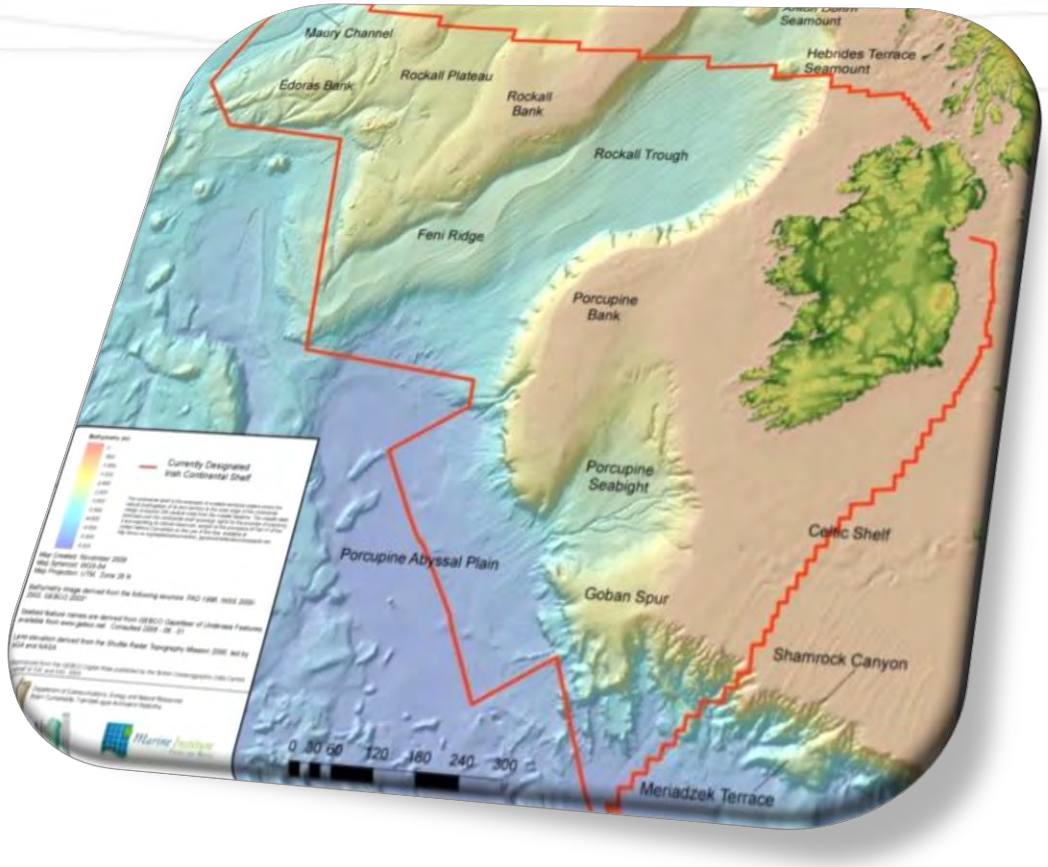
Putting Ireland's marine data to work…

Ireland's Integrated Digital Ocean



Adam Leadbetter, Eoin O'Grady,
Nigel Burke, Damian Smyth, Rob Fuller
Marine Institute, Ireland

IMDIS Conference, Gdansk, Poland
12th Oct 2016

Marine Institute
Feras na Mara

A Digital World

"The digital economy is developing rapidly worldwide. It is **the single most important driver of innovation, competitiveness and growth**, and it holds huge potential for European entrepreneurs and small and medium-sized enterprises (SMEs).

Unfortunately, **only two percent of European enterprises are currently taking full advantage of new digital opportunities**. How European businesses adopt digital technologies will be **a key determinant of their future growth**."

European Commission (2014)

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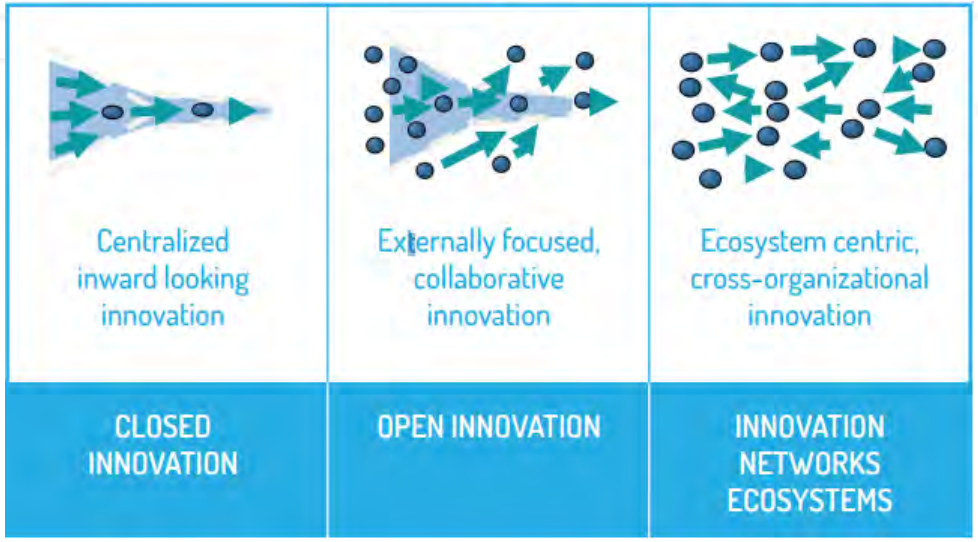
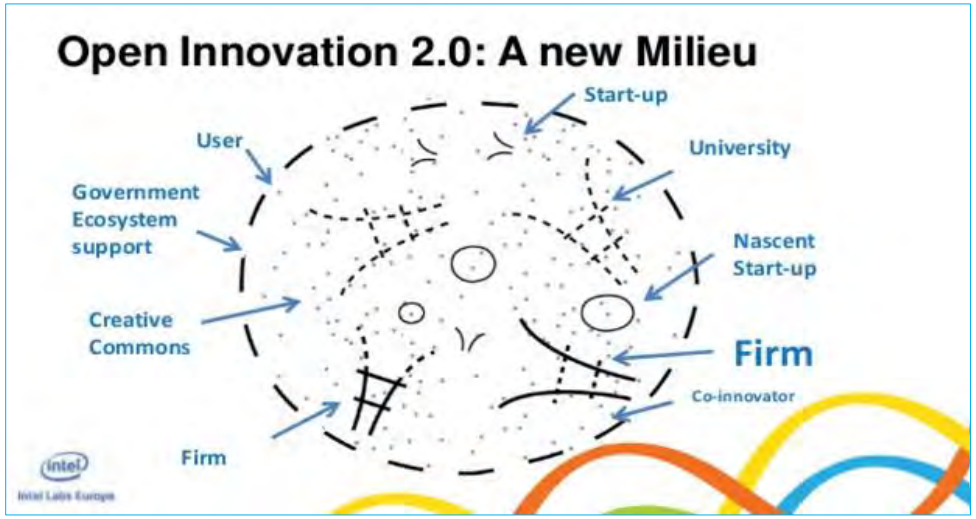
Open Innovation 2.0

"In today's complex world, experiments simply cannot be conducted in isolation. **Collaborative research will accelerate the innovative process** and improve the quality of its outcomes. While closed-world innovation will not disappear, it will be dwarfed by the efforts of teams that enable a wide spectrum of stakeholders to take on active roles"

Open Innovation 2.O is "**a new paradigm based on principles of integrated collaboration**, co-created shared value, **cultivated innovation ecosystems**, unleashed exponential technologies, and **extraordinarily rapid adoption**."
Curley[1] and Salmelin[2] (2013)





[1] ***Martin Curley,*** *PhD. Vice President & Director, Intel Labs Europe, Intel Corporation & Chair, Open Innovation Strategy and Policy Group*
[2]***Bror Salmelin,*** *MSc Eng. Adviser, Innovation Systems, EC Directorate General CONNECT & Board Member, Open Innovation Strategy and Policy Group*

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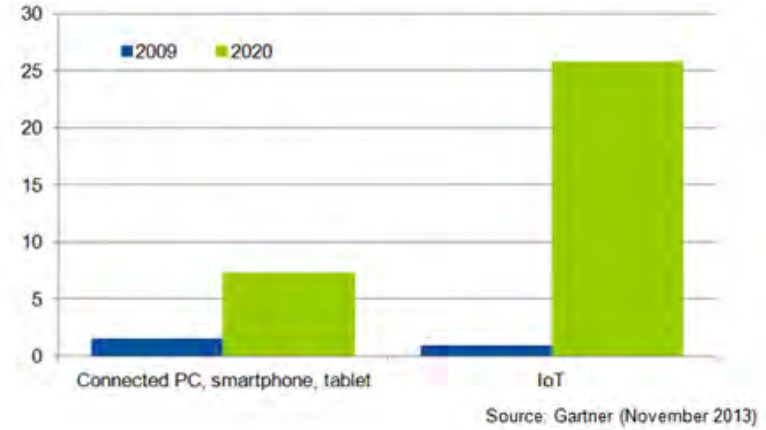
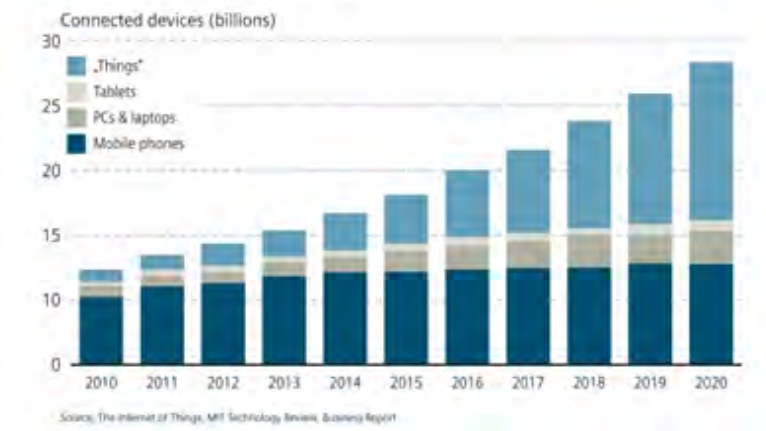
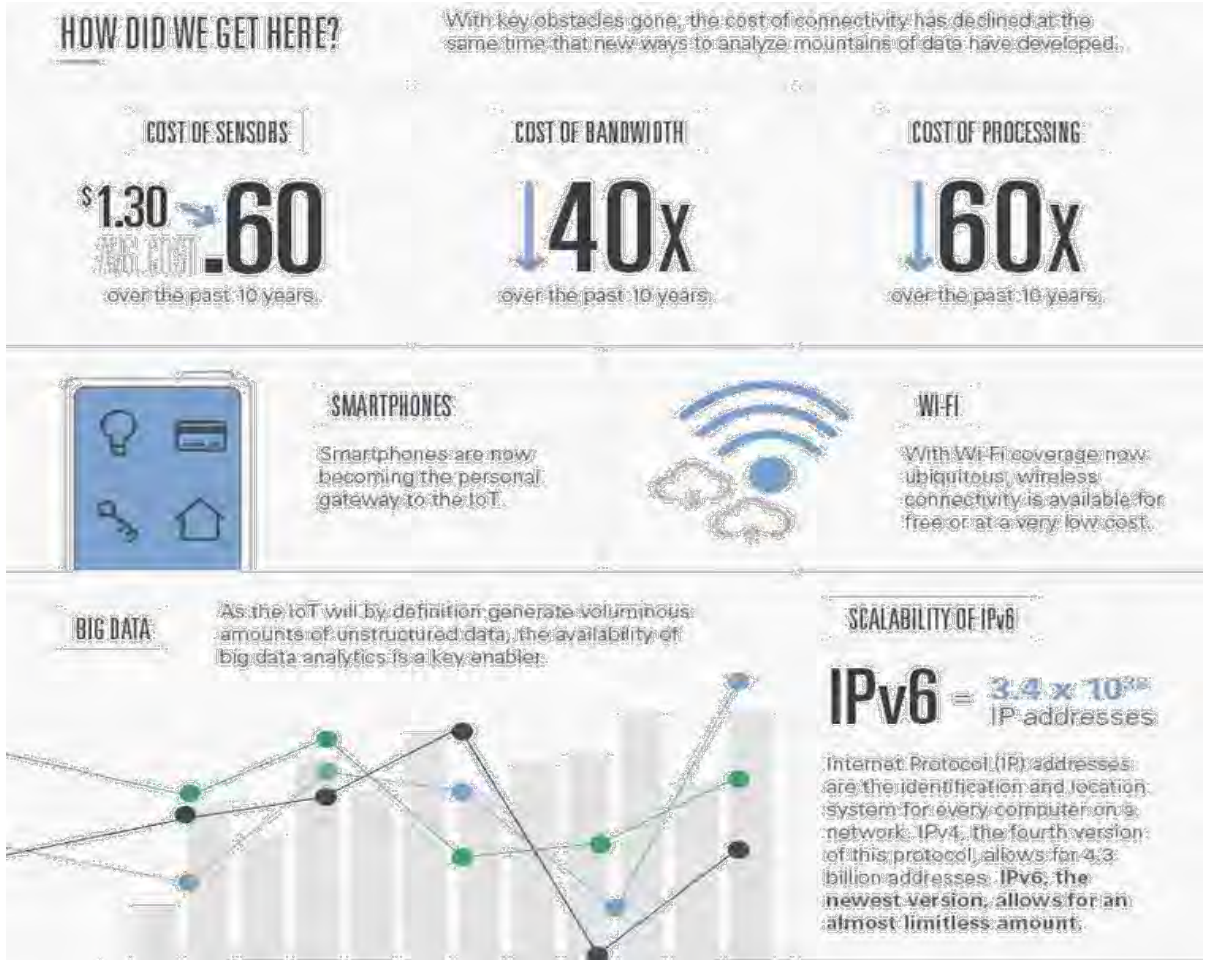
A Connected World

Figure1. Total of Connected Devices, Billions of Units (Installed Base)





Source: Siemens (Oct 2014)



Source: NetIQ (May 2015)

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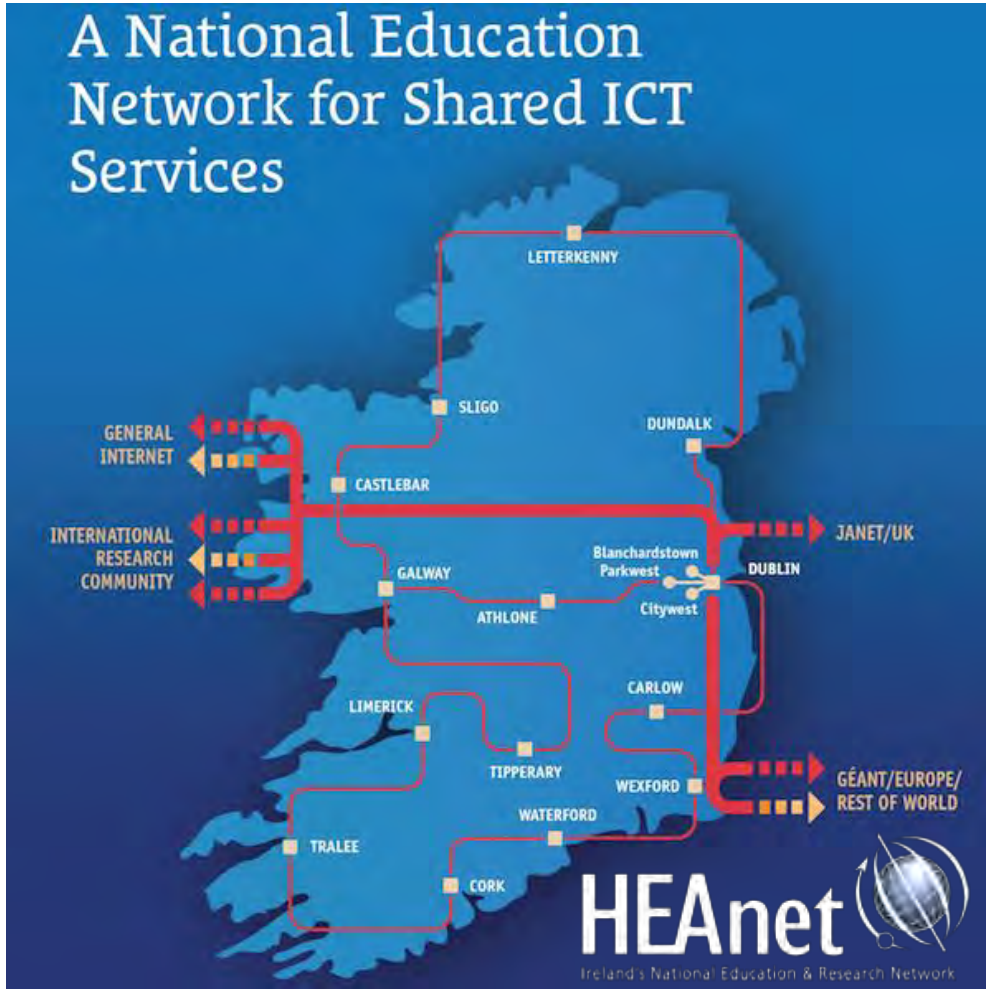
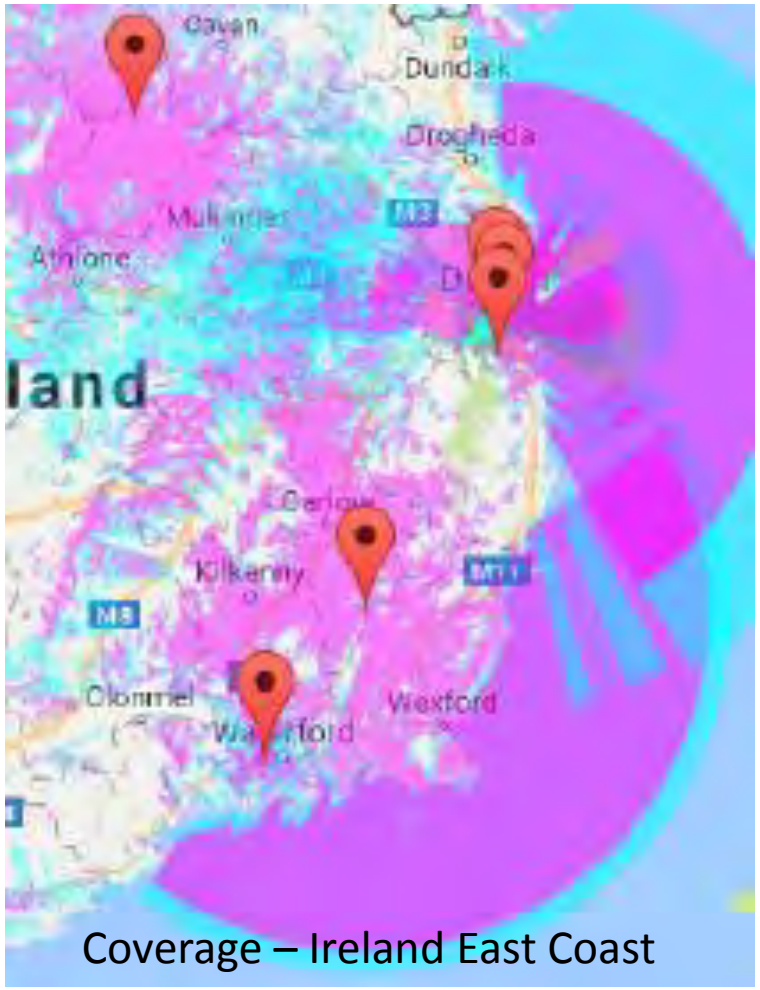
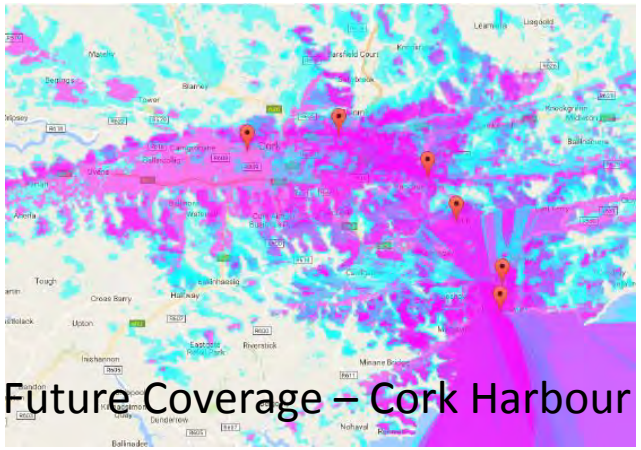
Pervasive Nation – Enabling Marine IoT





Coverage – Ireland East Coast

Future Coverage –Galway Bay


Future Coverage – Cork Harbour

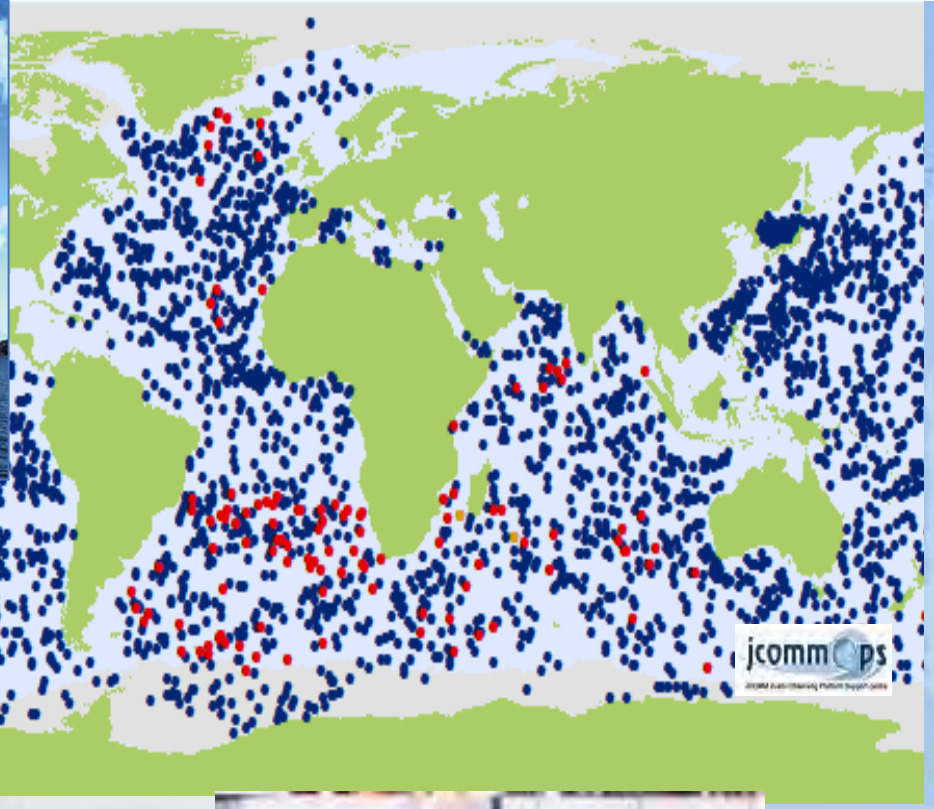
Pervasive Nation

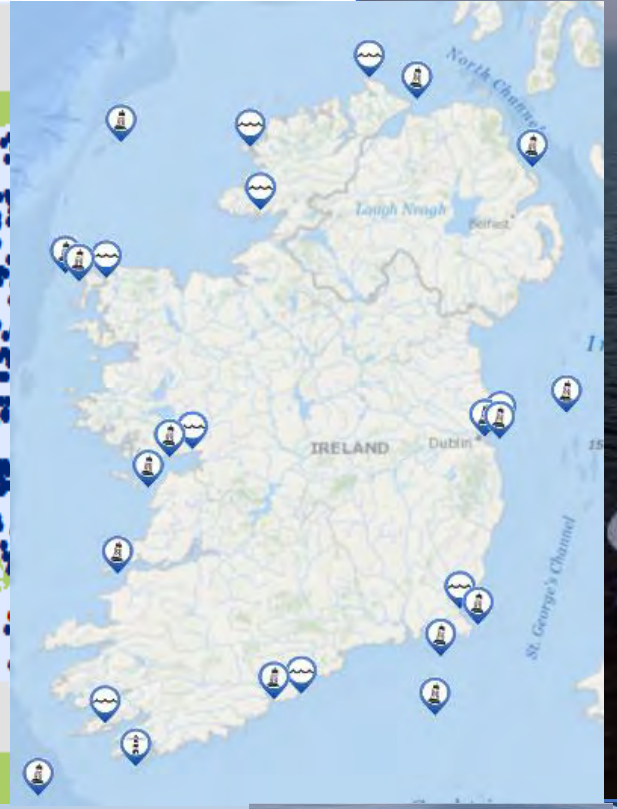
CONNECT Networks of the Future

Ireland's European Structural and Investment Funds Programmes 2014-2020
Co-funded by the Irish Government and the European Union

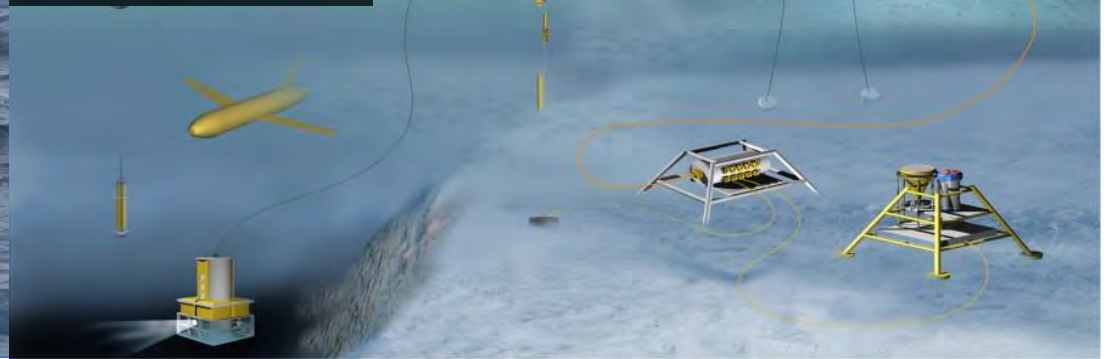
European Union
European Regional Development Fund

Science Foundation Ireland sfi For what's next

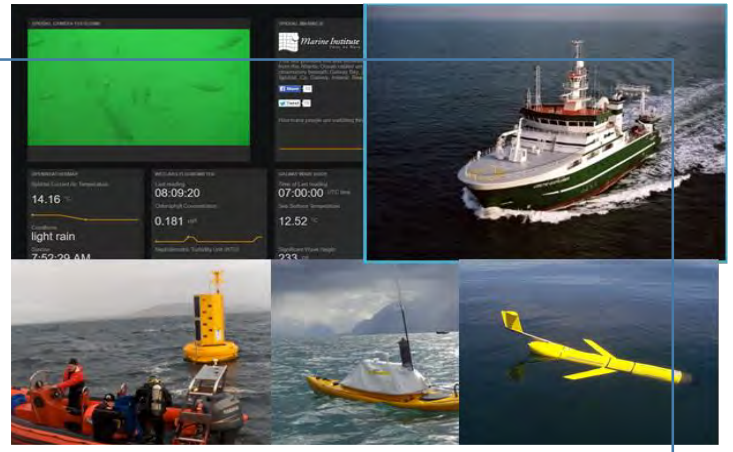

jcommops


North Channel
Lough Neagh
Belfast
IRELAND
Dublin
St. George's Channel

GAELIC EXPLORER

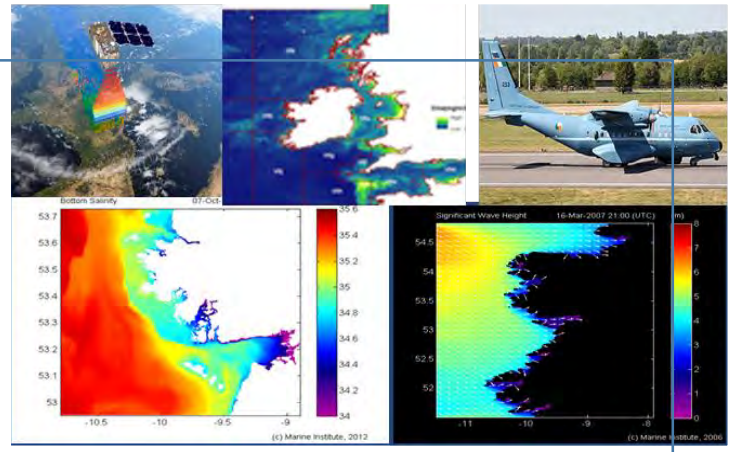


…and different types of marine digital content

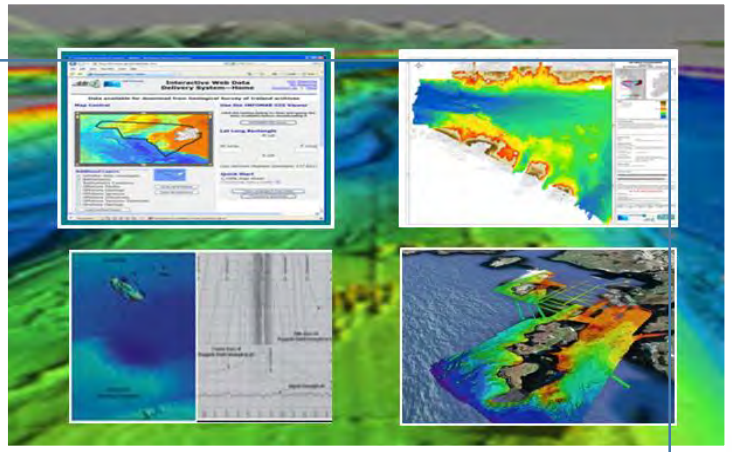


In-situ

Sampling



Remote Sensing and Models



Seabed

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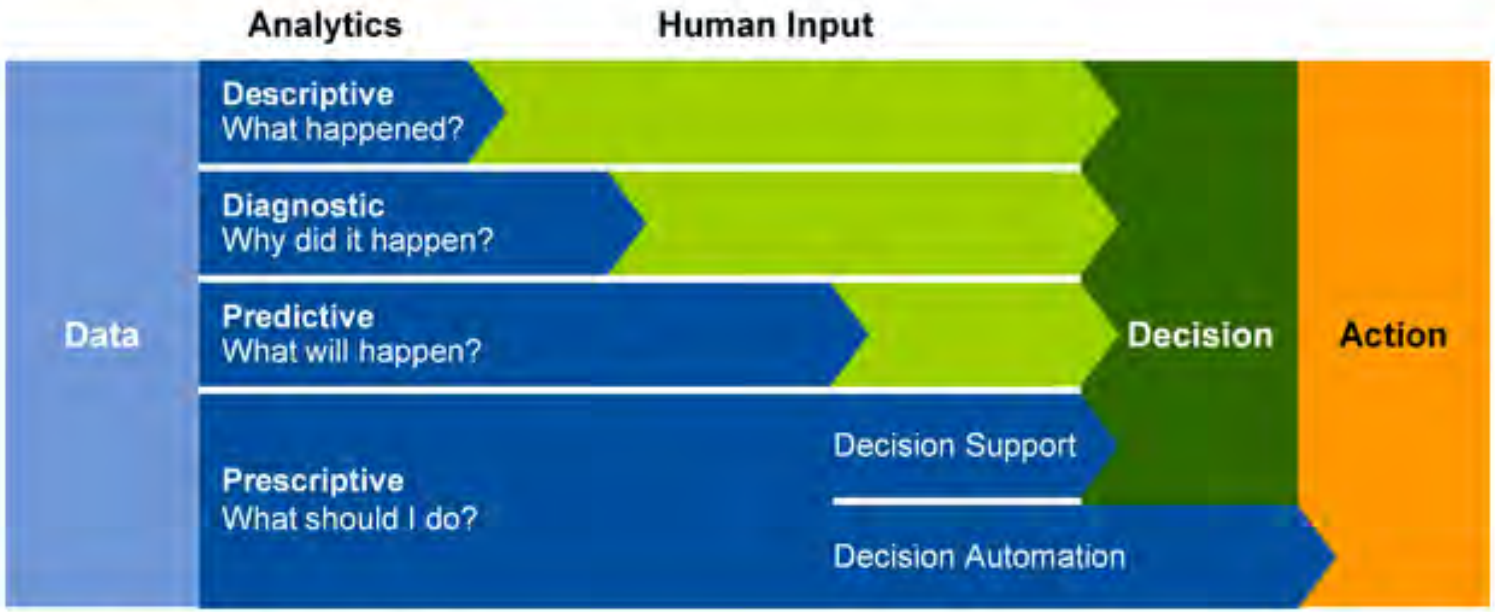
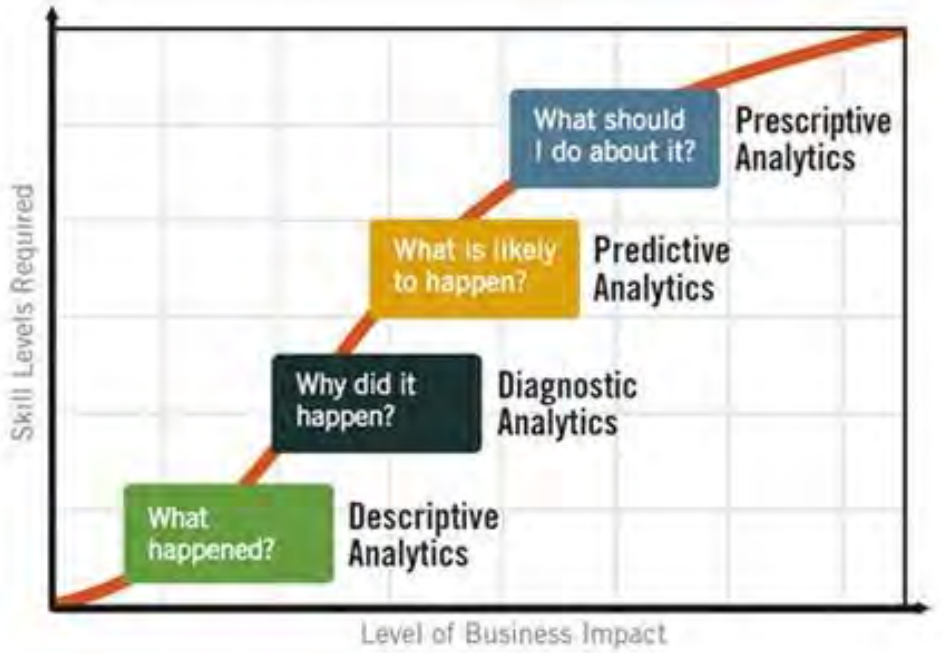
Increasing Value from Data to Decisions & Action

Figure 1: Four Types of Analytics Capability



Source: Gartner (October 2014)



[1] Neil Chandler, "Agenda Overview for Analytics, Business Intelligence, and Performance Management," Gartner (2013)

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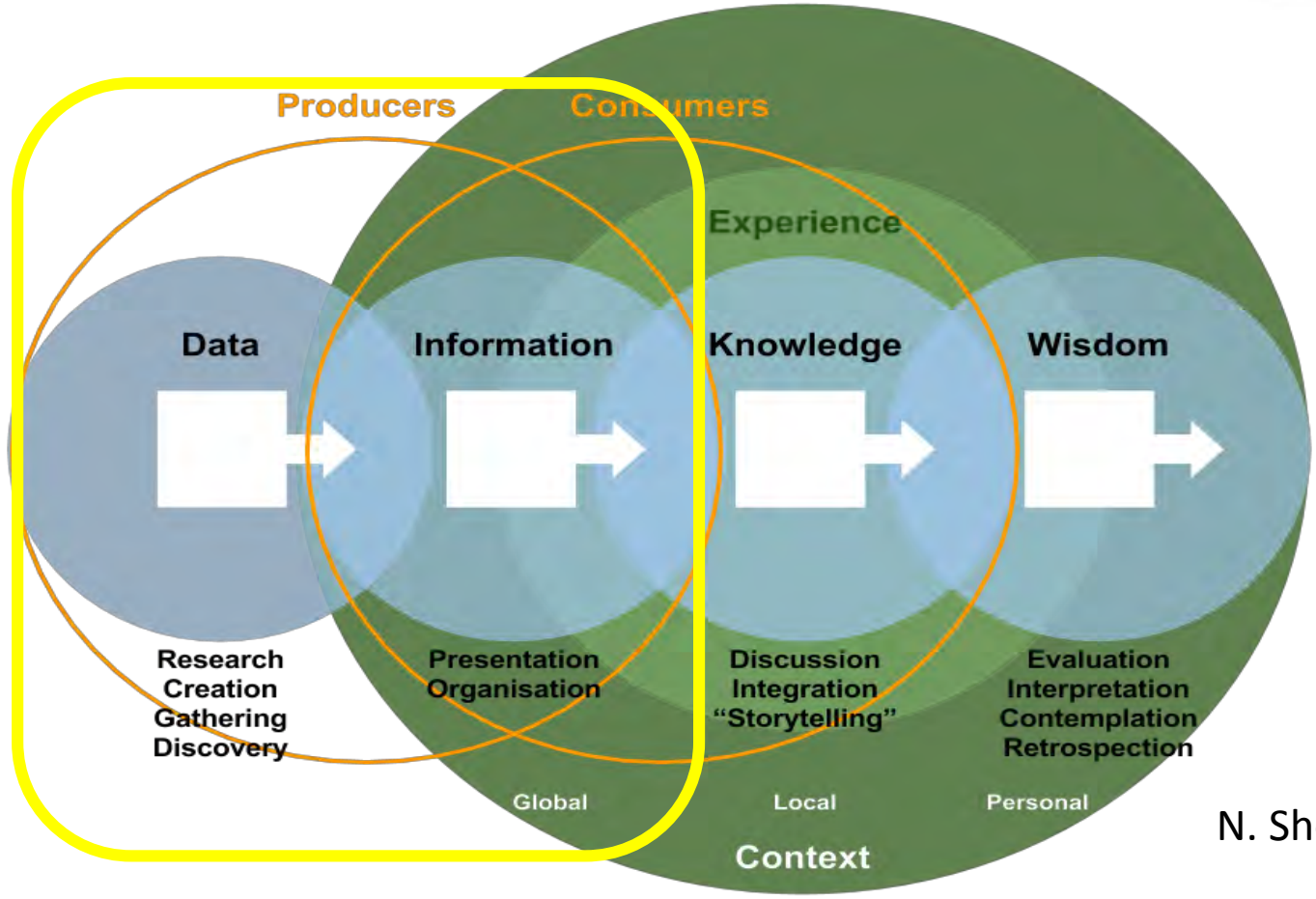
From Data to Information



N. Shedroff, 1999

Presentation, organisation and integration of data are important in developing new understanding

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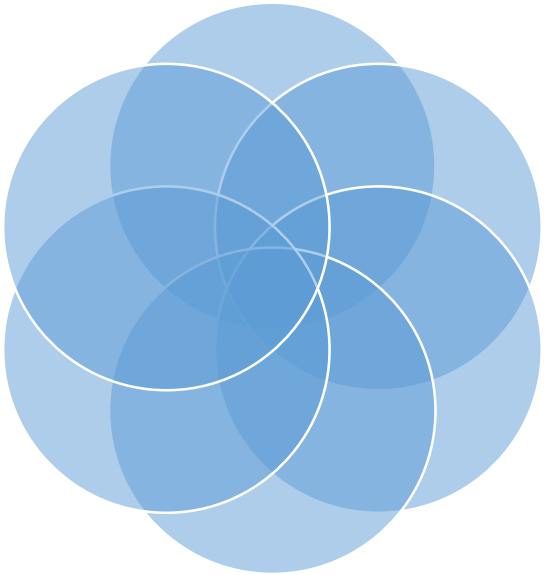
The Value Proposition

A coordinated way for access to national marine data

Ease of access to information (as well as data)



Reduced cost / effort to access information

Increased awareness of content

Faster development of new systems

Increased collaboration & reuse

"Data from smart, connected products is generating insights that help businesses, customers, and partners optimize product performance. Simple analytics, applied by individual products to their own data, reveal basic insights; more-sophisticated analytics, applied to product data that has been pooled into a "lake" with data from external and enterprise sources, unearth deeper insights"
(Porter and Heppelmann, 2015)

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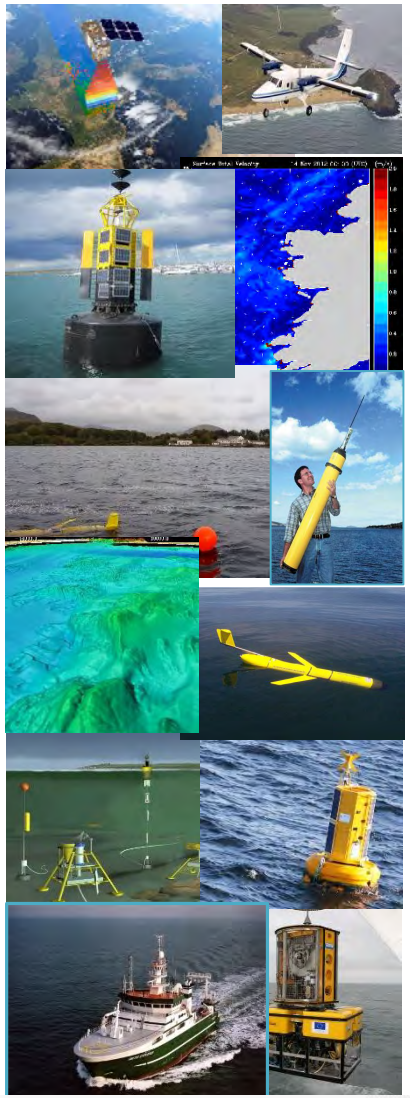
A Data Network Partnership



Custom APIs

ERDDAP

WMS

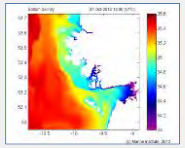
WFS

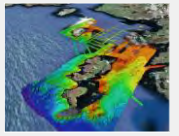
IRELAND'S DIGITALOCEAN

Portal
Integration & Application
Services

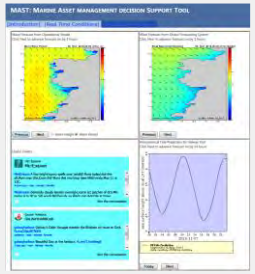
Public Sector

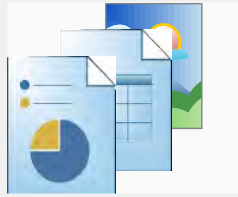
Research Organisations





Innovation Community





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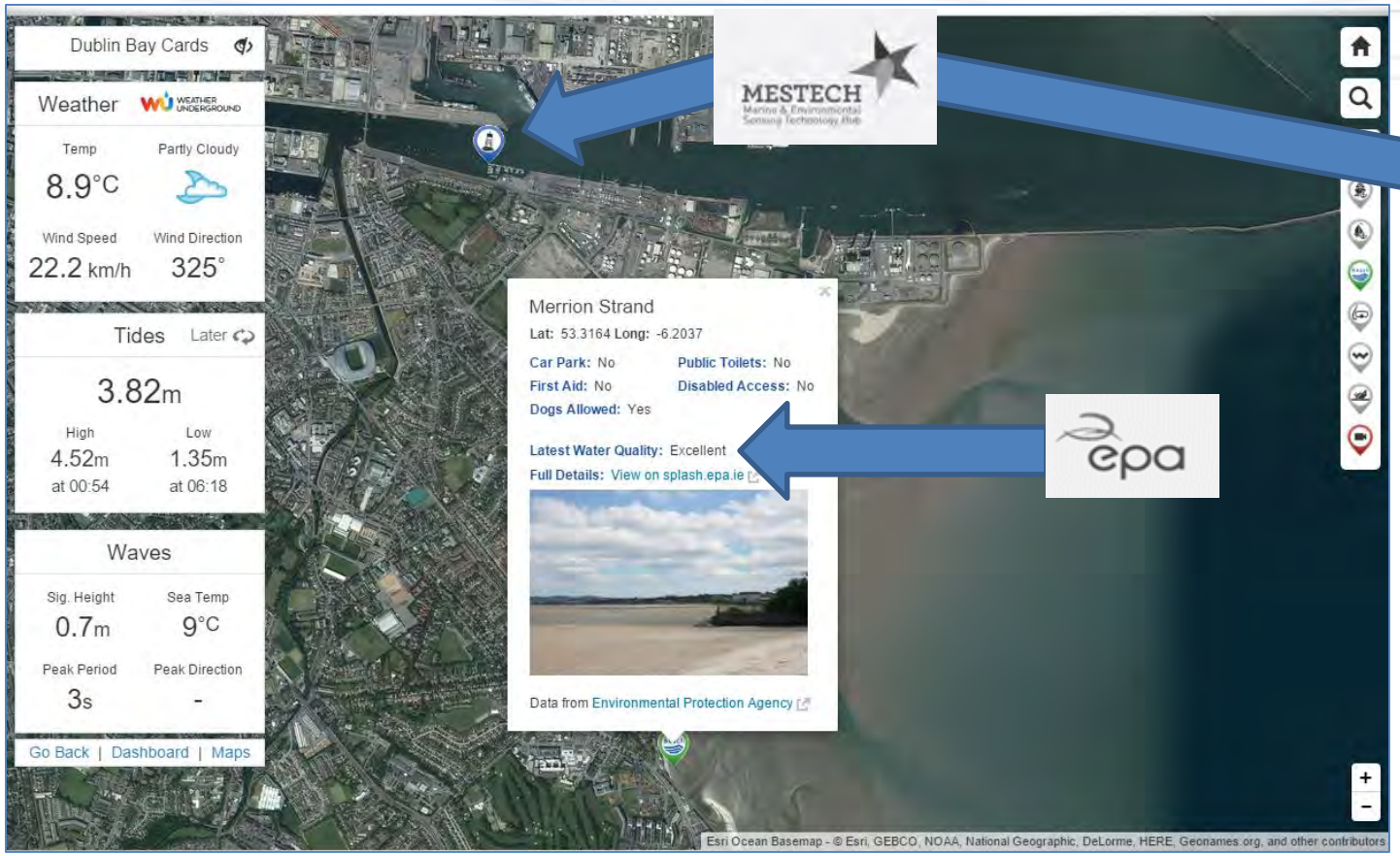
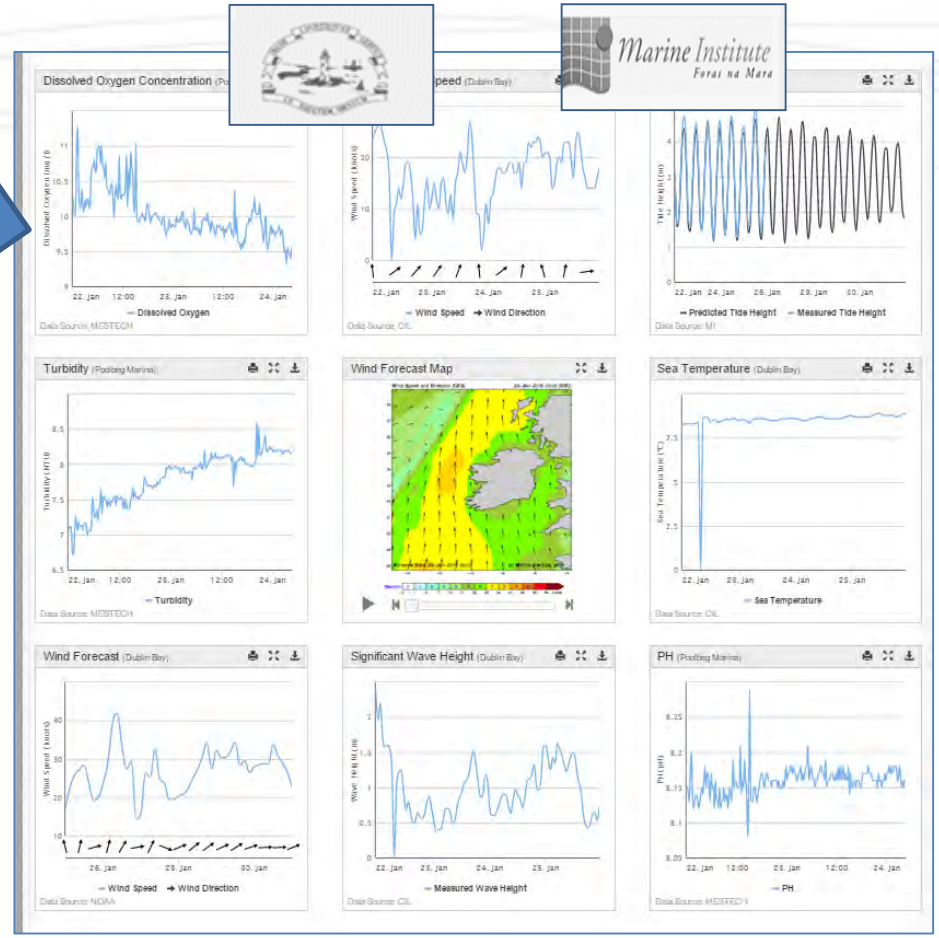
Visualisation of Data from Multiple Sources





www.digitalocean.ie

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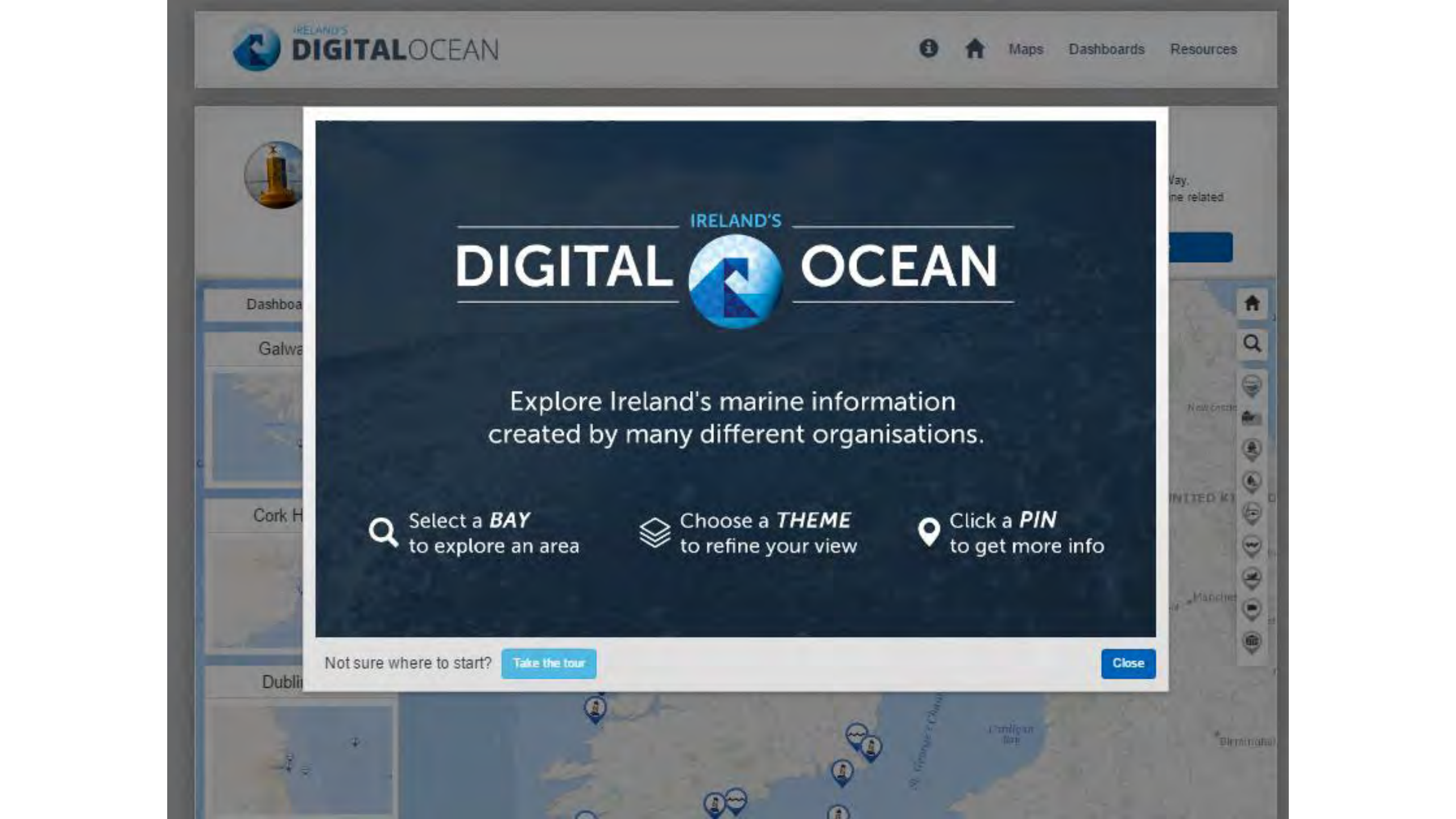
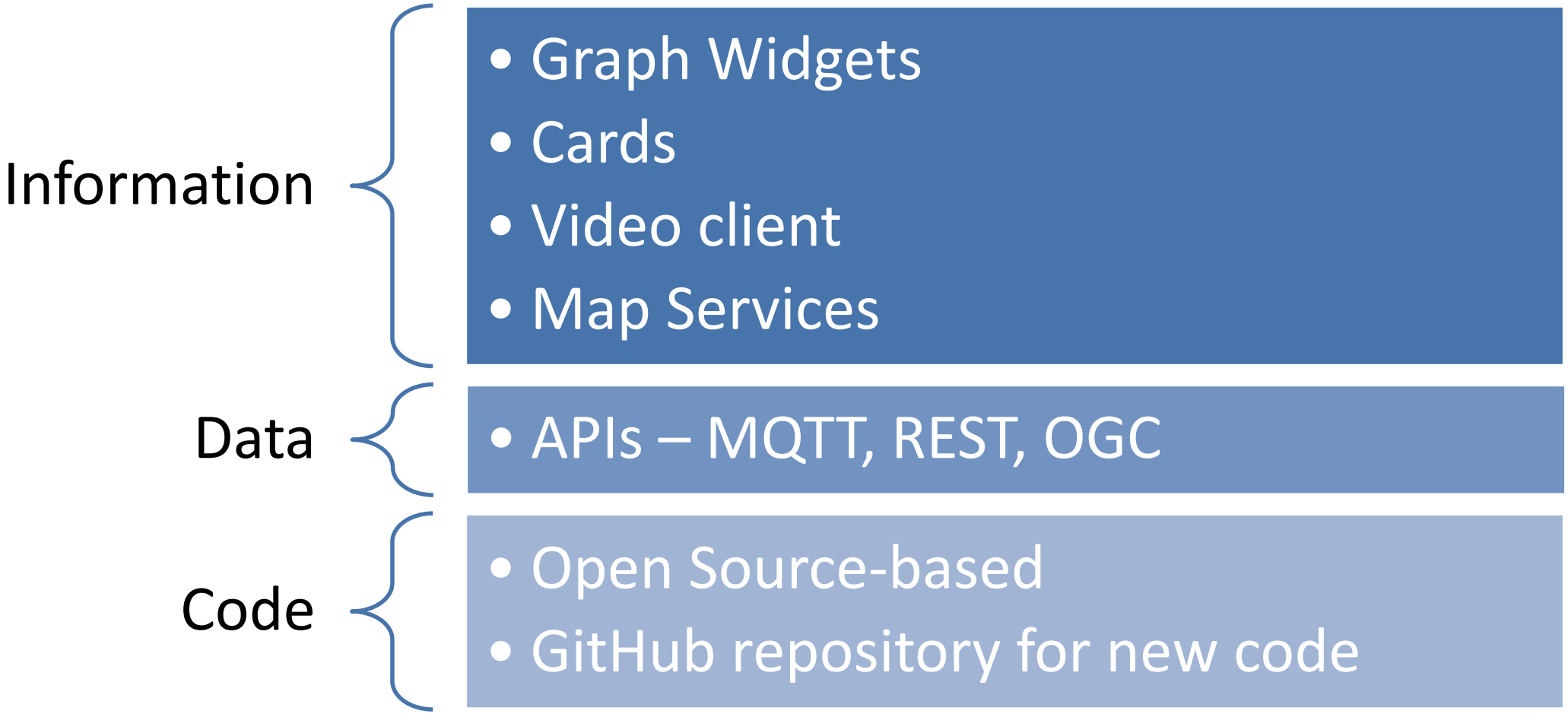

IRELAND'S
DIGITALOCEAN
Maps
Dashboards
Resources
IRELAND'S
DIGITAL OCEAN
Explore Ireland's marine information
created by many different organisations.
Select a BAY
to explore an area
Choose a THEME
to refine your view
Click a PIN
to get more info
Not sure where to start?
Take the tour
Close

Supporting Information, Data and Code reuse



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Supporting Information, Data and Code reuse

Information

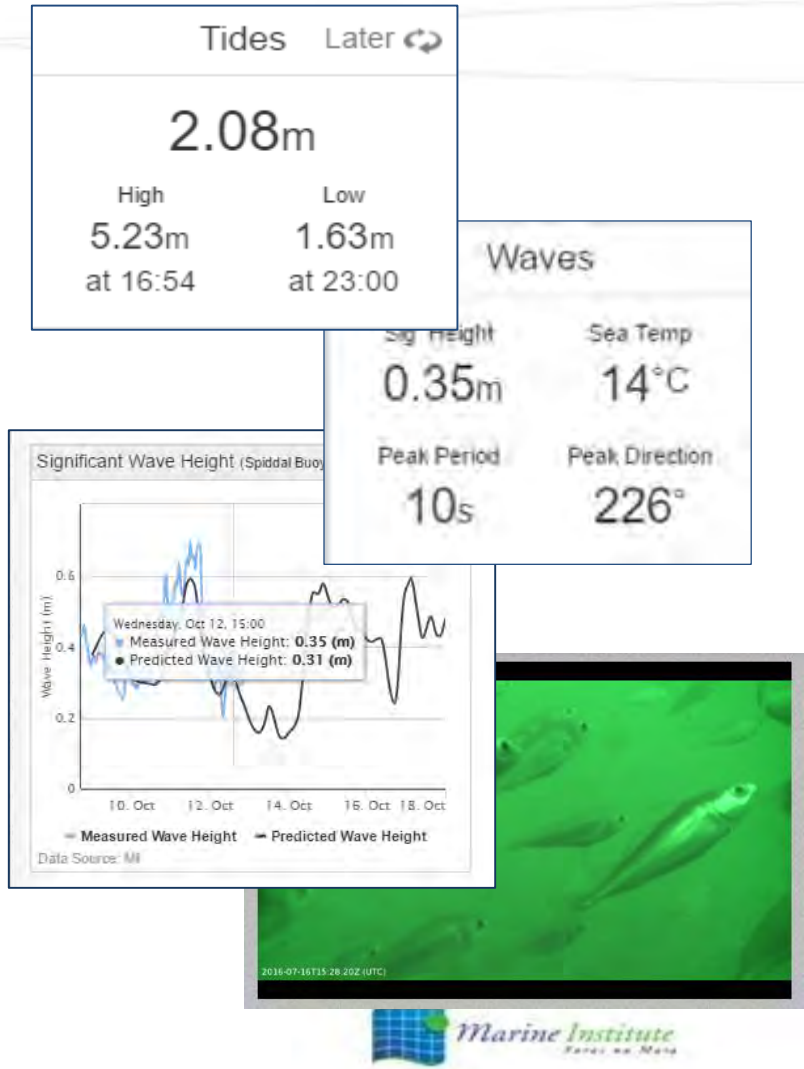
- Graph Widgets
- Cards
- Video client
- Map Services

Data

- APIs – MQTT, REST, OGC

Code

- Open Source-based
- GitHub repository for new code



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Supporting Information, Data and Code reuse

Information

- Graph Widgets
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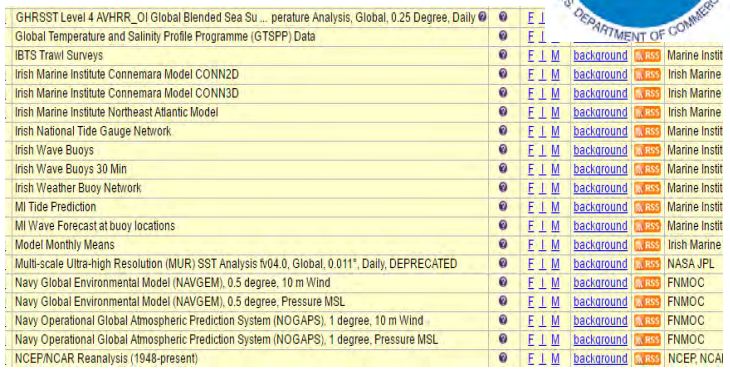
ERDDAP REST API



GHRSST Level 4 AVHRR_OI Global Blended Sea Su ... perature Analysis, Global, 0.25 Degree, Daily		F			
Global Temperature and Salinity Profile Programme (GTSPP) Data		F			
IBTS Trawl Surveys		F	M	background	Marine Instit
Irish Marine Institute Connemara Model CONN2D		F	M	background	Irish Marine
Irish Marine Institute Connemara Model CONN3D		F	M	background	Irish Marine
Irish Marine Institute Northeast Atlantic Model		F	M	background	Irish Marine
Irish National Tide Gauge Network		F	M	background	Marine Instit
Irish Wave Buoys		F	M	background	Marine Instit
Irish Wave Buoys 30 Min		F	M	background	Marine Instit
Irish Weather Buoy Network		F	M	background	Marine Instit
MI Tide Prediction		F	M	background	Marine Instit
MI Wave Forecast at buoy locations		F	M	background	Marine Instit
Model Monthly Means		F	M	background	Irish Marine
Multi-scale Ultra-high Resolution (MUR) SST Analysis fv04.0, Global, 0.011°, Daily, DEPRECATED		F	M	background	NASA JPL
Navy Global Environmental Model (NAVGEM), 0.5 degree, 10 m Wind		F	M	background	FNMOC
Navy Global Environmental Model (NAVGEM), 0.5 degree, Pressure MSL		F	M	background	FNMOC
Navy Operational Global Atmospheric Prediction System (NOGAPS), 1 degree, 10 m Wind		F	M	background	FNMOC
Navy Operational Global Atmospheric Prediction System (NOGAPS), 1 degree, Pressure MSL		F	M	background	FNMOC
NCEP/NCAR Reanalysis (1948-present)		F	M	background	NCEP, NCAI

SOS, WMS, WFS, CSW

MapServer

MQTT

MOSCA

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Supporting Information, Data and Code reuse

Information

- Graph Widgets
- Cards
- Video client
- Map Services

Data

- APIs – MQTT, REST, OGC

Code

- Open Source-based
- GitHub repository for new code

https://github.com/IrishMarineInstitute

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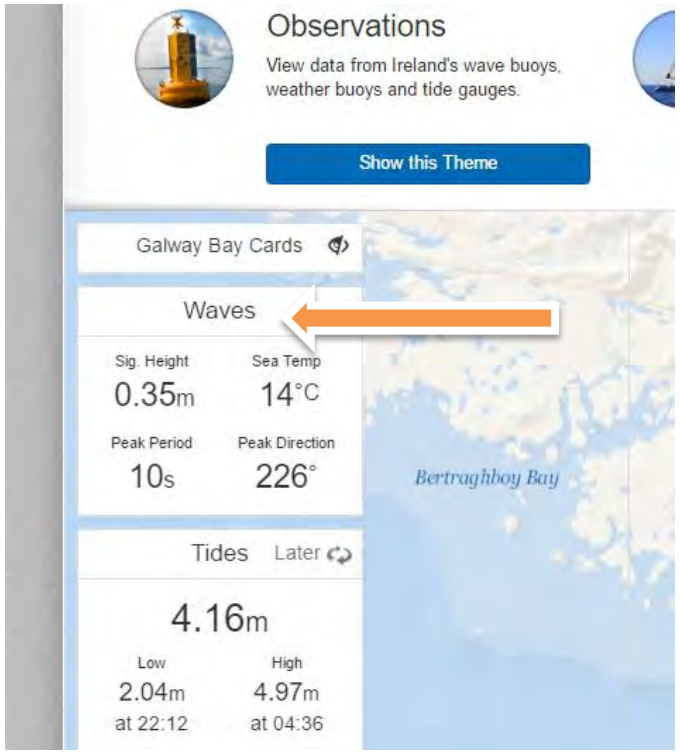
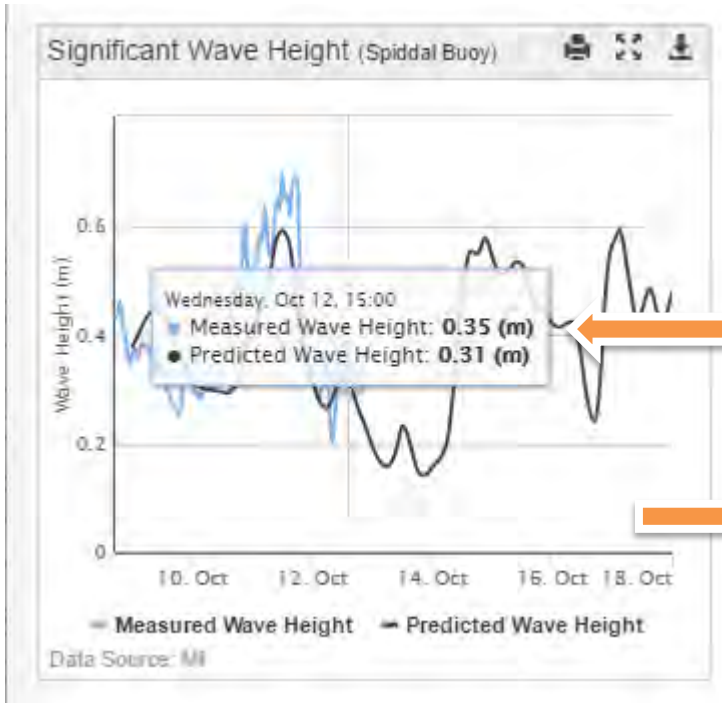
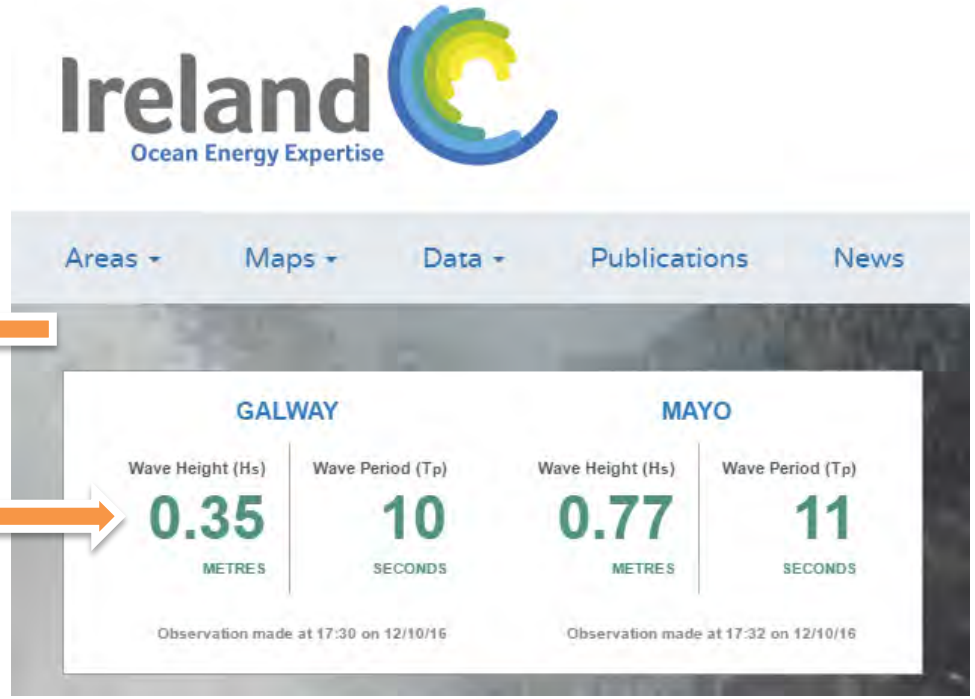
Usable and Reusable by Many







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Leverage for Multiple Sectors

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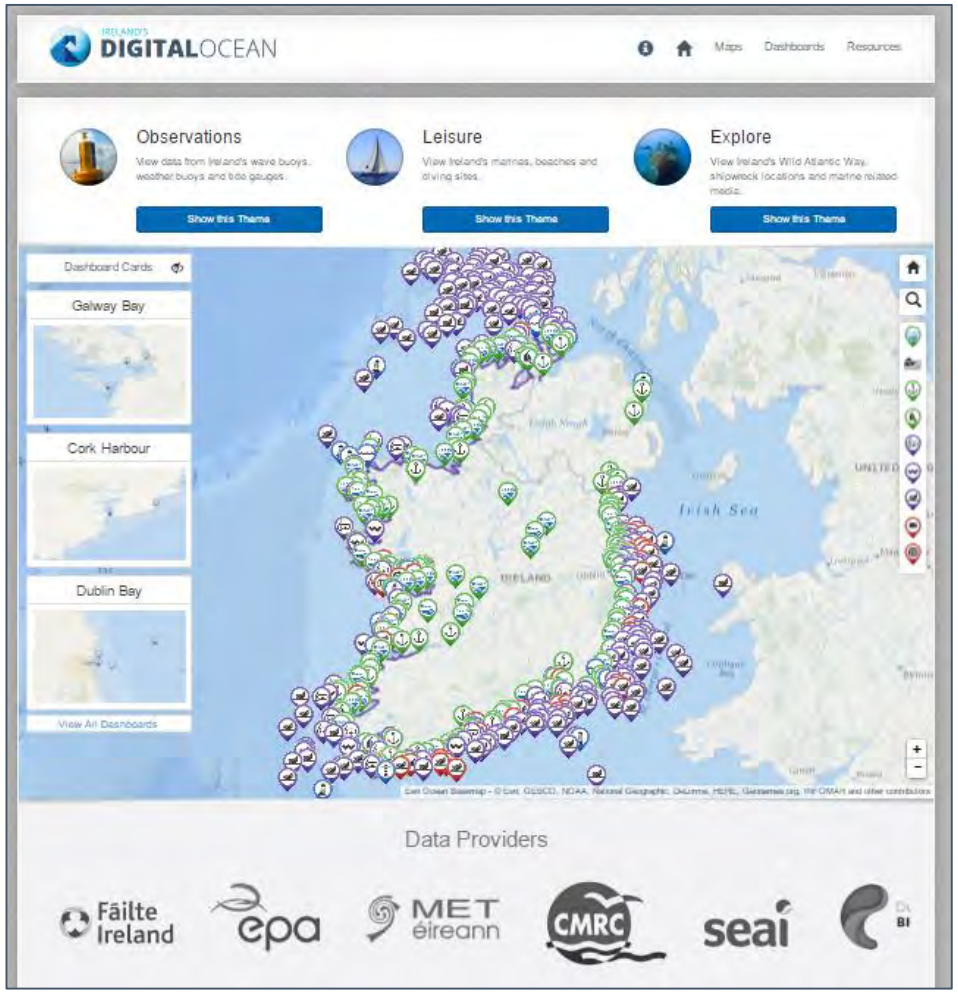
The Digital Ocean Opportunity

- **New technologies and capabilities** are generating new marine data, in new formats and from **many more sources.**
- These data are **often not easily accessible,** usable by many, or reusable
- A **community-based approach to sharing digital assets** for multiple stakeholder groups, will greatly expand the use of data being captured
- Greater awareness and easier access to digital content will enable **improved public services**, **cross-domain research collaboration** and will **facilitate innovation.**



Thank you

Ireland's Digital Ocean Portal
www.digitalocean.ie

Email:

eoin.ogrady@marine.ie
adam.leadbetter@marine.ie

Ireland's Digital Ocean Partners

Operational & Development

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Data Providers

Fáilte Ireland · ESB · Dublin Bay Biosphere · CMRC · NOAA