



PRODUCT USER MANUAL

Global surface ocean pH trends

Issue 1.0

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Change Record

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1. GLOSSARY AND ABBREVIATIONS

CMEMS	Copernicus Marine Environment Monitoring Service
MOI	Mercator Océan International
NetCDF	Network Common Data Form
OMI	Ocean Monitoring Indicator
PUM	Product User Manual
QUID	Quality Information Document

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I INTRODUCTION

I.1. Summary

This document is the user manual for the CMEMS Ocean Monitoring Indicator (OMI) GLOBAL_OMI_HEALTH_carbon_ph_trend. It includes estimates of secular trends and the associated uncertainty of surface seawater pH over the global ocean. These estimates are derived from the global reconstruction of surface water pH reported on total scale distributed as part of MULTIOBS_GLO_BIO_CARBON_SURFACE_REP_015_008 (see [V](#)). Units are in pH units per year for its trend and the associated uncertainty.

The product is published on the CMEMS dissemination server after automatic and delayed-mode quality controls. The product is available online and disseminated through the CMEMS Information System. Files downloaded are in NetCDF format and follow CF-1.7 convention.

Disclaimer: The quality of the product may vary during the proposed time series depending on the possible update of the system.

The OMI is described in the Quality Information Document (QUID) CMEMS-OMI-QUID-GLO-HEALTH-carbon-ph-trend.pdf (see [V](#)).

Information on operational issues on products and services can be found on our [User Notification Service](#). If you have any questions, please [contact us](#).

I.2. History of changes

March 2022	1st publication of GLOBAL_OMI_HEALTH_carbon_ph_trend
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II DESCRIPTION OF THE PRODUCT

II.1. General information

Product(s) name	GLOBAL_OMI_HEALTH_carbon_ph_trend		
Geographical coverage	Global		
Variables	trend_of_surface_ocean_ph_reported_on_total_scale uncertainty_of_trend_of_surface_ocean_ph_reported_on_total_scale		
Update frequency	Yearly		
Available time series	-		
Delivery mechanism	FTP		
Spatial resolution	1°x1°		
Integration depth	surface		
Format	NetCDF CF1.7		



II.2. Details of datasets

OMI_HEALTH_carbon

GLOBAL_OMI_HEALTH_carbon_ph_trend

contains the trends of surface water pH reported on total scale over the global ocean

ph_trend [1]

Trend of surface ocean pH reported on total scale

trend_of_surface_ocean_ph_reported_on_total_scale

ph_trend_uncertainty [1]

Uncertainty (standard deviation) of trend estimates of surface ocean pH reported on total scale:

uncertainty_of_trend_of_surface_ocean_ph_reported_on_total_scale

II.3. Product System Description

The estimates are derived from the global reconstruction of monthly surface water pH reported on total scale distributed as part of
MULTIOBS_GLO_BIO_CARBON_SURFACE_REP_015_008 (see V).



III DOWNLOAD A PRODUCT

After registration, you will be able to download our data. To assist you, our [HelpCenter](#) is available, and more specifically its [section about download](#). Information on operational issues on products and services can be found on our [User Notification Service](#). If you have any questions, please [contact us](#).

IV FILES NOMENCLATURE AND FORMAT

IV.1. Nomenclature of files when downloaded through the CMEMS

FTP Services

OMI_HEALTH_carbon files nomenclature when downloaded through the CMEMS FTP Services is based on the following nomenclature:

<datasetname>_<timestep>_P<productiontime>.nc

Where :

- **<datasetname>** is the dataset reference (**global_omi_health_carbon_ph_trend**).
- **<timestep>** is the first-time step contained in the file.
- **<productiontime>** is the production time when the file was generated.
- **.nc** is the standard NetCDF filename extension.

Example: global_omi_health_carbon_ph_trend_1985_P20220131.nc

IV.2. File Format: format name

The products are stored using the NetCDF format.

NetCDF (network Common Data Form) is an interface for array-oriented data access and a library that provides an implementation of the interface. The NetCDF library also defines a machine-independent format for representing scientific data. Together, the interface, library, and format support the creation, access, and sharing of scientific data. The NetCDF software was developed at the Unidata Program Center in Boulder, Colorado. The NetCDF libraries define a machine-independent format for representing scientific data.

See Unidata NetCDF pages for more information, and to retrieve NetCDF software package.

NetCDF data is:

- Self-Describing. A netCDF file includes information about the data it contains.
- Architecture-independent. A NetCDF file is represented in a form that can be accessed by computers with different ways of storing integers, characters, and floating-point numbers.
- Direct-access. A small subset of a large dataset may be accessed efficiently, without first reading through all the preceding data.
- Appendable. Data can be appended to a NetCDF dataset along one dimension without copying the dataset or redefining its structure. The structure of a NetCDF dataset can be changed, though this sometimes causes the dataset to be copied.
- Sharable. One writer and multiple readers may simultaneously access the same NetCDF file.

IV.3. Reading Softwares

The products are stored using the NetCDF-CF format. Note that these data can be browsed and used through several softwares, like:

- ✓ Basic Radar Altimetry Toolbox: <http://www.altimetry.info>
- ✓ ncBrowse: <http://www.epic.noaa.gov/java/ncBrowse/>
- ✓ NetCDF Operator (NCO): <http://nco.sourceforge.net/>
- ✓ <http://www.unidata.ucar.edu/software/netcdf/>

V REFERENCES

Quality Information Document (QUID) and Product User Manual (PUM):

<https://catalogue.marine.copernicus.eu/documents/QUID/CMEMS-OMI-QUID-GLO-HEALTH-carbon-ph-trend.pdf>

<https://catalogue.marine.copernicus.eu/documents/PUM/CMEMS-MOB-PUM-015-008.pdf>,

<https://catalogue.marine.copernicus.eu/documents/QUID/CMEMS-MOB-QUID-015-008.pdf>