

Evaluation and exploitation of CryoSat ocean products for oceanographic studies

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Aims of this presentation

- Routine CryoSat ocean products reporting
- Illustrate some examples of validation activity
 - Both routine and focussed

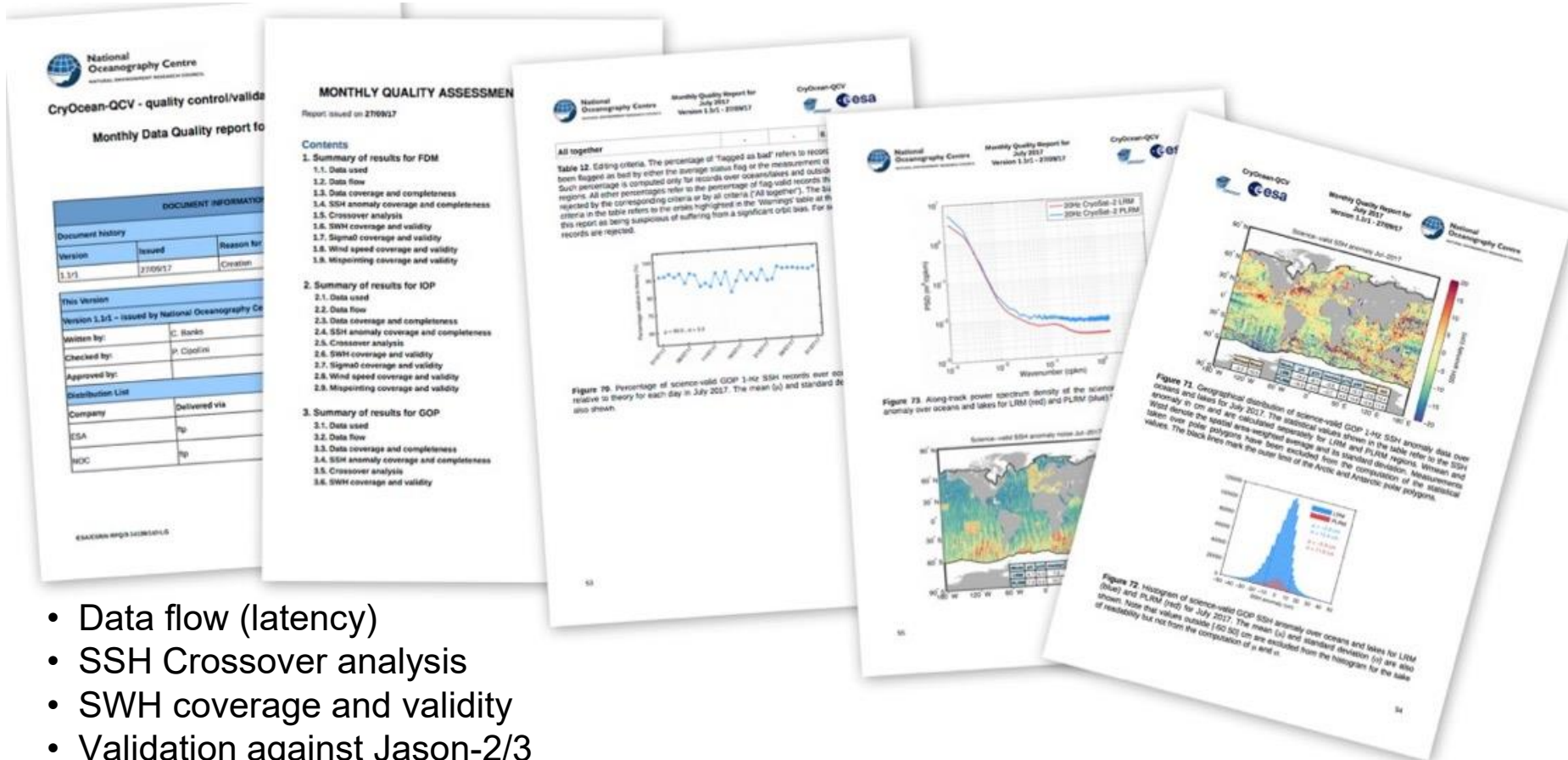


Calafat et al., 2017



Bouffard et al., 2018

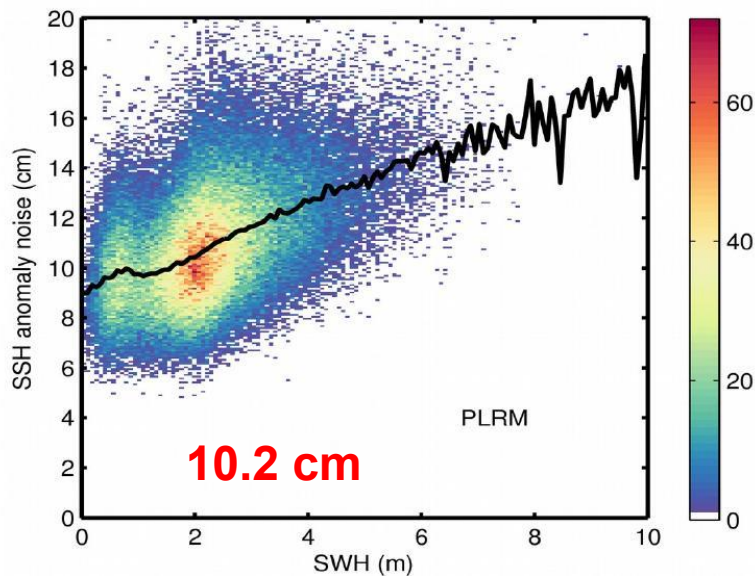
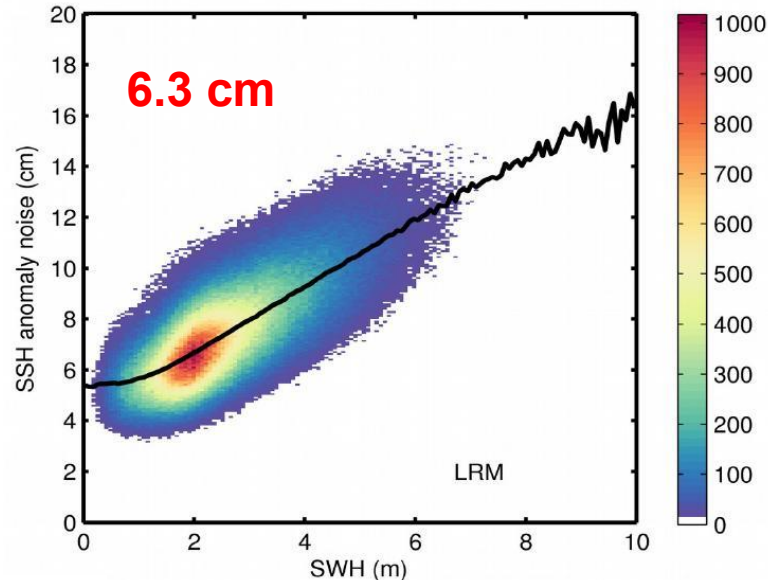
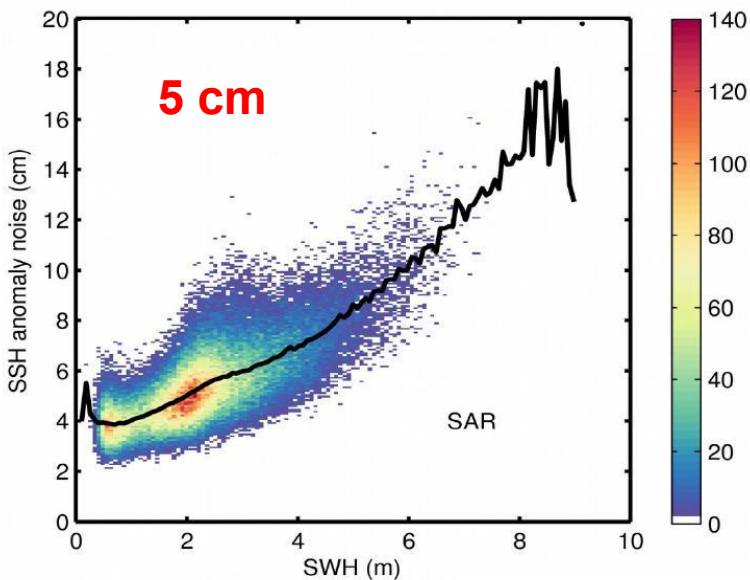
Daily and monthly reports available



- Data flow (latency)
- SSH Crossover analysis
- SWH coverage and validity
- Validation against Jason-2/3
- Validation against in situ measurements and models
 - tide gauges, wind speed against buoy data, WaveWatch III model data, steric heights derived from T/S Argo profiles

<https://earth.esa.int/web/sppa/mission-performance/esa-missions/cryosat/quality-control-reports/ocean-product-quality-reports>

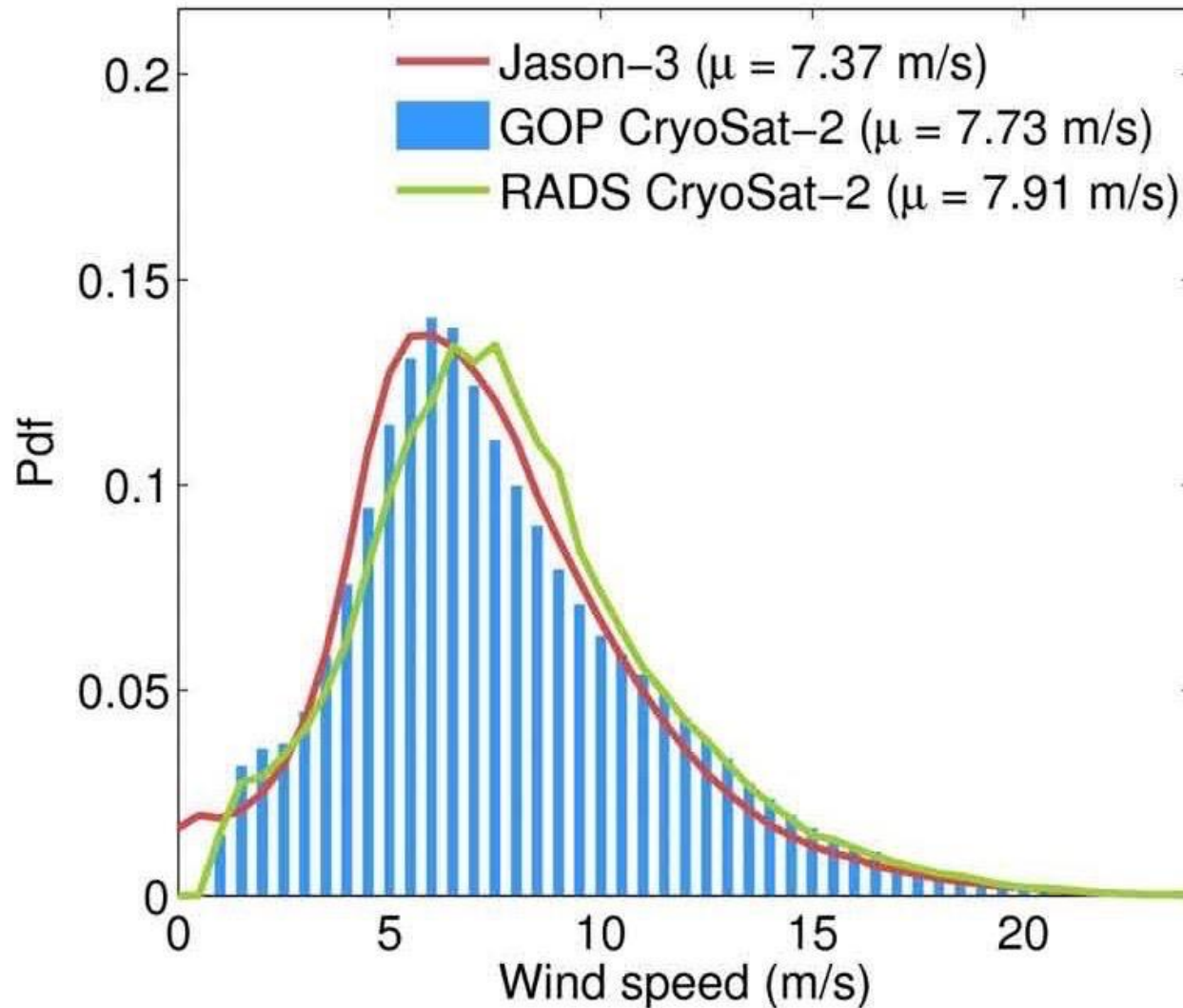
Noise of altimetric SLA increases with sea state



Median noise at SWH of 2 m

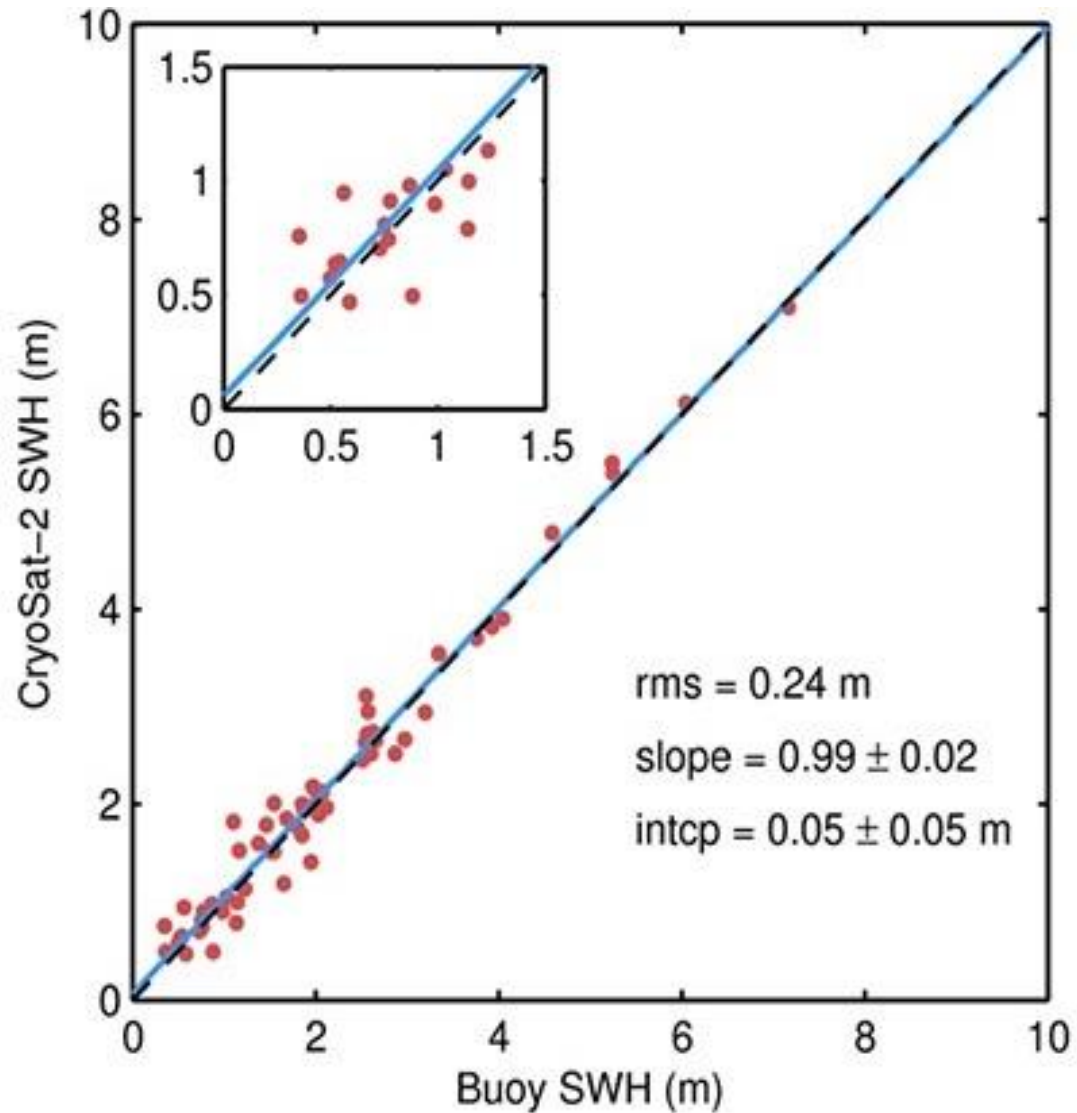
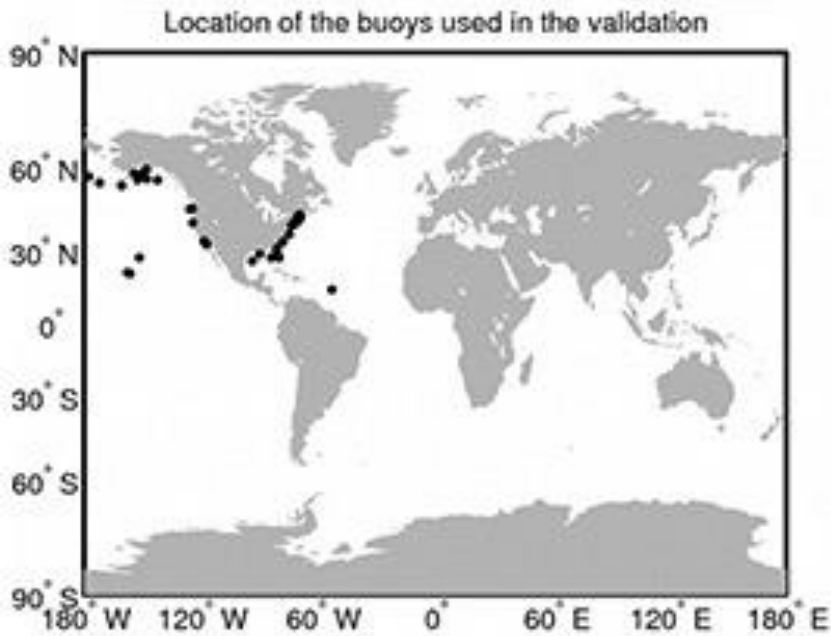
From monthly reports (March 2019)

Measuring global ocean winds with CryoSat January 2019



From monthly reports

Accurate global SWH - buoys

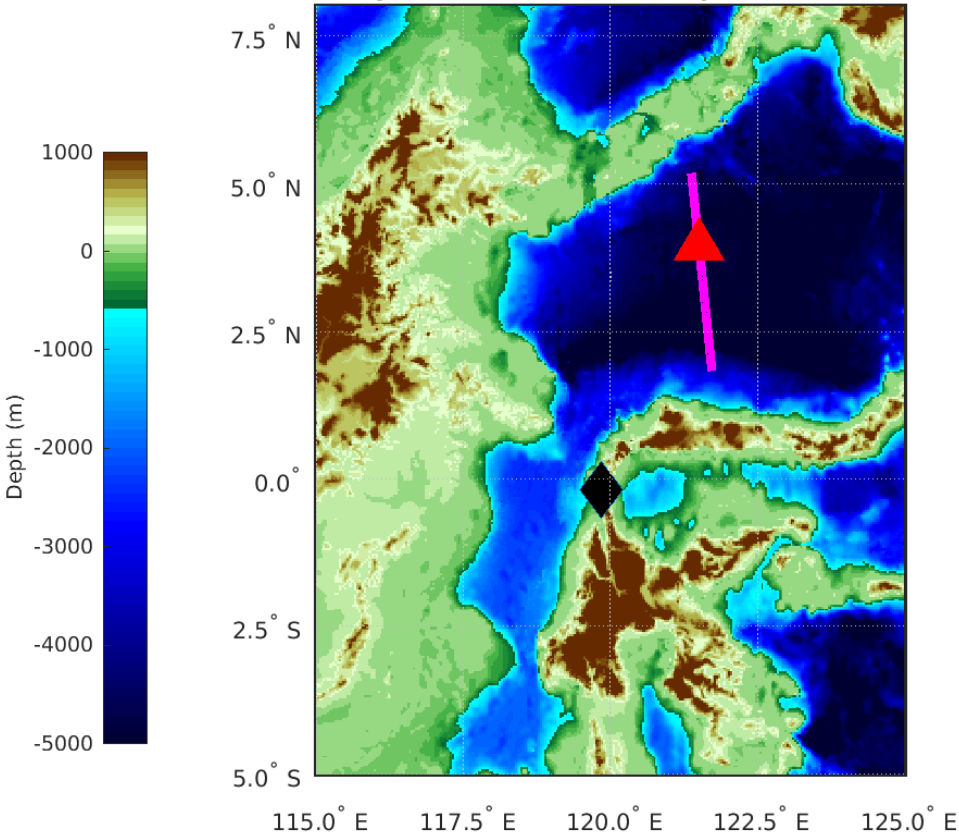


Inset plot zoomed-in for SWH < 1.5 m

From monthly reports

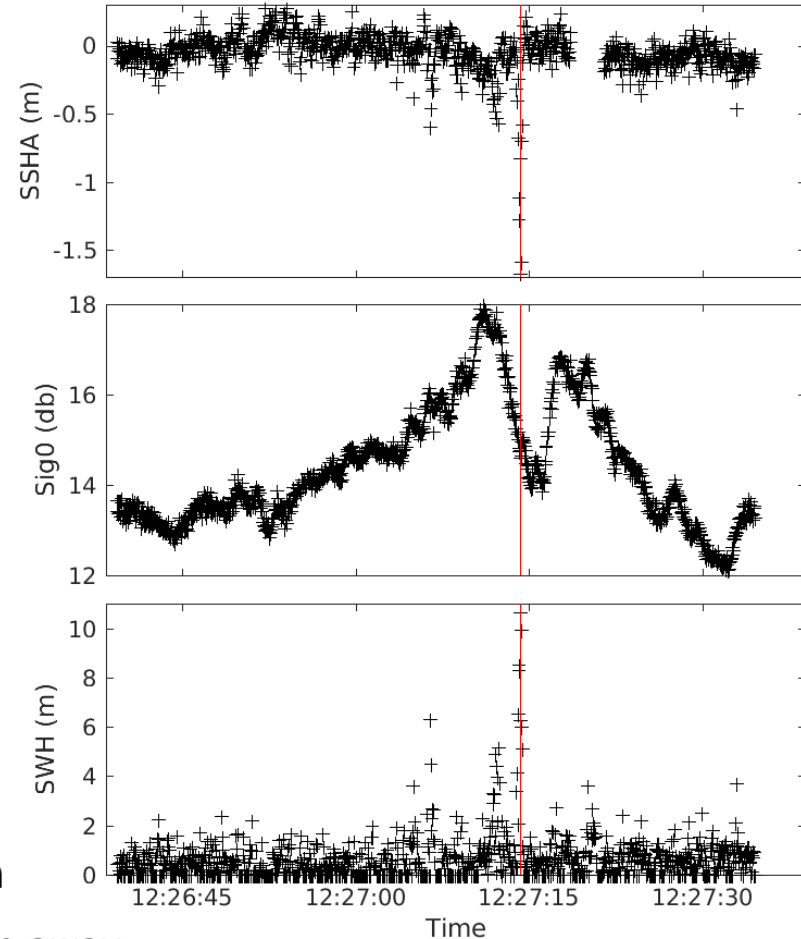
Signal of devastating tsunami observed by CryoSat

Earthquake occurred at 28-Sep-2018 10:02:43



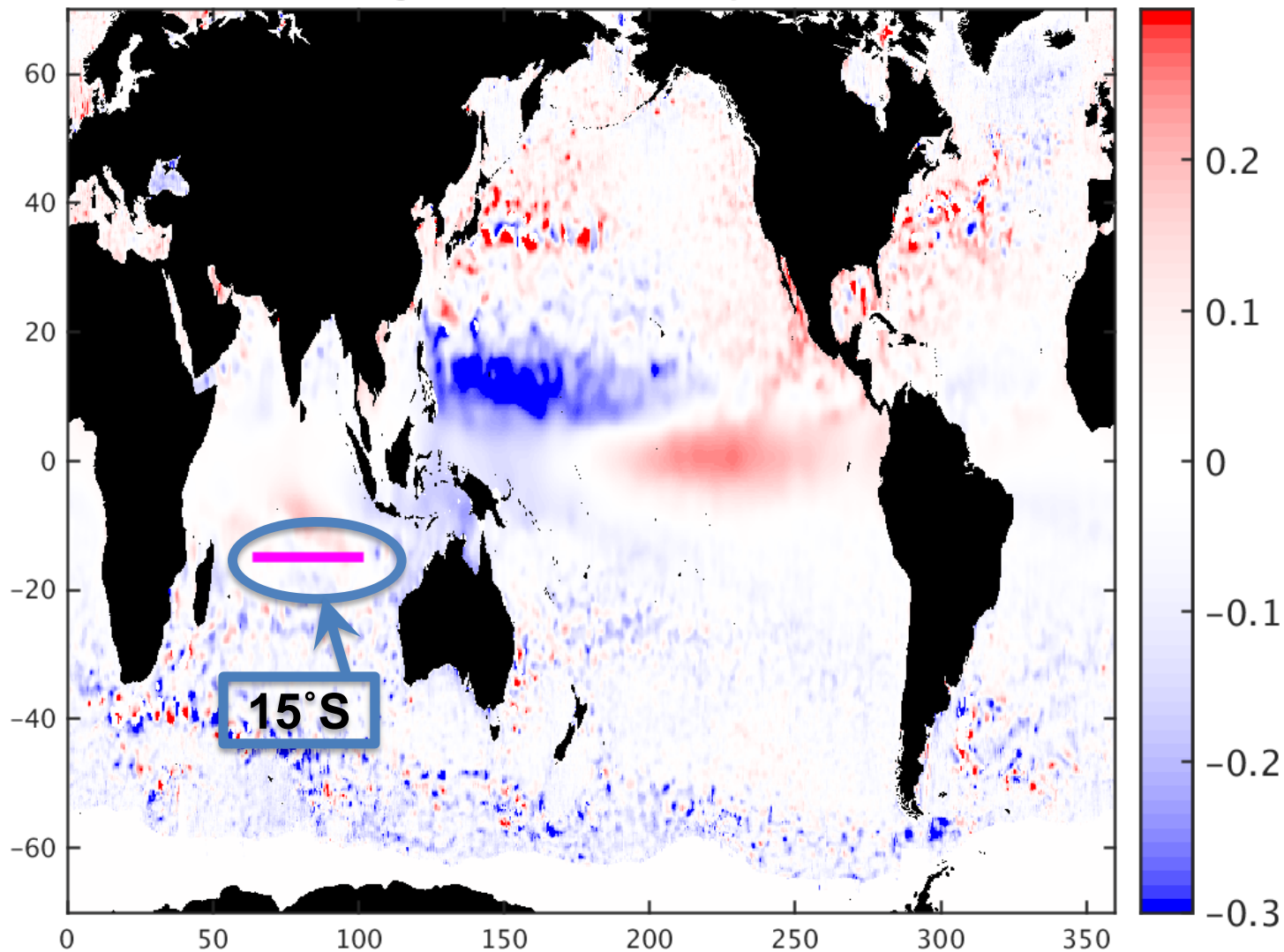
— CryoSat track ◆ Epicentre ▲ Marked Position

Marked point is 2.4 hours after earthquake and 495.3 km away



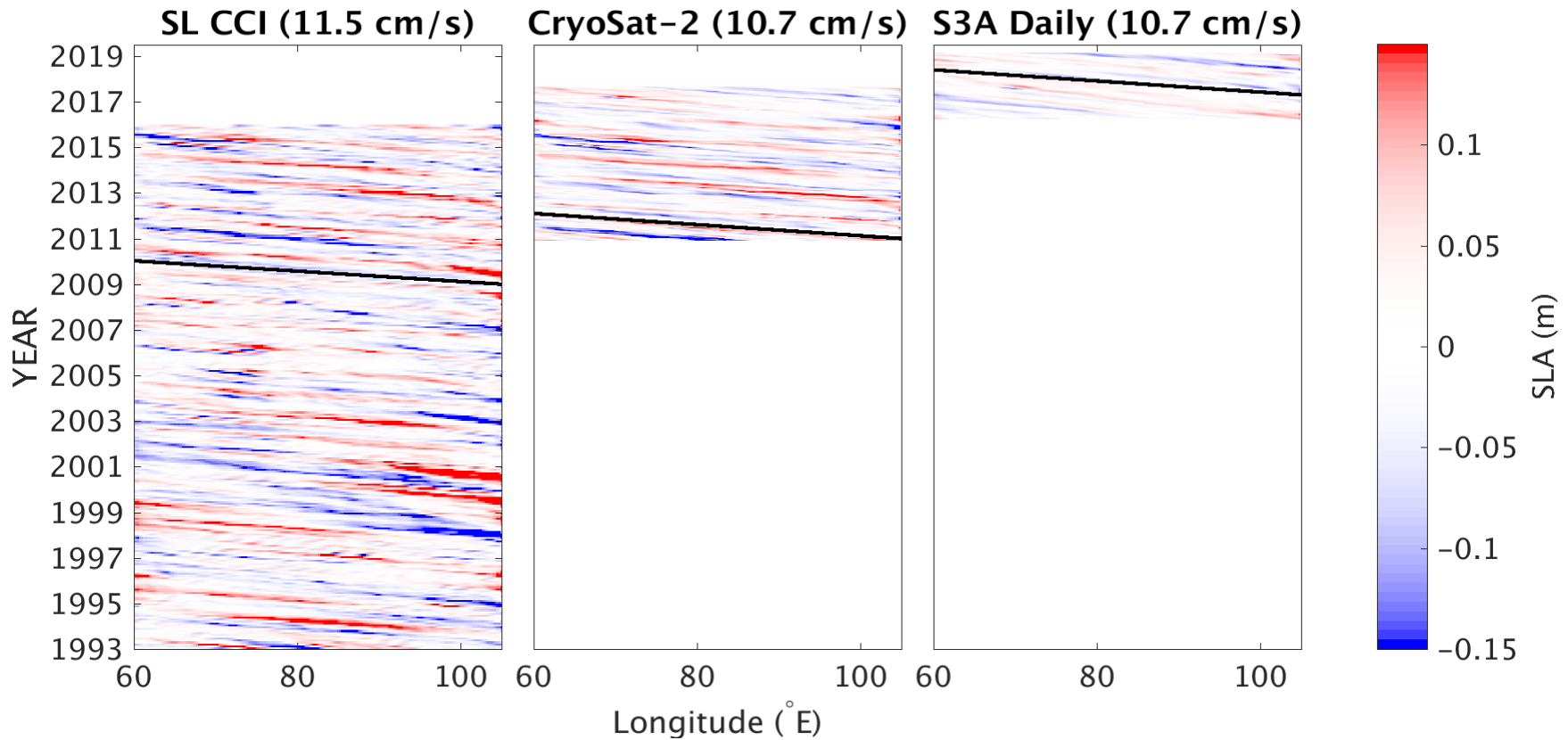
Rossby Wave Study (65°–100°E)

Global SSHA (weighted_median) from CryoSat2 for 20151029

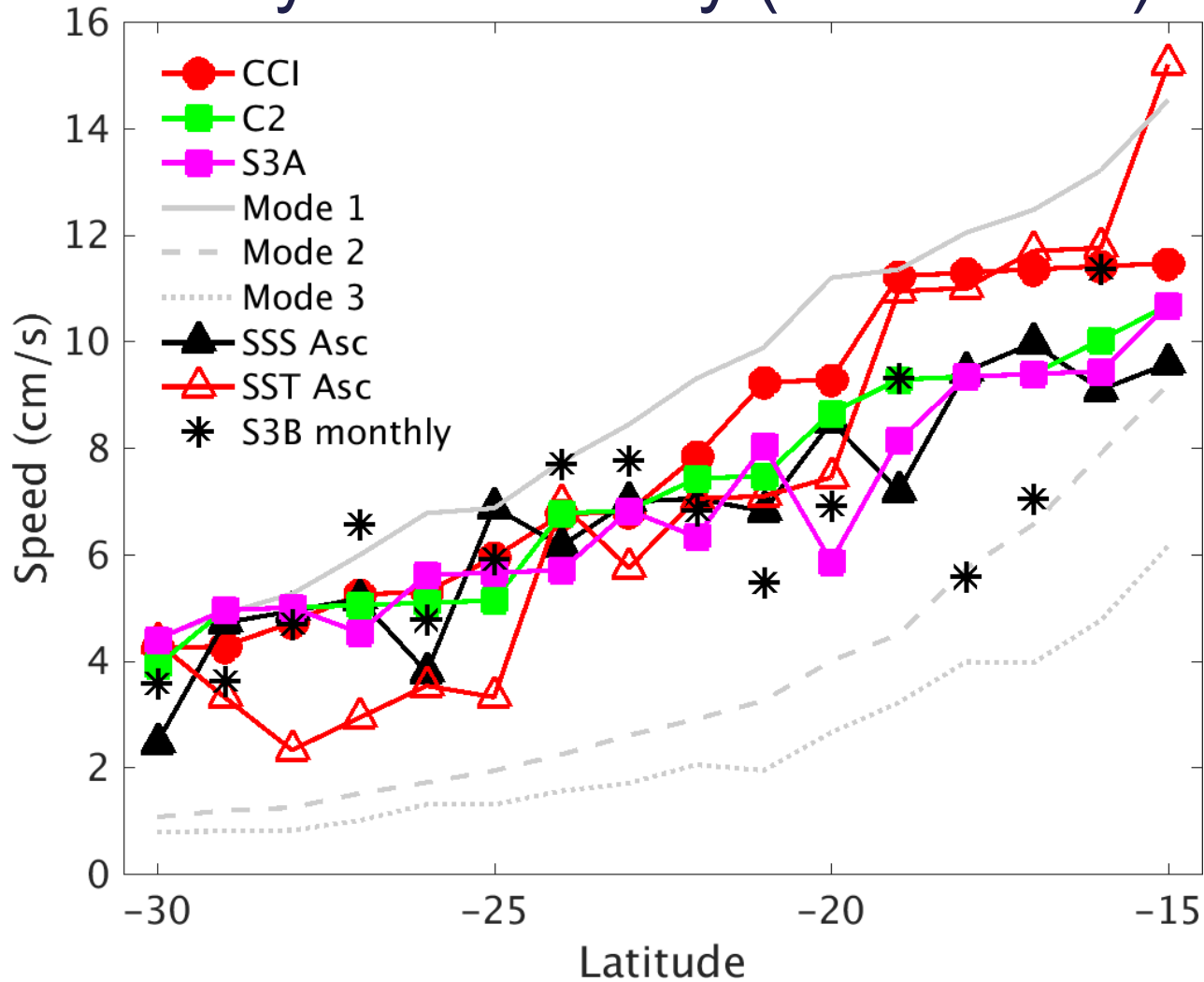


Rossby Wave Study (65°–100°E)

15°S



Rossby Wave Study (65°–100°E)



Propagation speeds derived using the Radon transform for the products given in the legend. The Mode 1–3 are the speeds calculated for the first 3 baroclinic modes using World Ocean Atlas 2013 data (2005–2012) as detailed in Banks *et al.* (2016).

Summary

- CryoSat Ocean Products available operationally since April 2014 from ESA then reprocessed from start of the mission (~9 years of data)
- Excellent performance over ocean
 - in terms of noise, compares well with TGs, ARGO, Jason products and other validation sources
- Operational change to Baseline C – including SAR and SARIn full dataset currently being reprocessed
- CryoSat Ocean products ready for oceanographic studies and applications
- **CryoSat Ocean Products complement the ocean altimetry record from repeat-orbit missions**