

# **OGC and IOGP Activities relevant to IHO and MSDI**

**Including Oil Spill Response, Common Operating Picture**

15<sup>th</sup> North Indian Ocean Hydrographic Commission Meeting

Muscat, Oman

16 – 18 March 2015

Content by: CARIS, OGC and IOGP SSDM Task Force

Presented by: Matt Holland, CARIS

# Contents

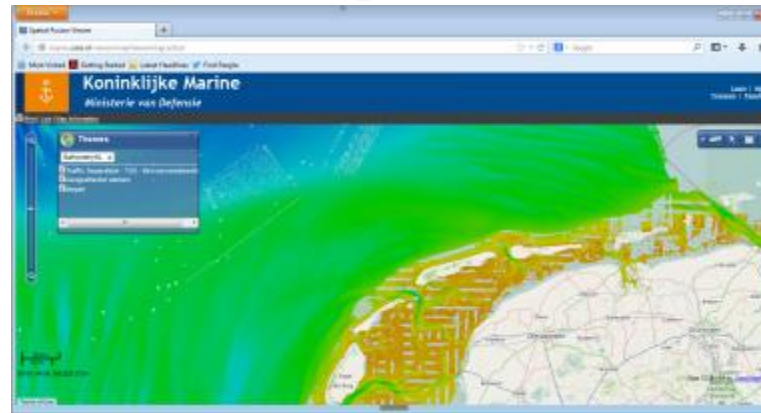
- OGC Update
- IOGP SSDM Update
- Harmonizing Data and Smart Data Exchange
- Oil Spill Response Common Operating Picture

# Basic Geospatial Interoperability Challenge Solved

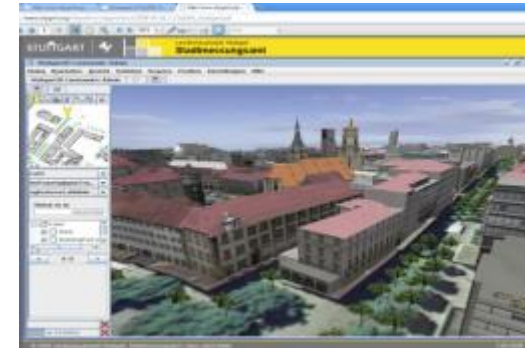
## Standards-based Technologies and Information Sources



Source: Geoportal of the Catalonia SDI



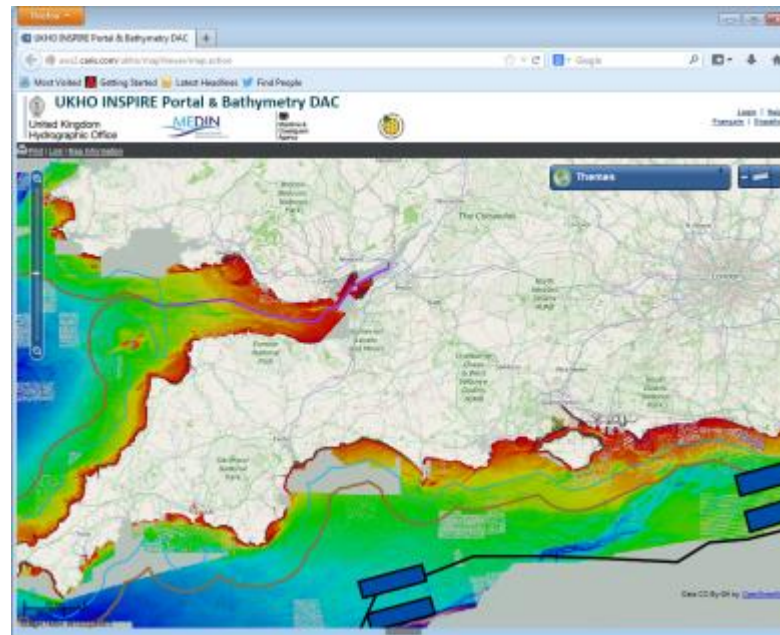
Source: Koninklijke Marine, Dutch Ministry of Defence



Source: Landeshauptstadt Stuttgart



Source: onegeology.org



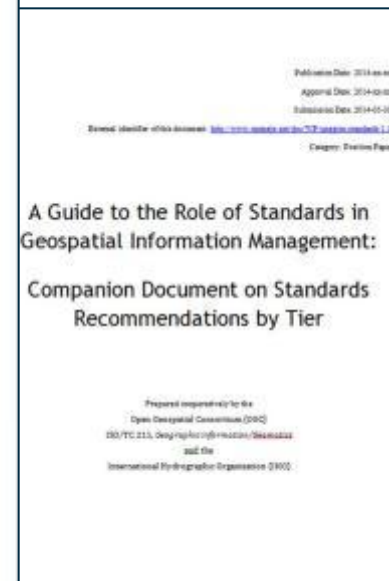
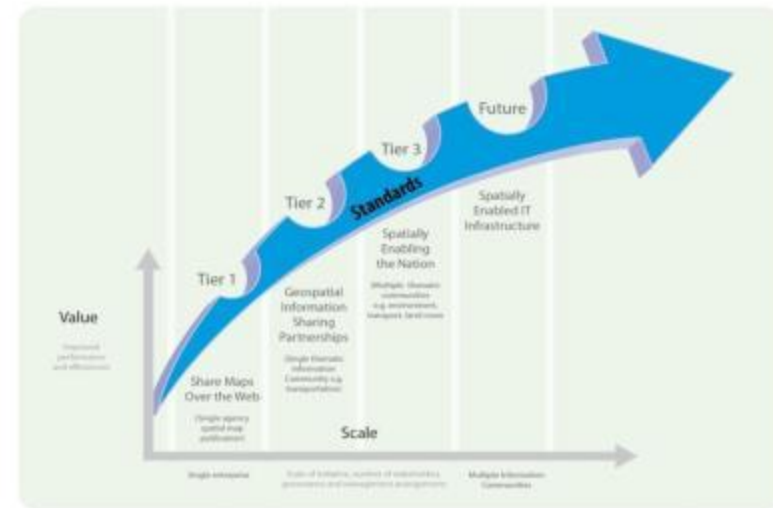
Source: ukho.gov.uk



Source: GeoNorge

# UN Global Geospatial Information Management (UN-GGIM) Report

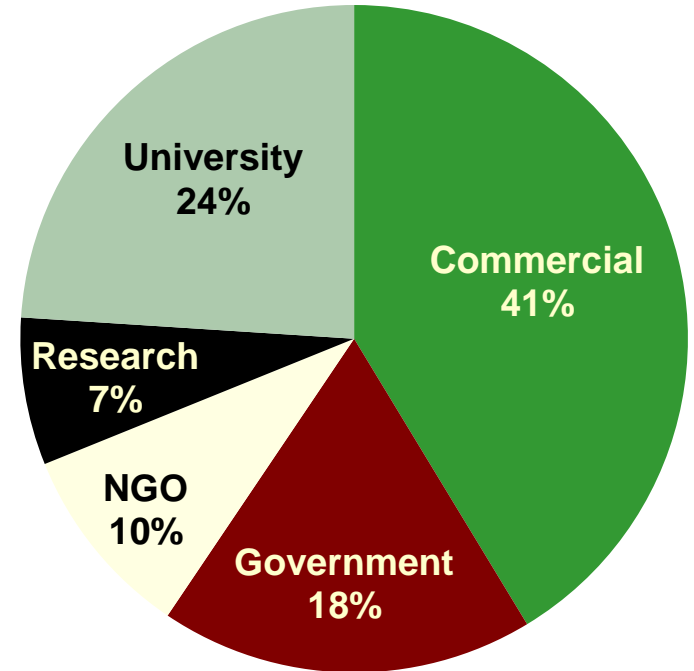
- *A Guide to the Role of Standards in Geospatial Information Management*
  - Purpose to provide a policy leader level guide to the role and benefit of geospatial standards in geospatial information management
  - Non-Technical
  - Joint development between OGC, IHO, MSDIWG, ISO and others
- Final version to UN-GGIM secretariat June 2014
- Presented by OGC in NYC in August on behalf of OGC, IHO and ISO



# The Open Geospatial Consortium

**Not-for-profit, international voluntary consensus standards organization;  
leading development of geospatial standards**

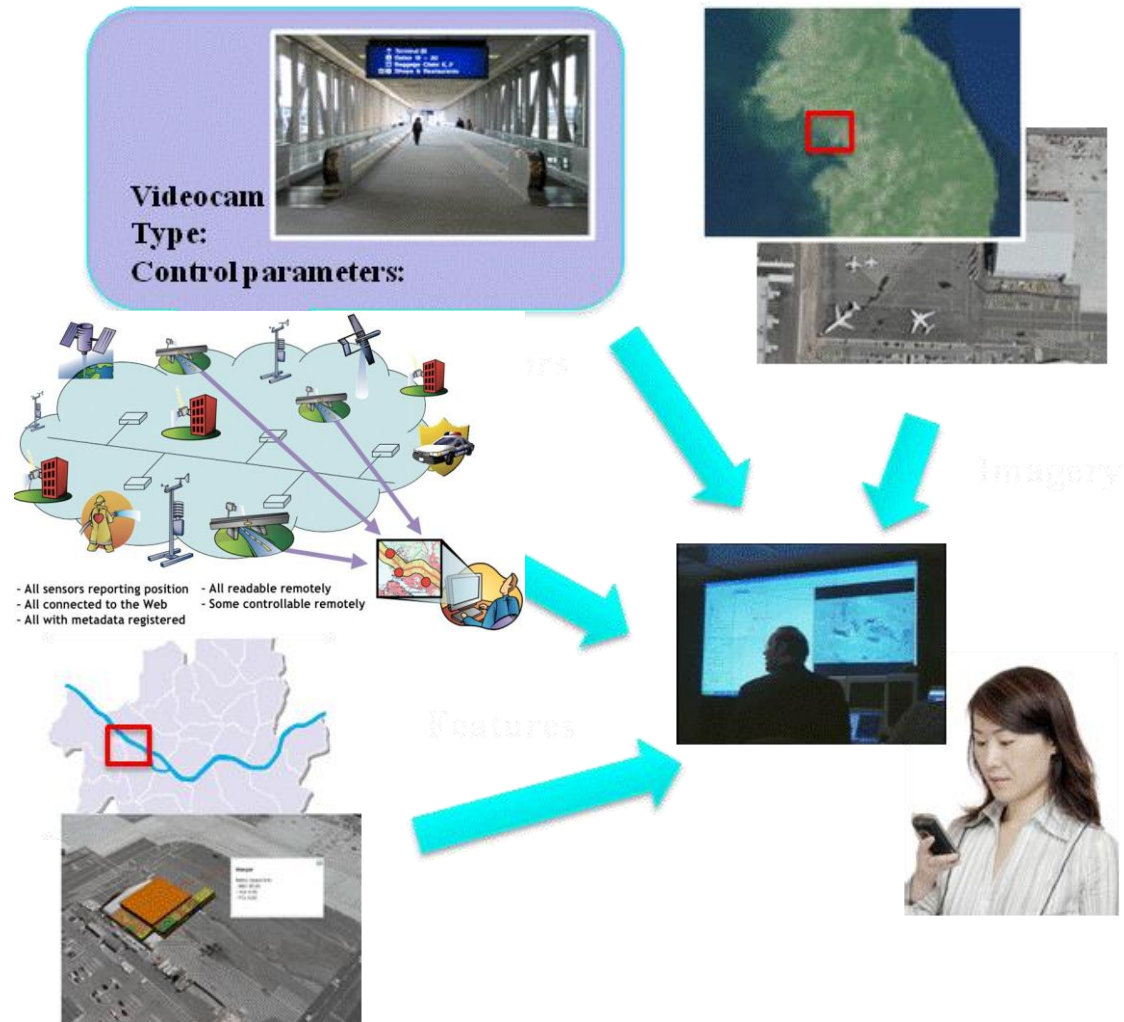
- 20<sup>th</sup> Anniversary
- 498 members
- 33 “core” standards
  - 15 extensions/profiles
- Hundreds of product implementations
- Broad user community  
implementation worldwide
- Alliances and collaborative activities with  
many other organizations



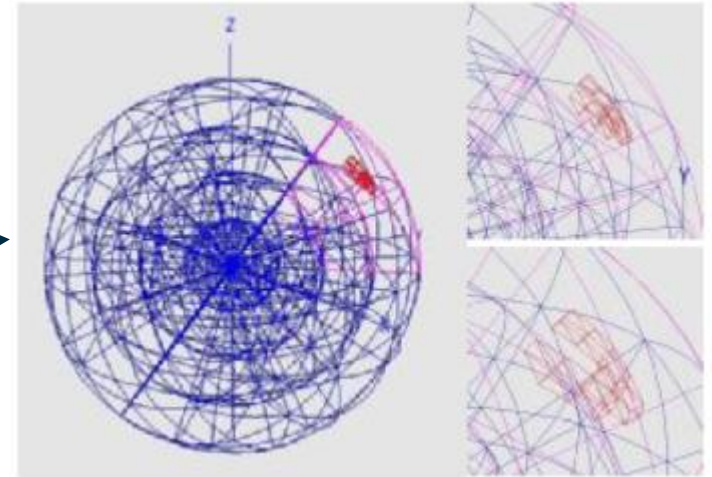
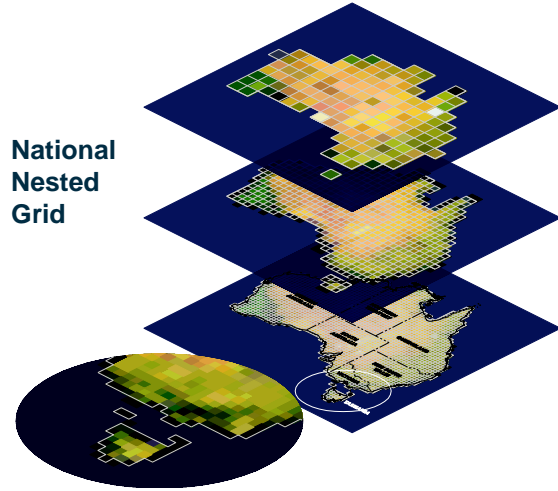
# OGC/ISO Web Services Standards

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

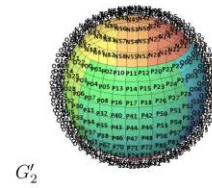
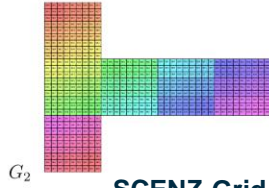
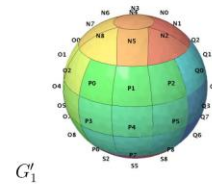
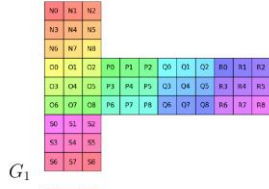
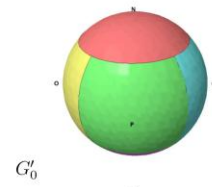
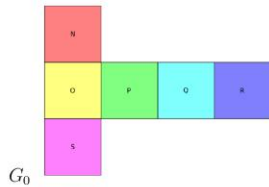
- Catalogue
- Geography Markup Language
- KML
- Web Coverage Service
- Web Feature Service
- Web Map Service
- Web Map Tile Service
- Web Processing Service
- Sensor Web Enablement



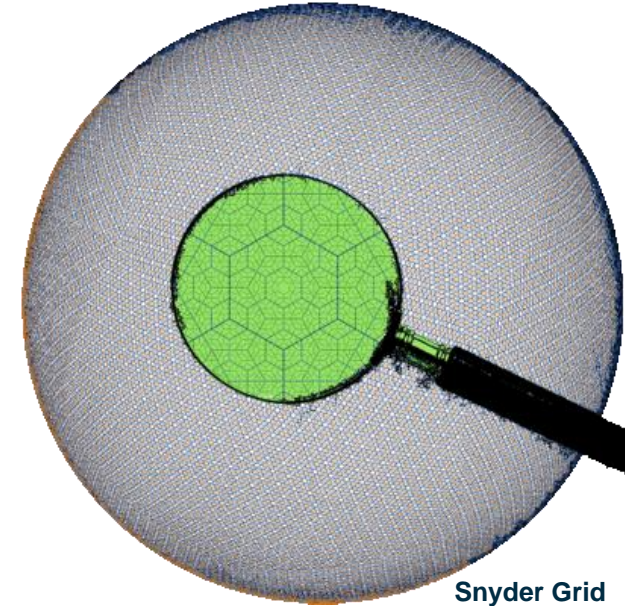
# Discrete Global Grid Systems



Earth System Spatial Grid



SCENZ-Grid



Snyder Grid

# 3D Information Management and Portrayal

- Interoperation across Geospatial domains
  - 3D City Models
  - 3D Visualization and Portrayal Services
  - Location Services
  - Indoor Location / Navigation
  - CityGML Discussions
  - *3D for e-Navigation?*



*Adapted from BuildingSmart Alliance presentation*

# GML Application Activities

## Profiles

- GML Point Profile
- GML Simple Features Profile
- GML GeoShape for use in IETF
- GML in JPEG2000
- GeoRSS: GML Serialization

## Programs building GML App Schemas

- US NSDI
- GEOINT
- INSPIRE
- IHO
- IOGP

## Application Schemas

- CityGML
- WaterML
- GeoSciML
- Climate Science ML (CSML)
- CleanSeaNet
- NcML/GML (NetCDF and GML)
- TDWG Biodiversity GML
- MarineXML
- Ground Water Modeling Language
- S-100
- SeabedML (SSDM)

More GML Application Schemas

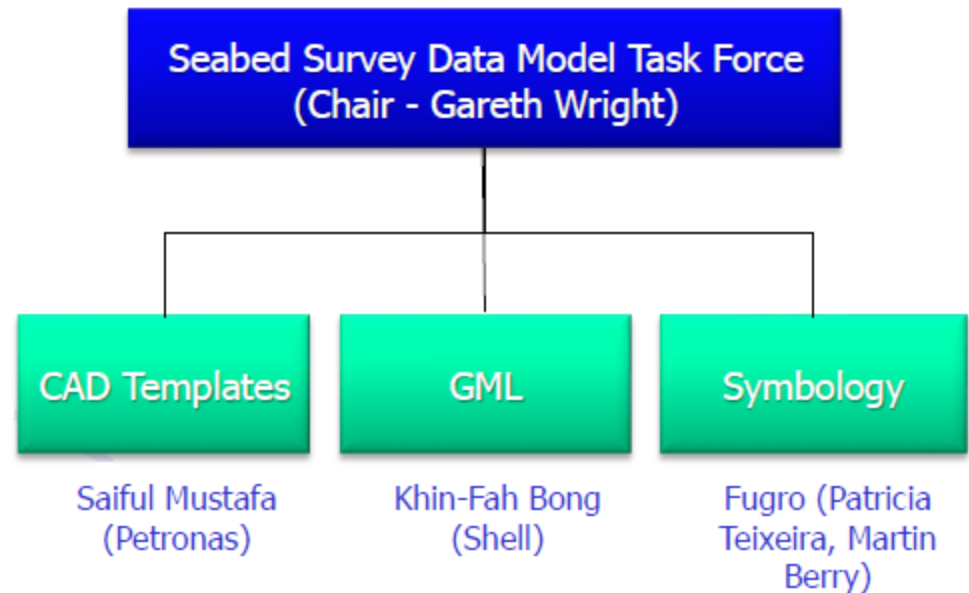
<http://www.ogcnetwork.net/node/210>

[http://en.wikipedia.org/wiki/GML\\_Application\\_Schemas](http://en.wikipedia.org/wiki/GML_Application_Schemas)

# IOGP SSDM Task Force

## • Members

- Wright, Gareth, WOODSIDE
- Mustafa, Saiful Nizam, PETRONAS
- Butcher, Katherine, DOF SUBSEA
- Bong, Khin-Fah, SHELL
- Vidal, Arnaud, TOTAL
- Van Beusekom, Xander, CHEVRON
- Berry Martin, FUGRO
- Blackburn, Tony, BP
- Bt M Faiz, Fariza, PETRONAS
- Haneberg, Bill, FUGRO
- Hoggarth, Andrew, CARIS
- Ingebresten, Egil, STATOIL
- Kennedy, Paul, FUGRO
- Larsen, Christine, FUGRO
- Lovely, Narmina, BHP BILLITON
- Quarrill, Bob, WOODSIDE
- Rutledge, Anne, EXXONMOBIL
- *Pamela, Kanu, FUGRO*
- *Milligan, Ian, BP*

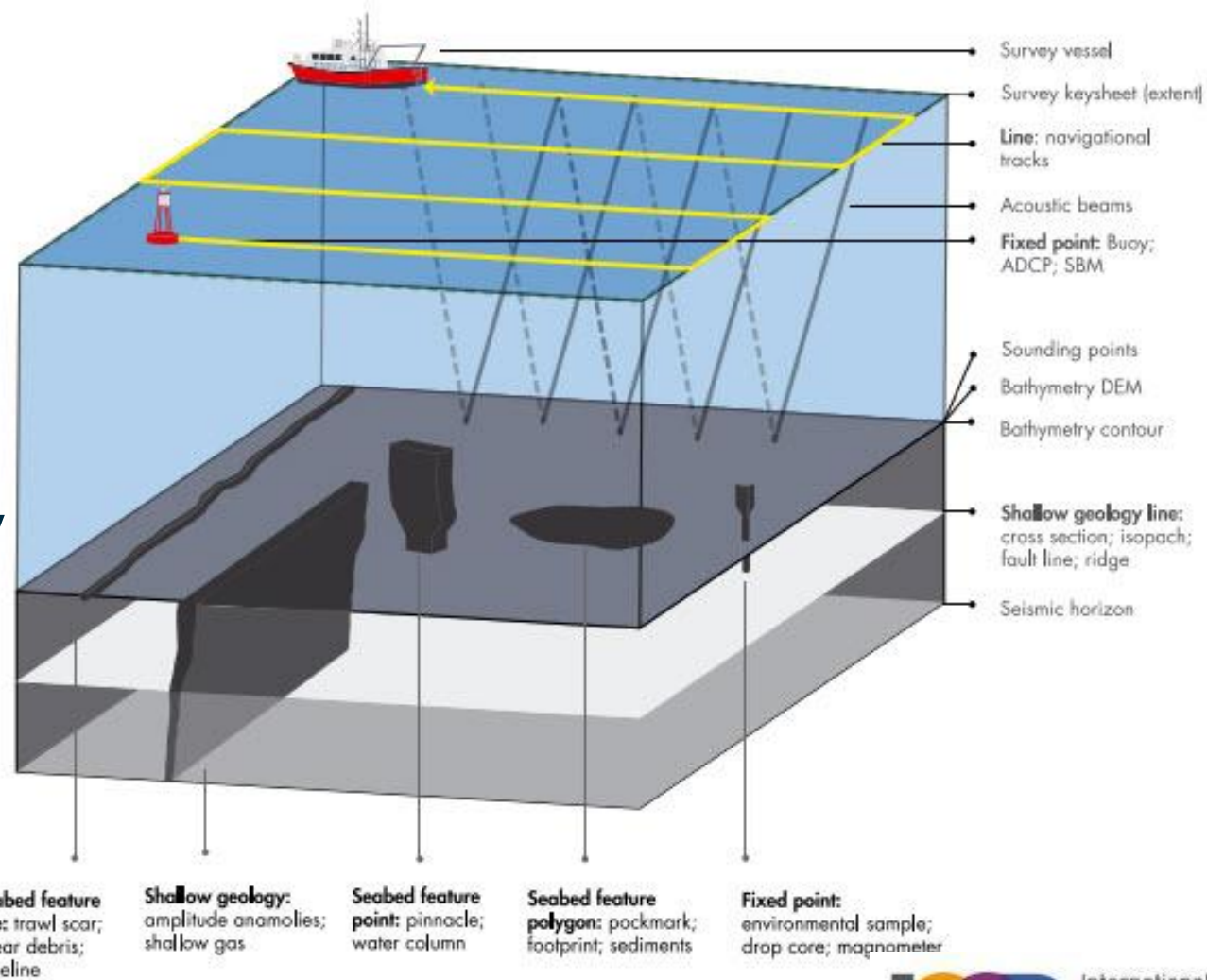


- SSDM V1 available in 2013
- Ancillary materials available in early 2015
  - SSDM schema remains unchanged
  - Symbology completed / improved
  - CAD templates available
  - Open version through SeabedML
- SSDM V2 in the works “late 2015”

# Seabed Survey Data Model

- Seabed Survey Data Model (SSDM)

- GIS model used by E&P industry for exchange of survey data
- Implemented initially in ArcGIS
- Emphasis on vector features rather than raster coverages



# SeabedML

- SeabedML

- Non-proprietary data exchange format for SSDM

- SeabedML is a GML application schema

- GML is a OGC standard

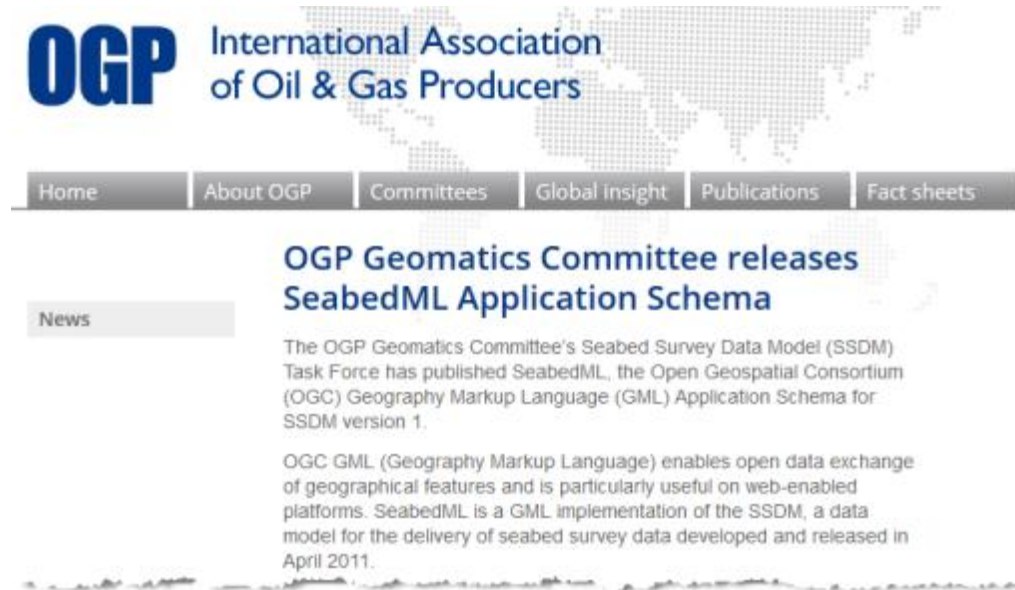
- GML is a ISO standard

- XML is a W3C standard

- SeabedML is an open data format allowing any GIS to work with SSDM data

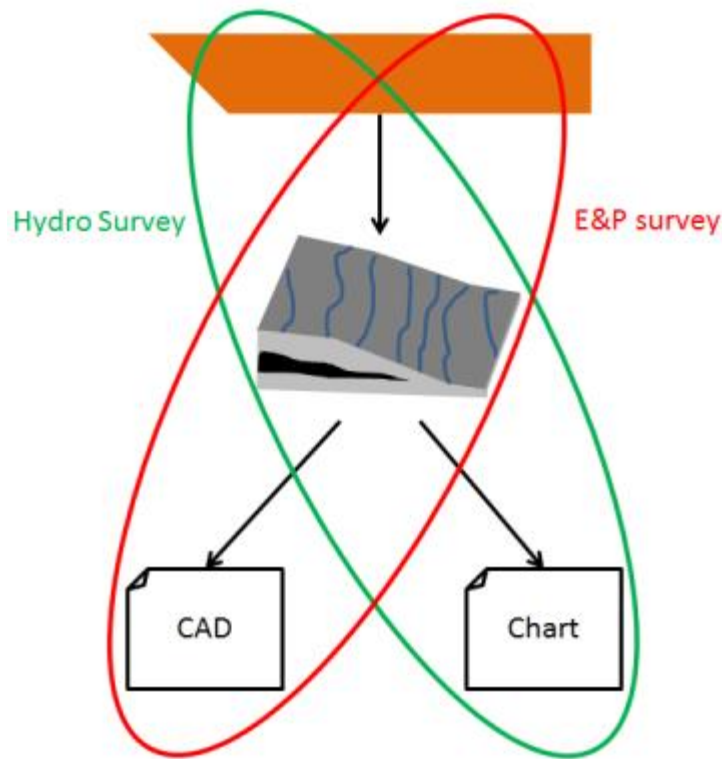
- SeabedML provides interoperability between Energy and Hydro

- CARIS working on SeabedML with Shell

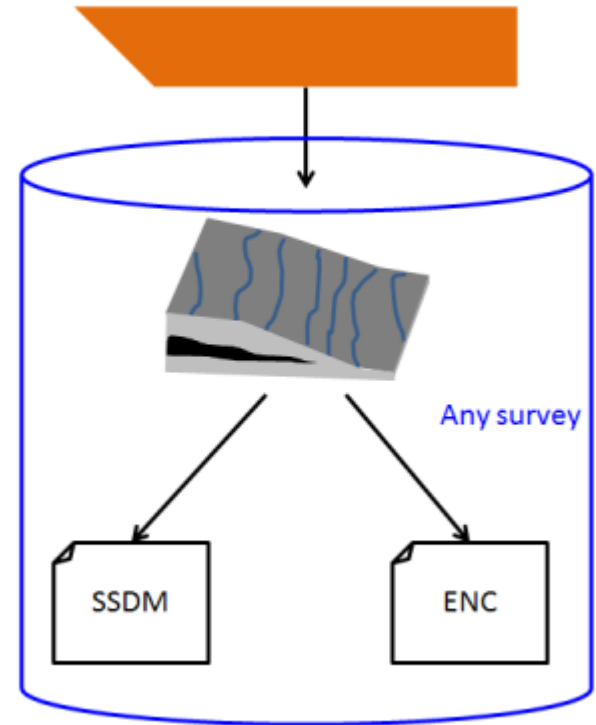


# Survey Specifications

- Different equipment, processes and data standards used depending on type of survey:
  - IOGP / IMCA guidelines for E&P Survey data deliverables
  - IHO for Hydro / Safety of Navigation Survey data deliverables
  - **Much of the data is the same!**



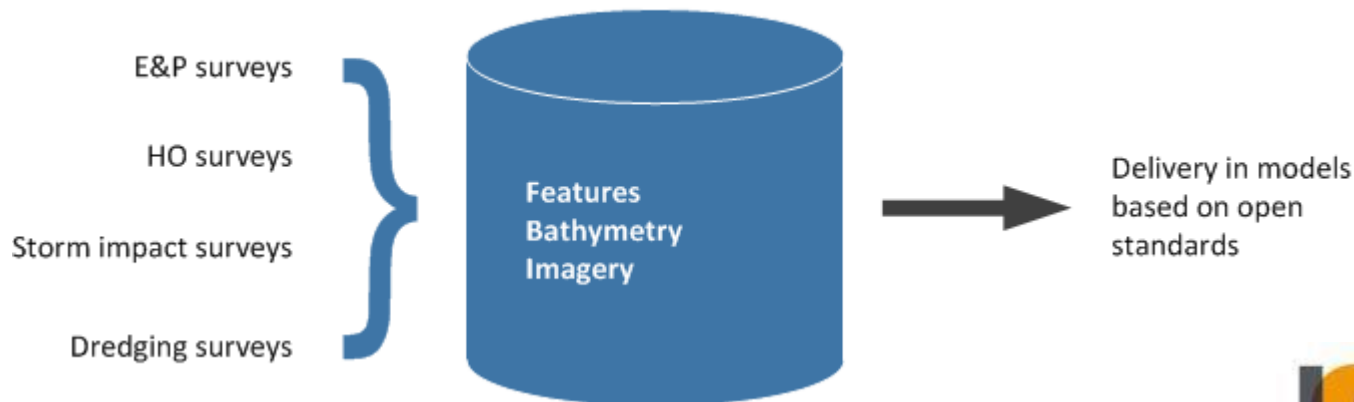
Traditional approach



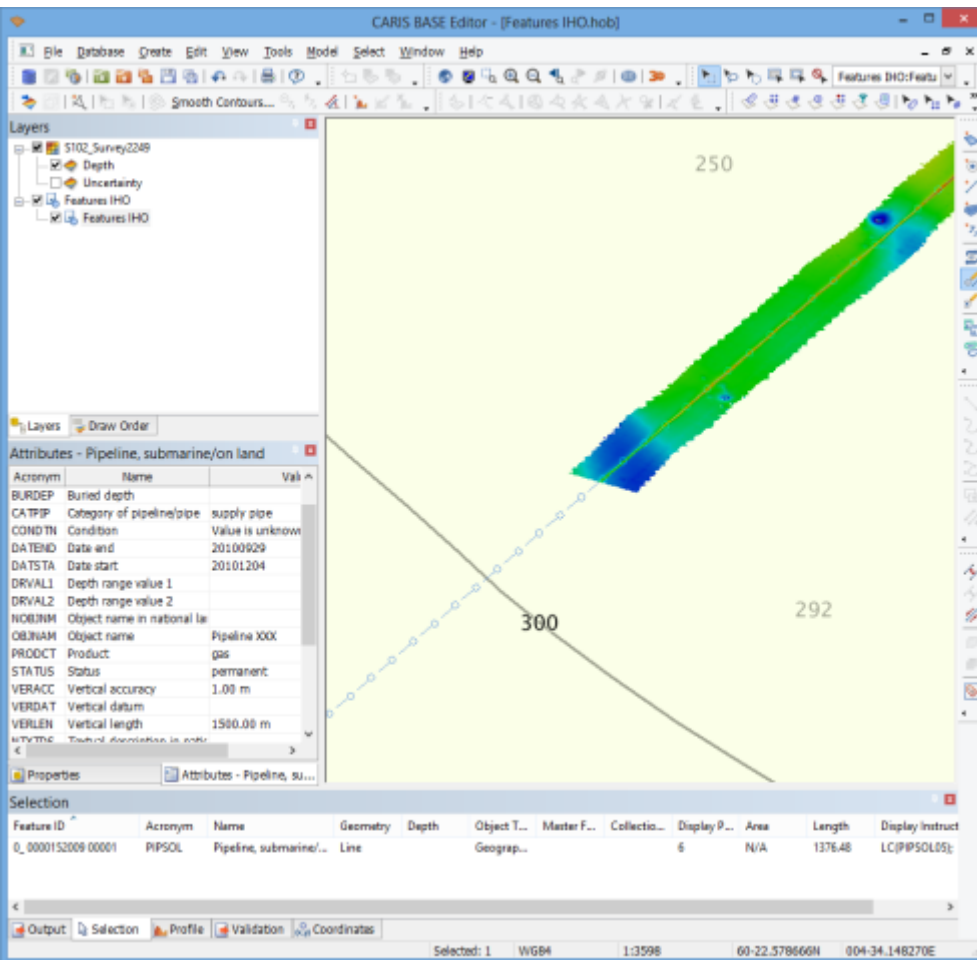
Better approach

# Harmonizing Survey Deliverables

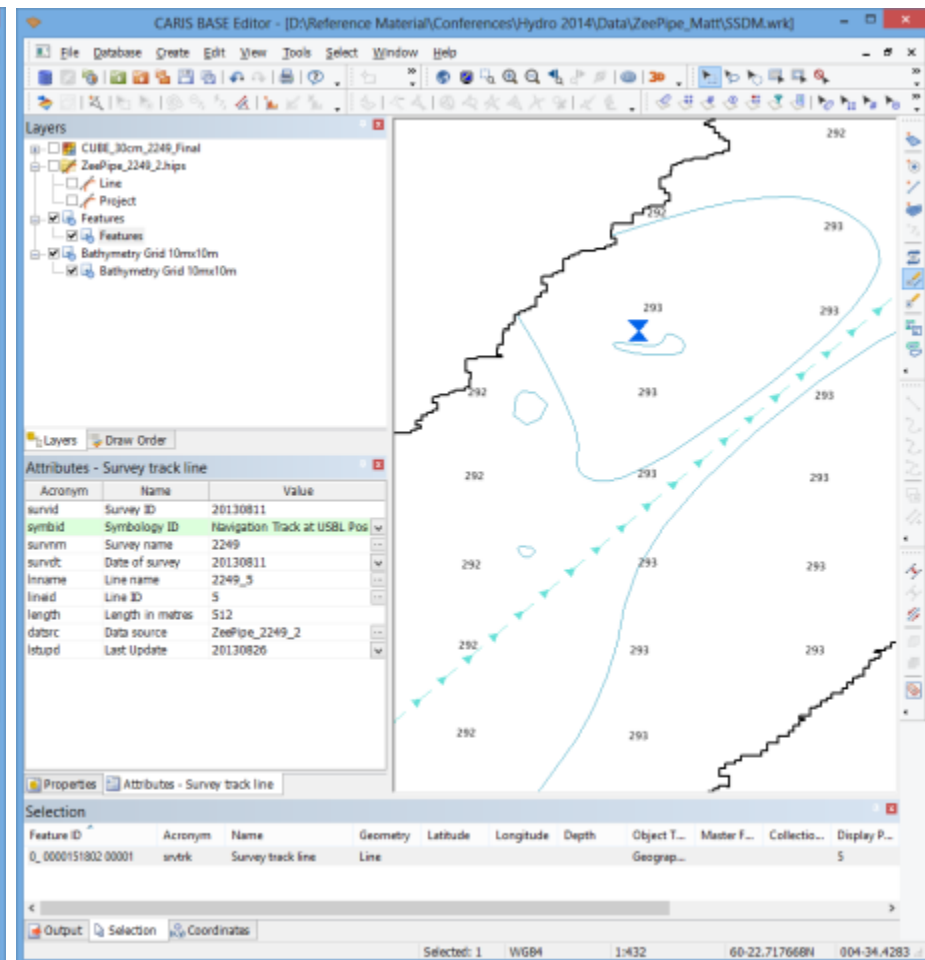
- E&P Industry and Hydrographic Offices can benefit from modern data management and GIS practices :
  - Increasing focus on data rather than paper products
    - Charts should be a report on a database (not the database)
  - Support for different / multiple data models
    - SSDM, S-100, *AIXM*, *PODS*
  - Commonality in metadata profiles (e.g. ISO 19115)
  - Portrayal and coordinate reference systems switched on the fly



# Harmonizing Survey Deliverables



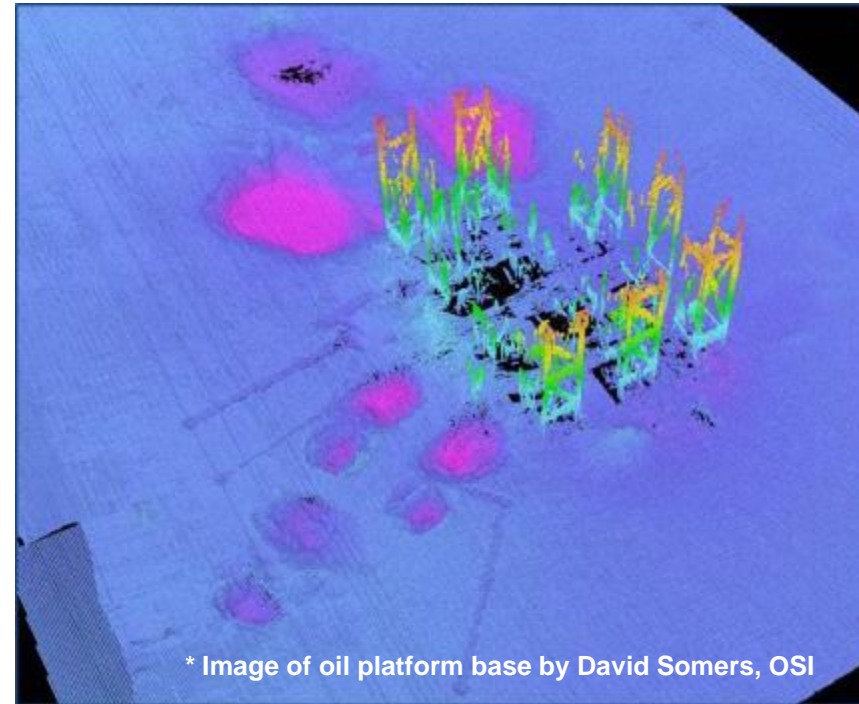
IHO portrayal (S-52, S-102)



SSDM portrayal

# Standards and Smart Data Exchange

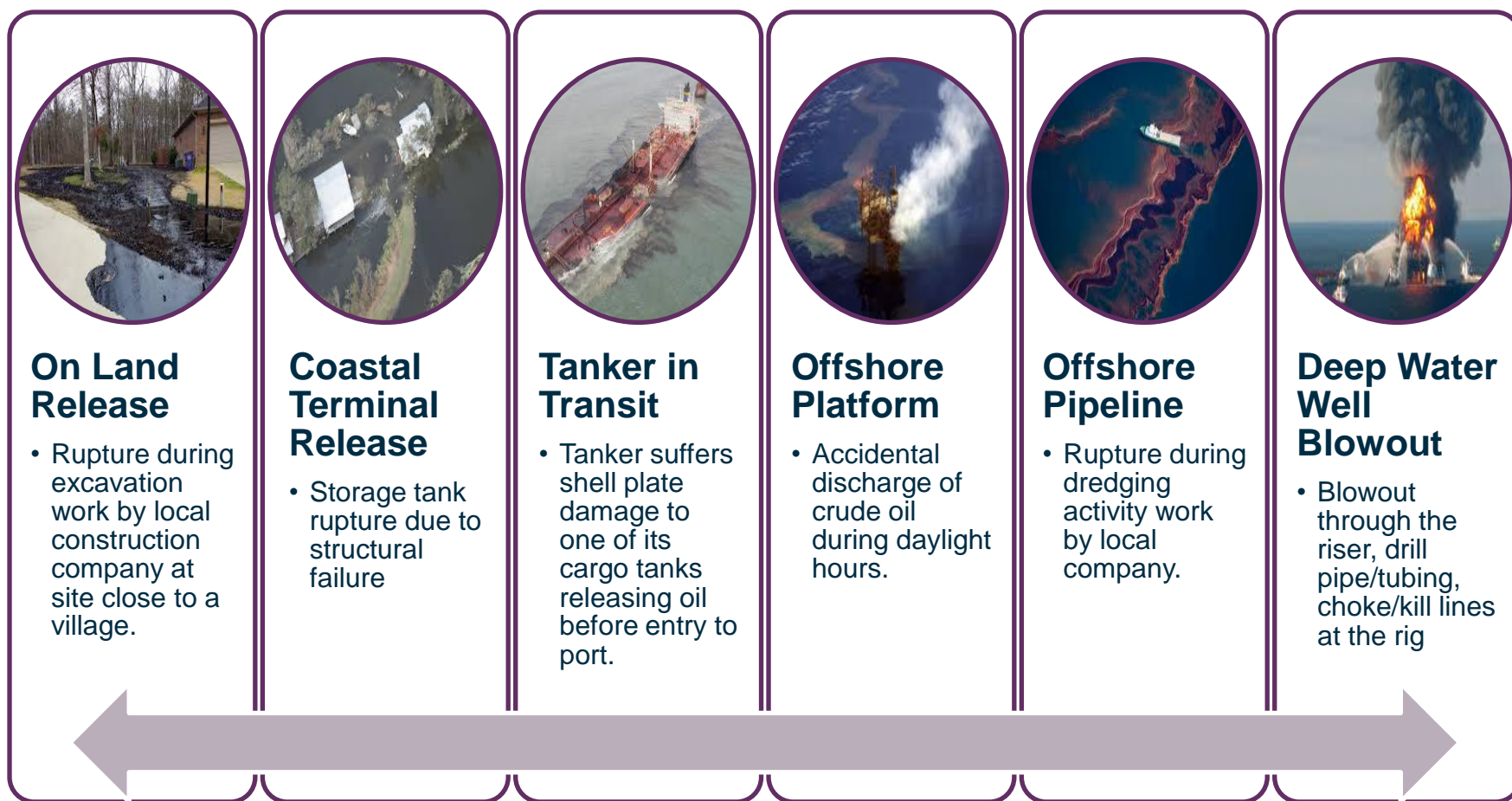
- A standard's based approach supports:
  - Exchange of data between stakeholders using **OGC/ISO** standards
  - Collect once use many times
  - Is required for the “Big Data” age
  - Needed for autonomous survey
  - Supports a **Common Operating Picture** incase of disaster
- Supports Marine Spatial Data Infrastructure



# Oil Spill Response Common Operating Picture

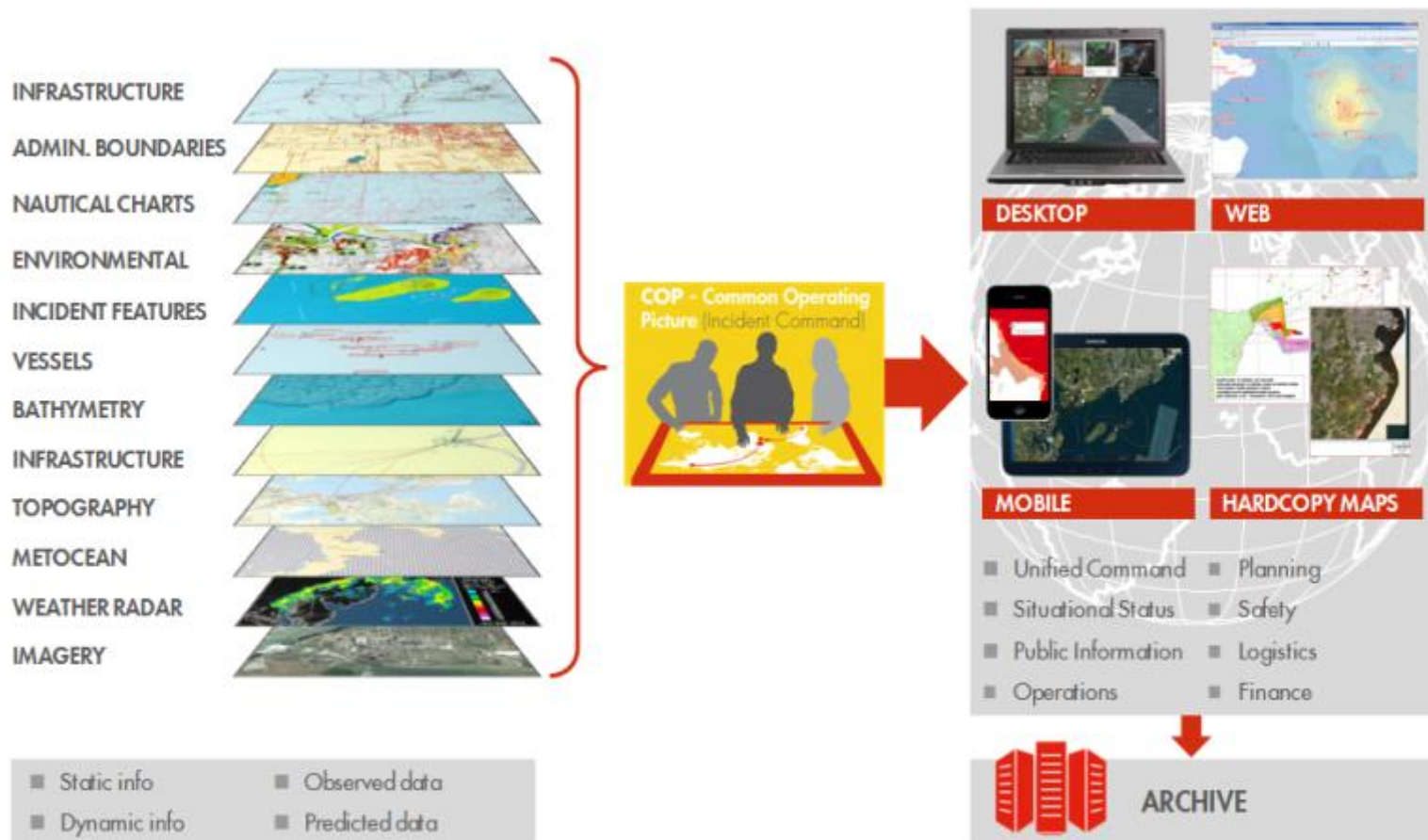
- OGC Concept Development process applied to IOGP
  1. Request for Information (RFI) – October 2013
  2. Engineering Workshops – December in UK, January in USA
  3. Prepare a Reference Architecture and Feasibility Report, 2014
- Team
  - IOGP (International Association of Oil and Gas Producers)
  - IPIECA (Global oil and gas association for environmental and social issues)
  - Resource Data Inc.
  - OGC
  - IHO has provided input and feedback

# Geographic Settings and Sources



(Figure source: IPIECA)

# COP - highlighting geospatial information



(Figure Source: Shell)

# Organization of Geospatial Information

- Base map and reference information
  - Information exists prior to the occurrence of a spill incident,
  - May be gathered and updated routinely as newer information becomes available
- Incident-specific information
  - includes relevant information following a spill incident
- Dashboard for COP users
  - Query resources
  - Combines maps, videos, graphs



(Graphics Source: Esri)

# Map Templates

Sets of geospatial information for specific purposes

- Facility Template
- Resource Allocation Templates
- Public Incident Template
- Situation Status Template
- Tactical Planning / Operational Templates:
  - Boom, Dispersant, Skimming, In-situ burning, SCAT. shoreline cleanup, Fish and wildlife, Environmental, Safety

Annex A identifies datasets for each Map Template

# Summary

- Open geospatial standards have important role and benefit
  - Support interoperability and exchange of data
  - Component of effective decision making
- OSR, COP is example of how open standards can improve emergency response

# Questions?

