SUB-SURFACE UNDERWATER DATA VALIDATION AT IEO DATA CENTER

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INTRODUCTION

Almost the entire Spanish Research Vessels fleet, together with VOSs (Voluntary Observing Ships) and SOOPs (Ship of Opportunity Program), are equipped with automatic sampling devices to detect physical, chemical and biological data along the survey routes. The board thermographs (TSG) measure the sub-surface seawater temperature and salinity. As the international scientific community welcomes such instruments, on board, data quality control is essential to ensure an international acceptance and to ensure the data and the research programmes, meeting information and duplicate.

DATASETS

IEO DATASETS

started in 2002 and cover the Spanish western and adjacent areas. Five research vessels: Cornide de Saavedra, J.M. Navaz, J. Rioja, R. Margalef and A. Alvaracín collect the data from a TSG device.

UTM DATASETS

coming from surveys activities of the Institutos de Estudios y Hospitales research vessels spanning from year 2000 to 2011, undertaken around the Spanish coasts and along ocean routes (North and South Atlantic, Pacific and Caribbean sea).

CONCLUSIONS

Good quality data coming from continuous measurements give valuable information to complete the world ocean data. The two procedures showed along this work achieve similar results in systematic errors detection and validation of the final datasets, although the output formats are different: ODV and MATLAB.


ODV software provides good and flexible visualizations, due to its QC-logging system. The continuous monitoring of both ODV and MATLAB tool process NC, allowed the anomalous detection in real-time during data collection procedures. The central procedure highlights the convenience of a careful planning for the sampling procedure.

Fig. 1. Global trajectory of marine spanish research vessels

Fig. 2. Spanish research vessel: Alboran: Cornide de Saavedra

Fig. 3. Total amount of data collected by spanish research vessels: Alboran: records distribution per research vessel, Bullena: annual records distribution.

The assembly of the two datasets after this validation improves the spatial coverage and allows to elaborate spatial distribution maps for the regions with enough data. An example is given in the following figures. Each map is obtained after data quality control procedures and ODV visual control validation.

Fig. 4. Sensor stabilization and vessel velocity, output from Procesa TSG. In some cases anomalies are found. The temperature spike marked red is probably due to the sensor stabilization in the cooling down of the seawater at the pipe.

Fig. 5. ODV data visualizations show bad values of temperature measurements (SDN QC=4): each time the vessel is performing acoustic measurements. It is possible to filter the data and visualization just the corrected data which show the temperature variation just along of the track.

Fig. 6. Seasonal situation of spanish coastal sea temperature distribution. Left: winter. Right: summer.

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