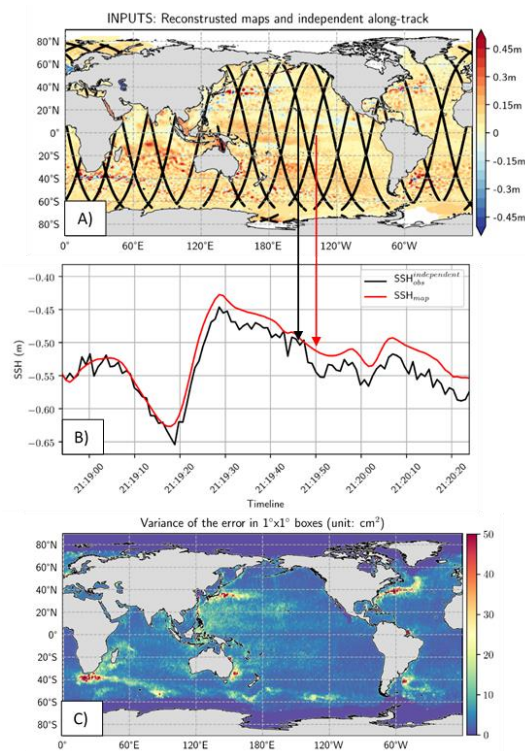




# Observing System Experiment data challenge– 2021A\_SSH\_MAPPING\_OSE User manual

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# 1 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 (<https://doi.org/10.24400/527896/a01-2021.005>) were developed, validated by CLS and MEOM Team from IGE (CNRS-UGA-IRD-G-INP), France and distributed by Aviso+”.*

## 2 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](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

### 3 Parameters description

List of the parameters available in each product.

NetCDF name	Units	Short description
<b>latitude</b>	degrees_north	Latitude coordinates of the measurement
<b>longitude</b>	degrees_east	Longitude coordinates of the measurement
<b>cycle</b>	-	Cycle the measurement belongs to
<b>track</b>	-	Track in cycle the measurement belongs to
<b>dac</b>	meters	Dynamic Atmospheric Correction
<b>lwe</b>	meters	Long wavelength error
<b>mdt</b>	meters	Mean dynamic topography
<b>ocean_tide</b>	meters	Ocean tide model
<b>sla_filtered</b>	meters	Sea level anomaly filtered not-subsampled with dac, ocean_tide and lwe correction applied
<b>sla_unfiltered</b>	meters	Sea level anomaly not-filtered not-subsampled with dac, ocean_tide and lwe correction applied
<b>time</b>	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
<b>lat</b>	degrees_north	Latitude coordinates of the reconstruction
<b>lon</b>	degrees_east	Longitude coordinates of the reconstruction
<b>ssh</b>	meters	Reconstruction SSH
<b>time</b>	days since 2017-01-01 00:00:00	Date of the reconstruction

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

## 4 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.

## 5 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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