REGIONAL CALVAL AND ALTIMETRY ACTIVITIES AT THE CTOH
Centre for Topographic studies of the Oceans and Hydrosphere

CTOH : An observational service dedicated to satellite altimetry
www.legos.obs-mip.fr/observations/ctoh/

INSTITUT NATIONAL DES SCIENCES DE L'UNIVERS — INSU

Centre de Topographie des Océans et de l'Hydrosphère *

Established in 1989, the Centre for Topographic studies of the Oceans and Hydrosphere (CTOH) is a French national observational service dedicated to satellite altimetry studies. The principal objective of the CTOH is to develop and maintain altimetric data bases with homogeneous, up-to-date corrections for the long term monitoring of sea level, lake and river levels, and the cryosphere for use in climate studies.

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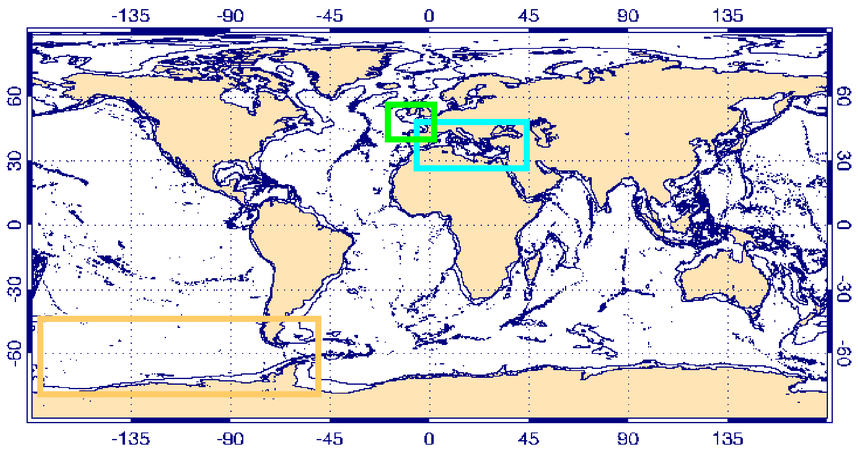


For the Jason-2 Calval phase, we focus here on **three regions** : two marginal seas – the **Bay of Biscay** and the **Mediterranean Sea**, and a **high-latitude region > 60°S** with winter sea-ice coverage.

Bay of Biscay CALVAL

1) Spatial coverage of Jason -2 vs Jason-1 close to the coasts

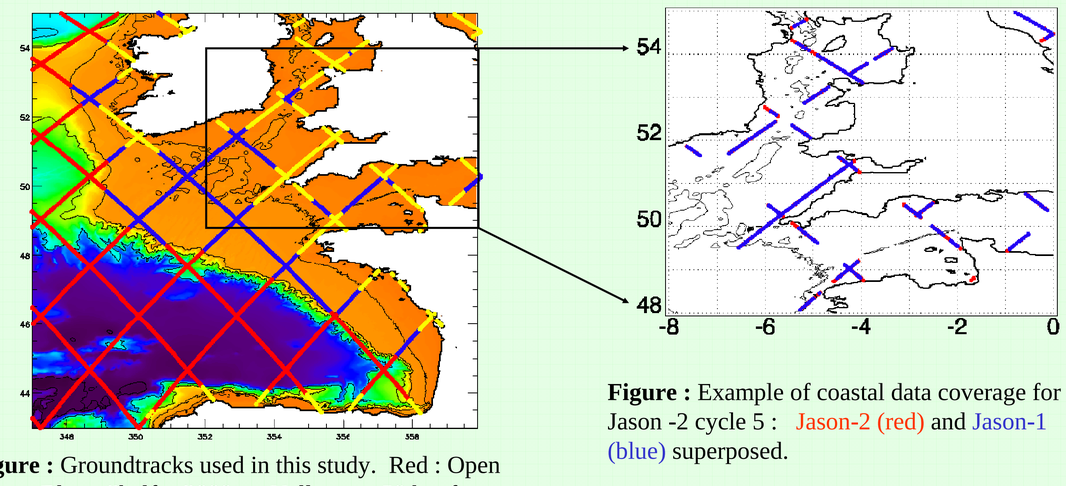
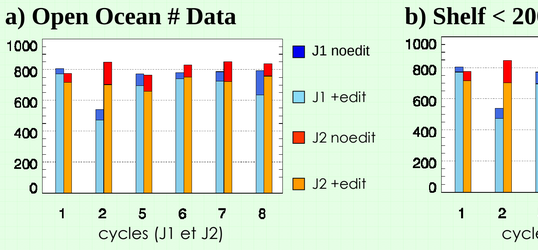


Figure : Groundtracks used in this study. Red : Open ocean; Blue : Shelf < 2000 m; Yellow : < 50 km from coast.

Figure : Example of coastal data coverage for Jason -2 cycle 5 : Jason-2 (red) and Jason-1 (blue) superposed.



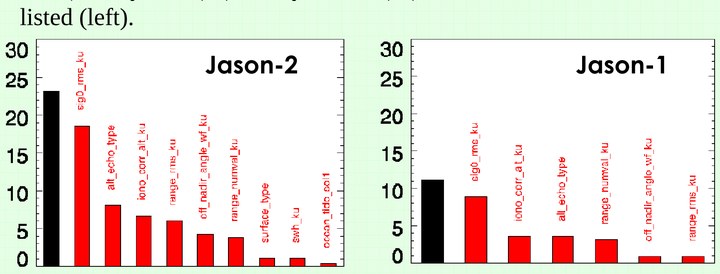
Jason-2 has more data available before editing, especially in the coastal zones. This extra J2 data is largely eliminated after standard editing is applied.

2) Editing

Standard Editing applied (Jason-2 Handbook) (without Radiometric terrain mask) :

range_numval_ku	10 ≤ x
range_rms_ku	0 ≤ x (mm) ≤ 200
altitude – range_ku	-130 000 ≤ x (mm) ≤ 100 000
model_dry_tropo_corr	-2 500 ≤ x (mm) ≤ - 1 900
rad_wet_tropo_corr	-500 ≤ x (mm) ≤ - 1
iono_corr_alt_ku	-400 ≤ x (mm) ≤ 40
sea_state_bias_ku	-500 ≤ x (mm) ≤ 0
ocean_tide_sol1	-5 000 ≤ x (mm) ≤ 5 000
solid_earth_tide	-1 000 ≤ x (mm) ≤ 1 000
pole_tide	-150 ≤ x (mm) ≤ 150
swh_ku	0 ≤ x (mm) ≤ 11 000
sig0_ku	7 ≤ x (dB) ≤ 30
wind_speed_alt	-0 ≤ x (m/s) ≤ 30
off_nadir_angle_wf_ku	-0.2 ≤ x (deg2) ≤ 0.64
sig0_rms_ku	x (dB) ≤ 1
sig0_numval_ku	10 < x

Figure : Percentage of data eliminated in the coastal zone (< 50 km from coast) for cycle 5 (J2) and cycle 244 (J1), for the standard corrections listed (left).



=> **In the coastal zone**, the **largest data loss** is due to the **editing imposed on altimeter instrumental parameters**. 10-15% of the additional Jason-2 data available is eliminated by the editing criteria : **rms sigma0 (ku) > 1 dB**

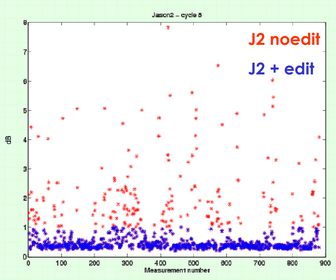


Figure : Jason-2 values of **rms Sigma-0 (Ku)** in the coastal zone (< 50 km) cycle 8

Work in Progress :

We are currently **testing the editing criteria** for all of the corrections and instrumental parameters in the coastal zone

Eg, Testing changes in the alongtrack evolution of parameters, rather than cutoff limits.

3) Tracks approaching and leaving the coast : Editing effects

Table : Mean distance of the first data point from the coast, for tracks approaching and leaving the coast, for Jason-1 and Jason-2, with and without standard editing.

Distance (km)	Jason-1 – no edit	Jason-1 – with edit	Jason-2 – no edit	Jason-2 – with edit
Approaching the coast	11.1	13.7	5.5	11.2
Leaving the coast	8.1	12.7	6.4	12.5

Jason-2 has more data point closer to the coast, and especially for tracks **approaching the coast**. This benefit is removed when the standard editing is applied.

Mediterranean CALVAL

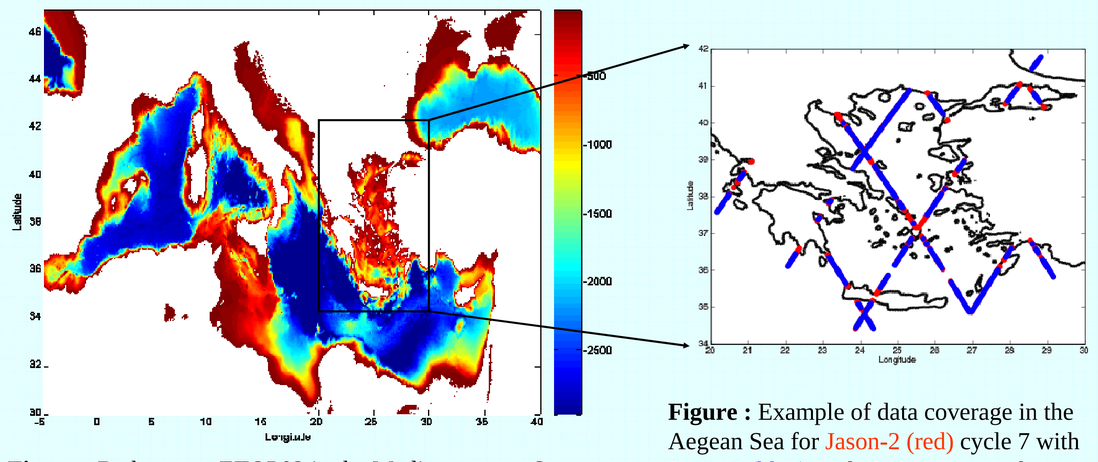
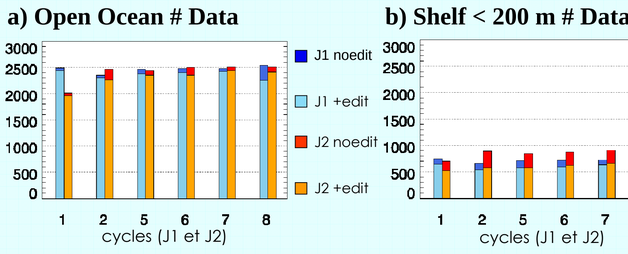


Figure : Bathymetry ETOP02 in the Mediterreanean Sea

Figure : Example of data coverage in the Aegean Sea for Jason-2 (red) cycle 7 with Jason-1 (blue) cycle 246 superposed.



Jason-2 has more data available before editing, especially in the coastal zones. This extra J2 data is largely eliminated after standard editing is applied.

Southern Ocean CALVAL

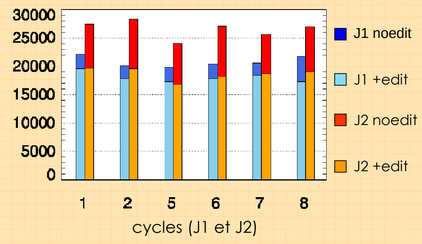


Figure : Comparison of available data before and after editing for J1 & J2

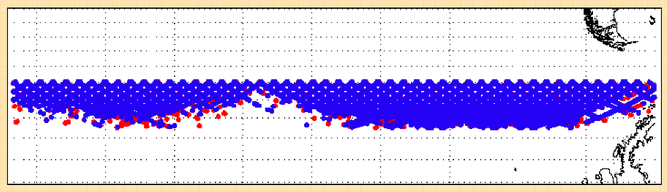


Figure : Example of data coverage in high latitudes for Jason -2 cycle 5 : Jason-2 (red) and Jason-1 (blue) superposed.

Close to sea ice, Jason-2 has more data available before editing. Once again, this extra J2 data is largely eliminated after standard editing is applied.

4) Evolution of regional bias and rms

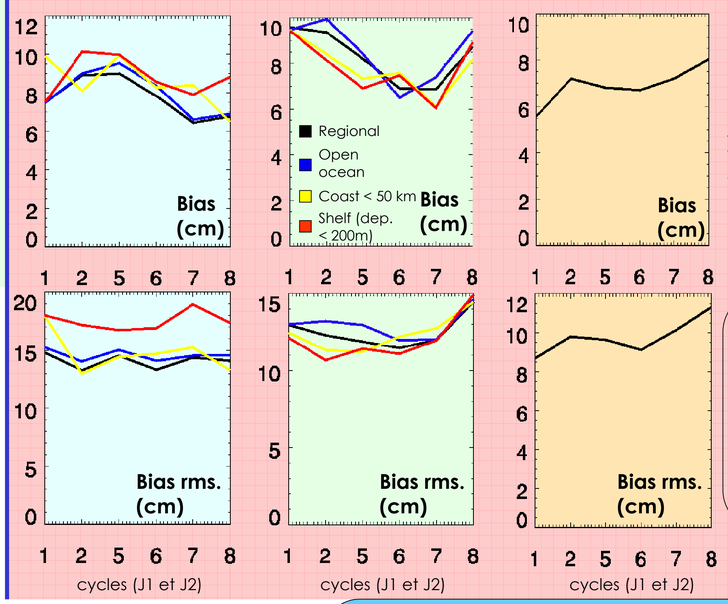


Figure : Jason-2 / Jason-1 SSH bias (top) and rms (bottom) for all the studied basins.

Biases (J2 – J1) in corrected SSH show a clear positive bias of **~7.8cm** with a significant variability (**1.25cm rms**). These biases also differ for all basins although coastal zones biases have a relatively good agreement over cycles with open ocean biases.

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