

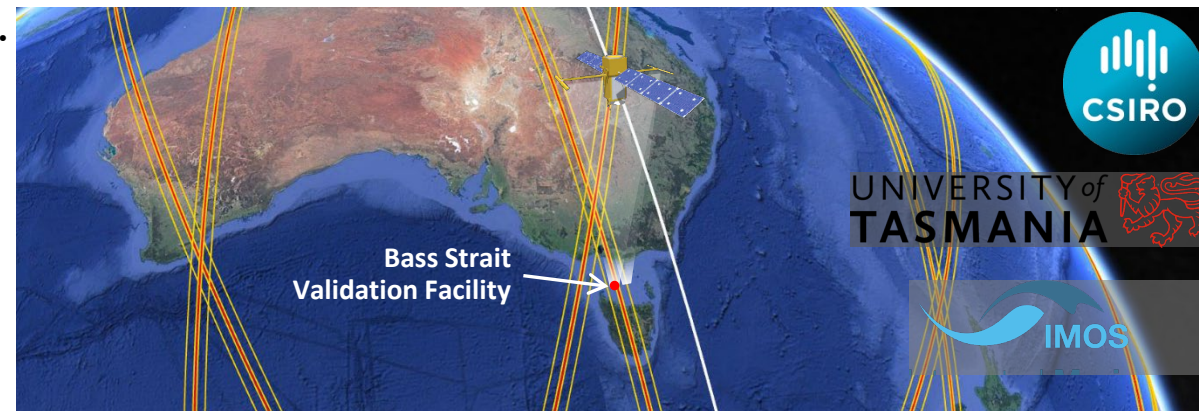
SWOT Validation Updates from the Bass Strait facility, Australia

Andrea HAY^(1,2), Benoit LEGRESY^(2,3), Christopher WATSON^(1,3), Matt KING⁽¹⁾

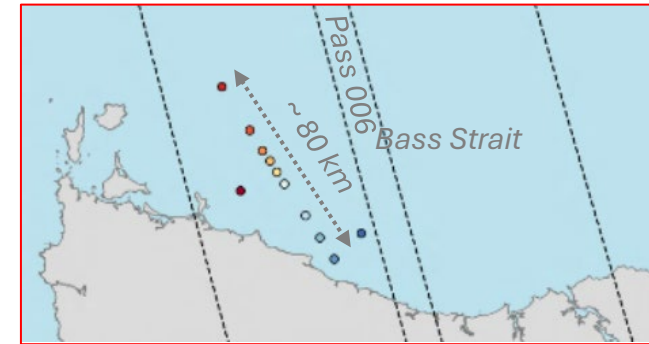
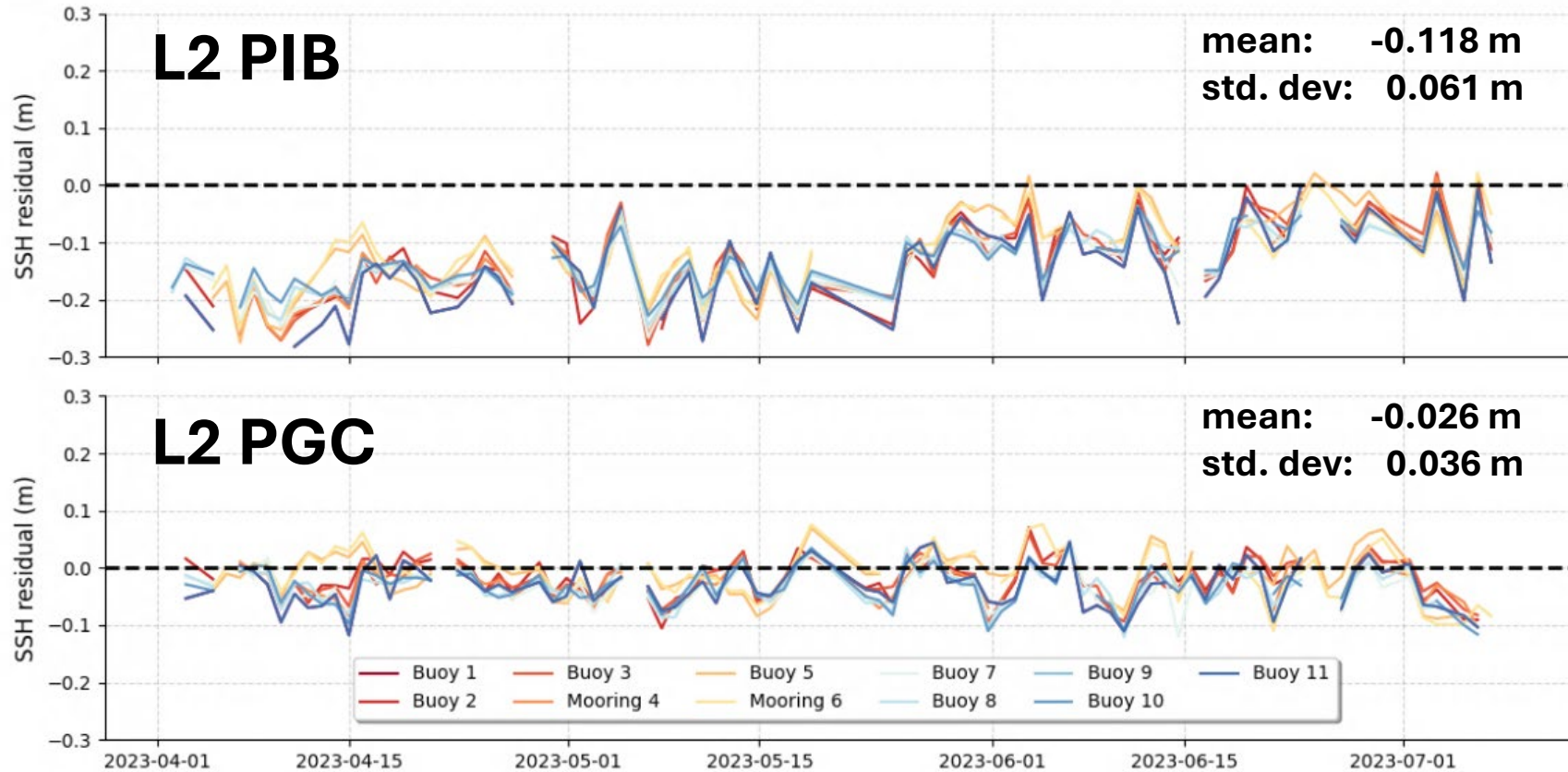
1. Discipline of Geography and Spatial Sciences, University of Tasmania, Australia. (andrea.hay@utas.edu.au)

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- The Bass Strait Facility operated 11 comparison points in one swath over 80km during the Fast Sampling Phase
- SWOT noise level close to detectability. [Bass Strait Facility Poster]
- Across track noise dependency not significantly detected. [Bass Strait Facility Poster] Bass Strait is also a good ground to test various Xtrack corrections.
- Noise level increases with wave height but limited. [Bass Strait Facility Poster]
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- Small scale troposphere signals are expected to be a major topic. Illustrated with cyclone Jasper signature and detailed study in Bass Strait [Hay et al. troposphere Poster].



Processing baseline improvements



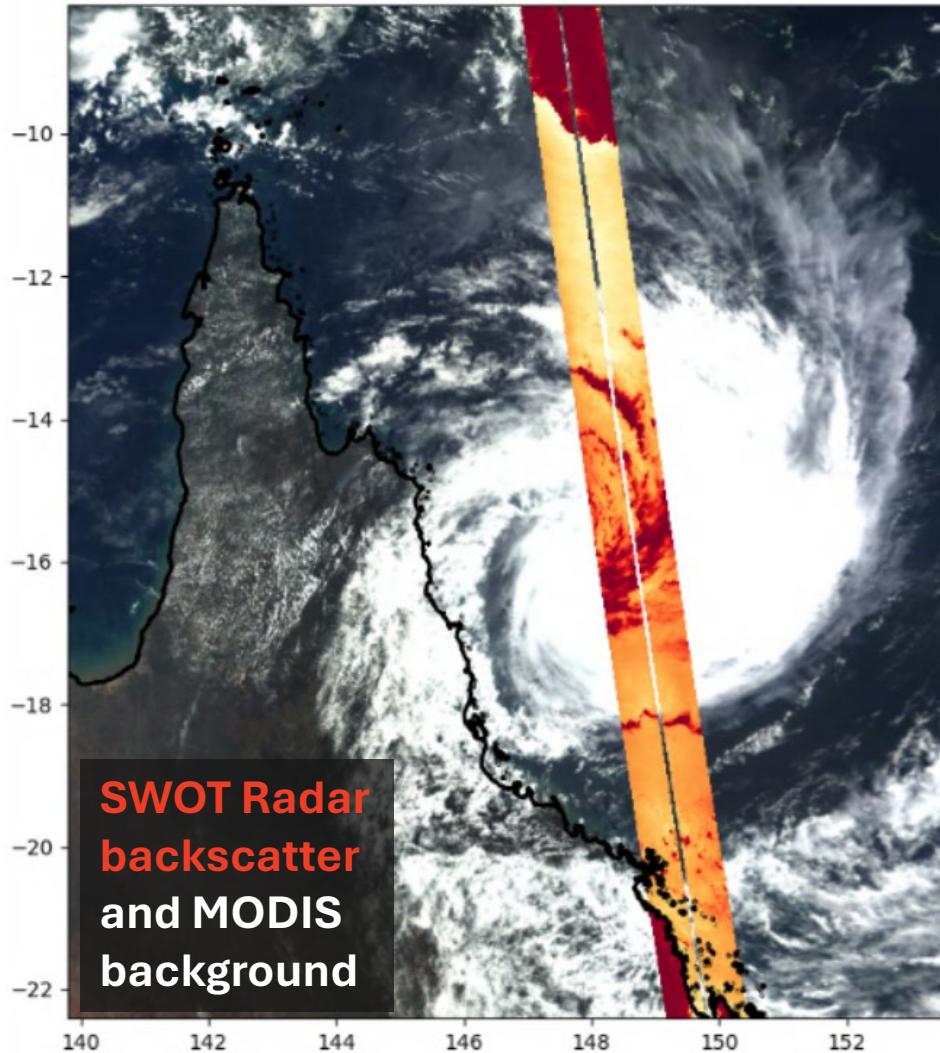
GNSS buoy and CWPIES mooring locations made 11 comparison points within the FSP swath

In-situ data showing significant improvement in absolute SSH from L2 PIB0 to PGC0

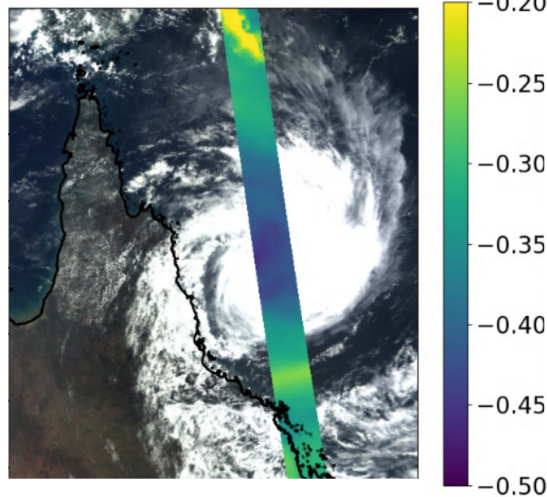


Wet troposphere error

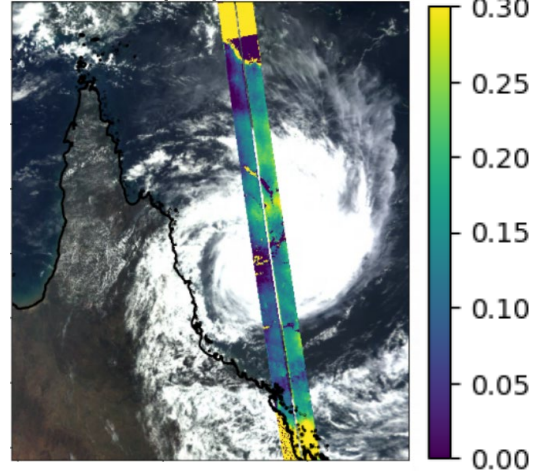
See Poster on troposphere



WTC (m)

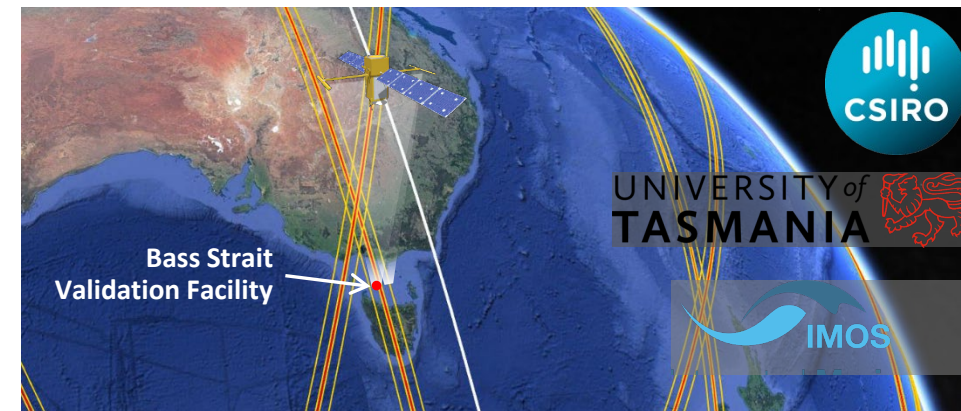


SSHA (m)



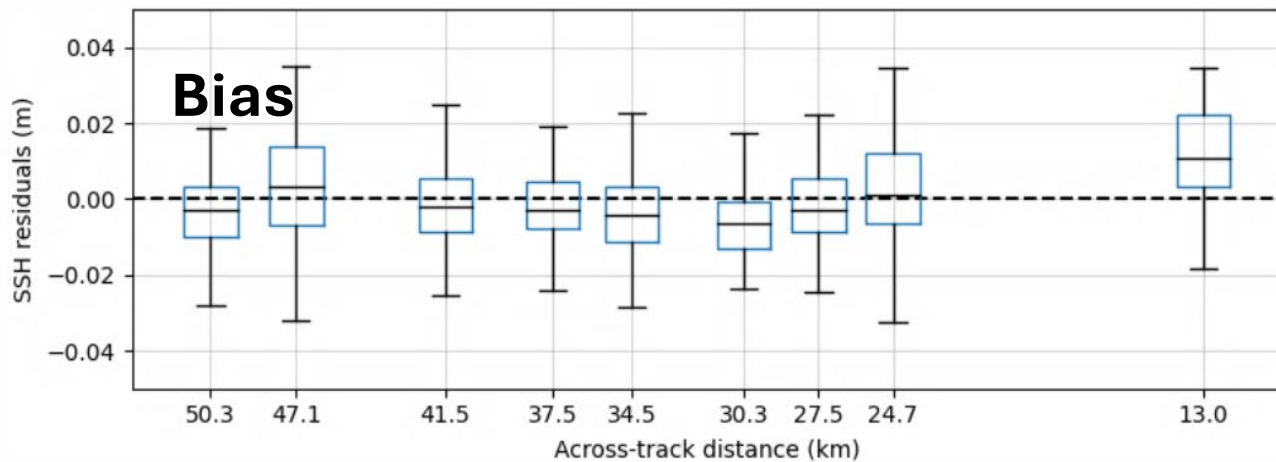
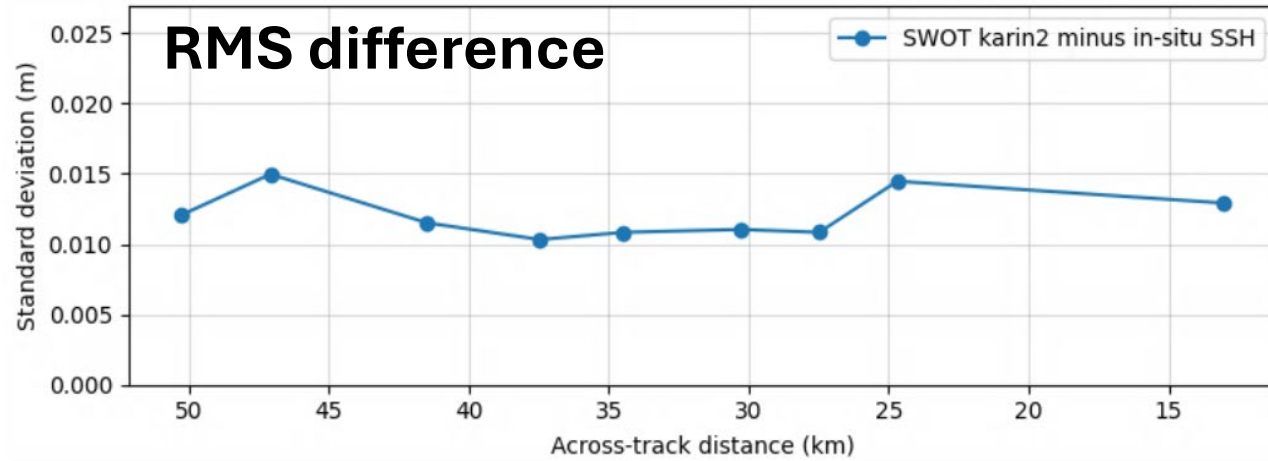
SWOT captures the signal of **Cyclone Jasper** (2023-12-12)

- The **wet troposphere model** corrects the larger-scale features of this extreme event
- However **finest scale features in the SSHA** suggest wet troposphere is driving errors of up to 30 cm

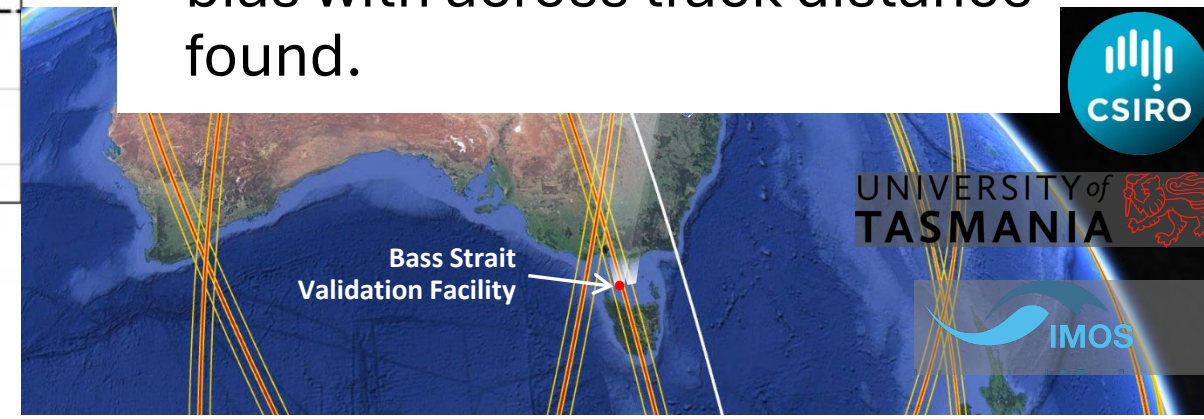


Across track noise level

Comparisons of SWOT L2 PGC and in-situ GNSS buoys show no clear across track signal in SSH residuals. With a noise level likely under detectability.

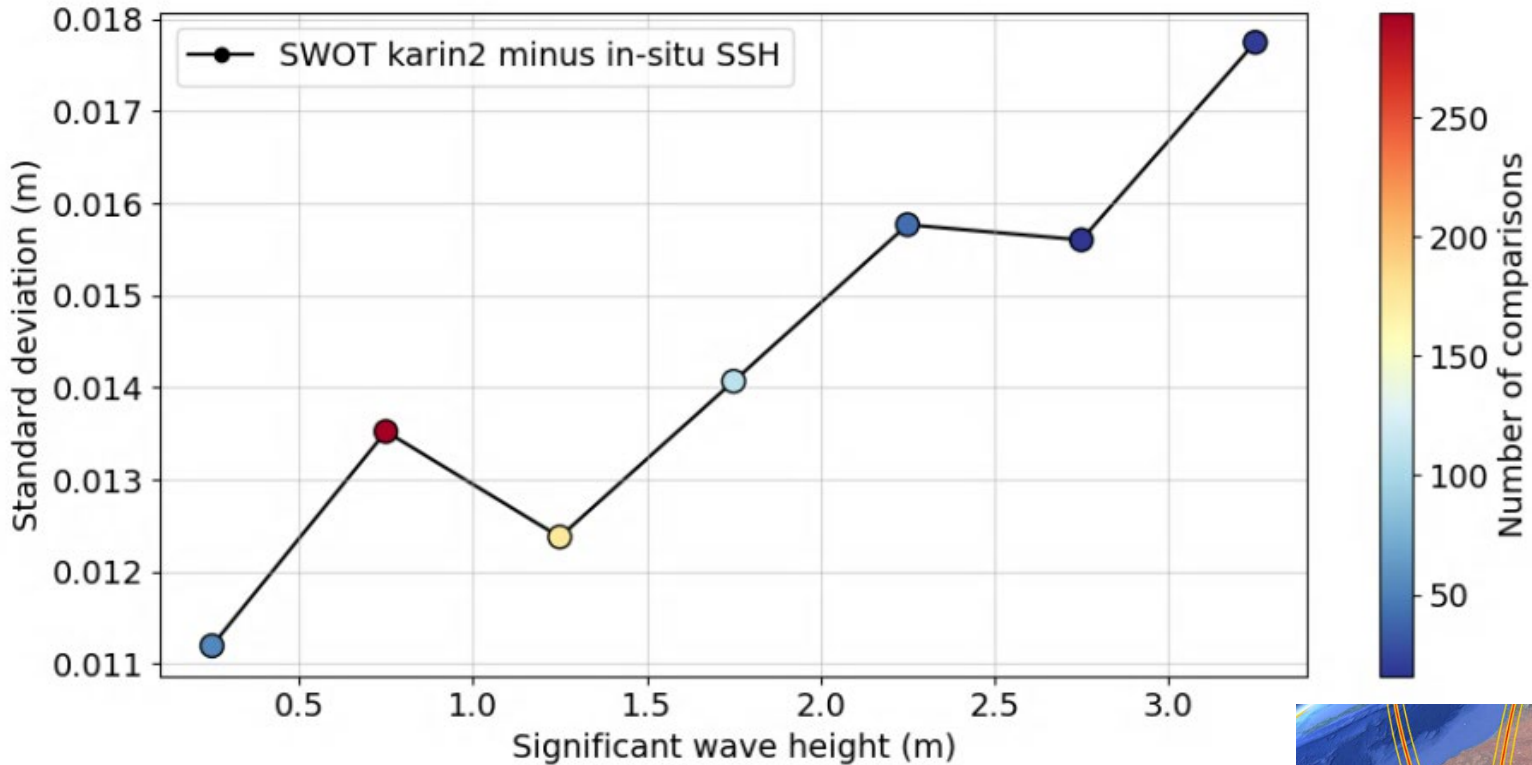


- Little evidence of detectable increase in noise at swath edges from buoy comparisons (< 5 mm variation in standard deviation between sites).
- SSH bias at inner swath edge of ~1 cm, but no systematic bias with across track distance found.

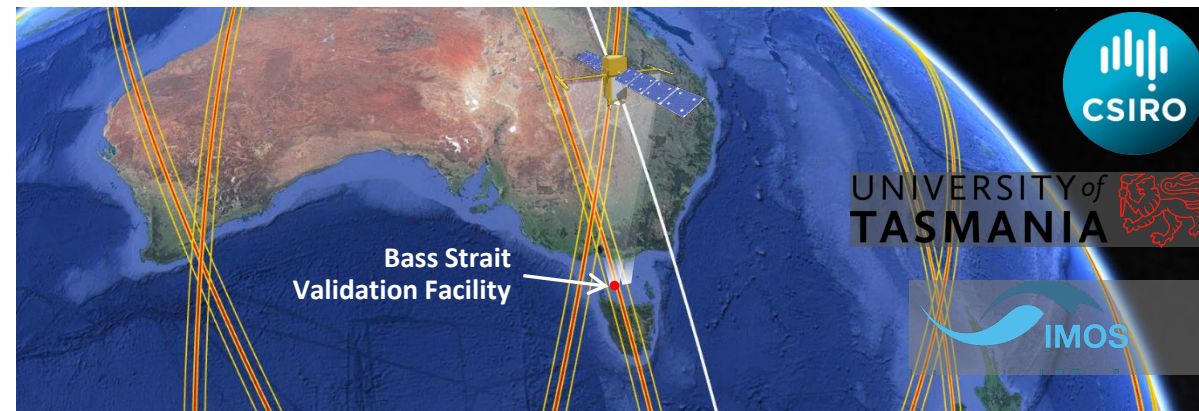


Influence of wave height on SSH noise

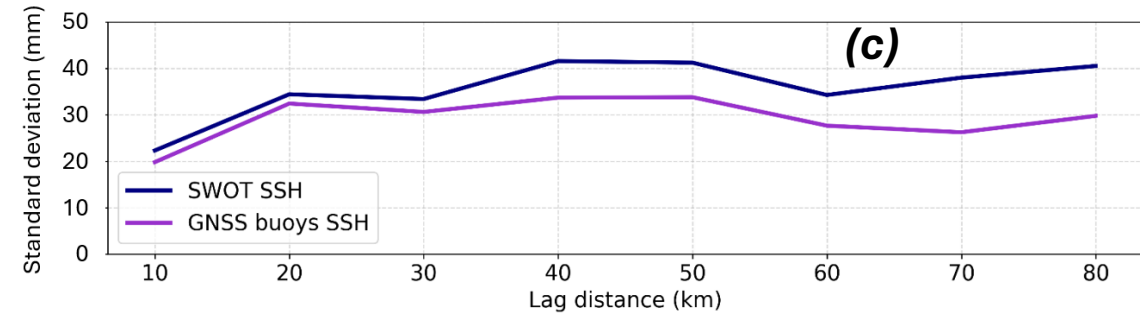
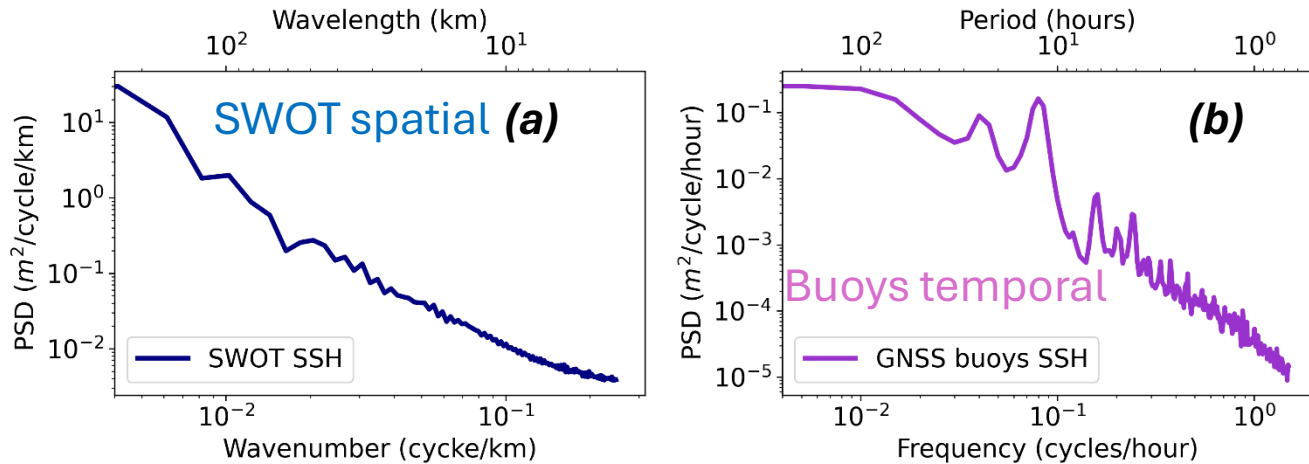
The spread of SSH residuals increases slightly with increasing wave height.



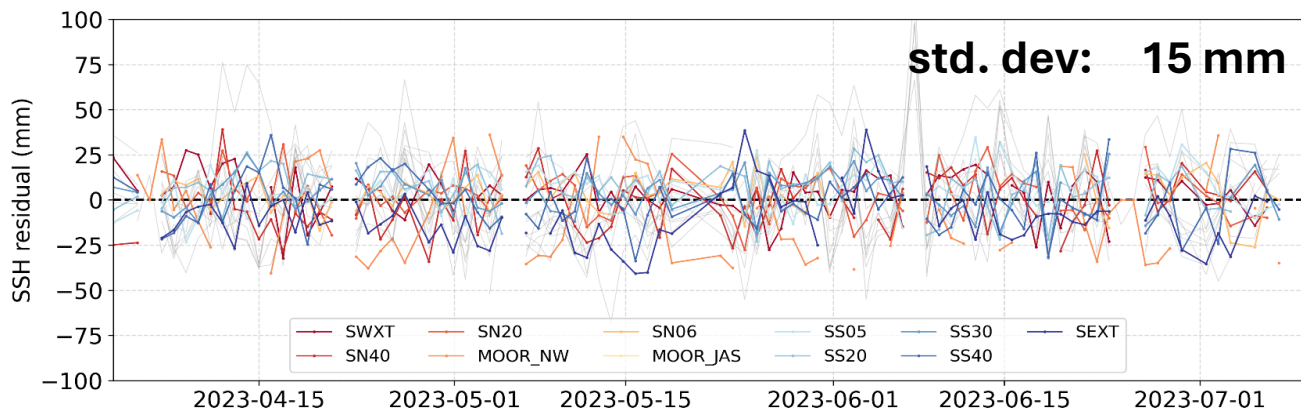
- Clear positive correlation between wave height and the SWOT L2 PGC minus GNSS buoy SSH residuals seen in Bass Strait (noting few comparisons in larger waves).



SSH validation numbers for Bass Strait

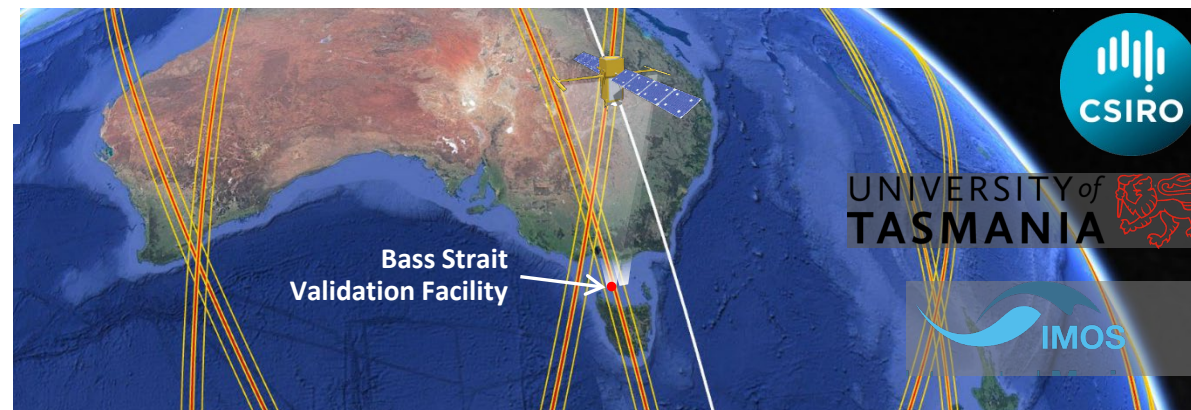


The wavenumber spectra of SWOT SSH (a), and frequency spectra of GNSS buoys SSH (b) over the FSP. The semivariance comparison is converted to standard deviation and shown in (c).



SWOT minus in-situ SSH over FSP with daily mean removed.

GNSS buoy noise level ~ 8 mm (Zhou et al., 2023)



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