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SHIP OBSERVATIONS TEAM (SOT)

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REPORT ON THE E-SURFMAR EXPERT TEAM ON VOS

(Submitted by Piere Blouch (France), E-SURFMAR Operational Service Manager)

Summary and purpose of the document

This document contains the report on Voluntary Observing Ship (VOS) activities of E-SURFMAR, the Operational Service of EIG EUMETNET (grouping of European National Meteorological Services) for Surface Marine Observations, and in particular on its VOS Expert Team.

ACTION PROPOSED

The Team will review the information contained in this report, and comment and make decisions or recommendations as appropriate. See part A for the details of recommended actions.

Appendices: A. Full report on the E-SURFMAR VOS component

- A - DRAFT TEXT FOR INCLUSION IN THE FINAL REPORT

7.1.3.1 Mr Pierre Blouch (France) reported on the activities by E-SURFMAR - the EIG EUMETNET operational service for Surface Marine Observations -, and in particular on its VOS Expert Team. Nineteen European NMS are financially contributing to the service which is still optional.

7.1.3.2 Although some of the topics were discussed in detail under other agenda items, Mr Blouch drew the meeting's attention to a number of developments carried out since SOT-6. In particular:

(i) The progress in the procurement of Shipborne Automated Weather Stations (S-AWS) having specifications commonly defined by E-SURFMAR participants. A call for tender was issued in 2012 by the EIG. A manufacturer was chosen. Three prototypes will be ordered in 2013. They will be tested at the beginning of 2014. Then, participants will be able to purchase series (see section 7.2.5).

(ii) The deployment of the « half compression » technique by KNMI on their conventional VOS (35 active by the end in February 2013). This technique allows to save communication costs (also discussed under section 6.1).

(iii) The improvement of ship-to-shore dataformat #100 in close cooperation with the JCOMM Expert Team on Marine Climatology (DMPA/ETMC). Several requirements were taken into account. This format is devoted to S-AWS. Another dataformat (#101) will be designed for conventional VOS.

(iv) The proper functioning of the E-SURFMAR metadata database which is continuously improved. Regularly updated by E-SURFMAR participants, it is also fed by Pub47 metadata submitted to WMO by non-European NMS. Thanks to that, the database is permanently up-to-date. On a daily basis, Pub47 metadata are extracted and made available on a public FTP site for active VOS as well as for active and non-active VOSClim.

(v) Mr Blouch reminded that the E-SURFMAR metadata database is open to any PMO or VOS operator in the world who would use it (even in read-only mode). In addition to Pub47 metadata (including digital images), the database handles mask identifiers, inspection reports and ship's contact details and give access to several internal or external monitoring tools (e.g. quality controls and ship's tracking). A MASK-REAL cross-reference list is also extracted every day and made available to JCOMMOPS. An online demonstration of the database was presented during the SOT Science and Technical Workshop.

7.1.3.3 The meeting noted again that about fifty percent of the operational VOS worldwide were recruited by E-SURFMAR and that all VOS operators could benefit from the E-SURFMAR experience.

7.1.3.4 The meeting made the following recommendations:

(i) Rec 1

7.1.3.5 The meeting decided on the following action items:

(ii) Action 1 (by whom; deadline)

APPENDIX A

REPORT ON THE E-SURFMAR VOS COMPONENT

Submitted by Pierre BLOUCH – E-SURFMAR Operational Service Manager

I. Background

1. In January 2013, E-SURFMAR has became an operational service of EIG EUMETNET. It is responsible for surface marine observations, including VOS and data buoys. EUMETNET is the Network of European Meteorological Services (http://www.eumetnet.eu). Nineteen countries out of the 29 EUMETNET members are currently participating in E-SURFMAR.

2. E-SURFMAR objectives are to coordinate, optimize and progressively integrate the surface marine observations within the operational observation framework of EUMETNET. Until now, EUMETNET observation programme aim was to optimize the ground observing system to improve short-range forecasts over Europe. The scope is now extended to climatology and 1km scale weather prediction models in Europe. It must be noticed that E-SURFMAR is also supporting VOS activities outside the EUMETNET area of interest.

3. The E-SURFMAR Operational Service is funded through participant contributions, which are based on their respective Global National Incomes (GNI). The service was a subject of a comprehensive study, carried out in 2004, which defines its broad design and objectives. At the beginning of 2013, the revision of the study was still outstanding.

II. Data availability

1. E-SURFMAR is coordinating the activities of about 50% of the VOS in the world. In 2012, EUMETNET ships reported 54% of world VOS observations, approximately.

2. In 2008, the number of manned observations reported by European VOS ships in the North Atlantic reached a minimum of 290 per day in average. This number must be compared to the 400 observations reported each day in 2002. Since, the number ranged from this minimum to 320 observations per day.

3. Germany, United Kingdom and the Netherlands remain the three European countries which provide the most numerous manned VOS reports: 15%, 10% and 5% of all manned reports sent onto the GTS by the world fleet, respectively.

4. Globally, EUMETNET ships reported 300,000 manned and almost 670,000 automated observations including sea level pressure in 2010 (22% more than in 2010).

III. Automation

1. The automation of the observation onboard ships is a priority for E-SURFMAR.

2. E-SURFMAR participants are operating different Shipborne Automated Weather Stations (S-AWS):

(a) France is operating 58 Batos stations (integrated S-AWS reporting through Inmarsat-C Data Mode) and 5 Minos (autonomous S-AWS reporting through Argos). Plans are to replace the Minos with modern AWS and to upgrade Batos AWS with Iridium SBD transmission meanwhile the availability of European stations;

(b) Germany is operating 17 Milos stations (integrated S-AWS reporting through Meteosat DCP) and 2 ship's own systems. Plans exist to renew these stations soon;

(c) UK is operating a fleet of 34 Amos (autonomous S-AWS reporting through Iridium SBD), three Minos and one Batos stations;

(d) Norway is using 5 S-AWS stations based on a QLC-50 system on their research vessels;

(e) Spain is operating a Vaisala MAWS 410 station (not reporting onto the GTS in 2013).

3. In addition, a few S-AWS stations were purchased by the E-SURFMAR Operational Service for its objectives. By the beginning of 2013:

(a) Ten Batos stations out of the twelve purchased in 2005-2007 have been installed on board European VOS: Irish and Italian Research Vessels as well as container carriers plying between Europe and Canada or Greenland. The remaining stations should be installed in 2013-2014.

(b) Sixteen Baros stations reporting only hourly pressure measurements through Iridium SBD have been installed onbard ships. Half of them were installed onboard upper air E-ASAP ships (on the E-ASAP container indeed). S-AWS are suitable on these ships to assist with their monitoring, most especially in the frame of Data Targeting Systems: operators may rapidly check where their ships are. The other stations were installed onboard ships plying in the Mediterranan Sea (ferries and container carriers) thanks to a fruitful cooperation with E-SURFMAR or MOON members in this area.

4. The call for tender for the procurement of S-AWS to be used on observing ships recruited by E-SURFMAR participants took more time than expected. Finally, it was issued in June 2012 by EIG EUMETNET. One must remind that the specifications were jointly defined by the interested participants. One manufacturer was chosen. A framework agreement was signed between EUMETNET and this manufacturer. Three prototypes should be ordered by the end of March 2013 through a subsequent contract between Meteo-France, coordinating member for E-SURFMAR, and the manufacturer. The prototypes should be evaluated/tested at the beginning of 2014. The ability to enter visual observations in the S-AWS prior to the data transmission is part of the final specifications. This will be ensured through a TurboWin interface software. Data transmission will use Iridium SBD. Data format will be E-SURFMAR #100 (see § IV).

IV. Data communication

1. E-SURFMAR acquired a certain experience in matter of data communication. Most especially, a couple of systems has been developed and tested in order to reduce communication costs while migrating to BUFR without too many drawbacks. These systems includes:

(a) Iridium Short Burst Data on S-AWS. A dataformat, called #100, was designed for this purpose in colaboration with the JCOMM Expert Team on Marine Climatology (DMPA/ETMC) and the oceanographic community. It is already used by E-SURFMAR BaRos stations. Details are given in the annex of the TT-SatCom to SOT-7.

(b) The so-called “half compression” data technique, which allows to report manned observations through Inmarsat-C to a dedicated Short Access Code, with two 32-byte blocks only. The functionality to code such reports was made available in the TurboWin electronic logbook software produced by KNMI. Because the technique proved its efficiency, KNMI started to deploy it on most of VOS ships recruited ny The Netherlands. By the end of 2013, 35 conventional Dutch VOS used this technique to report their observations. A future version of the format, called E-SURFMAR dataformat #101 will allow to report VOSClim data. This latest will be validated by ETMC before being applied.

2. Both systems require a data processing chain ashore able to convert the Iridium SBD messages and the “half compressed” data into WMO codes (FM13-SHIP, FM18-BUOY and FM96-BUFR) to be sent onto the GTS. The processing software has been developed by Meteo-France and it is made freely available to any NMS that would wish use it (Free Software License CeCILL).

3. In addition to FM13-SHIP reports, Meteo-France has been reporting all Batos and Baros S-AWS data in BUFR onto the GTS for a few months according to the B/C10 template (about 80 stations, 25,000 observations per month). The migration to any future template will be done instantaneously as soon as the decision will be taken to apply it. Presently, bulletin headers are ISSx11 LFPW, ISSx25 LFPW and ISSx30 LFPW, ‘x’ being the A_2 geographical area index.

4. Many European VOS continued to use masked or generic GTS identifiers, which are different from their ITU assigned REAL callsigns. The identifiers take the form “tttccnn” where: “ttt” is the type of station, “cc” a country code and “nn” an increment. Although they are used as a mask, they also assist greatly the day-to-day monitoring of the fleets.

V. VOS metadata

1. Because VOS metadata is essential for daily monitoring, performance evaluation and calculation of financial compensations to E-SURFMAR members, a metadata database has been developed within the service. Insofar non-European VOS are sailing in European waters, there were an interest in having all metadata available in this database. Since SOT-V, Pub47 metadata sent by non-European VOS operators to WMO are uploaded into the E-SURFMAR database as soon as they are available.

2. Extractions in CSV and XML formats are performed every day and made available on a FTP site (ftp://esurfmar.meteo.fr/pub/Pub47). These extractions presently include all Pub47 metadata available for active VOS and, separately, for any VOSClim (active or non-active). It is proposed that in future the E-SURFMAR metadata database provide the main Pub47 repository for VOSClim ships (recommendation by TT-VOSRPP to SOT-7).

3. The database already handles version 4 of Pub47 metadata.

4. Accounts may be created for VOS operators and PMOs in order they use the online interface to manage their fleets (http://esurfmar.meteo.fr/doc/vosmetadata/) and to perform queries on the database. The database handles digital images (part of Pub47 metadata) and masked identifiers (with limited access). It may serve to store inspections reports and it allows to edit quality reports which may be given to observers. It also may display possible multi-recruited ships and it used to manage the VOS ancillary fleet.

5. The database interface gives also access to the E-SURFMAR monitoring tools as well as a few functions such as tracking maps, last observation position map and observation counters for a selection of ships on a given period. Non-Pub47 metadata (e.g. ship contact details) may be also entered in the database. These medatada include a list of email addresses which may be used used by the VOS to report her observations ashore (whitelisting) and the MMSI Id. which allows to track the ship on the marinetraffic.com website thanks to her AIS system.

6. Some NMSes are using the E-SURFMAR database as their primary database.

7. The database is used by Meteo-France and E-SURFMAR to provide metadata - such as the height of the anemometer and the method of obtaining the SST -, which are added to the observation data of their fleet in FM96-BUFR bulletins.

VI. Compensations and fundings

1. Since E-SURFMAR started in 2003, financial compensation is paid every year to VOS operators for the observations carried out by their ships. In 2012, 0.24 € were paid for each manned observation and 0.09 € for each automated measurement.

2. Compensation is also paid to those National Meteorological Services who bear the communication costs. In 2012, 0.16 € were paid for each report sent by a conventional VOS and 0.04 € for each report sent by an AWS. The share of compensations between the operators and NMSes are based on the observations carried out in the previous year.

3. Since 2008, the service has been financially supporting KNMI for their work on the development and enhancements of the TurboWin program.

VII. Data monitoring and data quality

1. Since the E-SURFMAR design study was carried out, air pressure data reported by EUMETNET ships have been monitored as a matter of priority. Despite many actions, the quality of measurements reported by conventional VOS did not increase significantly since SOT-V if we compare to those of AWS reports. Human readings often introduce non systematic errors on sea level pressure observations. Double correction of the pressure height of the barometer above the waterline is still a common error, although TurboWin includes warnings to the observers about this issue.

2. E-SURFMAR developed monitoring tools for VOS (and data buoys). These, available at http://www.meteo.shom.fr/qctools/, include monthly statistics of differences with model outputs, dataplots and plots of differences with model outputs over the past two weeks, blacklists of VOS reporting dubious pressure values…These tools may be used by all VOS and Data Buoy operators. They are not restricted to EUMETNET members/platforms.

VIII. Meetings and Web sites

1. The 9th VOS-TAG meeting was be held in Las Palmas, Canary Is., on 2-3 May 2012.

2. E-SURFMAR public web pages: http://www.eumetnet.eu/ and http://www.eucos.net/
Working area (password protected) : http://esurfmar.meteo.fr/wikisurf-wa/