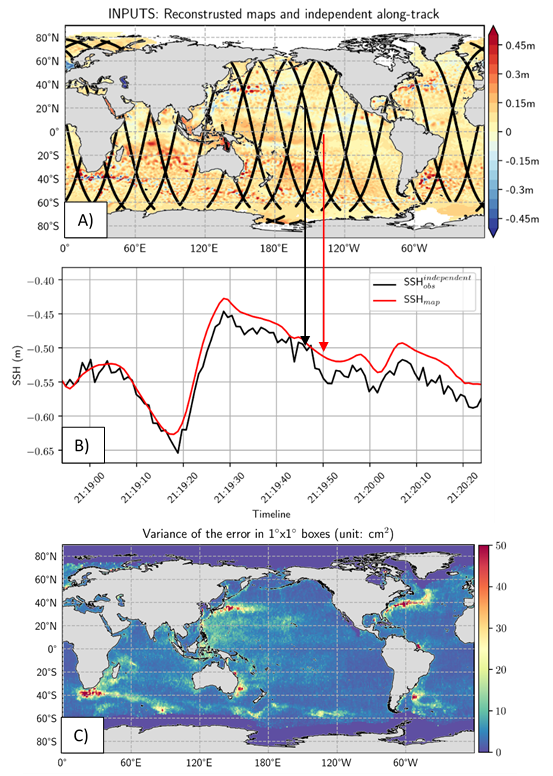
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Observing System Experiment data challenge– 2021A\_SSH\_MAPPING\_OSE User manual

**DOI:** [XXXXXXXXXXXX](https://doi.org/10.24400/527896/a01-2020.002)



**SALP-MU-P-EA- 23469-CLS**

Issue 1 rev 0 – 12/01/2021

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# Introduction

The 2021A\_SSH\_MAPPING\_OSE products are altimetry-based sea surface height products. They are designed to carry out Observing System Experiment for assessing, for example, the performance of mapping algorithms with present-day nadir-altimeters constellation. The present document describes each sub-products and variables referenced in 2021A\_SSH\_MAPPING\_OSE.

These products have been computed in collaboration between CLS and the MEOM Team from IGE within the BOOST-SWOT project (<https://meom-group.github.io/projects/boost-swot/> ) funded by ANR and the MIDAS project funded by CNES for the NASA/CNES SWOT Science Team. The dissemination of those products is part of the CNES Aviso+ project.

Data Policy and conditions of use

The 2021A\_SSH\_MAPPING\_OSE products are available free of charge for any project or study.

Citation

*Publications should include the following statement in the Acknowledgments: “The data used in this study (doi XXXXXXXXXXXXXXXXXX) were developed, validated by CLS and MEOM Team from IGE (CNRS-UGA-IRD-G-INP), France and distributed by Aviso+”.*

# Products description

2021A\_SSH\_MAPPING\_OSE contains sea-surface-height (SSH) data on 1) **several along-track altimeter orbits** (SARAL/Altika, Jason 2, Jason 3, Sentinel 3A, Haiyang-2A and Cryosat-2) and 2) **several gridded products** based on the combinations of the SARAL/Altika, Jason 2, Jason 3, Sentinel 3A, and Haiyang-2A mission (*Cryosat-2 being excluded from the mapping*).

The processing for the along-track observation production follows the same methodology as the along-track products distributed by the SL-TAC in the Copernicus Marine Service (CMEMS) and described in Pujol et al. (2016) and Taburet et al. (2019).

The gridded datasets contain: the mean dynamic topography CNES-CLS13 (Mulet et al., 2013) and spatio-temporal reconstructions of the SSH based on several mapping techniques such as a “**BASELINE**” optimal interpolation (as described in the github data-challenge repository https://github.com/ocean-data-challenges/2021a\_SSH\_mapping\_OSE), a **DUACS-DT2018** optimal interpolation (Taburet et al., 2019), a dynamic (**DYMOST**) interpolation method (Ubelmann et al, 2015, 2016; Ballarotta et al. 2020), a multiscale (**MIOST**) mapping approach (Ubelmann et al., 2021a, 2021b) and a method based on Back-and-Forth Nudging (**BFN**) a One-Layer Quasigeostrophic Model (Le Guillou et al. 2021)

The present datasets focus on a 10°x10° area in the GulfStream system.

|  |  |  |  |
| --- | --- | --- | --- |
| **Products** | **Mission** | **Period Coverage** | **Spatial Coverage** |
| Along-Track | SARAL/Altika | 2016/12/01-2018/01/31 | 75°W-45°W  23°N-53°N |
| Jason-2 | 2016/12/01-2017/09/14 |
| Jason-3 | 2016/12/01-2018/01/31 |
| Sentinel-3A | 2016/12/01-2018/01/31 |
| Haiyang-2A | 2016/12/01-2018/01/31 |
| Cryosat-2 | 2016/12/01-2018/01/31 |
| Mean dynamic Topography (CNES-CLS13) | grid | - | 65°W-55°W  33°N-43°N |
| DUACS mapping gridded SSH | grid | 2017/01/01-2017/12/31 |
| DYMOST mapping gridded SSH | grid | 2017/01/01-2017/12/31 |
| MIOST mapping gridded SSH | grid | 2017/01/01-2017/12/31 |
| BFN mapping gridded SSH | grid | 2017/01/01-2017/12/31 |
| BASELINE mapping gridded SSH | grid | 2017/01/01-2017/12/31 |

Table 1. Products’ characteristics

# Parameters description

List of the parameters available in each product.

|  |  |  |
| --- | --- | --- |
| NetCDF name | Units | Short description |
| latitude | degrees\_north | Latitude coordinates of the measurement |
| longitude | degrees\_east | Longitude coordinates of the measurement |
| cycle | - | Cycle the measurement belongs to |
| track | - | Track in cycle the measurement belongs to |
| dac | meters | Dynamic Atmospheric Correction |
| lwe | meters | Long wavelength error |
| mdt | meters | Mean dynamic topography |
| ocean\_tide | meters | Ocean tide model |
| sla\_filtered | meters | Sea level anomaly filtered not-subsampled with dac, ocean\_tide and lwe correction applied |
| sla\_unfiltered | meters | Sea level anomaly not-filtered not-subsampled with dac, ocean\_tide and lwe correction applied |
| time | seconds since 2016-12-01 | Time coordinates of the measurement |

Table 2. *Short description of all parameters available in Netcdf Along track files.*

|  |  |  |
| --- | --- | --- |
| NetCDF name | Units | Short description |
| lat | degrees\_north | Latitude coordinates of the reconstruction |
| lon | degrees\_east | Longitude coordinates of the reconstruction |
| ssh | meters | Reconstrcution SSH |
| time | days since 2017-01-01 00:00:00 | Date of the reconstruction |

Table 3: List of variables in the NetCDF grid products.

# Accessibility of products

The products are available via the authenticated Aviso+ OpenDAP:

* You first need to register via the Aviso+ web portal and sign the License Agreement: <https://www.aviso.altimetry.fr/en/data/data-access/registration-form.html>
* Please, choose the product “Ocean data challenge” in the list of products

A login /Password will be provided via email with all the necessary information to access the products.

# List of acronyms and abbreviations

**FTP**: File Transfer Protocol

**OSE**: Observing System Experiment

**SLA**: Sea Level Anomaly

**SSH**: Sea Surface Height

**BFN**: Back-and-Forth Nudging

**DUACS**: Data Unification and Altimeter Combination System

**CMEMS**: Copernicus Marine and Environment Monitoring Service

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