E-SURFMAR approach to wave measurements

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JCOMM Technical Workshop on Wave Measurements from Buoys, 2-3 October, New York, USA

Outline

- Introduction and background to E-SURFMAR
- E-SURFMAR Design Study
- E-SURFMAR Data Buoy (DB) programme
- E-SURFMAR DB programme wave measurements

Met Office

EUMETNET

The Network of European Meteorological Services

EUMETNET is a network grouping of
24 European Meteorological Services

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17 of which are participating in E-SURFMAR

E-SURFMAR Programme

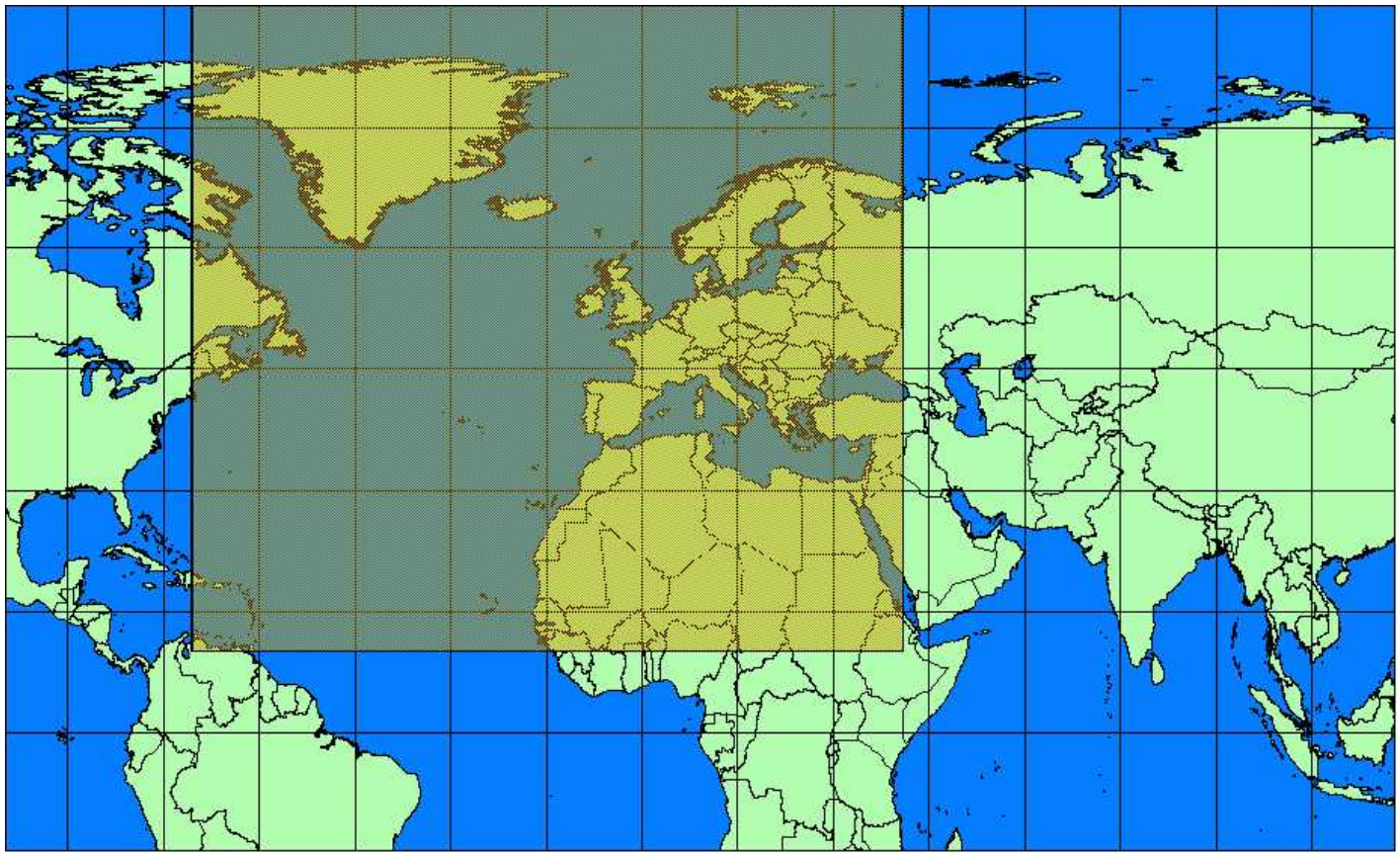
Main Objectives

- To co-ordinate, optimise and progressively integrate the activities for surface marine observations within the EUCOS Operational framework

- Main EUCOS aim is to optimise the ground observing system to improve Numerical Weather Prediction (NWP) over Europe

- First stage 2003-2006
  Second phase 2007-2011

E-SURFMAR Area



E-SURFMAR Programme

Design Study

- A design study was carried out in 2004, this study (Doc SURFMAR-102-131 dated 14th Sept 2004) included:
  - an outline of the surface marine data requirements for NWP
  - an outline of the surface marine data available for NWP
  - description of the present in situ observing systems at the sea surface
- It made a proposal for a network of in situ observing systems able to supply NWP with data that cannot be provided by satellites and which can serve for the calibration and/or validation of satellite data

E-SURFMAR Programme

Design Study

- WMO requirements (as compiled by the Expert Team on Observational Data Requirements and Redesign of the Global Observing System (ET-ODRRGOS)) give the threshold densities as:
  - 1 observation every 12 hours per 250 km × 250 km area for air pressure, temperature and humidity
  - 1 observation every 12 hours per 100 km × 100 km area for wind
  - 1 observation every 15 days per 50 km × 50 km area for SST

- Threshold value is that below which an improvement does not give any significant benefit

E-SURFMAR Programme

Design Study

- The study recommended:
  - an increase in air pressure measurements at the sea surface through the use of more drifting buoys and VOS ships, especially north of 30°N
    - to achive a density of 125% of the threshold value by funding 175 SVP-B drifters/year plus 45 shipborne AWS (in addition to present manual VOS)
  - the use of four existing moored buoys - upgraded and possibly re-located – for the validation and calibration of satellite wind and waves data

- Design Study currently being revisited – and likely to recommend no further increase in number of drifters (presently at ~110 per year)

E-SURFMAR Programme

Data Buoys

- E-SURFMAR has been responsible for the European meteorological data buoys since mid-January 2005
- Programme is managed by Meteo-France
- Programme has a Data Buoy Programme Manager
- Data Buoy Technical Advisory Group (DB-TAG) established (succeeded EGOS as an Action Group of the DBCP)

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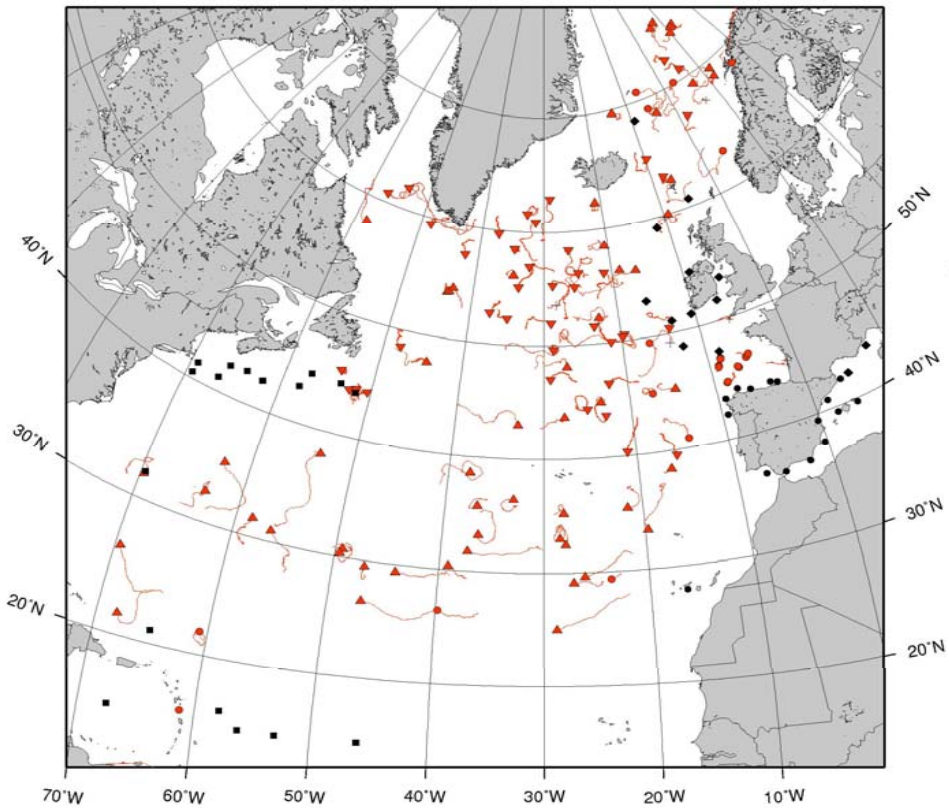
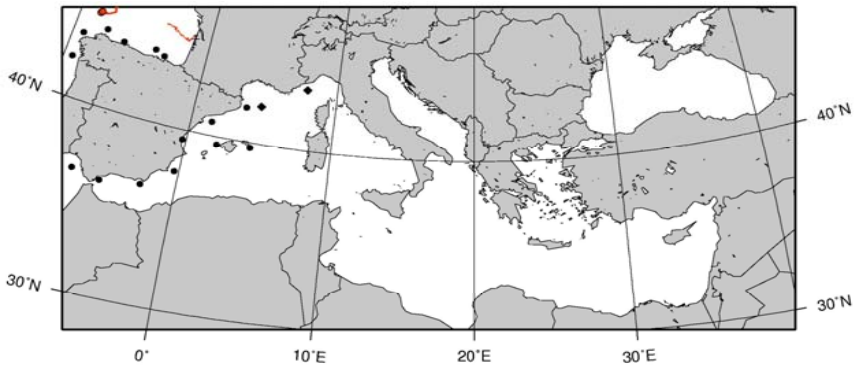
Data buoys operating in August 2008

Surface Marine Programme



August 2008 - Operating data buoys in the North Atlantic
Drifting buoy trajectories and moored buoy positions



August 2008 - Operating data buoys in the Mediterranean Sea
Drifting buoy trajectories and moored buoy positions

E-SURFMAR Programme

Drifting Buoys

- Fully integrated since January 2006, drifters procured centrally and comms costs met by the Programme
- In 2007 purchased 43 SVP-B Argos drifters, 40 SVP-B Iridium drifters and supported 30 (barometer) upgrades
- In 2008 will be 80 SVP-Iridium drifters plus 30 barometer upgrades
- Deployment of drifting buoys carried out in the Arctic Ocean during IPY
- Active participation in international activities (DBCP etc)

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Moored Buoys

- Two ex-EGOS moored buoy networks are monitored according to the EGOS/E-SURFMAR Memorandum of Understanding
- K-series buoys operated by
  - UK Met Office - 9 buoys
  - Marine Institute/Met Eireann (Irish National Buoy network) – 6 buoys
  - Meteo-France – 2 buoys
- Oceanor (SeaWatch, Wavescan) buoys operated by
  - Puertos del Estado (Spanish buoy network) – 16 buoys
- And recently a new Wavescan buoy deployed by Icelandic Met Office (north-west of Iceland)

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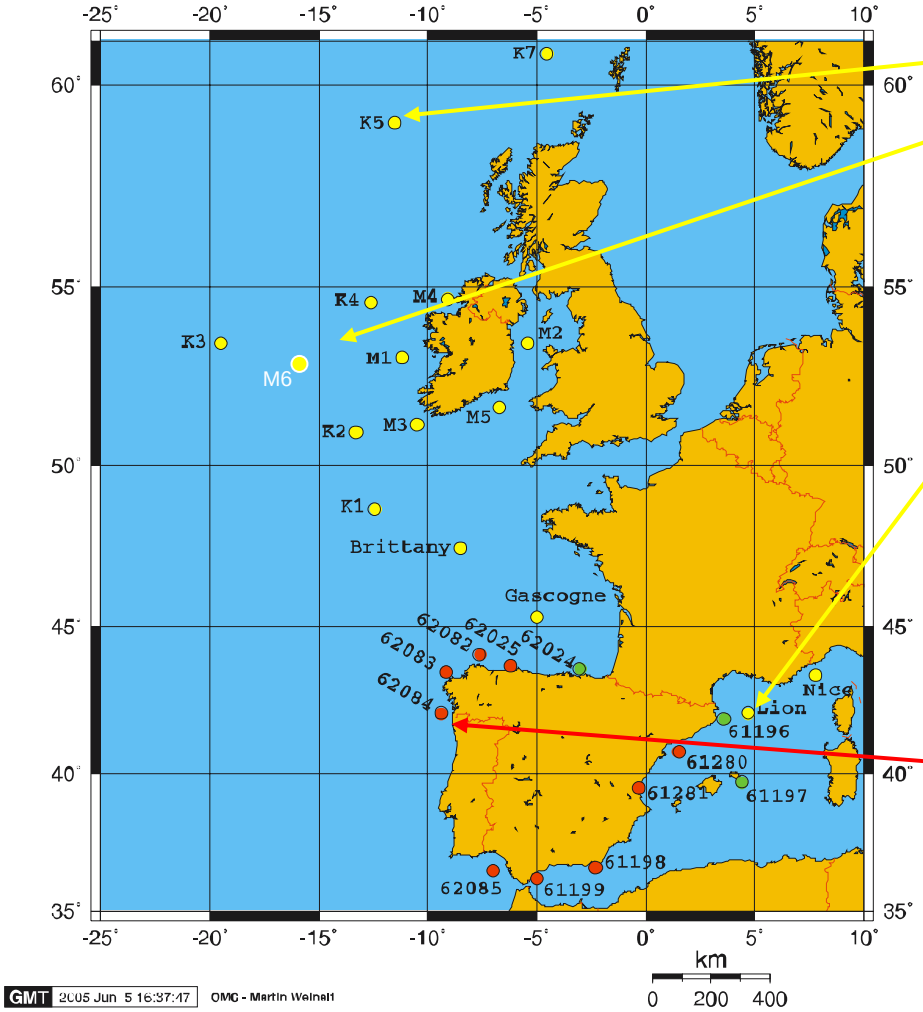
Moored buoys

Met Office

EUCOS

Surface Marine Programme



E-SURFMAR Programme

Moored Buoys

- 4 moored buoys are considered as being part of the E-SURFMAR programme for the calibration of satellite data (wind and waves)
  - Cabo Silleiro (Spain)
  - Lion (France)
  - M6 (Ireland)
  - K6 (UK)
- Partly compensated since 2005, increasing compensation is expected until ‘full’ funding level for these 4 buoys is reached
- Design Study states a specific requirement to deliver
  - directional wave spectra
  - 10 minute wind data

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Moored buoys

WMO	Name	Type	Country	GTS reports	Remarks
64045	K5	K-pattern	UK	FM-13 SHIP	New buoy deployed on 19th July 2008 with directional spectral wave capability
62095	M6	K-pattern	Ireland	FM-13 SHIP	Deployed September 2006 and replaced M1 as the EUCOS buoy
62084	Cabo Silleiro	SeaWatch	Spain	FM-96 BUFR (non-standard template)	With directional spectral wave capability
61002	Lion	K-pattern	France	FM-13 SHIP FM-65 WAVEOB	Only provides omni-directional wave spectra at present