Marine Meteorology and Altimetry

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MAIN APPLICATIONS

Marine meteorology includes a lot of oceanographic applications: safety at sea, storm surge alerts, ocean surface wave warnings at coast, Navy support, monitoring of oil pollution, ship routing, assistance for sailing races.
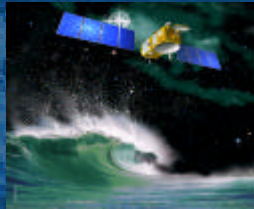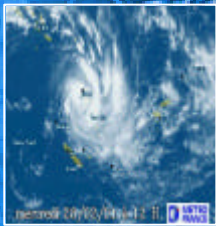
•Safety at sea

•Rescue

•Ocean surface wave warnings

•French Navy support

•Prediction of oil slick trajectories

•Sailing, Ship routing

CALVAL PROGRAMME:

Main Objectives:

to Calibrate/Validate JASON Fast delivery and Offline GDR wind and wave data sets through comparison with :

- buoys available on the Global Transmitting System

- Satellites

- Numerical Weather Predictions (NWP) models and Numerical Sea-State Predictions (NSSP) models.

Location:

Comparisons will be done at global scale (left figure) but also at locations of campaign experiments (Mainly in the Mediterranean Sea, right figure)

WAM (Global) Cycle 334

VAG / ALADIN (Medit occidentale) Cycles 322,323,324
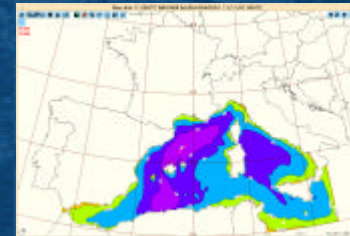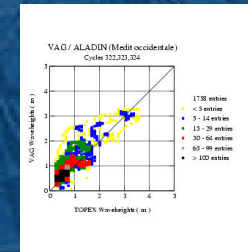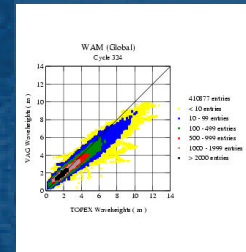
•During the CALVAL period, the VAG model (Meteo-France) will be run on a grid covering the western Mediterranean Sea with a spatial resolution of 0.1° with a wind forcing from the atmospheric limited area model ALADIN.

•METEO-FRANCE will also provide CNES with some surface parameters (wind vector, sea-state, surface fluxes) from NWP models in order to drive accurate sea level models.

OPERATIONNAL USE OF ALTIMETER DATA

After the calibration/validation period, JASON fast delivery wind/wave data will be assimilated in the Meteo-France wave prediction model VAG. In the operational global wave model operated at the French weather service, ERS-2 altimeter wave data have been assimilated every 6 hours. The analysis increments (difference between the analysis and the first guess) above 0.5 meter are shown on the figure below. They exceeded 1.5 m in the storm area.
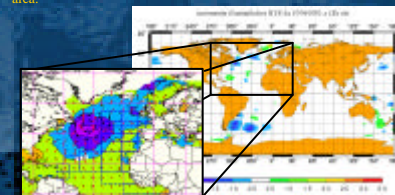
## ASSOCIATED SCIENTIFIC INVESTIGATIONS

•**Wave data Assimilation**

JASON data will be assimilated in a global numerical sea state prediction model. The impact of the Topex data, in addition to ERS-2 data on the forecast will be investigated. The potential impact (in meters) of using one altimeter on the forecast is shown below. On the top figure, the impact is shown at the time of the assimilation then for a 36 hours forecast (intermediate figure) and for a six days forecast (bottom figure).
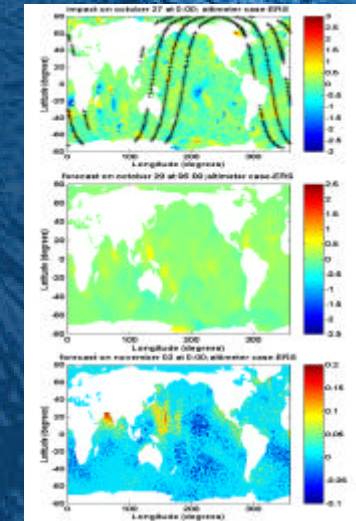
•**Sea level data assimilation**

The development of a method to assimilate sea level data in a surge model is under process at Meteo-France.
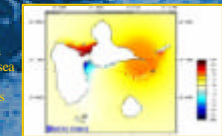
•**Improvement of surface currents**

The possibility of using currents derived from altimetry for the prediction of oil slick trajectories is under investigation

METEO FRANCE