



Company Overview
ESA Activities to 2020

Charlotte O'Kelly
Managing Director
TechWorks Marine Ltd.

Marine Data Systems
Robust, Reliable, Secure



Integrated Data Buoys

- Real-time enabled
- TMBB data acquisition technology
- Plug and play with a wide range of marine sensors
- 3G, VHF, and Iridium communications.



Data Management and Delivery

- Regular field service
- Data telemetry
- Data management including: quality assurance, calibration
- Live data portals

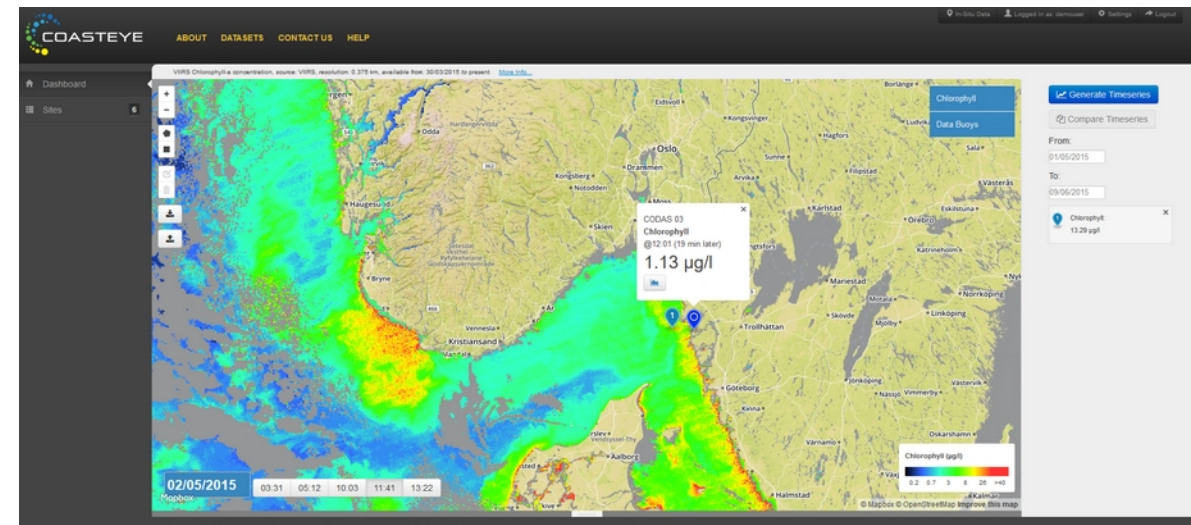
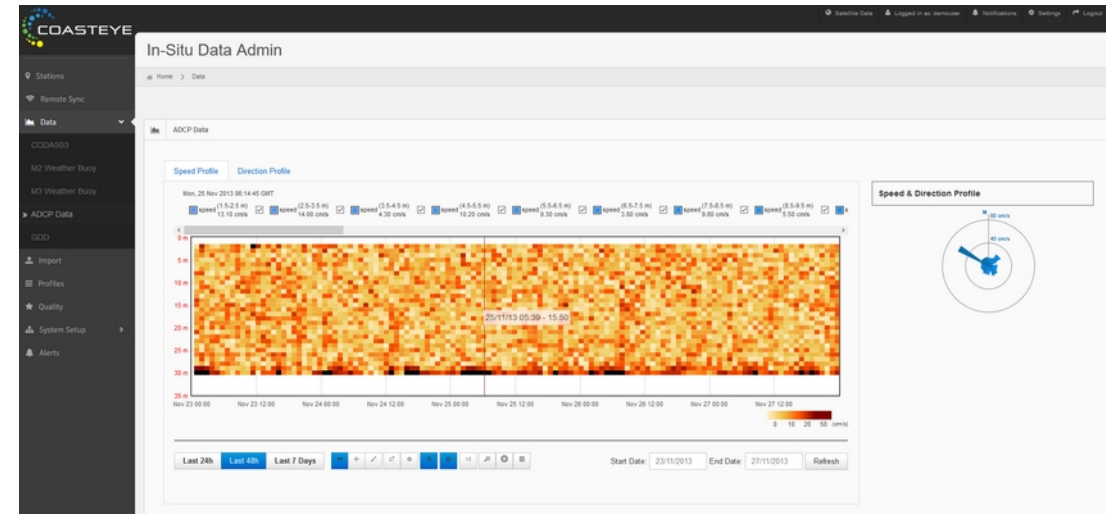


Value added products & services

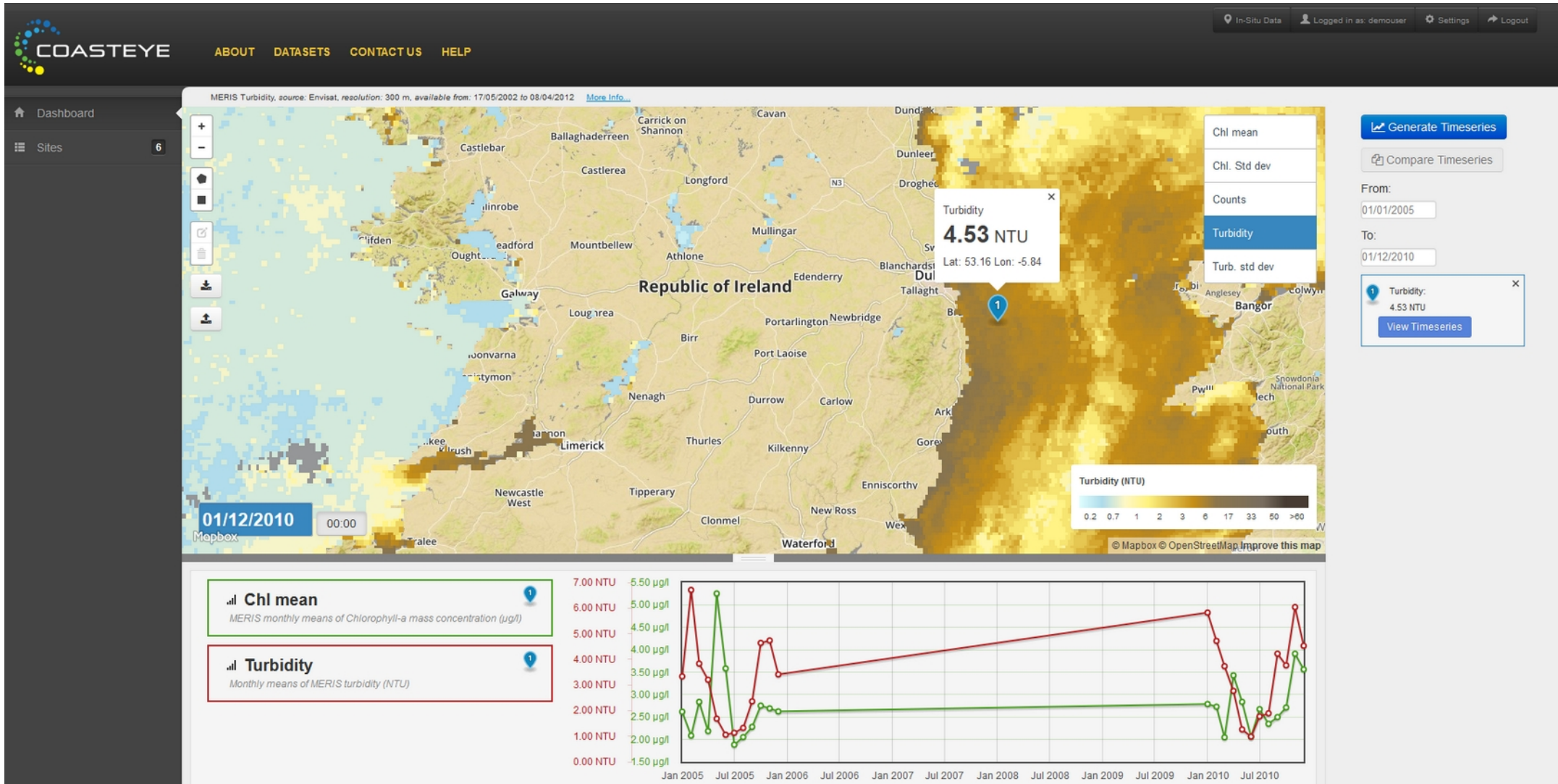
- Validating numerical models
- Hydrographic/Metocean survey provision
- Equipment sales/Rental
- Using satellite EO data products (spatial resolution)

Cloud Based Data Fusion Platform

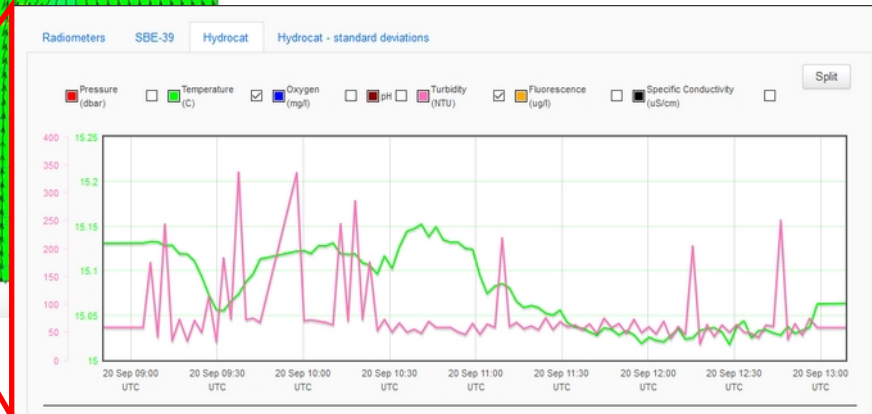
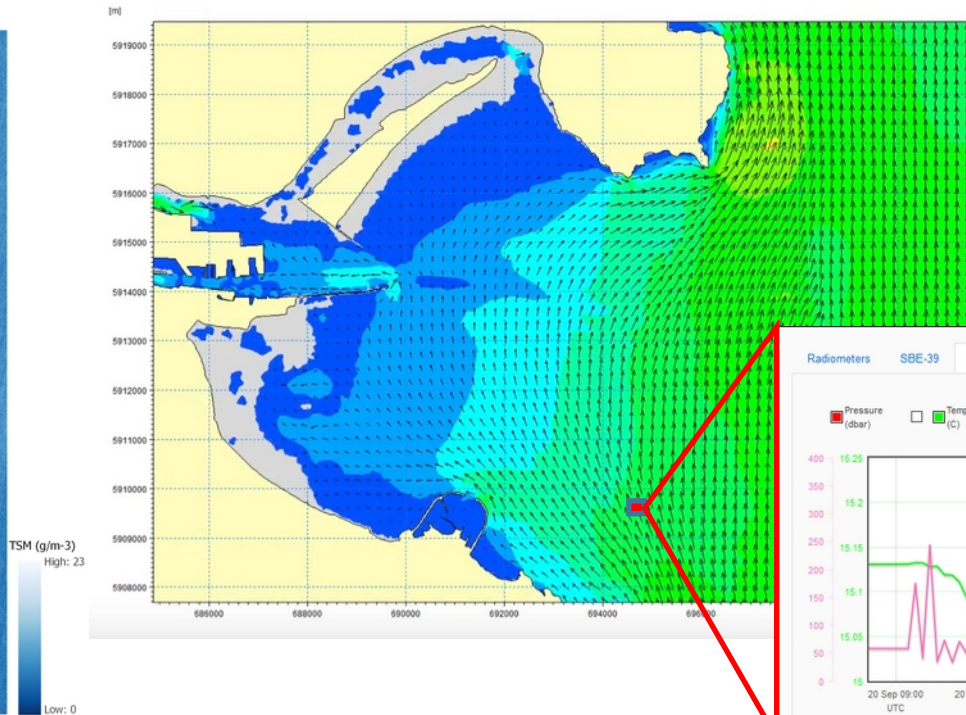
- Manage and monitor all deployed data buoys systems
- Visualise real-time data
- Upload/download and annotate data
- Visualise spatial data e.g Earth Observation Data products
- Access to model output e.g. WW3
- All data quality controlled
- Secure client access



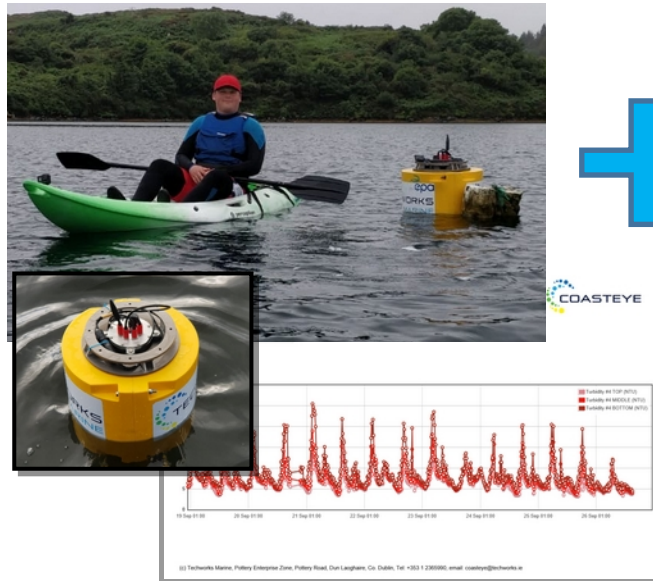
- CoastEO – validation of satellite data using CoastEye Minibuoy
- CoastVAL - ESA funded coastal validation project for Sentinel 3 (Ocean Colour) satellite
- ResGrow – Satellite EO products for Marine Renewables
- C-Wams – Satellite EO products for Wastewater Treatment/Desalination Plants
- SeaSearch – Tracking of Mobile assets at Sea



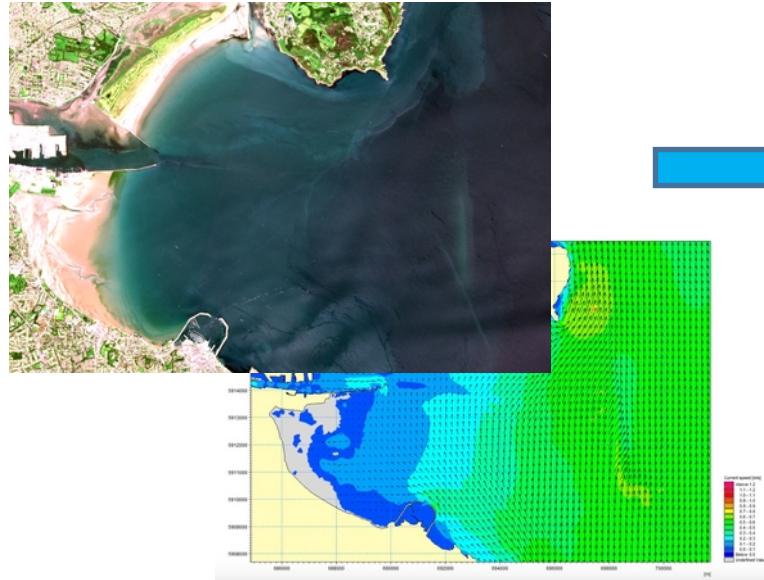
Ongoing activities



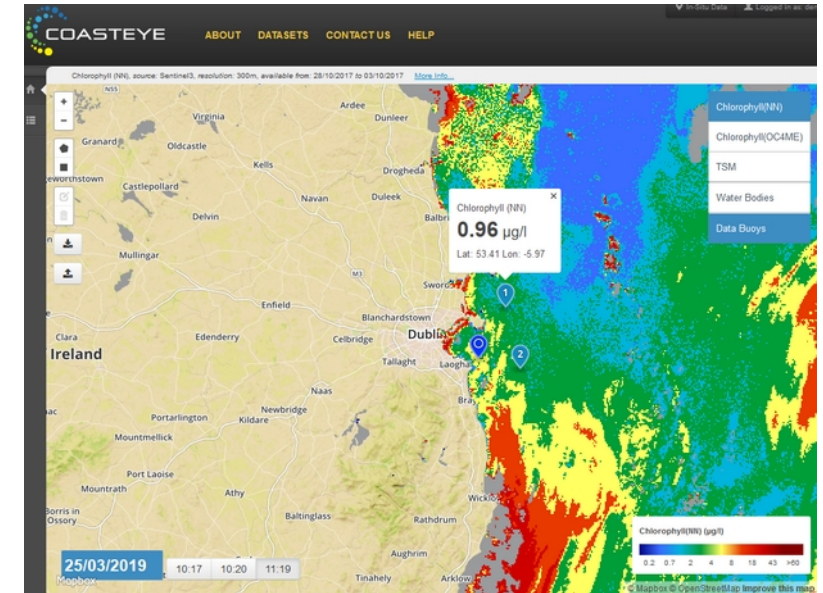
- Developing capacity to provide regional turbidity measurements from Sentinel 2
- Commercial monitoring services through new ESA “CoastEO” project
 - Users in dredging, construction, & environmental monitoring sectors
 - In situ monitoring using MiniBuoy & lower cost sensors validated against CoastVal equipment



In situ data



Satellite data + processing chains



Validated information

Objective: Low cost buoy platform + Sentinel 1/2/3 processing chains => validated water quality information

Timeline: 01/2020 – 07/2021

Customers: port authorities, regulatory agencies, water agencies, engineering companies

Aims: reduce time and costs of customer, through provision of ongoing coastal environmental water quality monitoring via EO



Designed for real-time monitoring in coastal and fresh water environments, the very low power nature of the buoy system enables the user to sample from multiple sensors at any one time.

Features:

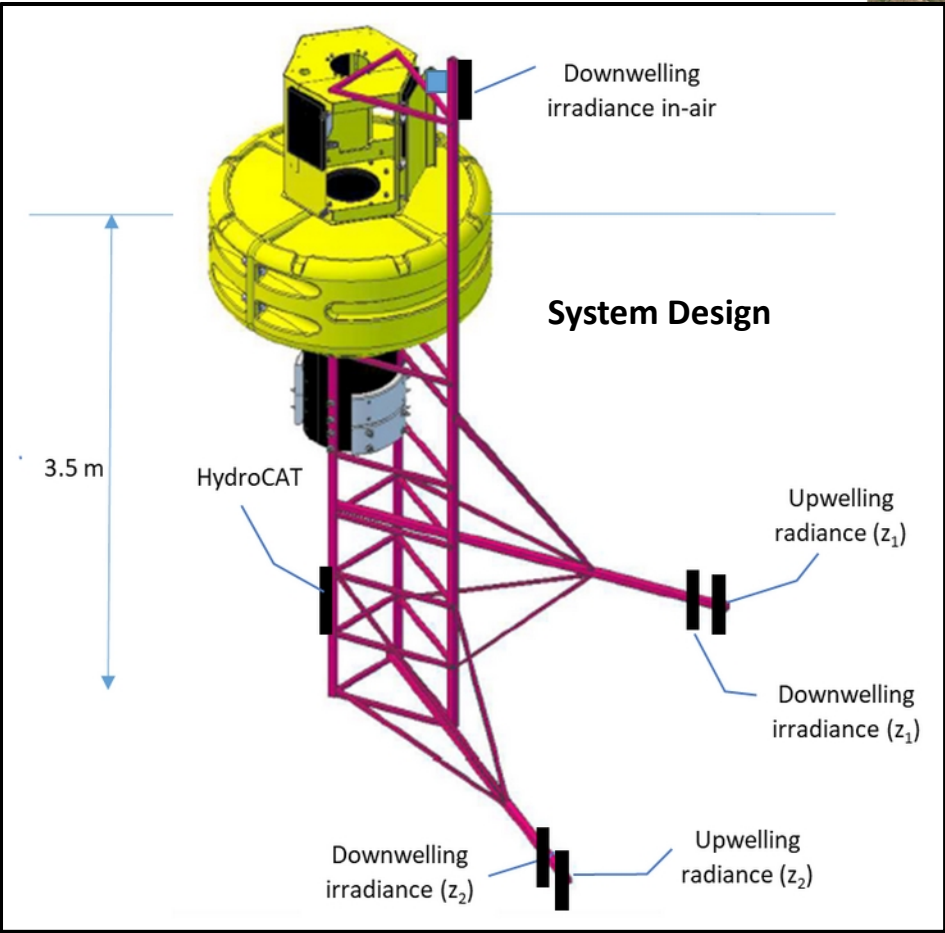
- Portable and easily deployable
- Flexible input options – up to three sensors
- Flexible telemetry options
- Flexible sampling
- Web based data interface
- Full platform monitoring and warning system



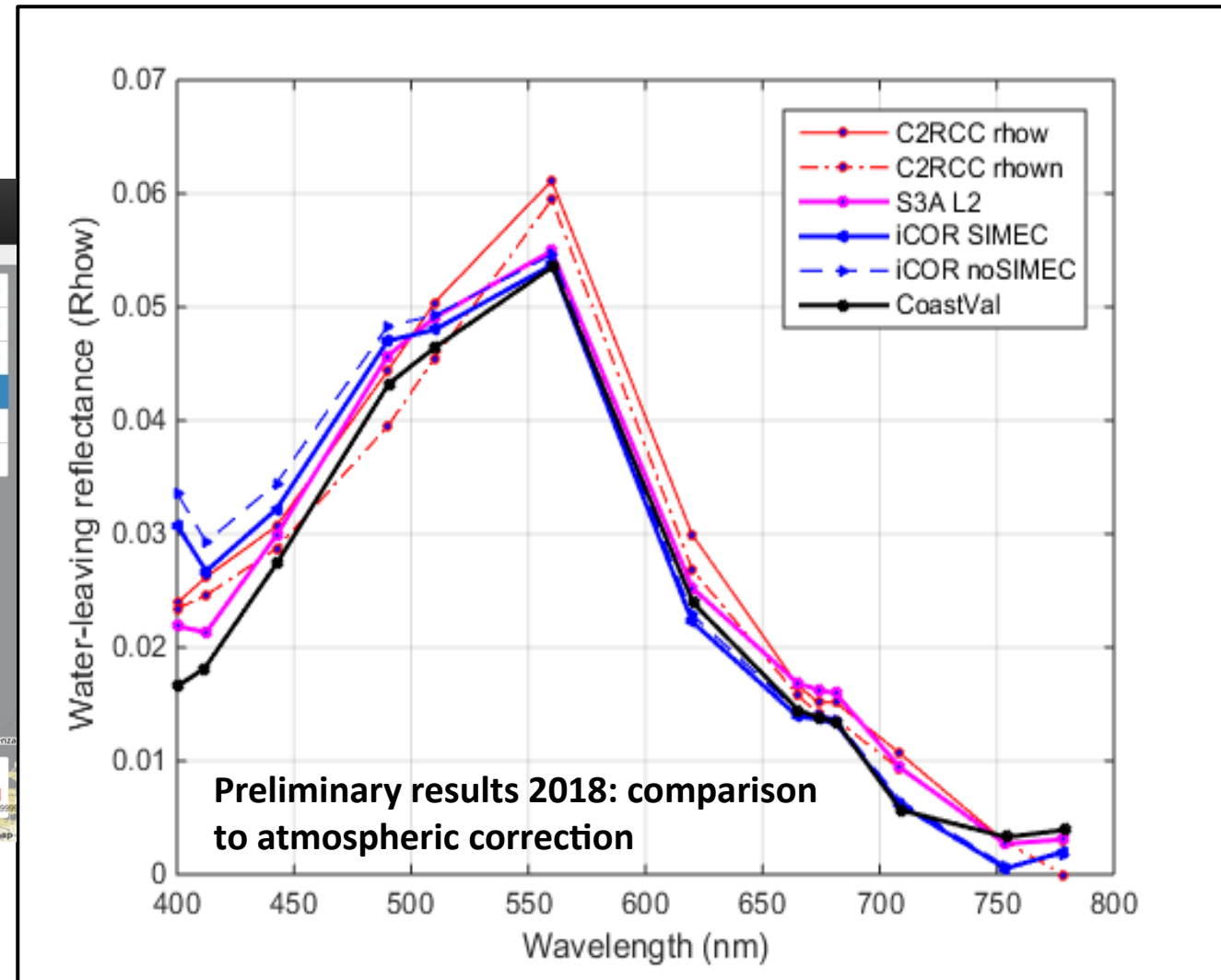
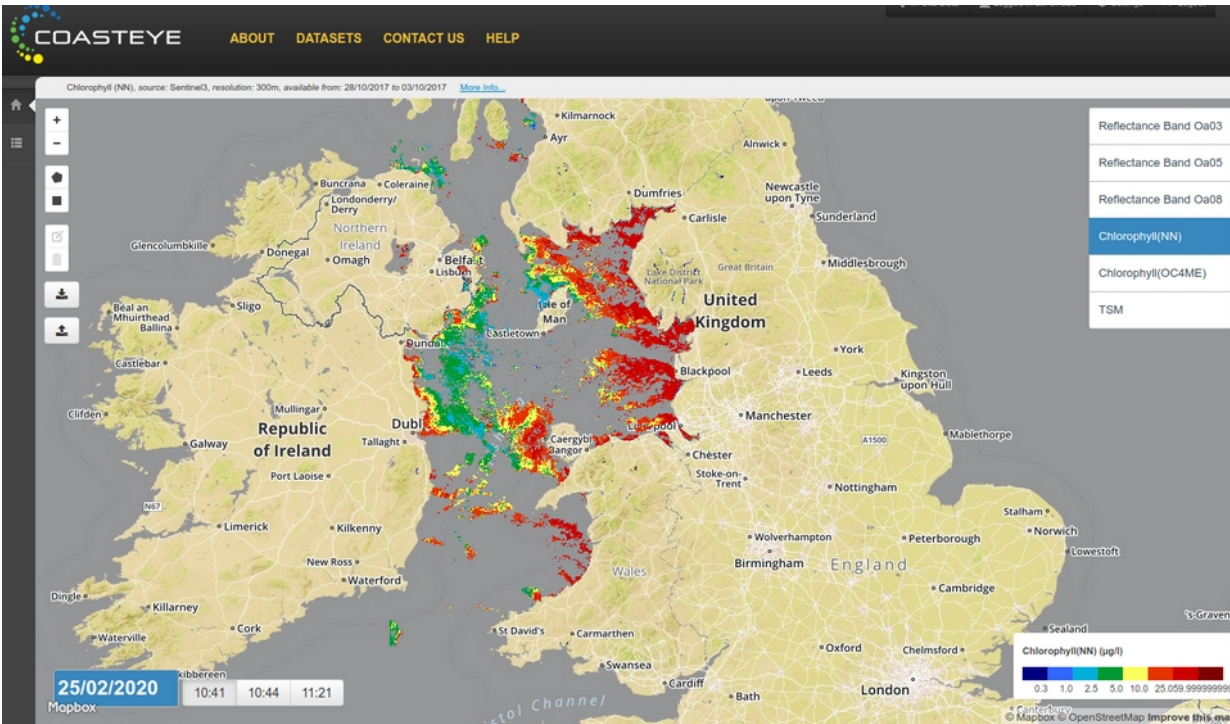


CoastVal: Coastal Colour Validation Platform

- ESA funded (2016-2019)
- Dedicated coastal colour platform for Sentinel 3 validation studies
- High spec radiance/irradiance sensor system
- Co-located with commercial project in Dublin Bay, Ireland
- Deployed in 2018 & 2019



Robust, Reliable, Secure Marine Data



Greater Dublin Drainage Project (Irish Water) 2015-2017

Turbidity Monitoring

4 Data Buoys live over 2 years

Passive Acoustic Monitoring

Deployments of C-Pods for 2 years

Current and Dye Studies

Deployment of 2 ADCP

Dye Survey

Drogue Survey

Earth Observation Report

Turbidity Study at GDD site location

Marine Noise/Acoustic Survey

Deployment and data processing of Hydrophones

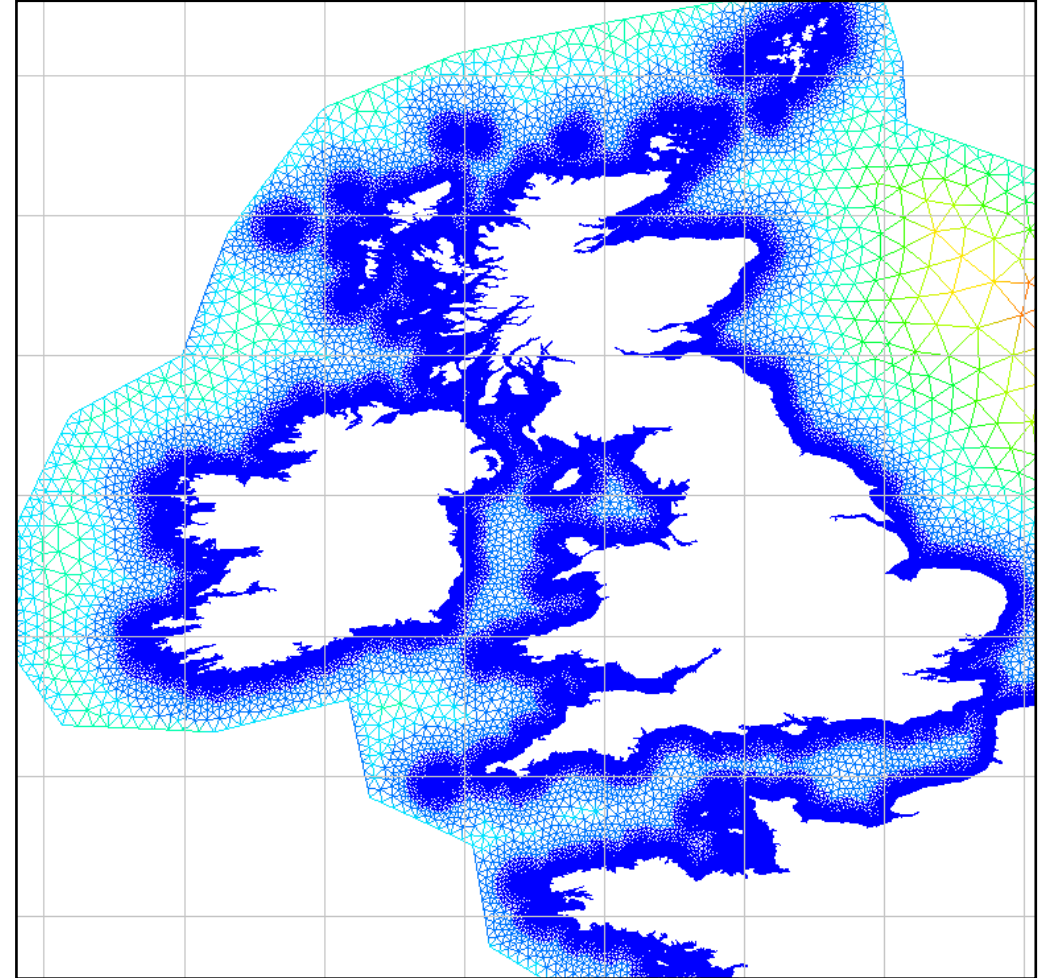
ADCP Deployment

12 month wave climatology for weather risk



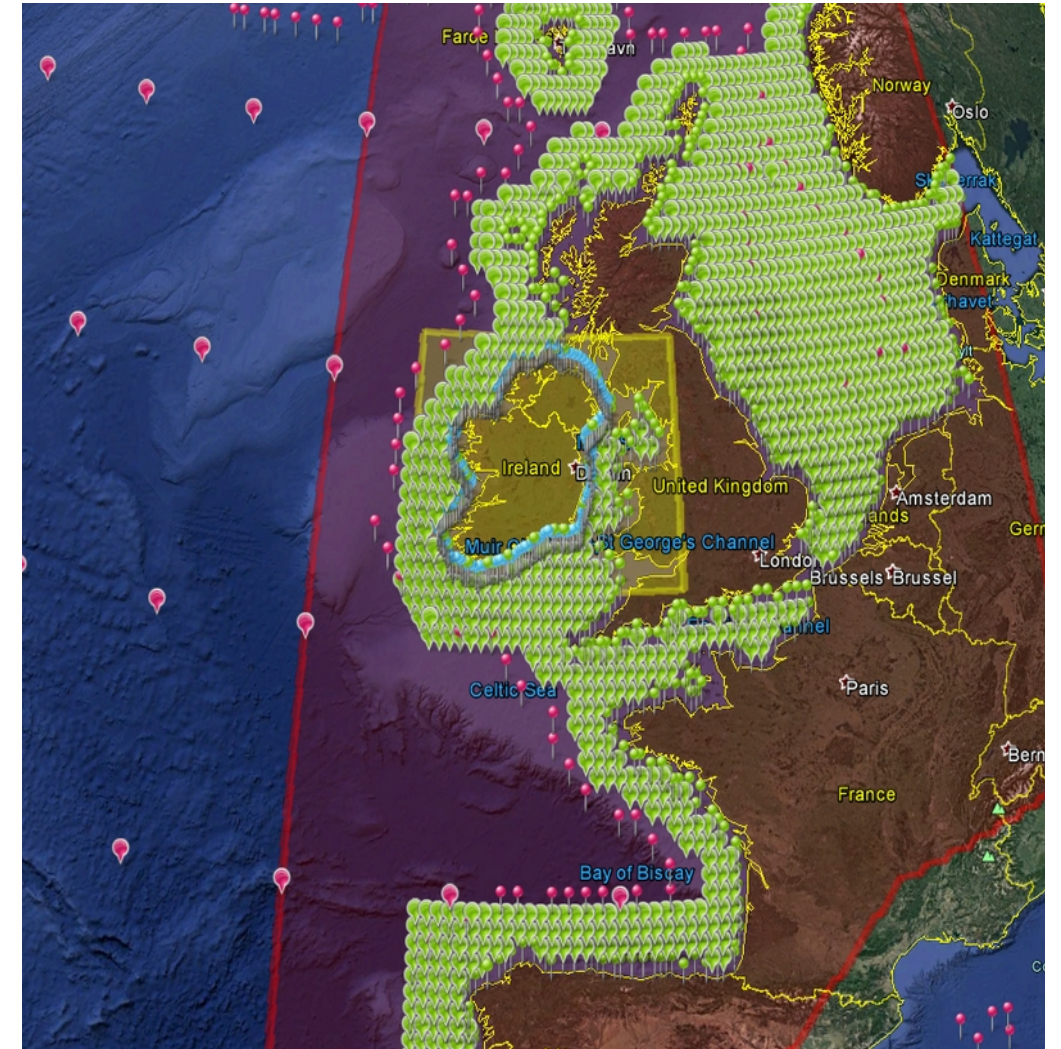
Turbidity Plumes

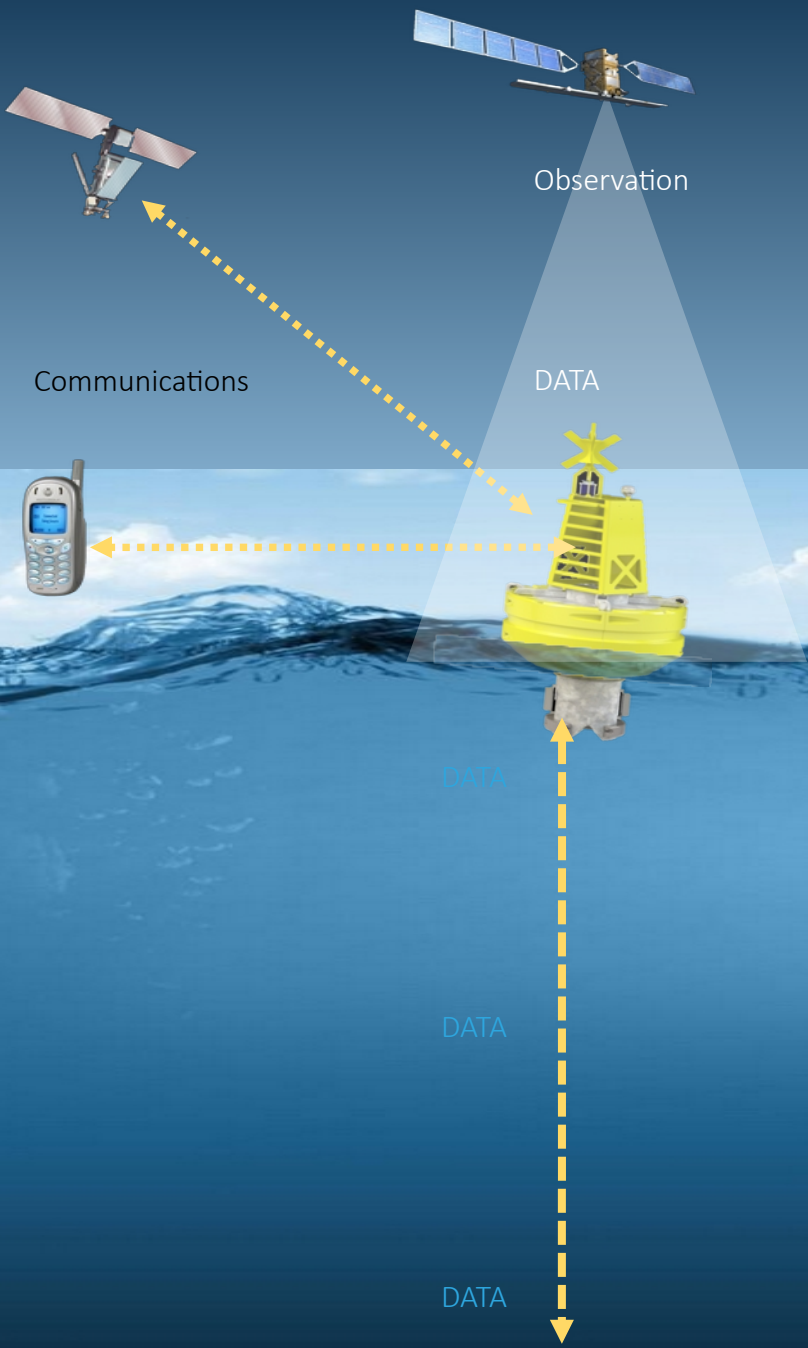
- Optimal interpolation scheme for significant wave height
- Developed in-house unstructured grid generation capacity
- Optimised code to run on parallel processing system.



TWM wave hindcast

- 22 year duration (1995-2017)
- Assimilation of satellite data
- Up-to-date wave model
- Most recent wind forcing data
- Global, European and Irish mean wave fields (height, direction, period, energy, etc), as per IEC TC114 specification
- Global, European and Irish mean wave fields, partitioned into windsea and primary swells
- Spectral output for boundary conditions
- Funded by Ocean Prototype Fund, SEAI





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