

OceanWise

End-to-End Marine and Coastal Data Management and Decision Support



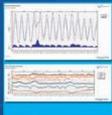
Intelligent Marine
and Coastal Mapping Data



Data Policy, Strategy
and Management Systems



Enterprise GIS
and Productivity Tools



Environmental Data
Sharing and Publishing



Capacity Building,
Training and Mentoring

www.oceanwise.eu

Independent • Experienced • Innovative • International • Trusted

Delivering a New Tidal Monitoring System to the Port of London

John Pepper

OceanWise Marketing Director

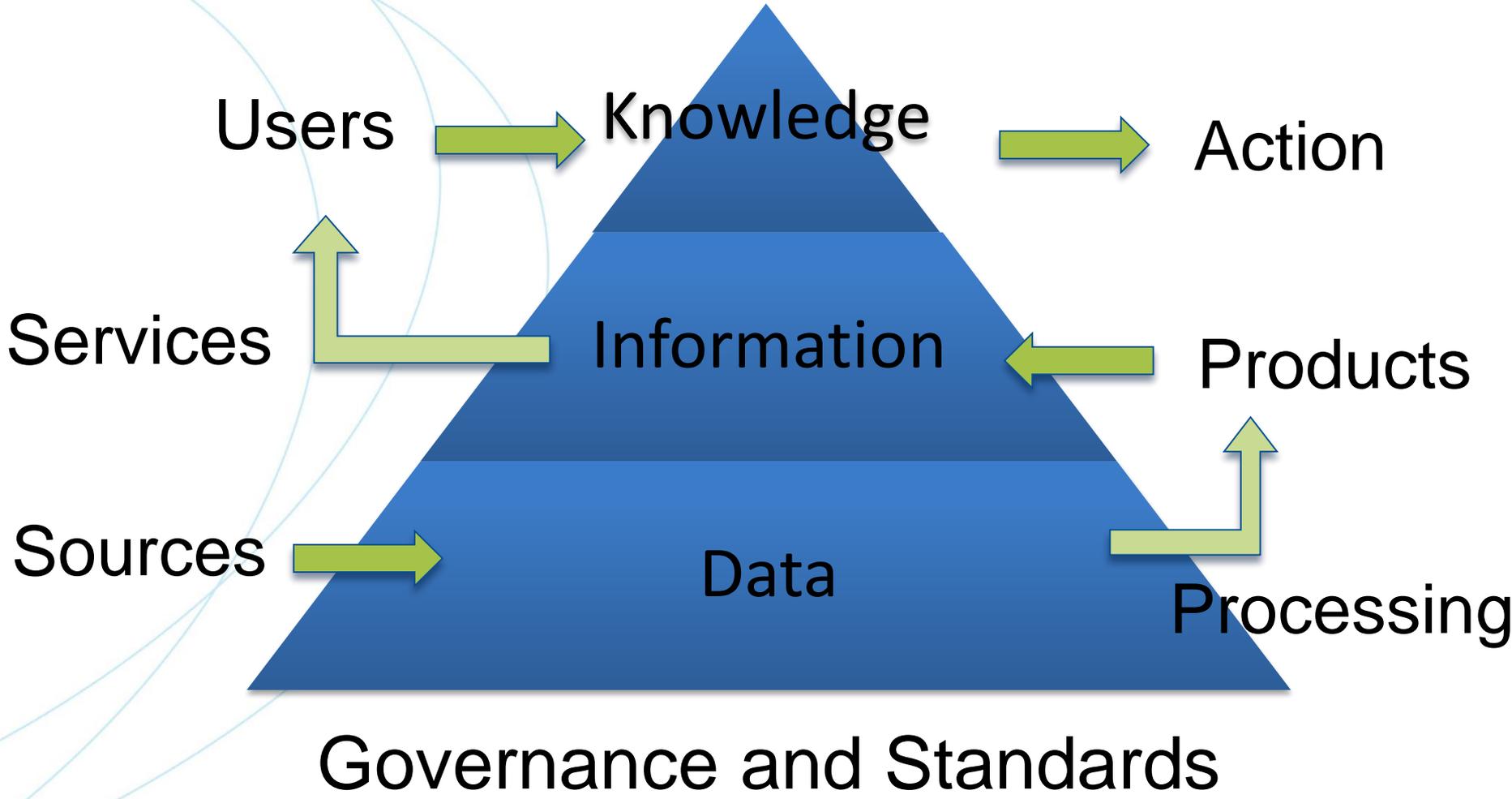


IHO MSDIWG Demonstration Workshop – January 25th 2016

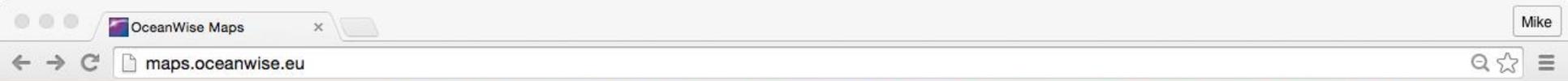
About OceanWise

- Independent SME formed in 2010
- Based in UK but operating worldwide
 - Numerous blue chip customers including:
UK Public Sector (DEFRA, CEFAS, MMO, Welsh & Scottish Governments)
Port of London, Port of Southampton, Harwich Haven & Peel Ports Group
BP, Premier Oil, RWE, Centrica, npower, European Commission
Thai Navy, KOHA (Korea), Nara (Sri Lanka), Brazilian Navy, MPA (Singapore),
Bayanat (UAE), Malta Transport Authority.
- We specialise in end-to-end marine and coastal data management and decision support
- Active in UK, European and International initiatives (e.g. IHO Marine SDI WG, EMODNet, MEDIN, SeaDataNet)

Where YOUR data matters!



Intelligent Marine and Coastal Mapping Data



OceanWise Maps

Welcome to the OceanWise online demonstration portal for intelligent marine and coastal mapping data. Demonstrators are available by selecting from the list below, hover over a product to preview. As well as individual web pages built using OpenLayers the data is available on the OceanWise website [data pages](#). These pages provide an illustration of what is available as OGC compliant web services. Please contact us for actual end points for the web services if you would like to trial these in your own desktop and web GIS.

Marine Themes

Marine Themes DEM

Raster Charts

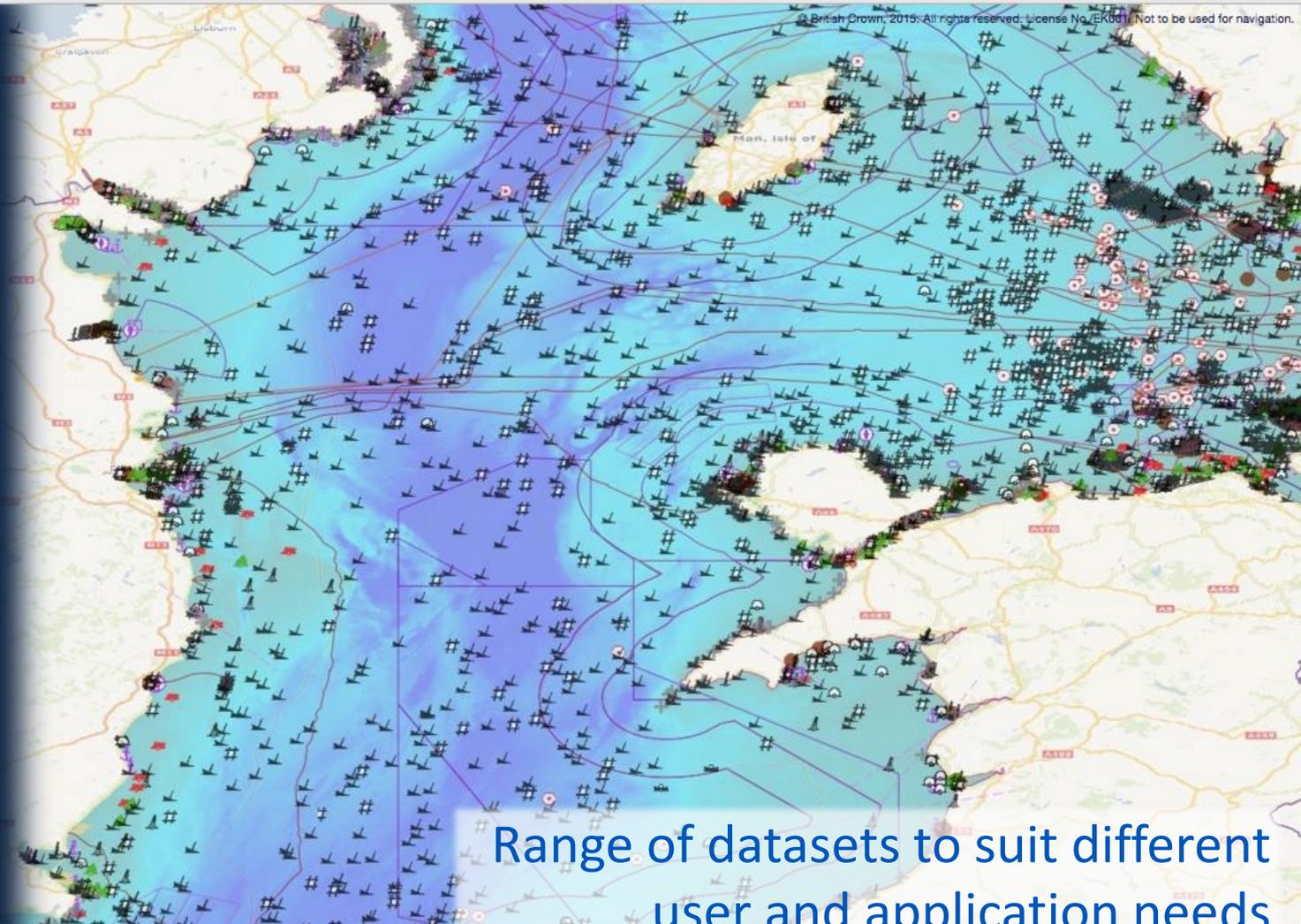
Raster Charts excluding Land

Electronic Navigational Charts

Wrecks

IMO Areas

OceanWise Limited is an independent company specialising in marine environmental data acquisition, management, publishing and GIS.



Range of datasets to suit different user and application needs

OceanWise Maps

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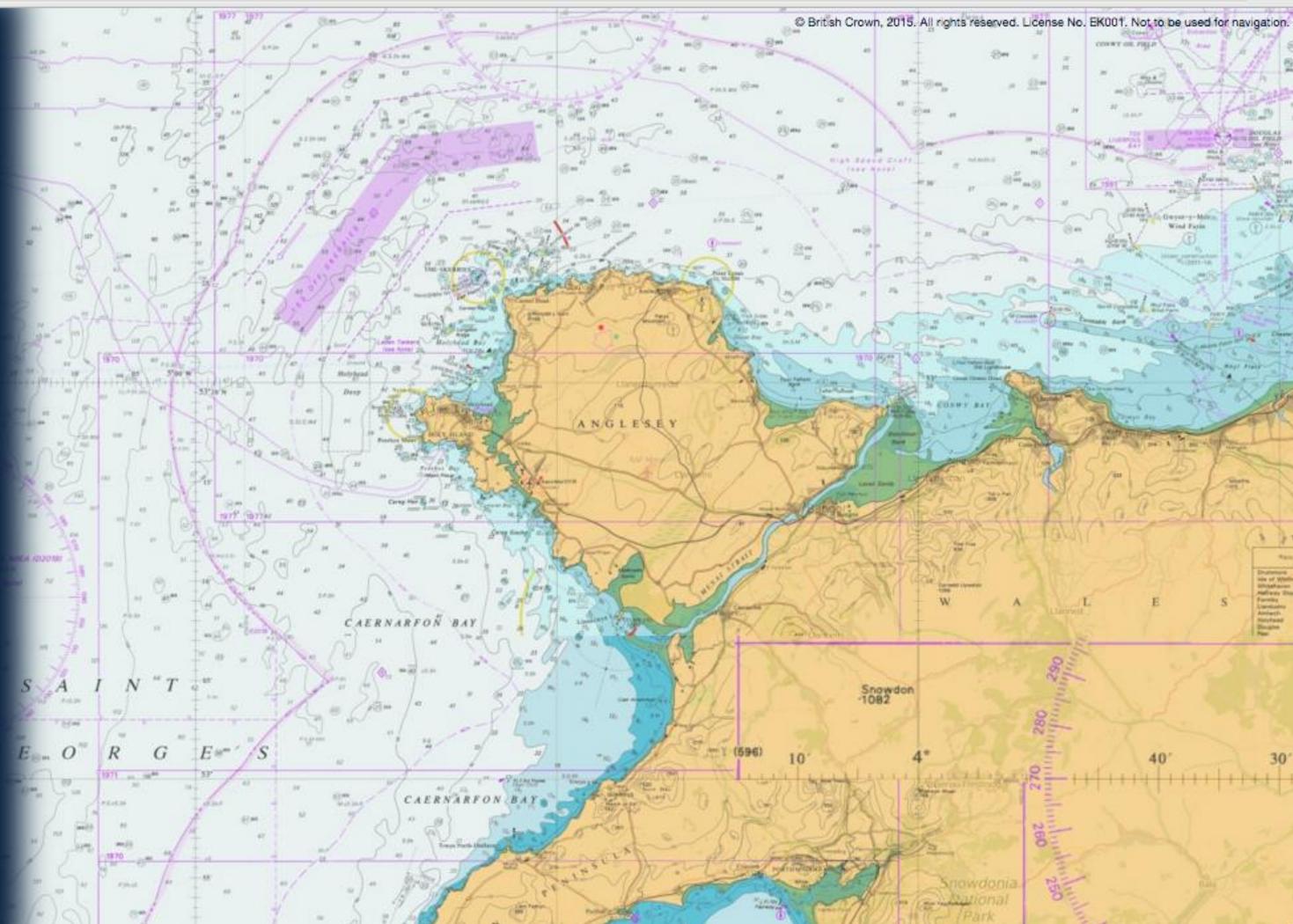


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- Marine Themes
- Marine Themes DEM
- Raster Charts**
- Raster Charts eXcluding Land
- Electronic Navigational Charts
- Wrecks
- IMO Areas

OceanWise Limited is an independent company specialising in marine environmental data acquisition, management, publishing and GIS.



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OceanWise Maps

Welcome to the OceanWise online demonstration portal for intelligent marine and coastal mapping data. Demonstrators are available by selecting from the list below, hover over a product to preview. As well as individual web pages built using OpenLayers the data is available on the OceanWise website data pages. These pages provide an illustration of what is available as OGC compliant web services. Please contact us for actual end points for the web services if you would like to trial these in your own desktop and web GIS.

Marine Themes

Marine Themes DEM

Raster Charts

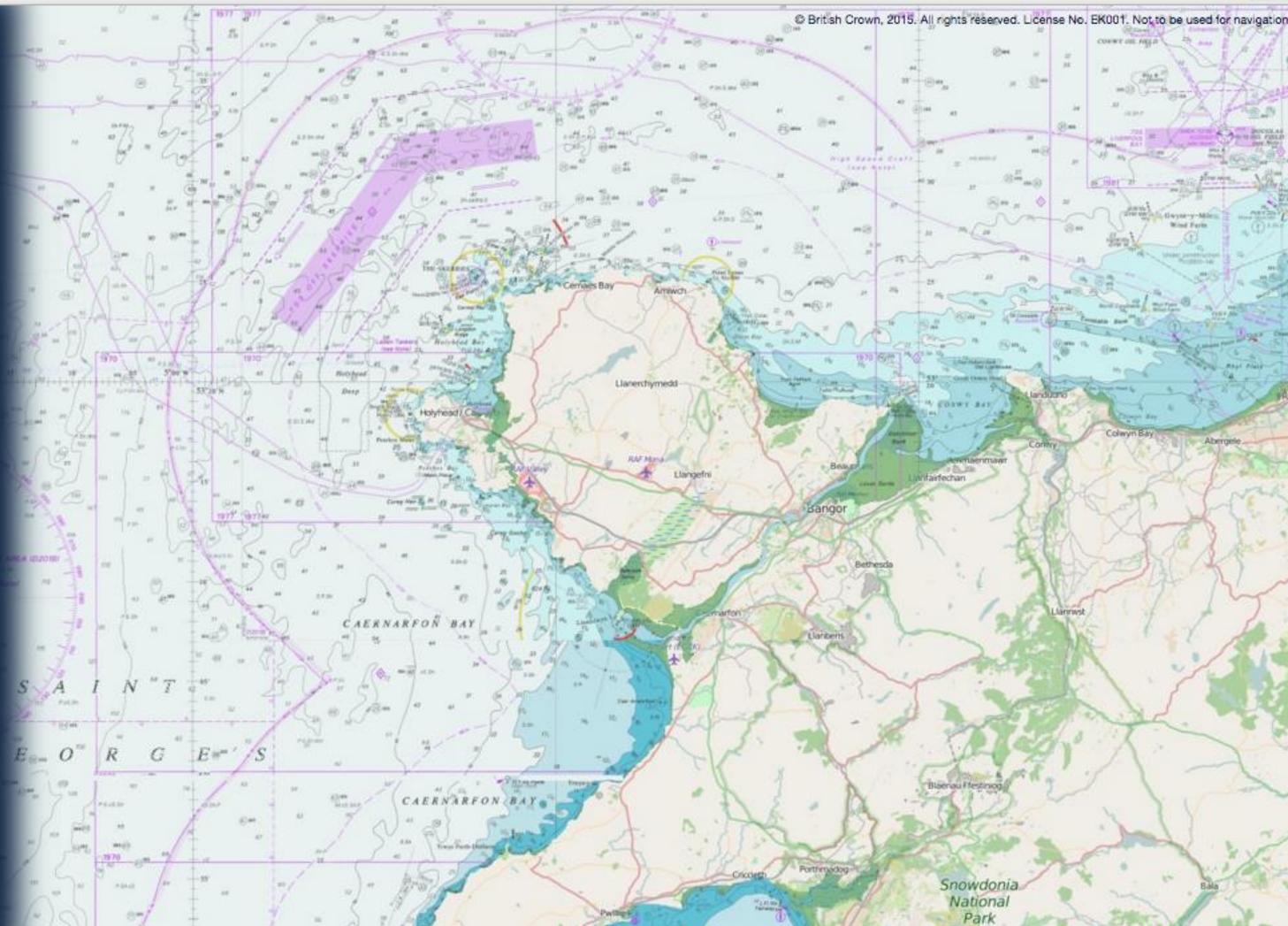
Raster Charts eXcluding Land

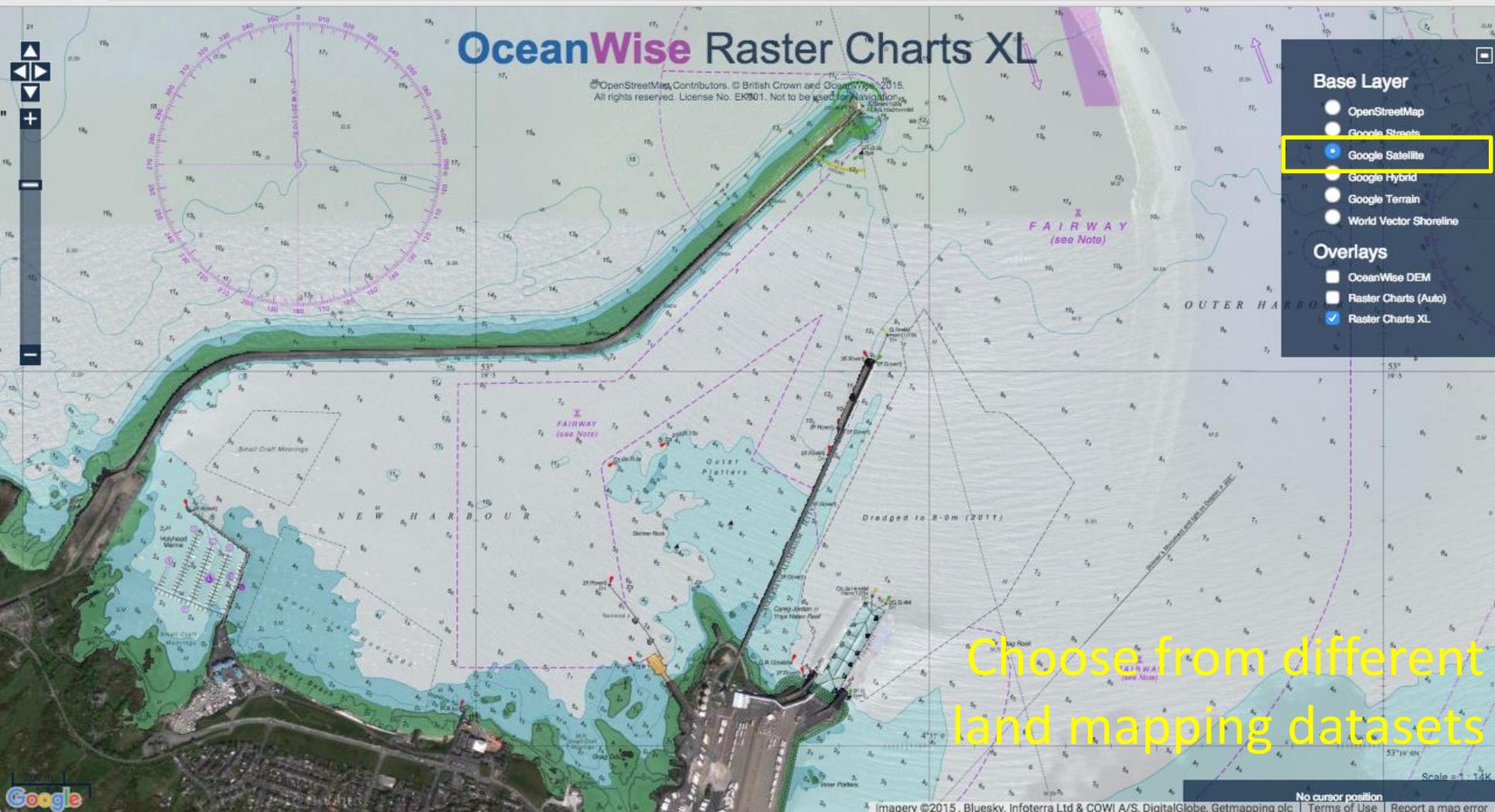
Electronic Navigational Charts

Wrecks

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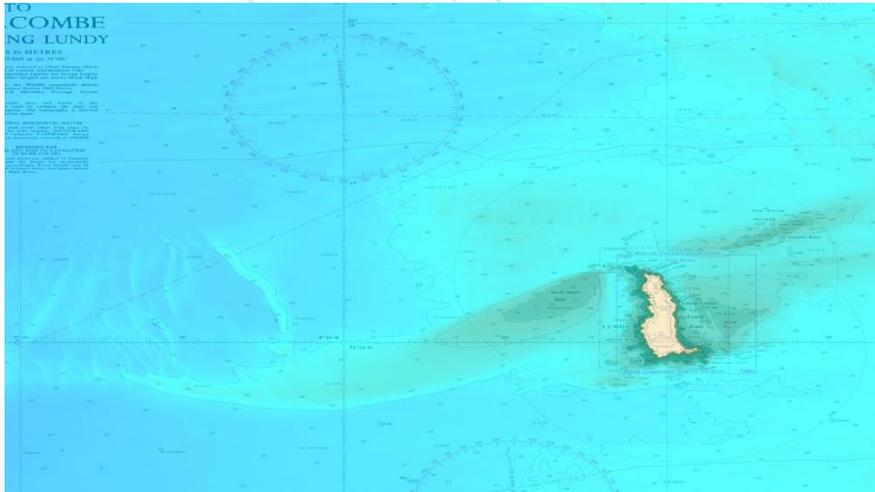
Choose from different land mapping datasets

Incorporating Source Data where possible e.g. IMO Adopted Areas

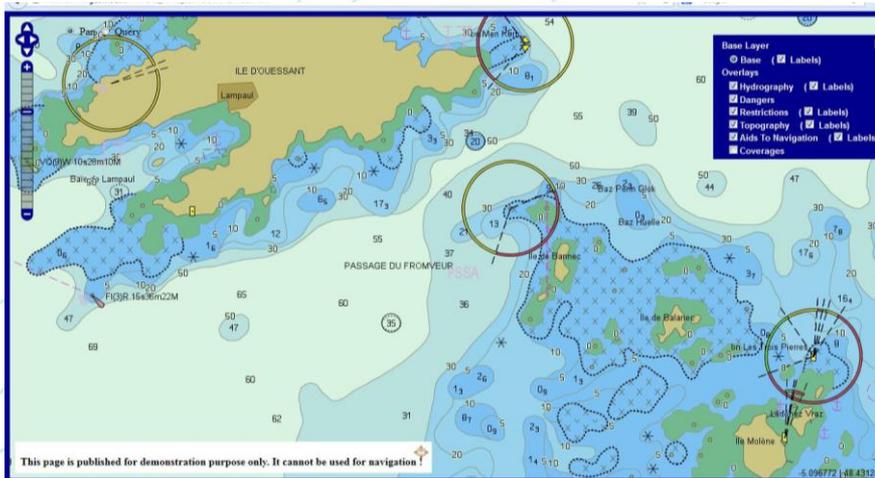


- Captured from IMO documentation
- Official and definitive
- More detailed attribution
- Replaces data captured from paper charts
- Includes PSS Areas

Web Map Services



- OGC Compliant Web Services for RC, MT and DEM
- Proven in ArcGIS Desktop and Server e.g. SNH
- Available through OceanWise partners
- Assistance to load to local server



- Official Electronic Navigational Charts (ENCs)
- Hosted or managed service
- Extensive Coverage
- Multiple Scale Bands
- Ideal for command and control type applications

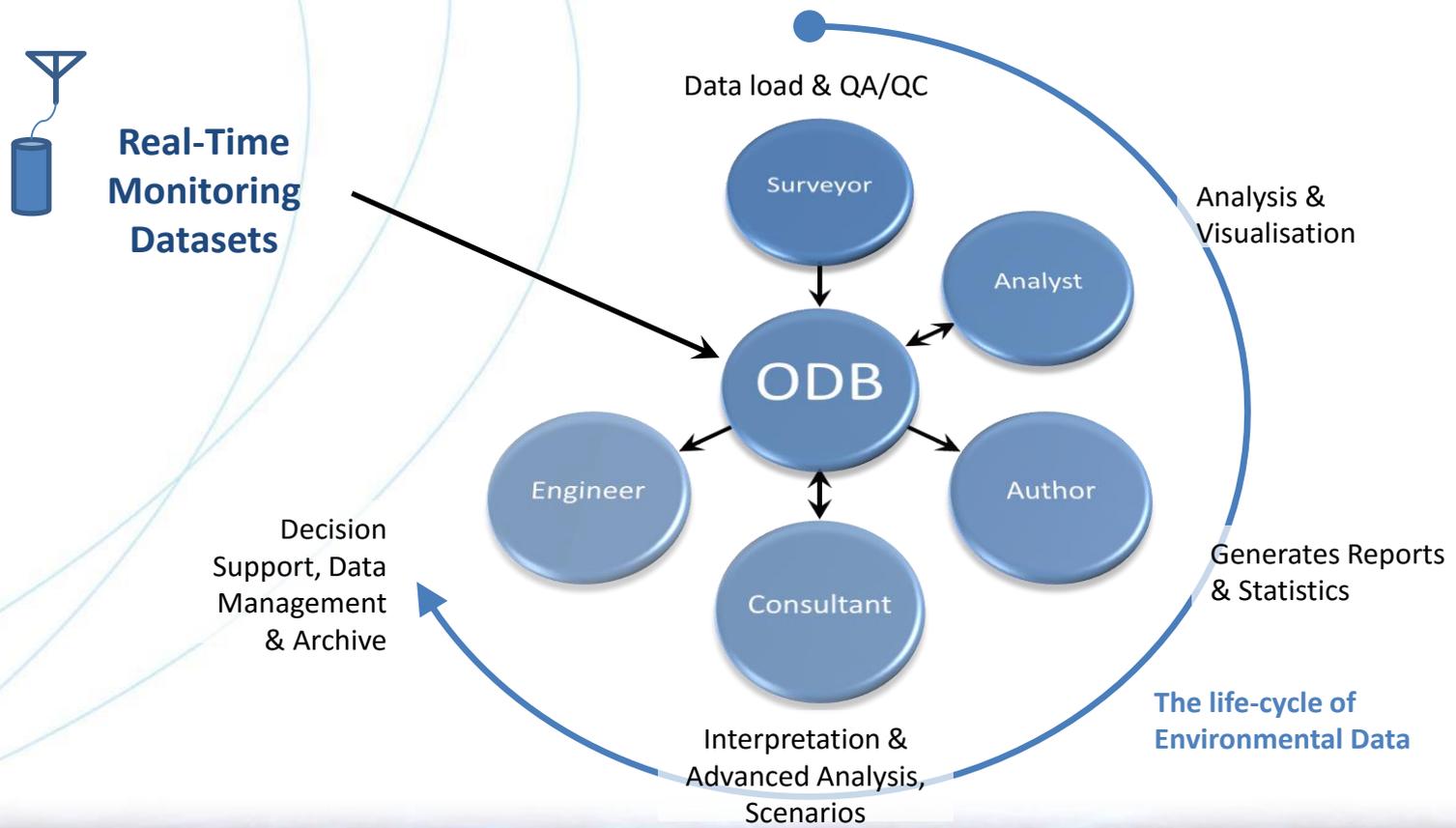
Ocean Database

What is Ocean Database (ODB)?

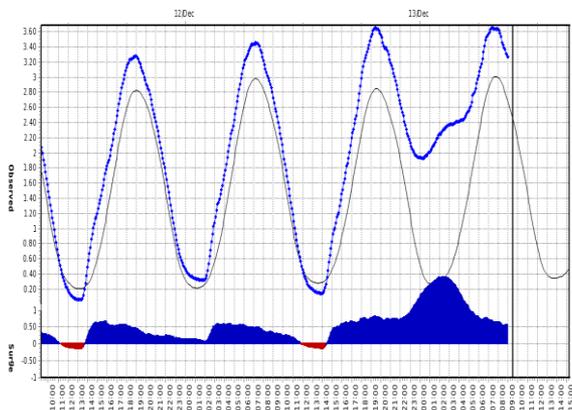
- **ODB** is a data solution that enables the storage and management of many standard types of simple and complex marine and environmental monitoring datasets within an **RDBMS**.
- Associated parameters used in **quality control** and **metadata creation** are included, facilitating onward data exchange and use.
- **ODB** is accessed through a variety of general and specialist software applications including GIS, Microsoft Excel, MATLAB as well as Traditional and Bespoke Database access and management tools.

Use of Ocean Database

ODB can be used to manage the **life cycle** of the dataset, whichever storage method is employed



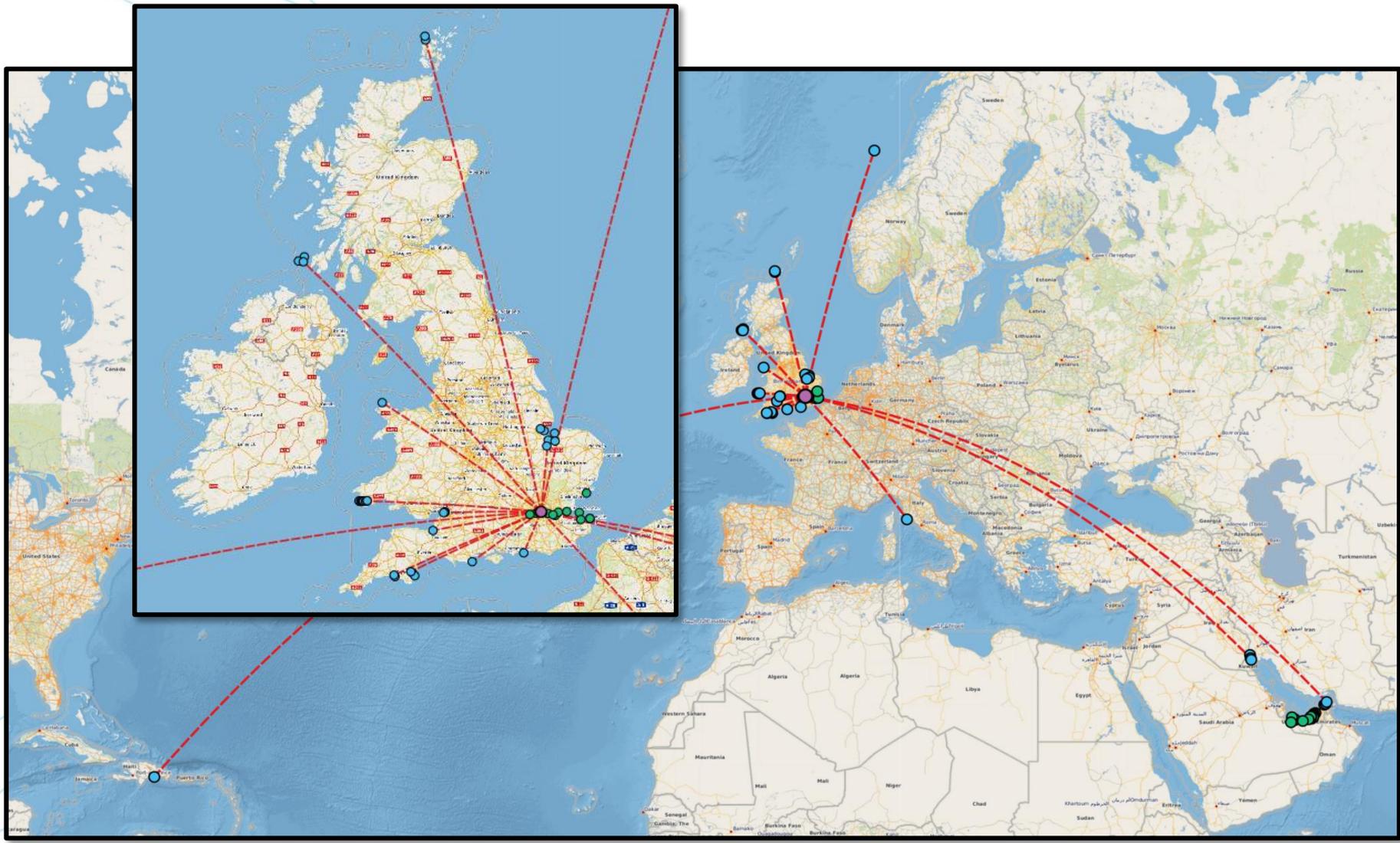
Environmental Data Sharing and Publishing



Port-Log.net and system:

- Storage and web display of environmental data
- On-line cloud based service
- Deployable as a standalone system on corporate LAN
- Compatible with numerous instrument and sensor types
- ‘Smart’ telemetry equipment available, if and when required

Port-Log.net – OceanWise Real-Time Services



"Smart" Telemetry and Display Systems

ip.buffer webserver x Port-Log - Waves x

https://demo.port-log.net/

S-57 Google Images Maps PortLog Partners Development Software Equipment ICT National Rail En... Other bookmarks

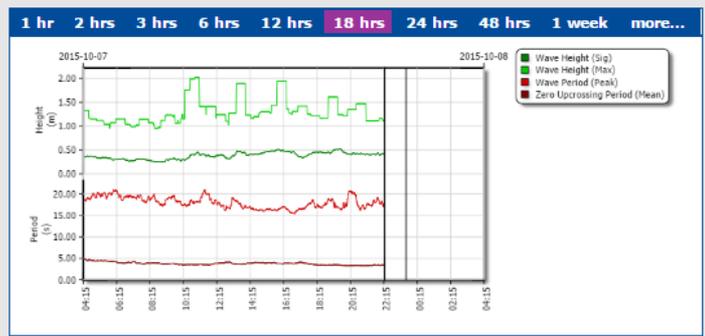
Port-Log - Waves

Map Latest History System

--- SWANAGE - WAVES ---

Data	Wave Height (Sig) (m)	Wave Height (Max) (m)	Wave Period (Peak) (s)	Zero Upcrossing Period (Mean) (s)
------	-----------------------	-----------------------	------------------------	-----------------------------------

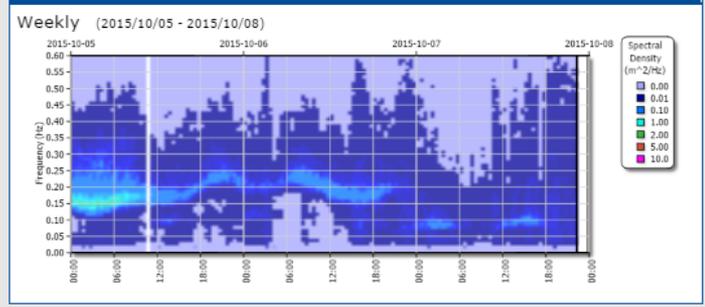
Latest: **0.41 1.11 17.40 3.38**



--- RECENT WAVES ---

Date/Time (UTC)	Averaged Parameters			
	Wave Height (Sig) (m)	Wave Height (Max) (m)	Wave Period (Peak) (s)	Zero Upcrossing Period (Mean) (s)
07 Oct 18:00	0.45	1.22	17.50	3.45
19:00	0.48	1.42	17.41	3.42
20:00	0.42	1.38	18.74	3.32
21:00	0.41	1.18	17.73	3.36
22:00	0.41	1.14	17.78	3.41

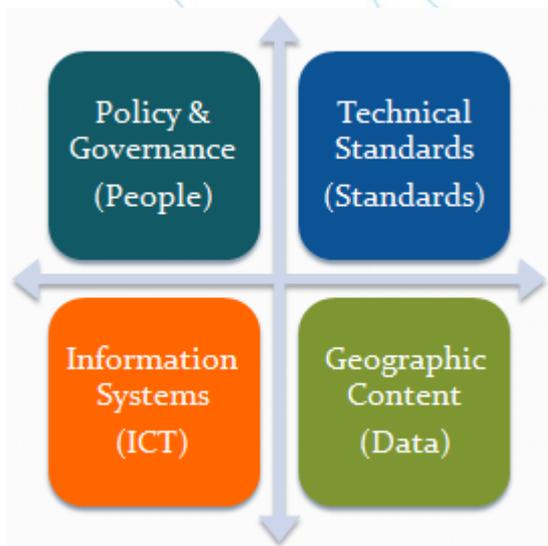
Wave Energy Density (m^2/Hz) more...



Latest Wave Spectra more...



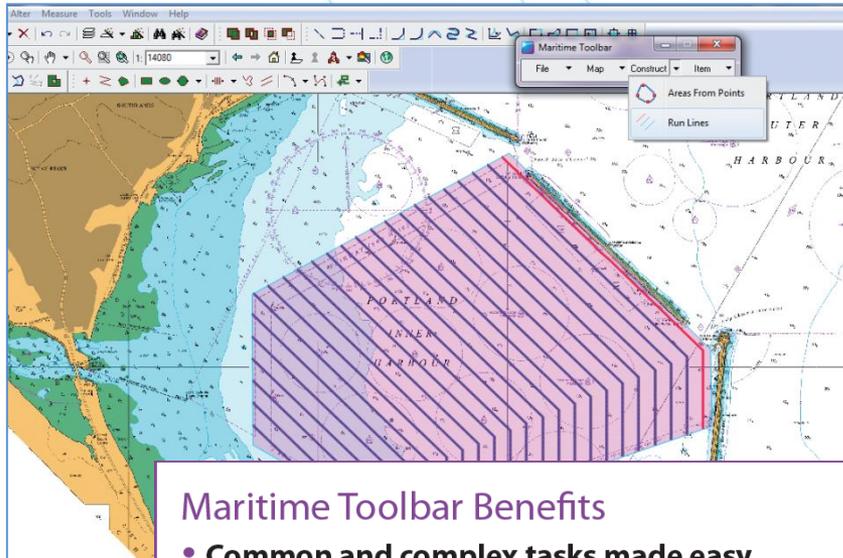
Capacity Building Training & Mentoring



- Experienced Trainers working on behalf of the International Hydrographic Organisation (IHO)
- Courses in data management, database design and marine SDI
- Briefings for directors and senior managers



Enterprise GIS and Productivity Tools



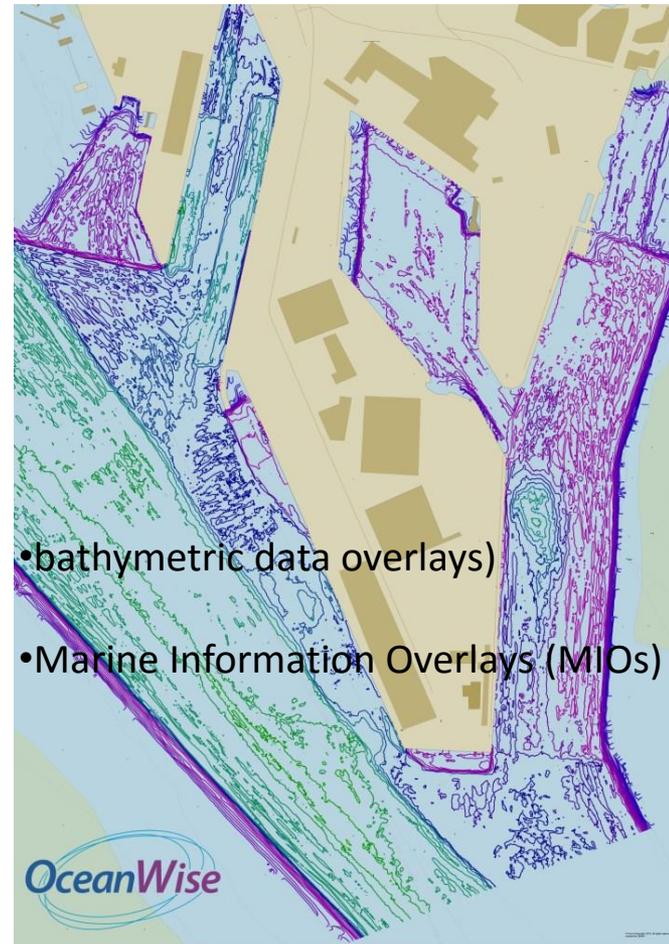
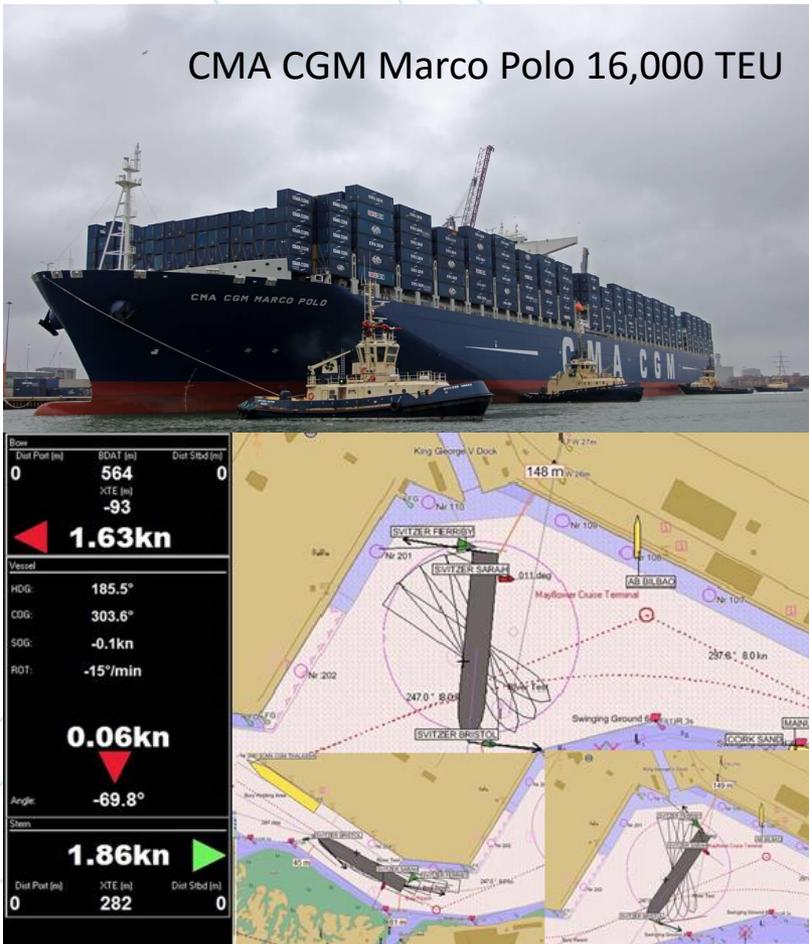
Maritime Toolbar Benefits

- **Common and complex tasks made easy**
- **Designed specifically for the marine GIS user**
- **Connects directly to Ocean Database**
- **Handles all common maritime datasets**
- **Simple handling of bathymetry data**
- **Batch tools to simplify repetitive tasks**

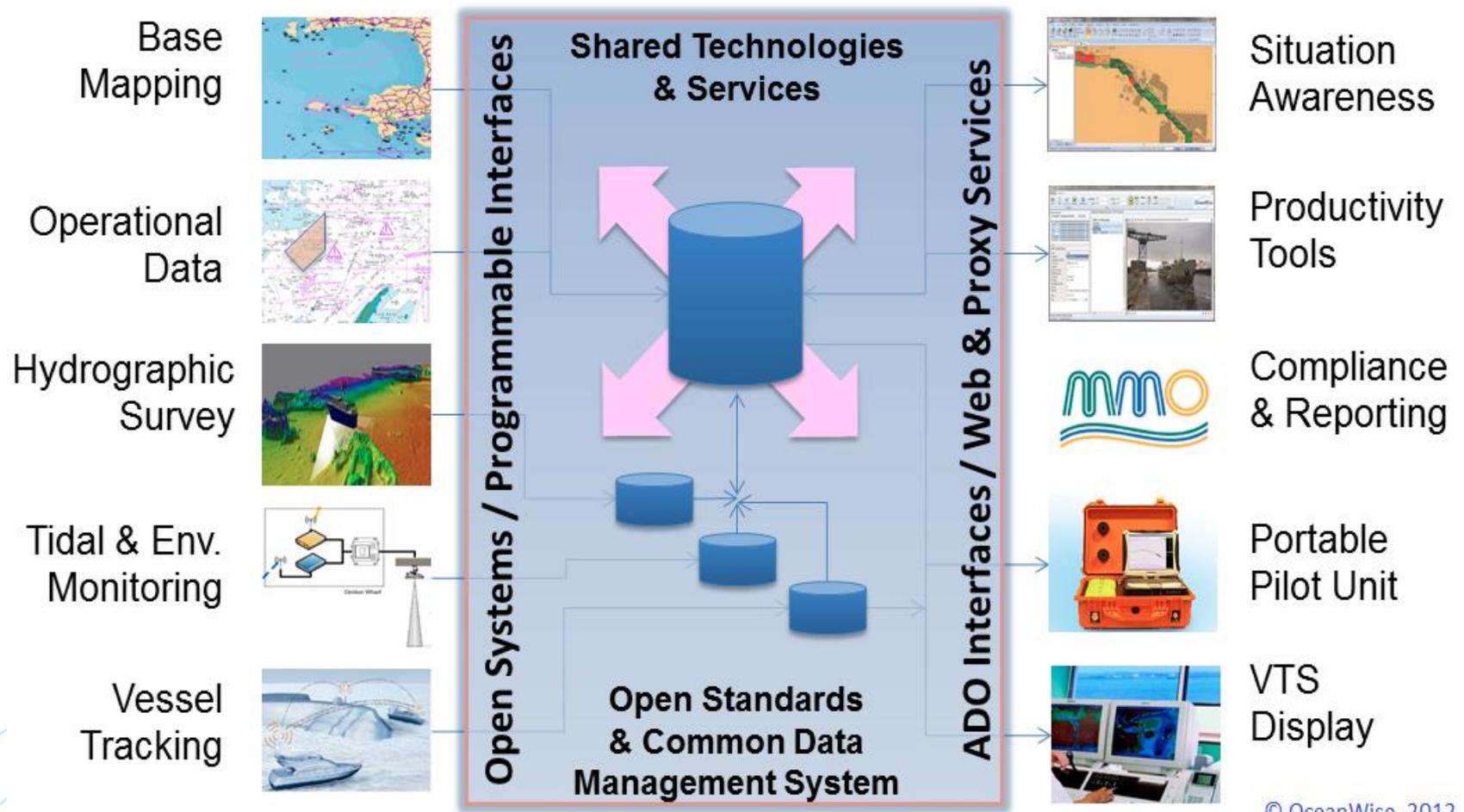
- **Powerful and easy to use tools for manipulating marine environmental and maritime operational data**
- **Developed in collaboration with numerous UK ports**
- **Workflow extensions include:**
 - Dredging and Licensing
 - Environmental Sampling
 - Infrastructure and Assets
 - Hydrographic Survey Metadata
- **Works with Esri ArcGIS, Cadcorp SIS and Open Source software**

Project S-57 overlays for use in PPU's and VTS operations

CMA CGM Marco Polo 16,000 TEU



Maritime Information Infrastructure



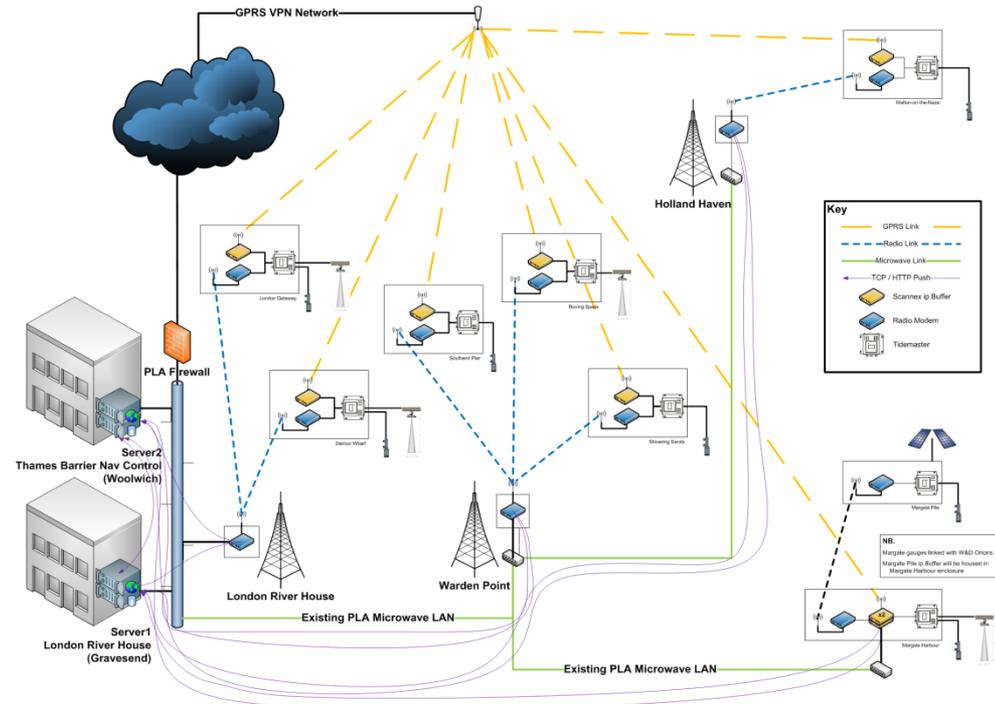
New Port of London (PLA) Tidal System

On-line Real-Time Data Management & Display

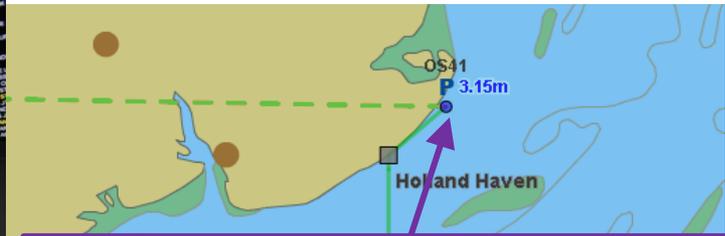


Contents

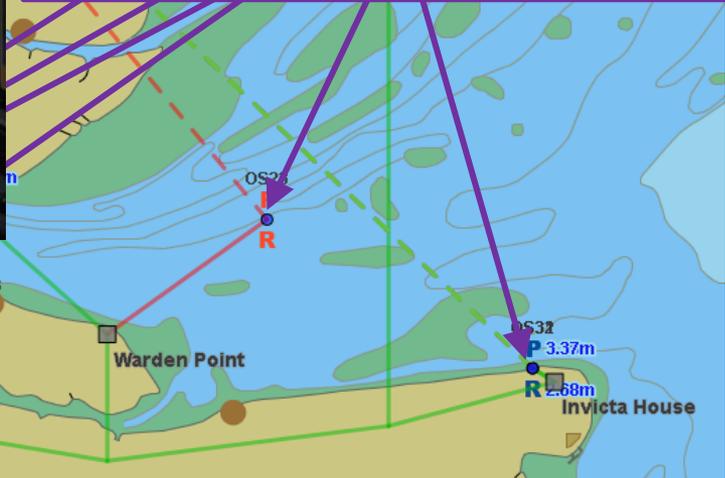
- User Requirements
- Specification
- Equipment
- Data flows
- Displays
- Configuration
- Database & Control
- User Perspective
- Conclusions



PolaTide 5 – PLA Tidal System



Replace 8 existing tide gauges in the outer estuary.



2 Control Servers/DB systems:
PCC: Gravesend
TBNC: Thames Barrier Navigation Control

Specification

Project Specification:

- Outstations enclosures – internal and external.
- 60sec data interval – burst averaged.
- 7-Day battery backup
- Local Calibration/Logging/Display.
- Remote access to the gauges for configuration/download.
- Redundancy:
 - Primary / Secondary Telemetry systems
 - Dual DB / Control Systems / Servers
 - Radar and Pressure Sensors
- Web-based display / control system.

Project Consortium:

Measurement /
Enclosures



Radio Telemetry



Project Management
/Control System /
Database / Web-pages /
Integration



Measurement Equipment

Valeport Sensors:

- VRS20 Radar Gauges
 - pulsed k-band radar level sensor
- Pressure Sensors
 - Vented
- Tidemaster Logger
 - Sensor Control
 - Local Display
 - Local Calibrations
 - Local Data Store



GPRS Telemetry Equipment

ipBuffer - RS232/Ethernet/GPRS Programmable Transceiver

- Interfaces directly with Tide logger, in parallel to the UHF Transmitters.
- TCP/FTP/email/HTTP Post
- Non-volatile data buffer – 128Mb
- Bidirectional communication, authentication and encryption – remote administration.
- Advanced power management
- Pass-through port – allowing remote administration of the Tide logger
- Scriptable – maintains Tide logger clocks, remote download etc.
- Manages power – reduces Sample/POST rates as voltages drop.



Wood & Douglas Radio Modems used

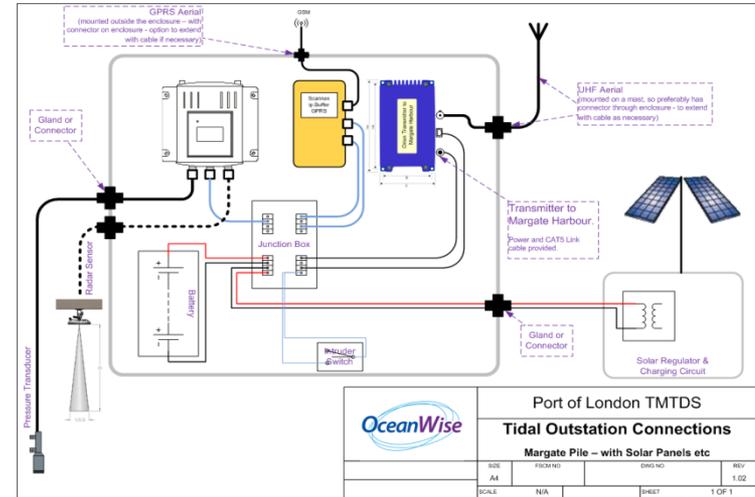
- OpenNet 6000 Max Programmable UHF Radio Modem
 - Networked across 4 base stations
 - Digital/Analogue I/O
 - Time Sync'd back to servers
- Orion UHF – Point-to-Point
 - Short range local links
 - Low power



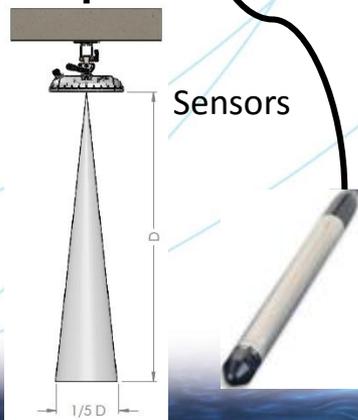
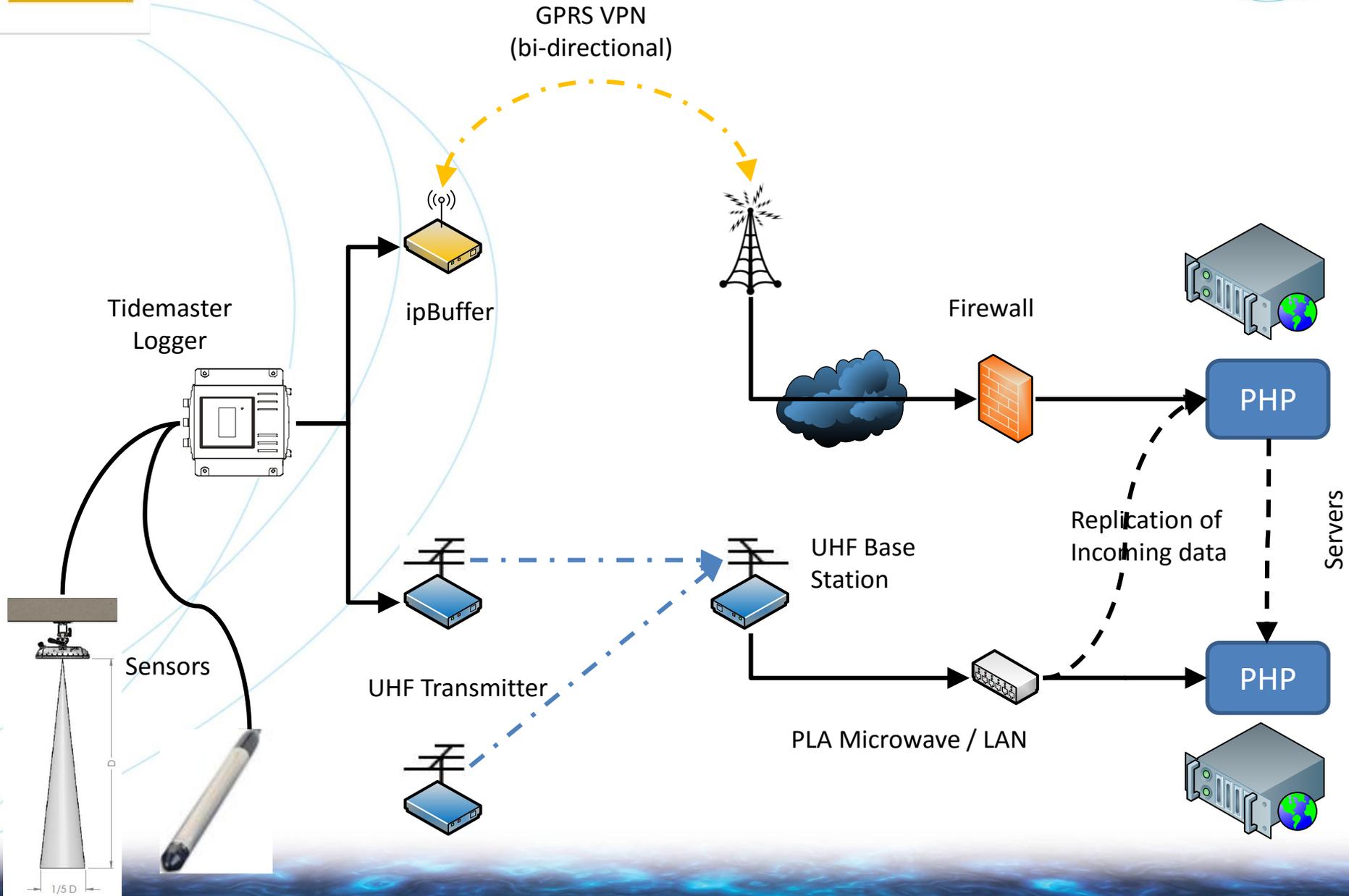
Enclosures

Standard Valeport Environmental Enclosures:

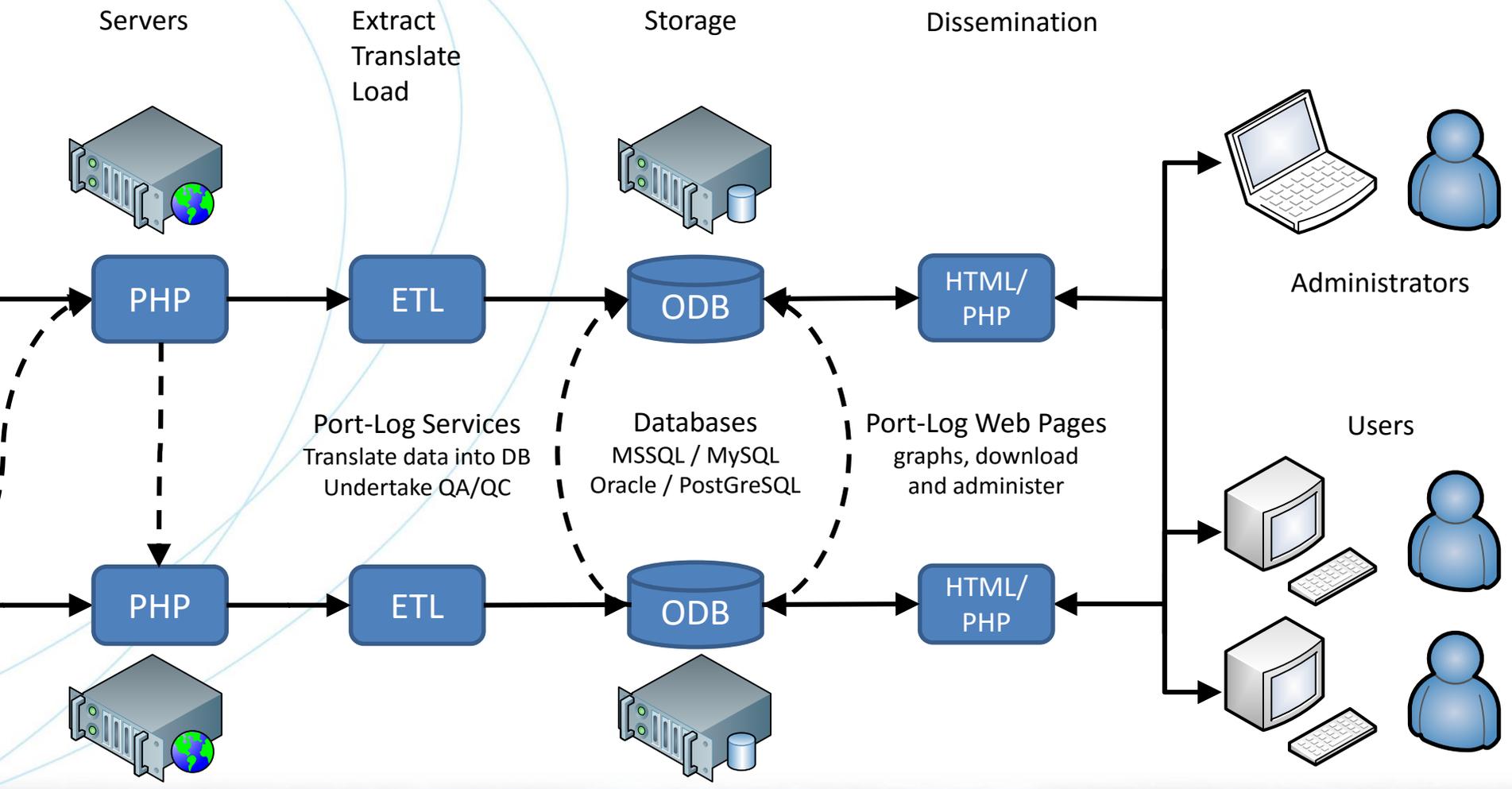
- IP66 enclosure
- Fully CE/EMC Tested
- 7 Days Battery power
- Charging options
 - 250 vac triple state
 - Solar Panels
- Distributes Power
- Digital I/O
 - Intruder Switches
 - External Charge Monitors



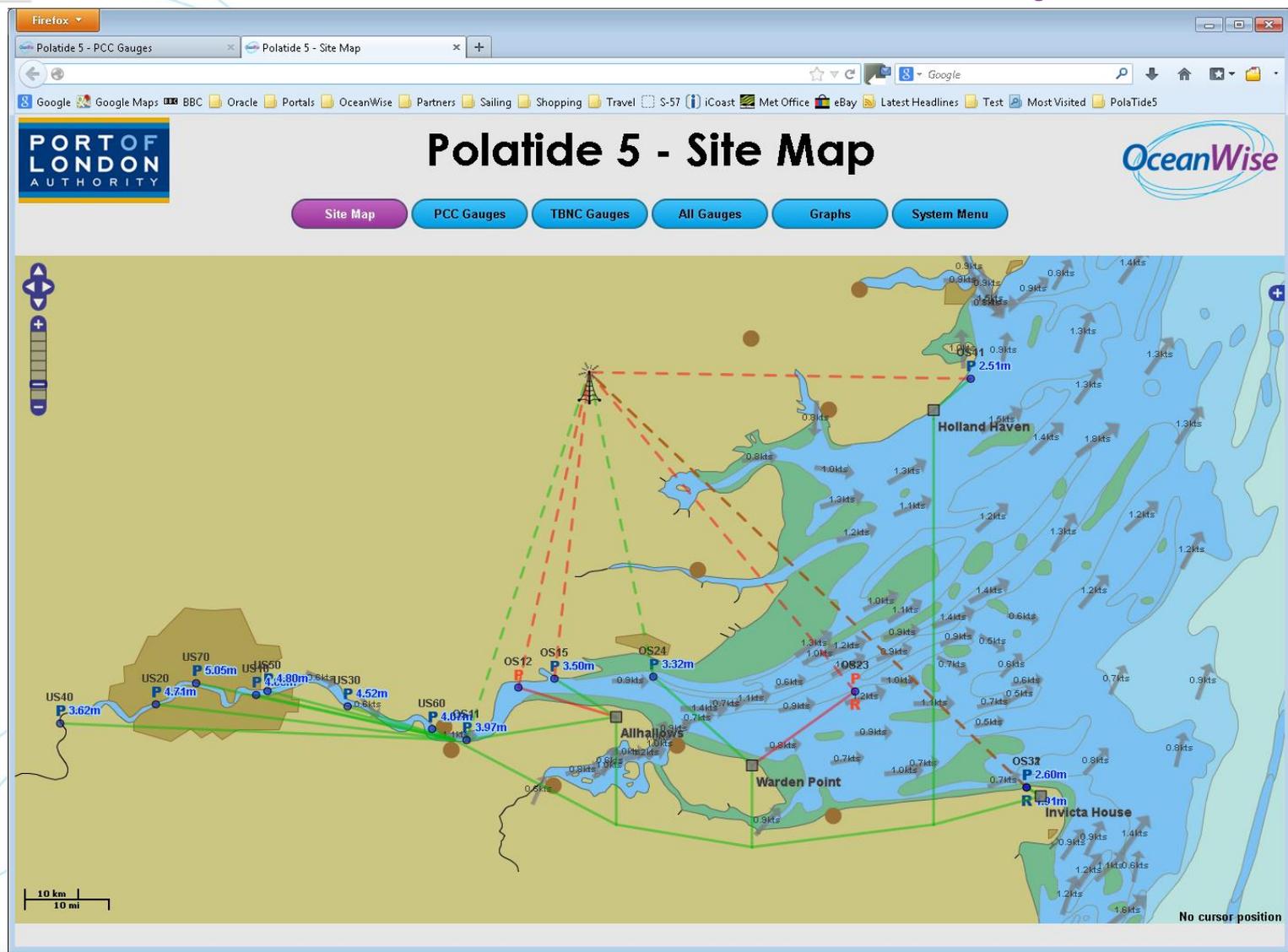
Data Flow (1)



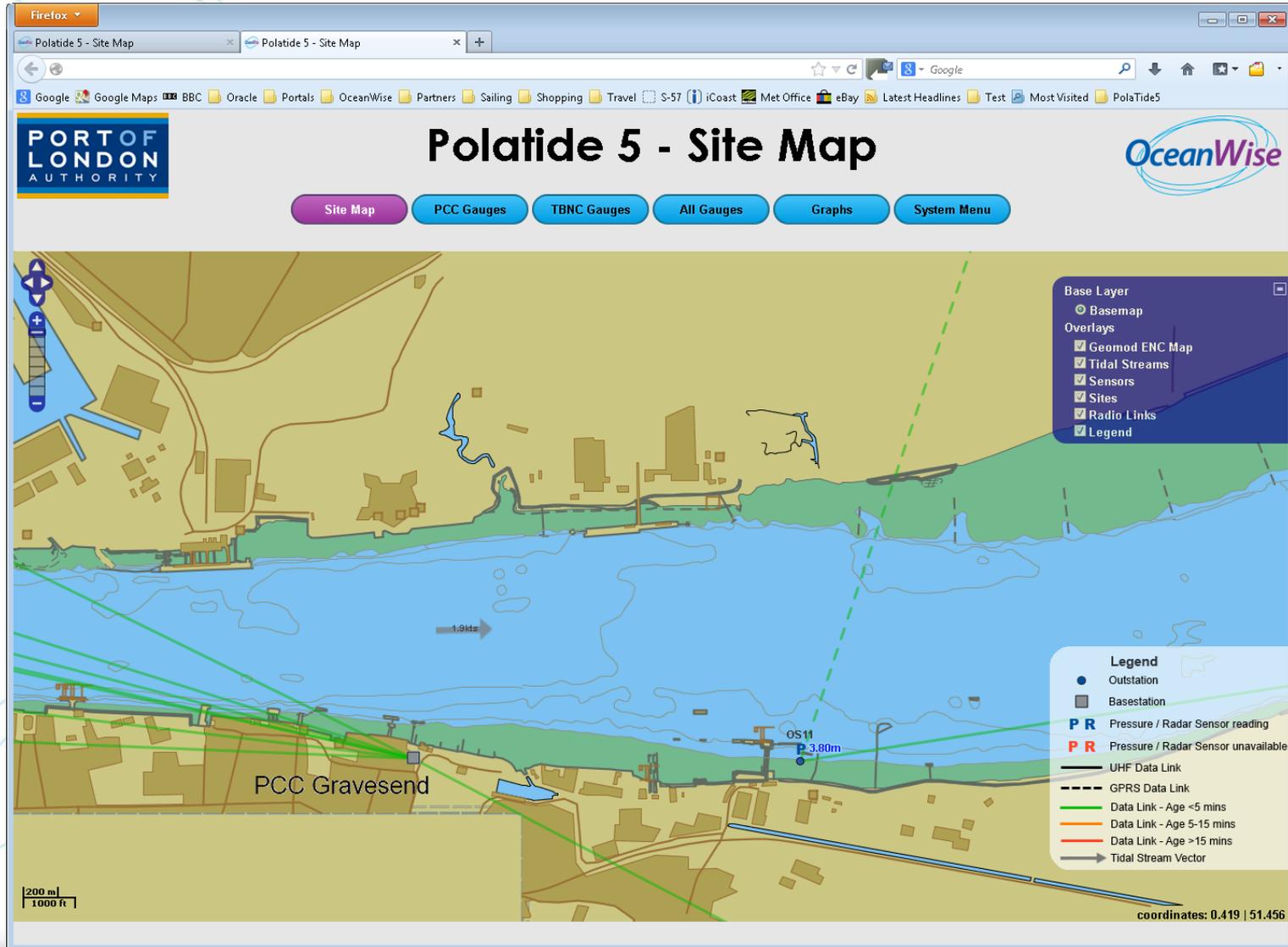
Data Flow (2)



Status Overview Map



Overview Map - Zoom



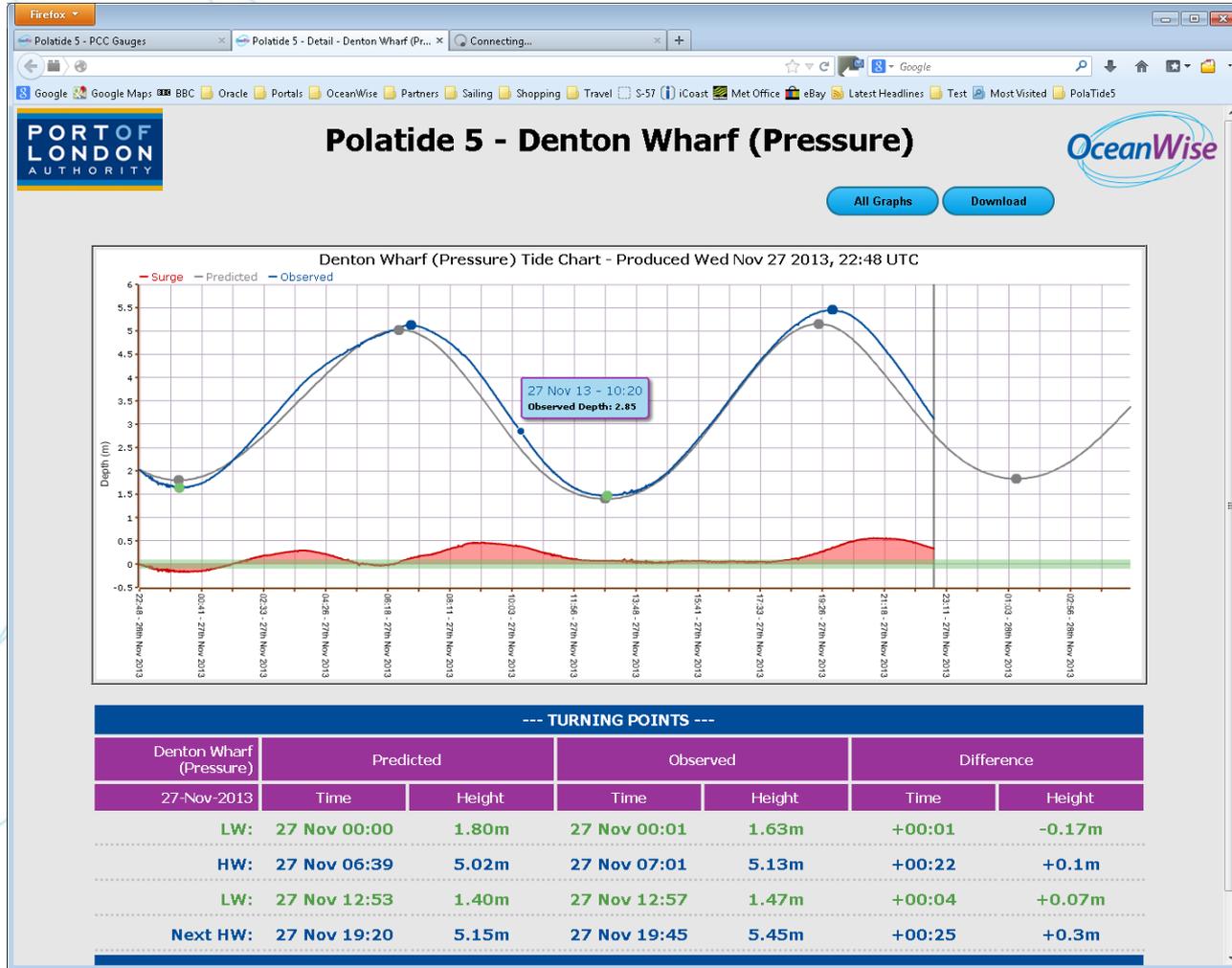
Gauge Displays

Firefox browser window showing the main page of the Polatide 5 - PCC Gauge Display. The page features the Port of London Authority logo on the left and the OceanWise logo on the right. The title is "Polatide 5 - PCC Gauge Display". Below the title is a navigation menu with buttons for "Site Map", "PCC Gauges", "TBNC Gauges", "All Gauges", "Graphs", and "System Menu".

Firefox browser window showing the "Polatide 5 - Setup Gauges - PCC" configuration page. The page features the Port of London Authority logo on the left and the OceanWise logo on the right. The title is "Polatide 5 - Setup Gauges - PCC". Below the title is a table titled "PCC - ESTUARY GAUGES SETTINGS".

Code	Sensor Name	Type	PCC
TM11P	Denton Wharf (Pressure)		Show Hide
TM11R	Denton Wharf (Radar)		Show Hide
TM12P	London Gateway (Pressure)		Show Hide
TM12R	London Gateway (Radar)		Show Hide
TM15P	Hole Haven (Pressure)		Show Hide
TM15R	Hole Haven (Radar)		Show Hide
TM23P	Shivering Sands (Pressure)		Show Hide

Gauge Charts



Status Displays

Firefox - Polatide 5 - Admin Console

Polatide 5 - Admin Console

PORT OF LONDON AUTHORITY

OceanWise

Site Map PCC Gauges TBNC Gauges All Gauges Graphs System Menu Admin Console

OUT STATION ENCLOSURES

Code	Name	Door Status	Power Status	UHF Connection		GPRS Connection		Alerts
				Last Status	Data Currency	Last Status	Data Currency	
OS11	Denton Wharf		13.5v		<5 mins		<5 mins	
OS12	London Gateway	---	--.		NO DATA		NO DATA	
OS15	Hole Haven		13.4v		<5 mins		>14 mins	
OS23	Shivering Sands	---	--.		NO DATA		NO DATA	
OS24	Southend Pier		13.6v		<5 mins		<5 mins	
OS31	Margate Harbour Arm		13.6v		<5 mins		<5 mins	
OS32	Margate Pile	---	--.		<5 mins		>18 mins	
OS41	Walton on the Naze		13.4v		<5 mins		>17 days	

BASE STATION ENCLOSURES

Code	Name	Door Status	Power Status	UHF Connection		GPRS Connection		Alerts
				Last Status	Data Currency	Last Status	Data Currency	
BS10	Allhallows	---	13.6v		<5 mins	---	---	
BS20	Warden Point	---	13.6v		<5 mins	---	---	

Site Configuration

The screenshot shows the 'Polatide 5 - Edit Sites' web application. The browser window title is 'Polatide 5 - Admin Console'. The page header includes the Port of London Authority logo on the left and the OceanWise logo on the right. Below the logos is a navigation bar with buttons for 'Site Map', 'PCC Gauges', 'TBNC Gauges', 'All Gauges', 'Graphs', 'System Menu', and 'Edit Sites'. A purple bar labeled 'SITE EDITOR' is positioned below the navigation. Underneath, there are tabs for 'Estuary Gauges', 'Upriver Gauges', 'Out Station Enclosures', 'Base Station Enclosures', 'Upriver Enclosures', and 'Other'. The 'Estuary Gauges' tab is active, showing a list of gauges on the left and a configuration form for 'TM11P' on the right. The form includes 'Site Details' and 'QA/QC Parameters' sections.

Site Details

ID: 111 Site Code: TM11P
 Name: Denton Wharf (Pressure)
 Description: Pressure Sensor
 Position: 51°26.637'N 00°23.820'E
 Tidal Reference: CORYTON (0110A)
 Site Parent: Denton Wharf

Datasets

- Tides
- CTD
- WQ
- Buoy
- Met
- Waves
- Currents
- Drogues
- GPRS
- UHF

QA/QC Parameters

Table	Parameter	Minimum Value	Maximum Value	Minimum Change	Maximum Change	Repeat	Maximum StdDev	Remove
Tides_Data	Observed	0.001			0.001	3	2	<input type="checkbox"/>

Buttons: Save, Cancel

Smart Phone Access

Polatide 5 - Site Map

Search

PORT OF LONDON AUTHORITY

Polatide 5 - Site Map

Site Map PCC Gauges TBNC Gauges All Gauges Graphs System Menu

Map navigation icons: back, forward, home, search, refresh.

Polatide 5 - PCC Gauges

Search

PORT OF LONDON AUTHORITY

Polatide 5 - Polatide 5 - PCC Gauge Display

Site Map PCC Gauges TBNC Gauges All Gauges Graphs System Menu

System Time: Saturday 09 November, 2013 18:30:41 UTC Display update: 7 Secs

PCC - ESTUARY GAUGES					
Gauge Location	Observed (m)	Predicted (m)	Surge (m)	Data Age (minutes)	Alert
Denton Wharf (Pressure)	5.18	4.66	+0.52	0:38	
Denton Wharf (Radar)	5.14	4.66	+0.48	0:38	
London Gateway (Pressure)	0.79	4.70	-3.91	2:38	
Hole Haven (Pressure)	4.58	4.68	-0.10	1:38	
Shivering Sands (Pressure)	4.00	3.68	+0.32	1:38	
Southend Pier (Pressure)	--	--	--	--	
Margate Harbour Arm (Pressure)	3.31	3.27	+0.04	0:38	
Margate Pile (Pressure)	3.32	3.29	+0.03	1:38	
Margate Pile (Radar)	--	--	--	20:38	!
Walton on the Naze (Pressure)	2.92	2.46	+0.45	1:38	

Map navigation icons: back, forward, home, search, refresh.

Polatide 5 - Admin Console

Search

PORT OF LONDON AUTHORITY

Polatide 5 - Admin Console

Site Map PCC Gauges TBNC Gauges All Gauges Graphs System Menu Admin Console

OUT STATION ENCLOSURES

Code	Name	Door Status	Power Status	UHF Connection	GPRS Connection	Alerts
OS11	Denton Wharf	🔒	13.5v	📶	📶 <5 mins	
OS12	London Gateway	---	13.9v	📶	NO DATA	
OS15	Hole Haven	🔒	13.6v	📶	📶 <5 mins	
OS23	Shivering Sands	---	13.6v	📶	NO DATA	
OS24	Southend Pier	🔒	13.7v	📶	📶 <5 mins	
OS25	Roving	---	---	📶	Radio OFF GPRS OFF	
OS31	Margate Harbour Arm	🔒	13.6v	📶	📶 <5 mins	!
OS32	Margate Pile	🔒	---	📶	📶 <5 mins	>1 Hour !
OS41	Walton on the Naze	🔒	13.6v	📶	📶 <5 mins	!

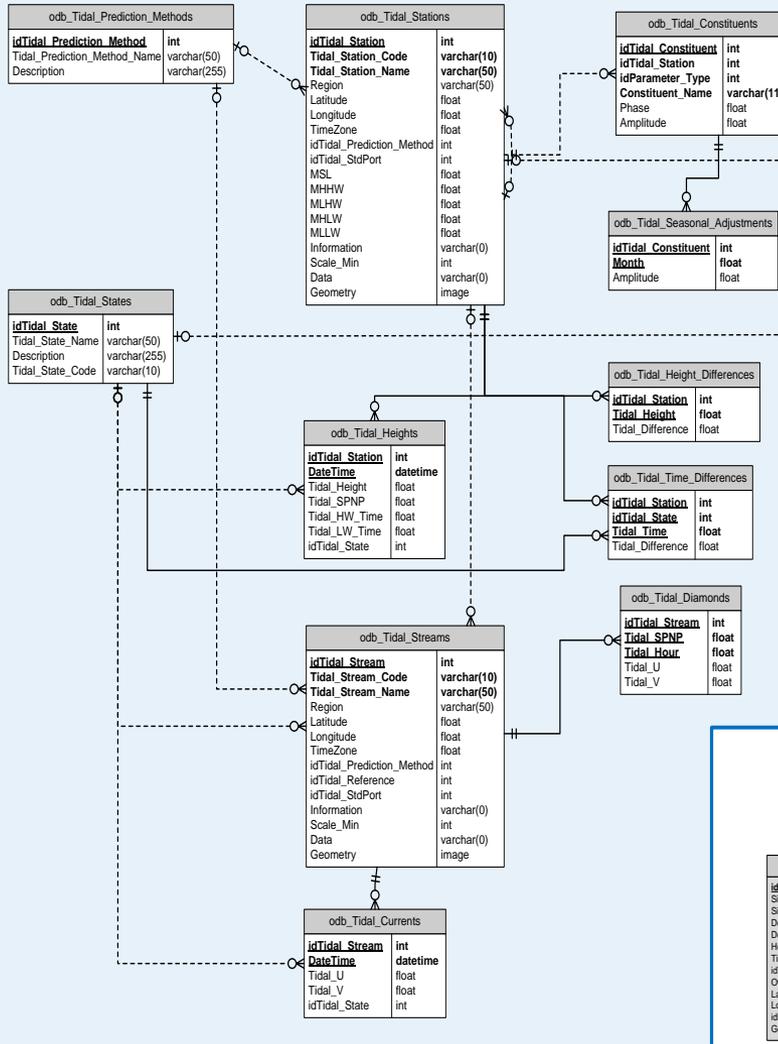
BASE STATION ENCLOSURES

Code	Name	Door Status	Power Status	UHF Connection	GPRS Connection	Alerts
BS10	Alhalews	---	13.6v	📶	📶 <5 mins	

Map navigation icons: back, forward, home, search, refresh.

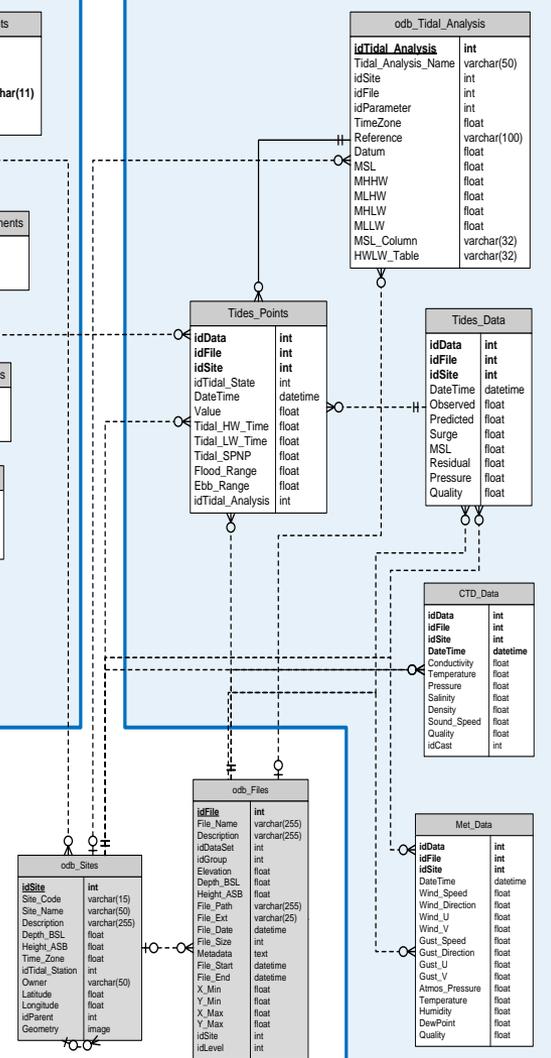
Ocean Database Data Model

Tidal Harmonics & Predictions



ODB Schema

Tidal Datasets



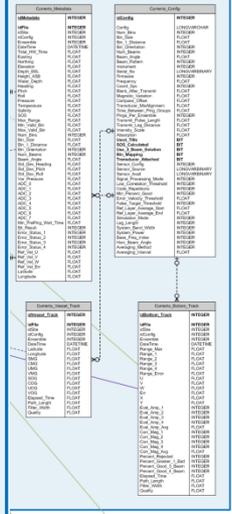
Real-time



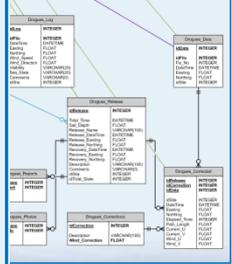
Time Series



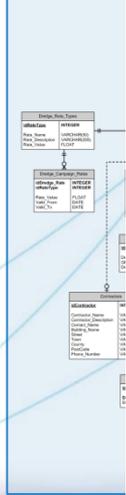
Currents / ADCP



ICES



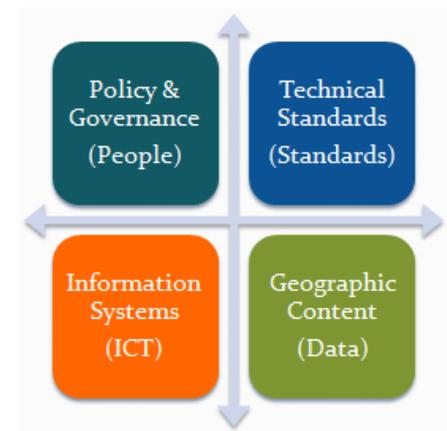
Dredging Model



- The complexity of designing and installing a tidal system covering such a large area, with sensors in remote and inhospitable sites, was a significant challenge.
- Access, permissions and power supplies required considerable planning, so the installation of the system took some time.
- Need to maintain a 24/7 port operation over linked radio systems was vital.
- Quality Control, data logging and retrieval and displays at all outstations could not be carried out until implementation was complete.

Summary

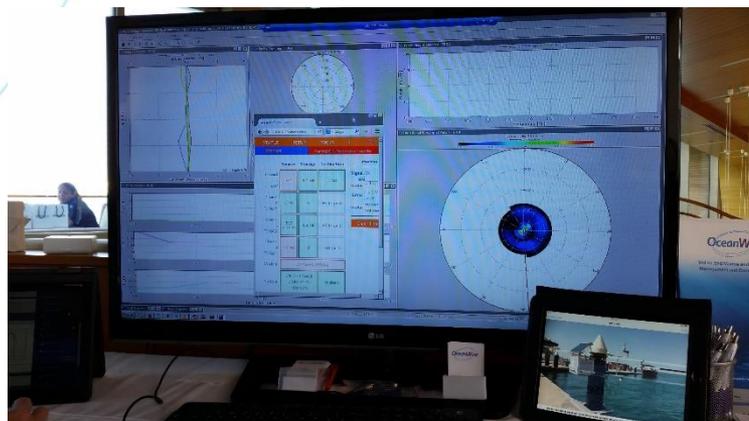
- Maritime Information Infrastructure (MII) is an Enterprise-wide SDI
- OceanWise products and services “fuel” the MII
- MSDI is about:
 - the data to populate it (x,y,z,t)
 - the technology to drive it
 - the standards to enable it and
 - the governance to allow it...!
- OceanWise approach is to provide the “one stop shop”



Thank You Any Questions?

<http://demo.port-log.net>

<http://maps.oceanwise.eu>



OceanWise

End-to-End Marine and Coastal Data Management and Decision Support



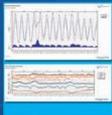
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