

### Abstract

Ssalto/Duacs system processes data from all altimeter missions to provide a consistent and homogeneous catalogue of products for varied applications, both for near real time applications and offline studies in the framework of the SALP/CNES and MyOcean/SL TAC project.

We present here a focus on the **future improvements of the SSALTO/DUACS production**. They concern the coming data reprocessing as well as the NRT production.

### Improved altimeter standards

✓ **Concerning past data:** Envisat has been recently reprocessed in GDR-2.1 with improved standards and Jason-2 GDR-D reprocessing is almost finished. For other altimeters, improved parameters are also available (e.g. improved orbits and DAC solutions for old missions). The new altimetric standards will lead to a more precise observation of the signal at mesoscales as well as climatic scales.

✓ **Concerning real time data:** Early 2013 Duacs RT products will also be improved with the use of a new real time DAC solution rather than simple Inverse Barometer.

VAR(SSH with DAC\_ERA) - VAR(SSH with DAC\_ECMWF)  
Mission tp, cycles 11 to 481

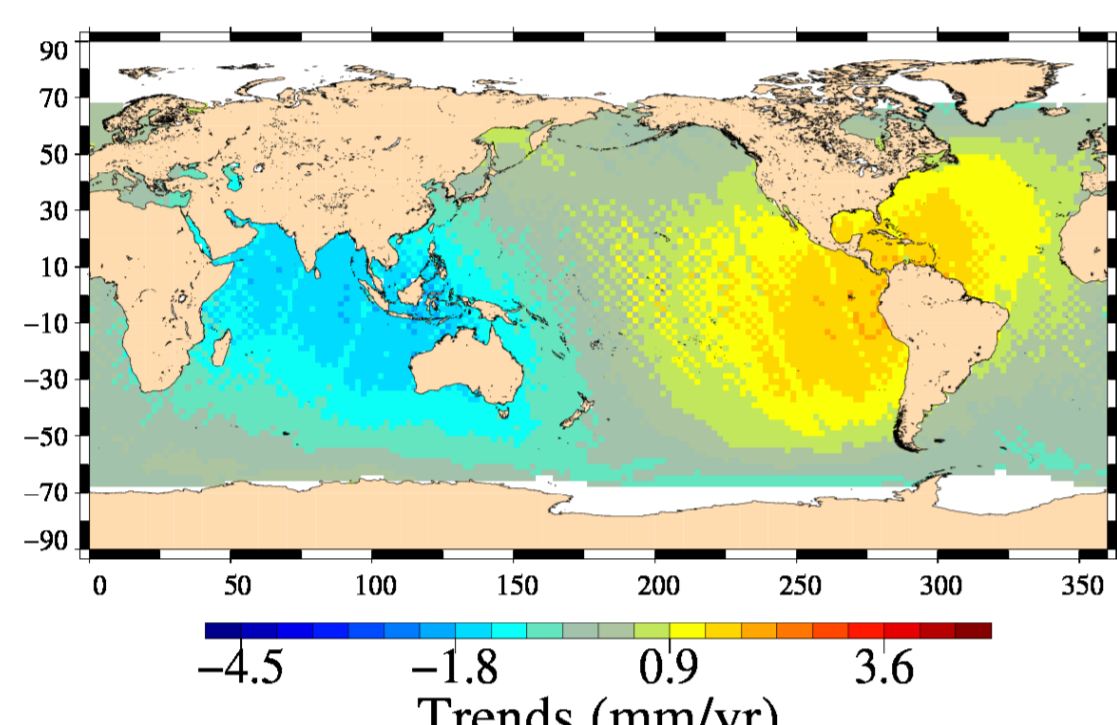


Fig : Regional MSL trends differences between CNES GDR-C (Eigen-GLO4S) and GDR-D (Eigen GRGS) orbit solutions for Jason-1  
→ The improved orbit solution improves the regional Mean Sea Level trend estimation (signature of improved gravity field at basin scales)

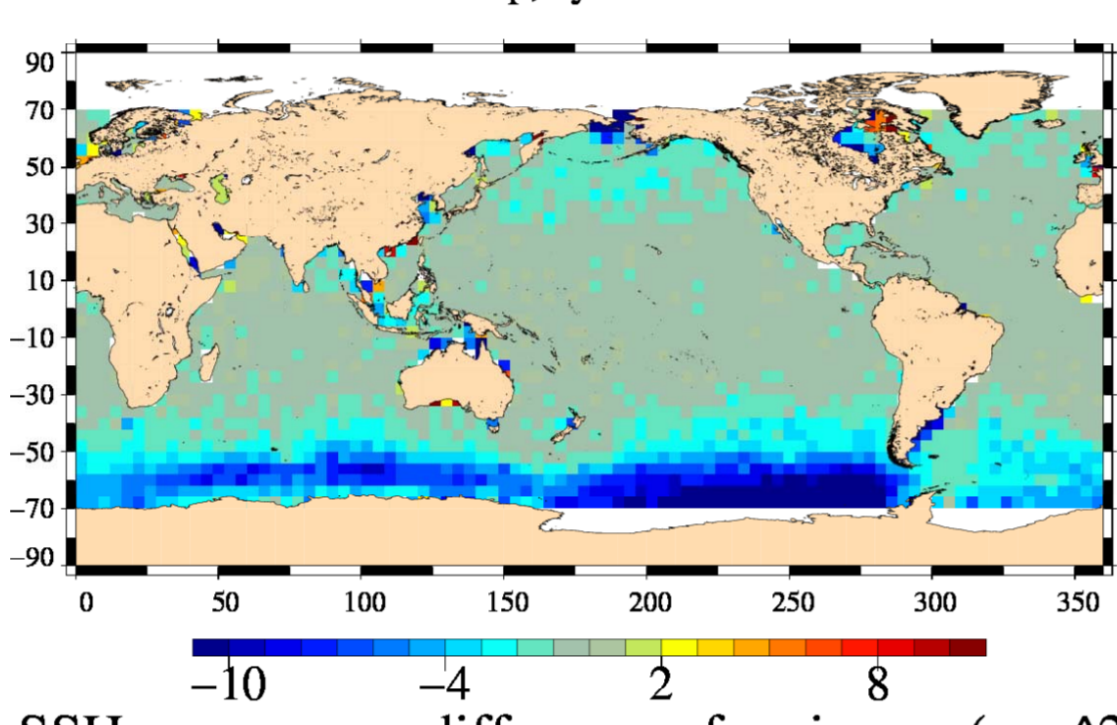


Fig : Maps of SSH variance differences at crossovers using successively the ERA-interim and reference DAC solutions in the SSH calculation for Topex/Poseidon (cycles 1 to 481).  
→ The DAC solution derived from ERA-interim allows reducing the residual variance at cross-overs by 10 cm<sup>2</sup> in the Southern Ocean

### And also ...

**The Mean Dynamic Topography** will be reprocessed in 2013 in order to take into account the latest Geoid model, an improved Ekman model, and additional in situ measurements. This new version of the MDT will also be referenced to the [1993,2012] period rather than the historical 7-year period.

In collaboration with the MyOcean project, **new regional products** has been developed in Near Real Time conditions : the Arctic and the European Seas were recently added to the Near Real Time production. The Baltic regions will also be soon included .

The evolution of the altimeter products will be completed with **changes in the nomenclature**. The objective is to make easier the identification of the product that correspond to your need.

The data format will also be modified in order to generalize the **NetCDF "CF"** convention for all the products (including grids).

### Change of the reference period

The Ssalto/Duacs SL Anomalies products are historically referenced to the 7-year period [1993, 1999]. As nearly 20 years of altimeter measurements are now available it is of high interest to change the reference period for a longer period which will allow us to have interannual signals with more relevant intensities and spatial signatures. It is thus proposed to compute anomalies relatively to the [1993, 2012] period.

**Main Impacts of this change on the products:**

- ✓ The reference change will impact the mean of the SLA at regional scales
- ✓ The along track and gridded anomalies will be impacted but not the Absolute products
- ✓ The DT products will be entirely reprocessed in 2013 with this new reference
- ✓ The change will also be implemented on NRT products mid 2013. **More information will be soon sent to you by Aviso to insure a smooth transition**

Fig : the reference change will impact the mean of the SLA at regional scales

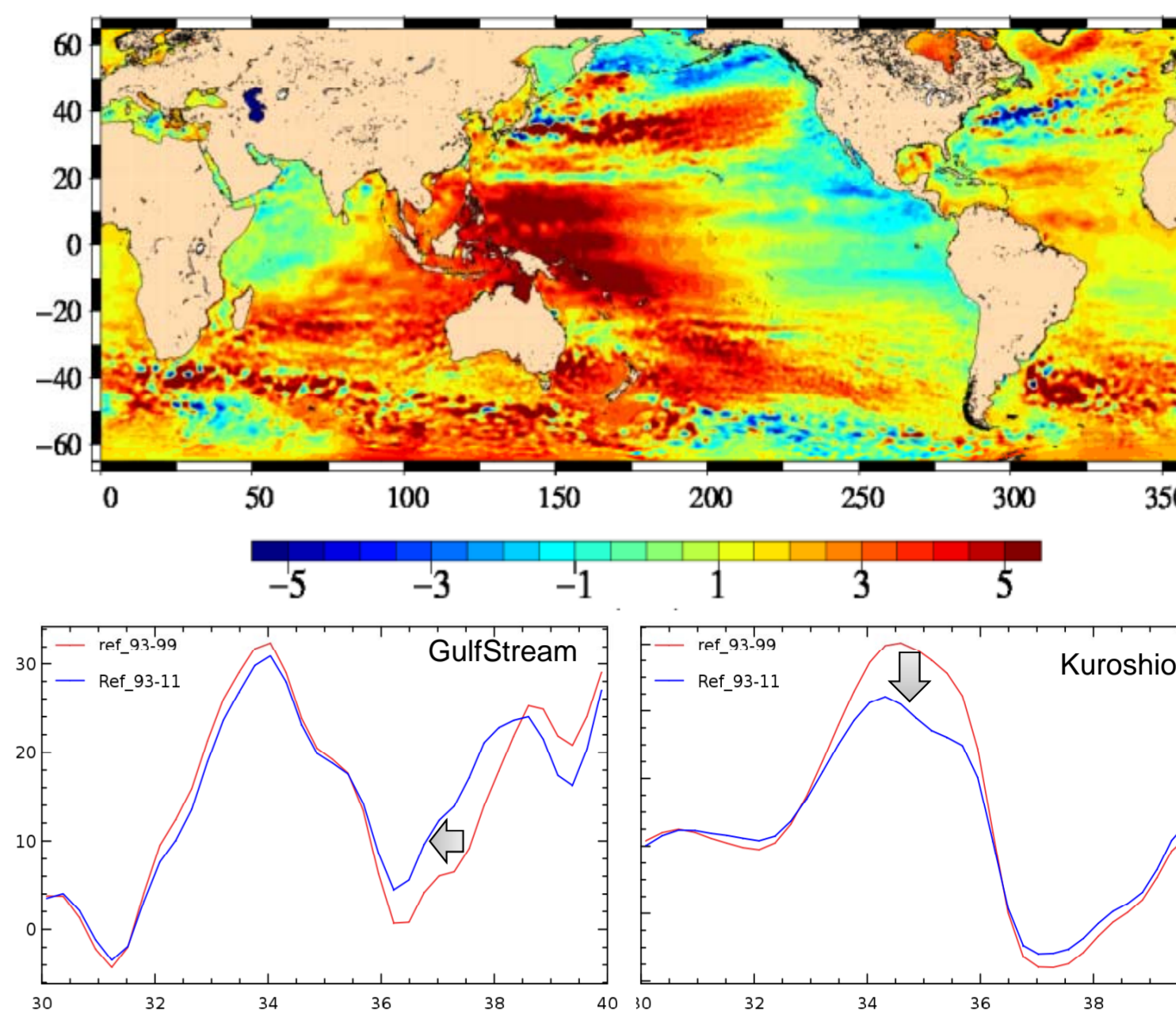


Fig: SLA along a meridional section crossing the GulfStream or the Kuroshio in December 2011. SLA referenced to the [1993, 1999] period (red) and [1993, 2011] period (blue).  
→ Changing the reference period can modify the SLA instantaneous signature of the specific structures of the global surface circulation. It does not modify the Absolute Dynamic Topography.

### Improved data Processing

✓ The data processing, allowing to estimate a calibrated SLA and merge the measurements from the different altimeters in a gridded product, will be reviewed.

○ The SLA calibration, i.e. correction of the **bias between the different altimeters**, will be improved in order to take into account the geographically variable part of the bias.

○ The **parametrization of the merging algorithm** will be tuned: new correlation scales, better taking into account the geographical variability of the signal, and tuned a priori measurement errors will also be improved by considering the specificities of the different altimeters.

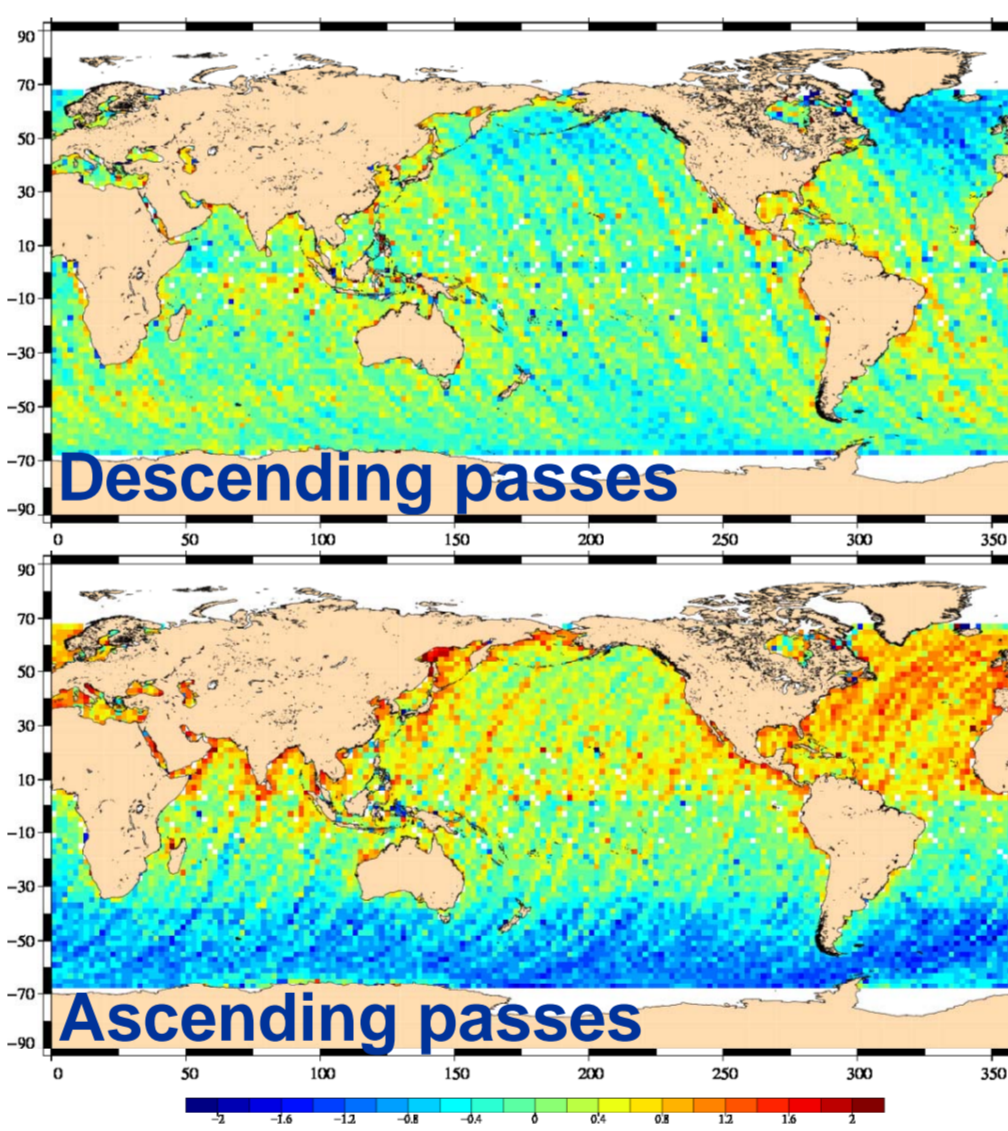


Fig : Map of SLA differences centered on the average between TOPEX and Jason-1 during the Jason-1 verification phase.

→ The correction of the geographically correlated bias observed between Topex and Jason-1, and between Jason-1 and Jason-2, allows us to estimate more precisely the regional mean sea level trend. Local differences of near 0.3 mm/y are observed with the MSL trend estimated from the products non corrected from the geographical bias.

✓ Moreover Both along-track products will be processed to optimally observe the mesoscales signals. They will thus be delivered with a **higher spatial resolution**. The measurement noise reduction will be optimally adjusted in order to keep as much as possible the short wave along-track signal.

✓ It is also envisaged to deliver the SLA maps only on a 1/4° Cartesian grids and we intend to stop the 1/3° Mercator maps delivery.

VAR(GFO - Merged(J1,EN)) - VAR(GFO - Merged(J1,EN))  
New Correlations - Old Correlations

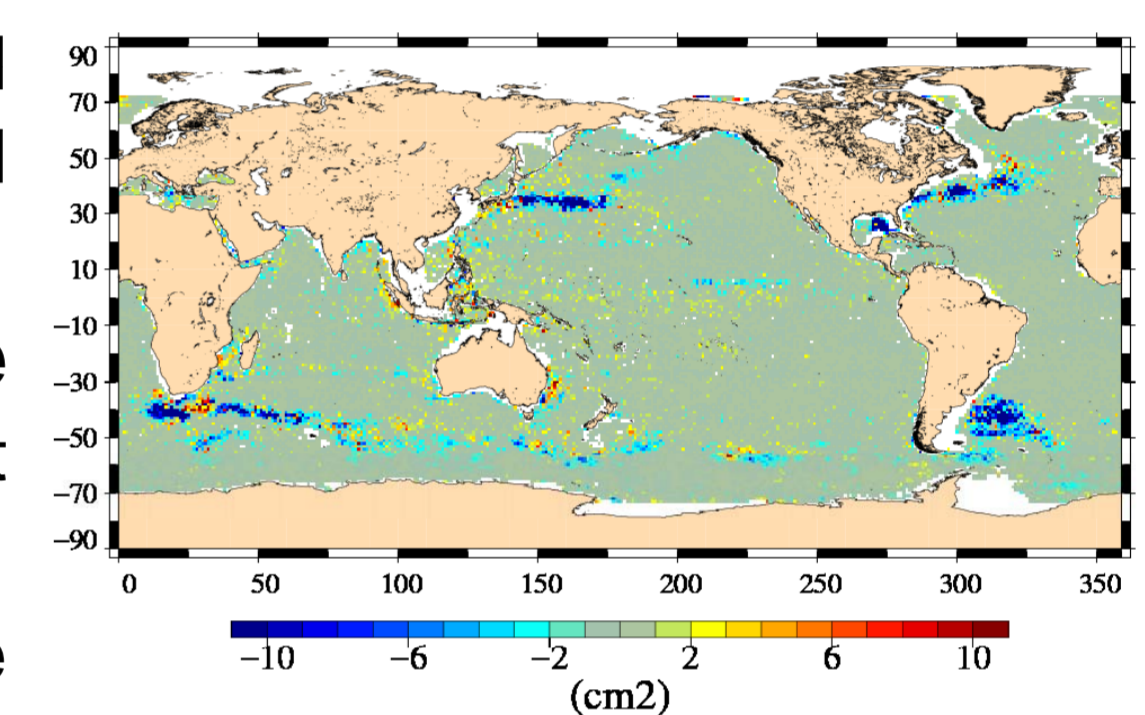


Fig : Maps of SLA, merging Jason-1 and Envisat data, were compared with independent GFO along-track data over the period [2003, 2004]. The figure shows the variance differences of the results obtained when current correlations scales and improved correlation scales are used for the mapping process.

→ The new version of the correlation scales improves (in blue) the coherence between the SLA maps and independent along-track data. The variance of the differences is reduced by near 10 cm<sup>2</sup> in high variability areas.

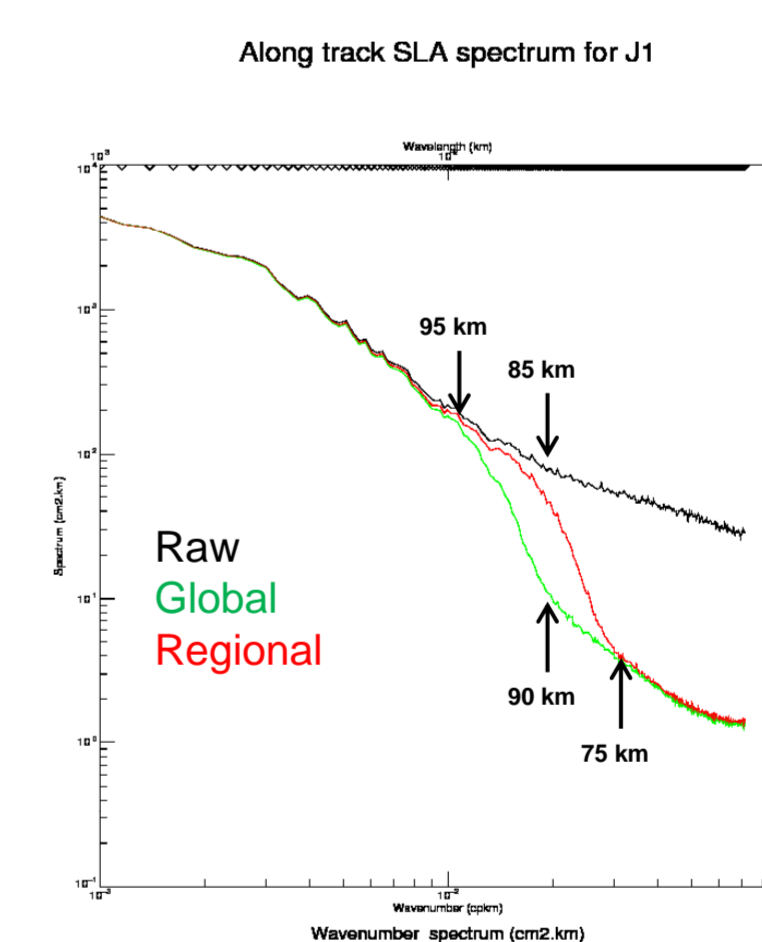


Fig : Power spectrum of Jason-1 data over the Europe area and for year 2008.

→ The optimisation of the noise reduction processing leads to a better resolution of the short wavelengths. In the European seas, 95 to 85 km wavelengths can be resolved whereas they are nearly absent in the current global product.

## In summary, what's new in 2013 for DUACS

- ✓ Change of the reference period
- ✓ Improved standards and processing
- ✓ New regional products
- ✓ New nomenclature and format

To be included mid 2013 in the NRT products and in a complete reprocessing of DT Products.

→ PLEASE SEND US YOUR FEEDBACKS!

aviso@oceanobs.com