A new version of the Experimental Multimission Gridded Level 4 Sea Level Heights and Velocities with SWOT is now available on AVISO.

This updated release features enhancements of the MIOST mapping algorithm and extends coverage over a longer period—from March 15, 2023, to December 31, 2024—compared to the previous version.

The Level 4 gridded product is constrained by Level 3 input data from the following sources:

- **CMEMS Global Ocean Along-Track L3 Sea Surface Heights Reprocessed (1993–ongoing, tailored for data assimilation)** – DOI: 10.48670/moi-00146, Product ID: *SEALEVEL_GLO_PHY_L3_MY_008_062* (for the period 2023-03-15 to 2024-06-01),
- **CMEMS Global Ocean Along-Track L3 Sea Surface Heights Near Real-Time** – DOI: 10.48670/moi-00147, Product ID: *SEALEVEL_GLO_PHY_L3_NRT_008_044* (for the period 2024-06-01 to 2024-12-31),
- **SWOT L3_LR_SSH Product (v2.0.1)** – [DOI: 10.24400/527896/A01-2023.018]. (for the period 2023-03-28 to 2024-12-31),

---

Notifications

[IMPROVEMENT]

This release introduces a new “a priori” noise estimation for SWOT KaRIn measurements, applied within the mapping protocol. In addition, the inclusion of a new mode of variability to represent coherent internal tides over a six-month period has significantly reduced mapping errors compared to the previous version (v1.0).

- Figure 1 illustrates the improvements gained by integrating KaRIn data into the MIOST mapping process for both the previous and current releases. These results are derived from a validation exercise using an along-track dataset (SARAL/Altika) which was excluded from the mapping procedure to ensure an independent assessment. The comparison demonstrates that the inclusion of KaRIn data has a more substantial impact in the new release. In this updated Level 4 products, the integration of KaRIn data leads to a reduction in mapping error of up to 11% in high-variability regions and 7% in low-variability regions—a performance gain that is nearly twice as large as that observed in the previous L4 KaRIn release. Assessment metrics by oceanic regime are summarized in Table 1 for the new release and Table 2 for the former release.

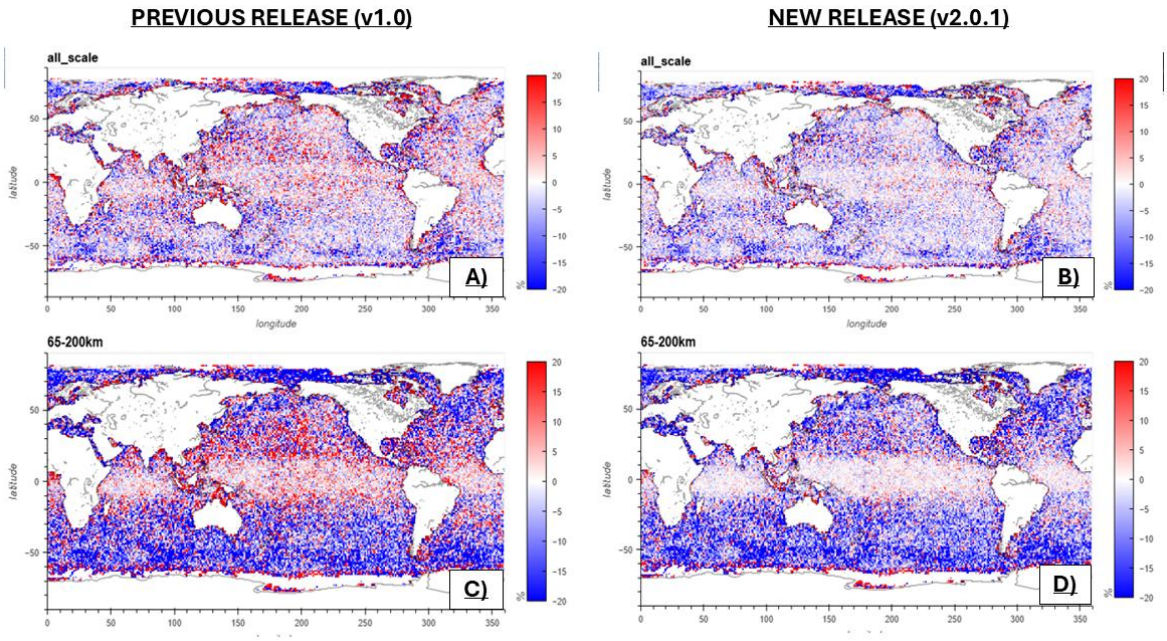

Figure 1: Gain/loss of the mapping error variance of SLA when integrating SWOT KaRIn in the MIOST in the previous release for A) all spatial scale in A) and C) scale < 200km, and in the new release for all spatial scale B) and scale < 200km D). Blue color means a reduction of error variance with respect to KaRIn.

*Table 1: **Regionally averaged mapping error variance and corresponding error reduction (gain) for the Sea Surface Height (SSH) variable in the MIOST experiment incorporating SWOT KaRIn in the new release.***
Values in parentheses indicate the percentage reduction in mapping error variance achieved by integrating KaRIn data, calculated as the difference between experiments with and without KaRIn.

	mapping_err [cm²]	mapping_err 65-500km [cm²]	mapping_err 65-200km [cm²]
coastal	21.22 (-1.5%)	4.52 (-2.6%)	1.73 (-3.8%)
offshore_highvar	22.57 (-6.2%)	6.14 (-11.2%)	2.86 (-11.2%)
offshore_lowvar	11.58 (-2.5%)	1.93 (-6.0%)	0.92 (-6.7%)
equatorial_band	13.93 (-0.7%)	3.02 (-0.6%)	1.31 (-0.2%)

Table 2: ***Regionally averaged mapping error variance and corresponding error reduction (gain) for the Sea Surface Height (SSH) variable in the MIOST experiment incorporating SWOT KaRIn in the former v1.0 release.***
Values in parentheses indicate the percentage reduction in mapping error variance achieved by integrating KaRIn data, calculated as the difference between experiments with and without KaRIn.

	mapping_err [cm²]	mapping_err 65-500km [cm²]	mapping_err 65-200km [cm²]
coastal	21.72 (+0.8%)	4.73 (+2.1%)	1.79 (-0.2%)
offshore_highvar	22.79 (-5.3%)	6.26 (-9.5%)	2.91 (-9.9%)
offshore_lowvar	11.67 (-1.8%)	1.99 (-3.3%)	0.93 (-5.2%)
equatorial_band	14.19 (1.2%)	3.14 (3.2%)	1.34 (2.0%)

[GENERAL INFORMATION]

Unlike previous versions, which were produced with a horizontal grid spacing of 1/10° x 1/10°, this new release adopts a coarser grid of 1/8° x 1/8°. This change ensures consistency with other MIOST products distributed through the Copernicus Marine catalog. Additionally, a sea-ice mask has been implemented in polar regions to exclude sea-level values resulting from extrapolation by the MIOST system. This mask is derived from OSI SAF CDR V3.0 products (OSI-450_a) up to 2020, and from OSI SAF ICDR V3.0 interim products (OSI-430-a) from 2021 onwards (Lavergne et al., 2019). The masking is based on a 15% sea-ice concentration threshold.

Reference:

Lavergne, T., Sørensen, A. M., Kern, S., Tonboe, R., Notz, D., Aaboe, S., Bell, L., Dybkjær, G., Eastwood, S., Gabarro, C., Heygster, G., Killie, M. A., Brandt Kreiner, M., Lavelle, J., Saldo, R., Sandven, S., and Pedersen, L. T.: Version 2 of the EUMETSAT OSI SAF and ESA CCI sea-ice concentration climate data records, The Cryosphere, 13, 49–78, https://doi.org/10.5194/tc-13-49-2019 , 2019.