Needs and Challenges in Industry

Environment and Engineering

by

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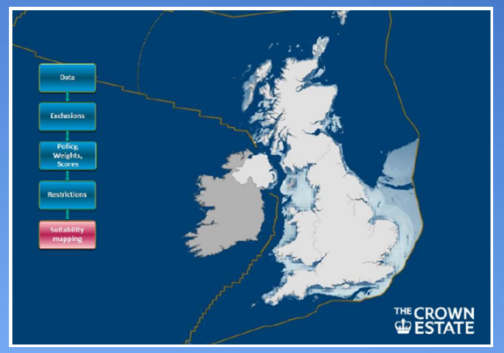
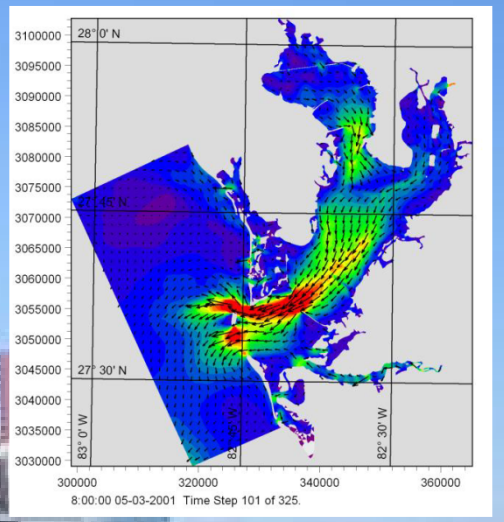
Offshore Development

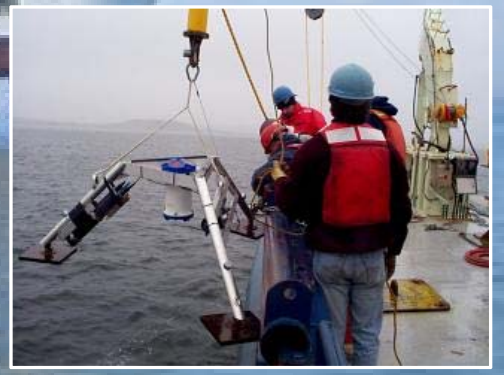
All stages of marine and coastal development require access to:

- Comprehensive accessible fit for purpose data
- Quality assurance, confidence levels and provenance
- Data processing and management tools
- Presentation and dissemination tools
- Expert knowledge on:
  - information management
  - marine data standards
  - specifications for data acquisition
  - data QA, analysis and GIS

Offshore Renewable Energy







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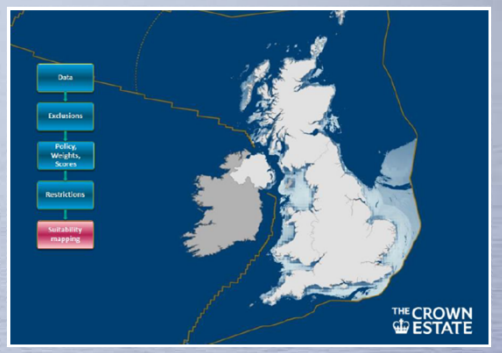
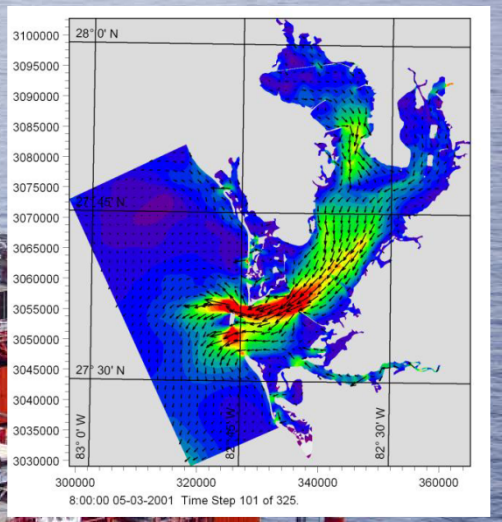
Oil & Gas Exploration & Production





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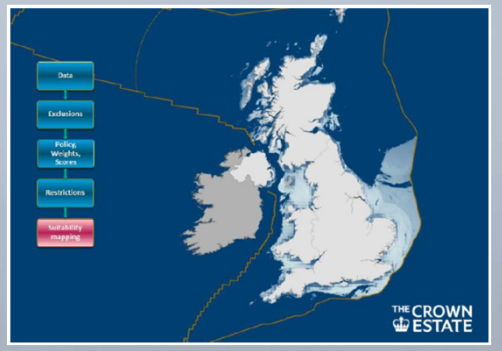
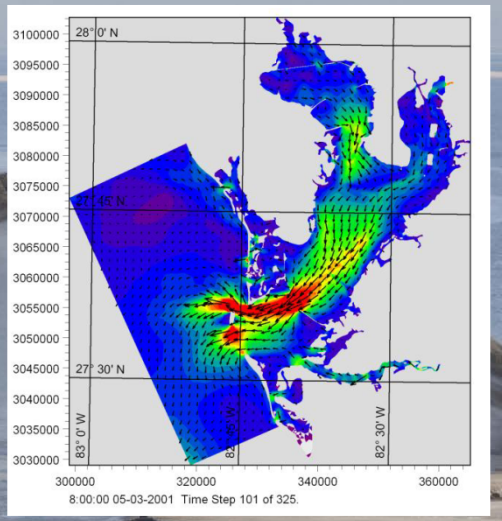
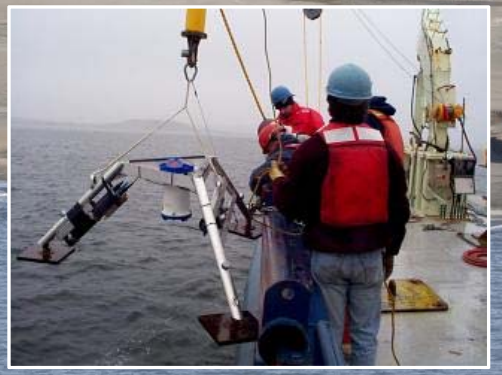
Coastal Engineering







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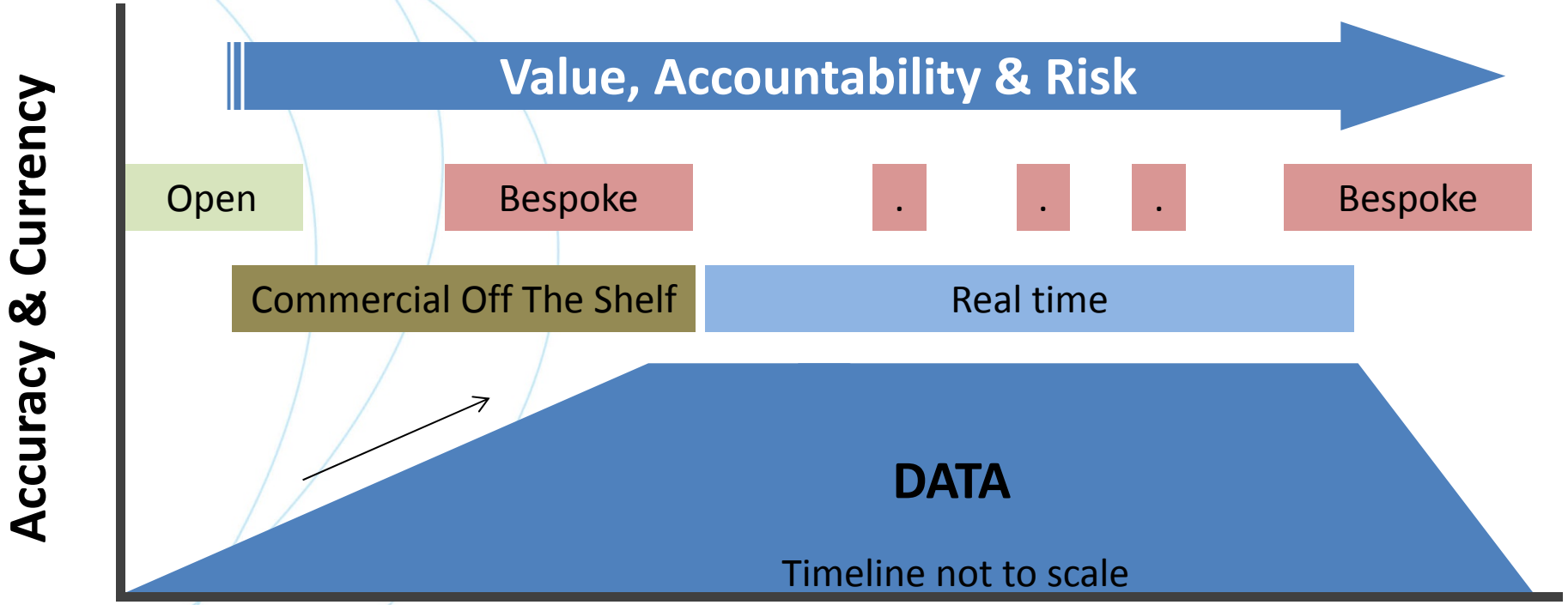
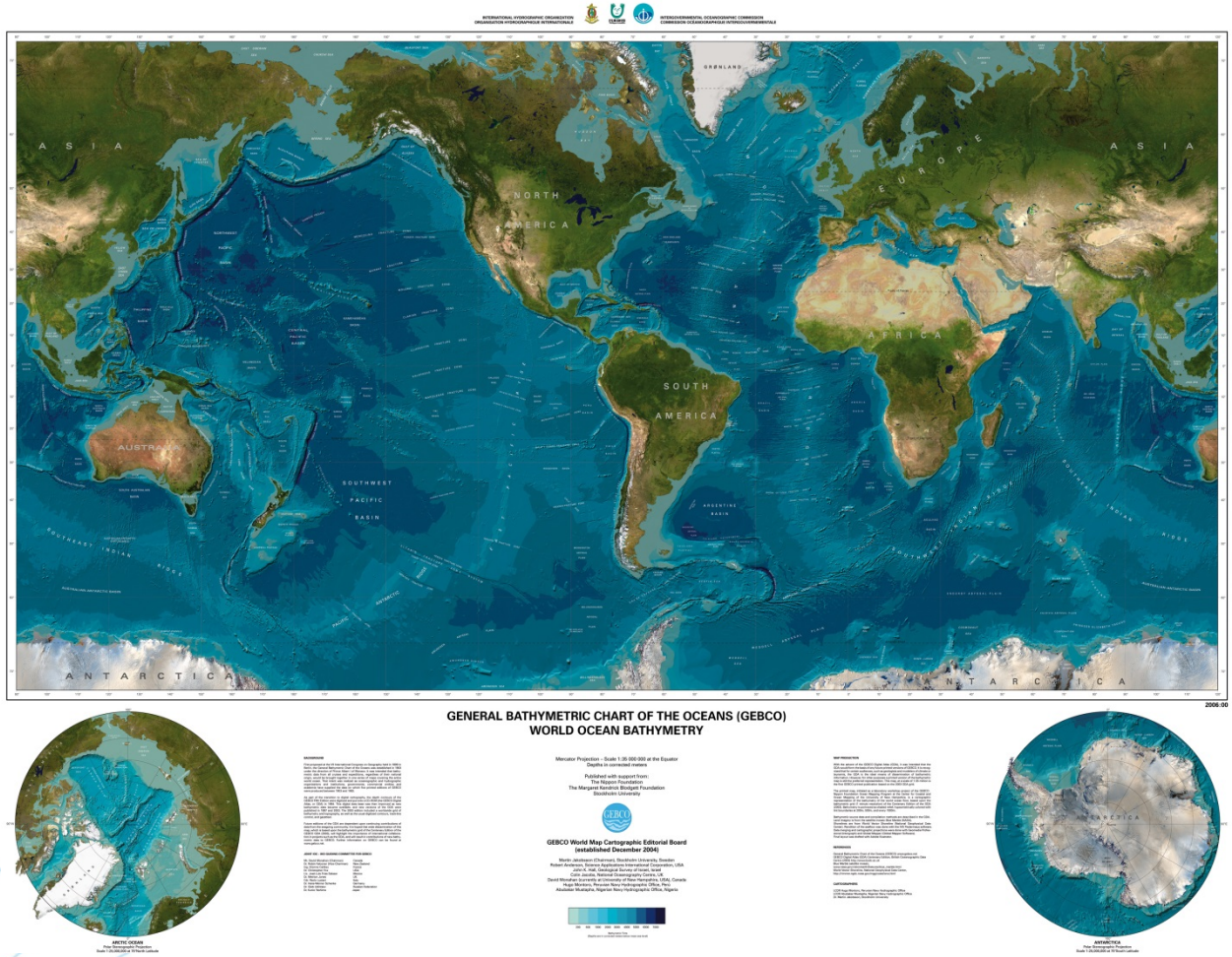
Typical Development Lifecycle



Feasibility & Planning	Engineering Design FEED Detailed	Installation & Commissioning	Operations	De – commissioning

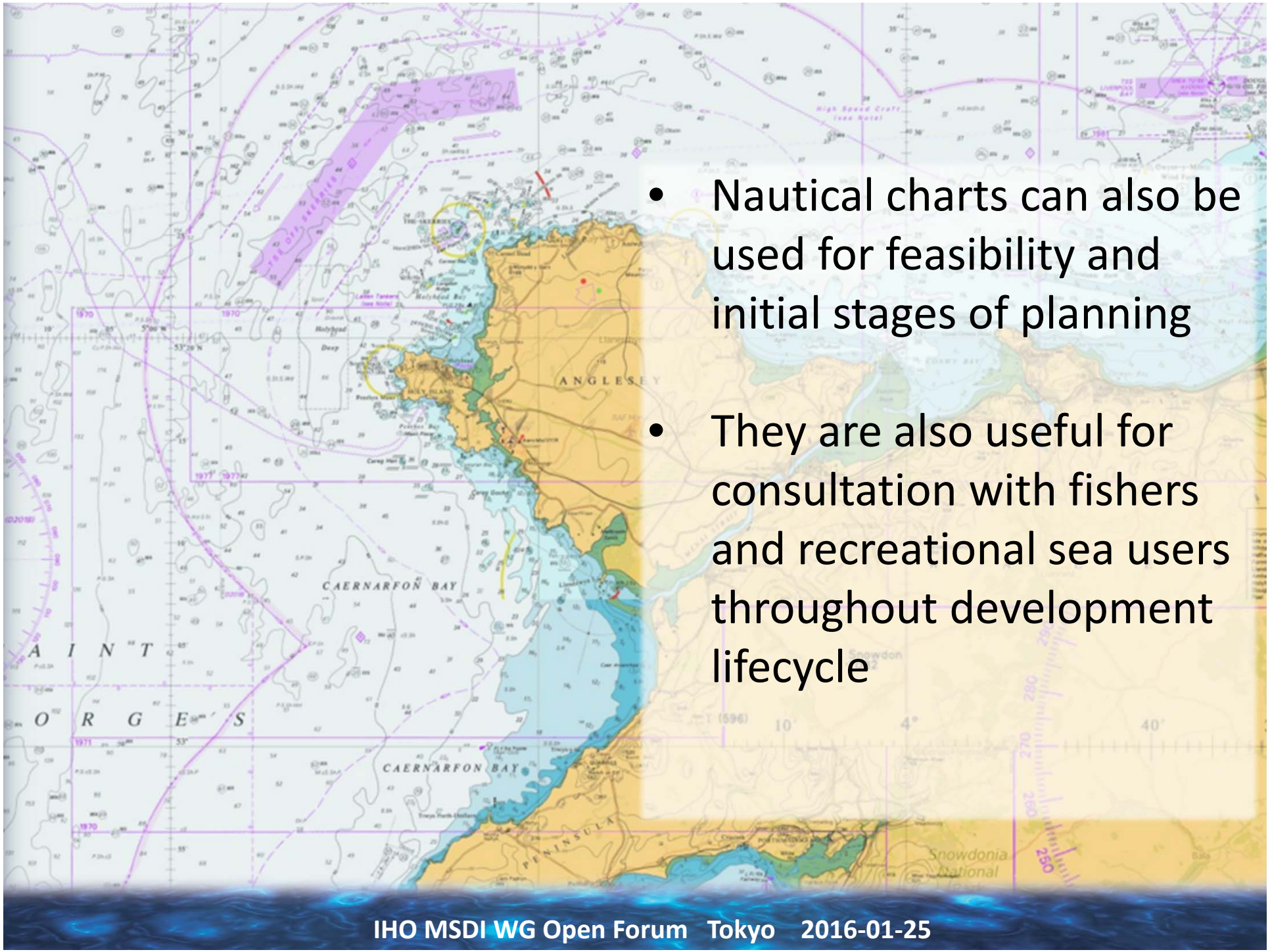
Licensing & Consenting	Environmental Reporting	Restoration

So-called ‘Free’ Data

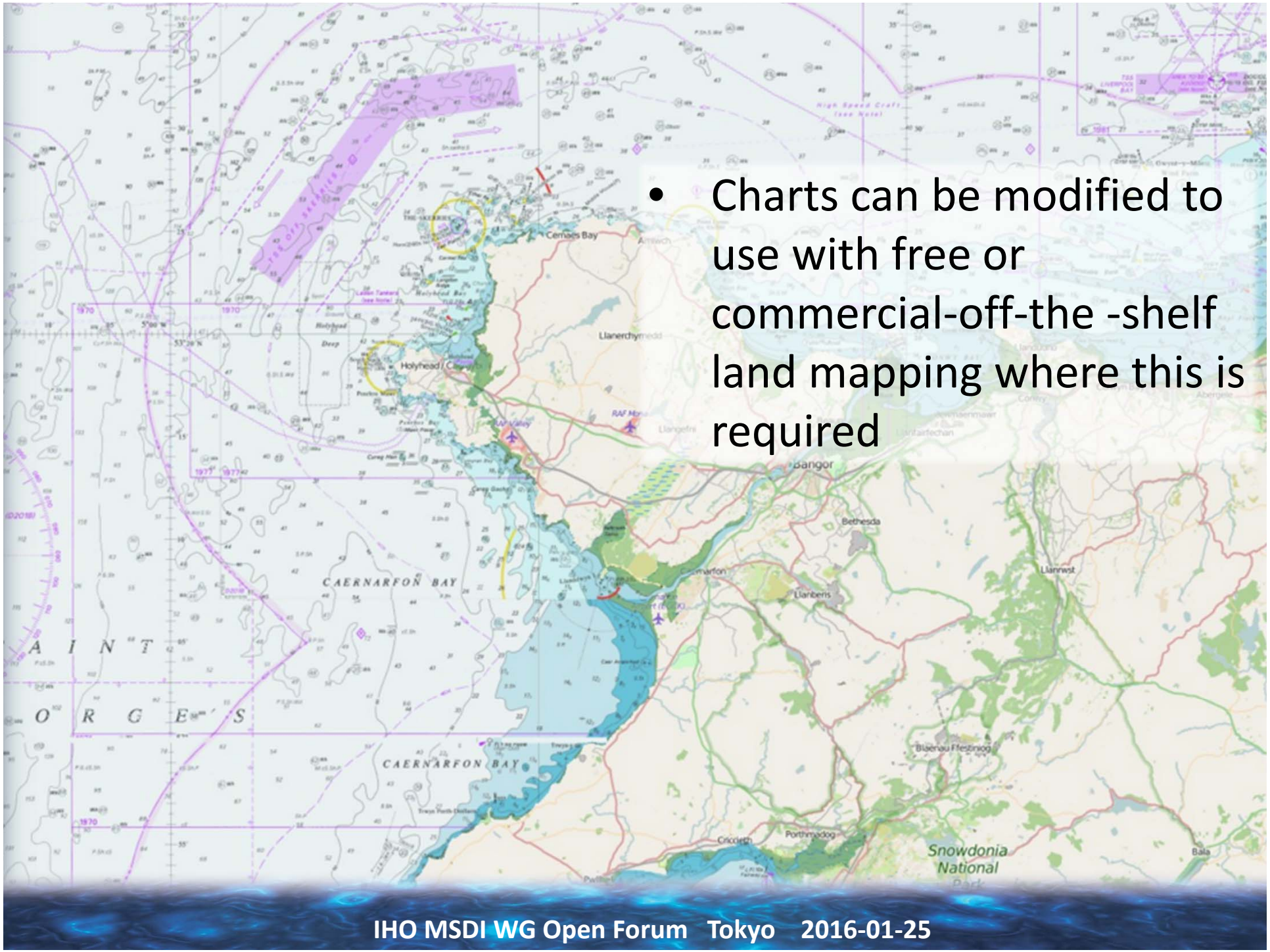


‘Free’ data e.g. Google and GEBCO is useful for initial feasibility, however:

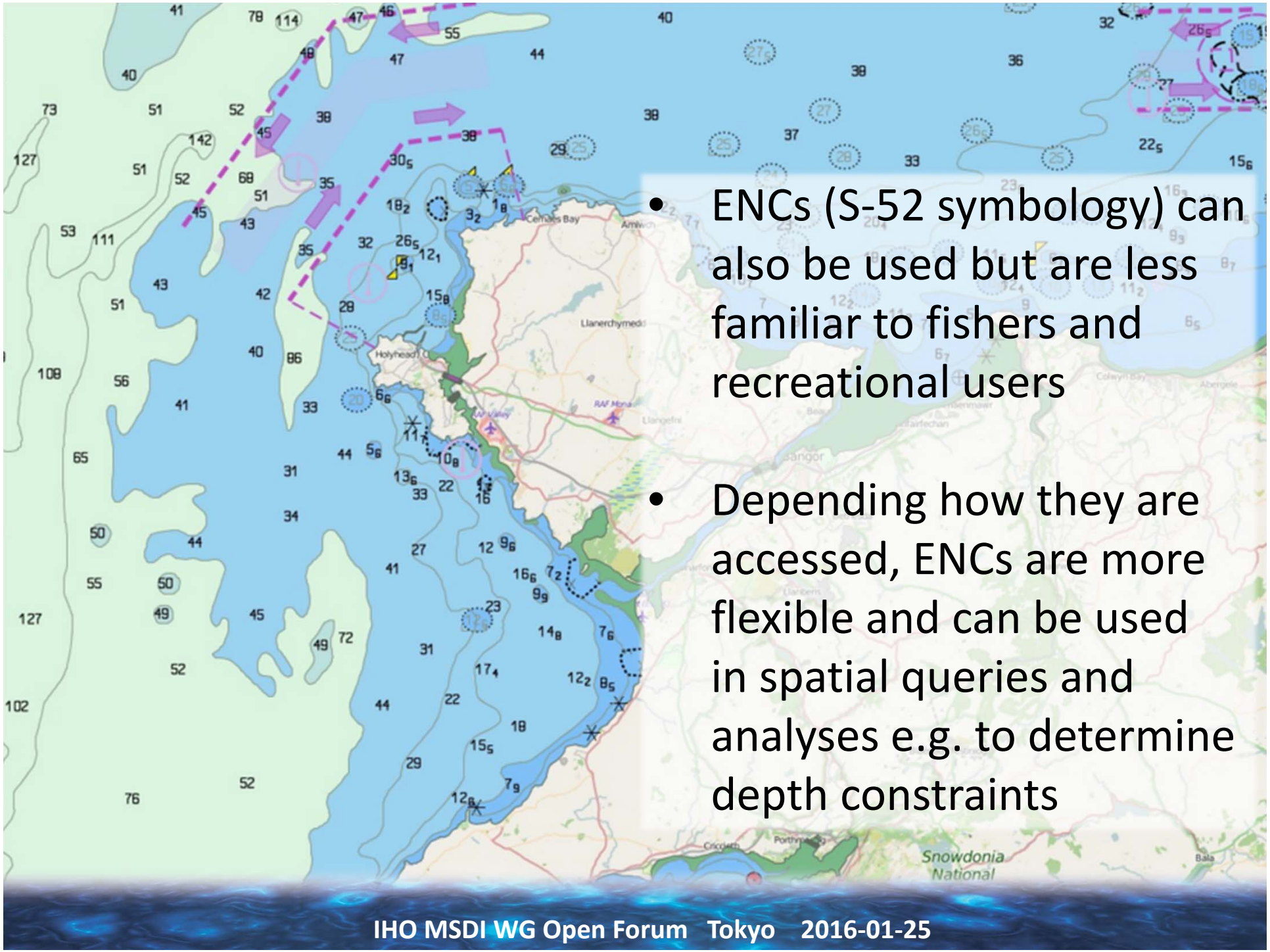
- resolution and currency is usually poor
- there may be quality issues
- there is little or no accountability



- Nautical charts can also be used for feasibility and initial stages of planning
- They are also useful for consultation with fishers and recreational sea users throughout development lifecycle

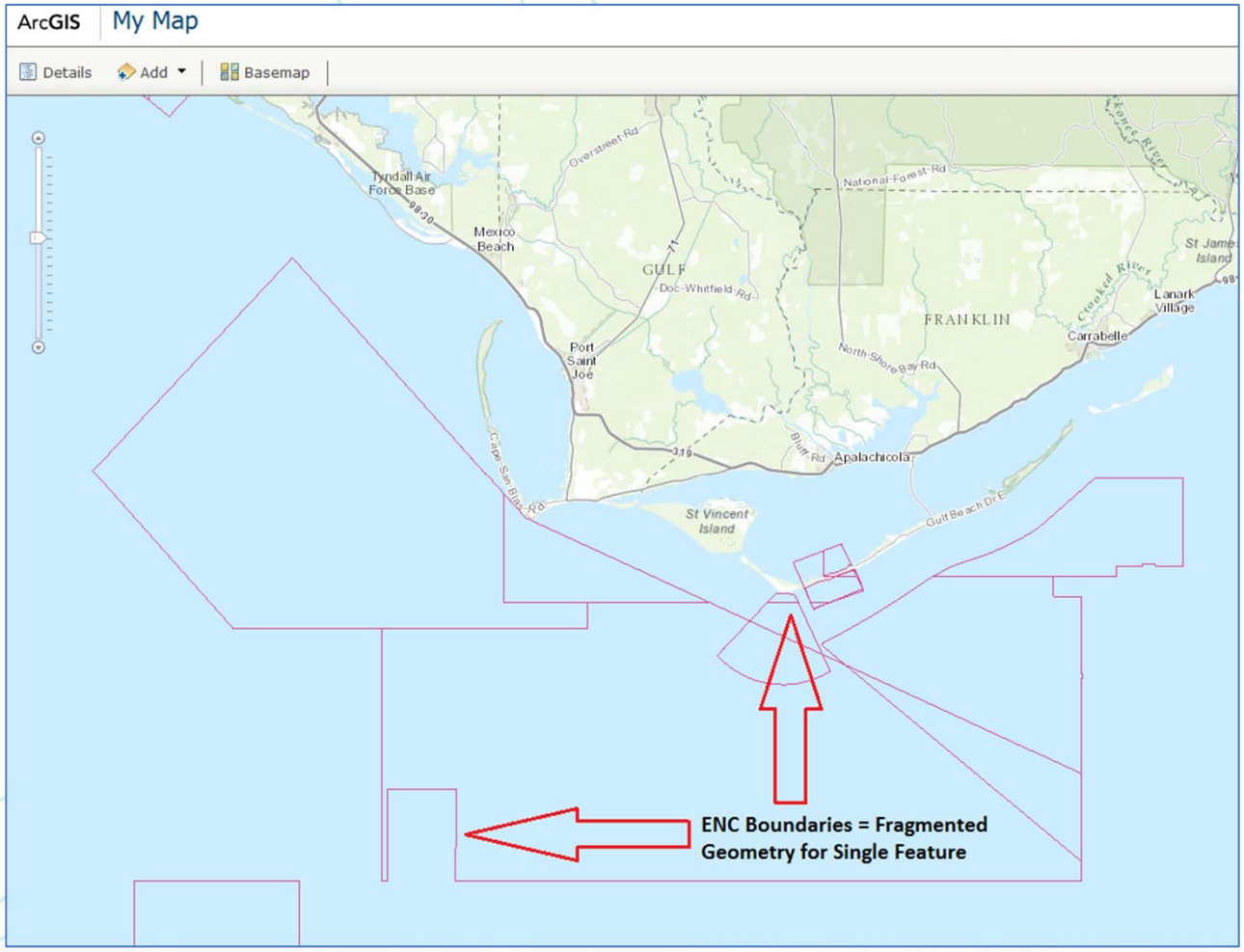


- Charts can be modified to use with free or commercial-off-the -shelf land mapping where this is required



- ENCs (S-52 symbology) can also be used but are less familiar to fishers and recreational users
- Depending how they are accessed, ENCs are more flexible and can be used in spatial queries and analyses e.g. to determine depth constraints

However ENC and Chart Derived Content can be an Issue

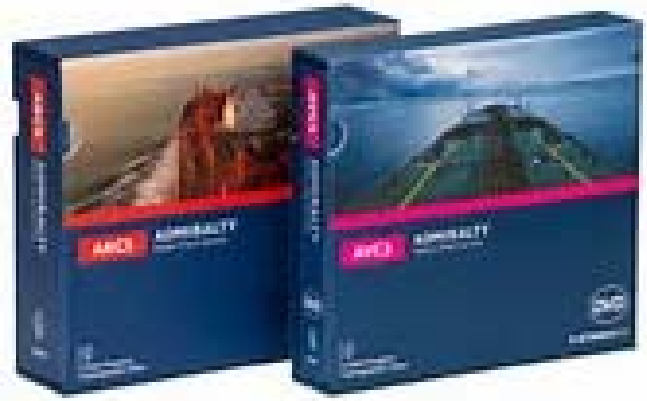


- US Marine Planning Portal (accessed 2014)
- S-57 Objects used as captured with fragmented and incomplete geometry
- Better to have used source data directly

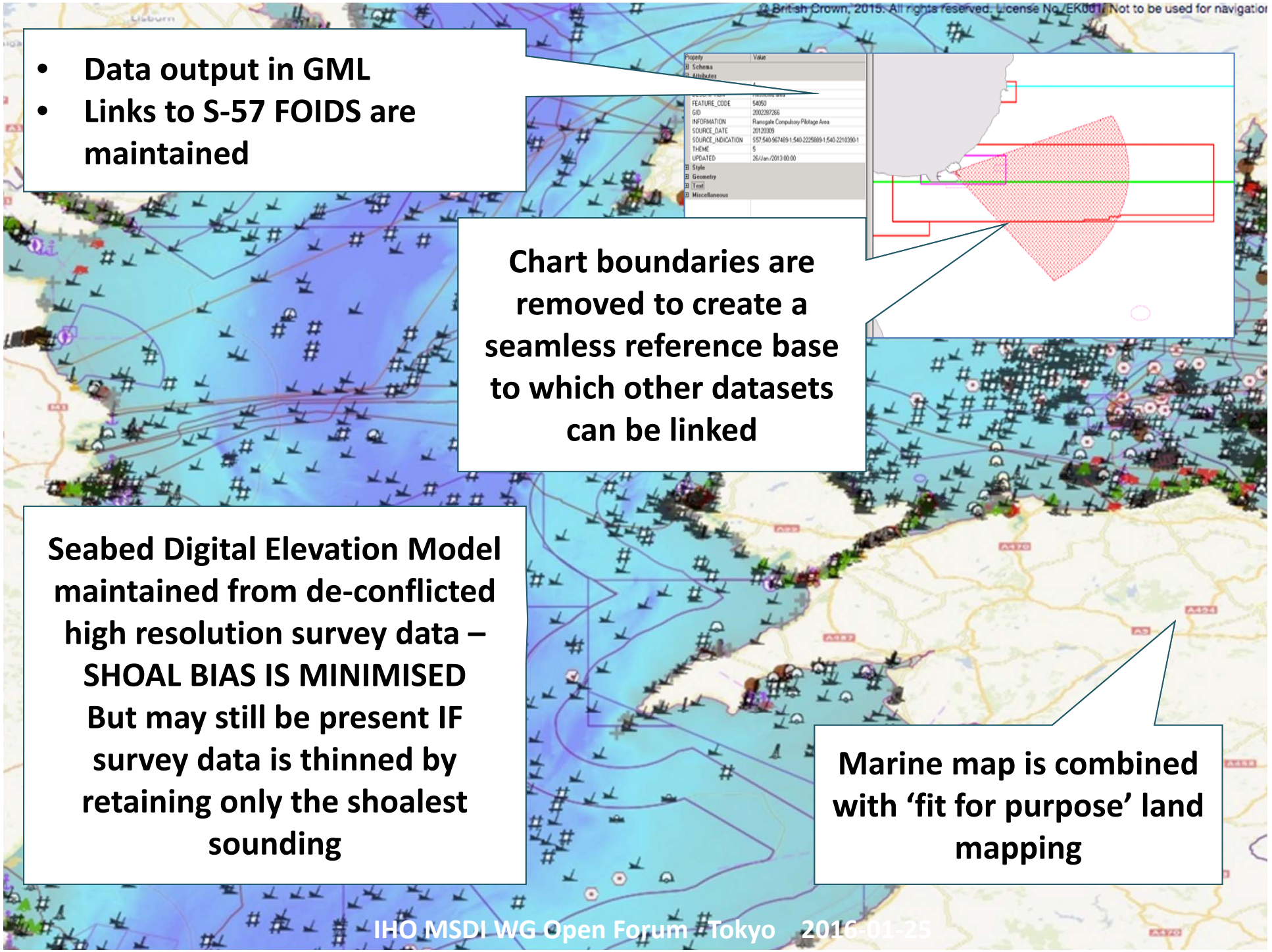
  or

- Create source from re-engineered dataset e.g. Marine Themes

- ENCs are navigational products designed for a particular purpose
- Charts have features omitted e.g. non significant cables and shipwrecks
- Charted depths are shoal biased
- Charts have to be safe!



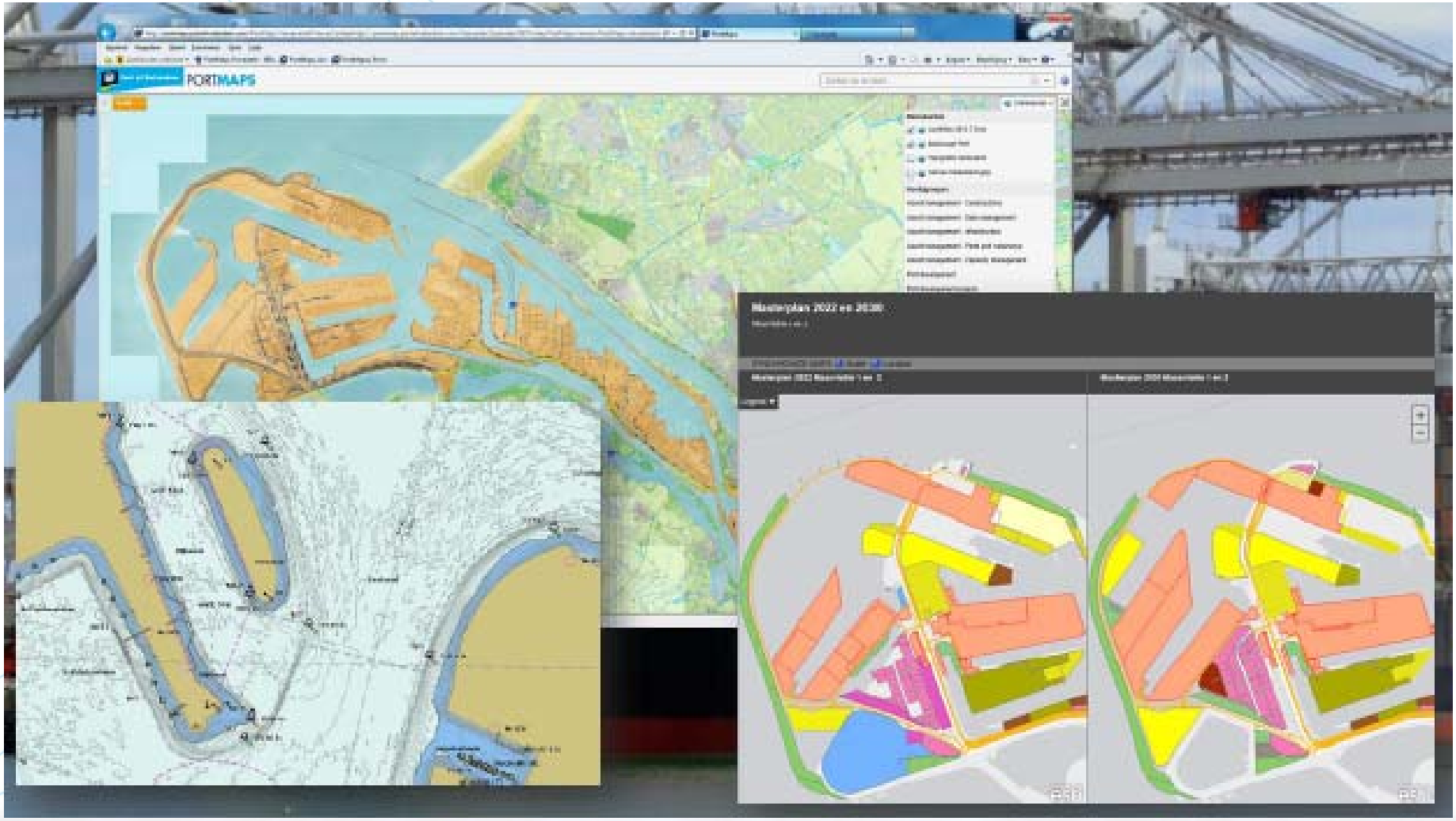
- The terms and conditions of use in GIS and Desktop GIS - the tool of choice for developers - is at least open to interpretation (or deliberately ignored)
- Workarounds to licensing conditions exist and always have – e.g. I was digitizing paper charts for environmental modelling in the late 1980s
- **Better is for HOs to provide a *bona fide* alternative**


© British Crown, 2015. All rights reserved. License No./EK001. Not to be used for navigation
Property
Value
Schema
Attributes
FEATURE_CODE
54050
GID
2002287266
INFORMATION
Ramsgate Compulsory Pilotage Area
SOURCE_DATE
20120309
SOURCE_INDICATION
557,540,967489-1,540,2225889-1,540,2210390-1
THEME
5
UPDATED
26/Jan/2013 00:00
Style
Geometry
Text
Miscellaneous
• Data output in GML
• Links to S-57 FOIDS are maintained
Chart boundaries are removed to create a seamless reference base to which other datasets can be linked
Seabed Digital Elevation Model maintained from de-conflicted high resolution survey data – SHOAL BIAS IS MINIMISED But may still be present IF survey data is thinned by retaining only the shoalest sounding
Marine map is combined with 'fit for purpose' land mapping

Example Engineering and Environmental Applications

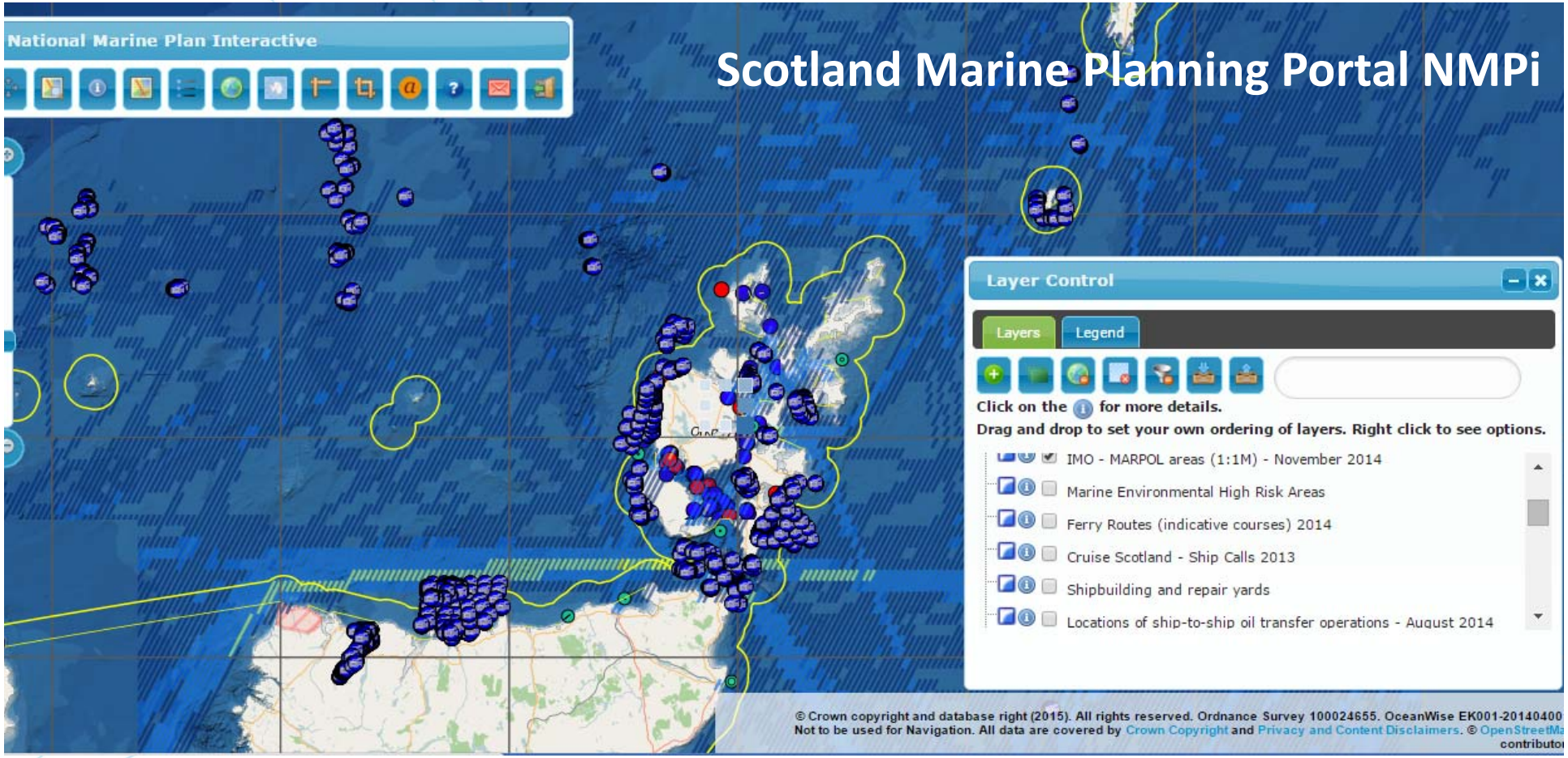
Port Management and Pilotage

Source: Presented by Esri at OceanWise Marine GIS Workshop 2015-11-23

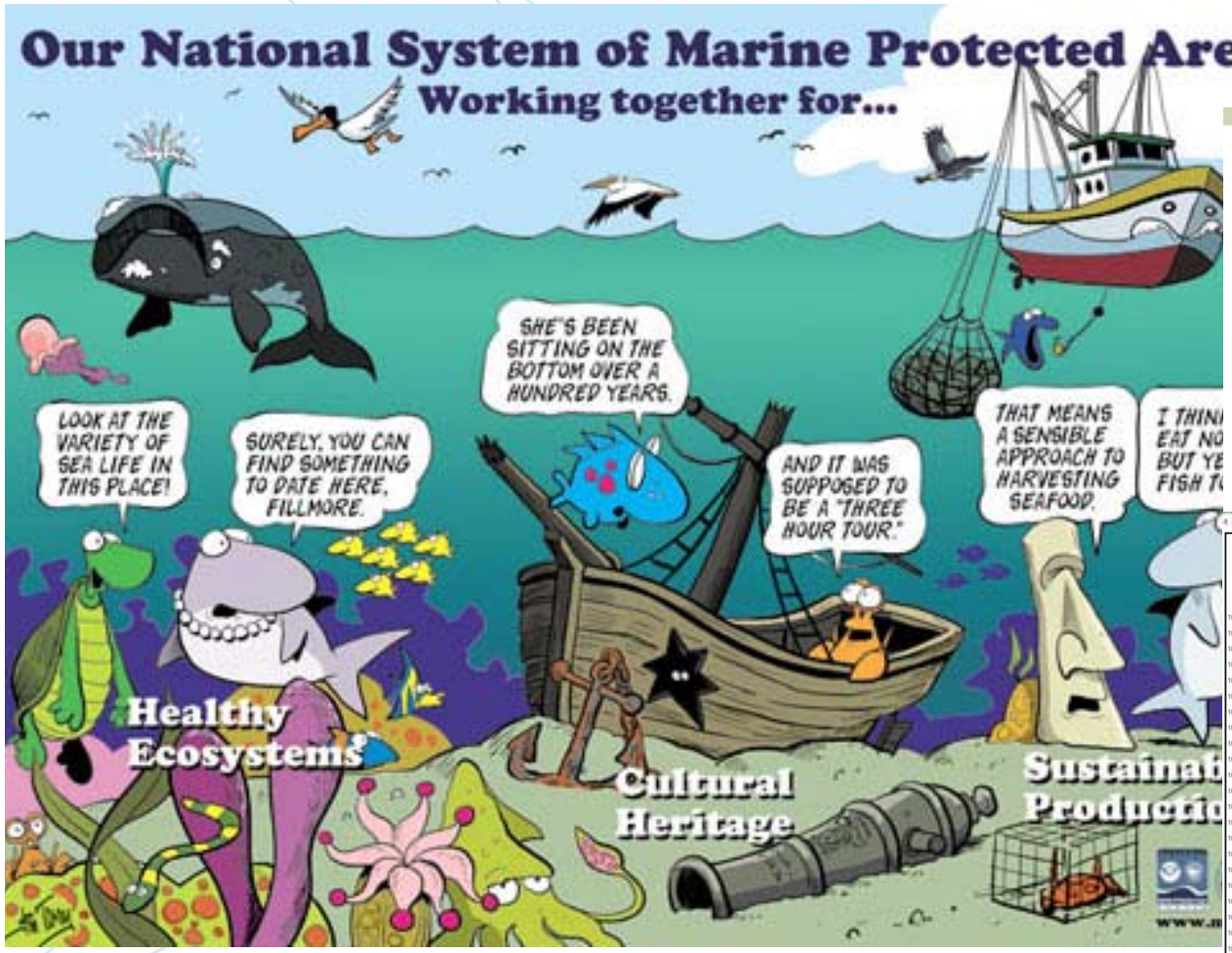


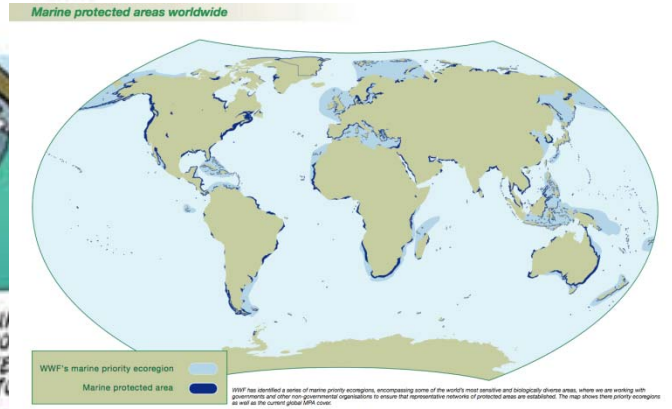
Wind Farm Site Selection

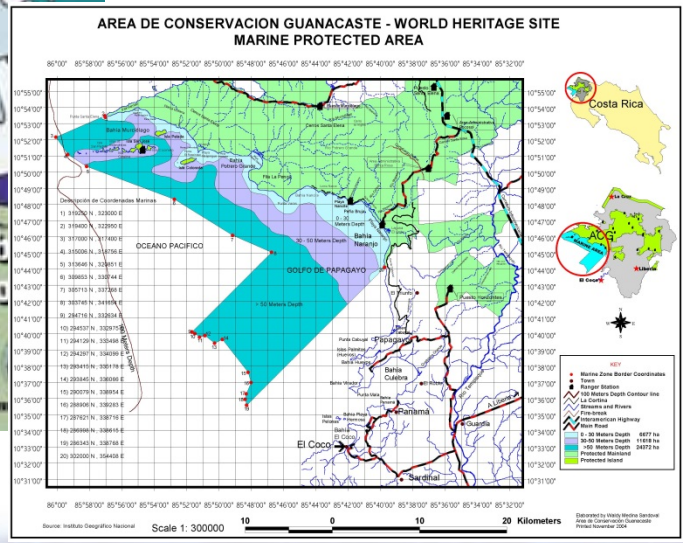
Marine Spatial Planning



Selection and Designation of MPAs



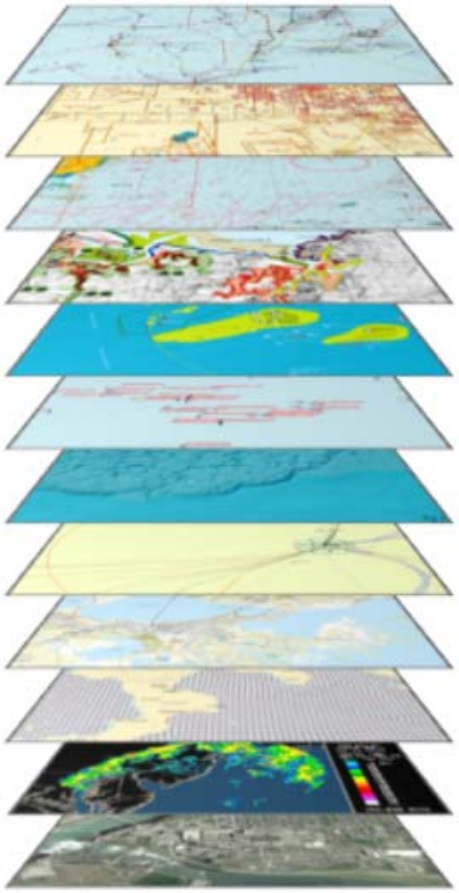


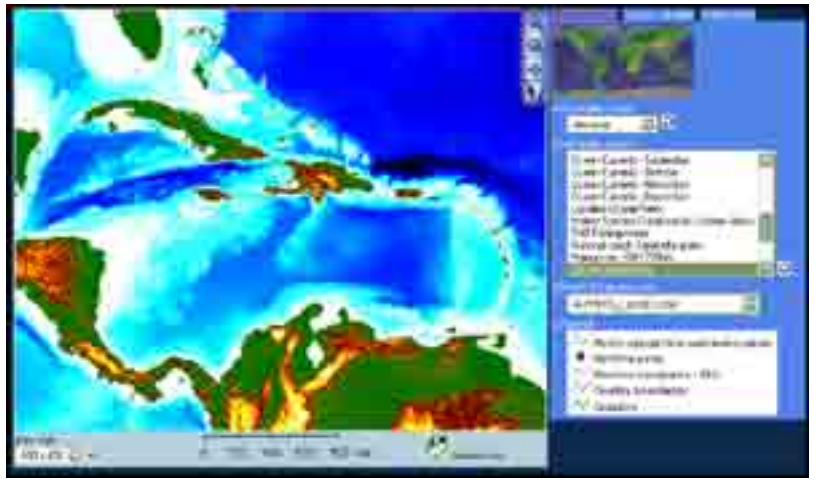


Source: blogspot.com

UN-IOC Regional Atlases

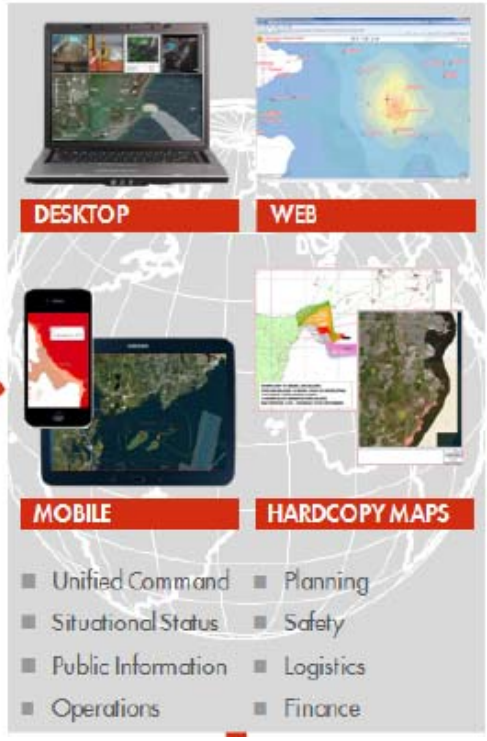
MULTIPLE DATA THEMES





Regional Hydrographic Commissions could create and contribute core hydrographic data themes as web services

Oil Spill Response
Common Operating Picture (COP)

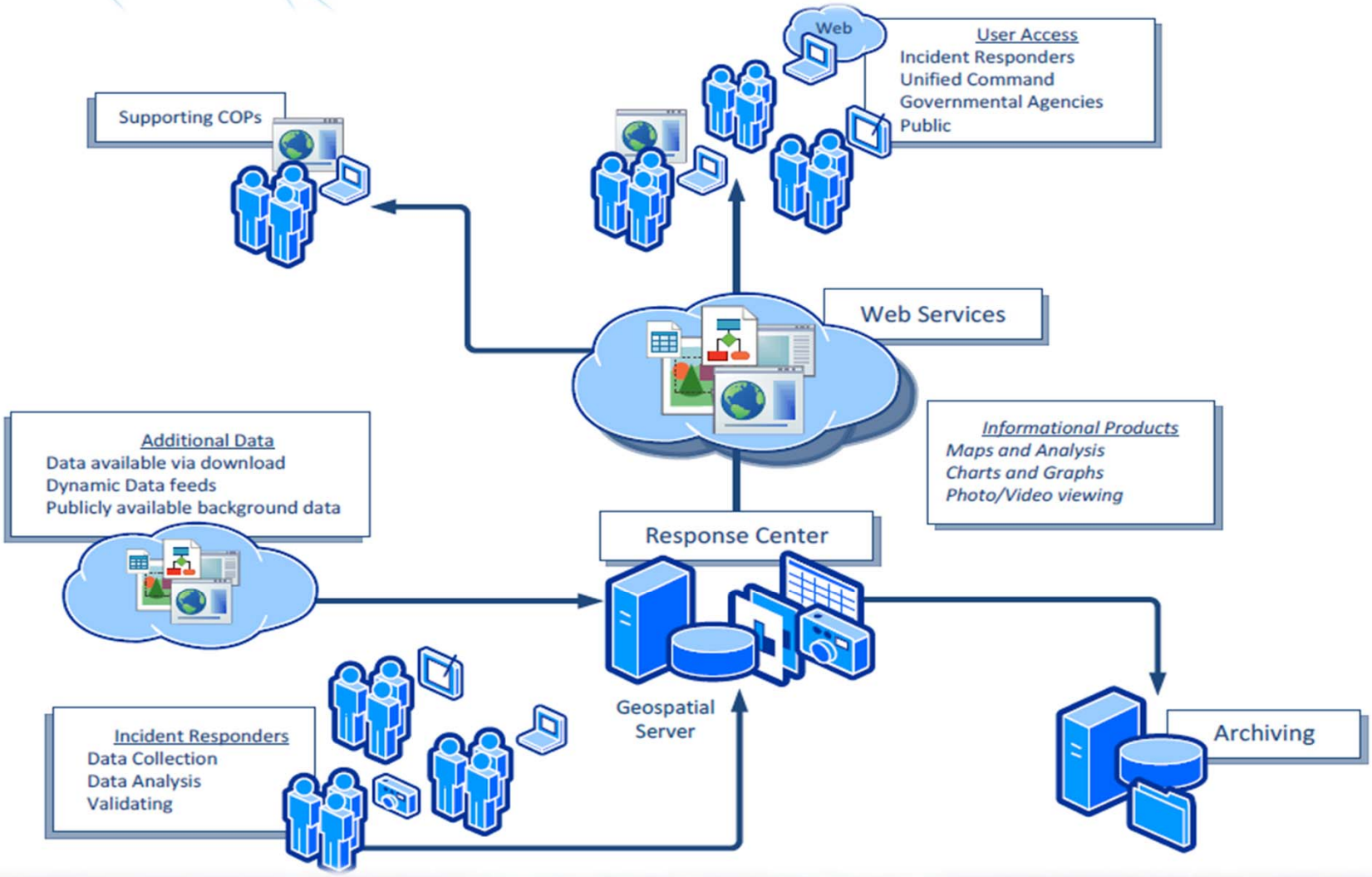


IPIECA

International Association of Oil & Gas Producers

OGC® Open Geospatial Consortium, Inc.

Components of COP Platform



Data Exchange and Web Services

Web Service Applications

GeoNetwork opensource

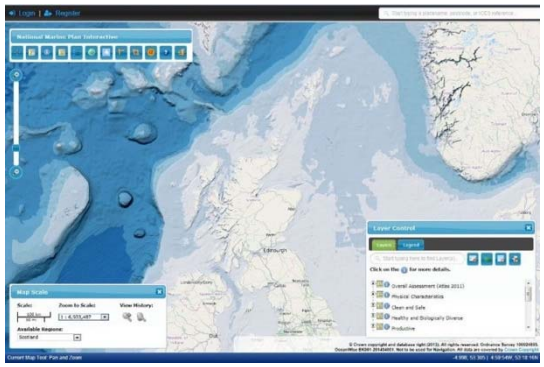
Manage metadata and discover datasets and services

Heritage

Wrecks

Geology

Bathymetry



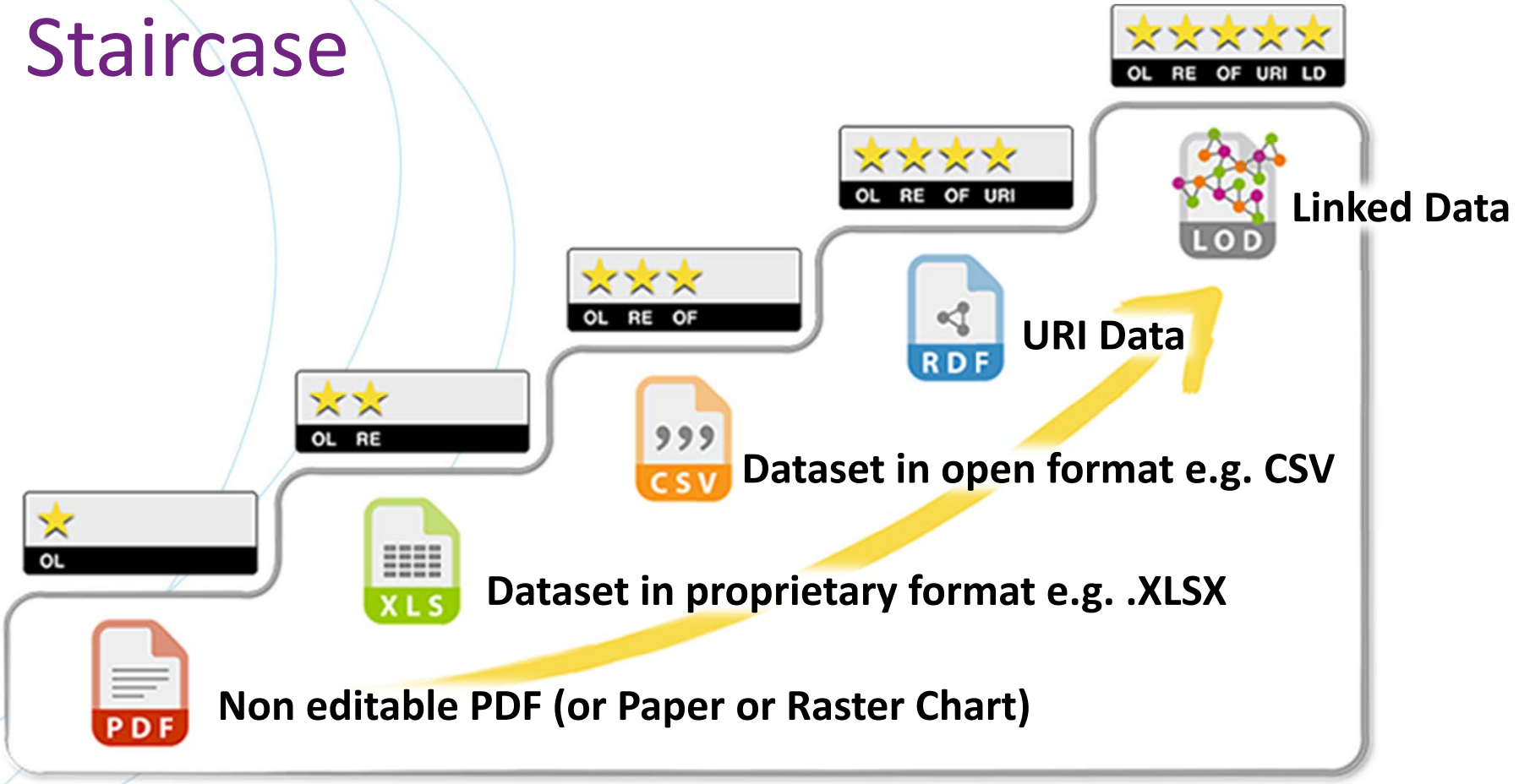
OpenLayers 3

Individual Data Marts

Web Application

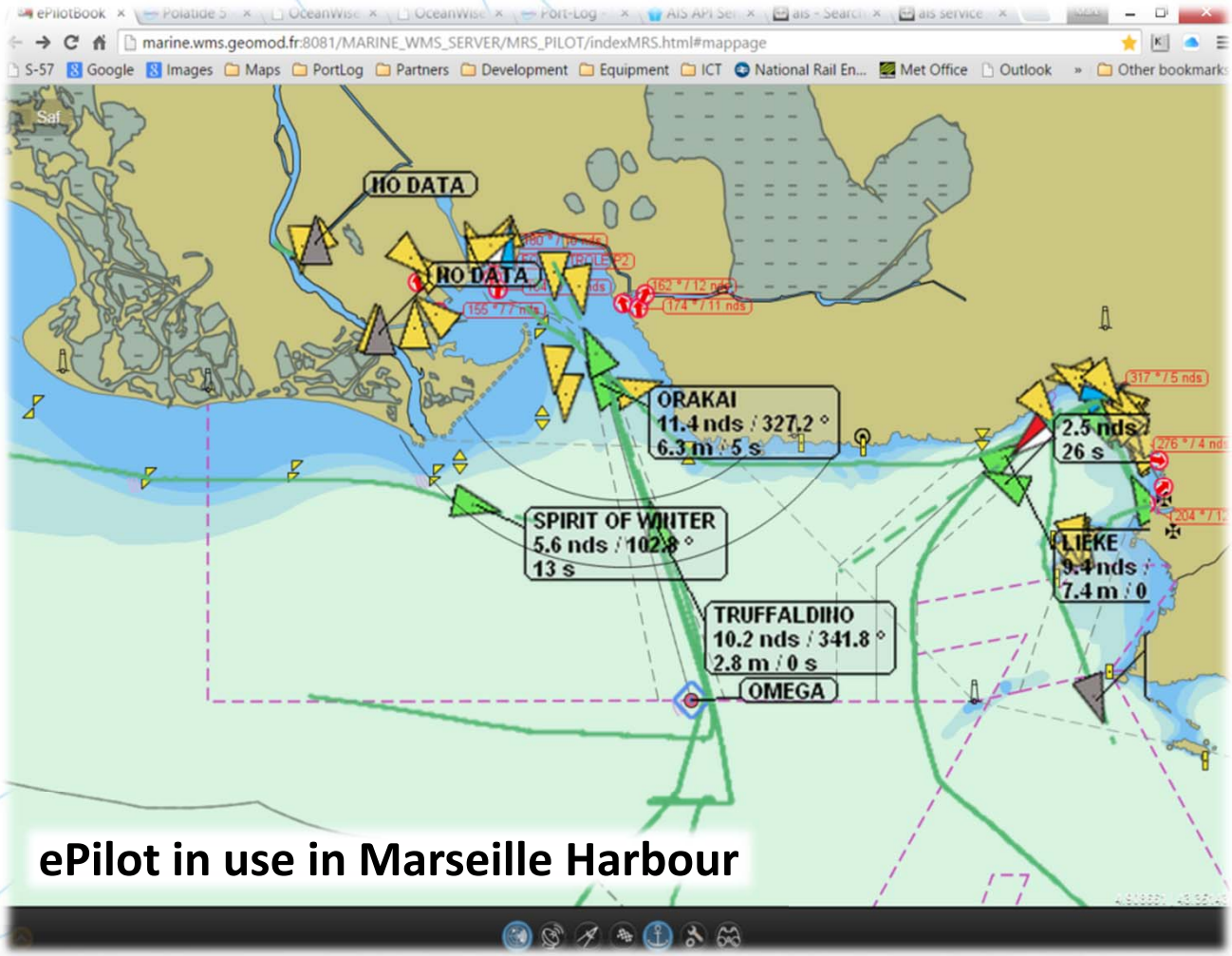
USERS

Data Publishing Staircase



http://5stardata.info

Is this the future for Navigation?



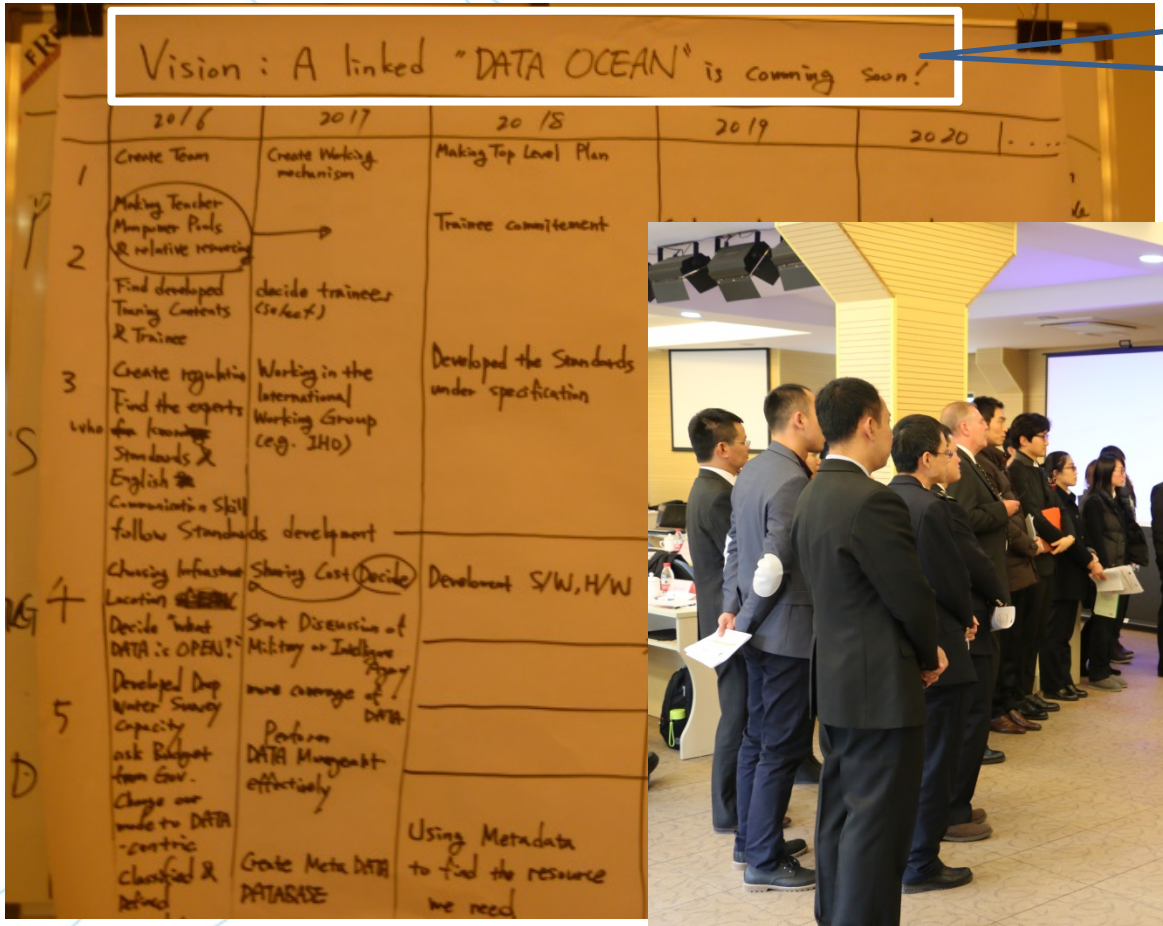
ePilot in use in Marseille Harbour

- Data layers via Web Services
- ENCs & MIOs
- Real Time Tides
- Vessel Tracking
- Uses standard browser i.e. no installed software
- Available on range of clients e.g. PC, Mac, iPad etc.
- Data can be cached for offline access

Is this the future for Navigation?

- The HO may not be the primary source for the data used in nautical charting
- Navigational service providers accessing data from various sources and delivering direct to vessels over web services (cached where necessary)
- Sources such as weather, ship routing, traffic and logistical data can be included
- HOs can play a part in this fast developing geospatial matrix or they can continue to focus on a product which for many will become less relevant as more flexible alternatives become available

I know what I would do!



"A linked DATA OCEAN is coming soon!"

Photos: EAHC MSDI Training Course, Shanghai, 18-22 Jan 2016

Thank you

Demonstrations of OceanWise Marine Mapping,
Web Services and Web Applications
at
maps.oceanwise.eu

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