Combination of multi-mission altimetry data for monitoring extreme waves approaching coastal areas

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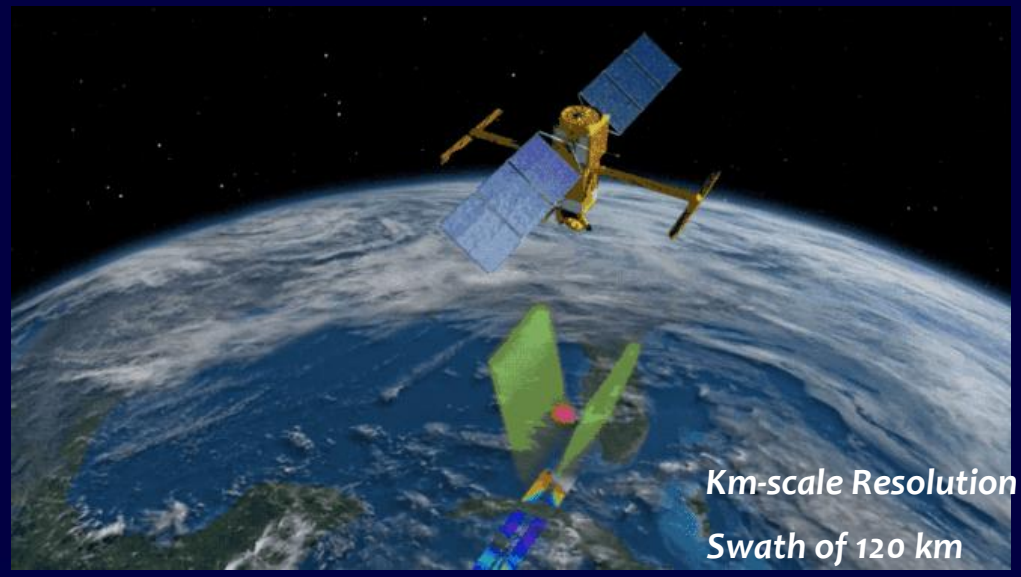
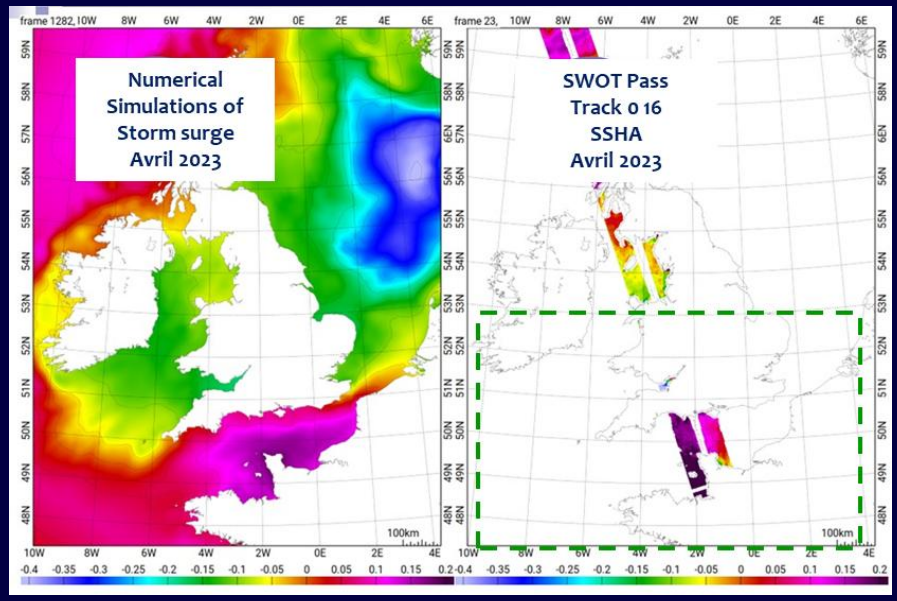
Laboratoire de Morphodynamique Continentale et Côtière
UMR CNRS 6143 M2C

New Mission SWOT (December 2022)

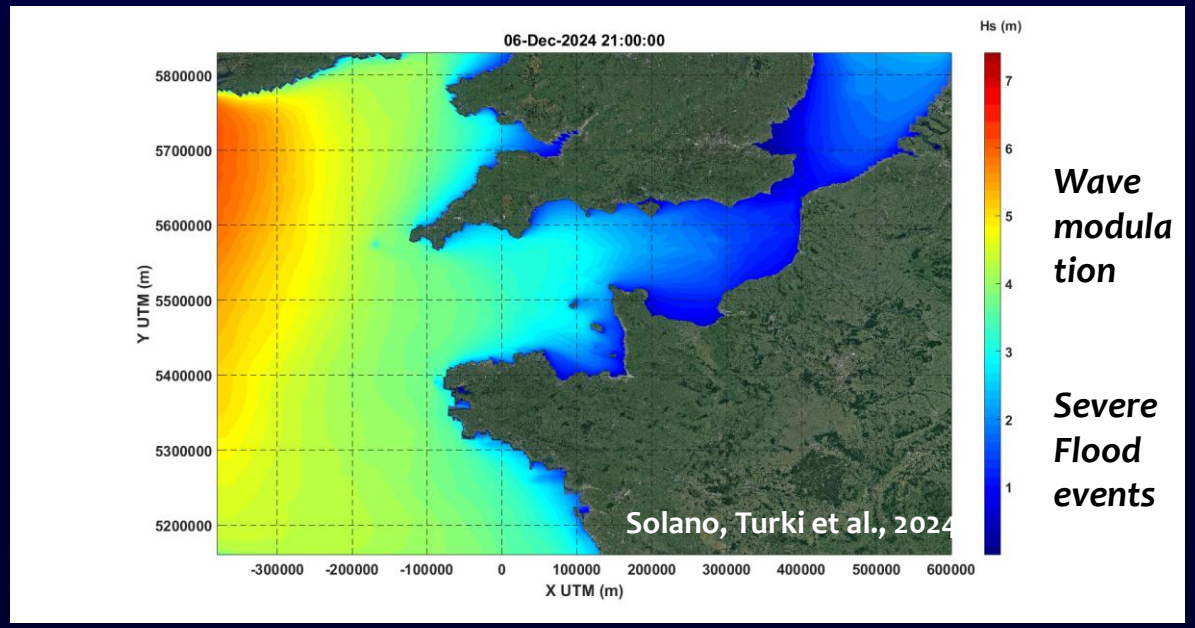


English Channel

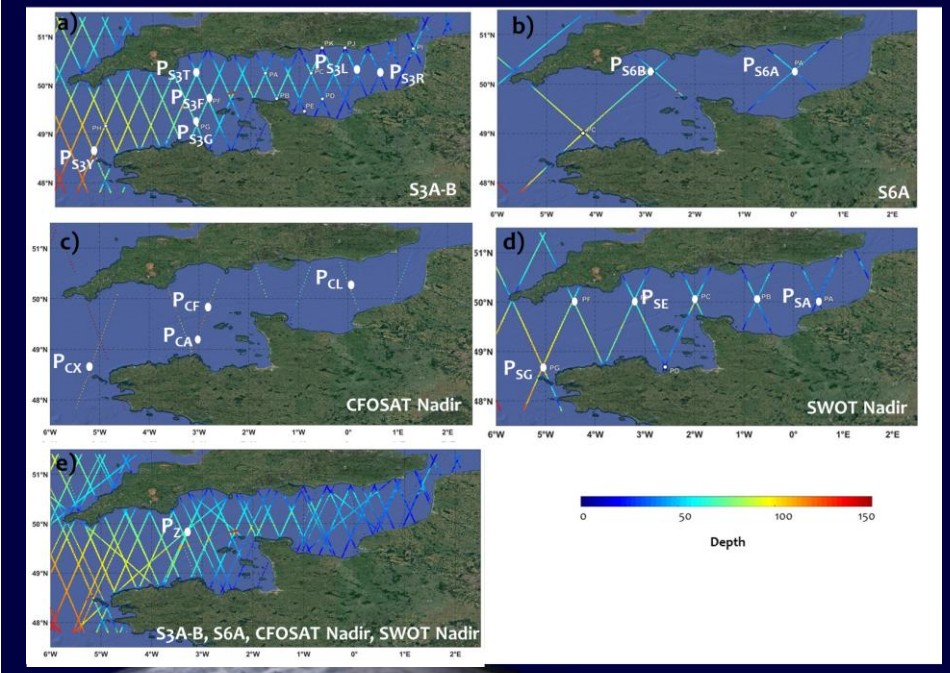


Conventional Altimeters

Wave Modelling; Ciaran Storm (Nov. 2023)

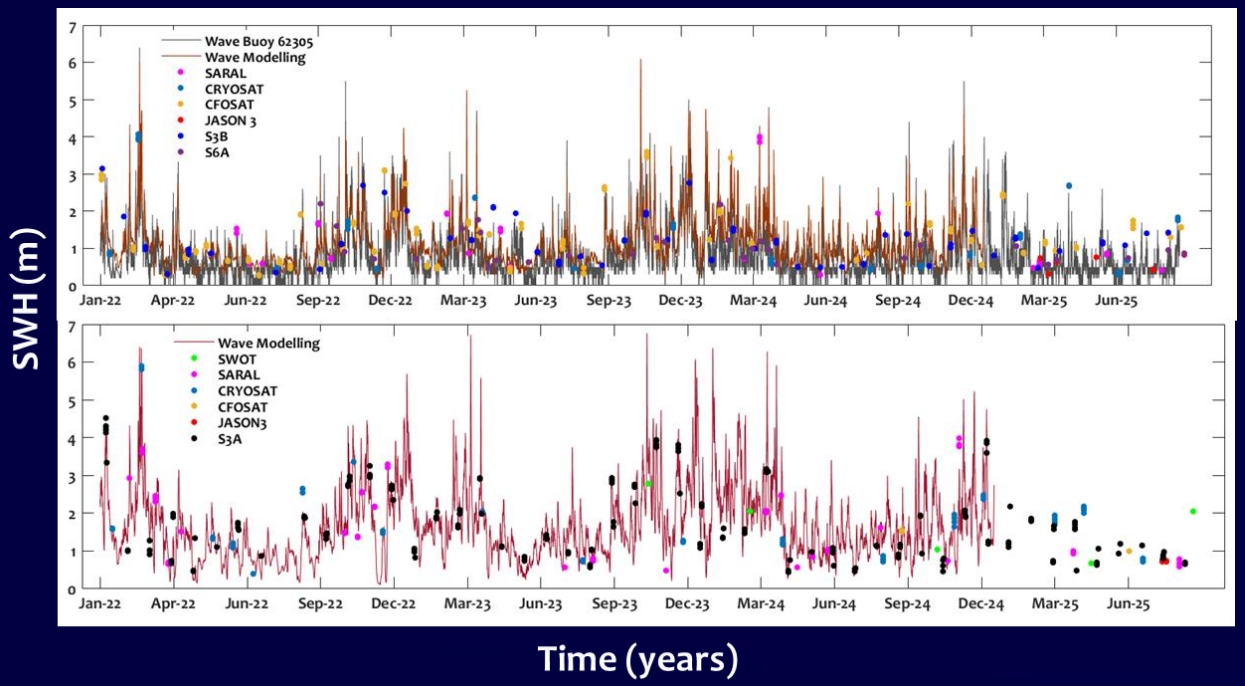


SWOT with 9 conventional missions

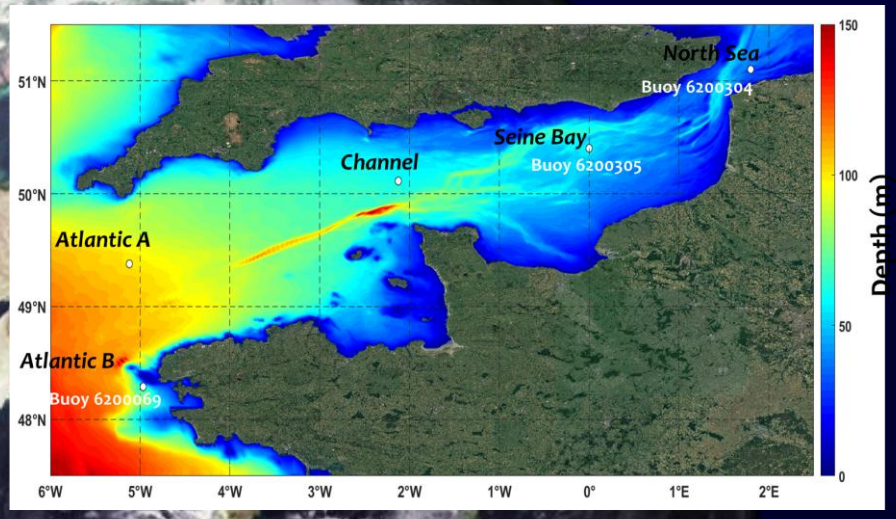


SWOT
CFOSAT
CRYOSAT-2
SARAL
Jason-3
Hai Yang-2B
Hai Yang-2C
Sentinel-3A
Sentinel-3B
Sentinel-6

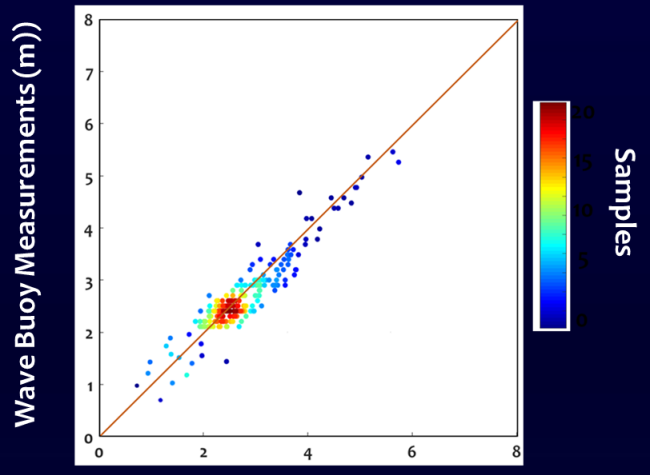
SWH altimetry observations vs Measurements and Models

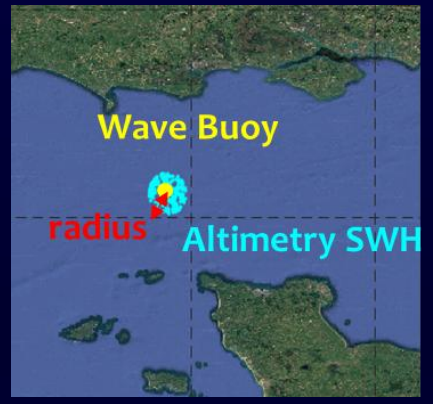


English Channel



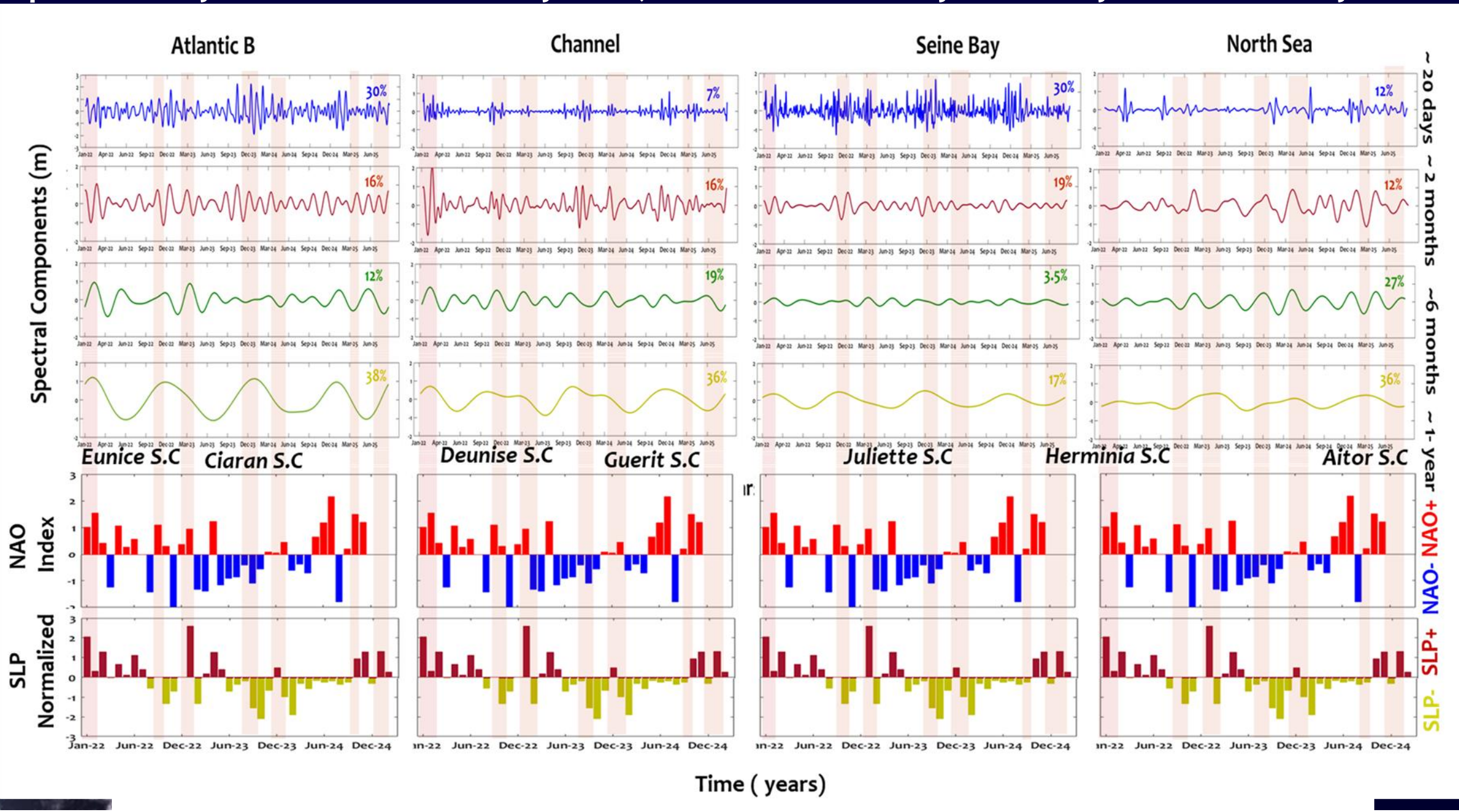
Consistency of Multi-source Altimetry Observations





R^2 varying with Radius: 0~ 50 km

Spectral Analysis of the non-stationary SWH ; Timescale Variability: inter-daily to inter-monthly scales



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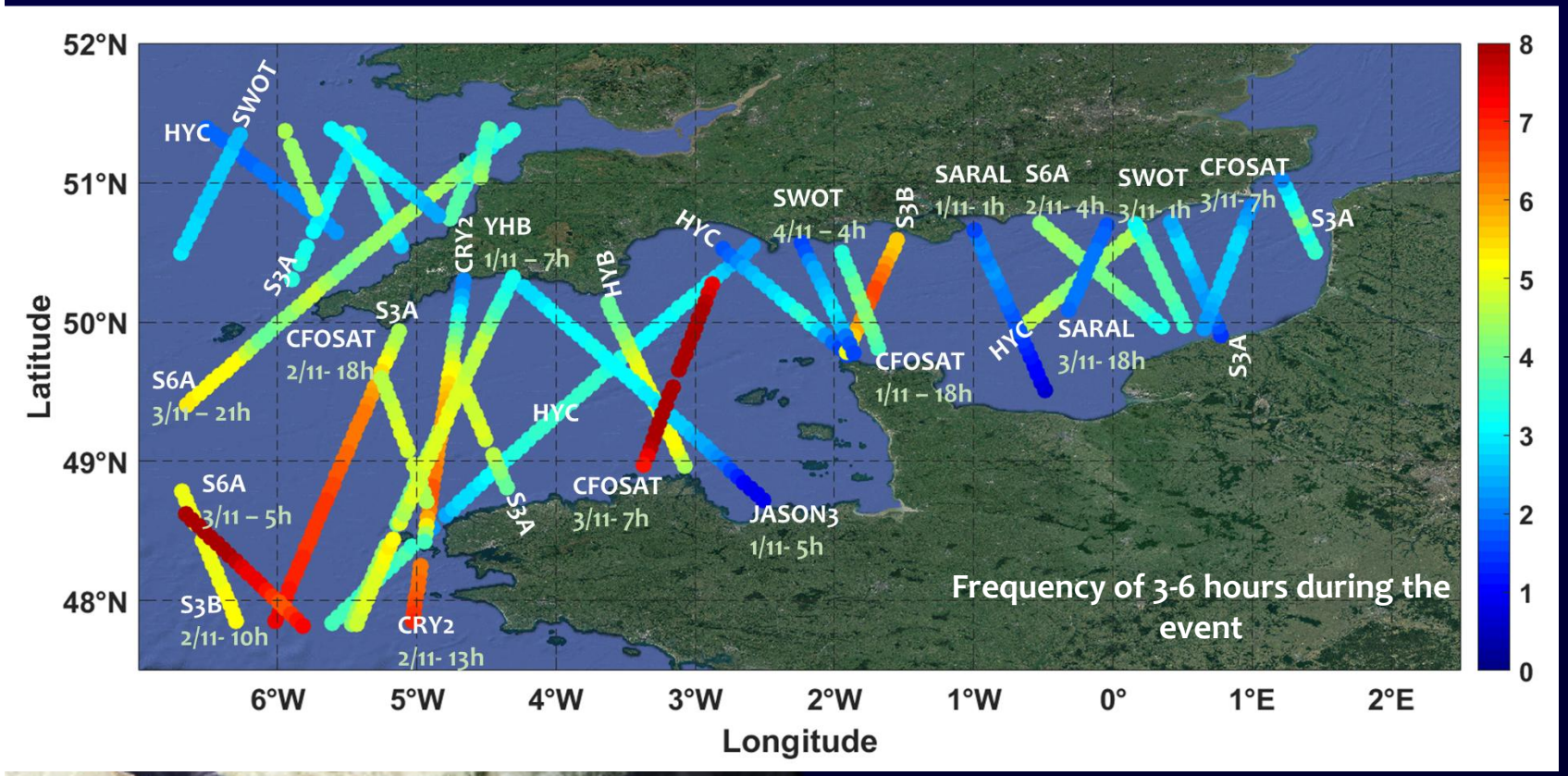
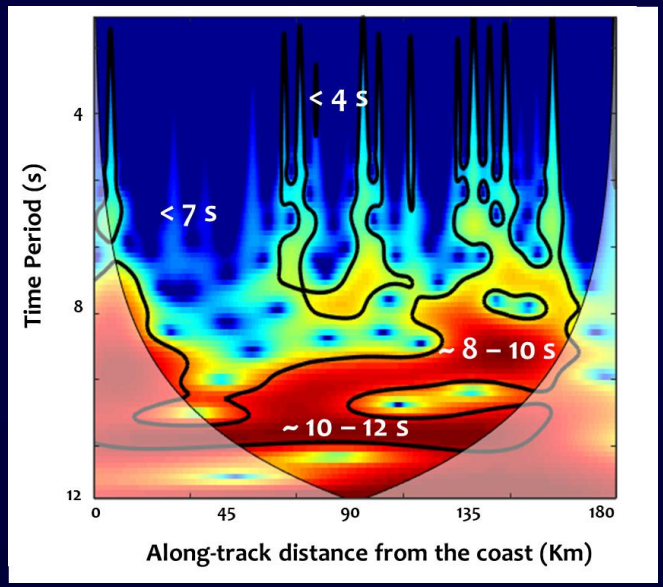
> 35%

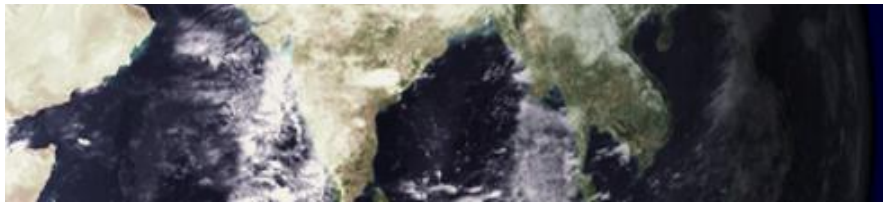
Monitoring of marine storms along the English Channel and the French/UK coasts through the coupling of SWOT with conventional mission .
Case of Ciaran Storm , 1-3 November 2023



Wave features and their changes from the nearshore to the coast,

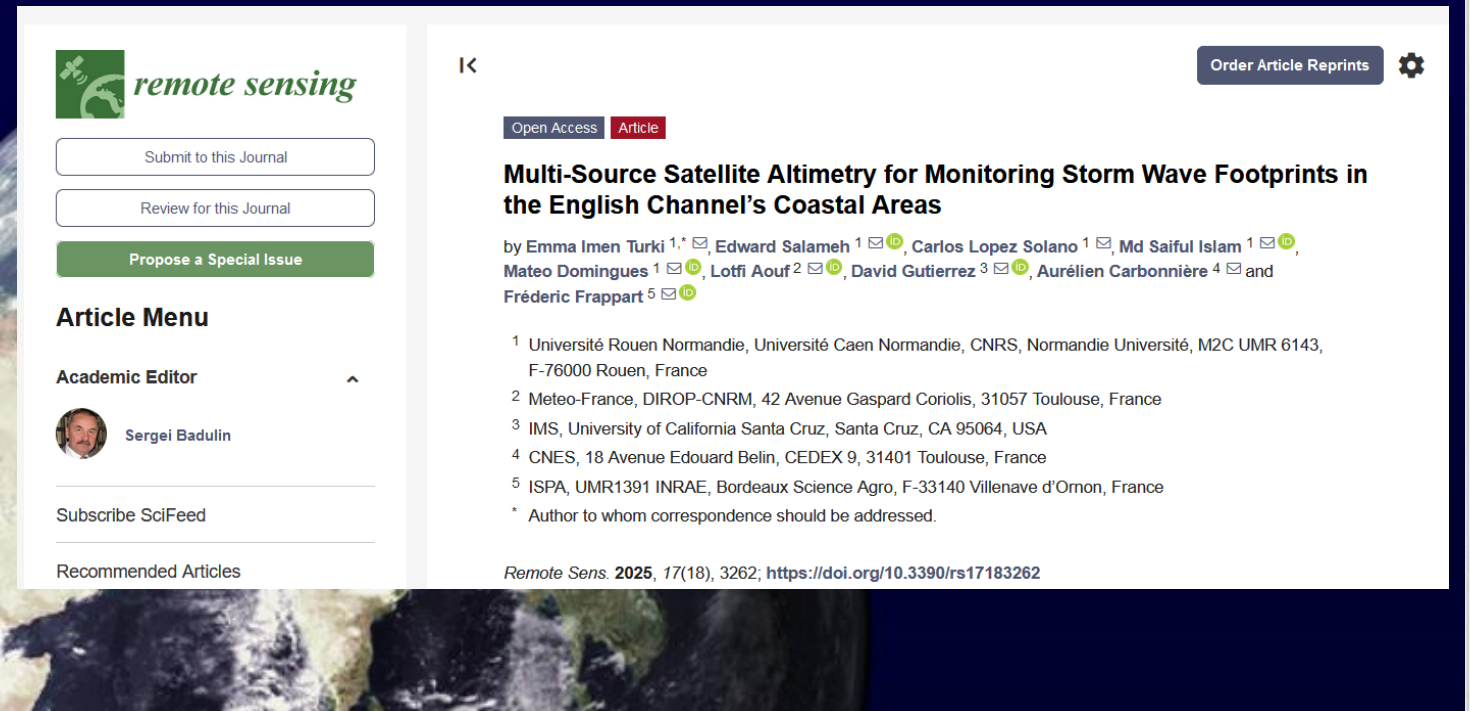


Example, CFOSAT 5 Hz



Valuable insight of **Merging multi-source altimeter SWH datasets** for monitoring storms and strengthen the reliability of models.

The potential of **SWOT's 2D wide-swath capability** to enhance the spatial and temporal monitoring of storms and observe wave features with short wavelengths.



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Multi-Source Satellite Altimetry for Monitoring Storm Wave Footprints in the English Channel's Coastal Areas

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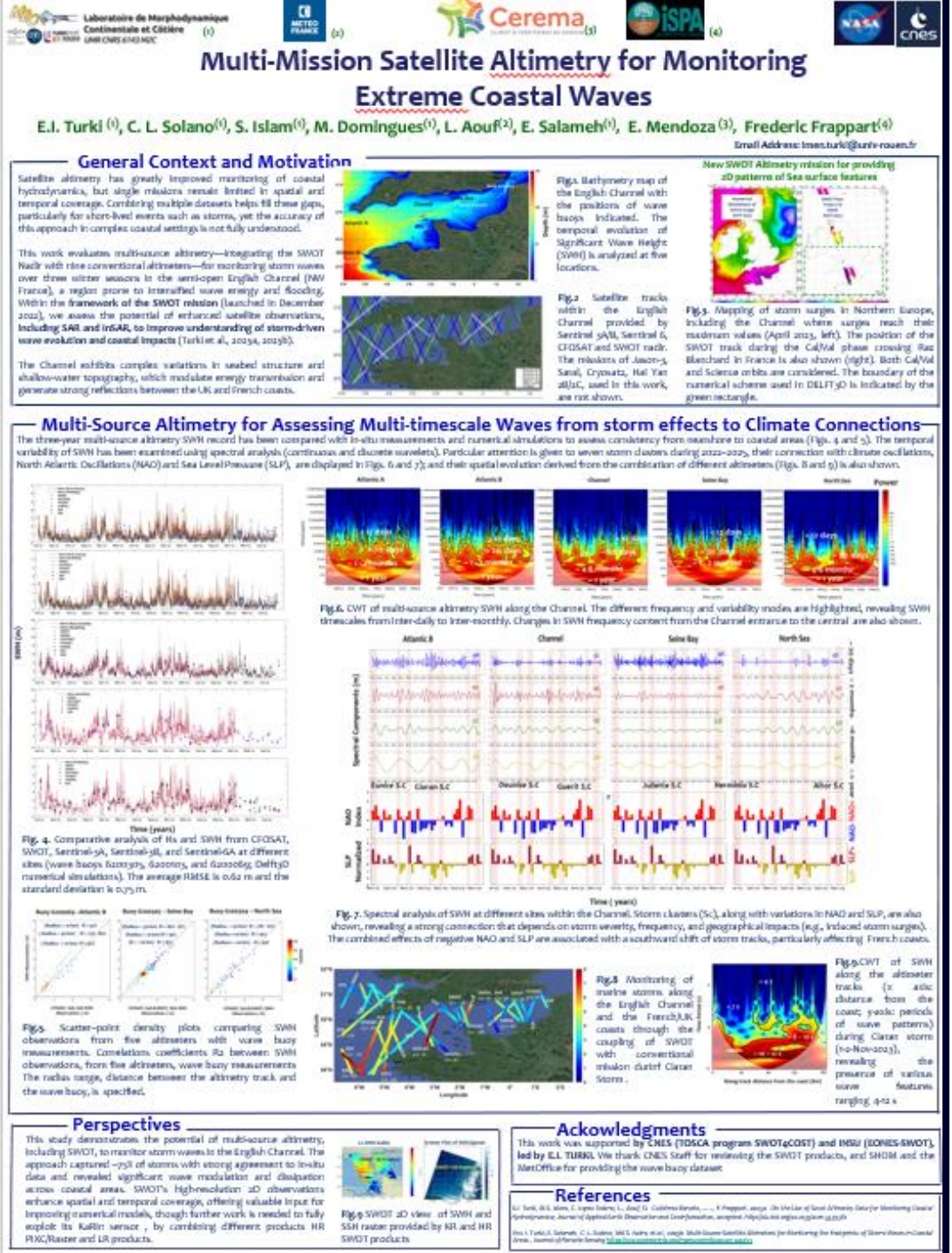
Remote Sens. **2025**, *17*(18), 3262; **https://doi.org/10.3390/rs17183262**



Multi-Mission Satellite Altimetry for Monitoring Extreme Coastal Waves

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General Context and Motivation

Multi-Source Altimetry for Assessing Multi-timescale Waves from storm effects to Climate Connections

Perspectives

Ackowledgments

References