World Ocean Circulation

Product User Manual
Geostrophic surface current in the Agulhas region (Theme 1)

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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 improved geostrophic current product for Theme 1: Safe Navigation.

This is the primary document that users should read before handling the products. It provides an overview of the product content and format. For algorithms and main validation results, the reader may refer to the ATBD.

1.2 Document structure

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

- Chapter 1 describes the product content
- Chapter 2 describes the product format

1.3 Applicable & Reference documents

Le Guillou, F., Gaultier, L., Ballarotta, M., Metref, S., Ubelmann, C., Cosme, E., and Rio, M.-H.: Regional mapping of energetic short mesoscale ocean dynamics from altimetry: performances from real observations., EGUsphere, 2023, 1–17, https://doi.org/10.5194/egusphere-2023-509, 2023

1.4 Terminology

ATBD	Algorithm Theoretical Basis Document
BFN	Back and Forth Nudging
QG	Quasi Geostrophic
RB	Requirements Baseline

2 Product content

The product contains the improved geostrophic current from the BFN-QG algorithm. This algorithm allows to dynamically map the altimetric observations by adding a dynamical constraint based on the QG dynamics in the mapping procedure. All the details about the algorithm and the performances of this product are given in the ATBD. An illustration is shown on Figure 1.

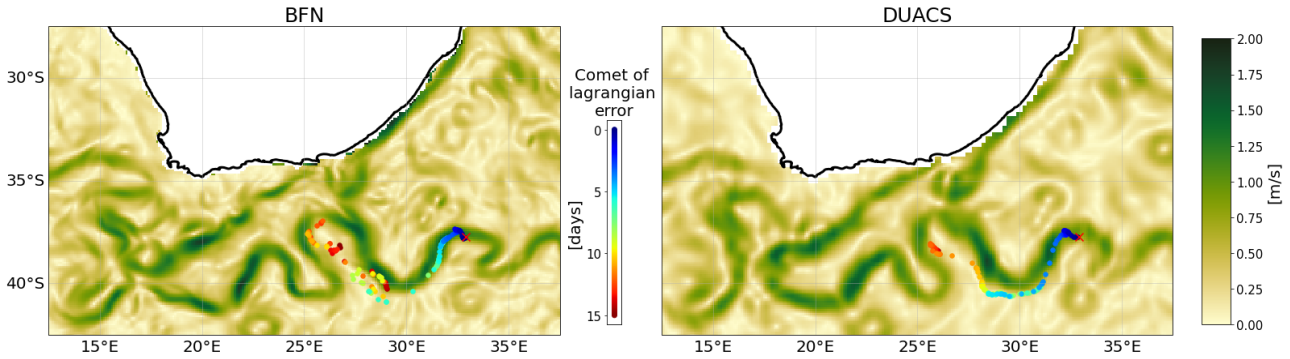

Figure 1 : Geostrophic currents mapped by the BFN-QG (left) and DUACS (right) systems on the 2 November 2019. The red cross represents the location of one drifter at this date. The colored dots represent the expected drifter positions as predicted from the true past positions with the mapped currents. Dots' color indicates the prediction lead time. For example, the yellow dots are predictions initialized 9 days in the past. Their distances to the red cross indicate the prediction errors.

3 Product format

3.1 Product Spatial information

The product covers the zone 10°E, 40°E and 25°S, 45°S in longitude and latitude respectively. The data are defined on a spatial grid over the area with regular coordinates at 0.1°

3.1 Product Temporal information

The dataset covers the years 2010 to 2020 at 3 hours resolution. The datafiles are gathered daily (8 time steps per file).

3.1 Variable content

Table 1. Product information for *Sargassum* simulations.

Dataset name	Parameter usual	Variable name	units

	name		
• 20150121-WOC-L4-BFN-QG-Agulhas_3H-v1.0-fv2.0.nc	time	time	seconds since 1970-01-01
	zonal current	surface_geostrophic_eastward_sea_water_velocity	meters per second
	meridional current	surface_geostrophic_northward_sea_water_velocity	meters per second
	latitude	latitude	degrees_north
	longitude	longitude	degrees_east

2.3.4 File name convention

The filename convention followed is:

<Indicative Date><Indicative Time>-WOC-<Processing Level>-<Parameter>-<Product String>-v< Product Version>-fv<File Version>.<File Type>

Where:

- Indicative Date: date of the release of the first particle in YYYYmmdd format
- Indicative Time: time of the release of the first particle in HHMMSS format
- Processing Level: level here is L4
- Parameter: CURlag here (Currents Lagrangian drift)
- Product Version: e.g. fv02
- File Version: e.g. fv02
- File Type: 'nc' as, as explained in section 3.3.5, files are saved in netCDF format so 'nc'

2.3.5 File format

The files are saved in NetCDF4 format. Each file contains 8 time steps of the 3-hours field, over the Agulhas current domain. The time dimension is format is unlimited to allow an easier concatenation if needed.

2.3.6 Metadata

Table 2. Metadata description of *Sargassum* simulation output files.

Element name	**Description**
standard_name_vocabulary	The source of the standard name table
title	A short description of the dataset.
license	Licensing policy (open)
tracking_id	A UUID allowing this file to be uniquely referenced back against other information in a database, providing complete provenance on request
keywords	A comma separated list of key words and phrases.
id	The file name
history	An audit trail for modifications to the original data.
naming authority	Identifies a namespace provider
creation_date	Time of file creation date_created
creator_name creator_email	The data creator's name, URL, and email. The "institution" attribute will be used if creator_url the "creator_name" attribute does not exist.
project	The scientific project that produced the data.
time_coverage_start	Describe the temporal coverage of the data as a time range.
time_coverage_end time_coverage_duration time_coverage_resolution	

processing_level	A textual description of the processing level of the data.
geospatial_lat_min geospatial_lat_max geospatial_lat_resolution geospatial_lon_min geospatial_lon_max geospatial_lon_resolution	Describe a simple latitude, longitude, and vertical bounding box.