



# Report on Met Office buoy activities

DBCPC-29, Paris, September 2013

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# Drifter activities

- Have budget for drifter activities that includes support for E-SURFMAR plus funding to procure and deploy barometer drifters mainly in the South Atlantic/Southern Ocean as a contribution to the global drifter array (supporting GCOS and NWP)
- Has enabled purchase of
  - Iridium drifters (contributing to the DBCP Iridium Drifter Pilot Project)
  - Drifters with lithium batteries (anticipate up to 2x the normal SVP lifetime at ~1.3 x the normal SVP cost)
  - Drifters with high precision SST sensors (contribution to the DBCP/GHRSSST pilot project)



# Drifter deployments

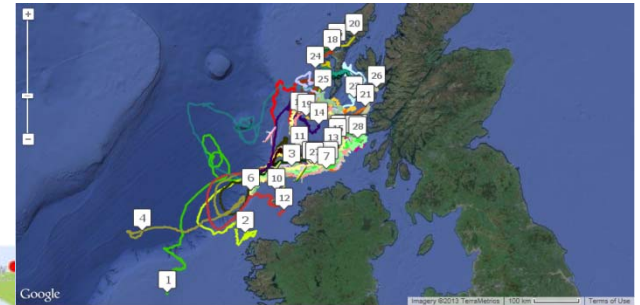
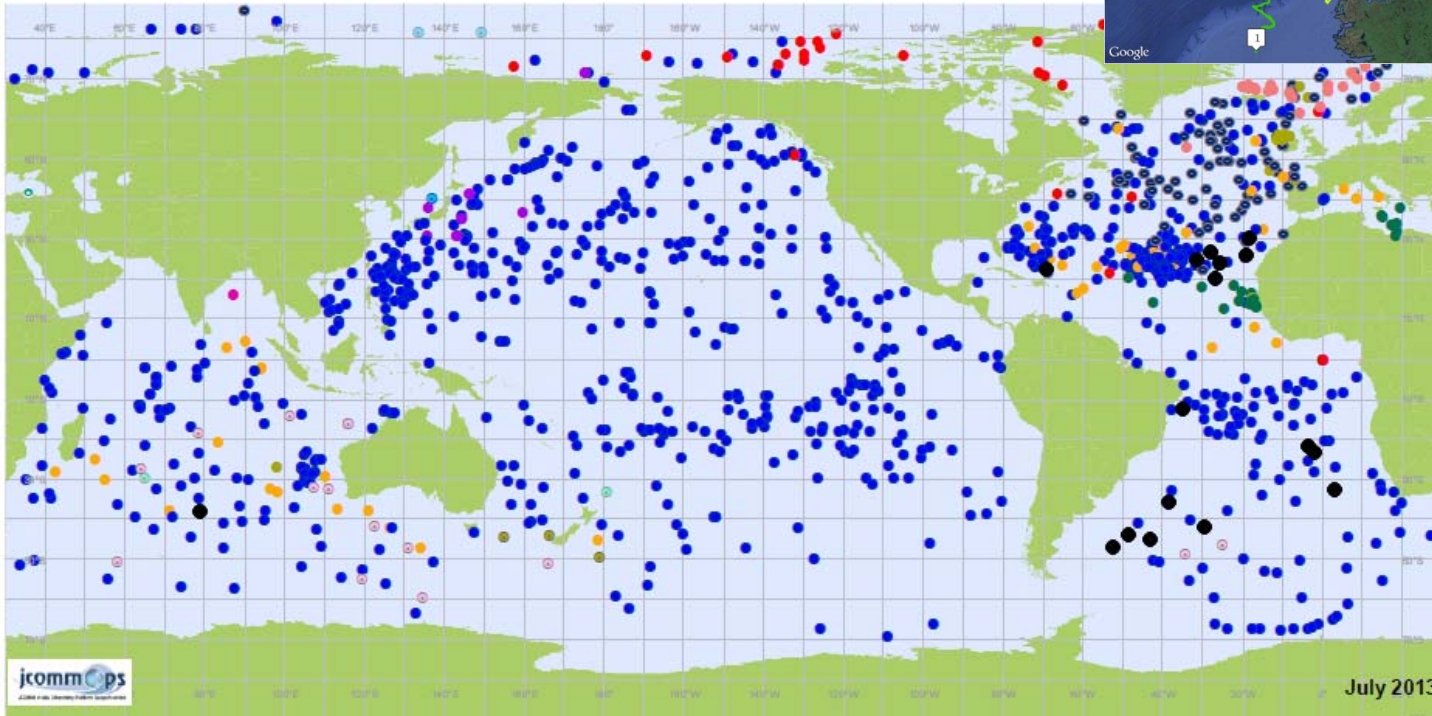
- 38 SVP-B drifters deployed (2005 to 2011) – 28 with Iridium
- 18 drifters deployed since last DBCP
  - 12 SVP-B HRSST-2 drifters deployed in North Atlantic
  - 1 SVP-B HRSST-2 drifter deployed in South Atlantic
  - 5 SVP-B drifters deployed in South Atlantic
- 17 drifters presently operating

## NERC FASTNEt (Fluxes Across Sloping Topography of the North East Atlantic) drifters

- 30 drifters (SST only) deployed in July
- 26 presently operating

# Active drifters (at 29 May)

UKMO drifters ●, NERC drifters ●





# Drifters available for deployment

- 3 MetOcean Iridium SVP-B drifters
- 6 MetOcean Iridium SVP-B drifters with HRSST-2 upgrades

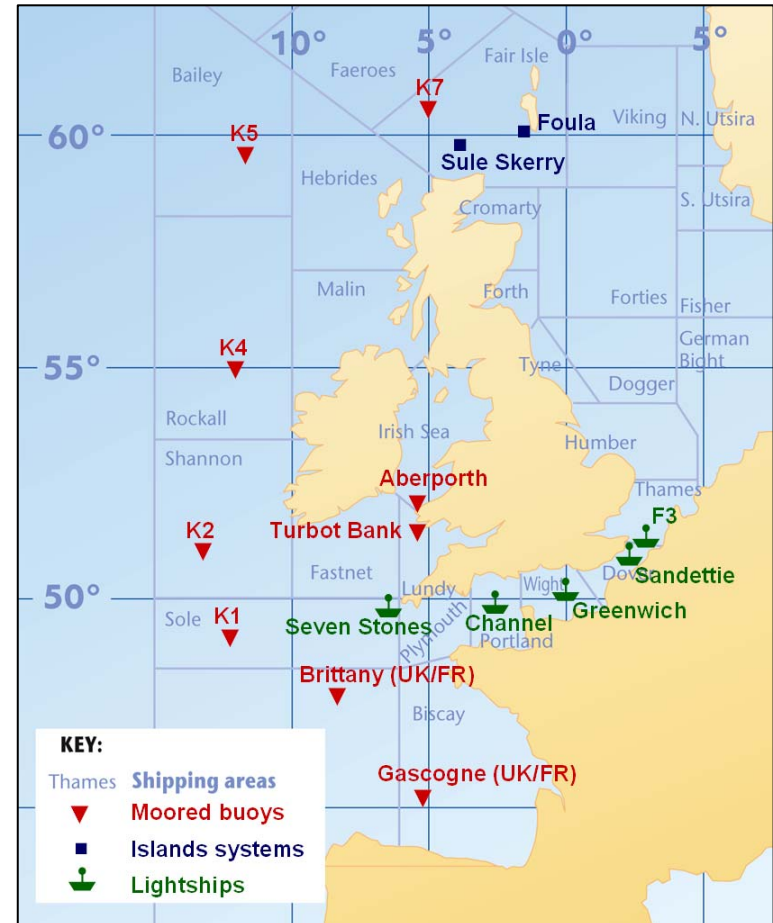
## Drifter lifetimes

- Typically get ~ x2 lifetime for Iridium drifters when lithium batteries are fitted



# Marine Automatic Weather Station (MAWS) network

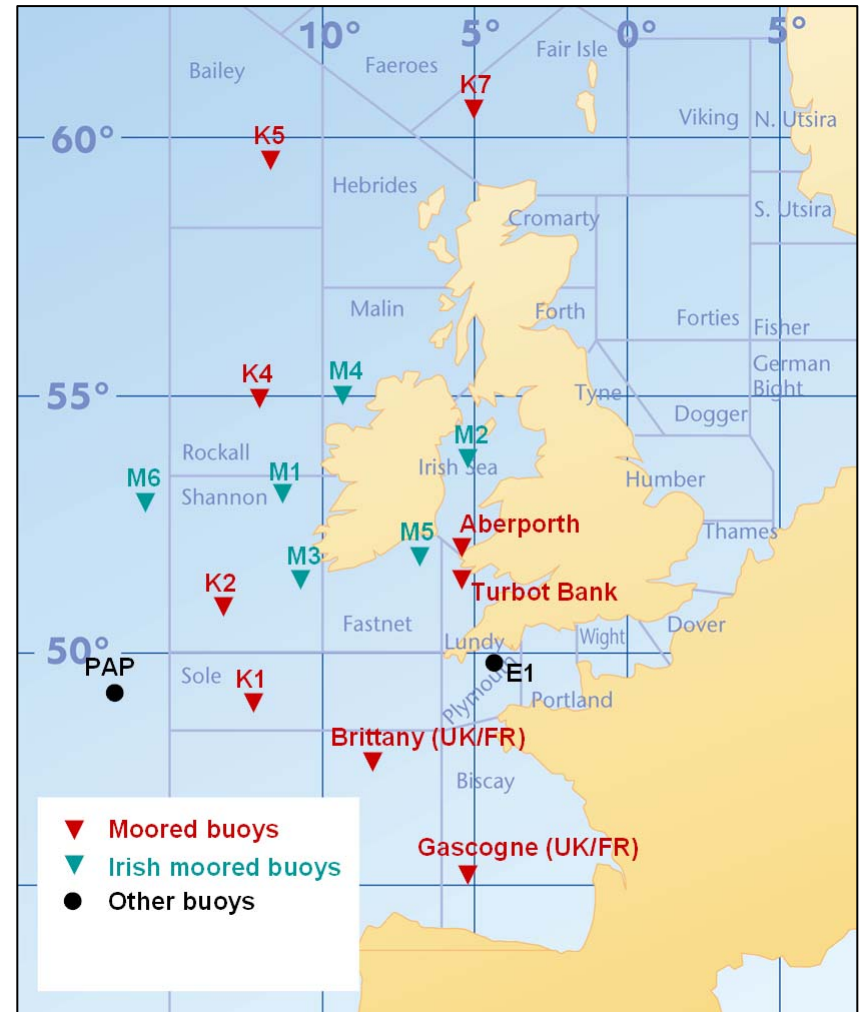
- Operational MAWS network presently comprises
  - 9 moored buoys
  - 5 light vessels
  - 2 remote islands





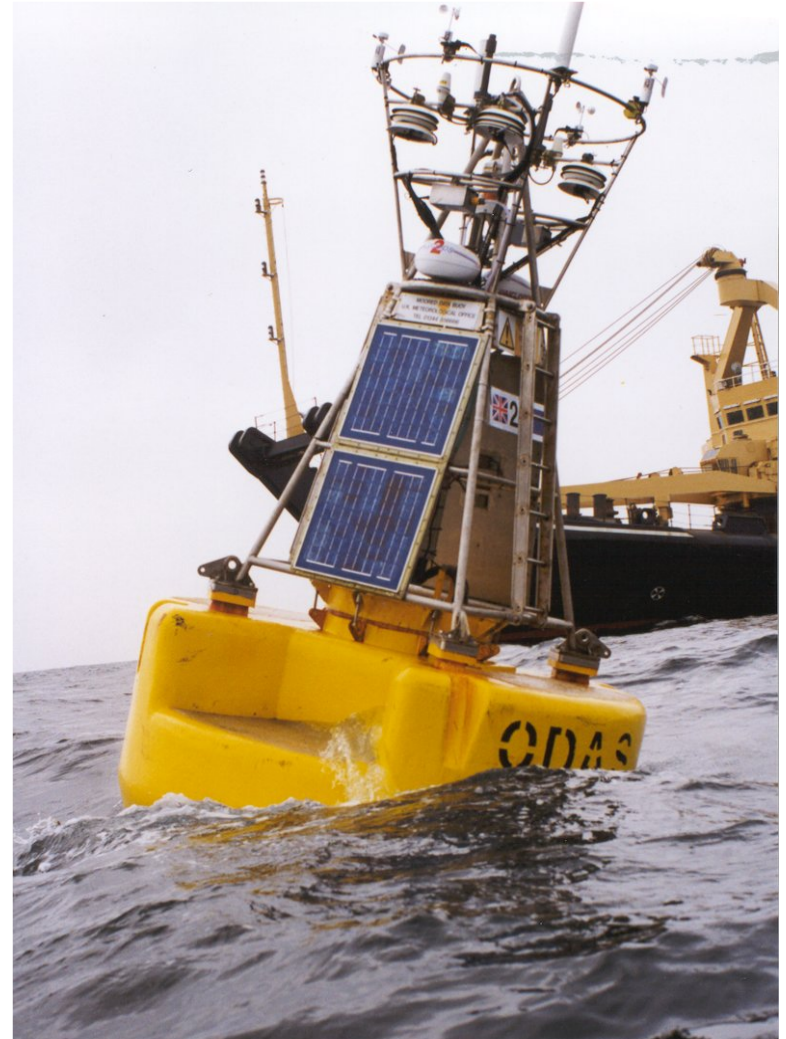
# Moored buoy networks

- Met Office moored buoy network developed following the 'Great Storm' of 1987
- Brittany/Gascogne operated jointly with Météo-France
- Jointly operated systems at
  - PAP with the National Oceanography Centre
  - E1 with Plymouth Marine Laboratory
- Collaborate with Irish Marine Institute and Met Eireann on the Irish buoy network



# The 'old buoys'

- Basic design has been in operation since the early 90s
- Dual sensors (other than for waves), cross-linked to dual electronics and satellite communications
- Mid-life upgrades in the late 2000s
  - Iridium SBD (+ Meteosat DCP) comms
  - Gill Windsonic anemometers
- Now being replaced by new buoy designs





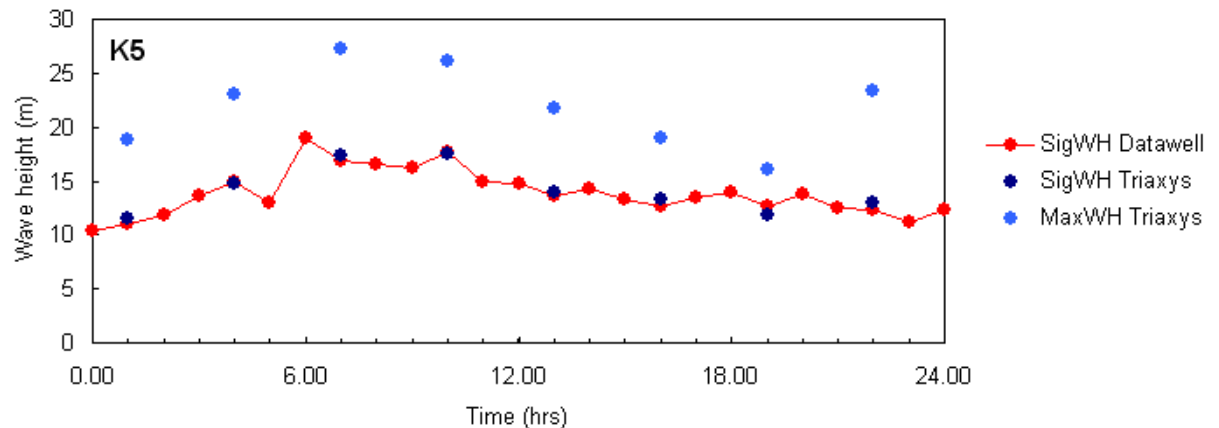


# Met Office moored buoys

- Parameters measured include: wind speed and direction, max gust, air pressure, air temperature, relative humidity, significant wave height, average wave period
- All stations transmit their observations hourly – 24 hours a day, 365 days a year
- Designed to operate through extreme conditions

Severe waves in the north-east Atlantic, February 2013

Highest SWH at K5 of 19m with max WH of 27m





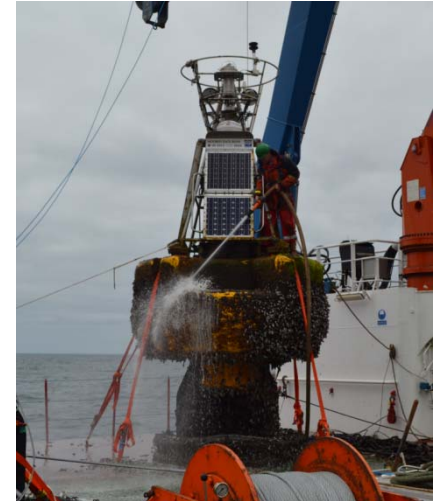
# Spectral wave data

- Stand-alone Triaxys spectral wave sensors now returning hourly data from Brittany, Gascogne, K5, K7, Turbot Bank and E1
  - Returns 'first-five' parameters (energy, mean direction, principal direction, first and second-moment directional spread) over 32 frequency bands
  - Triaxys data disseminated on GTS in a short self-describing BUFR message
- Integrated spectral wave system on PAP sending hourly data (standard Triaxys hex output over 0.05 KHz bands) alongside the Watchman metocean message



# PAP buoy system

- Initially deployed June 2010 at NOCS PAP OceanSITES mooring site
- Modified K-series buoy with a single met system as one side is used by NOCS to receive and transmit sub-surface data from a sensor frame 30m below the buoy
- Replaced in May 2012 with a more resilient system having dual sensors, AxyS Watchman DAS and Triaxys with more batteries/solar panels
- Came adrift 29<sup>th</sup> Dec 2012 in high waves (some collision damage) and recovered. Repaired system redeployed in April and presently operating





# New design Hydrosphere DB-8000 systems

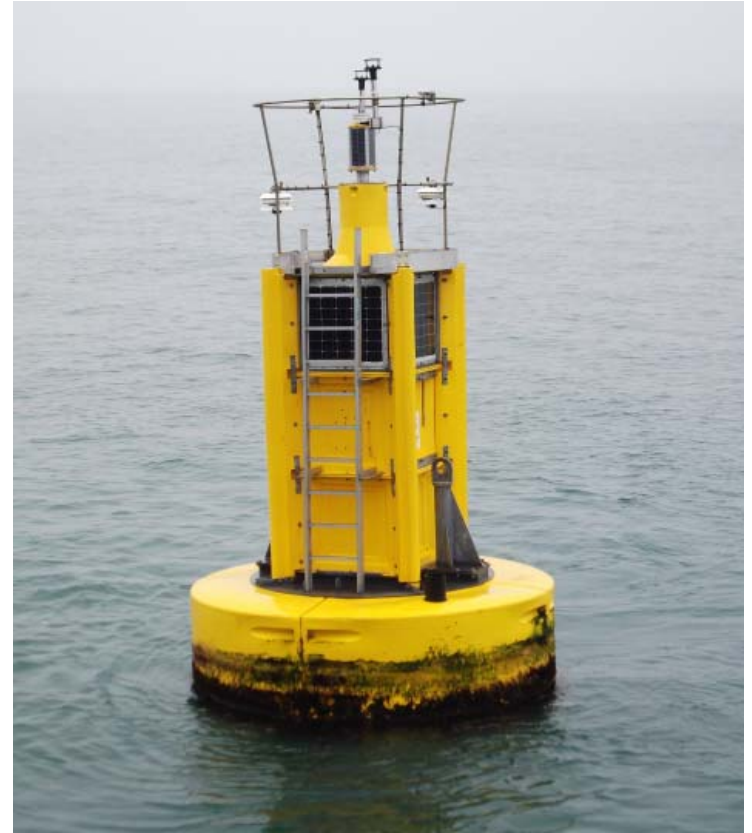
- First operational system deployed at K7 end Nov 2012
  - 3m Mobilis hull, dual met systems, dual Axys Watchman data collection systems, dual Iridium comms and an autonomous Triaxys system
  - Almost twice the battery capacity (>1300 ampere hours) of the old buoys
- Second system deployed at E1 in June in collaboration with Plymouth Marine Laboratory
  - one side used for met, the other for oceanography (temperature, salinity, dissolved oxygen, chlorophyll fluorescence, turbidity, CDOM, nitrates, PAR)
  - modified design to allow a sub-surface sensor cage to be winched into/out of the water for cleaning the sensors
  - autonomous Triaxys/Iridium system for directional spectral wave measurements





# Turbot Bank buoy

- Operated for the Milford Have Port Authority
- Single Axys Watchman with Iridium system and an autonomous Triaxys spectral wave sensor, on a DB-300 3m hull
- Deployed March 2013







# Other network developments

- Deploy standard K-type buoy with Triaxys in the Celtic Sea in November in support of the CANDYFLOSS project (1 year deployment)
- If the Hydrosphere DB-8000 systems prove to be sufficiently robust then plan is to replace the offshore K-type buoys with these over the next 2-3 years (funding agreed)
  - K7 system has operated through waves with 15m SWH and 25m MWH
  - Need to inspect the buoy before the winter
- Comparison of wave spectra from the larger buoys with Triaxys against a Datawell waverider remains an outstanding requirement
  - Datawell Mk-3 Waverider buoy purchased spring 2012
  - Plan to deploy initially at Aberporth to compare against a K-type buoy



# Cefas WaveNet and SmartBuoys

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**Observing and modelling**

- European Marine Ecosystem Observatory (EMECO)
- Monitoring programmes
  - Clean Seas Environment Monitoring Programme
  - UK-Netherlands collaborative monitoring programme
  - Sea temperature and salinity trends
  - Monitoring sites
- Wavenet
  - Project background
  - Steering group
  - Data archive
  - Implementation plan
  - Data policy
  - Partners
    - GA/CC procedure
    - Satellite data coverage
  - Survey tools
- Marine Climate Change Centre (MCC)
- Ecosystems and biodiversity
- Assessing human impacts
- Animal health and food safety
- Fisheries information

**Wavenet**

The Defra's strategic wave monitoring network for England and Wales provides a single source of real-time wave data from a network of wave buoys located in areas at risk from flooding. Defra has policy responsibility for this topic and the Wavenet programme is managed by a steering group.

Wavenet data is used by flood managers, local authorities, consultants and other stakeholders to assess flood and coastal erosion risk, and to improve the management of floods. The wave data is used to validate the Met Office wave model, which is run four times daily. In addition, on a longer timescale, the data can be used to help design improved flood defence schemes and to provide evidence for climate change studies.

Funded by:

- Environment Agency
- defra
- SEPA

In Association with:

Real-time data

New version

- Map view
- Text view
- Satellite data
- Reset and download criteria

User registrations have been copied to the new version. You will need to reset your password in order to log in to the new system. This will not reset the password for the old system.

Old version

- Basic data
- Advanced data
- Satellite data

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**Monitoring programmes**

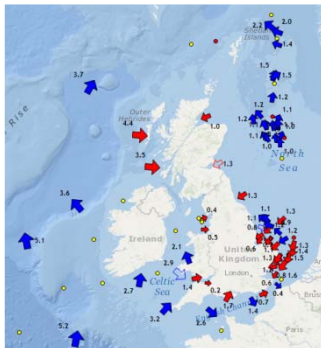
UK, EU and global legislation requires that we monitor our seas - looking at both their biodiversity and the quality of the physical environment. We have been delivering, and continue to provide, significant monitoring programmes to meet these needs.

We assess both long-term trends and spatial variability. Using standardised collection methods ensures that we consistently deliver high-quality, comparable data sets.

- Clean Seas Environment Monitoring Programme
- UK-Netherlands collaborative monitoring programme
- Sea temperature and salinity trends
- Monitoring sites
- Wavelet

**Related links**

- Monitoring and mapping
- Programme management
- UK Directory of the Marine-observing Systems
- UK's Initial assessment and proposals for Good Environmental Status



Plan to investigate potential to fit Met Office AMOS to the SmartBuoys



**Met Office**

