

New altimetry products over shelf and coastal zone from the eSurge processor

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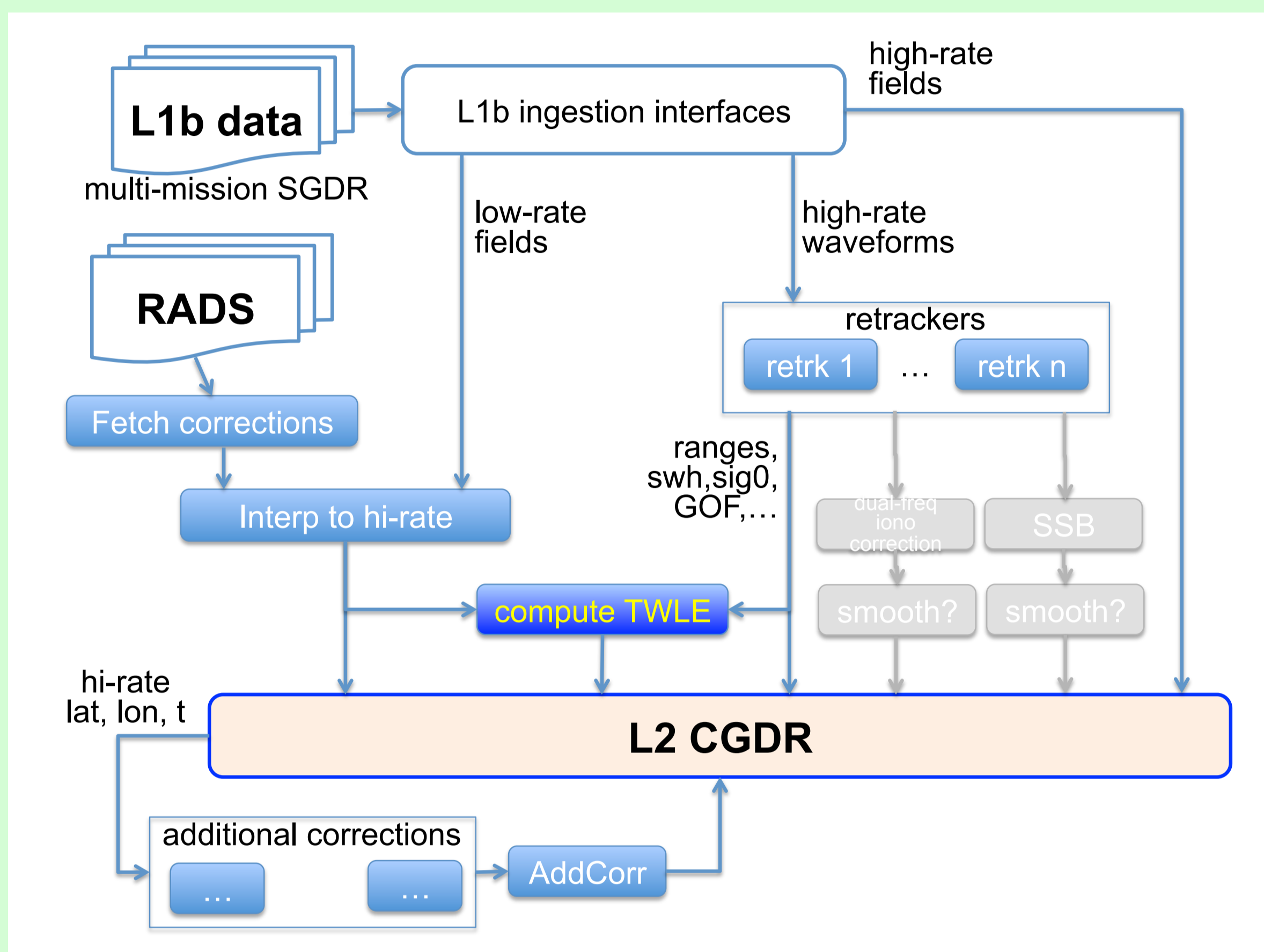
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Project eSurge and Coastal Altimetry

The ESA Data User Element eSurge Project is aiming to improve the modelling and forecasting of storm surges through the increased use of advanced satellite products. The eSurge SEARS (eSurge Event Analysis and Repository Service) archive, publicly available via the eSurge Portal (www.storm-surge.info), contains data collected for about 200 storm surge events worldwide, including coastal altimetry data from Envisat and CryoSat-2 (both SAR and LRM). Jason-1, Jason-2 and AltiKa are being added too.

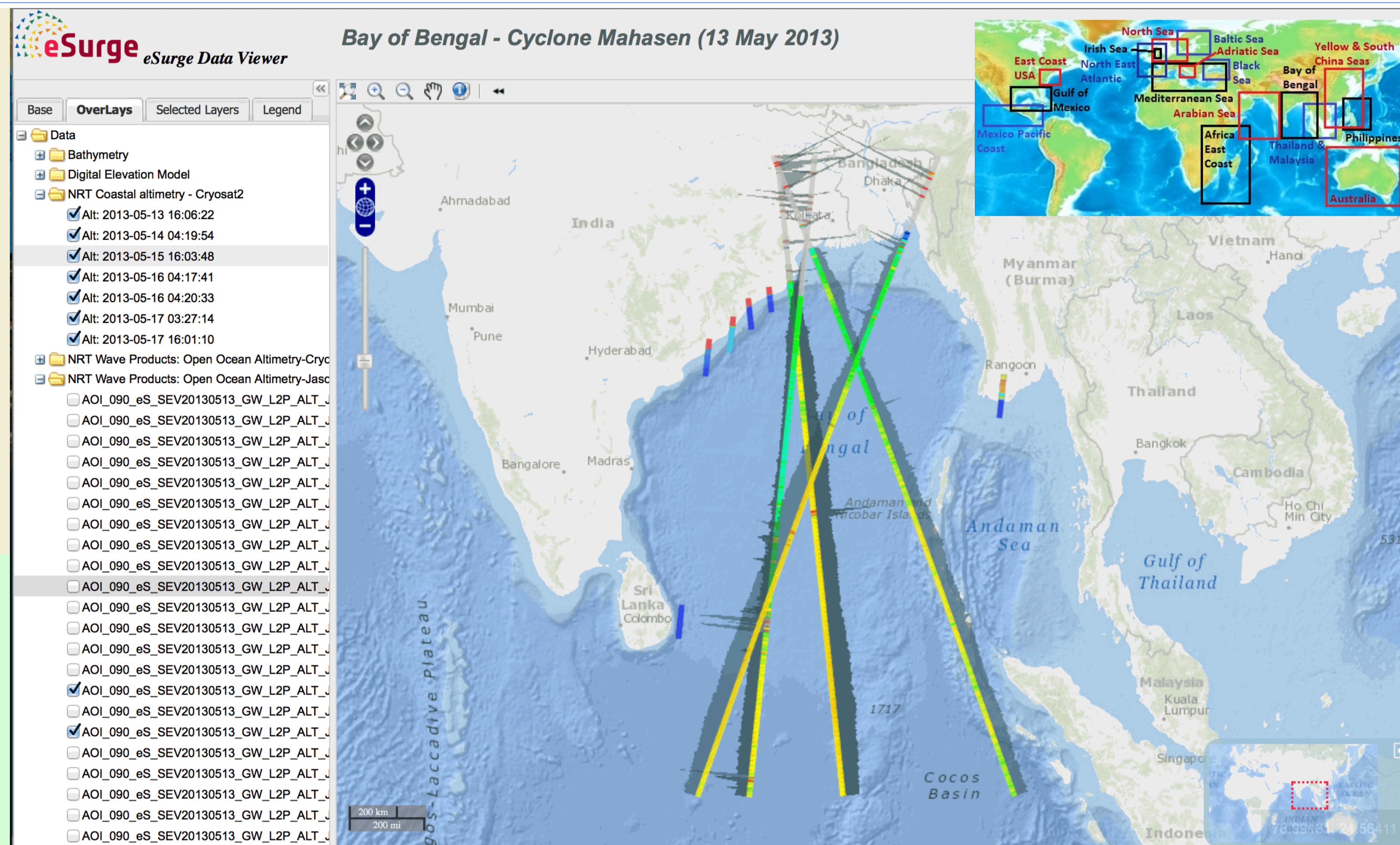
The eSurge Coastal Altimetry Processor



In eSurge, coastal altimetry data are generated by a dedicated processor, an evolution of the processor developed in the COASTALT project (2008–2012).

MAIN FEATURES:

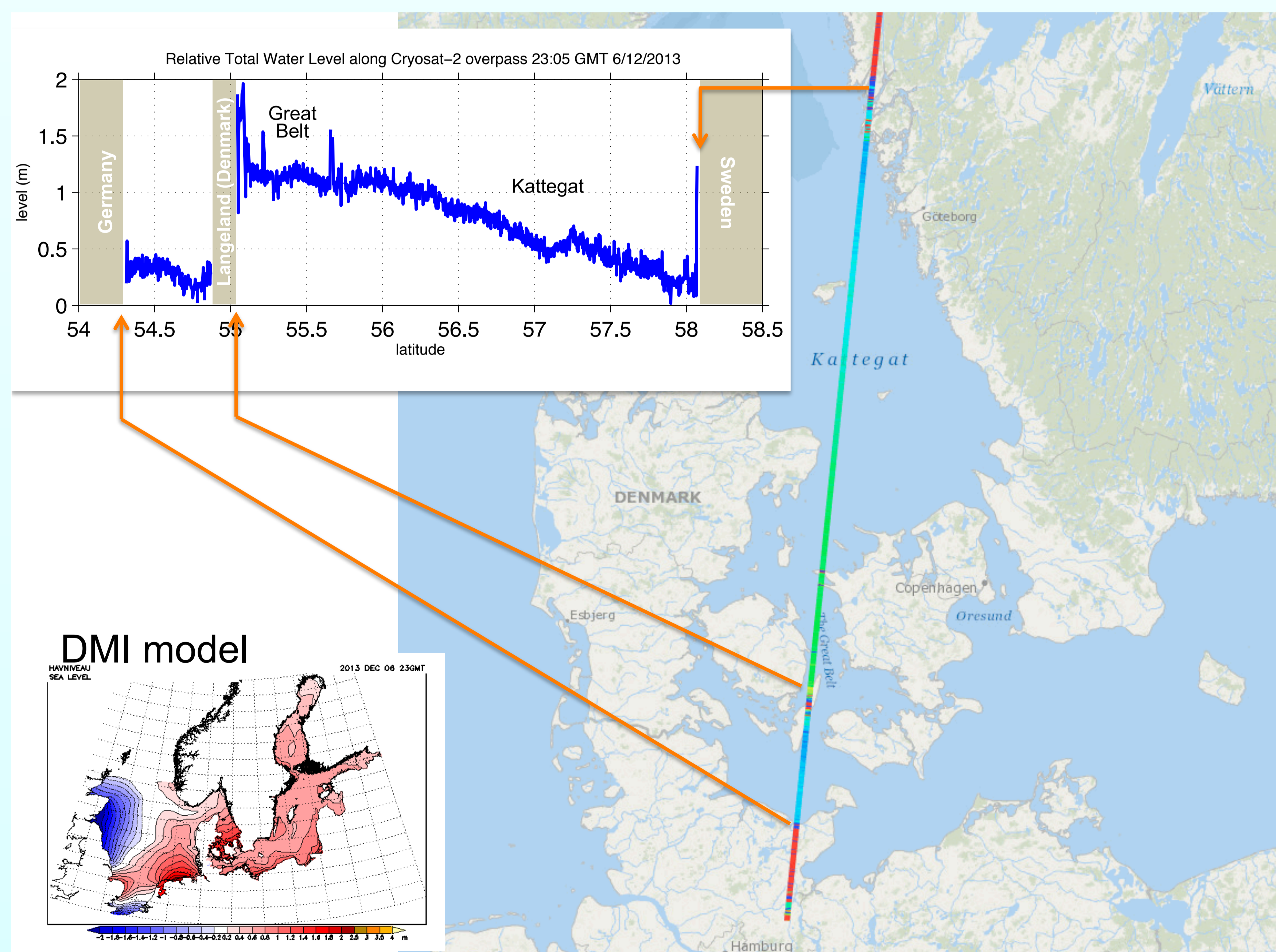
- ingests Envisat, CryoSat-2, Jason-2 (J-1 and AltiKa in progress)
- retracking of LRM/PLRM waveforms: R&D work carried out within eSurge lead to the development of the **ALES subwaveform retracker** (Passaro et al., Rem. Sens. Env., 2014) which is now our retracker of choice
- retracking of SAR mode waveforms: **ESA SAMOSA model** (Ray et al., IEEE TGARS, 2014);
- corrections for ionospheric, tropospheric, pressure and wind effects, tides and sea state bias are updated with the latest available models from the reference RADS archive; these corrections are then interpolated to high-rate (20Hz)
- computes one of the quantities of widespread use in storm surge research, the Total Water Level Envelope (TWLE) which contains tidal and high frequency atmospheric effects
- the final products are packaged into Coastal Geophysical Data Records (CGDRs) in netCDF format
- products can be downloaded by the users via ftp or OPeNDAP, or directly displayed using the visualisation tools (eSurge viewer) on the eSurge portal.



eSurge viewer showing some CryoSat-2 SAR data from eSurge processor and CryoSat and Jason-2 SWH data from Globwave Project

Example: Xaver/Bodil surge in December 2013

The eSurge processor generated TWLE in Near Real Time from Cryosat-2 for the Xaver Storm (also known as Bodil) over the North Sea in December 2013. This activity was carried out as part of the 'eSurge-Live' demonstration service and captured the signature of the storm over the Danish Straits.



These data have then been used by Danish Meteorological Institute (DMI), also participating in eSurge, for verification of their surge model, with good agreement – see OSTST talk by Kristine Madsen et al.

For more information, to access data and to contact us, visit the project website at www.storm-surge.info

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