



How to improve data driven assessments of short term impacts: needs for specific derived biological data products

EMODNET Biological Data Products Workshop
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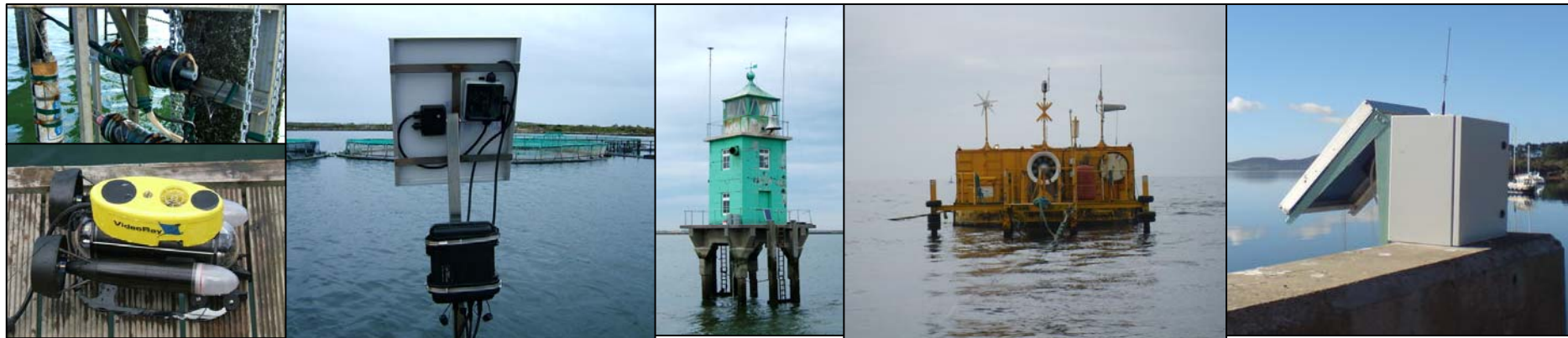
www.techworks.ie

TechWorks Marine: Background

- Established in 2002, based in Dun Laoghaire, Ireland
- Over 30 years experience in Operational Oceanography, Electronics and Sensor Integration.
- Develop Real-time Data Acquisition and Transmission Systems
- Providers of Real-time Monitoring Products and Services since 2005 in Europe:
 - **Water Quality Monitoring:** Aquaculture, Statutory Monitoring
 - **Tides and Waves Monitoring:** Surveys, Ports and Harbours, Marine Renewables and Coastal Engineering
 - **Integrated MetOcean Data Buoy Systems:** Statutory Monitoring, Marine Renewables
 - **Engineering and Equipment services:** State Agencies, Academia, Commercial sectors

Full Turnkey Products and Services

- **Integrated Data** collection and transmission solutions to monitor the marine environment.
- **Real-time data** transfer from remote monitoring platforms to facilitate effective management decision making by clients.
- **TechWorks Marine Black Box™ (TMBB)** is an Irish designed and developed proprietary data acquisition and transmission system
- TMBB is designed for use in **hostile environments** delivering data via real-time telemetry to viewed **online 24/7**.



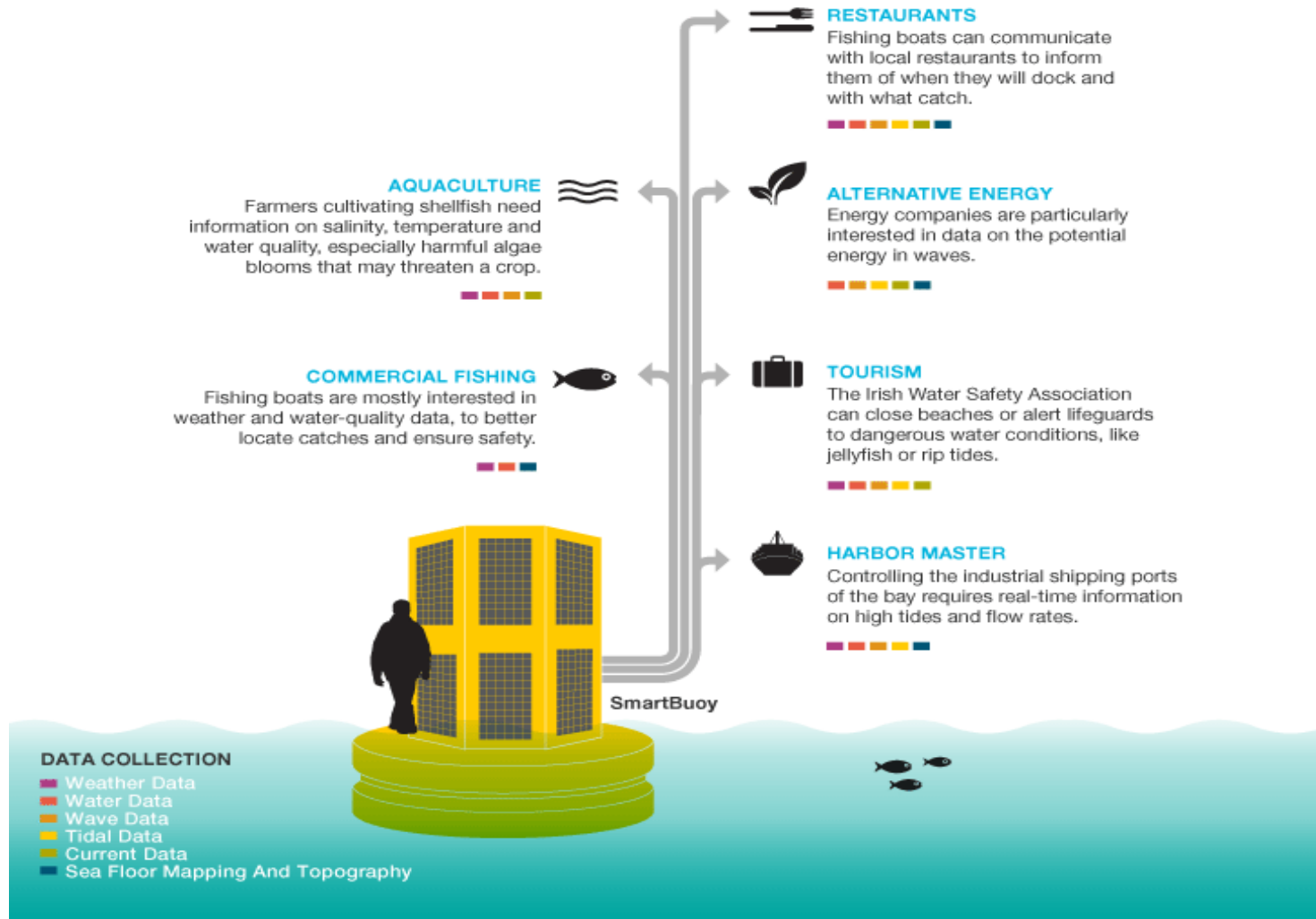


Irish Marine
Institute Coastal
Buoy Network –
Smartbay Buoys



SmartBay Galway

In Galway Bay, Ireland, data is collected from a variety of sources and used to inform a host of industries.



Source: IBM website

Water Quality Monitoring



Real-time integrated water quality monitoring products and services

For use on:

- Fish Farms*
- Engineering works*
- Offshore Energy*
- EU Water Framework Directive*
- Regulatory Monitoring*
- National Infrastructure*



Providing operational risk management tools to clients

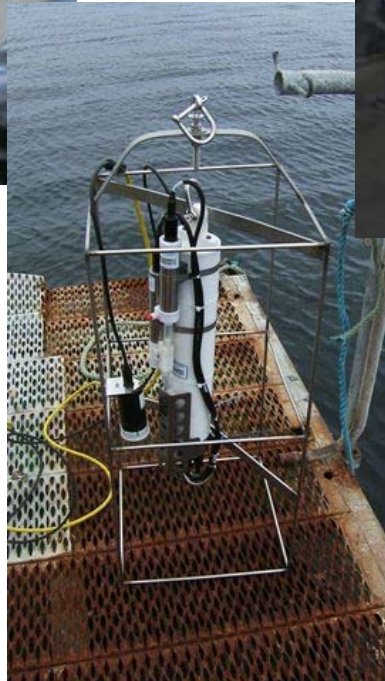
Aquaculture – Fin Fish

- Requirements for monitoring and good data:

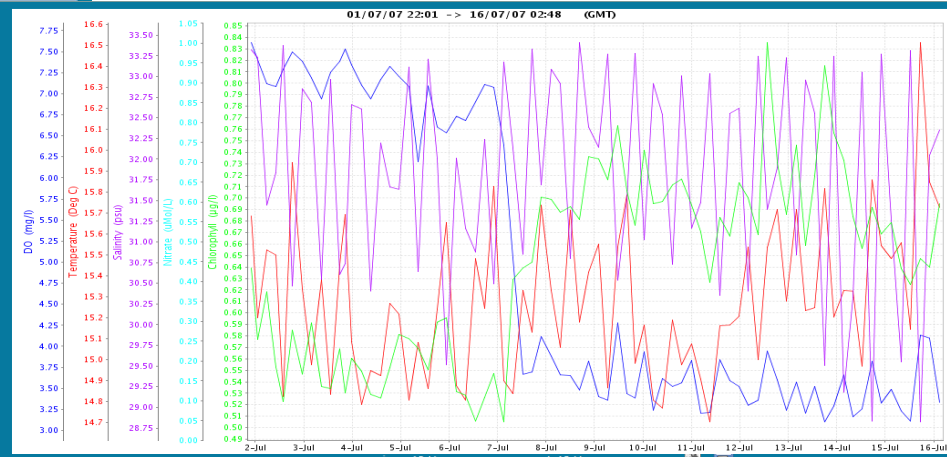
Risk Management Tool

- Reduction in Overhead costs:
- Accurate T, and DO data means more accurate information on feed quantities required for environmental conditions.
- Reduction on mortalities due to stress and environmental change
- Good for audit purposes (e.g. third party collected data)

Current monitoring



Real-time Web Data Tool

Administrate Instrument

company | employee | tmbb | instrument | parameter | reso.

Site - Tmbb serial nb:

Instrument:

Serial number:

Name:

Brand:

Class:

Description:

Application field:

Status:

Calibration frequency:

Last calibration date:

	Last value	Minimum	Maximum	Average
Chlorophyll (µg/l)	0.7	0.51	0.84	0.64
Nitrate (uMol/L)	?	?	?	?
Salinity (psu)	32.36	28.83	33.41	31.84
Temperature (Deg C)	15.73	14.7	16.51	15.29
DO (mg/l)	3.34	3.11	7.61	4.93

List of variables which can be plotted for data set

Tabular data of the selected time series

Triggering water sampler functionality

Aquaculture – Data Needs

- Local Information
 - Links to Algal Bloom events
 - Fish mortality links to water quality (historical records)
- Jellyfish information
 - Occurrence
 - Species
 - Biology (lifecycle information...)
- Marine Mammals

Marine Renewables

Ocean Energy Ltd.

- 25% scale model wave energy generation devices
- 2.5 years testing at sea on SEI test site, Spiddal, Co Galway



TechWorks Marine provides:

- Real-time remote control of wave energy device using wireless telemetry
- Live webcam transmitted over WIFI
- Real-time metocean data collection

Marine Renewables

- Biological data required by device companies:

- Marine Mammals

- Developers need to ensure their equipment will not be a hazard and threat to marine mammals.
 - Currently using hydrophones to monitor these. Need for technology development to differentiate between different species automatically.
 - In very coastal areas information on seals and other mammals is needed.

Marine Renewables

openhidro
tidal technology

Coastal Engineering

Example: Shannon Tunnel, Ireland.

Data Requirements:

- Salmon and Eel migratory trends
- Cetacean population information
- Bird habitats

DirectRoute monitoring



Jellyfish Forecasting

Jellyfish have a massive economic impact globally:

- Tourism (Spain, Australia)
- Aquaculture (Northern Ireland, Scotland, Ireland)

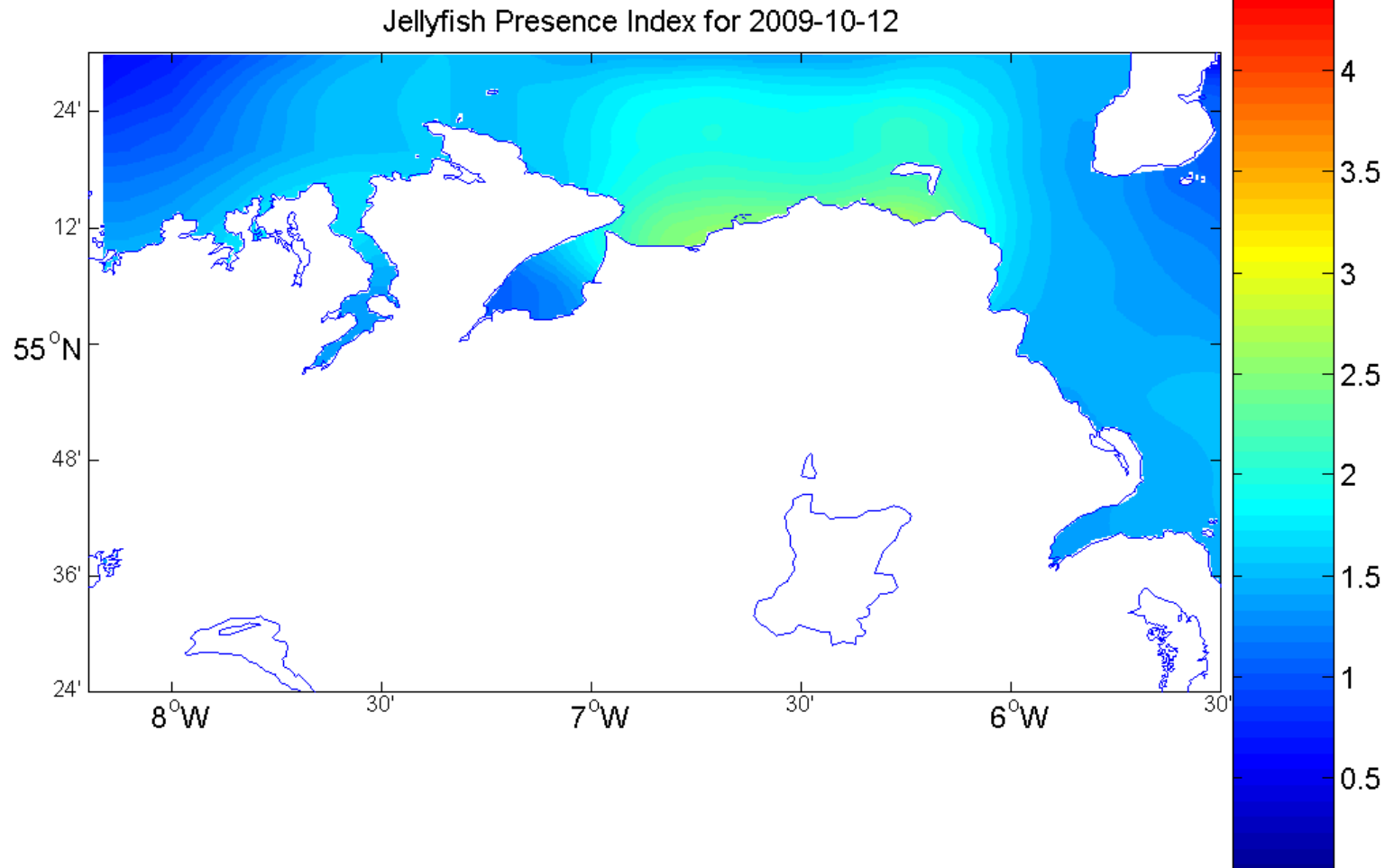
Forecasting tools need in situ data validation and “visual observations”.

Glenarm Organic Salmon

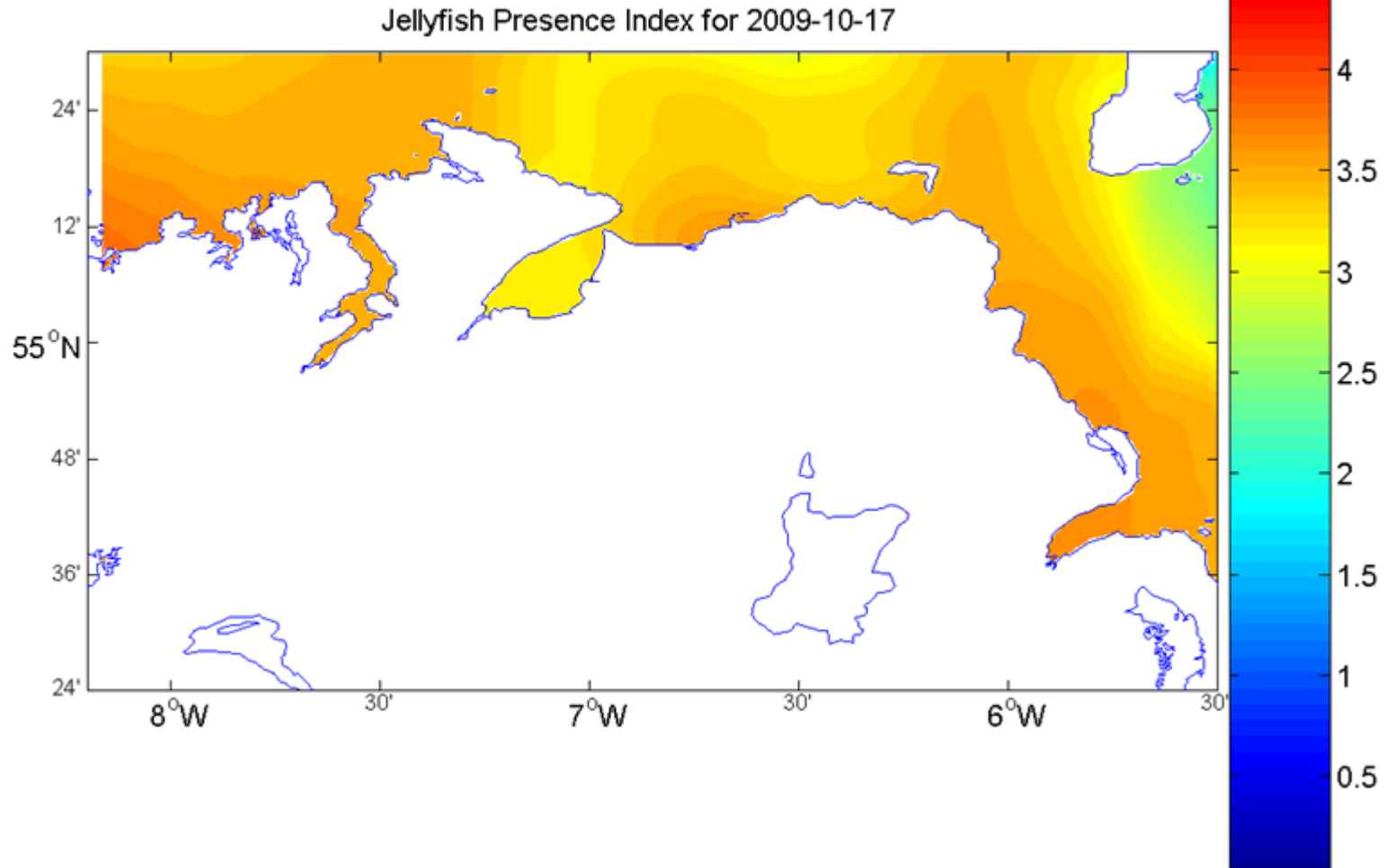
2007 fish kill



Jellyfish Forecast tools

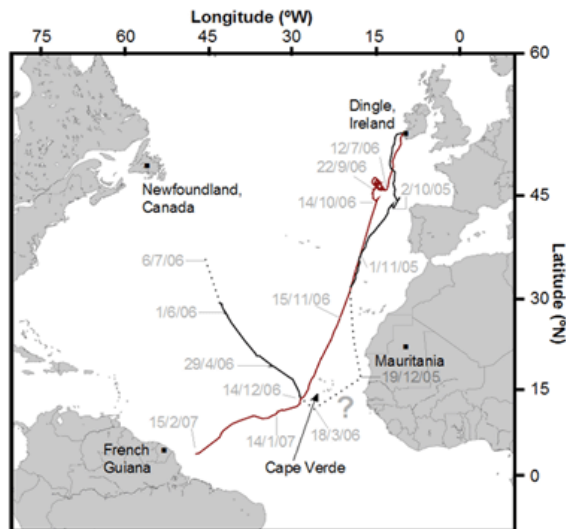


Jellyfish Forecast tools (2)

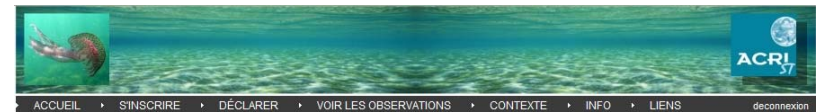


Biological Data Needed

- What we need:
 - Jellyfish sightings information
 - Plankton Information
 - Leatherback turtle sightings



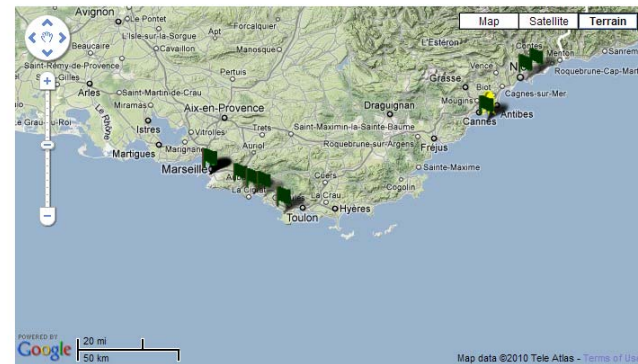
Source: jellyfish.ie



Observations depuis 60 jour(s) (25-12-2009)

Observations depuis jour(s)

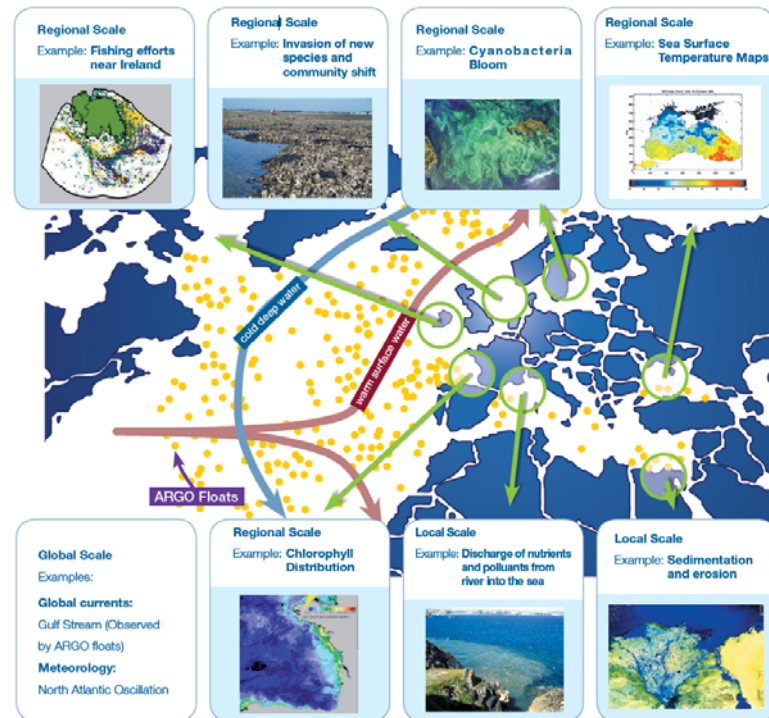
Choisir un secteur:



Remarque: les modes "Plan", "Satellite" et "Mixte" autorisent un niveau de zoom plus important que le mode "Relief".

Issues going forward

- Data Coverage/Scale: temporal and spatial



Issues (2)

- Data Quality: Common QA procedures across the board, difficult for visual observations, is it even possible?
- Data Access: Is there a data policy in place for the commercial sector to use such information for “downstream service” provision or even R&D.

Summary

- Physical data (C,T, DO) is relatively easy to source or acquire in situ for clients.
- Biological data is generally scarce and data repositories are not well known or publicised outside of the academic/research communities.
- Sharing of information from our experience is not common practice between academia/research and the commercial sector even for research purposes.
- There will be a greater need for long terms biological data sets going forward with the ever increasing coastal activity, the data requirements will be very localised, data resolution may be an issue.
- Quality Assurance and common data formats will have to be worked on if the EDMODNET approach is going to work and be used by the community at large

“One Stop Shop” for marine data is a great aspiration but will it happen?

Thank You

www.techworks.ie