

REPORT BY E-SURFMAR
EUCOS-SURFACE MARINE PROGRAMME
2009

1. INTRODUCTION

The EUMETNET Composite Observing System (EUCOS) surface marine (E-SURFMAR) programme is an optional programme involving 17 out of the 24 EUMETNET members: (Belgium, Croatia, Cyprus, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, The Netherlands, Norway, Portugal, Spain, Sweden and the United Kingdom), who fund the activity on a GNI basis. Its main objectives are to coordinate, optimise and progressively integrate the European meteorological services activities for surface observations over the sea – including drifting and moored buoys, and voluntary observing ships. E-SURFMAR is responsible for coordination of buoy activities carried out by the European meteorological services, and the programme supports a Data Buoy Manager (DBM) to manage these activities. The DBM is supported and advised by the E-SURFMAR Data Buoy Technical Advisory Group (DBTAG) which is an action group of the DBCP. The sixth annual DB-TAG meeting was held in Southampton 26-27 May 2009.

2. OPERATIONAL PROGRAMME

2.1 Drifting buoys

One hundred drifting buoys were deployed between July 2008 and June 2009 including **twenty** upgrades of SVP drifters. **Fifty seven** out of the SVP-B were fitted with Iridium transmitters. **Nine** SVP-BW were a contribution of Environment Canada.

Deployments in 2008/09 were carried out by research vessels, voluntary observing ships, and ships of opportunity plying the Atlantic Ocean from various ports (Canada, Iceland, France, Norway, UK, US). Drifting buoys are also regularly deployed from OWS Mike (66°N – 2°E).

Although the E-SURFMAR area of interest is mainly up to 70°N (i.e. to the ice limits), the EUCOS area actually extends to 90°N. **Five** SVP-B (Argos transmitters) were deployed by fall 2008 in the Arctic for IPY (International Polar Year) in addition to the 100 drifters mentioned above.

The deployments balanced the loss of buoys which occurred during the year. Over the year an average of about 100 drifting buoys were in operation in the EUCOS area of interest. The minimum number of operational drifting buoys at the end of each month in 2008-2009 was 90 (December 2008) and the maximum was 110 (June 2009).

The mean lifetime (for Air Pressure) of the SVP-B drifters was approximately 15 months (463 days). The average age of the network was 359 days at the end of August 2008 and 280 days at the end of June 2009. Eighty eight buoys failed to report air pressure measurements.

The evaluation of the Iridium communication system continued as a contribution to the DBCP drifter Iridium Pilot Project. The number of Iridium drifters deployed has increased during the year with more than 1/2 of the buoys operating now using Iridium (see Fig 1). This improves the data timeliness and also has a lower transmission cost.

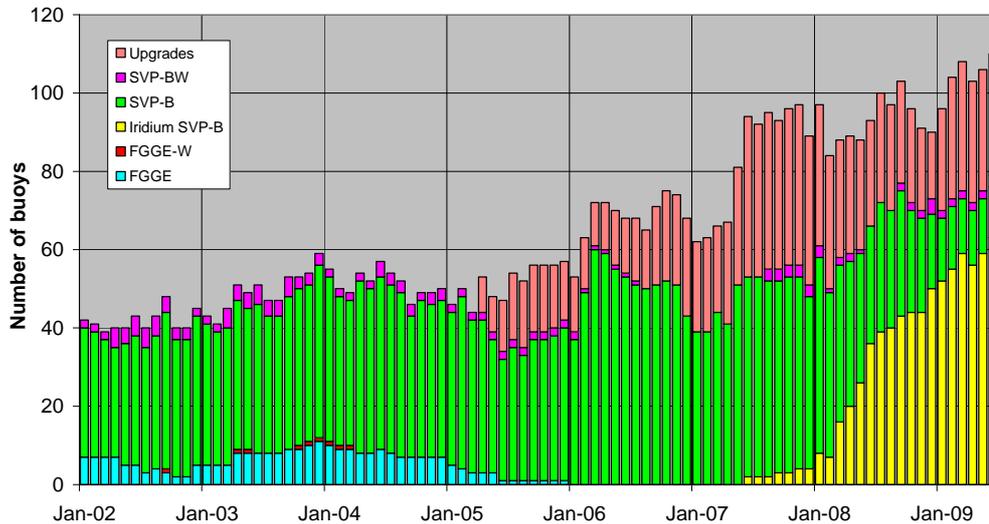


Figure 1. The number of operational EGOS/E-SURFMAR drifting buoys by the end of each month from 2002 to 2009

The availability, timeliness and quality of drifting buoy data from the EUCOS area continues to be carefully monitored.

The availability of data depends on the number of buoys operating. About 800 messages per day were received within 50 minutes in September 2008. However, more than 1,500 messages per day are being received within 50 minutes in 2009 mainly due to the use of Iridium satellite system. More than 2,500 hourly observations per day are currently (mid 2009).being reported on the GTS

The AP differences from the French model outputs showed that the target of 1% of Gross Errors was easily being achieved. The RMS of AP differences still has a seasonal variation, being higher in winter (0.8 hPa) than in summer (0.6 hPa).

Real time observations from drifting buoys are subject to routine quality monitoring. Besides monthly statistics provided by various meteorological centres for individual buoys, tools are used by Meteo-France to identify buoys reporting dubious data as quickly as possible. These tools have been enhanced. More parameters than before are Quality Controlled: humidity, wave height and period are now compared to model outputs. As for wind speed, results are presented in the form of rates rather than biases. ECMWF analyses are systematically used for all parameters in parallel to French Arpege models outputs. Mercator SST and SSS outputs are also used.

<http://www.meteo.shom.fr/qctools/>

2.2 Moored buoys

The E-SURFMAR design study recommended that four moored buoys were needed to meet the EUCOS requirements, i.e. providing a suitable network to improve the quality of regional NWP over Europe, and for the validation and calibration of satellite wind and wave measurements. The four E-SURFMAR moored buoys are operated by UK, Ireland, France and Spain. (i.e. three K-pattern buoys at K5, M6 and Lion and one SeaWatch buoy at Cabo Silleiro respectively).

However, monitoring of the availability, timeliness and quality of moored buoys data from the full K-series moored buoy network continues. By the end of June 2009, 12 K-pattern buoys and 15 Oceanor buoys were operating (although the Oceanor buoys are not yet being monitored).

The AEMET (Spain) is reporting data from the Cabo Silleiro buoy (as well as others operated by Puertos del Estado) to the GTS in BUFR code. During the year AEMET modified the BUFR coding to comply with the WMO BUFR template agreed for moored buoy data. The messages received in Toulouse RTH are forwarded to Exeter and Offenbach.

At present, of the 4 E-SURFMAR moored buoys, only Cabo Silleiro and K5 are able to provide directional wave spectra data. Lion is providing omni-directional wave spectra. For K5 a Triaxys spectral wave system is being used. The data are presently being archived by the Met Office in NMEA format as the ability to generate BUFR messages and issue to GTS has yet to be developed.

The availability of moored buoy data depends on the number of buoys operating. An average of 150 hourly observations per day are being reported from the offshore K-series buoys to the GTS, with about 70 messages per day from the 3 K-pattern E-SURFMAR buoys.

More than 95% of data were received by HH+50 minutes (to be compared to the EUCOS target for timeliness of 85%) for the K-pattern buoys.

The Air Pressure (AP) differences with the French model outputs shows the EUCOS target of 0.5% of Gross Errors was achieved. The RMS of AP differences are between 0.5 to 0.8 hPa.

Real time observations from moored buoys are subject to routine quality monitoring in the same way as the drifting buoys.

3. PLANS

3.1 Drifting buoys

The E-SURFMAR design study recommended the deployment of an average of 175 SVP-B type drifters per year. The drifting buoy component has been fully funded by E-SURFMAR since 2006, i.e. in addition to the drifting buoy purchases, all the communication costs are funded by E-SURFMAR. Within the allocated budget more than 100 buoys (including 30 upgrades) will be deployed in the E-SURFMAR area of interest in the coming twelve months. A revision of the design study will be made after the results of an OSE which will be carried out by ECMWF for a period running from December 2008 to January 2009.

The transmission of drifting buoy data through Iridium will become the standard for E-SURFMAR rather than Argos.

E-SURFMAR will continue to deploy buoys in the Arctic Ocean through IABP. The main challenge with the ice buoys is their ability to survive after being released from frozen ice.

3.2 Moored buoys

As noted earlier the E-SURFMAR design study has recommended that directional wave spectra should be provided by all four buoys and it is expected that the solution developed by the Met Office will be also installed on the Lion buoy (and in time other buoys within the K-series network). For M6 it is expected that the Irish Marine Research Institute will replace M6 with an Oceanor buoy with spectral wave capability. Cabo Silleiro, which is a SeaWatch buoy, already has direction spectral wave capability

4. INFORMATION ON E-SURFMAR

There is a EUCOS website (<http://www.eucos.net>). Under the heading "EUCOS Public" in "EUCOS networks" there is information about E-SURFMAR. This site is the official public site for E-SURFMAR. A link will be provided from this site to provide access to publicly available documents such as the monthly and annual reports.

In addition there is a restricted working area web site for E-SURFMAR participants (<http://esurfmar.meteo.fr>), it is based on a collaborative scheme which allows the participants to easily create and modify certain pages on the site.

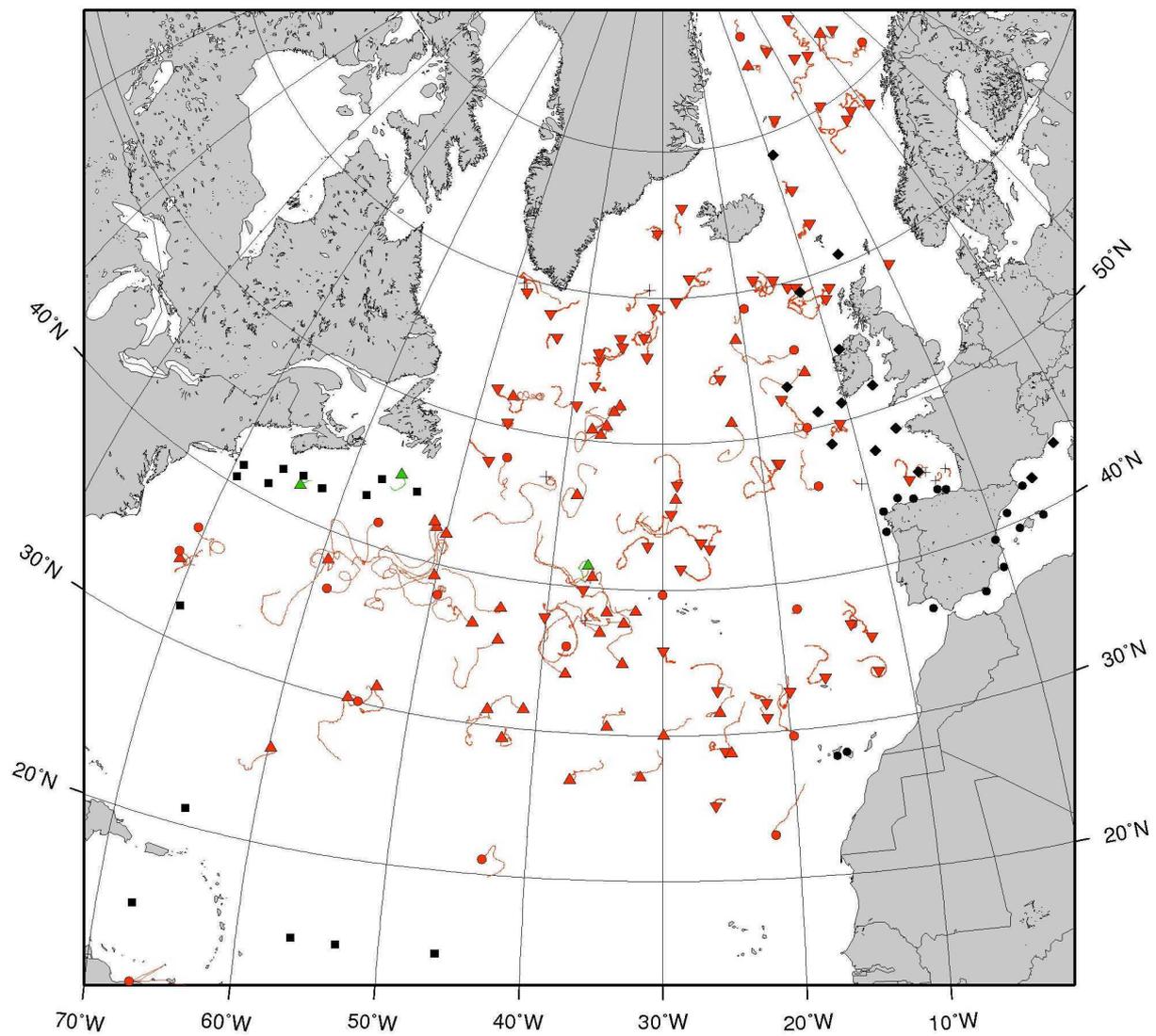


Figure 2. Operating Buoys in E-SURFMAR area
Drifting buoy trajectories and moored buoy positions
(June 2009)