



SYNTHESIS QUALITY OVERVIEW DOCUMENT (SQO)

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INSITU_GLO_PHY_SSH_DISCRETE_MY_013_053

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CHANGE RECORD

When the quality of the products changes, the QuID is updated and the SQO is updated. A line is added to this table and the version of the SQO document is the same than that of the REFERENCE QUID. The third column specifies which sections or sub-sections have been updated.

Issue	Date	§	Description of Change	Authors	Validated By
1.0	28/08/2022	All	First version of the document	Begoña Pérez Gómez, Jue Lin Ye, Marta de Alfonso	Stéphane Tarot
1.1	10/08/2023	All	Second version: new dataset and improved	Begoña Pérez Gómez, Jue Lin Ye	Stéphane Tarot

Contents

Executive summary.....	3
1. Original time sampling sea level data.....	4
2. Hourly sea level data	5
References	6

Executive summary

The INSITU_GLO_PHY_SSH_DISCRETE_MY_013_053 product is based on in situ sea level observations.

The data validation (parameter SLEV) is carried out by automatic quality control tests both in real time and delayed mode, according to Copernicus Marine Service and the Global Sea Level Observing System (GLOSS) best practices (Pérez Gómez et al. 2010, UNESCO/IOC, 2020). A visual inspection of flagged data, total sea level and non-tidal residuals, and differences with nearby stations, complements automatic procedures to detect wrong data.

It is important to note that this product is providing data from stations operated by national or local institutions, and they are responsible of the data transmission and the equipment maintenance.

The temporal coverage is analysed for three periods since 1880 up to now (2022). The metric includes the mean number of stations per year and the standard deviation, the average completeness index and the mean number of year with completeness index larger than 70% for each period and different regions. The spatial coverage is presented through maps with the distribution of platforms, coloured according to the number of years with data coverage.

There are a few stations with more than 100 years of data, and a significant increase of stations along the years, especially in the last decades. Higher frequency sampling data (1 min, 5 min) start to become available in recent years in In Situ TAC, but the number of hourly sampling files, the main original focus, is higher, and their time series the longest.

Regarding the spatial coverage, most of the stations in In Situ TAC are concentrated in the European Seas. There are differences between the regions with high coverage and high density in practically all countries, smaller density in higher latitudes, and practically no data in the Southern Mediterranean and Sea and in the Northern Black Sea.

For additional information regarding the in-depth validation of this product, the calculation of the assessment metrics presented in this product and other detailed information in quality and remarkable events please refer to the reference quid document CMEMS-INS-QUID-013_053 (https://catalogue.marine.copernicus.eu/documents/QUID/CMEMS-INS-QUID-013_053.pdf).

Important notice:

The contents of this document are an assessment based on the best set of observations available for evaluation at the time the operational system was validated. The validation methodology was defined and agreed within Copernicus Marine Service, inheriting the long experience of MyOcean and MERSEA series of projects (Hernandez et al., 2018) The results presented in this report and derived estimated accuracy numbers (EAN) are representative of average error levels over large areas of the ocean. These numbers might be used as a mean error in one given point of the area, but in order to refine error estimates locally, the reader is invited to use complementary information from reference QUIDs (error maps for instance, when available).

1. Original time sampling sea level data

Historic sea level observations in In Situ TAC are distributed with different sampling intervals. Temporal evolution of total number of platforms/year, for different samplings and geographical regions are presented in Figure 1.1, and spatial coverage with number of years in Figure 1.2.

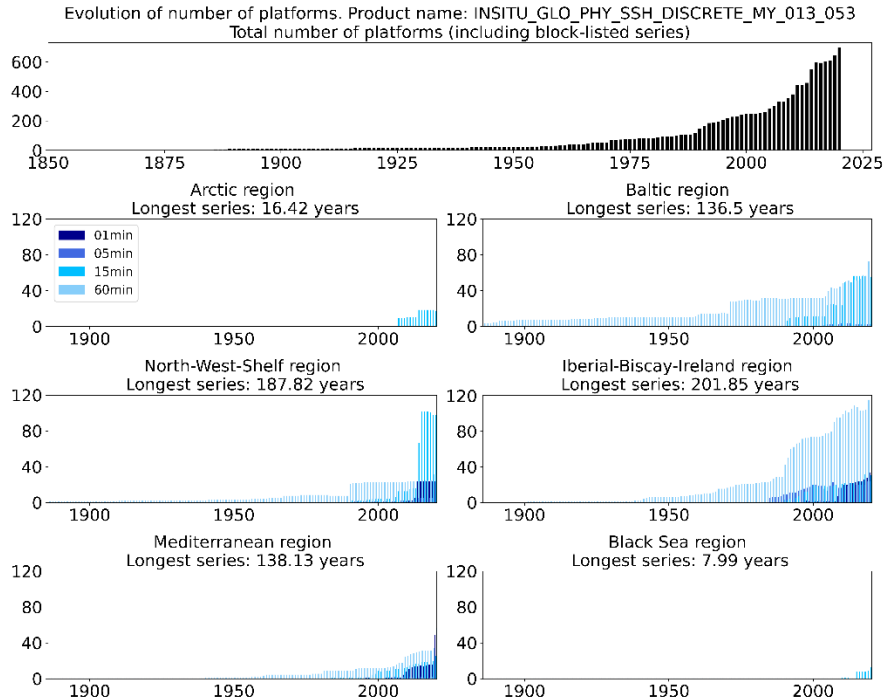


Figure 1.1: Number of platforms per year, from the sea level reprocessed product, for all the regions (top figure) and for different geographical regions, depending on the original time sampling data.

Longest series of SLEV data at each station in Copernicus Marine Service
In Situ TAC (2022) - original sampling series

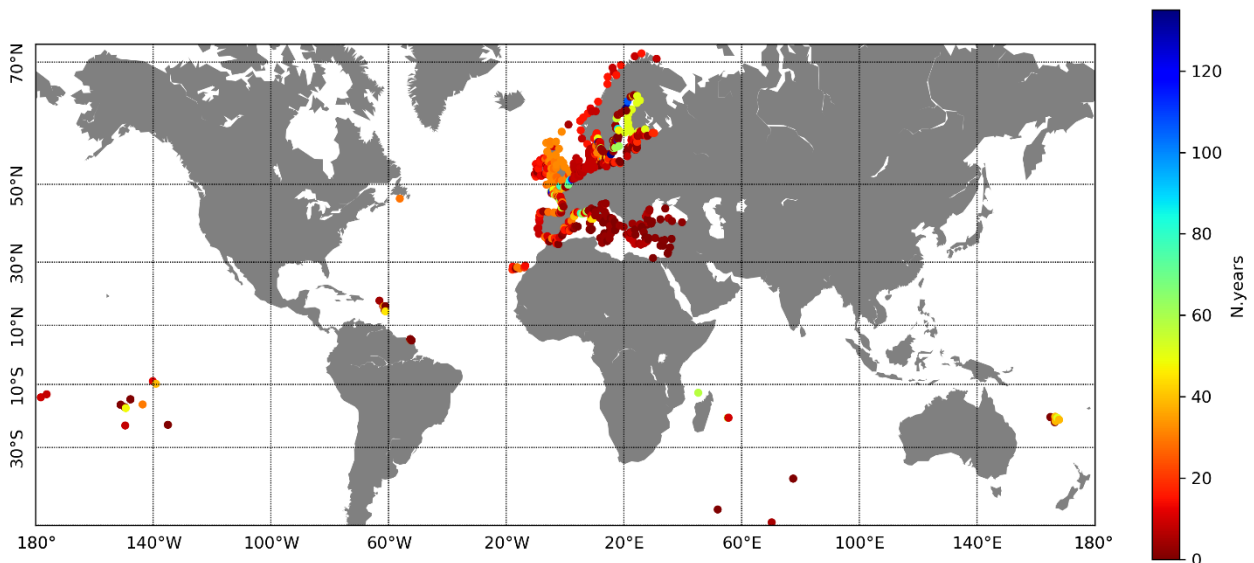


Figure 1.2: Stations in In Situ TAC sea level reprocessed product for any sampling interval, longest timeseries (colour scale number of years).

2. Hourly sea level data

Historic hourly sea levels are provided, filtered with standard filters from higher-frequency sampling data, when necessary. Basic statistics for three different periods are displayed in Table 2. The spatial coverage with number of years is presented in Figure 2.1.

Hourly sea levels dataset	Coverage (Number of platforms and Completeness Index)											
	1880-1950				1951-1985				1986-2022			
	\bar{N}	Std	$\overline{C.I.}$	Ny>70	\bar{N}	Std	$\overline{C.I.}$	Ny>70	\bar{N}	Std	$\overline{C.I.}$	Ny>70
GL	13.7	5.0	92.8	35.0	55.3	24.4	78.7	12.7	286.1	151.9	81.1	12.6
AR									14.1	4.0	98.1	12.2
BO	7.9	1.9	97.0	50.4	19.4	8.4	96.8	19.5	65.5	34.5	91.3	13.7
BS									11.2	8.6	36.7	
NWS	1.8	0.7	94.8	51.0	5.9	1.9	91.3	21.8	52.1	53.7	87.1	10.1
MED	1.0	0.0	85.8	23.0	4.7	2.4	62.9	5.5	46.1	32.4	85.5	12.8
IBI	3.8	2.0	88.3	15.6	16.2	5.3	78.0	12.1	84.5	27.8	86.6	17.5

Table 2. Mean number of platforms \bar{N} and Std, mean Completeness Index ($\overline{C.I.}$), and mean number of years with $C.I.>70\%$ for different regions and three periods: 1880-1950, 1951-1985 and 1986-2020. GL: global (all stations); AR: Arctic region, BO: Baltic Sea; BS: Black Sea; NWS: North-West-Shelf; MED: Mediterranean and IBI: Iberia-Biscay-Ireland region

Number of years of SLEV data in Copernicus Marine Service
In Situ TAC Rep. products (2022) - filtered hourly series

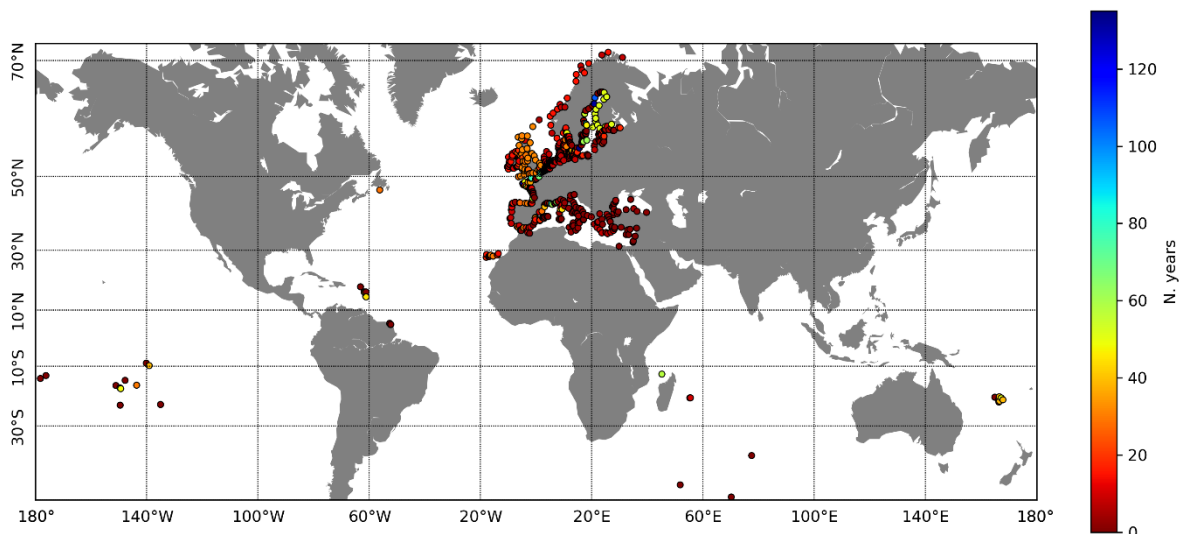


Figure 2.1. Stations in In Situ TAC for the hourly reprocessed dataset (colour scale number of years).

References

Hernandez, F., et al., 2018: Measuring performances, skill and accuracy in operational oceanography: New challenges and approaches. In "New Frontiers in Operational Oceanography", E. Chassignet, A. Pascual, J. Tintoré, and J. Verron, Eds. GODAE OceanView, 759-796, doi:10.17125/gov2018.ch29.

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Pérez Gómez, Begoña, De Alfonso Alonso-Muñoyerro, Marta, Huess, Vibeke, Rickards, Lesley (2010). Near Real Time Quality Control and validation of Sea Level in-situ data within MyOcean. CMEMS-INS-SEALELEVEL-RTQC. <https://doi.org/10.13155/74307>.