



WORLD OCEAN CIRCULATION

PRODUCT USER MANUAL SURFACE STOKES DRIFT (THEME 3)

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|---------------------------|-------------------------------------|
| customer | ESA/ESRIN |
| ESA contract | ESA Contract No. 4000130730/20/I-NB |
| document reference | WOC-ESA-ODL-NR-010_T3_SSD_V1.0 |
| Version/Rev | 1.0 |
| Date of issue | 26/07/2021. |

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Document evolution sheet

| Ed. | Rev. | Date | Purpose evolution | Comments |
|-----|------|------------|----------------------|----------|
| 1 | 0 | 26/07/2021 | Creation of document | |
| | | | | |

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1 Introduction

1.1 Purpose of the document

The present document is the Product User Manual dedicated to the content and format description of the Surface Stokes Drift for Theme 3: Drift of *Sargassum* and oil spills.

This is the primary document that users should read before handling the products. It provides an overview of technical product content and format.

1.2 Document structure

In addition to this introduction, this document includes the following chapter :

- Chapter 2 describes the product content

1.3 Applicable & Reference documents

- [RD-1] ESA WOC2019: <http://woc2019.esa.int/index.php>
- [RD-2] Synthesis of the WOC2019 User Consultation Meeting recommendations http://woc2019.esa.int/files/WOC2019_summary_synthesis.pdf
- Alday, M., Accensi, M., Ardhuin, F., Dodet, G., 2021. "A global wave parameter database for geophysical applications. Part 3: improved forcing and spectral resolution". Ocean Modelling [in press]. <https://www.essoar.org/doi/abs/10.1002/essoar.10505476.1>
- The WAVEWATCH III ® Development Group, 2019. User manual and system documentation of WAVEWATCH III ® version 6.07. Tech. Note 333, NOAA/NWS/NCEP/MMAB, College Park, MD, USA, 465 pp. + Appendices.

1.4 Terminology

CCI

Climate Change Initiative

2 Product content

2.1 Overview

The products contain the Stokes drift at the sea surface estimated by the spectral model WAVEWATCH-III ® (WW3). The surface Stokes drift is described by its meridional and zonal components. The wave model was forced by winds from ERA-5 reanalysis and water velocities from CMEMS-Globcurrent. Ice concentration is taken from Ifremer SSMI-derived daily product and partial blocking of waves by icebergs distribution database from Altiberg. Model performance has been validated through an intensive process described in Alday et al 2020 by comparing model outputs against altimeter from CCI Sea State database and in situ data from InsituTAC and CDIP.

2.3 Product Description

2.2.1 spatial information

The product is provided over a regular grid with a 0.5degree horizontal resolution covering the Global grid from latitudes -78° to 83° and longitudes from -180° to 179.5°.

2.2.1 temporal information

The product output is available every 3 hours for the timespan 1993 to 2020. The data is stored in monthly files.

2.2.1 product content

| Parameter usual | Variable | units |
|-----------------|----------|-------|
|-----------------|----------|-------|

| | | |
|--------------------------------|-----------|-----------------------|
| name | name | |
| time | time | days since 1990-01-01 |
| longitude | longitude | degrees_east |
| latitude | latitude | degrees_north |
| eastward surface stokes drift | uuss | m s-1 |
| northward surface stokes drift | vuss | m s-1 |

2.2.1 file name convention

The filename convention followed is:

LOPS_WW3-GLOB-30M_<date>.nc

where :

<date> is the covered period expressed in the format YYYYMM

2.2.1 file format

The files are stored in netCDF4 format with internal compression based on netCDF 4.7.3.

The spatial and temporal dimensions in the file are named time, latitude and longitude.

2.2.1 metadata

The global attributes included in the netcdf files described the metadata. The major information are provided below

- WAVEWATCH_III_version_number = "7.00" ;
- WAVEWATCH_III_switches = "F90 NOGRB NC4 SCRIP SCRIPNC SHRD PR3 UQ FLX0 LN1 ST4 STAB0 NL1 BT4 DB1 MLIM TR0 BS0 IC2 IS2 REF1 XX0 WNT2 WNX1 WCOR RWND CRT1 CRX1 TIDE TRKNC O0 O1 O2 O2a O2b O2c O3 O4 O5 O6 O7" ;
- netcdf_version = "4.5.2" ;
- software_version = "v7.08_e756361_sf/exe_datarmor_intel_Ifremer2_WCOR-NOIG" ;
- references = "https://github.com/umr-lops/WW3" ;
- source = "WAVEWATCH III (R)" ;

- area = "Global 0.5 deg wave grid" ;
- easting = "longitude" ;
- northing = "latitude" ;
- southernmost_latitude = "-78." ;
- northernmost_latitude = "83." ;
- westernmost_longitude = "-180." ;
- easternmost_longitude = "180." ;
- field_type = "3-hourly" ;
- institution = "CNRS-Ifremer-IRD-UBO" ;
- institution_references = "https://www.umr-lops.fr/" ;
- contact = "mickael.accensi@ifremer.fr" ;
- grid = "GLOB-30M" ;
- forcing_wind = "wind_era5" ;
- forcing_ice = "ice_cersat" ;
- forcing_level = "no" ;
- forcing_current = "cur_cmmsgc" ;
- start_date = "2010-04-01 00:00:00" ;
- stop_date = "2010-04-30 21:00:00" ;