

Theme #6 Ocean Prediction

Evolution of the IBI-MFC wave service component: delivery of new enhanced near-real-time wave forecasts, consistent with multi-year reanalysis wave products

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Introduction

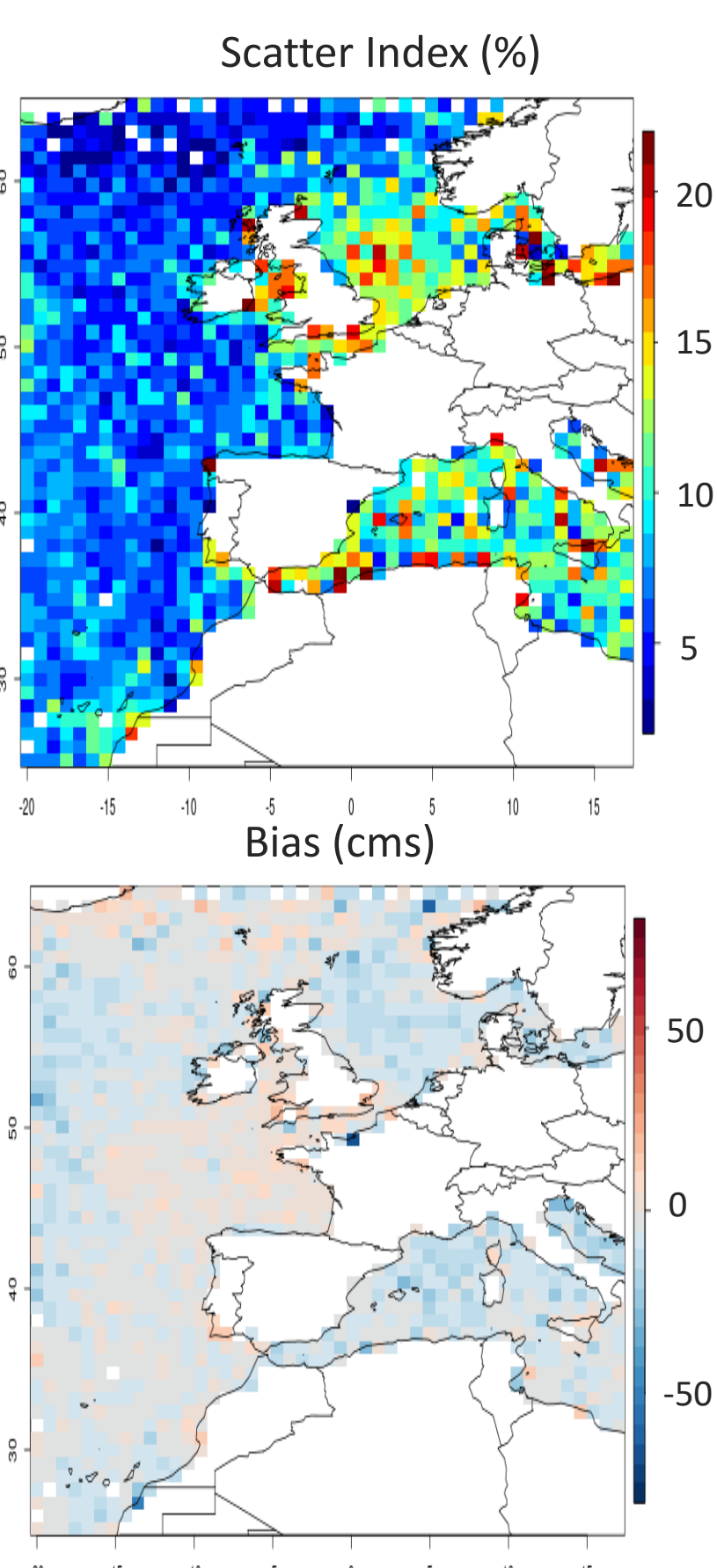
- The Iberian-Biscay-Irish analysis and forecast (NRT) and reanalysis (MY) systems from the Copernicus Marine Service have been upgraded and aligned, providing a consistent service between the operational forecasts and the multidecadal products for the IBI area.
- On November 2024, a new catalogue for IBI waves is published covering Jan 1980-Dec 2023 (MY) and Nov 2022-present (NRT), including new wave parameters.

IBI Wave Systems configuration

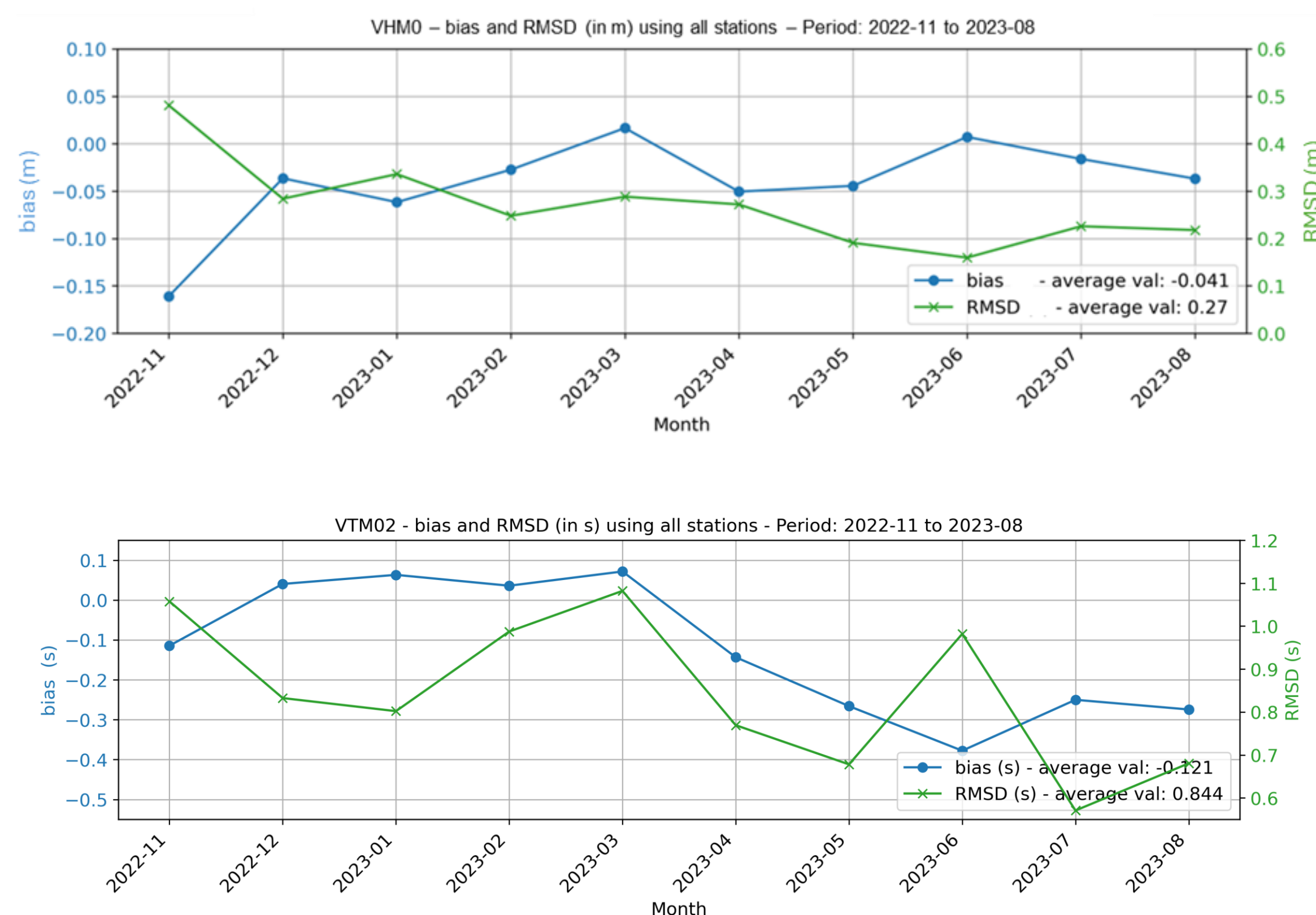
- IBI Wave (NRT & MY) Products resolution at 1/36 degrees, model represents waves on (30 energy bins)x(36 directions)
- Altimeter assimilation from Jason 3, Saral, Cryosat2, Sentinel 3A, 3B & 3C, Sentinel 6A, CFOSAT-nadir (from 1993)
- CFOSAT-SWIM spectral assimilation (NRT from Nov 2022, MY from Mar 2020).
- Wind forcing from ECMWF IFS (NRT) and ECMWF ERA5 (MY)
- Open boundary forcing from CMS GLObal (NRT & MY) systems
- Surface Current forcing from CMS NRT & MY IBI PHY systems

IBI-MFC Near Real Time Wave Validation

Model vs satellite



Model vs in-situ



Satellite validation

- Validation (Bias & scatter index) of wave height against HY2 altimeter (Jan 2023 - June 2023).
- Despite some regional variations, results show a homogeneous behaviour across the model domain. With improved performance on open ocean areas.

In-situ validation

- Validation (Bias & RMSD) of wave height and period for ~100 mooring locations between Nov 2022 and Aug 2023.
- Generally consistent performance across the evaluated period, with larger Bias and RMSE over winter period because of higher wave events.

IBI-MFC Multi-Year Wave Validation

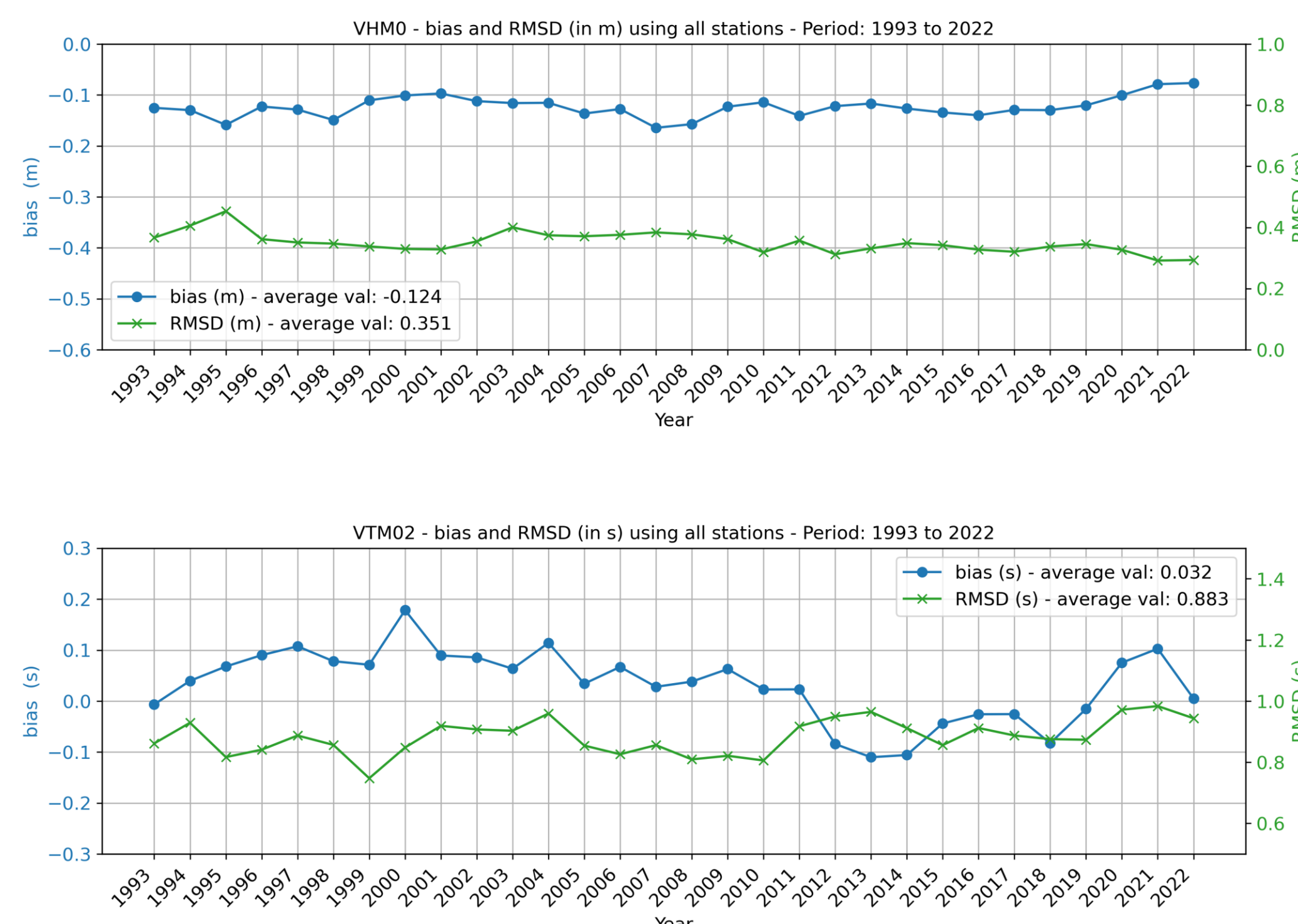
Satellite validation

- Validation (Bias & scatter index) of wave height against HY2 altimeter (2014-2018).
- Even performance across the domain with some small degradation over sheltered coastal

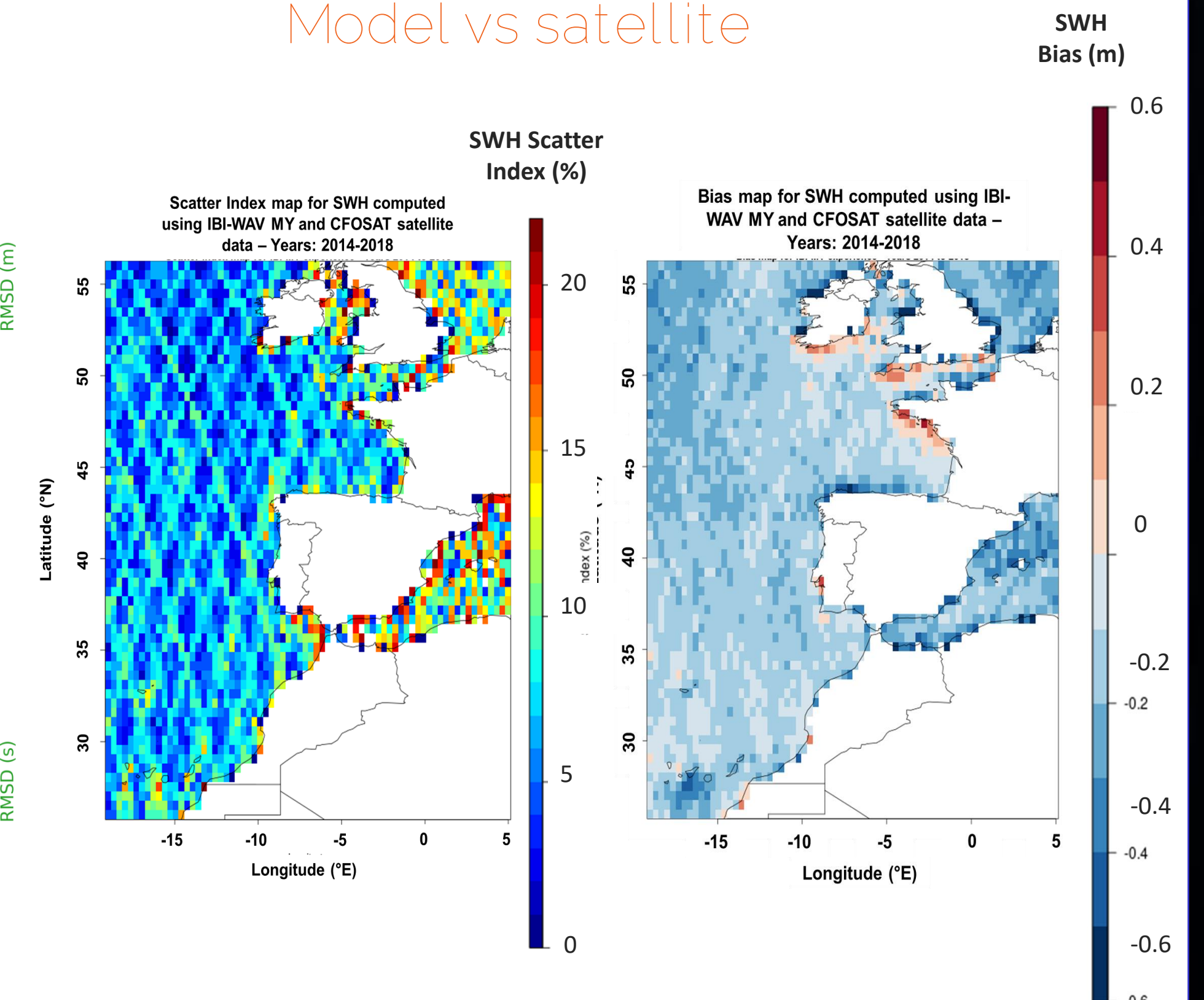
In-situ validation

- Validation (Bias & RMSE) of wave height and period for ~130 mooring locations between 1993 and 2022.
- Consistent performance across the evaluated period with some year-to-year variability.

Model vs in-situ



Model vs satellite



Conclusions

- Consistency between IBI-MFC NRT and MY Wave products, both products generated by analogous model and data assimilation systems
- Significant resolution increase, both NRT and MY wave products at 1/36 degrees
- Extensive verification indicates high and homogeneous performance. More info in the Quality Information Documents (QUIDs) at the product page of the Marine Data Store

