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Open Geospatial Consortium

Open Geospatial Consortium Meteorology & Oceanography Domain Working Group Current Work

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Introduction

OGC Background:

- Standards Development Organisations
- Key Standards

Met Ocean DWG:

- Short History
- WMO / Met Ocean DWG Interests & Progress
- Future works & Possibilities

Questions & Answers

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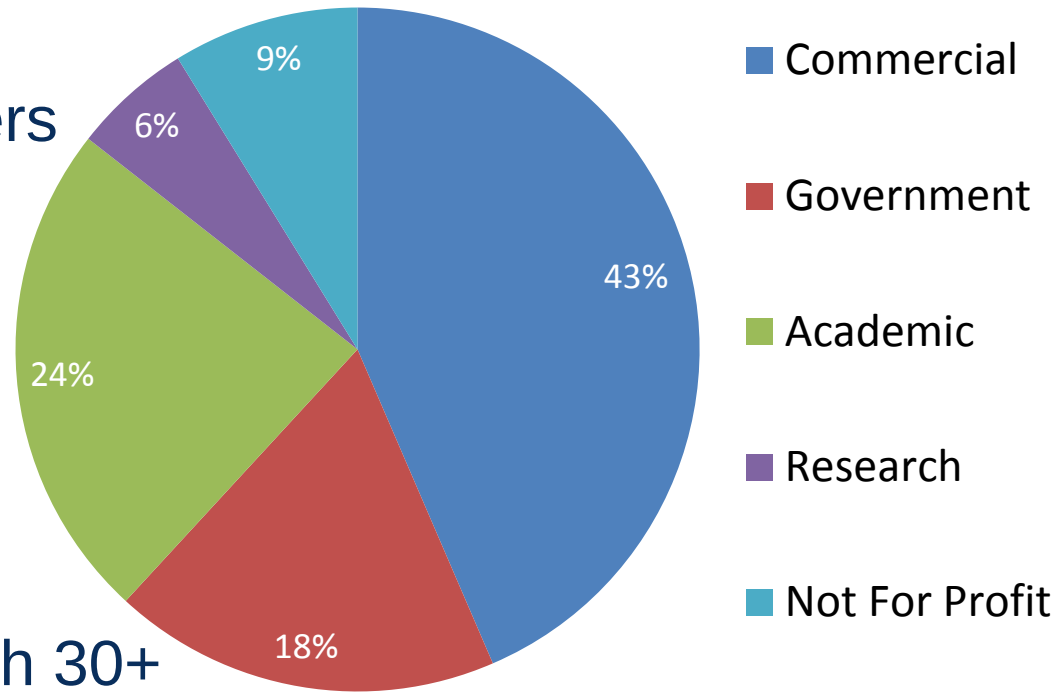
What is OGC?

- Develops standards for geospatial data & services
- Funded by ~500 members
- 38 adopted standards
- Consensus process
- Freely available
- 100s of implementations
- Alliance partnerships with 30+ standards & professional organizations
- Broad user community worldwide
- Some standards fast tracked in ISO (and WMO!)



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OGC Membership Growth

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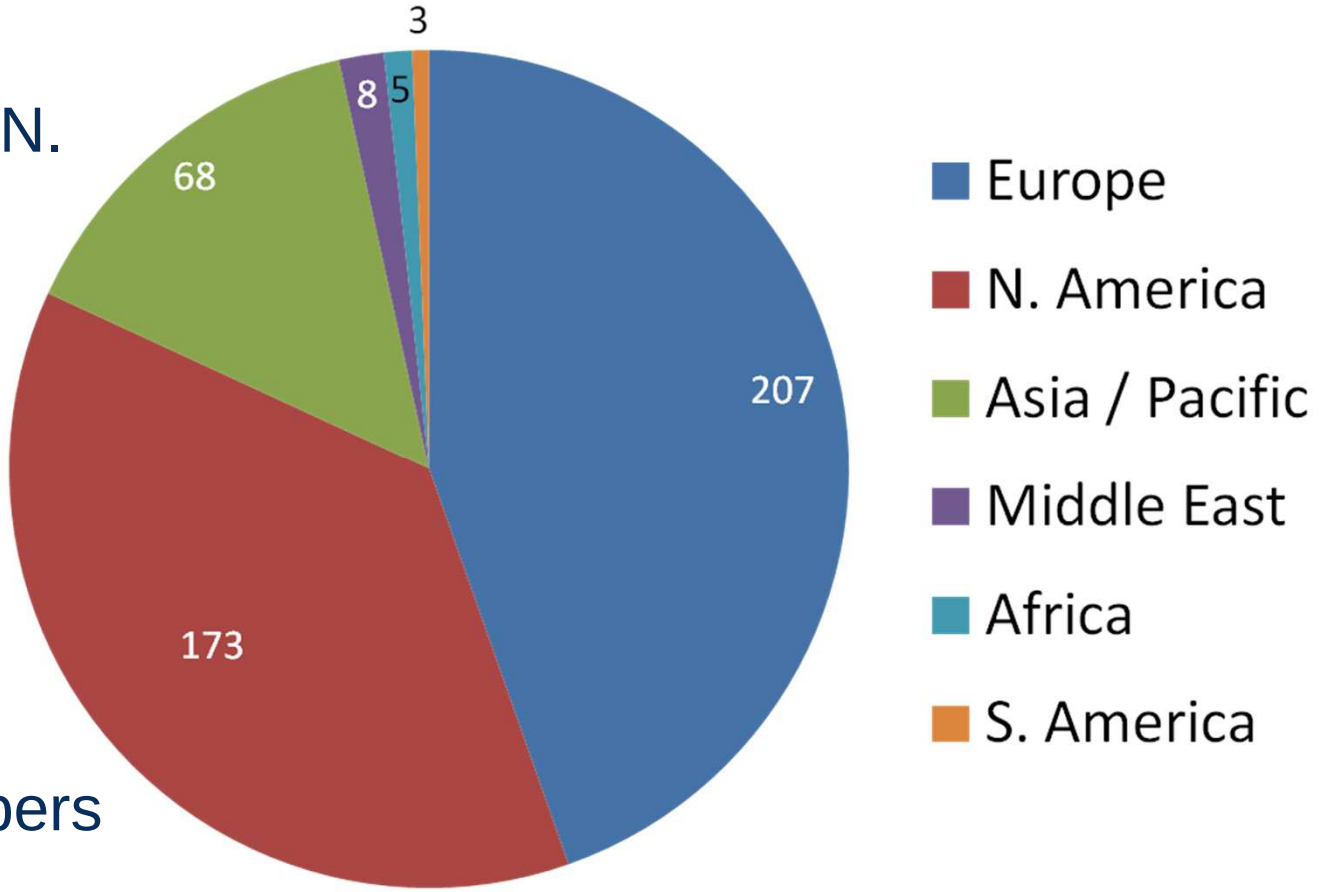
OGC: Membership Distribution

2008 - mostly N. American members

2010 - more European members

2012 – big increase of Eastern members

>2014 – becoming more global



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Other Standards Development Organisations

- WMO
- ICAO
- ISO
- ITU
- UNESCO/IOC
- IHO
- IMO
- …
- IETF (Internet Engineering Task Force)
- IANA (Internet Assigned Name Authority)
- IEEE (Institute of Electrical and Electronic Engineers)
- …
- W3C (World Wide Web Consortium)
- OASIS (Organization for the Advancement of Structured Information Standards)
- OMG (Object Management Group)
- …

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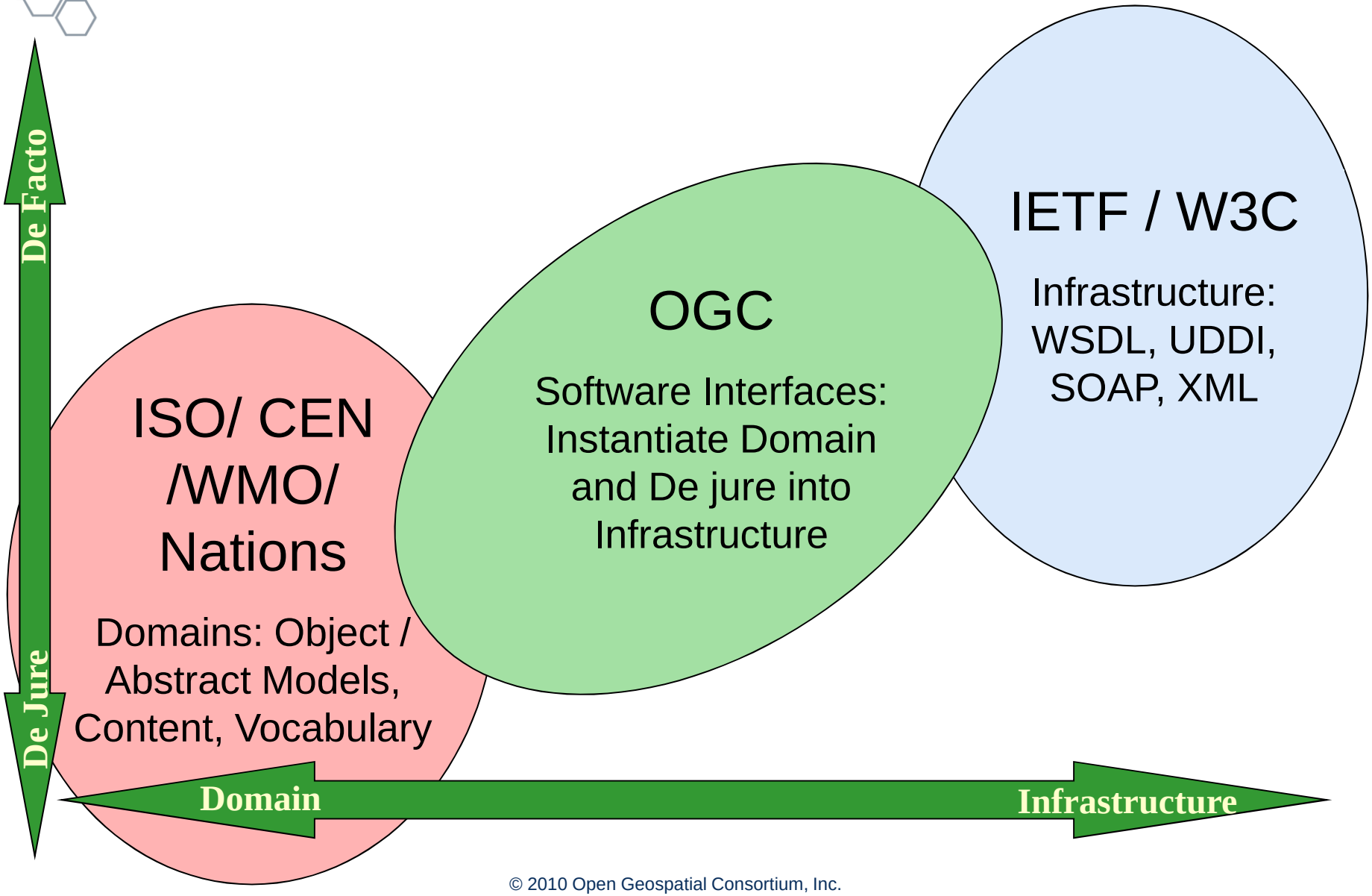
Where does OGC fit in the ‘standards’ world?



Classes of OGC Standards

- Interface Standards
  - Application Profiles (extensions) to an interface standard
- Encoding Standards
  - Profiles
  - Application Schemas
- Tightly or Loosely Coupled
  - Server-Client or
  - Web Service

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Key OGC Standards

Web Services – work over HTTP:

- WMS, Web Map Service: “Get me a map”
- WFS, Web Feature Service: “Get me something on a map”
  - Point or line
- WCS, Web Coverage Service: “Get me data covering an area on a map”
  - Area
  - Could be polygon, imagery or grid

Lots of associated standards & profiles: WMTS, SLD/SE, etc

Also Best Practices, Discussion Papers, Engineering Reports, etc

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Other OGC Standards

- O&M Observations & Measurements: conceptual model and mark-up language
- SWE Sensor Web Enablement:
  - SPS Sensor Planning Service
  - SOS Sensor Observation Service
  - WaterML2.0 (now WMO standard)
- 3D ML
- CityGML, IndoorML
- Mobile
  - GeoSMS, GeoPackage, etc
- IoT Internet of Things

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Key OGC Foundation Standards

Abstract Reference Model:

- Commonality with ISO 19xxx geospatial standards
- Well established and still relevant

GML Geospatial Mark-up Language:

- XML to describe geospatial things
- ISO standard

OWS Common: OGC Common to Web Services

- Shared entities
- Needs updating

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OGC Strategies

- ‘Old Guard’ “2D world” vs ‘New Guard’ “4D+ world”
- Restructuring standards into Core + Extensions
- Moving from KVP Client/Service API to RESTful http based
- Keep using Interoperability Experiments and Test Beds
- Scenario and Use Case driven
- Establishing naming, registries & validation chains with URIs
- Expanding from US based to European to global
  - Expanding out of traditional GIS communities
- Documents migrating to GitHub/HTML5 rather than MS Word

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OGC Technical Issues

2D standards well accepted

- Stuff everything into 2D + ‘layers’

3D not quite integrated

- Mainly in city building descriptions

4D causing ‘churn’

- ‘slice & dice’
- WCS 2.0 approved but not yet widespread support
- WMS2.0 failed to gain support
- OWS Common, Abstract Ref Model probably need revision

5D ??

- Ensembles/Probability Distribution Function
- Another Layer?

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Challenges for OGC standards in Meteorology

- Long history of interoperability at human/paper level
- Spatial & Temporal, 2D, 3D, 4+D, constantly changing
- Not MBytes, but GB, TB and PBytes of data daily.
- Regular & Irregular time intervals
- Timescales: hours,.., seasons,.., centuries, + & -
- Multiple Time attributes
- ‘Regular’ grids are not always regular
- Continual change of coordinate systems & re-projecting
- Eulerian versus Lagrangian viewpoints
- Vertical coordinates
- Cross-sections, height-time diagrams, T/φs, etc
- Ensembles: probabilistic distributions
- Significant ‘Objects’, features of interest
- Meteorology specific terminology

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Met Ocean Domain Working Group - 1

2007-10 ECMWF 11th Workshop on Operational Meteorology:

- Recommended workshop/conference on GIS
- 2007 Météo-France joined OGC, 2008 UKMO

1st Workshop on Use of GIS/OGC Standards in Meteorology:

- 2008-11-24/26, ECMWF,
- Review use of OGC (Open Geospatial Consortium) standards in geo-sciences in Europe & worldwide)
- Promote collaboration between meteorological services in order to define a set of common standards that will enhance interoperability
- Recommended OGC involvement and establish Met DWG
- Established theme: **Web Map Services interoperability for NMSs**

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Met Ocean Domain Working Group - 2

2009-03 OGC Technical Conference, Athens:

- Meteorology DWG established
- Hydrology DWG also established

2009-06 OGC Technical Conference, Boston

- Meteorology DWG Co-chair elected

2009-09 OGC Technical Conference, Darmstadt:

- Meteorology DWG converted itself to :
- Meteorology & Oceanography DWG
- Stopped separate Climatology DWG
- Environmental System Science DWG already well established

2009-11 OGC and WMO signed MoU (Met, Ocean, Hydro)

- Short legal doc, flexible Annex, lightweight – let experts work

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Met Ocean Domain Working Group - 3

2nd Workshop on Use of GIS/OGC Standards in Meteorology:

- 2009-11-23/25 Toulouse
- Established second major work theme: Conceptual modelling
- Plugfest attempted at EGOWS
- Questionnaire for issues and priorities

3rd Workshop on Use of GIS/OGC Standards in Meteorology:

- 2010-11-15/17 Exeter
- Progressed previous work (WMS, Conceptual modelling)
- Use EGOWS 2011-06 for IE and test-beds
- SLD/SE work started
- Assess WCS requirements
- Observations theme - FAILED

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Met Ocean Domain Working Group - 4

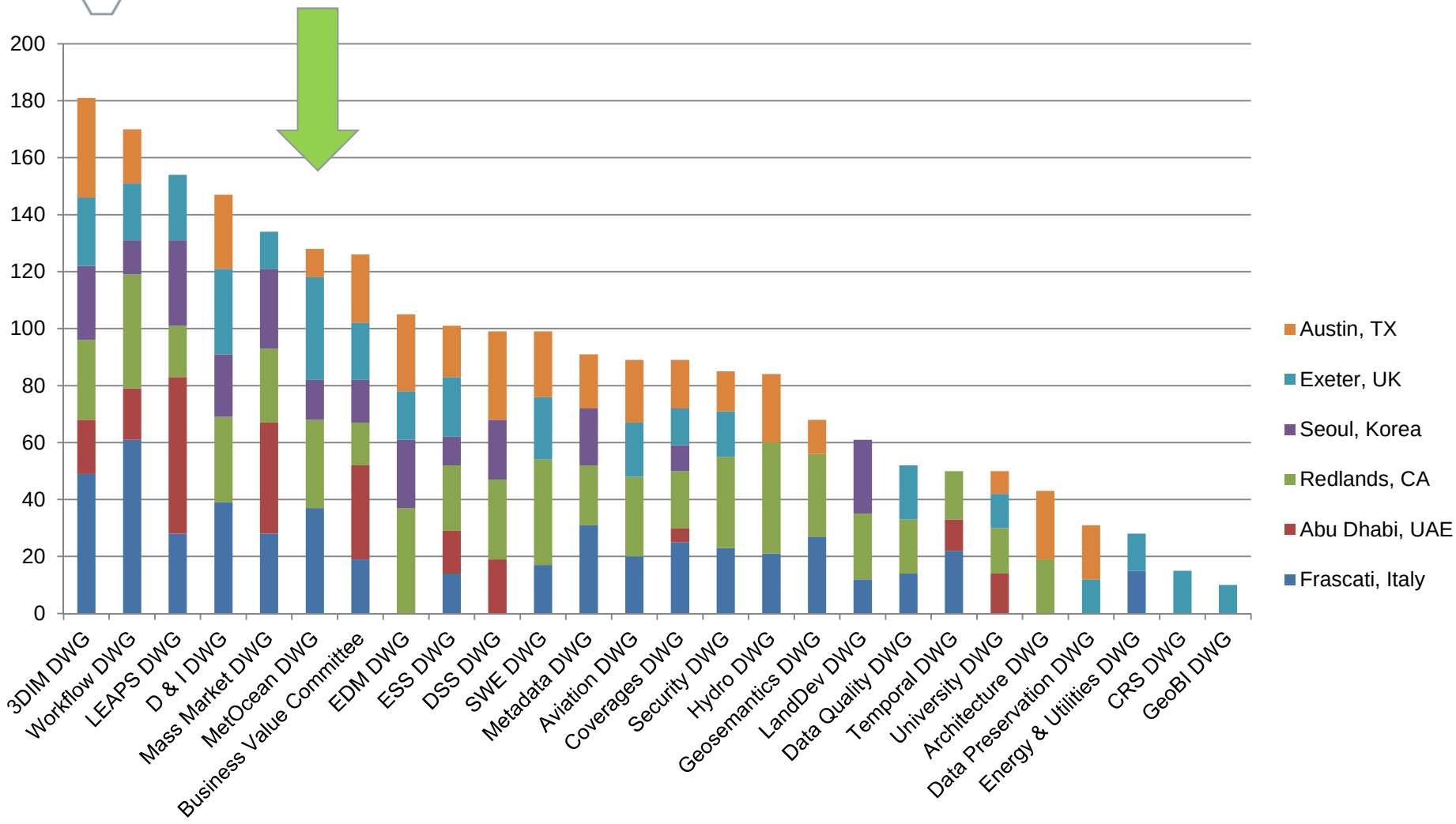
2011-11 ECMWF 13th Workshop on Operational Meteorology

- Emphasised WCS requirements
- Emphasise DAR rather than Visualisation

4th Workshop on Use of GIS/OGC Standards in Meteorology:

- 2013-03 Reading
- WMS 1.3 Best Practice needs editorial work only
- Support WMS2.0 work (-> 4D)
- WCS 2.0 Met Ocean extensions work started
- Temporal work started
- WKT CRS work started
- Inspire recommendations
- Mismatch between OGC CSW3.0 and WMO WIS SRU1.3

DWG Attendance, including Met Ocean



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Met Ocean DWG Achievements

- Open Wiki, open mailing list, community established
  - OGC more open Twikis, Mailing lists in response to Met Ocean
- WMS 1.3 Best Practice published, no Met terminology
  - Successful EGOWS plugfest 2014 Oslo
- Aviation/Meteorology Conceptual modelling published
  - Founded on O&M
- WCS 2.0 Extension progressing (slice, dice, curtain, …)
- Met Ocean DWG and Hydro DWG collaboration
  - Hydro WaterML is now WMO standard
- Météo-France participated in OGC IE Test bed
  - Lightweight Plugfests preferable to IE
- Contributing to 2D versus 4D debate in OGC
  - Move to 4D world has slowed in OGC
- Realise importance of O&M, Sensor Web, IoT
  - Clearer view of importance of other standards

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WMO / Met Ocean DWG Standard Interests

- WMS –Proactive
  - Time & Elevation – consensus achieved. Published. Informal IE held
  - Map Projections – changes to existing repositories in progress, WKT
  - SLD/SE – Aviation SigWx and standard WMO Plots Use Cases - slow
  - Tiling – WMTS now a separate standard – jigsaw edges – stationary!
- Conceptual Modelling - Proactive
  - IWXXM for Aviation
  - GML3.2.1, KML2.2
  - geoSMS for use with CAP??
- WCS/WFS – lots of 'churn' – Proactive
  - Payload formats (GRIB2)
  - Data Cubes/Tiling - Just starting to be Proactive
- Temporal CRS - Proactive
- Vertical CRS - Just starting to be Proactive
- CSW – compatibility with ISO23950, OpenSearch - Reactive
- O&M, SWE increasing in importance - Passive

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WMO / Met Ocean DWG currently NOT* interested

- 3D and Augmented Reality Some activity last year
- CityGML – city and building modelling
- GeoXAMCL – security at detailed feature level
- OpenLS - Location Services ??
- WPS - Web Processing Service As lightweight framework??
- Etc

* Or rather: no critical mass of interested volunteers

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Met Ocean DWG: Some Interesting Domain WGs

Active dialogues

- Aviation
- Catalogues
- Co-ordinate Reference Systems
- Coverages
- Defence & Intelligence
- Emergency & Disaster Management
- Hydrology
- Metadata (Discovery, not Interpretation)

Not currently Active

- Data Preservation
- Decision Support
- Earth Systems Science
- Location Services
- Mass Market
- Sensor Web Enablement *
- Internet of Things*

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Met Ocean DWG future work priorities

- Work on Met Ocean aspects of WCS2.0 extension proposals
- Develop WCS Data Tile standard
- Follow GeoTIFF WCS shortcut process with WMO GRIB format

- Extend WMS1.3 BP to other standards (WMTS… Other than WCS 2.0)
- Expand WMS1.3 BP with ensembles, climatology periods, calendars, etc
- Extend the BP towards a Profile, with conformance tests
- Express Requirements/Change Request to WMS2.0 (now back to 1.4)

- Carry on with weather symbols in SVG, & styles, for SLD/SE on Github

- Work on WMO Registries, Vertical & Temporal CRSs, etc
- Interact more with the Aviation DWG for Met
- Influence/use other OGC standards: O&M for WIGOS, PubSub, WPS,etc

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Met Ocean DWG work

Wiki (open)

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

Mailing list (open) meteo.dwg@lists.opengeospatial.org

Teleconferences most / many Tuesdays, 15:00 - 16:00 UTC

SLD/SE wiki and GitHub https://github.com/chris-little/WorldWeatherSymbols

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Met Ocean DWG Summary

- Members: UKMO, M-F, DWD, ECWMF, EUMETSAT, met.no, FMI, CMC, NOAA, KNMI, (JMA, KMA, ??)
- WMS 1.3 Best Practice recommendations made
- Consistency between WMO, ICAO and OGC conceptual models achieved, published
- Work started on WCS & data payloads (NetCDF, GRIB, data tiles/cubes, ‘slice & dice’, ‘curtains & corridors’)
- Temporal DWG producing Best Practice on TIME (CRS, Calendars, statistics, …)
- Non-WMO observations are increasingly important, so OGC observation standards are becoming very important
- Lots of work, increasing importance, – join in!

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OGC Summary

- OGC becoming global, rather than American
- Has opened up processes to community groups
  - Twikis, mailing lists
- Is updating standards
  - From client/server to RESTful
  - To a ‘Core & Extensions’ model
  - In middle of ‘2D+Layers’ versus ‘4D+slice & dice’ churn
- Interoperability Experiments & Test beds are heavyweight
  - To protect members’ IPR
  - Not an issue for Met Ocean community
  - Realistic Met & Ocean data needed, both volume and timeliness
- Takes on Met Ocean requirements in key standards
  - Even when Met Ocean people not actively involved
  - We have a good reputation

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More volunteers and experts needed

Met Ocean DWG

- Questions and Answers?

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Spare Slides

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Welcome to the MetOceanDWG web

The Meteorology and Oceanography Domain Working Group (Met Ocean DWG) is a community orientated working group of the Open Geospatial Consortium (OGC). The group does not directly revise OGC standards, but rather enables collaboration and communication between groups with meteorological and oceanographic interests. The Met Ocean DWG maintains a list of topics of interest to the meteorological and oceanographic communities for discussion, defining feedback to the OGC Standards Working Groups (SWG), and performing interoperability experiments. The DWG covers Oceanography as well, because of the long history of collaboration and shared institutions between meteorology and oceanography. Climatology is, of course, a subset of Meteorology.

The Met Ocean DWG is intended to be a public forum for communication, and both the email list and this Twiki are open to interested parties.

- **Charter :** Please see the current Met Ocean DWG Charter. *(The original charter is at Meteo DWG Charter)* .
- **Twiki :** Anyone can edit this wiki, but, of course, responsibly. Instructions can be found on the TWiki Text Formatting Rules page.
- **Email list :** Subscribe to the public email list at : https://lists.opengeospatial.org/mailman/listinfo/meteo.dwg

Events

- **Met Ocean Teleconfs and Meetings Announcements** UPDATED, UPDATED
- **Last meeting Austin, Texas, USA : OGC TC/PC Meeting : 19 March- 23 March 2012 : MetOceanDWGAustin**
- **Next meeting Exeter, UK : OGC TC/PC Meeting : 18 June-21 June2012 : MetOceanDWGExeter**
- **Other connected events**
- **Met Ocean DWG Meetings archives**

Current Activities

* *WMS Best Practices:*

- **Minutes of all telecons on WMS Best Practices**
- **Met Ocean WMS Best Practices Hot Topics** _Cleaned up in March 2012 to focus on issues that really impact the Best Practices
- **Archives of older works on Met Ocean WMS Best Practices Hot Topics**

* *SLD/SE Requirements:*

- Styling (using SLD/SE) in other words: **Weather Symbols**

* *Conceptual Modelling:*

_UNDER REORGANISATION TO ENHANCE CLARITY

- Overview
- Use Cases for conceptual modelling
- Roadmap [TO BE DEFINED]

Abstract Specifications:

reference models for the development of OGC Implementation Specifications

1. Feature Geometry
2. Spatial Referencing by Coordinates
3. Locational Geometry Structures
4. Stored Functions and Interpolation
5. Features
6. Coverage Type
7. Earth Imagery
8. Relationships between Features
9. Feature Collections
10. Metadata
11. OpenGIS Service Architecture
12. Catalog Services
13. Semantics and Information Communities
14. Image Exploitation Services
15. Image Coordinate Transformation Services
16. Location-based Mobile Services
17. Geospatial Digital Rights Management Reference Model (GeoDRM RM)
18. Topic Domain Models 1 - Telecommunications

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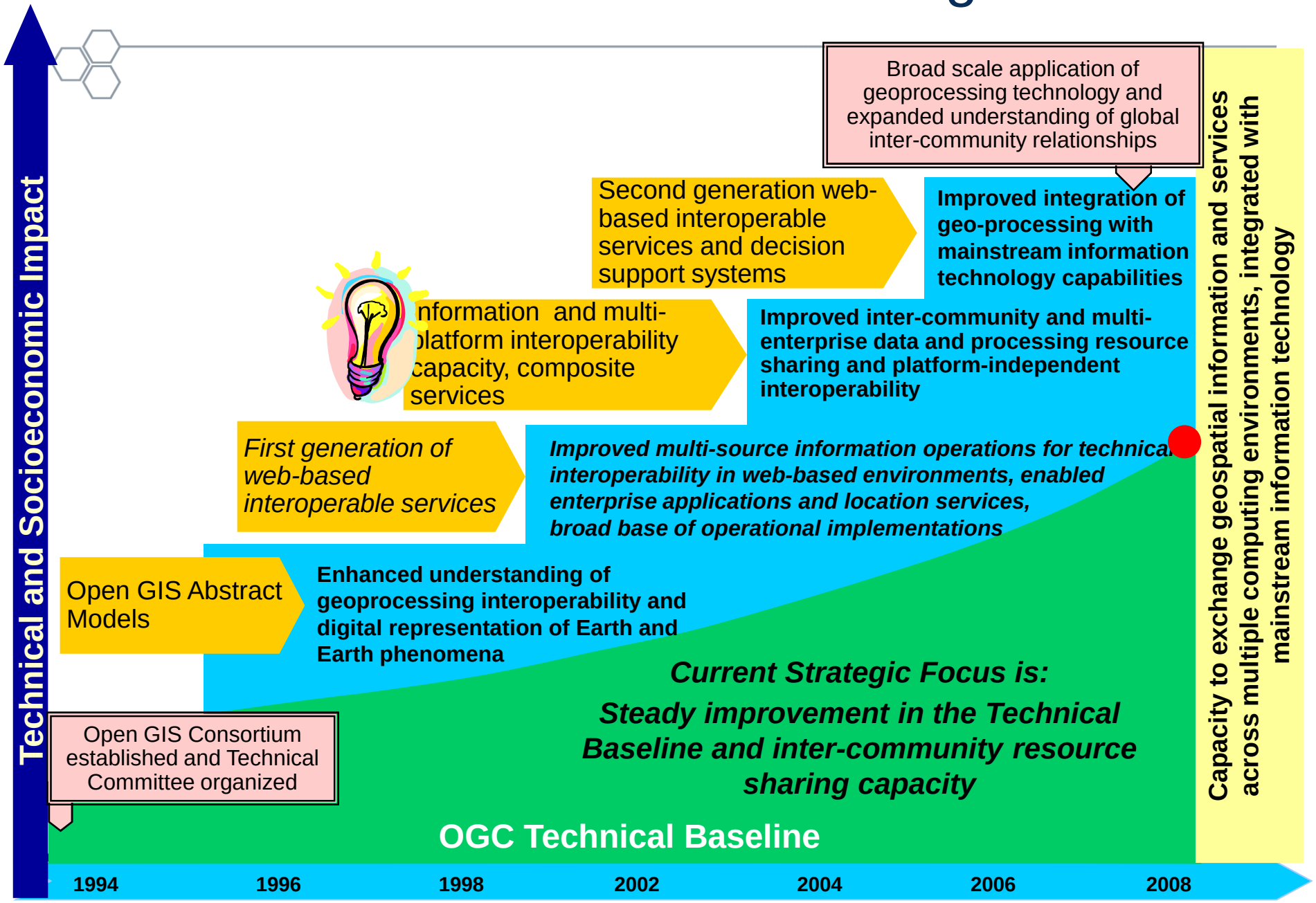
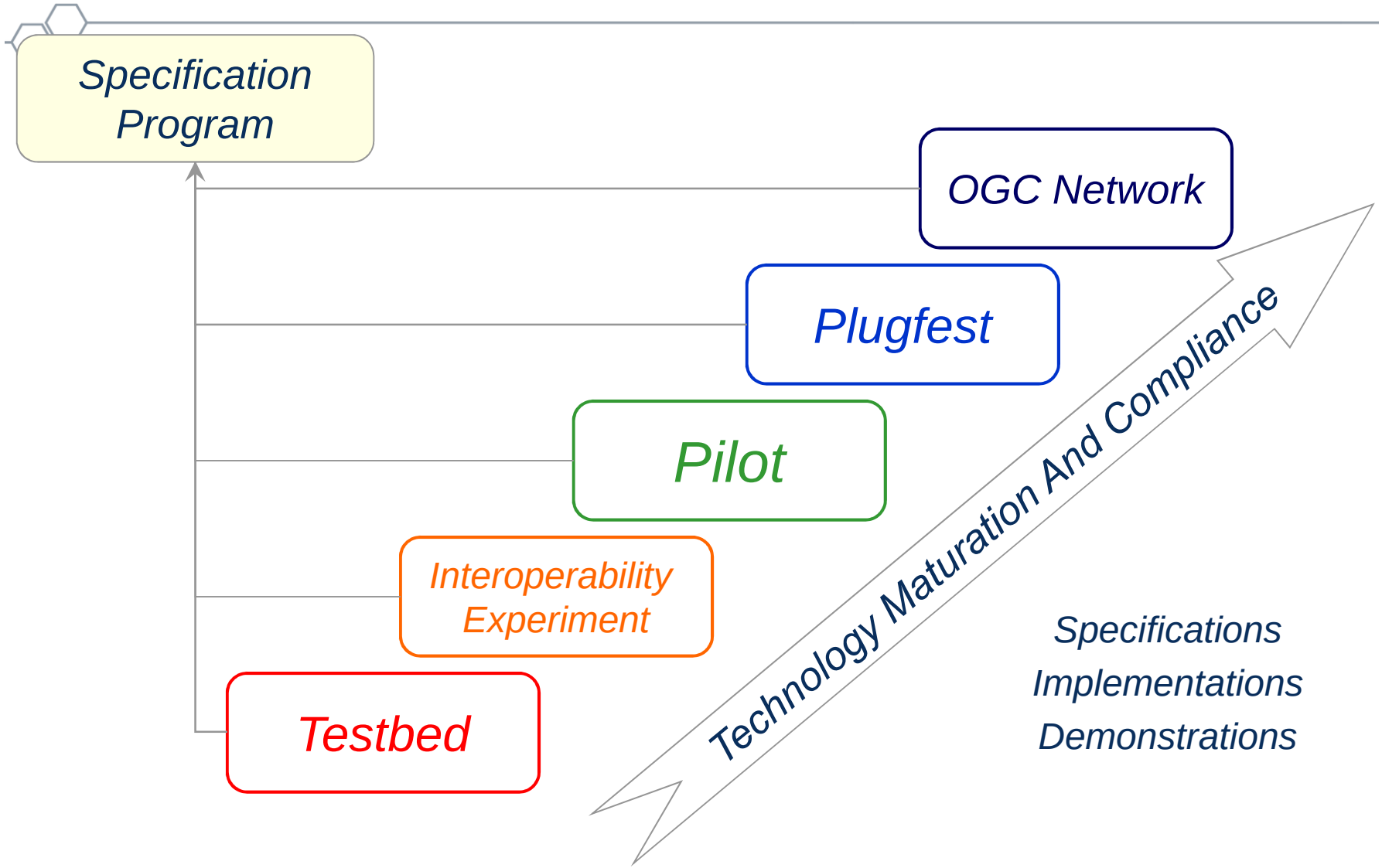
The Evolution of the OGC Strategic Focus…



OGC Interoperability Program



Types of Interoperability Program Initiatives

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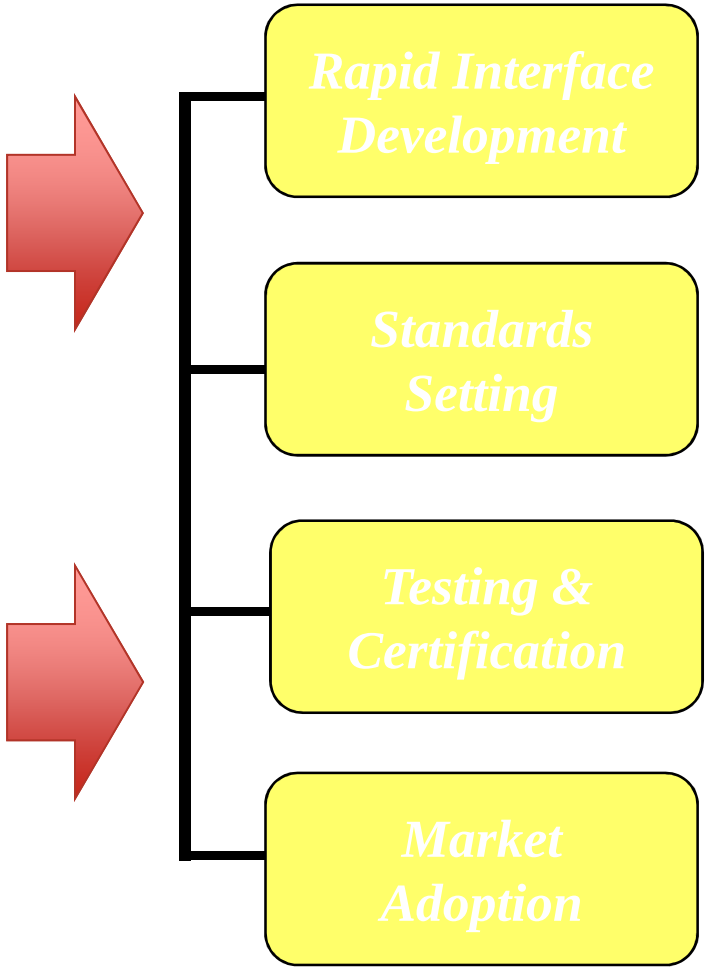
OGC: Approach to Advancing Interoperability

- **Interoperability Program (IP)** - a global, innovative, hands-on rapid prototyping and testing program designed to unite users and industry in accelerating interface development and validation, and the delivery of interoperability to the market
- ***Specification Development Program*** – *Consensus standards process similar to other Industry consortia (World Wide Web Consortium, OMA etc.).*
- ***Compliance Testing and Certification Program*** - *allows organizations that implement an OGC standard to test their implementations with the mandatory elements of that standard*
- ***Marketing and Communications Program*** *– education and training, encourage take up of OGC specifications, business development, communications programs*



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OGC: Where is the money?

	Annual cost	Voting	Conf Places	Other Benefits
Strategic (5)	"Significant resources"	Strategic Advisory Committee	20 free	6 memberships for contracts 40 hours training
Principal (17)	$55K	Planning Committee	4 free	3 memberships for contracts 24 hours training
Technical (74)	$11K	Technical Committee	2 free	
Associate	$4.4K	SWG & DWG	1 free	
Associate <$2m p.a.	$2.2K	SWG & DWG	1 free	
Non Gov Not for Profit	$1.1K	SWG & DWG	1 free	
University	$0.5K	SWG & DWG	1 free	
Provincial Government	$0.5K	SWG & DWG	1 free	
Individuals	$0.5K	SWG & DWG	1 free	
Local Government	$0.2K	SWG & DWG	1 free	

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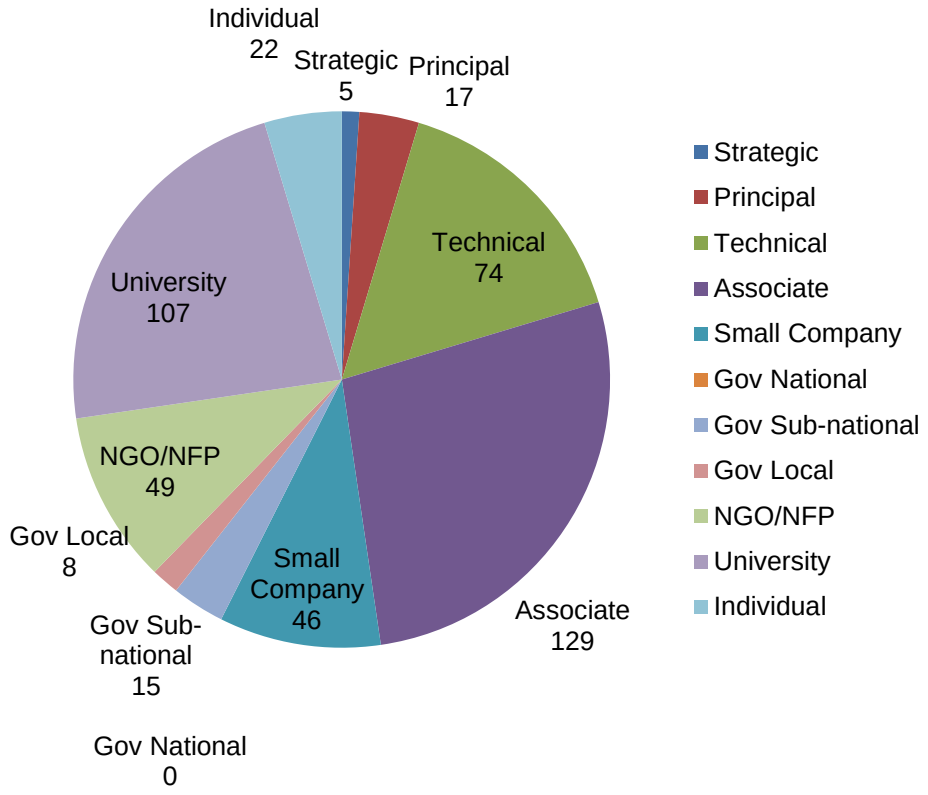
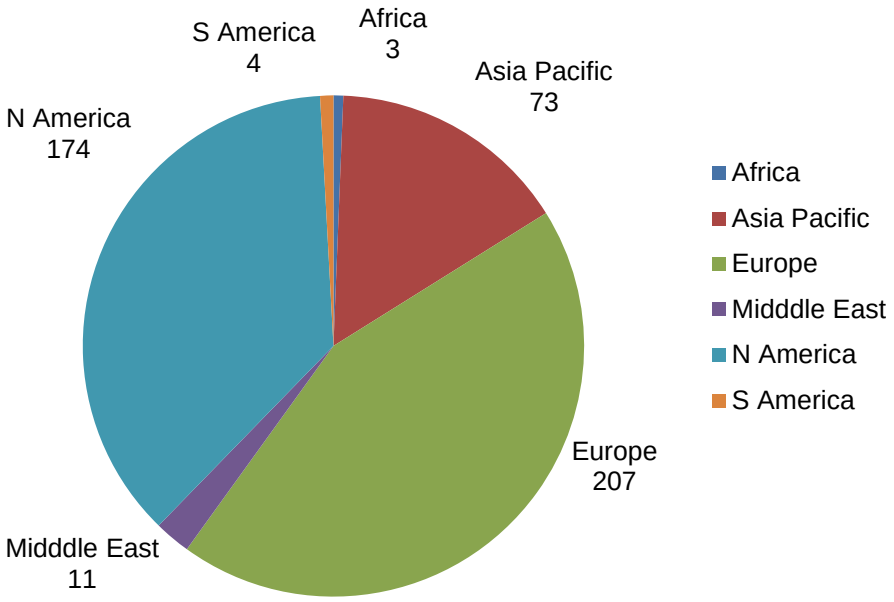
OGC Membership breakdown





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OGC Public Documents

All at the OGC Portal

- Implementation Standards (50)
- Profiles of Standards (5)
- Abstract Specification and Reference Model (~20 topics)
- Formal Schemas (26)
- Best Practices (25)
- Public Discussion Papers & Engineering Reports (~200)
- Policy directives and documents (8)
- White Papers (36)
- Requests for Comment, Requests for Quotation
- Change Requests
- Deprecated and Retired Documents

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Making location count.

Home | Standards | Programs | Participate | OGC Blog | Events | About OGC | Member Login | Search

Geospatial and location standards for:

- Aviation
- Built Environment & 3D
- Business Intelligence
- Defense & Intelligence
- Emergency Response & Disaster Management
- Geosciences & Environment
- Government & Spatial Data Infrastructure
- Mobile Internet & Location Services
- Sensor Webs
- University & Research