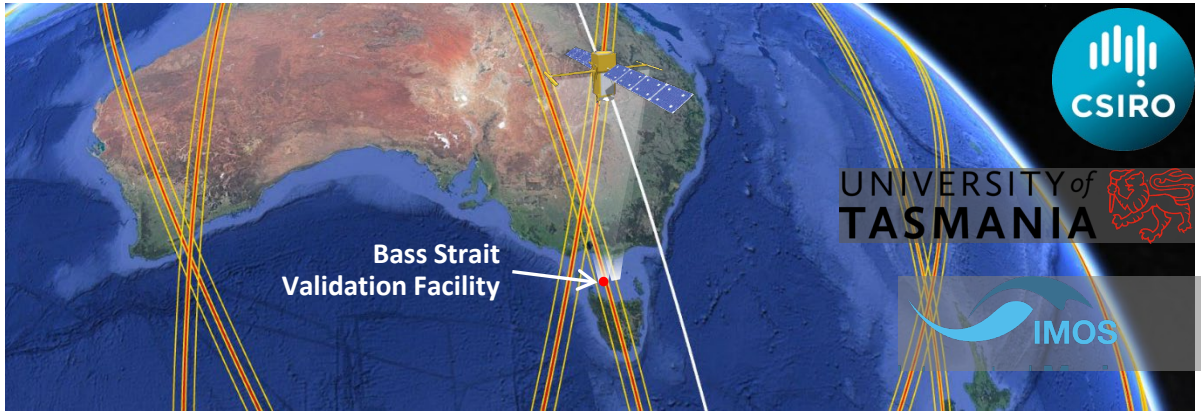
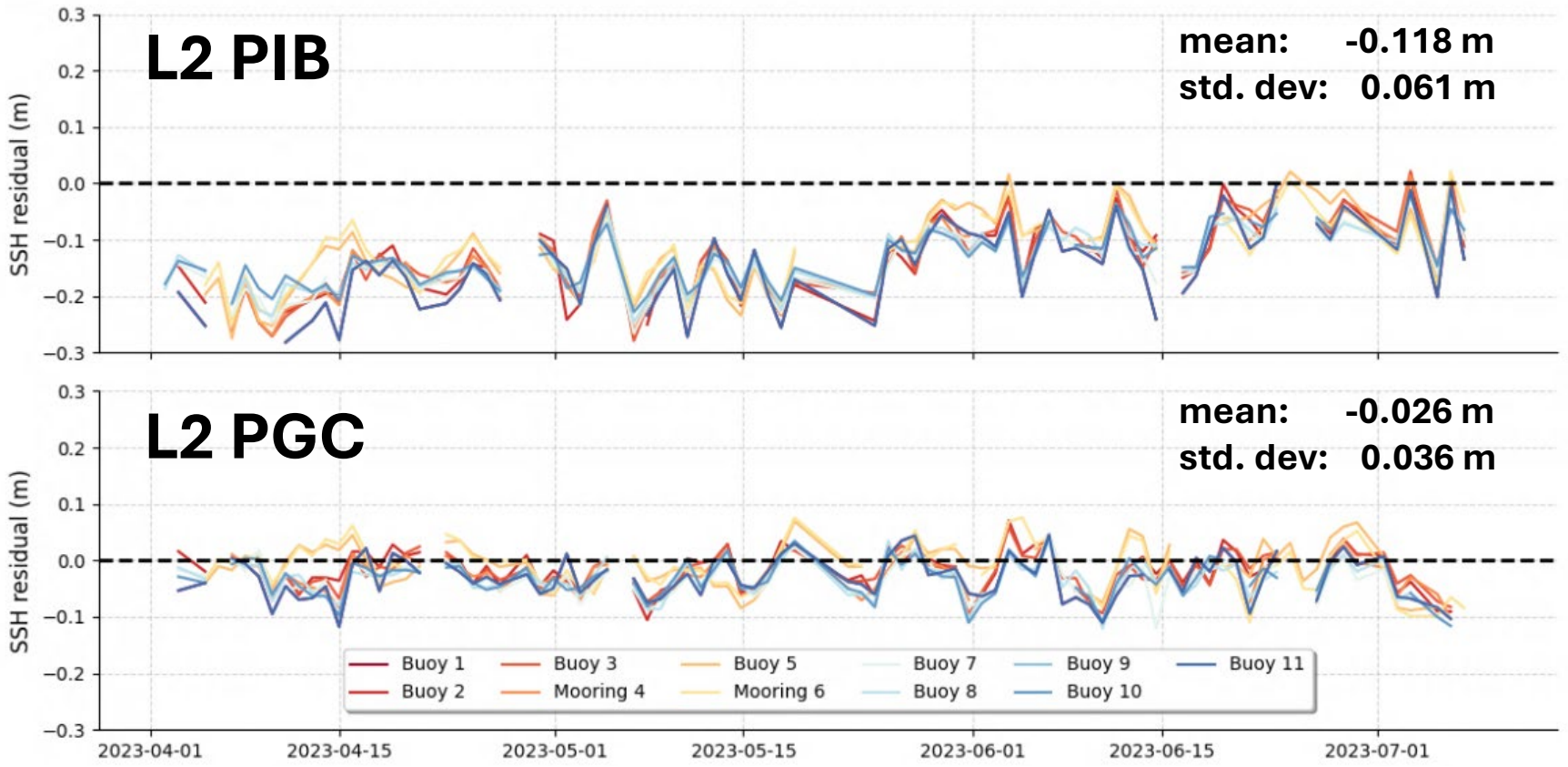
SWOT Validation Updates from the Bass Strait facility, Australia

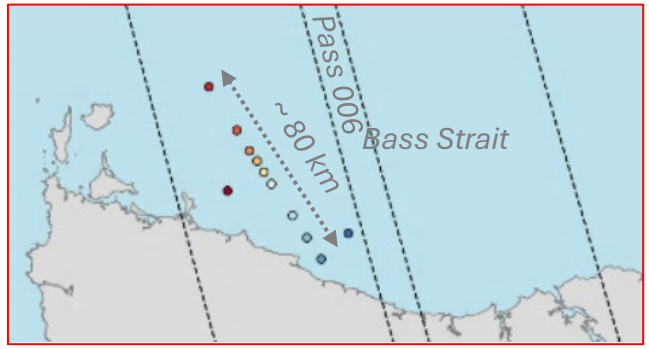
From Andrea HAY, Benoit LEGRESY, Christopher WATSON, Matt KING

- 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]
- The SOFS mooring also now provides extended wave products validating the SWOT swath wave products.
- 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].



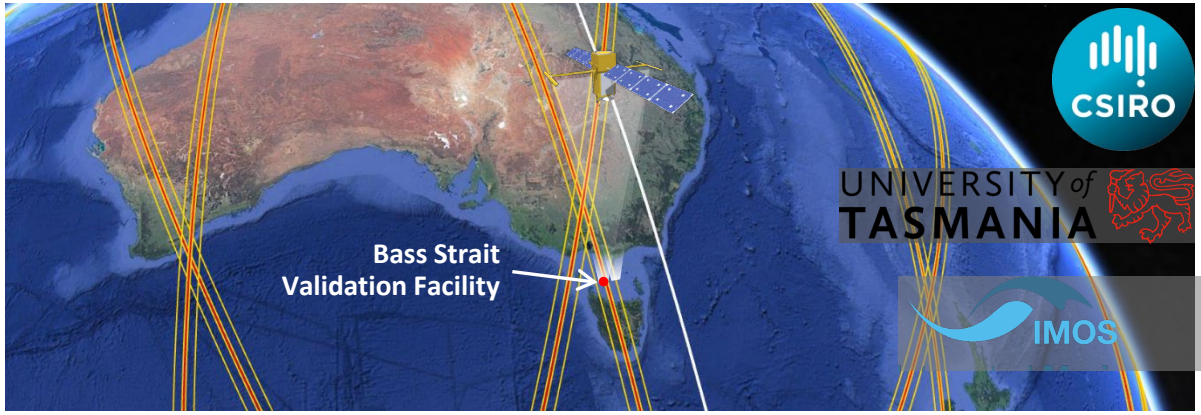
Processing baseline improvements





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

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



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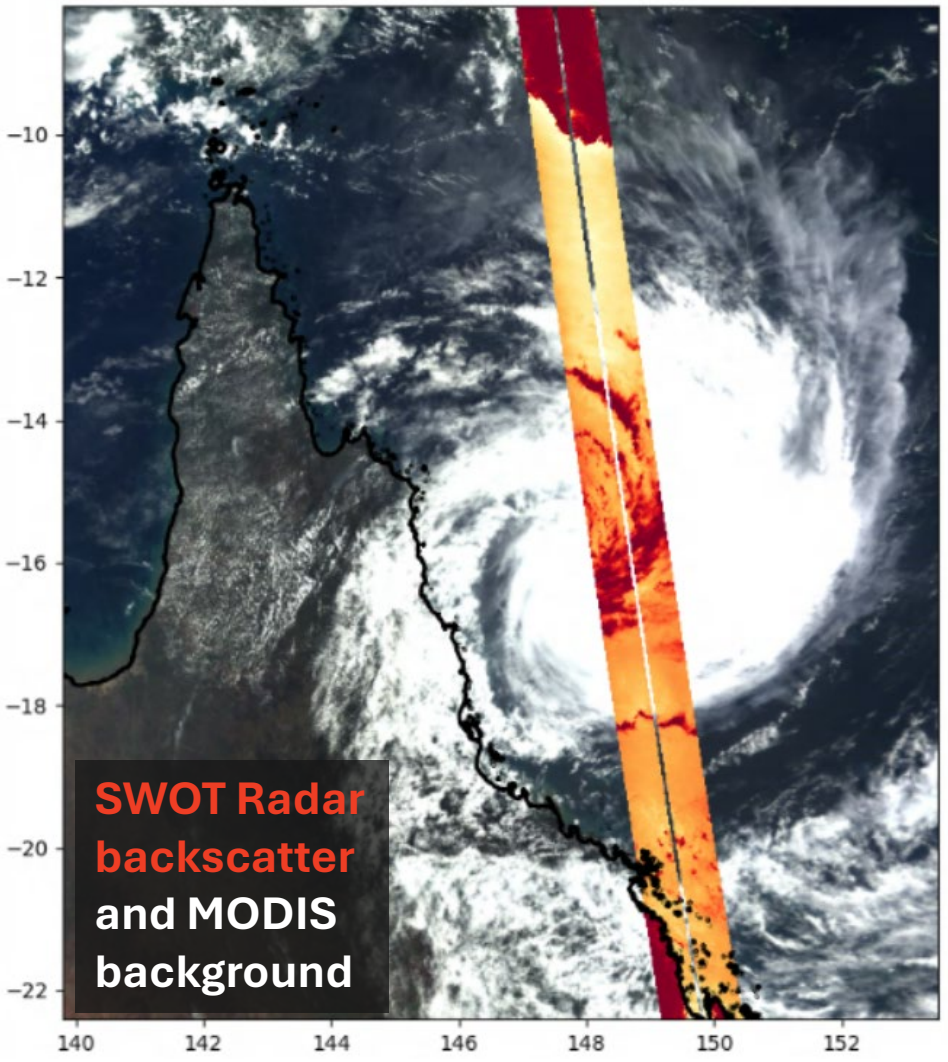
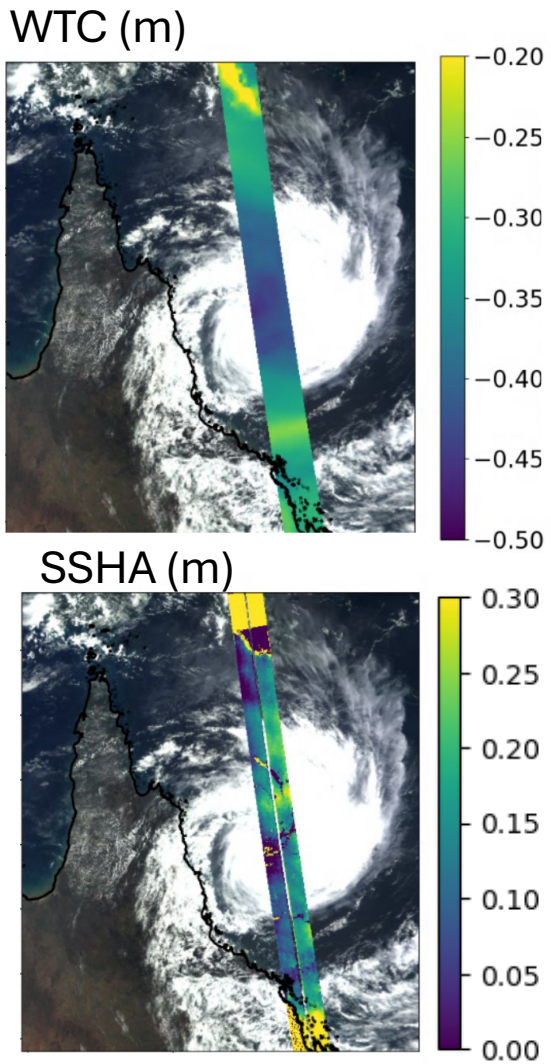
Hay et al. SWOT-ST, Chapel Hill, June 2024

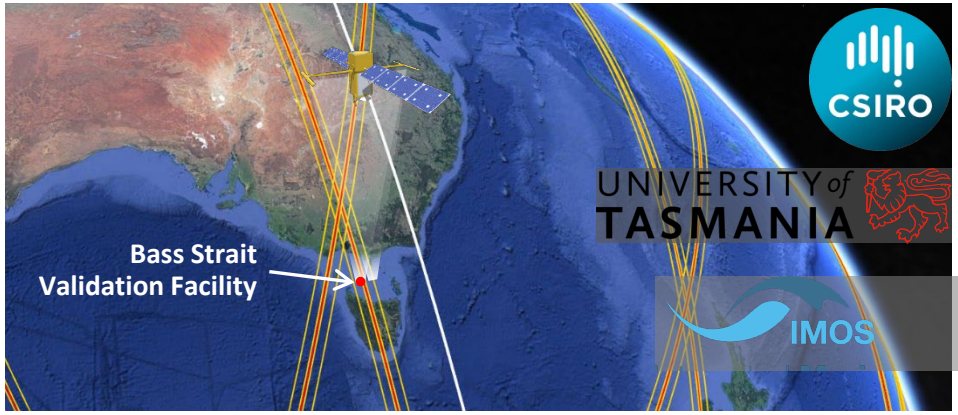
Wet troposphere error





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

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



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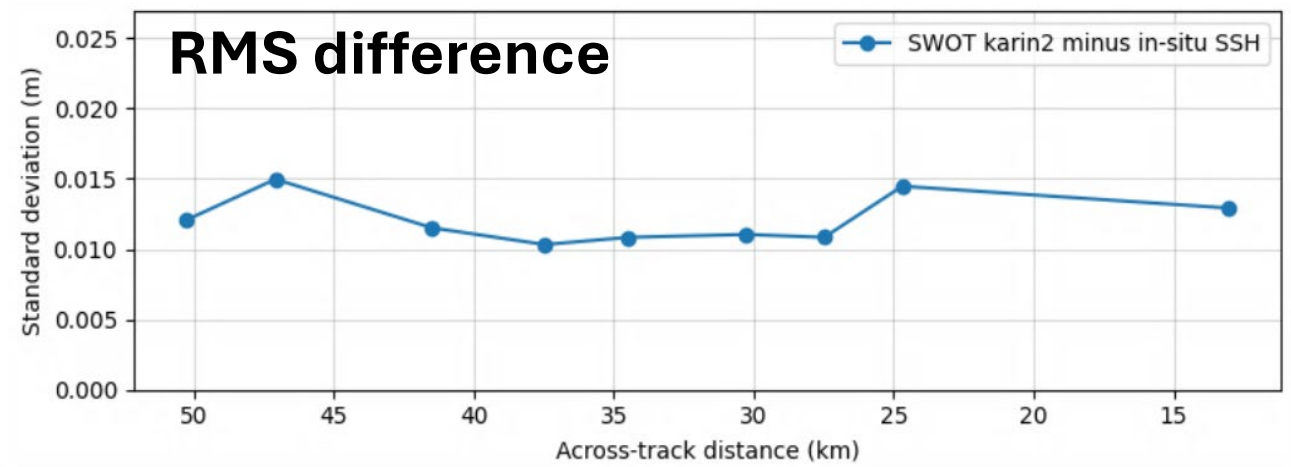
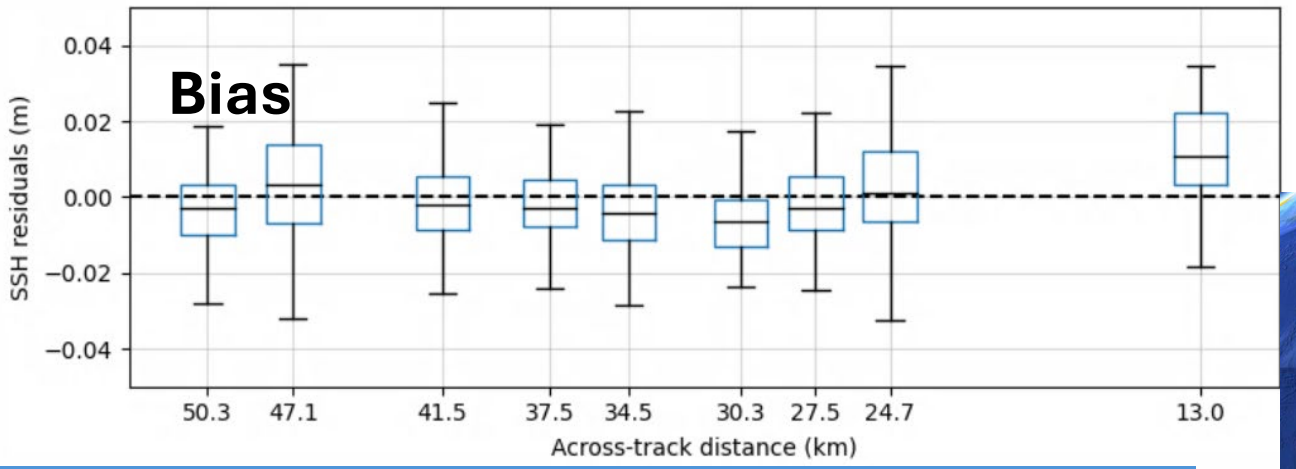
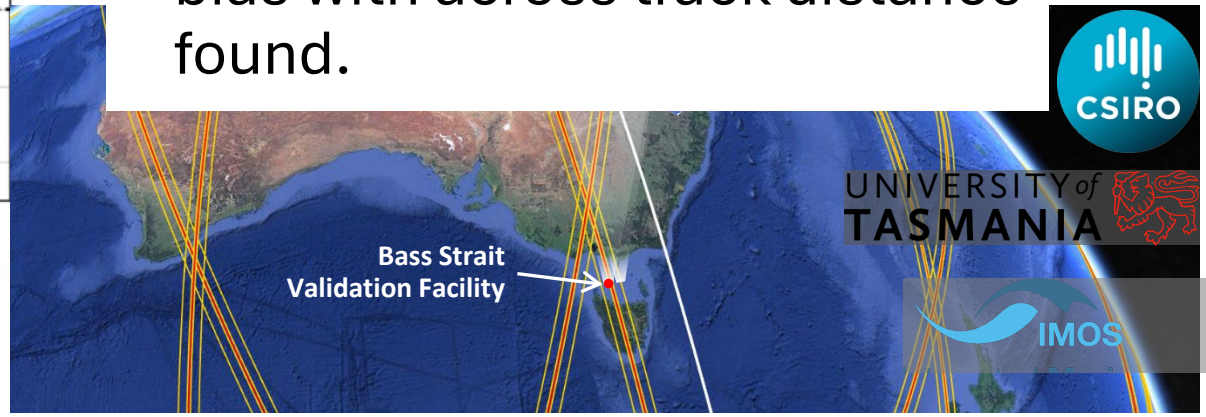
Across track noise level

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.



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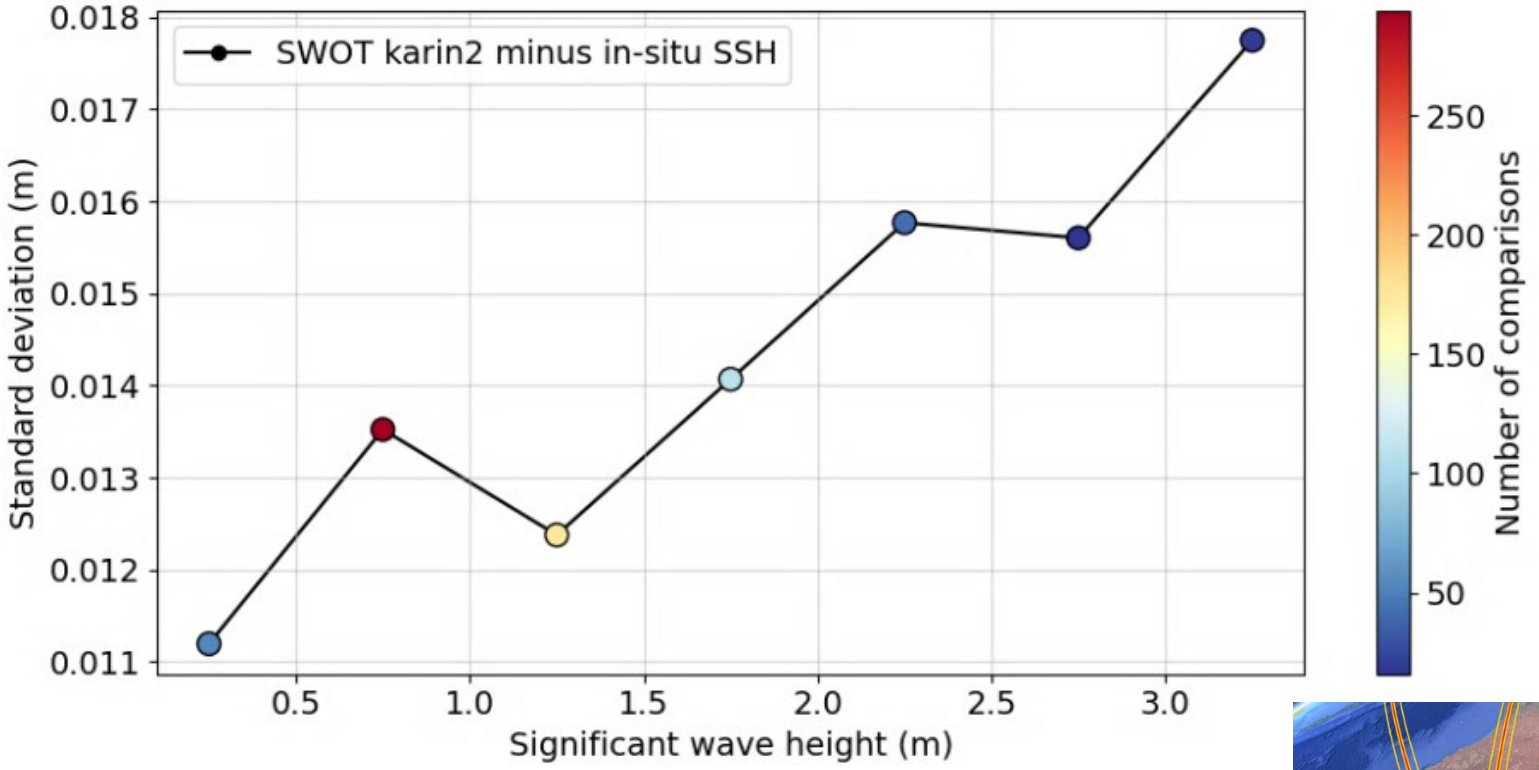
Influence of wave height on SSH noise

The spread of SSH residuals increases 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).