PRODUCT USER MANUAL

For Global Ocean- Delayed Mode in-situ Observations of Ocean Surface Currents and Temperature from Drifters

INSITU_GLO_UV_REP_OBSERVATIONS_013_044

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GLOSSARY AND ABBREVIATIONS

CF	Climate Forecast (convention for NetCDF)
CMEMS	Copernicus Marine Environment Monitoring Service
CORIOLIS	In situ data system for operational oceanography
DT	Delayed Time
EU	European Union
FTP	File Transfer Protocol
GDAC	Global Data Archiving Centre
GTS	Meteorological data exchange network
INS	In situ
ISAS	In Situ Analysis System
MFC	Monitoring and Forecasting Centre
NetCDF	Network Common Data Form
NRT	Near Real Time
PUM	Product User Manual
RAN	ReANalysis
R&D	Research and Development
RT	Real Time
S	Sea Salinity
T	Sea Temperature
TAC	Thematic Assembly Centre

I INTRODUCTION

I.1 Scope of this document

This Product User Manual describes Delayed Time Surface Drifters dataset called INSITU_GLO_UV_REP_OBSERVATIONS_013_44 distributed by the CMEMS In Situ Thematic Assembly Centre: how it is built, what is the content, what data services are available to access them, and how to use the files.

The INS-TAC is a distributed system built on the existing activities and services developed previously within the EU supported projects (Mersea, MFSTEP, FerryBox, SEPRISE ...) and EuroGOOS Regional alliances (ROOSes). It aims at providing a research and operational framework to develop and deliver in situ observations and derived products based on such observations, to address progressively global but also regional needs either for monitoring, modelling or downstream service development.

I.2 The CMEMS project

The main objective of the CMEMS project is to deliver and operate a rigorous, robust and sustainable Ocean Monitoring and Forecasting system of the GMES Marine Service to users for all marine applications: maritime safety, marine resources, marine and coastal environment and climate, seasonal and weather forecasting. The CMEMS INS-TAC prepares re-analysed datasets for reanalysis activities performed by the CMEMS MFCs and external users in collaboration with the SeaDataNet infrastructure first for the global ocean and as prototype for the regional seas.

I.3 Short introduction to the product

The *In Situ* delayed mode product designed for reanalysis purposes integrates the best available version of *in situ* data for ocean surface currents.

The data are collected from the Surface Drifter Data Assembly Centre (SD-DAC at NOAA AOML). All surface drifter's data have been processed to check for drogue loss. Drogued and undrogued drifting buoy surface ocean currents are provided with a drogue presence flag as well as a wind slippage correction buoys.

Altimeter and wind data have been used to extract the direct wind slippage from the total drifting buoy velocities. This product is designed to be assimilated into or for validation purposes of operational models operated by ocean forecasting centers, for reanalysis purposes or for research community. These users need data aggregated and quality controlled in a reliable and documented manner.

II PRODUCT DESCRIPTION

II.1 General information

The Delayed Time Surface Drifters Dataset is constructed from the Atlantic Oceanographic and Meteorological Laboratory (AOML) surface drifter database and upgraded with some ancillary data.

AOML participates to the Global Drifter Program (GDP) via the Drifter Operations Center (DOC) and the Drifter Data Assembly Center (DAC). The DOC manages global drifter deployments using volunteer ships of the Ship of Opportunity Program, research ships, and aircraft. The DAC verifies that the drifters are operational, distributes the data to meteorological services via the Global Telecommunications System (GTS), assembles, quality controls, and makes the data available on the web (Lumpkin et Pazos; 2006; Lumpkin et al., 2012) and offers drifter-derived products.

Satellite-tracked surface drifting buoy observations of currents and sea surface temperature are used. Wind slip correction is then computed (Rio, 2012), added to the database as well as quality control flags.

II.2 Content of the product

This is a global coverage data set and available variables are listed in Table 1. The database time period extends from 01/01/1990 to 31/12/2016. As geostrophic currents are needed to compute EWCT_WS and NSCT_WS (see II.2.3), these variables are available from 01/01/1993 only. For details on the products see CMEMS-INS-QUID-013-044.

Variable name	Description
TIME	Date of the data
DEPH	Depth of the data
LATITUDE	Latitude of the data position
LONGITUDE	Longitude of the data position
EWCT	East-West sea water velocity
NSCT	North-South sea water velocity
EWCT_WS	East-West wind slippage correction
NSCT_WS	North-South wind slippage correction
WS_TYPE_OF_PROCESSING	Wind slippage correction method
TEMP	Temperature

Table 1: List of the available variables.

II.2.1 *Depth*

Temperature and sea water velocity are measured at different depth. The depth of each data is indicated in the file.

II.2.2 *Sea water velocity*

This is the sea water velocity at the drogue depth computed from the drifter position. When drogue is lost (see IV.3), this is the surface sea water velocity (see V.3).

II.2.3 *Wind slippage correction*

Wind slippage correction of zonal and meridional velocity is estimated following Rio, 2012 method. The total drifter velocity $\mathbf{U}_d$ is decomposed into different contributions:

- geostrophic current $\mathbf{U}_g$
- Ekman current $\mathbf{U}_e$
- Remaining ageostrophic current $\mathbf{U}_a$, including wind slip.

When the drogue is lost, the drifter is directly under the influence of the wind stress. Using DUACS geostrophy (DUACS/Aviso team; 2014) and an empirical Ekman model, a wind slippage correction $\mathbf{W}_s$ is computed (see CMEMS-INS-QUID-013-044 for more details).

This variable is not provided in the Mediterranean sea nor at the equator for the drogued buoys.

II.2.4 *Wind slippage correction method*

Method to compute the wind slippage correction is based on the minimization of the correlation between wind speed and a residual velocity when removing geostrophic and Ekman components (see II.2.3 from CMEMS-INS-QUID-013-044 for more details).

We consider that the optimal length for the correlation window is 100 days, but it can only be applied on drifter's trajectories longer than 200 days. Some trajectories are shorter, and the correlation window is adapted for trajectories down to 60 days. Beginning and end of the trajectories are completed using a mean value.

Moreover, for trajectories shorter than 60 days, a climatology is used.

The **WS_TYPE_OF_PROCESSING** is an indication of the way the wind slippage correction is computed.

Method	WS_TYPE_OF_PROCESSING value
Optimal	0
Mean	1
Climatology	2
Adaptative	3

Table 2: WS_TYPE_PROCESSING values

II.2.5 *Temperature*

All standard SVP drifters measure temperature 20-30 cm beneath the sea surface. This measurement is not impacted by the drogue loss.

II.3 Data flags

The quality control flags indicate the quality of the data values in a file, and are assigned after quality control procedures have been performed. These codes are used in the <*DATA*>_QC variables to describe the quality of each measurement.

Examples: TEMP_QC, EWCT_QC

Code	Meaning	Comment
0	No QC was performed	-
1	Good data	All real-time QC tests passed.
2	Probably good data	-
3	Bad data that are potentially correctable	These data are not to be used without scientific correction.
4	Bad data	Data have failed one or more of the tests.
5	Value changed	Data may be recovered after transmission error.
6	Not used	-
7	Nominal value	-
8	Interpolated value	Missing data may be interpolated from neighbouring data in space or time.
9	Missing value	-

Table 3: Data flags.

III PRODUCT DISTRIBUTION

III.1 Which Download mechanism is available for this product?

The download mechanisms available for this product are:

- CMEMS FTP

III.2 How to download this product?

You first need to register. Please find the registration steps on our website:

http://marine.copernicus.eu/web/56-user-registration-form.php

Once registered, the CMEMS FAQ http://marine.copernicus.eu/web/34-products-and-services-faq.php#1 will guide you on how to download a product through the CMEMS Web Portal FTP Service.

III.3 Portal ftp structure

The Global Delayed Mode In-situ Surface Drifters dataset is available in the **Core/INSITU_GLO_UV_L2_REP_OBSERVATIONS_013_044** directory.

IV FILES NOMENCLATURE AND FORMAT

IV.1 File Format: Netcdf

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 Centre in Boulder, Colorado. The netCDF libraries define a machine-independent format for representing scientific data.

Please 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.

For INSITU files, the used NetCDF format is Argo 2.3 (see http://projets.ifremer.fr/argodatamgt/Documentation/Argo-NetCDF-sample-files) and for other files it is CF-1.4.

IV.2 File nomenclature

NetCDF file names are as follow: GL_TS_DC_***XXX_YYY***.nc. The file naming convention is:

- GL: region bigram corresponding to GLobal area
- TS: for Time Serie
- DC: for drifter buoy reporting calculated sea water current
- ***XXX***: unique platform identifier
- ***YYY***: WMO platform identifier.

Examples: GL_TS_DC_34754_52535.nc, GL_TS_DC_7644_52535.nc

IV.3 Global attributes

Name	Meaning
data_type	OceanSITES trajectory data
platform_code	AOML unique platform identifier.
date_update	Date of update of the file
institution	Provider of the in-situ measurements. Here set to "**AOML**"
institution_edmo_code	1799
wmo_platform_code	WMO id of the platform
platform_name	Type of platform. Equal to "**DRIFTING BUOY**" in present case.
source	**Surface drifting buoy**
data_mode	Set to "**D**", for delayed mode data.
references	References of the PUM and Quid of the product
comments	Instrument type (cf IV.3.2)
doi	doi reference of the dataset
id	Name of the NetCdf file
cdm_data_type	"**Time-series**" are delivered in this database.
area	Spatial coverage of the data. Set to "**Global Ocean**"
geospatial_lat_min	Minimum of the latitude displayed in the file
geospatial_lat_max	Maximum of the latitude displayed in the file
geospatial_lon_min	Minimum of the longitude displayed in the file
geospatial_lon_max	Maximum of the longitude displayed in the file
geospatial_vertical_min	Minimum depth measured by the platform
geospatial_vertical_max	Maximum depth measured by the platform
time_coverage_start	Begin date of the measurements
time_coverage_end	End date of the measurements

AOML_experiment_number	Id of the deployment experiment
deployment_date	Date of the platform deployment
deployment_lon	Longitude of the platform deployment
deployment_lat	Latitude of the platform deployment
end_lon	Longitude of the platform death position, if any.
end_lat	Latitude of the platform death position, if any.
date_drog_lost	Date of the platform drogue lost, if any
death_type	Death type of the platform, if any (cf IV.3.1)
end_date	Date of the platform death, if any

Table 4: List of the main file's global attributes.

IV.3.1 *Death code:*

AOML Code	Meaning
0	buoy still alive
1	buoy ran aground
2	picked up by vessel
3	stop transmitting
4	sporadic transmissions
5	bad batteries
6	inactive status

Table 5: Death code convention.

IV.3.2 *Instrument type:*

Name	Description	Measurement
SVP	Standard Surface Velocity Program drifter	SST
SVPB	SVP with Barometer	SST, air pressure
SVPC	SVP with seabird Conductivity	SST, SSS
SVPW	SVP with Wind sensor	SST, wind speed and direction
SVPBS	SVP with Barometer and Salinity	SST, Pressure
SVPBW	SVP with Barometer and Wind sensor	SST, wind speed and direction, air pressure

Table 6: Instrument type.

IV.4 Structure and semantic of NetCDF files

```
netcdf GL_TS_DC_7644_52535 {
dimensions:
        TIME = UNLIMITED ; // (2141 currently)
        DEPTH = 2 ;
        LATITUDE = 2141 ;
        LONGITUDE = 2141 ;
        POSITION = 2141 ;
variables:
        double TIME(TIME) ;
                TIME:long_name = "time" ;
                TIME:standard_name = "time" ;
                TIME:units = "days since 1950-01-01T00:00:00Z" ;
                TIME:valid_min = 0. ;
                TIME:valid_max = 90000. ;
                TIME:QC_indicator = 1. ;
                TIME:QC_procedure = 1. ;
                TIME:uncertainty = " " ;
                TIME:comment = " " ;
                TIME:axis = "T" ;
        byte TIME_QC(TIME) ;
                TIME_QC:_FillValue = -128b ;
                TIME_QC:long_name = "quality flag" ;
                TIME_QC:conventions = "OceanSites reference table 2" ;
                TIME_QC:valid_min = 0b ;
                TIME_QC:valid_max = 9b ;
                TIME_QC:flag_values = "0b, 1b, 2b, 3b, 4b, 5b, 6b, 7b, 8b, 9b" ;
```

TIME_QC:flag_meanings = "no_qc_performed good_data probably_good_data bad_data_that_are_potentially_correctable bad_data value_changed not_used nominal_value interpolated_value missing_value" ;
byte POSITION_QC(POSITION) ;
POSITION_QC:_FillValue = -128b ;
POSITION_QC:long_name = "quality flag" ;
POSITION_QC:conventions = "OceanSites reference table 2" ;
POSITION_QC:valid_min = 0b ;
POSITION_QC:valid_max = 9b ;
POSITION_QC:flag_values = "0b, 1b, 2b, 3b, 4b, 5b, 6b, 7b, 8b, 9b" ;
POSITION_QC:flag_meanings = "no_qc_performed good_data probably_good_data bad_data_that_are_potentially_correctable bad_data value_changed not_used nominal_value interpolated_value missing_value" ;
float DEPH(TIME, DEPTH) ;
DEPH:_FillValue = -99999.f ;
DEPH:long_name = "Depth" ;
DEPH:standard_name = "depth" ;
DEPH:units = "meter" ;
DEPH:valid_min = 0.f ;
DEPH:valid_max = 12000.f ;
DEPH:axis = "Z" ;
DEPH:positive = "down" ;
byte DEPH_QC(TIME, DEPTH) ;
DEPH_QC:_FillValue = -128b ;
DEPH_QC:long_name = "quality flag" ;
DEPH_QC:conventions = "OceanSites reference table 2" ;
DEPH_QC:valid_min = 0b ;
DEPH_QC:valid_max = 9b ;
DEPH_QC:flag_values = "0b, 1b, 2b, 3b, 4b, 5b, 6b, 7b, 8b, 9b" ;
DEPH_QC:flag_meanings = "no_qc_performed good_data probably_good_data bad_data_that_are_potentially_correctable bad_data value_changed not_used nominal_value interpolated_value missing_value" ;
float LATITUDE(LATITUDE) ;
LATITUDE:long_name = "Latitude of each location" ;
LATITUDE:standard_name = "latitude" ;
LATITUDE:units = "degrees_north" ;
LATITUDE:valid_min = -90.f ;
LATITUDE:valid_max = 90.f ;
LATITUDE:QC_indicator = 1L ;
LATITUDE:QC_procedure = 1L ;
LATITUDE:uncertainty = "" ;
LATITUDE:comment = "" ;
LATITUDE:axis = "Y" ;
float LONGITUDE(LONGITUDE) ;
LONGITUDE:long_name = "Longitude of each location" ;
LONGITUDE:standard_name = "longitude" ;
LONGITUDE:units = "degrees_east" ;
LONGITUDE:valid_min = -180.f ;
LONGITUDE:valid_max = 180.f ;
LONGITUDE:QC_indicator = 1L ;
LONGITUDE:QC_procedure = 1L ;
LONGITUDE:uncertainty = "" ;

LONGITUDE:comment = "" ;
LONGITUDE:axis = "X" ;
float EWCT(TIME, DEPTH) ;
EWCT:_FillValue = 9.96921e+36f ;
EWCT:long_name = "West-east current component" ;
EWCT:standard_name = "eastward_sea_water_velocity" ;
EWCT:units = "meter/second" ;
byte EWCT_QC(TIME, DEPTH) ;
EWCT_QC:_FillValue = -128b ;
EWCT_QC:long_name = "quality flag" ;
EWCT_QC:conventions = "OceanSites reference table 2" ;
EWCT_QC:valid_min = 0b ;
EWCT_QC:valid_max = 9b ;
EWCT_QC:flag_values = "0b, 1b, 2b, 3b, 4b, 5b, 6b, 7b, 8b, 9b" ;
EWCT_QC:flag_meanings = "no_qc_performed good_data probably_good_data bad_data_that_are_potentially_correctable bad_data value_changed not_used nominal_value interpolated_value missing_value" ;
float NSCT(TIME, DEPTH) ;
NSCT:_FillValue = 9.96921e+36f ;
NSCT:long_name = "South-north current component" ;
NSCT:standard_name = "northward_sea_water_velocity" ;
NSCT:units = "meter/second" ;
byte NSCT_QC(TIME, DEPTH) ;
NSCT_QC:_FillValue = -128b ;
NSCT_QC:long_name = "quality flag" ;
NSCT_QC:conventions = "OceanSites reference table 2" ;
NSCT_QC:valid_min = 0b ;
NSCT_QC:valid_max = 9b ;
NSCT_QC:flag_values = "0b, 1b, 2b, 3b, 4b, 5b, 6b, 7b, 8b, 9b" ;
NSCT_QC:flag_meanings = "no_qc_performed good_data probably_good_data bad_data_that_are_potentially_correctable bad_data value_changed not_used nominal_value interpolated_value missing_value" ;
float EWCT_WS(TIME, DEPTH) ;
EWCT_WS:_FillValue = 9.96921e+36f ;
EWCT_WS:long_name = "West-east current wind slippage correction" ;
EWCT_WS:standard_name = "northward_sea_water_velocity" ;
EWCT_WS:units = "meter/second" ;
byte EWCT_WS_QC(TIME, DEPTH) ;
EWCT_WS_QC:_FillValue = -128b ;
EWCT_WS_QC:long_name = "quality flag" ;
EWCT_WS_QC:conventions = "OceanSites reference table 2" ;
EWCT_WS_QC:valid_min = 0b ;
EWCT_WS_QC:valid_max = 9b ;
EWCT_WS_QC:flag_values = "0b, 1b, 2b, 3b, 4b, 5b, 6b, 7b, 8b, 9b" ;
EWCT_WS_QC:flag_meanings = "no_qc_performed good_data probably_good_data bad_data_that_are_potentially_correctable bad_data value_changed not_used nominal_value interpolated_value missing_value" ;
float NSCT_WS(TIME, DEPTH) ;
NSCT_WS:_FillValue = 9.96921e+36f ;
NSCT_WS:long_name = "South-north current wind slippage correction" ;
NSCT_WS:standard_name = "eastward_sea_water_velocity" ;
NSCT_WS:units = "meter/second" ;

byte NSCT_WS_QC(TIME, DEPTH) ;
NSCT_WS_QC:_FillValue = -128b ;
NSCT_WS_QC:long_name = "quality flag" ;
NSCT_WS_QC:conventions = "OceanSites reference table 2" ;
NSCT_WS_QC:valid_min = 0b ;
NSCT_WS_QC:valid_max = 9b ;
NSCT_WS_QC:flag_values = "0b, 1b, 2b, 3b, 4b, 5b, 6b, 7b, 8b, 9b" ;
NSCT_WS_QC:flag_meanings = "no_qc_performed good_data probably_good_data bad_data_that_are_potentially_correctable bad_data value_changed not_used nominal_value interpolated_value missing_value" ;
byte WS_TYPE_OF_PROCESSING(TIME, DEPTH) ;
WS_TYPE_OF_PROCESSING:_FillValue = 9b ;
WS_TYPE_OF_PROCESSING:long_name = "Wind slippage correction method" ;
WS_TYPE_OF_PROCESSING:valid_min = 0b ;
WS_TYPE_OF_PROCESSING:valid_max = 3b ;
WS_TYPE_OF_PROCESSING:flag_values = 0b, 1b, 2b, 3b ;
WS_TYPE_OF_PROCESSING:flag_meanings = "nominal, from mean , from climatology, adaptative" ;
float TEMP(TIME, DEPTH) ;
TEMP:_FillValue = 9.96921e+36f ;
TEMP:long_name = "Sea temperature" ;
TEMP:standard_name = "sea_water_temperature" ;
TEMP:units = "degree_Celsius" ;
byte TEMP_QC(TIME, DEPTH) ;
TEMP_QC:_FillValue = -128b ;
TEMP_QC:long_name = "quality flag" ;
TEMP_QC:conventions = "OceanSites reference table 2" ;
TEMP_QC:valid_min = 0b ;
TEMP_QC:valid_max = 9b ;
TEMP_QC:flag_values = "0b, 1b, 2b, 3b, 4b, 5b, 6b, 7b, 8b, 9b" ;
TEMP_QC:flag_meanings = "no_qc_performed good_data probably_good_data bad_data_that_are_potentially_correctable bad_data value_changed not_used nominal_value interpolated_value missing_value" ;

// global attributes:
:data_type = "OceanSITES trajectory data" ;
:format_version = "1.2" ;
:platform_code = "7644" ;
:date_update = "2015-11-24T17:12:53Z" ;
:institution = "AOML" ;
:institution_edmo_code = "1799" ;
:site_code = "" ;
:wmo_platform_code = "52535" ;
:platform_name = "DRIFTING BUOY" ;
:source = "Surface drifting buoy" ;
:history = "2016-01-04T15:43:49Z : Creation" ;
:references = "Product User Manual http://dx.doi.org/10.13155/41257; Quality Information Document http://dx.doi.org/10.13155/41256; http://marine.copernicus.eu; http://www.coriolis.eu.org" ;" ;
:comment = "SVP: Standard Surface Velocity Program drifter" ;
:conventions = "OceanSITES Manual 1.2, Copernicus System Requirements Document http://dx.doi.org/10.13155/40846" ;
:netcdf_version = "3.5" ;
:title = "Global Ocean - Coriolis delayed mode currents from drifting boys" ;

:summary = “In-situ observation yearly delivery in delayed mode of Ocean surface currents. The In Situ delayed mode product designed for reanalysis purposes integrates the best available version of in situ data for Ocean surface currents. The data are collected from the Surface Drifter Data Assembly Centre (SD-DAC at NOAA AOML). All surface drifters data have been processed to check for drogue loss. Drogued and undrogued drifting buoy surface ocean currents are provided with a drogue presence flag as well as a wind slippage correction for undrogued buoy. The product is designed to be assimilated into or for validation purposes of operational models operated by ocean forecasting centers for reanalysis purposes or for research community." ;

:naming_authority = "OceanSITES, Copernicus Marine In Situ TAC" ;

:citation = "These data were collected and made freely available by the Copernicus project and the programs that contribute to it" ;

:doi = "10.17882/41334" ;

:naming_authority = "OceanSITES" ;

:id = "GL_TS_DC_7644_52535.nc" ;

:cdm_data_type = "Time-series" ;

:area = "Global Ocean" ;

:geospatial_lat_min = 15.37 ;

:geospatial_lat_max = 24.289 ;

:geospatial_lon_min = 126.713 ;

:geospatial_lon_max = 150.921 ;

:geospatial_vertical_min = 0.5 ;

:geospatial_vertical_max = 15. ;

:time_coverage_start = "2001-06-10T06:00:00Z" ;

:time_coverage_end = "2002-11-27T06:00:00Z" ;

:institution_references = "" ;

:contact = "codac@ifremer.fr" ;

:author = "Copernicus In Situ Thematic Assembly Center" ;

:data_assembly_center = "Coriolis" ;

:pi_name = "-" ;

:distribution_statement = "These data follow Copernicus standards; they are public and free of charge. User assumes all risk for use of data. User must display citation in any publication or product using data. User must contact PI prior to any commercial use of data." ;

:update_interval = "" ;

:qc_manual = "OceanSITES Users Manual v1.2" ;

:history_version = "2" ;

:AOML_experiment_number = "9600" ;

:deployment_date = "2001-06-10T04:56:00Z" ;

:deployment_lon = "144.00" ;

:deployment_lat = "18.00" ;

:end_lon = "126.72" ;

:end_lat = "19.84" ;

:date_drog_lost = "2002-05-15T03:20:59Z" ;

:death_type = "stop transmitting" ;

:end_date = "2002-11-27T08:29Z" ;

}

V GUIDANCE FOR THE USERS

V.1 How to find a particular drifter?

Each file corresponds to a particular drifter trajectory. It is indicated by the platform ID contained in the file name (cf IV.2). A search can be made using the WMO ID (also indicated in the file name). In this case, more than one files can be found, considering that the WMO ID can be reassigned.

V.2 How to use Quality Flags?

The DEPH_QC, NSCT_QC and EWCT_QC are an indication of the drogue status and how to correct the velocity data.

DEPH_QC	Temperature level	Velocity level
1	-	Drogue on
3	-	Drogue lost
7	Nominal value	-

Table 7: DEPTH Quality Control use.

NSCT_QC / EWCT_QC	
1	Drogue on
3	Drogue lost

Table 8: NSCT and EWCT Quality Control use.

NSCT_WS_QC / EWCT_WS_QC	
1	Computed data
Fill_value	No data computed

Table 9: NSCT_WS and EWCT_WS Quality Control use.

V.3 How to use wind slippage correction

- Velocity data previous to the drogue loss date correspond to the velocity computed at the drogue depth. No correction is usually needed, but the value of the wind slippage even at 15 m can be significant in some area (see CMEMS-INS-QUID-013-044 for more details). **So, if the wind slippage correction is estimated superior to ±0.03 m.s^{-1}, it is recommended to remove it from the 15m depth velocity. Note that the wind slippage correction is not provided for 15m velocity at the equator (±5°) for validity reason.**
- **When data time is later than the drogue loss, the velocity has to be corrected**. The wind slippage correction has to be removed from the surface sea water velocity.

The drogue loss indication can be found in the quality flags of the sea water velocity and depth (see §V.2).

The wind slippage methodology has been changed in this version of the data base to increase the spatial coverage. As indicated in CMEMS-INS-QUID-013-044 §**VI**, the user can select the method used to compute the windage correction using value of WS_TYPE_OF_PROCESSING variable (see Table 2):

- 0: optimal method (100 days correlation window). These data are computed as in the previous version of the product.
- 3: for drifter's trajectories ranging between 60 and 200 days.
- 2: for drifters with trajectories shorter than 60 days
- 1: use to complete end and beginning of the trajectories.

Hence, to retrieve previous version windage correction data, the user has to select data with WS_TYPE_OF_PROCESSING=0.

VI REFERENCES

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