



Challenges and Opportunities Panel

25 May 2010

Mark E. Reichardt
President & CEO

mreichardt@opengeospatial.org

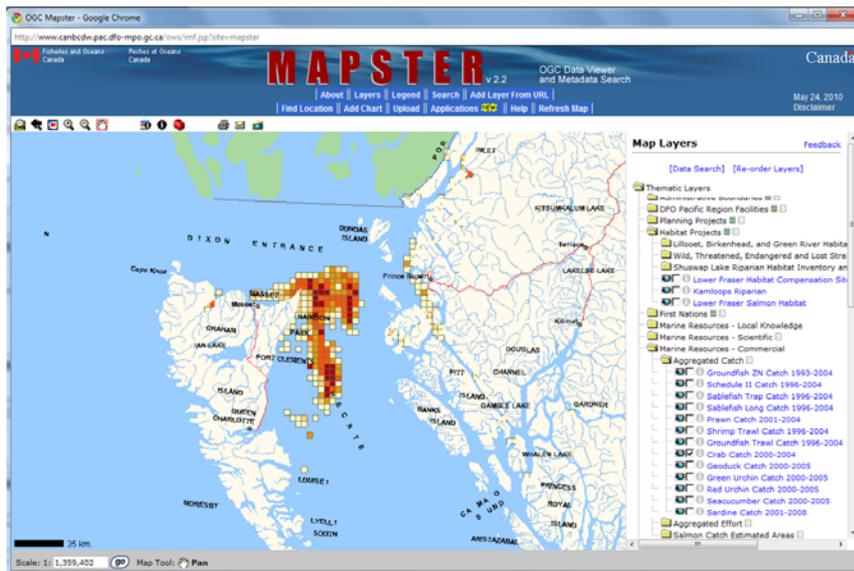
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Interoperability and Standards are Key



OGC Vision

To achieve the full societal, economic and scientific benefits of integrating location resources into commercial and institutional processes worldwide

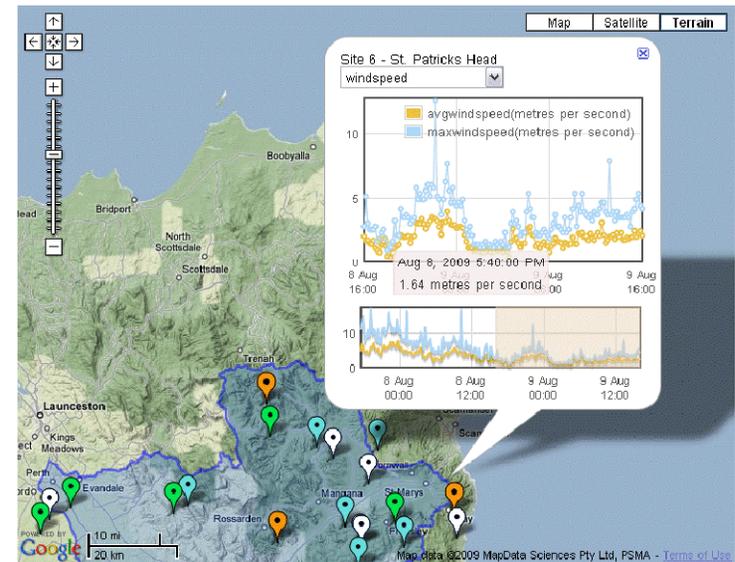


Source: Fisheries and Oceans Canada

Mapster



Source: CSIRO, South Esk River Catchment Hydrologic Sensor Web, Tasmania



Open Standards Development Driven By Community Requirements



Defense &
Intelligence



Research &
Education



Sustainable
Development



Energy
&
Utilities



Geosciences



Homeland Security /
Emergency Services



Consumer Services /
Mass Market



Aviation



E -Government



OGC[®]

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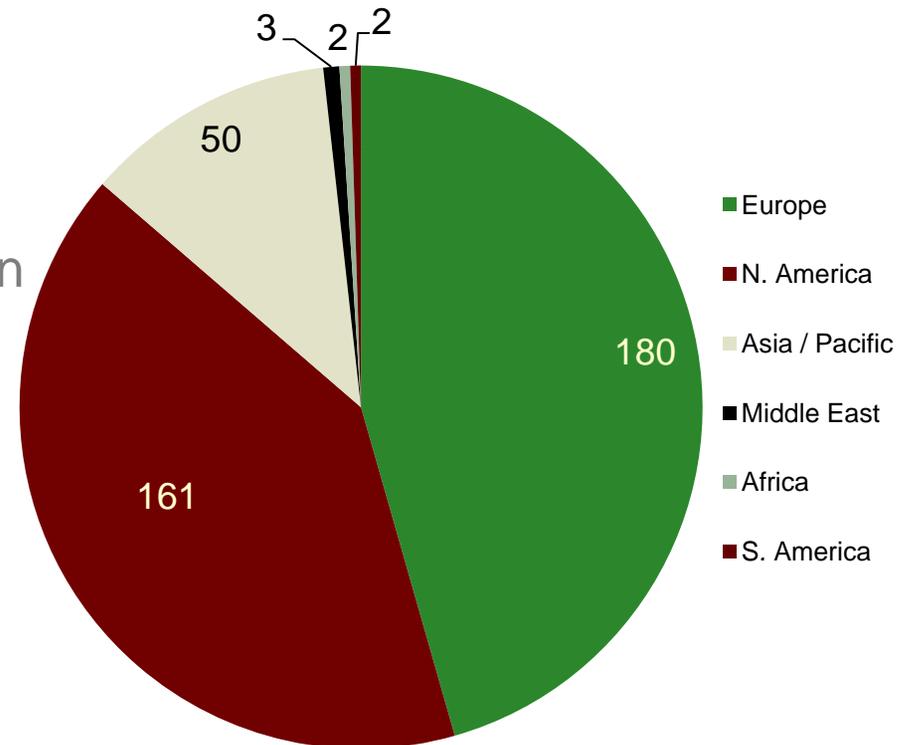
Making Location Count...

OGC Snapshot



- An International Voluntary Consensus Standards Organization, founded in 1994.
- 398 members and growing
- 28 implementation standards
- Hundreds of product implementations in the market
- Broad user community implementation worldwide
- NOAA has been a member of OGC for over a decade

**OGC Membership Distribution
By Region**

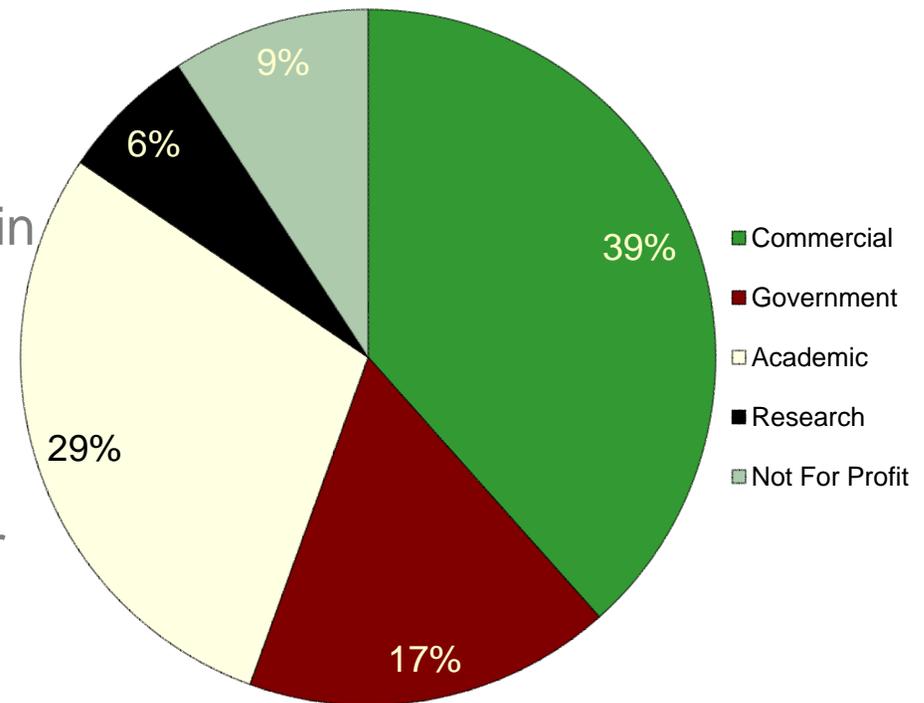


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**OGC Membership Distribution
By Type**



NOAA in OGC



- Involved in a range of OGC working Groups
 - Earth System Science
 - Hydrology
 - Meteorology & Oceans
 - Sensor Web Enablement
 - Aviation Information Mgt
 - Data Quality
 - Mass Market
 - Web Map Service 1.4 SWG
 - Web Coverage Service 2.0 SWG
 - Catalog 3.0 SWG
 - CF-netCDF 1.0 SWG
 - Others...
- Participant in OGC Interoperability Program Initiatives
 - Ocean Science Interoperability Experiment
 - OGC Web Services Testbeds
 - GEOSS Architecture Implementation Pilot Initiatives
 - Others

Involved in Advancement of OGC Web Services Standards

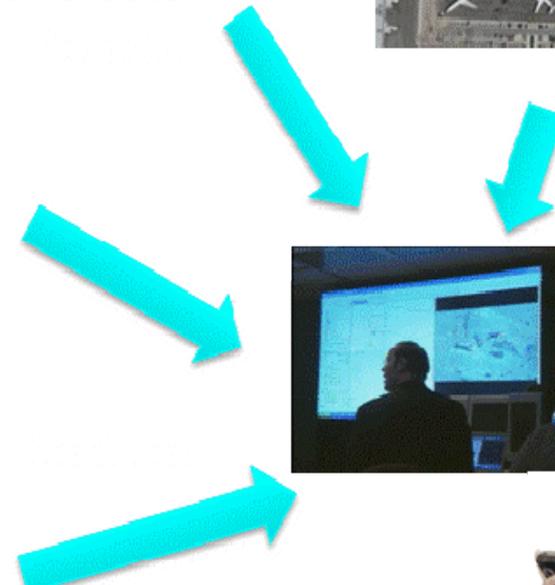
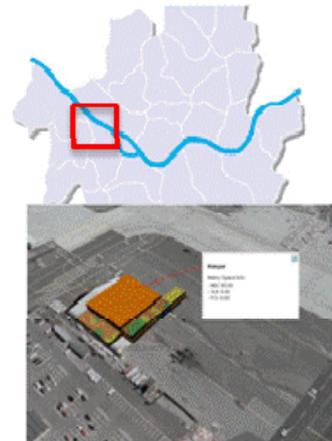
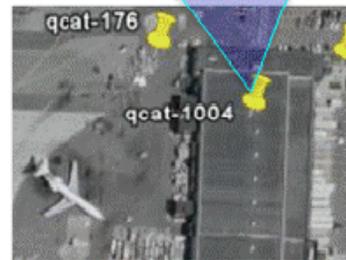


Rapid discovery, access, fusion and application of location information for:

- Critical Infrastructure
- Emergency Management
- Weather Forecasting / Warning
- Climate Change
- Defense and Intelligence
- Local Government Services
- Routing / Logistics
- And many more applications...



Videocam
Type:
Control parameters:



OGC Web Services Standards



Core OGC Standards:

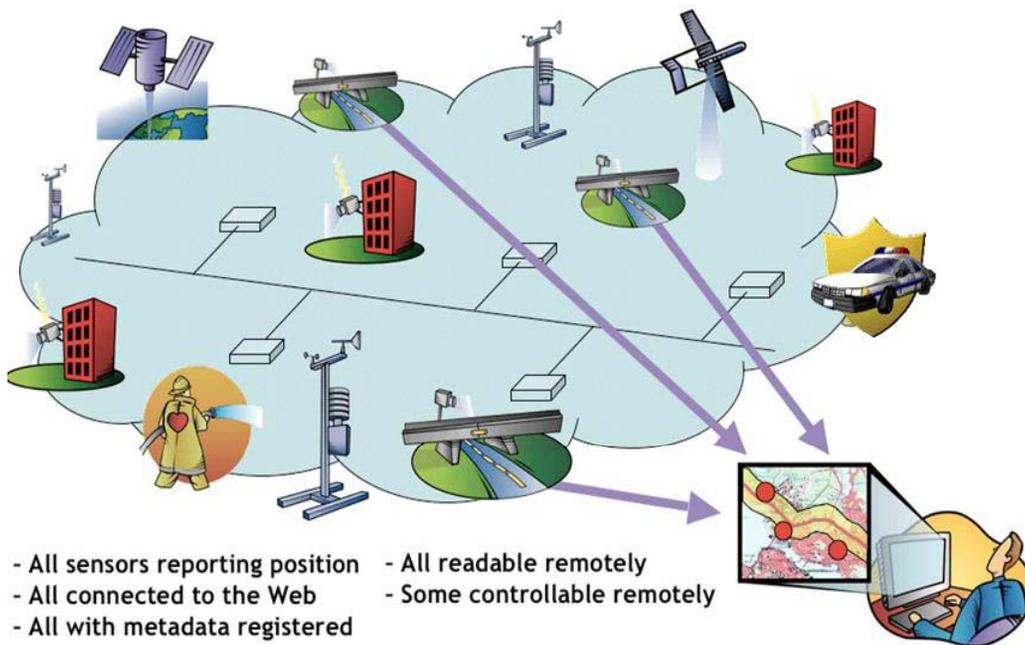


- Web Map Service (WMS)
- Web Feature Service (WFS)
- Web Coverage Service (WCS)
- Catalogue (CSW)
- Geography Markup Language (GML)
- KML
- Others...

Involved in Advancement of OGC Sensor Web Enablement Standards



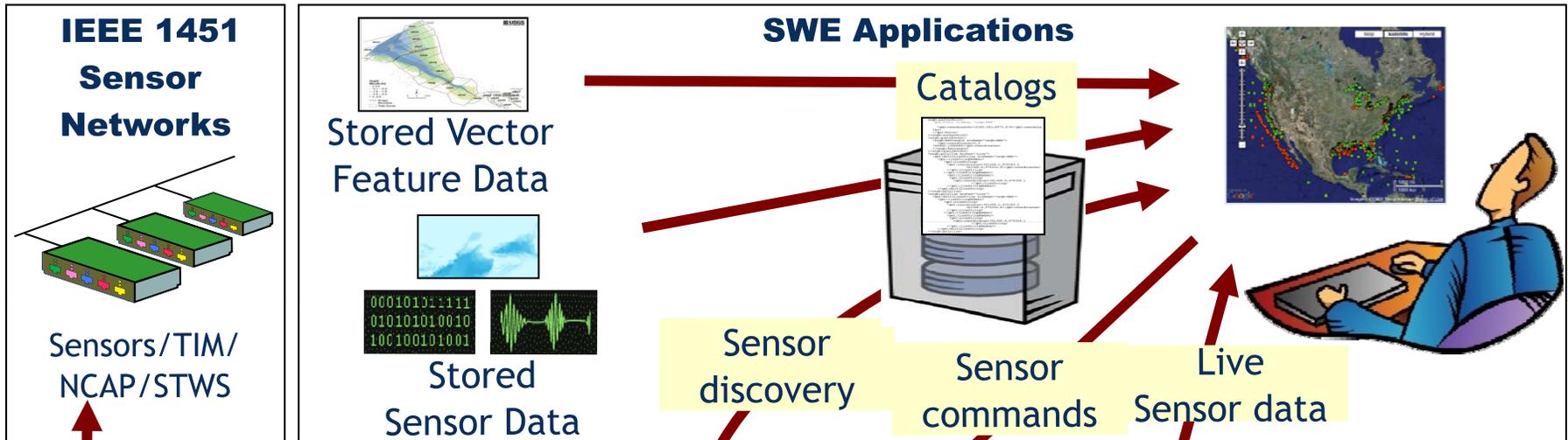
Enables discovery and tasking of sensor assets, and the access and application of sensor observations for enhanced situational awareness



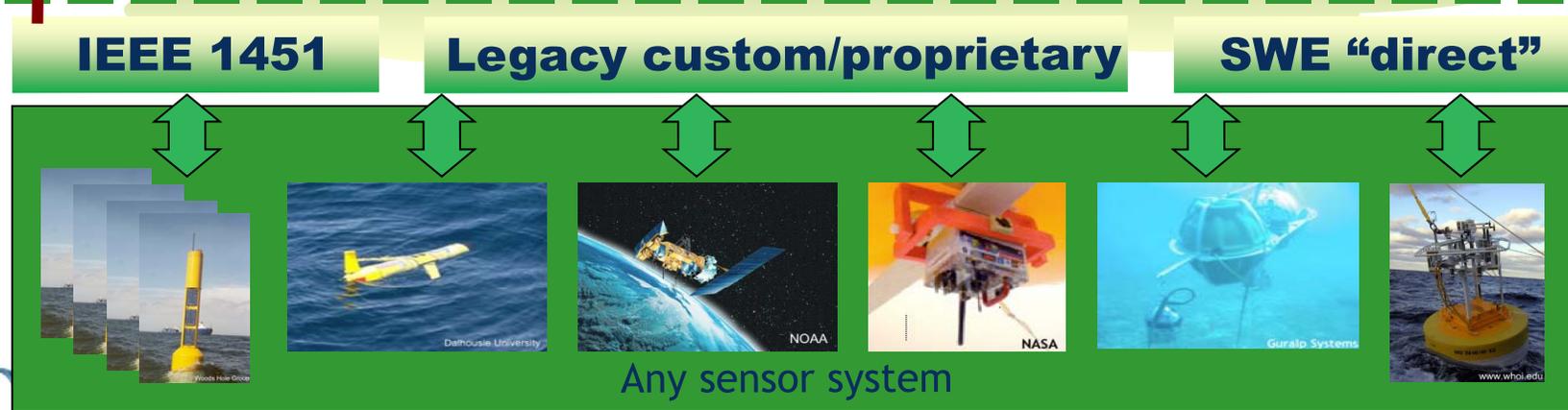
- ✓ Sensor Model Language (SensorML)
- ✓ Transducer Markup Language (TML)
- ✓ Observations & Measurements (O&M)
- ✓ Sensor Planning Service (SPS)
- ✓ Sensor Observation Service (SOS)
- ✓ Catalogue Service
- ✓ Sensor Alert Service (SAS)
- ✓ Web Notification Service (WNS)
- ✓ IEEE smart sensor standard
- ✓ OASIS (alert) standards

Sensor Standards for Ocean Observation

Diverse sensors are discoverable and Web-accessible via OGC Sensor Web Enablement (SWE) interfaces, in diverse architectures and applications, with geospatial context.



Sensor Web Enablement (SWE) services (and “cloud” resources)



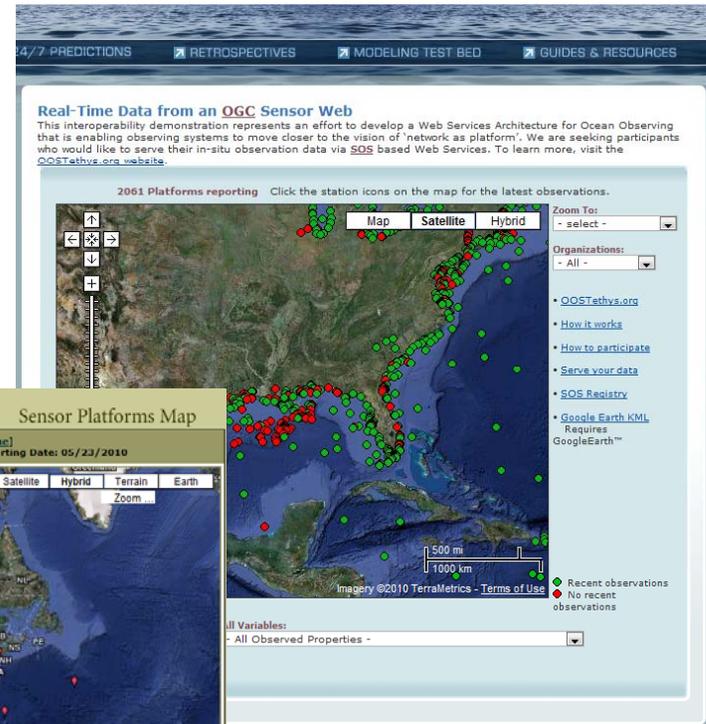
Sensor Web Enablement Standards Application Ocean Observation



Core DIF Standards

These are some of the basic standards and specifications adopted by the NOAA IOOS Data Integration Framework.

- OGC Sensor Observation Service (SOS) specification NOAA IOOS uses this service type to provide access to in-situ oceanographic data in an XML encoding defined by the GML application schema referenced above.
- OGC Web Coverage Service (WCS) specification NOAA IOOS uses this service type to provide access to gridded remotely sensed data in binary formats such as NetCDF and GeoTIFF.
- IOOS Observation Registry v2.5
- OPeNDAP information This service provides access to gridded remote sensing data such as NetCDF and GeoTIFF.
- OGC Web Map Service (WMS) This service is used to provide georeferenced data.



Note: all features of this Google map application may not work with the the Internet Explorer 6 browser. Please use Firefox or Internet Explorer 7.



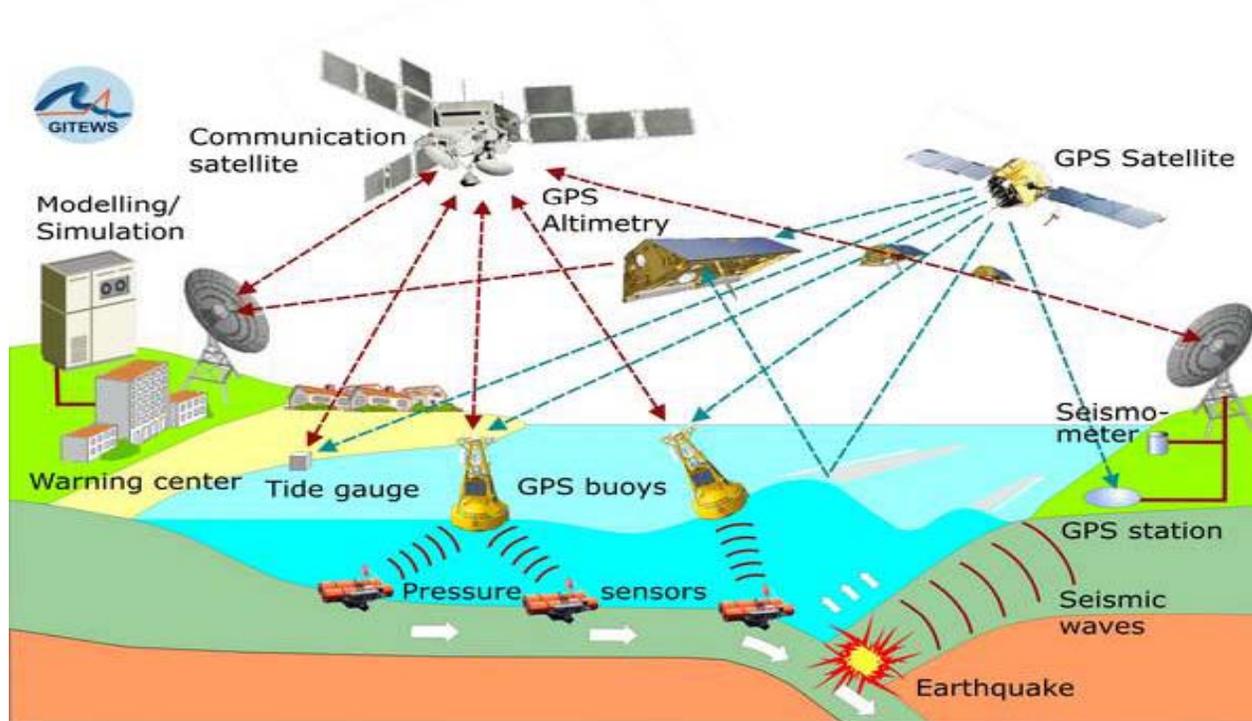
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Making Location Count...

Sensor Web Enablement Standards Application

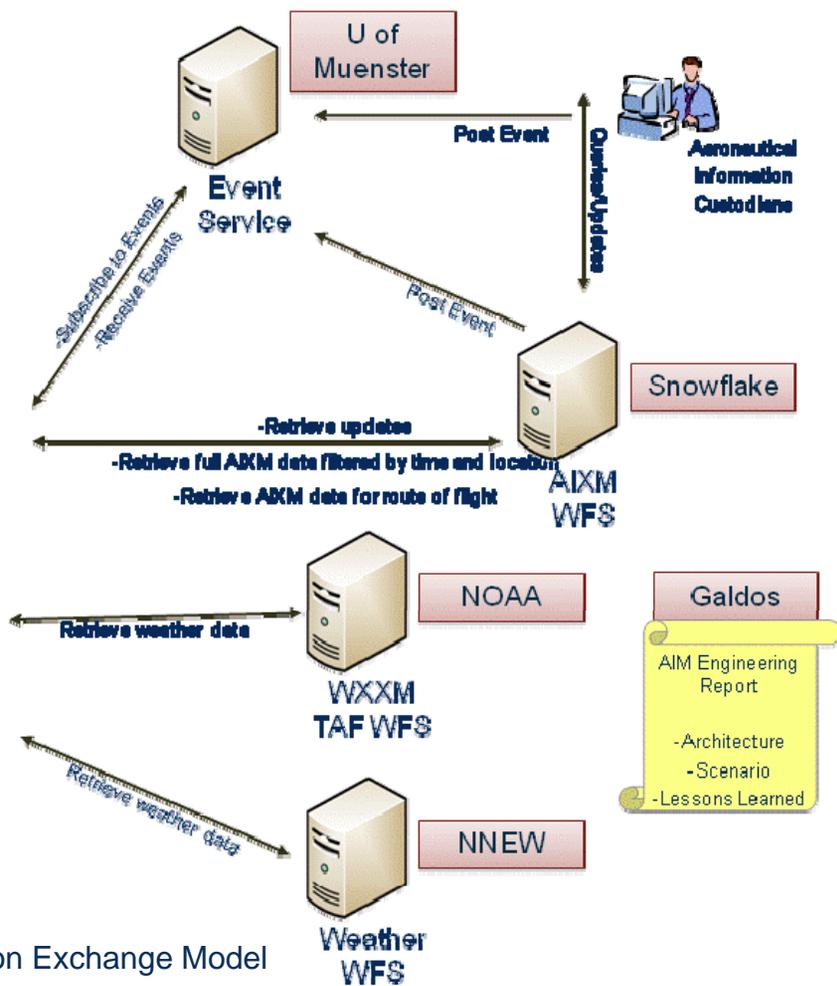


German Indonesian Tsunami Early Warning System



Source: www.gitews.org

OWS-6 Aeronautical Information Management Architecture



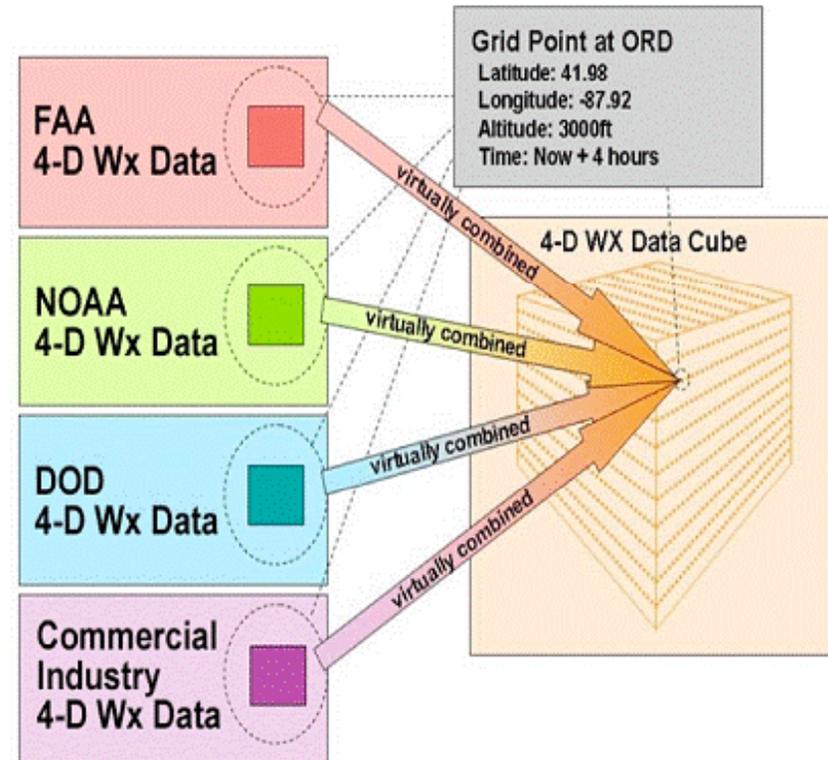
- AIXM - Aeronautical Information Exchange Model
- NNEW - NextGEN Network Enabled Weather
- TAF - Terminal Aerodrome Forecast
- WXXM - Weather Info. Exchange Model
- WFS - OGC Web Feature Service



4D Weather Data Cube



- Key element of US NextGen vision
- Shared 4D network-enabled, virtual repository of aviation weather data
- Collaborative development (NOAA, FAA, DoD)
- Uses open standards
 - OGC standards for data access
 - XML, GML, NetCDF, WXXM, JMBL for data formats

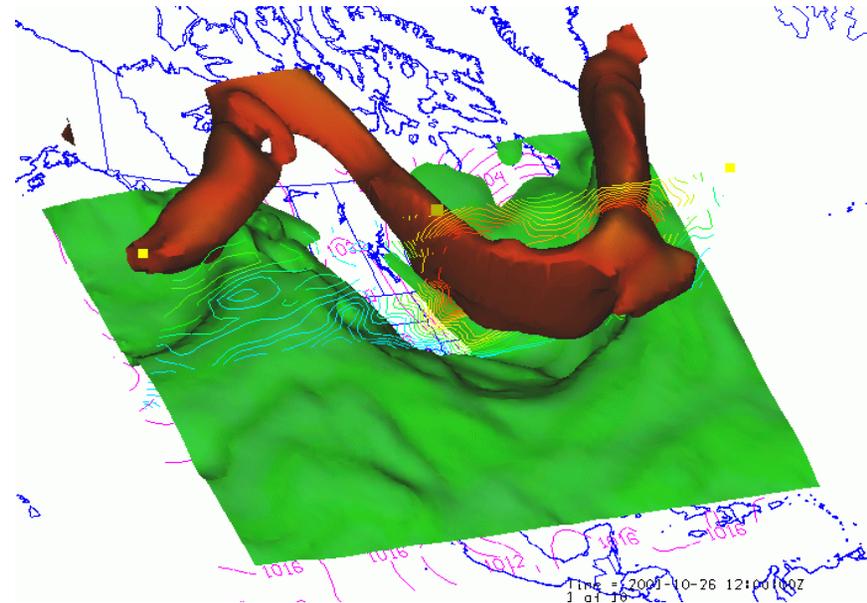


Geo-Interface to Atmosphere, Land, Earth, Ocean NetCDF



- Establishes a geospatial interface with complex science datasets using OGC Web Coverage Service (WCS) standard
- Provides interoperability among netCDF, OPeNDAP, ADDE, and THREDDS client/server and catalog protocols used by the community
- CF-netCDF moving forward as an OGC standard

GALEON Interoperability Experiment
Geo-interface to Atmosphere, Land, Earth, Ocean, NetCDF



Example Member Organizations



NORTHROP GRUMMAN

ORACLE

Google



ESRI

EADS
astrium

Infotech
Creating Business Impact

PCI
Geomatics

Bentley

BAE SYSTEMS

LOCKHEED MARTIN

INTERGRAPH

erdas
The Earth to Business Company

SURA

DIGITALGLOBE



NCAR

SAIC
From Science to Solutions

Microsoft



IBM

COMPUSULT

GeoEye

OGC

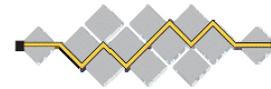
Example Government Organizations



- DOD Australia
- Geoscience Australia
- NSW Dept of Environment and Climate Change (Australia)
- Eurocontrol
- European Environment Agency
- European Satellite Centre
- European Space Agency
- UK MOD
- UK MET
- METEO France
- Korea Land & Housing
- BRGM (France)
- Ordnance Survey (UK)
- State Land Agencies (Germany)
- US DHS
- US EPA
- US FAA
- US NASA
- USGS
- US NGA
- US Census
- US NOAA
- JPEO
- Oakridge National Lab
- Natural Resources Canada
- NC Dept of Environment & Natural Resources
- Dept. Science & Technology (India)
- EU Joint Research Centre

OGC Alliance Partners

A Critical Resource for Advancing Standards



... and others

www.opengeospatial.org/ogc/alliancepartners



Challenges / Opportunities



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

David Schell
Chairman and Founder
OGC

