

REPORT BY E-SURFMAR
EUCOS-SURFACE MARINE PROGRAMME
2008

1. INTRODUCTION

The EUMETNET Composite Observing System (EUCOS) surface marine (ESURFMAR) 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 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. ESURFMAR is responsible for coordination of buoy activities carried out by the European meteorological services, and the programme supports a Data Buoy Manager to manage these activities. The DBM is supported and advised by the ESURFMAR Data Buoy Technical Advisory Group (DBTAG) which has superseded the European Group on Ocean Stations (EGOS) as an action group of the DBCP. The fifth annual DB-TAG meeting was held in Reykjavik 20-21 May 2008.

2. OPERATIONAL PROGRAMME

2.1 Drifting buoys

Seventy eight drifting buoys were deployed between September 2007 and August 2008 including **eight** upgrades of SVP drifters. **Forty three** out of the SVP-B were fitted with Iridium transmitter.

Deployments in 2007/08 were carried out by research vessels, voluntary observing ships, and ships of opportunity plying the Atlantic Ocean from ports including Halifax (Canada), Reykjavik (Iceland), Foynes (Ireland), Le Havre (France), Fos (France), Brest (France), London (UK), Fairlie (UK), Charleston (USA), Boston (USA), Trondheim and Aalesund (Norway). Drifting buoys are regularly deployed from OWS Mike (66°N – 2°E) too.

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. **Three** ICEB buoys and **four** SVP-B (2 with Iridium transmitters) were deployed by September 2007 in the Arctic for IPY (International Polar Year) in addition to the 78 ones.

The deployments balanced the loss of buoys which occurred during the year. An average of about 90 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 2007-2008 was 84 (in February 2008) and the maximum was 100 (in July 2008).

The mean lifetime (for Air Pressure) of the SVP-B drifters was approximately 14 months (425 days). The average age of the network was 287 days by the end of August 2007 and 359 days by the end of August 2008. Sixty five buoys failed to report air pressure measurements.

Most of drifting buoys used the Argos system to report their data during the first part of the session. The evaluation of the Iridium communication system began as a contribution to the DBCP drifter Iridium Pilot Project. The Iridium drifters have been increasingly deployed during the year and by the end of the session more than 1/3 of the buoys operating were using Iridium, which will be used more in the future. This improves the data timeliness and also has a lower transmission cost.

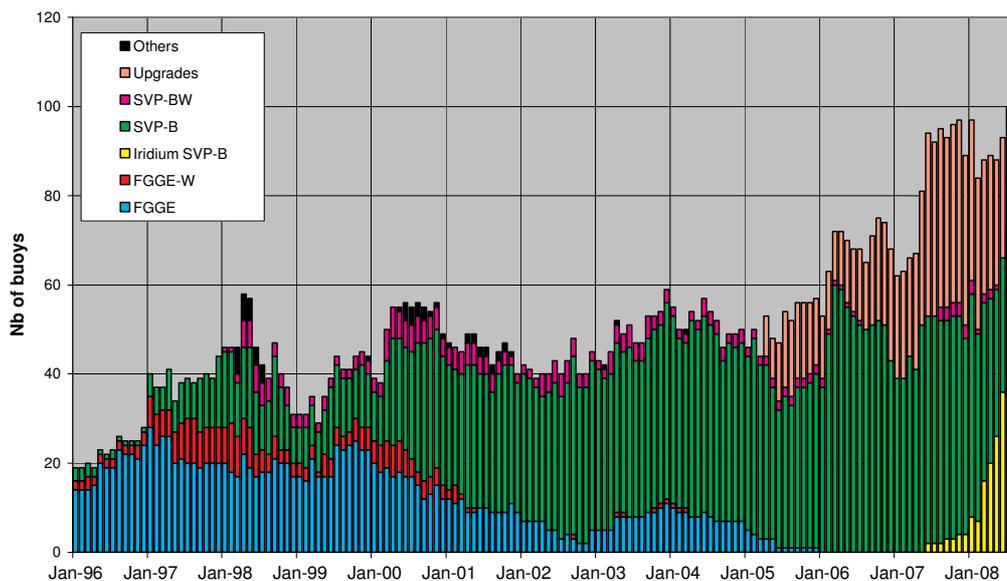


Figure 1. The number of operational EGOS/E-SURFMAR drifting buoys by the end of each month from 1996 to 2008

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

The availability of data depends on the number of buoys operating in the EUCOS area. About 800 messages per day were received within 50 minutes in September 2007. We can note an improvement from beginning of 2008 with more than 1300 messages per day in August mainly due to the use of Iridium satellite system. More than 2000 hourly observations per day had been reported on the GTS during the inter-sessional period.

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 had a seasonal variation, being higher in winter (0.8 hPa) than in summer (0.5 hPa). This could be due to less accurate measurement in rough seas and also to more low pressure systems crossing the North Atlantic in winter.

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 Météo-France to identify buoys reporting dubious data as quickly as possible. Among these tools is a blacklist computed over the previous 14 days which is available on the web at: <http://www.meteo.shom.fr/qctools/eblackap.htm>.

2.2 Moored buoys

In 2004 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 and one SeaWatch buoy respectively).

In accordance with the MOU between EGOS and E-SURFMAR the monitoring of the previous EGOS moored buoy network has been continued. The availability, timeliness and quality of moored buoys data are carefully monitored. By the end of August 2008, 12 K-pattern buoys and 17 Oceanor buoys were operating.

The INM (Spain) is reporting data from the Cabo Silleiro buoy (as well as others operated by Puertos del Estado) to the GTS in BUFR code. The messages received in Toulouse RTH are forwarded to

Exeter and Offenbach. However, these data are apparently not yet being processed or used by forecast meteorological centres. INM is working to modify the BUFR code they use to the BUFR template proposed by the DBCP.

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. A new buoy at K5, with a Triaxys spectral wave system was deployed in July. The data are presently being archived by the Met Office in NMEA format while the ability to generate BUFR messages and issue to GTS is developed.

The availability of moored buoy data depends on the number of buoys operating. An average of 150 hourly observations per day have been reported on the GTS from the initial EUCOS buoys. About 70 messages per day were reported from the 3 K-pattern E-SURFMAR buoys.

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

The Air Pressure (AP) differences with the French model outputs shows the 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 drifting buoys.

3. PLANS

3.1 Drifting buoys

The E-SURFMAR design study has recommended the deployment of an average of 175 SVP-B type drifters per year. For financial reasons (buoy and transmission costs) this will take several years to achieve. However, 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.

The transmission of drifting buoys data through Iridium will be more and more used as an alternative to 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

K5 (59.1N – 11.5 W), Cabo Silleiro (42.1N – 9.4W), Lion (42.1N – 4.7E) and M6 (53.1N – 15.9W) are designated as E-SURFMAR moored buoys.

The E-SURFMAR design study has recommended that directional wave spectra should be provided by all four buoys. By fall 2008, K5 buoy should report directional wave spectra data through Iridium 4 times each day at the main synoptic hours. Once proven the system could be procured and installed on the M6 and Lion buoys.

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 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.

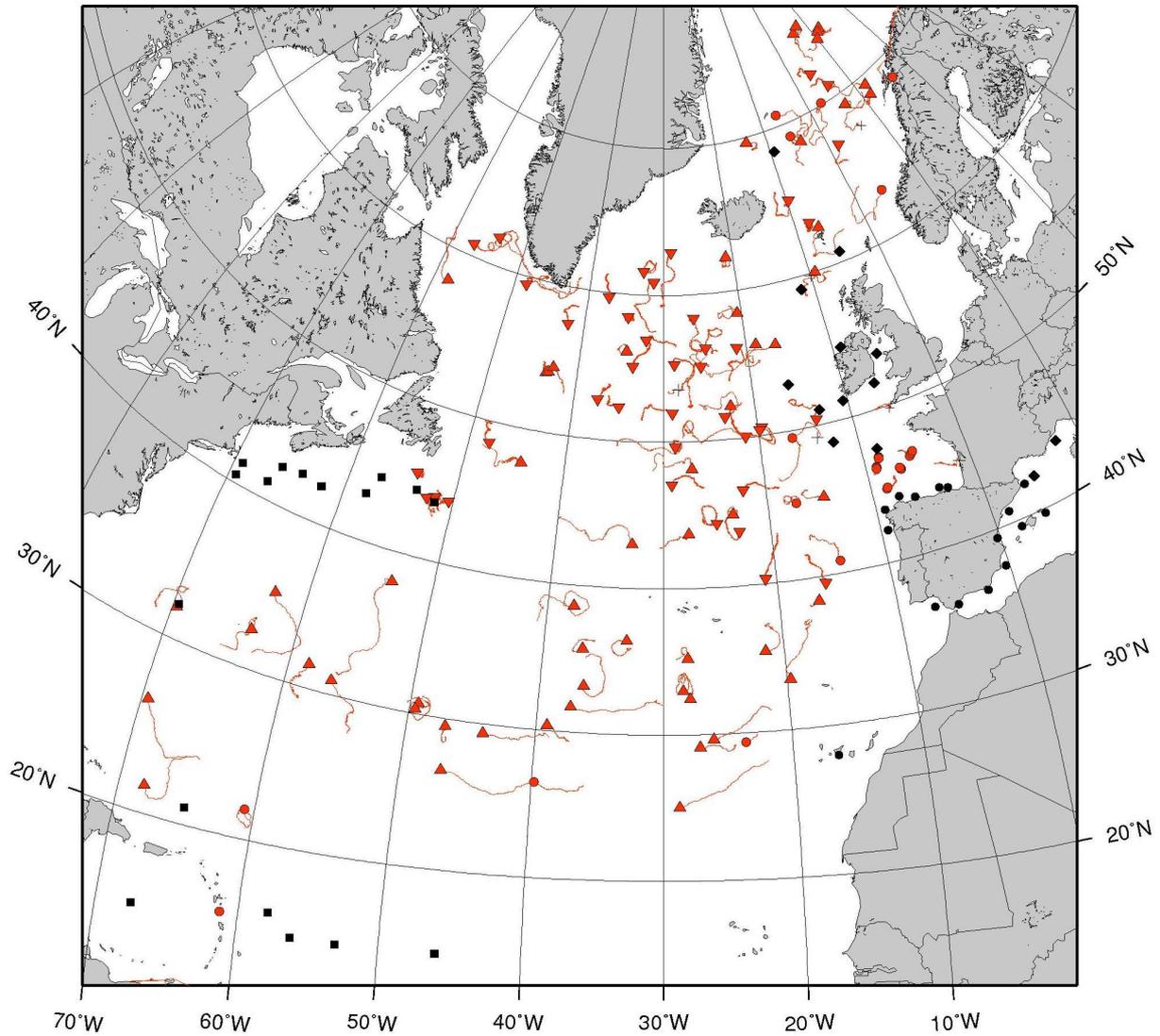


Figure 2. Operating Buoys in E-SURFMAR area
Drifting buoy trajectories and moored buoy positions
(August 2008)