WP2600 - High latitudes

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2600 High Latitude Issues

WP2600: High latitudes Issues (DTU)

Tailored editing
At high latitudes: “loosen up editing”

Tidal Model
Ocean Tides
Annual sea level

WP2610: Data editing

WP2620: Range and Geophysical corrections

WP2630: Estimation of sea level in areas with sea ice

WP2640: Improve MSS and sea level trends in Polar oceans

Sea Level CCI – Selection Meeting – 02th - 04th May 2012
Tidal models:
TPXO7.2 reduces the along-track SLA variance in the Arctic Ocean, north of Russia and Alaska, but it raises the variance in other coastal regions. Elsewhere in deep ocean results are similar to GOT4.7. DTU10 reduces the SLA variance in most of the Arctic Ocean and in northern part of Baffin bay; in northern Pacific and Atlantic oceans, DTU10 raises the residual variance if compared to GOT4.7.

Differences of SLA respectively computed with TPXO7.2 and GOT4.7 on left and DTU10 and GOT4.7 on right for Envisat.
High latitudes area

MSS

CNES/CLS 11 in the Arctic
Eigen5C? Fill-in in Voids

Difference CNES/CLS-DTU10
RECOMMENDATIONS
Mean Sea Surfaces:

Both MSS (DTU10 and CNES/CLS 2011) are complementary since at very high latitudes the DTU10 MSS provides better SLA performances.

Recommendation:

We recommend to use the DTU10 MSS in order to favour the Arctic Ocean which is an area of main interest for climate studies.
**Tidal models:**

At high latitudes, the DTU10 tidal model in the Arctic area and northern very high latitudes regions provides a strong SSH variance reduction in these regions and it has also a significant impact on regional MSL (+/- 1 mm/yr).

**Recommendation:**

We recommend to use the DTU10 tidal model in the Arctic area and northern very high latitudes regions.
High latitudes area

OPEN ISSUES
High latitudes area

Issue 1: Annual Cycle Model (should it be applied).

SODA  
DRAKKAR  
DTU10 (altim+GECCO)

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Issue 2: Focused Data Editing (improving data coverage). “Question is:” Should you accept slightly less accuracy but much more data”

Radiometer quality flag (use or not)
High latitudes area
Loosen up Editing on SWH
Loosen up editing increases Std in some places.
Issue-3
Should a separate High Latitude product be created.

Linear Sea Level Trends (1993-2009)

• Additional slides on MSS evaluation.

On the other hand, the use of the DTU10 MSS instead of “a time period corrected” CNES/CLS 2011 MSS reduce the SLA performances in open ocean which could have an impact on mesoscale applications. However, as the Sea-Level CCI products (ECV) are monthly products dedicated to climate studies, this impact will be very low.
Global Evaluation of MSS

One repeat picked at random (repeat 100 used for 3 satellites)
Cycle 25 used for Cryosat-2 -
Identical processing/corrections – No data above 70N
Assume none of the data have been used for the DTU10 (and CNES/CLS11 MSS?)

<table>
<thead>
<tr>
<th>Satellite</th>
<th>DTU10 Mean (cm)</th>
<th>DTU10 Std (cm)</th>
<th>CNES/CLS-11 Mean (cm)</th>
<th>CNES/CLS-11 Std (cm)</th>
<th>D(RMS) (cm)</th>
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<td>GFO-1 (rep 100) 844.072 obs</td>
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