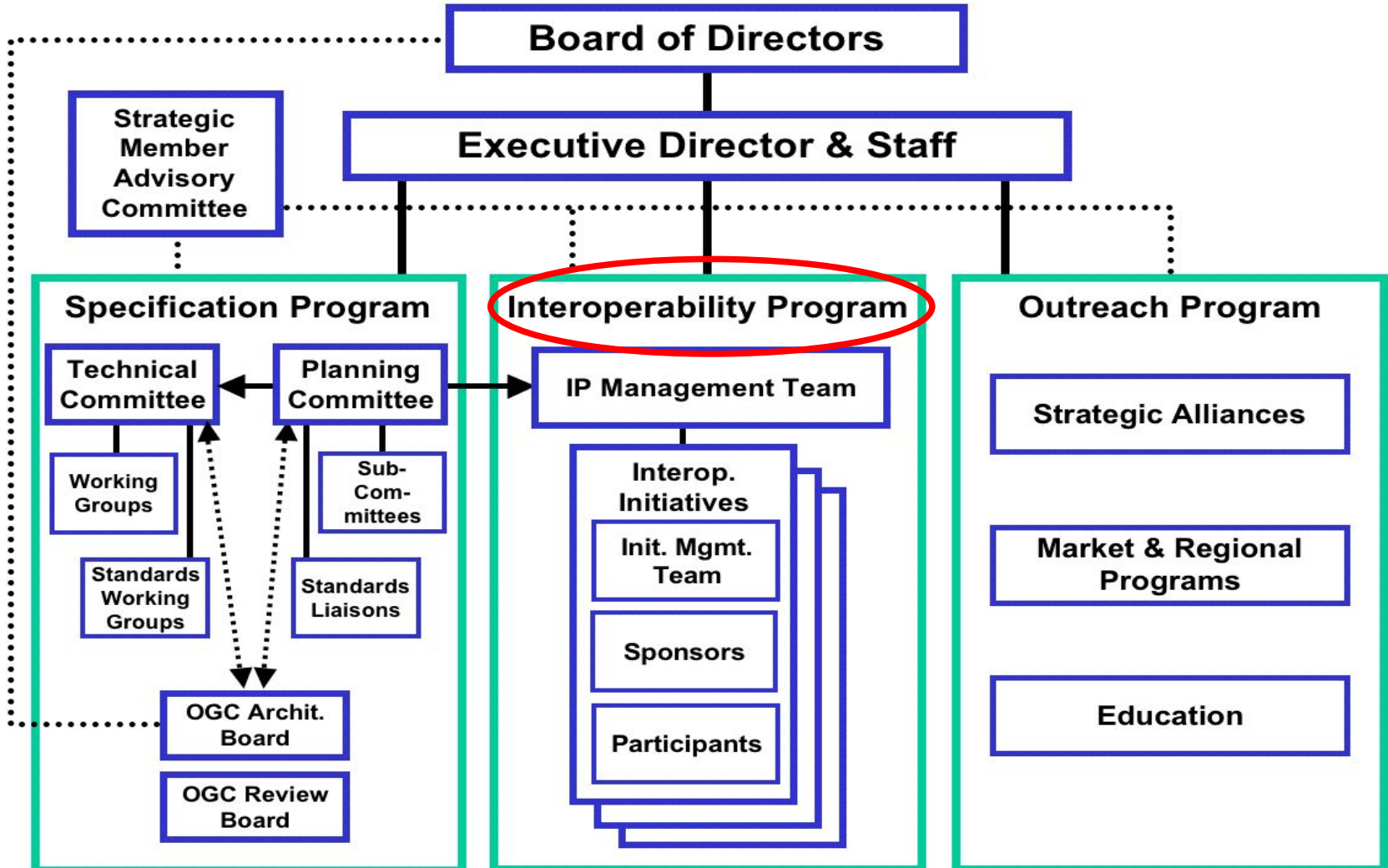
www.opengeospatial.org/standards/orm



- What is the purpose of the ORM?
 - Overview of OGC Standards Baseline
 - Insight into the current state of the work of the OGC
 - Basis for coordination and understanding of the OGC documents
 - Resource for defining architectures for specific applications

- Why Read This Document?
 - Better understand the OGC Standards Baseline and Architecture
 - Better understand the ongoing work of the OGC
 - Gain an understanding necessary to contribute to OGC process
 - Aid in implementing one or more of the OpenGIS Standards

Organisational Chart



Interoperability Program Overview



- **Testbeds** are fast-paced, multi-vendor collaborative efforts to define, design, develop, and test candidate interface and encoding specifications. These draft specifications are then reviewed, revised, and, potentially, approved in the OGC Specification Program.
- **Pilot Projects** apply and test OpenGIS specifications in real world applications using standards based commercial off-the-shelf (SCOTS) products that implement OpenGIS Specifications. Pilot projects help users understand how to best implement interoperable geoprocessing that meets their requirements for application, spatial data, and geoprocessing service sharing. These projects also help identify gaps for further work.
- ***Interoperability Experiments*** are brief, low-overhead, formally structured and approved initiatives led and executed by OGC members to achieve specific technical objectives that further the OGC Technical Baseline.
- **Interoperability Support Services** are designed to help organizations with open, standards based architecture.

Current IE's Underway



- **Hydro DWG Groundwater IE (GW IE)**
 - Will advance the development of WaterML 2.0, test its use with various OGC service standards (SOS, WFS, WMS and CSW), as well as investigate its interaction with GroundwaterML (GWML), in the context of sharing groundwater data between the USA and Canada.
 - Public: <http://www.opengeospatial.org/projects/initiatives/gwie>
 - Twiki:
http://external.opengis.org/twiki_public/bin/view/HydrologyDWG/GroundwaterInteroperabilityExperiment

IE's in Planning: Hydrology



- **Surface Water IE (SW IE)**

- Will further advance the development of WaterML 2.0 and test its use with various OGC service standards. It will also contribute to the development of a hydrology domain feature model and vocabularies, which are essential for interoperability within the hydrology domain.
- Will study three typical hydrological use case scenarios:
 - Surface water data exchange across national and organizational jurisdictions (European)
 - Surface water flow data collection to support forecasting
 - Quantifying the flow of surface water to coastal systems (WMO Global Runoff Data Centre)
- Twiki:
http://external.opengis.org/twiki_public/bin/view/HydrologyDWG/SurfacewaterInteroperabilityExperiment

Interoperability Pilots



- **Earth Observation and ENVironmental modelling for the mitigation of HEAlth risks (EO2HEAVEN)**
 - OGC is a member of the EO2HEAVEN team that is executing a Collaborative Project of the European Commission 7th Framework Program.
 - EO2HEAVEN contributes to a better understanding of the complex relationships between environmental changes and their impact on human health. The project will monitor changes induced by human activities, with emphasis on atmospheric, river, lake and coastal marine pollution. The result of this collaboration will be the design and development of a GIS based upon an open and standards-based Spatial Information Infrastructure (SII) envisaged as a helpful tool for research of human exposure and early detection of infections.
 - <http://www.opengeospatial.org/projects/initiatives/eo2heaven>

IE's in Planning: Meteorology



- **WMS Best Practices:**
 - Time handling
 - Get Capabilities layering or metadata
- **SLD/SE Requirements:**
 - Styling (using SLD/SE)
- **Conceptual Modelling:**
 - Weather Exchange Models (XML)
 - Use Cases for conceptual modelling
 - Controlled vocabulary (going towards a Taxonomy or Ontology)

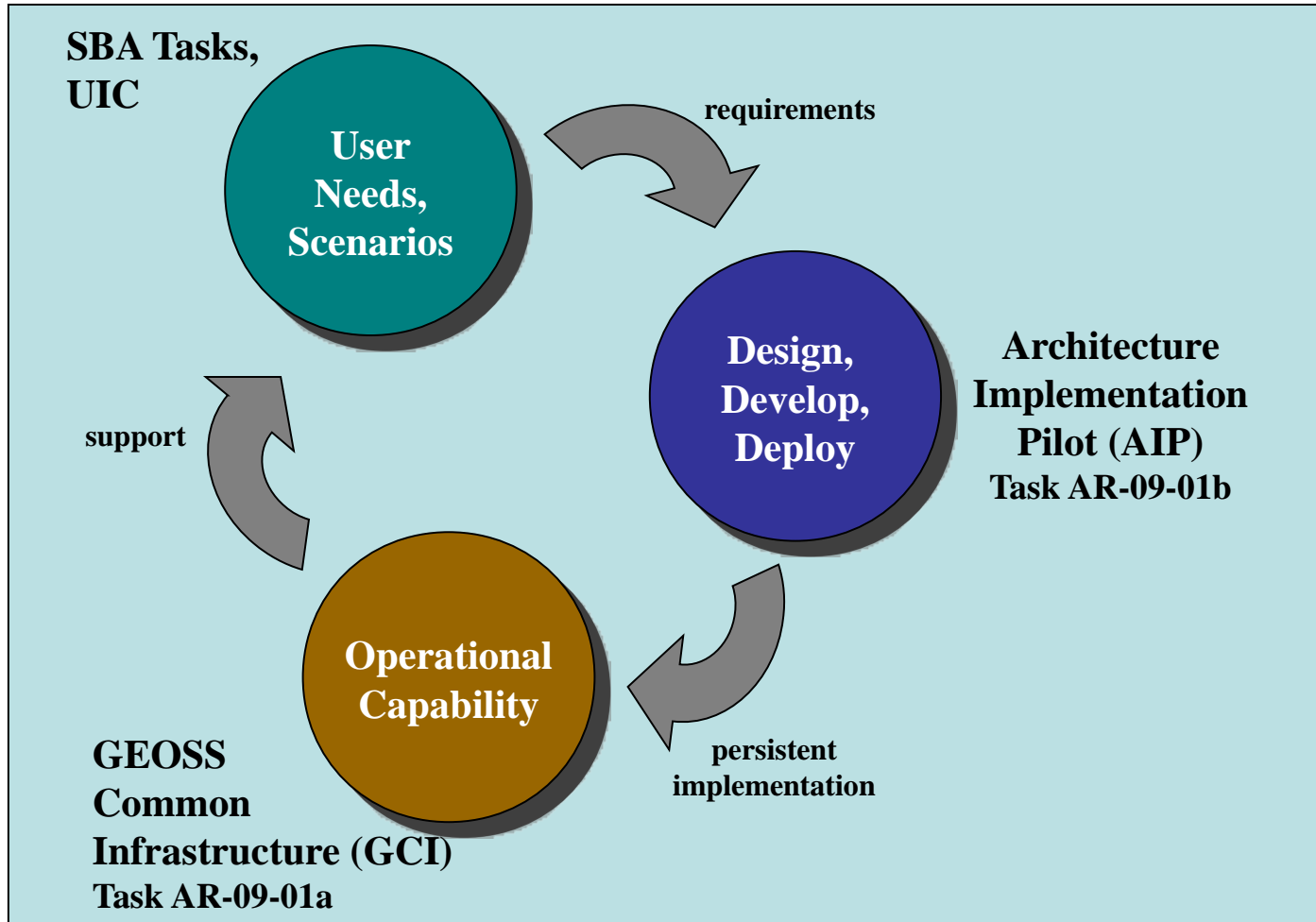
http://external.opengeospatial.org/twiki_public/bin/view/MetOceanDWG/WebHome

GEOSS Support Activities

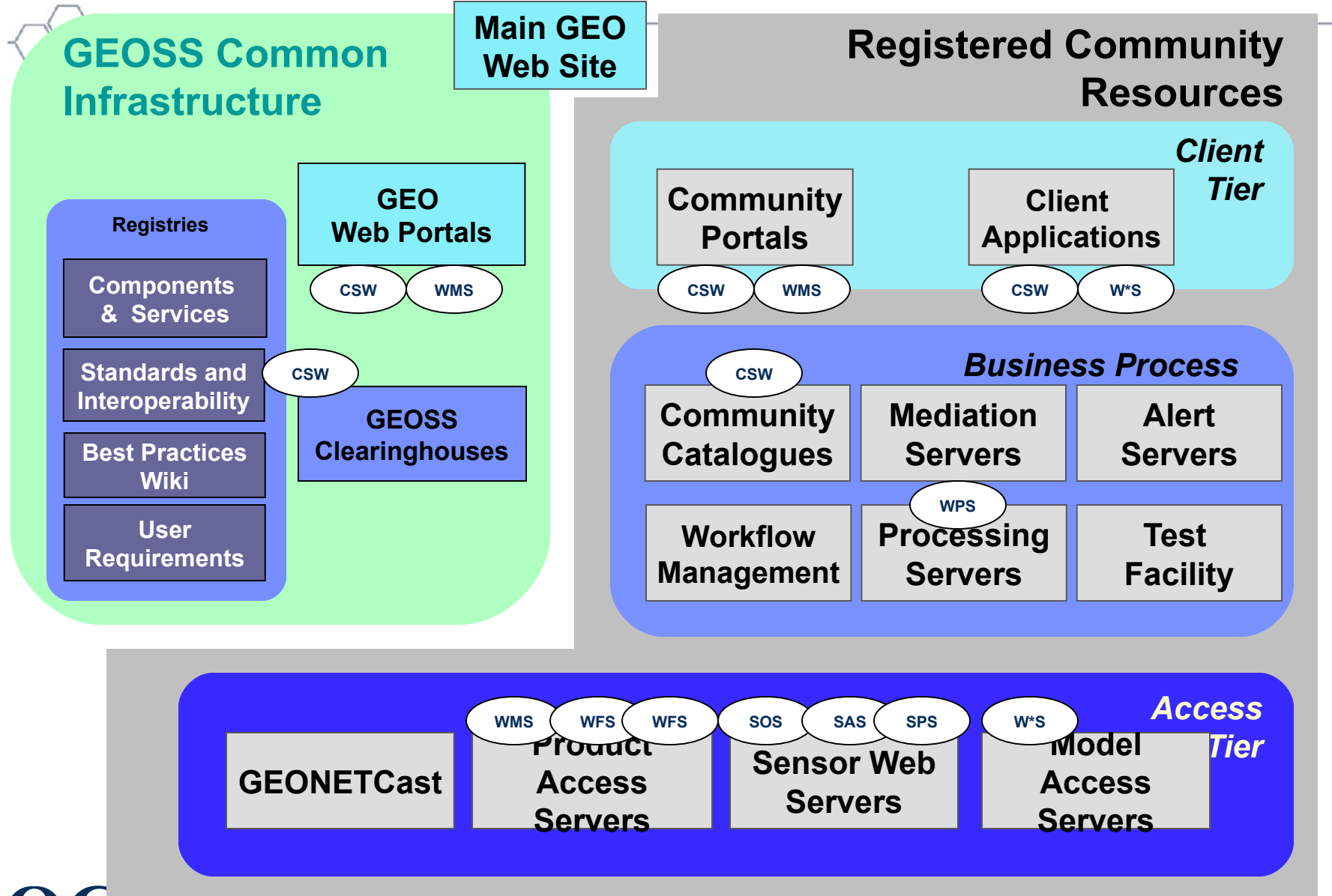


- **GEOSS Architecture Implementation Pilot (AIP)**
 - The GEOSS AIP develops and deploys new process and infrastructure components for the GEOSS Common Infrastructure (GCI) and the broader GEOSS architecture. AIP is a core task ([GEO Task AR-09-01b](#)) of the GEO Architecture and Data Committee. Results of the AIP are transitioned to GEO Task AR-09-01a and the GCI.
 - Scenarios from AIP-2: Disaster Management, Health (Air quality), Biodiversity and Climate Change (Prediction of an Ecosystem Evolution as well as Arctic Spatial Data Infrastructure), Energy
 - Scenarios from AIP-3: Water (Drought and Water Quality), extreme Precipitation, Health and Environment Scenario (Early Warning of Malaria)
 - <http://www.ogcnetwork.net/Alpilot>
- **Standards and Interoperability Forum (SIF)**
 - Manages the GEOSS Standards and Interoperability Registry, and provides advice, expertise and impartial guidance on issues relating to standards and interoperability for GEOSS, to increase degrees of interoperability among GEOSS components. This activity is jointly led by IEEE and OGC.
 - http://seabass.ieee.org/groups/geoss/index.php?option=com_content&task=view&id=17&Itemid=61

Elaboration of GEOSS Architecture



GEOSS Engineering Viewpoint



Questions? Inform yourselves!



Athina Trakas

Director European Service

OpenGeospatial Consortium, Inc.

Heerstr. 162

53111 Bonn

Tel.: +49 – 228 – 54 88 99 42

Mobil: +49 – 173 – 211 2623

eMail: atrakas@opengeospatial.org

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

Reference Architecture Service Distribution

