INDESO

Product User Manual – Meteorological data

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CLS (siège)
8-10 rue Hermès
Parc technologique du Canal
31520 Ramonville Saint-Agne
FRANCE

Tél. : +33 (0)5 61 39 47 00
Fax : +33 (0)5 61 75 10 14
Mél. : info@cls.fr
Web : www.cls.fr

CLS
COLLECTE LOCALISATION SATELLITES

CLS Brest Le Ponant
Avenue La Pérouse
29280 Plouzané
FRANCE

Tél. : +33 (0)2 98 05 76 80
Fax : +33 (0)2 98 05 76 90

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People involved in this issue:		
Written by (*):	V. Rosmorduc	Date + Signature:(visa ou réf)
Checked by (*):	B. Pirrotta	Date + Signature:(visa ou réf)
Approved by (*):		Date + Signature:(visa ou réf)
Application author-ized by (*):	R. De Dianous	Date + Signature:(visa ou réf)

**In the opposite box: Last and First name of the person + company if different from CLS*

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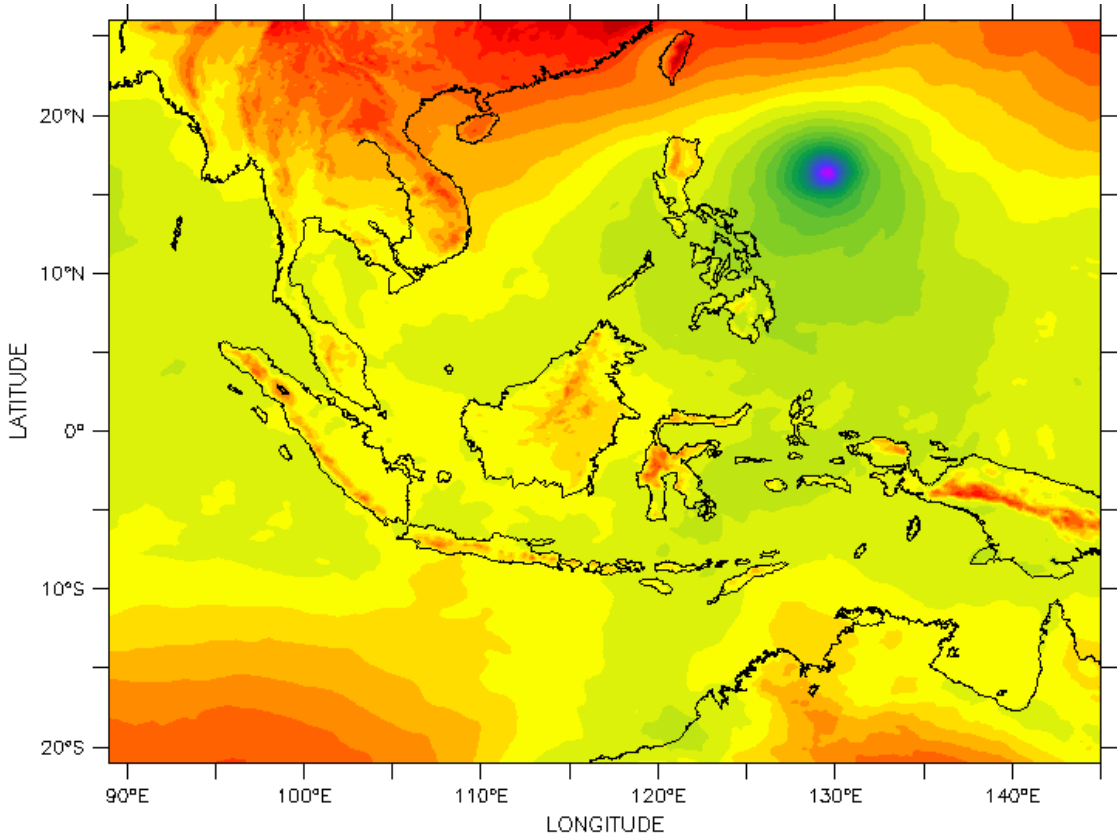
1. PURPOSE

This document presents he information needed by users for the **Meteorological data** products provided in the frame of the Indeso project.

This document is organized as follows:

- Chapter 2; processing: input data and method applied.
- Chapter 3; the product description, with the different files provided, the nomenclature
- Chapter 4; the file format
- Chapter 5; how to download products.
- Chapter 6; bibliographical references



2. PROCESSING

2.1. INPUT DATA

ECWMF (European Centre for Medium Range Weather Forecasting) meteorological analysis and forecast are provided over the INDESO area on a 1/8° horizontal grid and a 3-hour temporal resolution up to 6 days and 6-hour temporal resolution after (10 days).

These fields are post-processed in order to be read for the ocean model on an ORCA grid at 1/12°. The post-processing consists of calculating/converting input parameters into suitable variables for the ocean model. Excepted for short and long radiation waves that directly force the ocean model, the "Bulk formulae" CORE (Large & Yeager, 2004) are used for the other physical quantities.

Finally, this product covers eight parameters:

- Relative humidity at 2 m
- Air temperature at 2 m
- Zonal component of wind at 10 m
- Meridian component of wind at 10 m
- Precipitation (convective + large-scale)
- Surface solar radiation downward
- Surface thermal radiation downward
- Mean sea level pressure

Fields are available on the physical model horizontal grid which is defined on a ORCA grid at 1/12° horizontal resolution. Temporal resolution is 3 hours up to 10 days forecast.

3. DESCRIPTION OF THE PRODUCT SPECIFICATION

3.1. PRODUCT GENERAL CONTENT AND SPECIFICATIONS

Each Indeso product includes a series of related datasets. Those datasets are delivered with different names (see nomenclature), contents (see NetCDF contents and PDF contents) and format (below).

Note that the datasets available for a given user depend on the user profile.

Dataset Name	Dataset time coverage	Production frequency	Geographical coverage	Spatial Resolution	File format
Meteorological data historical & real-time analysis and forecast	from start to T0+10	daily	21S-26N/89E-145E	0,125 dg	netCDF CF
Meteorological data historical analysis	from start to (T0 - 30 days)	daily	21S-26N/89E-145E	0,125 dg	netCDF CF

Table 1: Meteorological datasets

3.2. NOMENCLATURE OF FILES

Files downloaded using Indeso downloading services are named using a unique identifier (13 digits, corresponding to the current time (downloading time) in milliseconds since January 1, 1970 midnight UTC.) at the end of the file name. The metrics pdf are compressed within a zip file (nomenclature of both the zip file and the pdf within are listed here).

Meteorological data historical&real time analysis&forecast
METEO_%Y%m%d(field)_%Y%m%d(prod).nc

Meteorological data historical analysis
METEO_%Y%m%d(field)_%Y%m%d(prod).nc

Where

Date	Macro used	# digits	Ex: Date 2001/03/20 9H15M20S
Year	%Y	4	2001
Year	%y	2	01
Month	%m	2	03
Day in month	%d	2	20
Day of the year	%j	3	079
Hour	%H	2	09
Minute	%M	2	15
Second	%S	2	20

3.3. ACKNOWLEDGMENTS

Original INDESO Products - or Value Added Products or Derivative Works developed from INDESO Products including pictures - shall include the following credit conspicuously displayed and written in full:

"© INDESO, 2013, a system implemented by CLS for Balitbang KP, all rights reserved".

(b) In case of any publication, the Licensees will ensure credit INDESO in the following manner:

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4. DATA FORMAT

4.1. NETCDF

The products are stored using the NetCDF CF 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. Please see Unidata NetCDF pages for more information, and to retreive NetCDF software package on: http://www.unidata.ucar.edu/packages/netcdf/

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.

4.2. STRUCTURE AND SEMANTIC OF NETCDF FILES

Variable name	Description (long_name)	Standard_name	Dimensions	Units
METEO_%Y%m%d(field)_%Y%m%d(prod).nc				
Netcdf-CF ORCA Grid Dimensions: x=652, y=559, time=8				
nav_lon	longitude	longitude	(y,x)	degrees_east
nav_lat	latitude	latitude	(y,x)	degrees_north
time	hours since 1950-01-01 00:00:00	time	(time)	hours since 1950-01-01 00:00:00
sohumrel	Relative humidity at 2m	relative_humudity_at_2m	(time,y,x)	%
sotemair	Air temperature at 2 m	air_temperature_at_2m	(time,y,x)	degree_Celsius
sowinu10	Zonal component of wind at 10 m	eastward_wind_at_10m	(time,y,x)	m/s
sowinv10	Merdian component of wind at 10 m	northward_wind_at_2m	(time,y,x)	m/s
sowaprec	Precipitation (Convective + large-scale)	total_precipitation_rate	(time,y,x)	m/s
sosudosw	Surface solar radiation downward	surface_solar_radiation_downward	(time,y,x)	W/m^2
sosudolw	Surface thermal radiation downward	surface_thermal_radiation_downward	(time,y,x)	W/m^2
somslpre	Mean sea level pressure	air_pressure_at_sea_level	(time,y,x)	Pa

5. HOW TO DOWNLOAD A PRODUCT

5.1. REGISTRATION

To access data, registration is required. During registration process, the user shall accept using licenses for the use of INDESO products and services.

License shall include:

- Data use conditions,
- Legal and contractual clauses

5.2. ACCESS SERVICES

Different services enable registered users to access the data. Depending on the dataset, not all of them are relevant.

Dataset Name	File format	Discover	View	Get
Meteorological data historical & real-time analysis and forecast	netCDF	Yes	No	Yes
Meteorological data historical analysis and forecast	netCDF	Yes	No	Yes

6. REFERENCES

Large W; G. and Yeager S. G., 2004: Diurnal to decadal global forcing for ocean and sea-ice models: the data sets and flux climatologie. NCAR technical notes.