

INDES

## Product User Manual -Radar wind

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Nomenclature: -

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**Index Sheet:**

Context:	
Keywords:	[Mots clés ]
Hyperlink:	

**Distribution:**

Company	Means of distribution	Names
CLS	Notification	CLS Management review team
CLS	Soft copy	CLS INDES0 team
Balitbang KP	Soft copy	Balitbang KP INDES0 team

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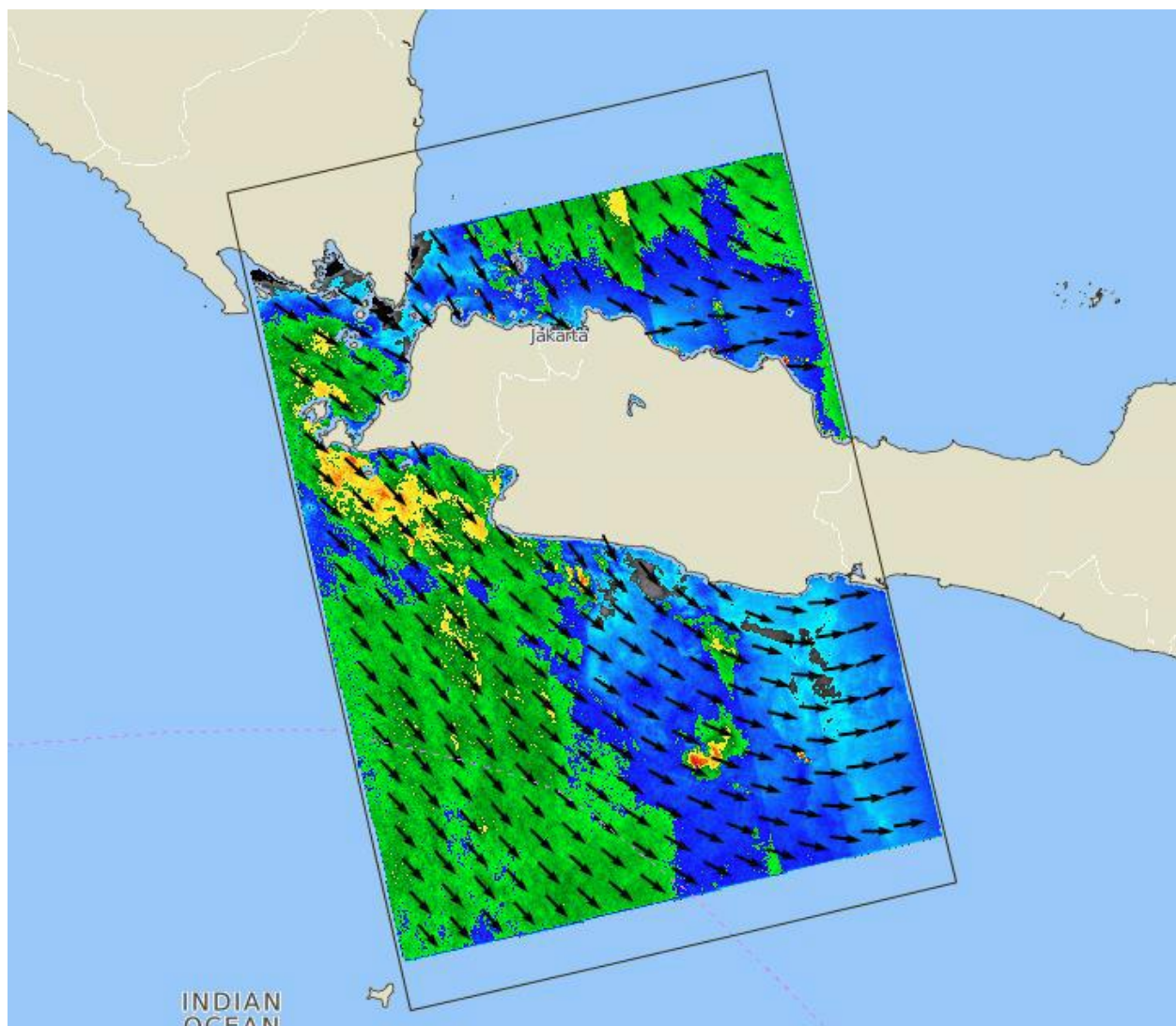
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## 1. PURPOSE

This document presents the information needed by users for the **radar wind** 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.



## 2. PROCESSING

### 2.1. INPUT DATA

Images are taken from Radarsat-2 satellite.



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## 2.2. METHOD

Every time SARTool is requested to perform Oil Spill Detection and Ship Detection, it runs in parallel the Wind module.

This SARTool Wind module allows retrieving high resolution wind field from well radiometrically calibrated SAR level-1 products. The Wind products are mostly used as ancillary information available to the Radar Analyst for the Oil Spill detection process but are also used in many different applications such as wind resource assessment for offshore wind farm projects, weather prediction or understanding the tropical cyclones.

SARTool is designed by a CLS team of radar experts. SARTool has proven high level of performance to detect sharp features of interest in the radar scene, and produce user-friendly reports for end users. SARTool, including all the software and accompanying documentation, is provided under the terms and conditions of SARTool License. SARTool name is a registered Trademark.

The wind retrieval algorithm follows the algorithm described in the figure below.

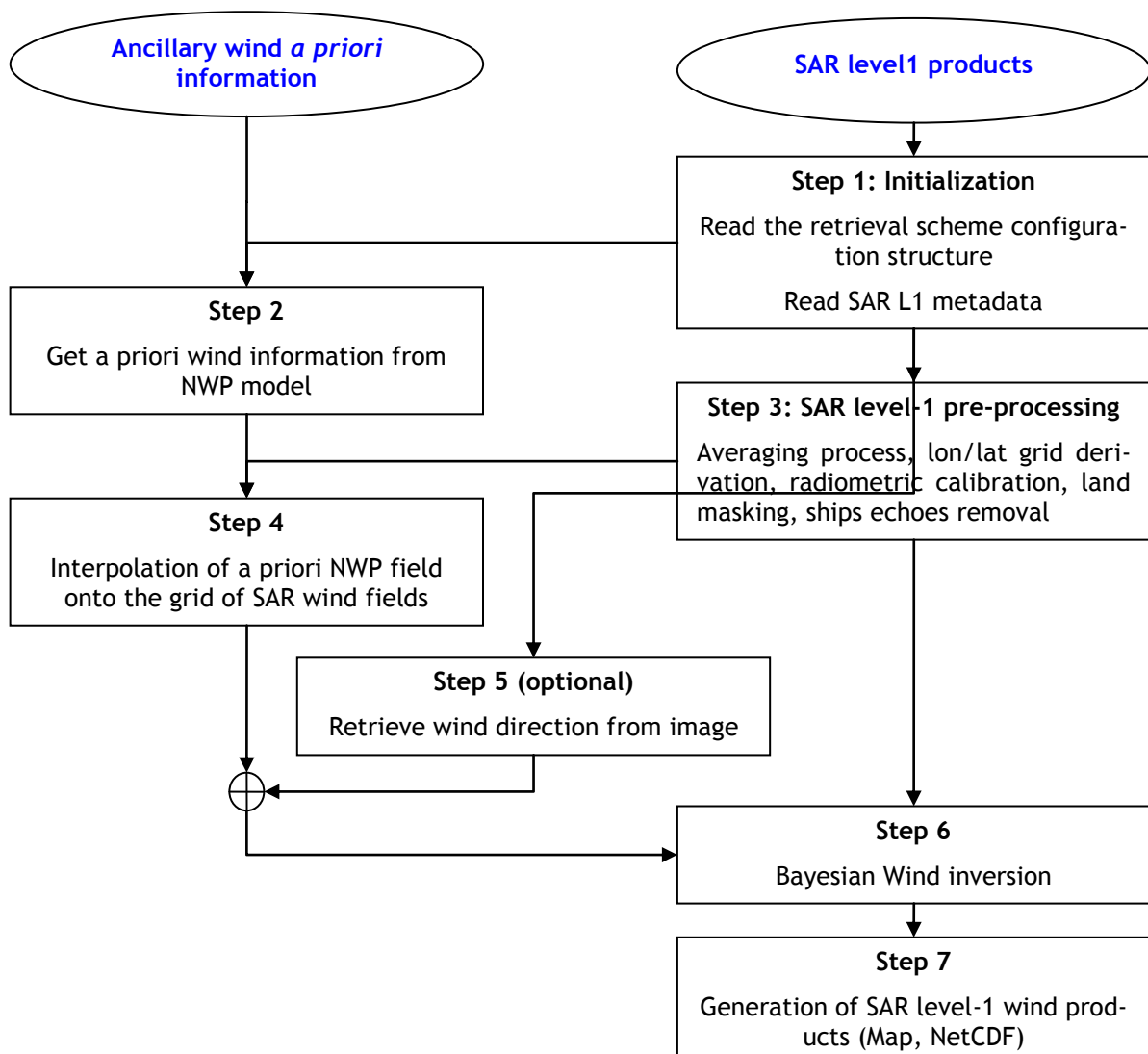
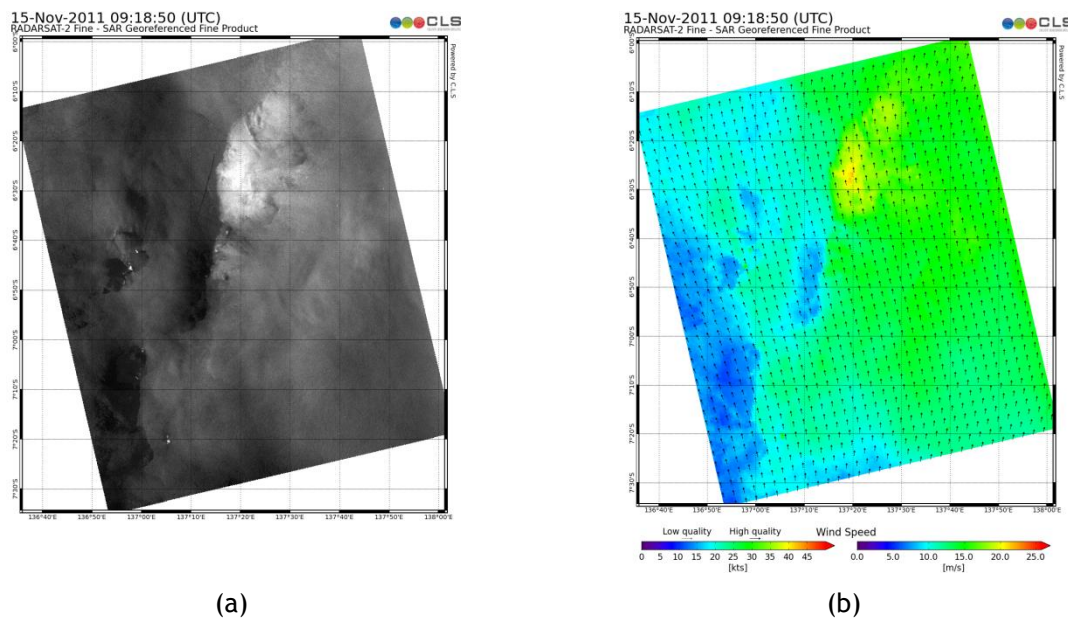


Figure 1: Flowchart of SARTool wind retrieval algorithm

The retrieval scheme is easy to parameterize (exclusion distance from shoreline, scattering model, wind cell size, etc) and is performed in a fully automated batch processing chain.



**Figure 2: (a) Roughness map retrieved from an RADARSAT-2 Fine Wide product. (b) SAR wind field retrieved using SARTool Wind**

### Ancillary a priori wind information

The wind retrieval algorithm uses ancillary a priori wind information to estimate ocean wind vector. SARTool uses by default the information generated by the Numerical Wind Prediction (NWP) model called **NCEP GFS** (Global Forecast System). This GFS model delivers a 3 h forecast updated every 6 hours (at 00, 06, 12 and 18 UTC) on a  $1/5^\circ \times 1/5^\circ$  latitude/longitude grid.

The INDES Core will automatically download and archive locally the NCEP GFS products, so that SARTool Wind module will be able to retrieve them whenever running.

### Level-2 wind products

SARTool Wind module generates Wind output products representing the 10-m height neutral equivalent wind. Neutral wind speed is defined as the mean wind speed that would be observed if there was neutral atmospheric stratification.

The SARTool Wind module can generate graphical map (PNG format) or Google Earth format file of the wind field retrieved from SAR level-1 product.

The SAR-derived wind field can also be provided in a numerical file in **NetCDF** format. The content of such a file is twofold:

- global attributes describing the underlying SAR product and the wind inversion configuration parameters
- Variables describing the detected winds

The NetCDF format is the one used here.



### 3. DESCRIPTION OF THE PRODUCT SPECIFICATION

#### 3.1. PRODUCT GENERAL CONTENT AND SPECIFICATIONS

The products and datasets are available on request for a given user depending on the user profile.

Dataset Name	Dataset time coverage	Production frequency	Geographical coverage	Spatial Resolution	File format
Wind Radar	Time coverage of the dataset	On demand	spatial coverage of the dataset	1km to 2 km	Netcdf CF

Table 1: Radar wind datasets

#### 3.2. ACKNOWLEDGMENTS

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

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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 retrieve NetCDF software package on: <http://www.unidata.ucar.edu/packages/netcdf/>

NetCDF data is:

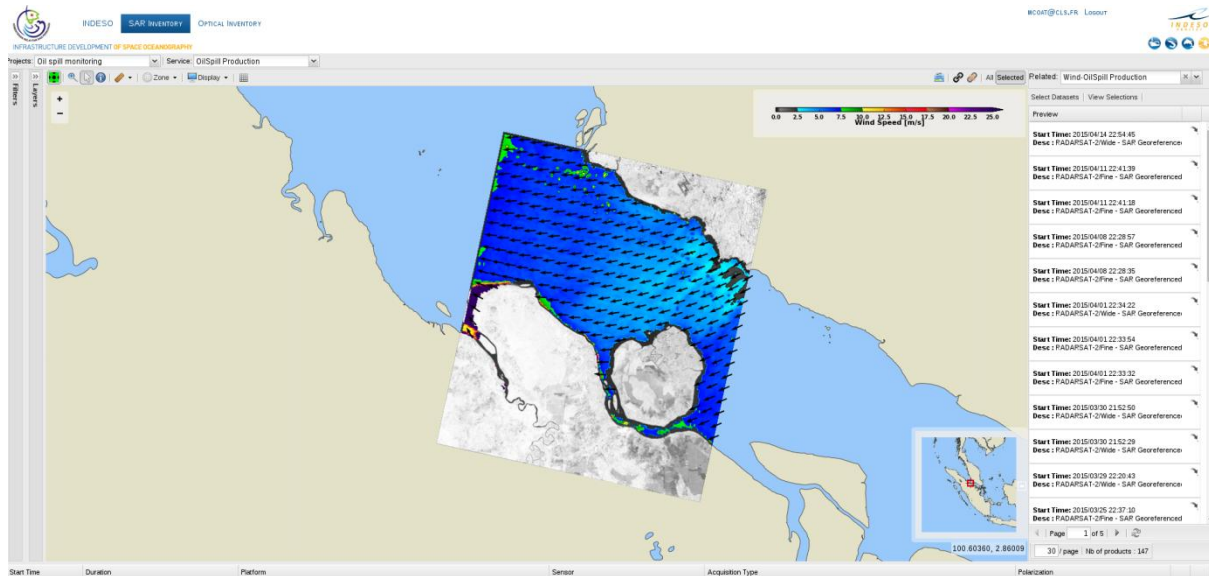
- Self-Describing. A netCDF file includes information about the data it contains.
- Architecture-independent. A netCDF file is represented in a form that can be accessed by computers with different ways of storing integers, characters, and floating-point numbers.
- Direct-access. A small subset of a 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.



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## 5. HOW TO DOWNLOAD A PRODUCT

The wind product is only available for visualization on maestro Indeso website.



### 5.1. REGISTRATION

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

License shall include:

- Data use conditions,
- Legal and contractual clauses