



Sea Level CCI project

Phase II 1st annual review





WP2510

Impact of loss of Envisat on the MSL evolution

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**National
Oceanography Centre**
NATURAL ENVIRONMENT RESEARCH COUNCIL



WP2510: The questions



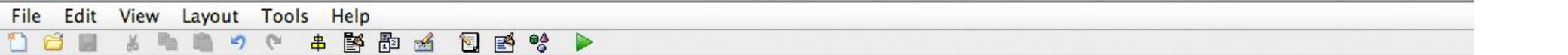
This task aims at analyzing the impacts of loss of continuity on the 35-day track (in October 2010) on MSL evolution, namely:

- Is there an impact on the global MSL evolution?
- What are the regional impacts?
- How is the impact reduced by reinstatement of the 35-day orbit with AltiKa from March 2013?
- How is the impact reduced by using the Phase C (30-day) Envisat data until April 2012?

WP2510: tools



- **EPPA – Error Prediction Program for Altimetry**
 - developed at NOC with NOC spin-off SkyMat
 - Originally for ESA’s Scientific Assessment of Fine Scale Altimetry Using a Constellation of Small Satellites
 - allows the user generate any number of orbits / satellite constellations for altimetry satellites in order to predict either the sea surface height formal error or a combination of corrections errors
 - here we use it to sample
 - a. the real altimetric surface
 - b. a realistic model



Select

OK Push Button

Slider

Radio Button

Check Box

Edit Text

Static Text

Pop-up Menu

Listbox

Toggle Button

Table

Axes

Panel

Button Group

Starting Instrument Error

1. Orbits

2. Regions

Start Time (Days)

Inland Water Parameters

Number of Days

Separation Dist (km)

File Names

Input orbital parameters

Altitude

Inclination (°)

Eccentricity

True/ Mean Anomaly (°)

R.A. of the ascending node (°)

Argument of Perigee (°)

Save Orbit Configuration Calculate Orbit

Input Date, Time, Time Step, Duration

Year [YYYY]

Month [MM]

Day [DD]

Hour [24 HH]

Minutes [mm]

Seconds [ss]

Time Step (min)

Duration (Days)

Show Inland Results

3. Visualise Orbits/ Constallations Configuration

4. Corrections

Dry Tropospheric

Wet Tropospheric

Ionospheric

Apply All Corr (SSH)

5. Observations Derived From

Jason 1 and 2

ENVISAT

Jason 1 & 2 and ENVISAT

NEMO

Altimeter

Freq Band (Ku/Ka)

Single/ Dual

6. 2D or 3D Kriging

No. Days

2D

3D

10. Calculate statistical errors

7a. Ionospheric Effects

Corr. for dual band altimeter

Corr. using dual GPS

Corr using the GIM model

7b. Wet Tropospheric Correction

Corr. using Microwave Radiometer

Corr. using the ECMWF model

Corr. using the NCEP model

No Correction

8. Temporal Resolution

3 Hrs

6 Hrs

12 Hrs

1 Day

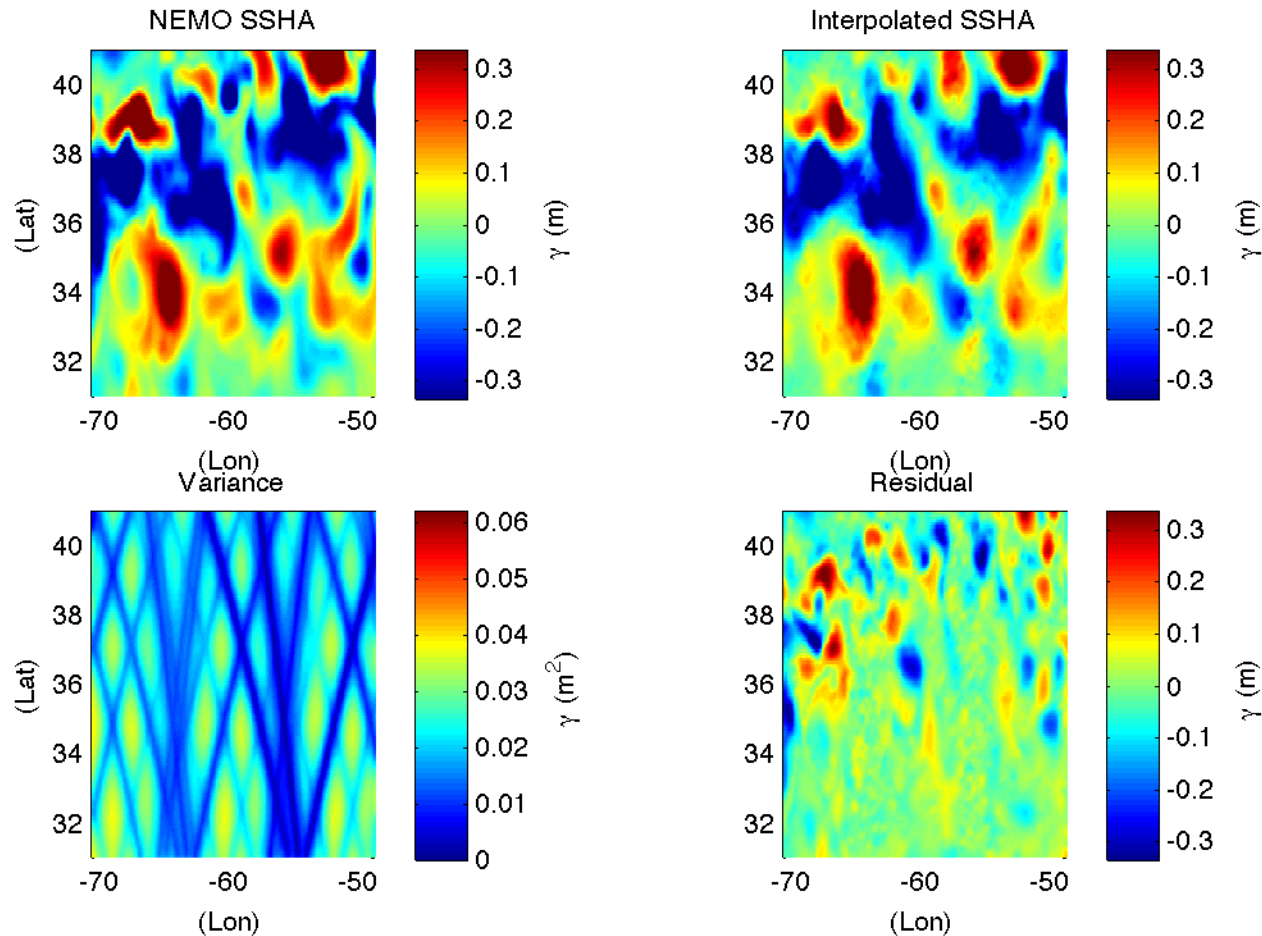
2 Days

9. Spatial Sampling (km)

Reset Corrections

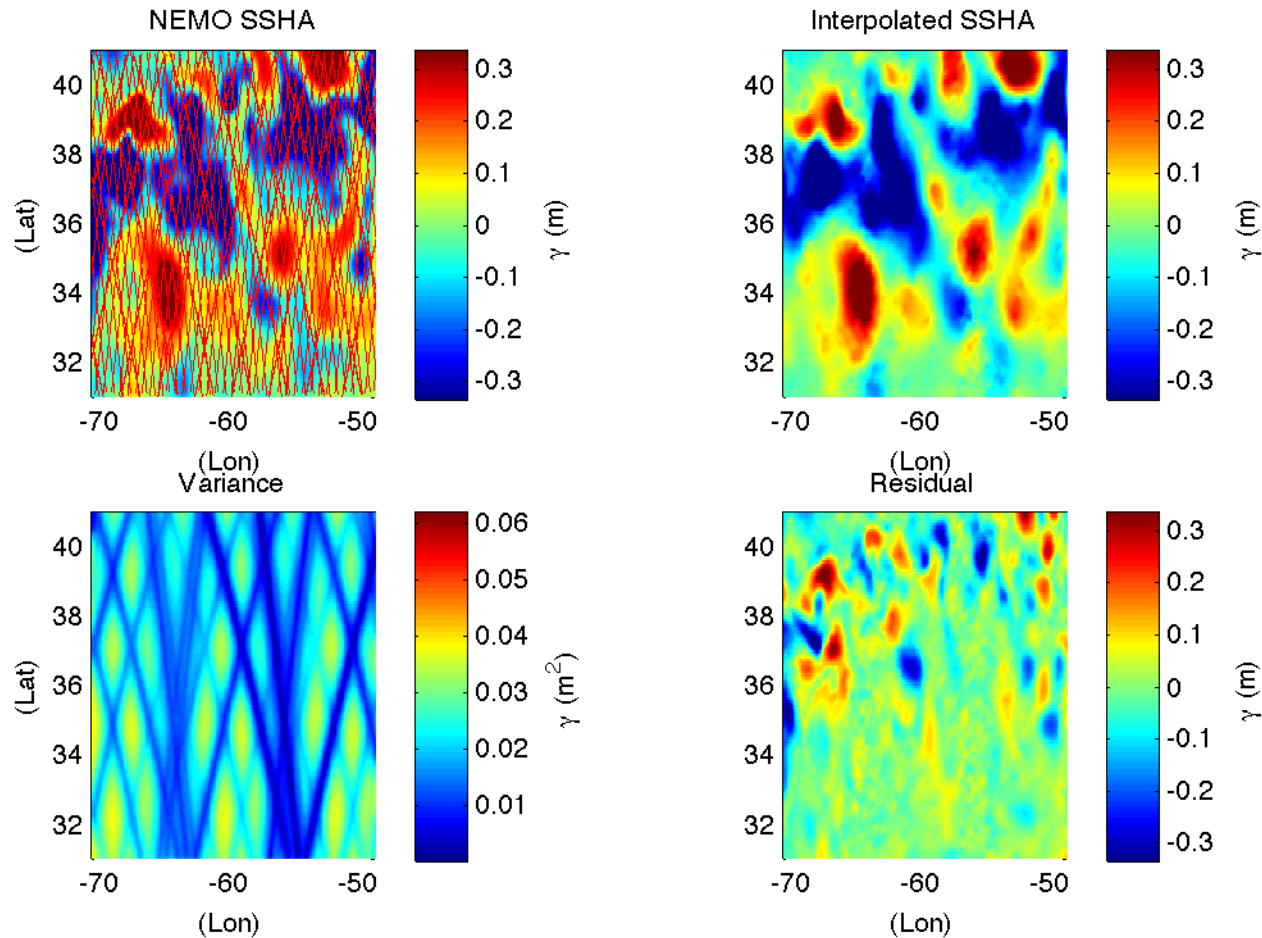
Close EPPA

EPPA: example



Day 8 Hrs 6 Gulf Stream SSH with GIM : Obs derived from Jason 1&2; ENVISAT

EPPA: example



Day 8 Hrs 6 Gulf Stream SSH with GIM : Obs derived from Jason 1&2; ENVISAT

WP2510: strategy



1. Take time series of the real altimetric surface (maps)
2. ‘Validity check’ that sampling the surface with reference 10-day mission and computing **ECV indicators** they are consistent with ECVs v1.1.
3. Sample according to a few ‘scenarios’ that reproduce loss of 35-day mission, with/without reinstatement after one year, etc
4. for each scenario compute ECV indicators and assess impact (as differences wrt ECVs 1.1.)
5. Redo but this time sampling a realistic high-res model

WP2510: discussion



1. Take time series of the real altimetric surface (maps) **Which maps?**
2. ‘Validity check’ that sampling the surface with reference 10-day mission and computing **ECV indicators** they are consistent with ECVs v1.1.
3. Sample according to a few ‘scenarios’ that reproduce loss of 35-day mission, with/without reinstatement after one year, etc **Which scenarios?**
4. for each scenario compute ECV indicators and assess impact (as differences wrt ECVs 1.1.)
5. Redo but this time sampling a realistic high-res model **Which model?**

Which map time series?



- **AVISO DT-MSLA 1/4° 1-day**
 - good time resolution
 - virtually same GMSL rate than SL_cci
 - main difference is ERA atmospheric however impact negligible in years post-2010
 - ‘two sat’ or ‘all sat’?
- **SL CCI, 1/4° monthly**
 - monthly: coarse time resolution
 - is there an intermediate product with higher time resolution?

Which scenarios?



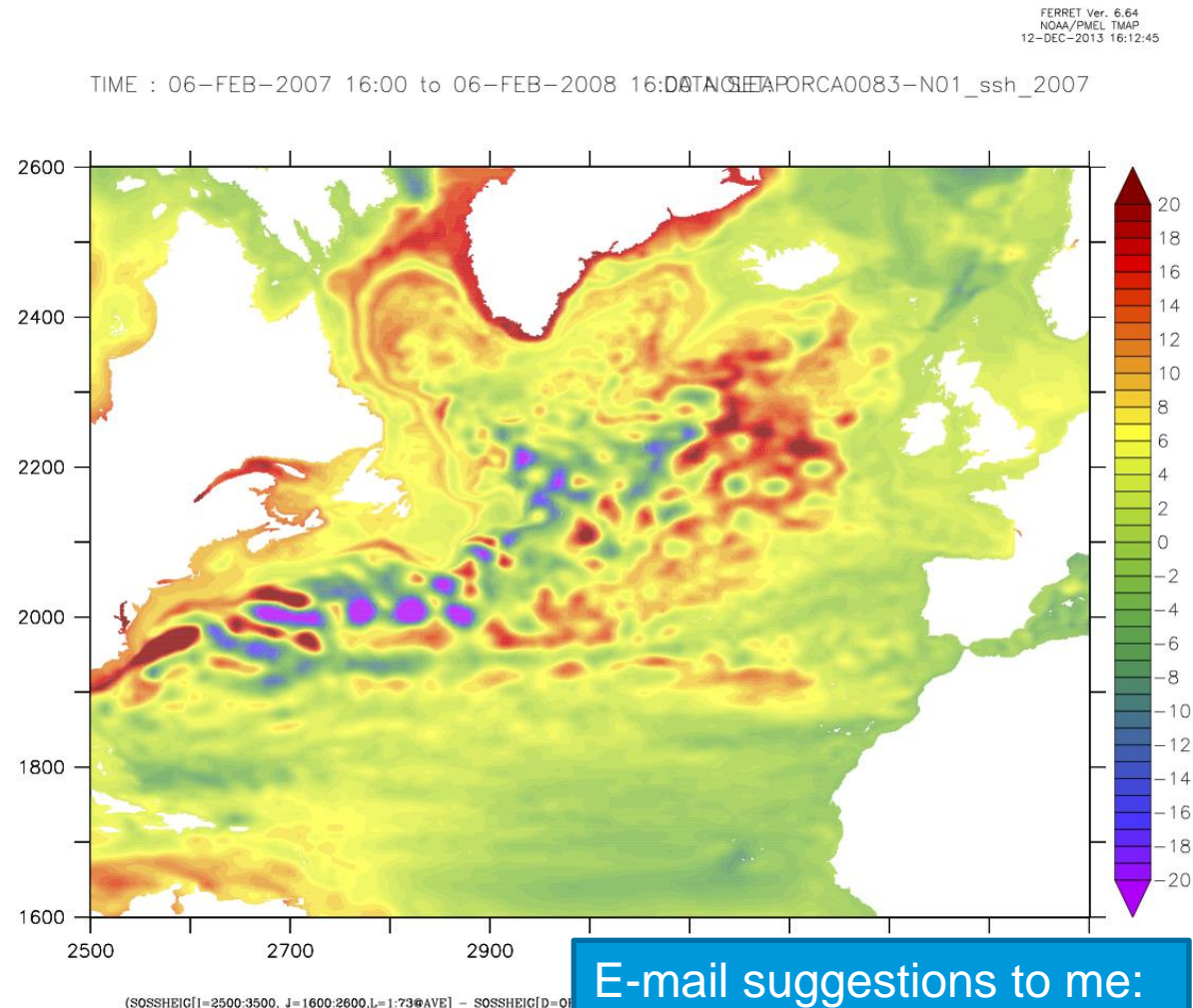
- 10d+35d up to Oct 2010, then 10d only
- as above, but restart 35d in Mar 2013 (AltiKa)
- as above, but add Envisat Phase C + AltiKa

- All scenarios for lat within ± 66 ...
- ...but should we compute also 'full latitude' scenarios regardless of time gaps?

Which model?



- Suggest NEMO run (1978-2010, 1/12°, 5-day resolution), obtained with DFS4 forcing, over the entire North Atlantic
 - realistic SLR rates
 - includes both areas of increase and areas of decrease



E-mail suggestions to me:
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