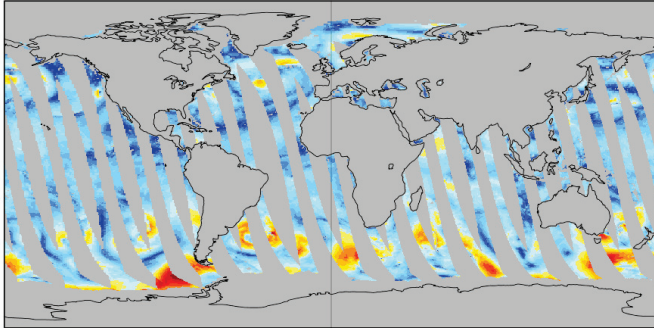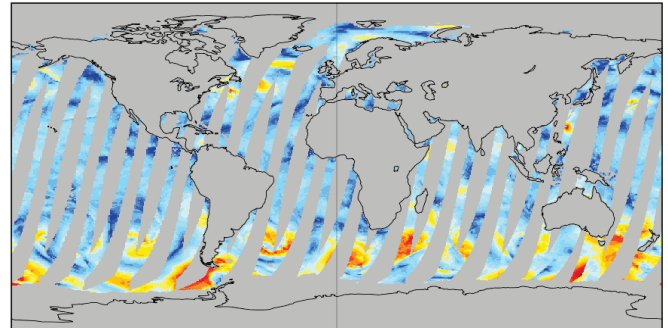# MyOcean Level 3 Global Wind product

Tilly Driesenaar[1], Anton Verhoef[1], Jean-François Piolle[2], Ad Stoffelen[1]

GLO-WIND_L3-OBS_METOP-A_ASCAT_25_ASC_20120604.nc

GLO-WIND_L3-OBS_METOP-A_ASCAT_25_DES_20120604.nc
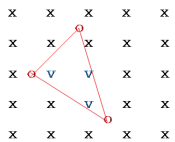
1. Introduction

Within the context of the FP7 funded MyOcean project, KNMI has developed the L3 Global Wind product to facilitate oceanographic and climate users with daily scatterometer data on a regular lat-lon grid, in NetCDF format following the CF conventions. The product is distributed by Ifremer and available at http://www.myocean.eu.

2. Specifications

- Scatterometer wind speed and direction ("to", following oceanographic convention) and u and v components, on regular lat-lon grid;

- Does not lose or increase swath coverage when interpolating to L3 grid;

- L3 grid domain: lat [-90°, 90°] and lon [0,360°];

- Grid spacing 0.25 deg (from 25 km ASCAT product), and 0.125 deg (ASCAT coastal product, 12.5 km) supporting resp. 50 km and 25 km resolution (Nyquist);

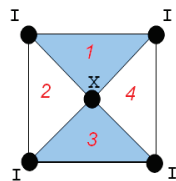- Also includes interpolated background ECMWF wind, retrieved exactly the same way.

3. Gridding technique

- Bilinear interpolation within triangles, using *Gouraud shading*.

x: L3 grid points (lat/lon)
o: "observation" points (equidistant)
v: grid points within triangle

- Around each Wind Vector Cell (WVC) center (**X**), 4 triangles are created using Interpolation Points (**I**).

- Any information from previous passes is discarded in the L3 grid points in these triangles.

- The Interpolation points (I) are created as follows:

- If 4 surrounding WVC are available: by means of interpolation

```
6  X  X  X  -  X  X  X        X: measured WVC (even rows)
5  I  I  -  -  I  I  I        I: interpolated values (odd)
4  X  X  X  -  X  X  X
3  I  I  I  I  I  I  I
2  X  X  X  X  X  X  X
```

- Extend swath to the left and fill gaps:

```
6  X  X  X  -  X  X  X        I: interpolated values
5  I  I  I  -  I  I  I           in this step (odd rows)
4  X  X  X  -  X  X  X
3  I  I  I  I  I  I  I
2  X  X  X  X  X  X  X
```

- Extend swath to the right and fill gaps:

```
6  X  X  X  -  X  X  X        I: interpolated values
5  I  I  I  I  I  I  I           in this step (odd rows)
4  X  X  X  -  X  X  X
3  I  I  I  I  I  I  I
2  X  X  X  X  X  X  X
```

- Extend swath before (after) first row of WVC and fill lacking interpolation points within WVC swath using two following (previous) interpolation points after:

```
7                             I: interpolated values
6  X  X  X  -  X  X  X           in these steps
5  I  I  -  -  I  I  I
4  X  X  X  -  X  X  X
3  I  I  I  I  I  I  I
2  X  X  X  X  X  X  X
1  I  I  I  I  I  I  I        ──: boundary interpo-
                                lation area
```

- Fill all interpolation points with wind component u and v values by interpolation from the available surrounding WVC measurements. Only the WVC's that passed KNMI Quality Control are used.

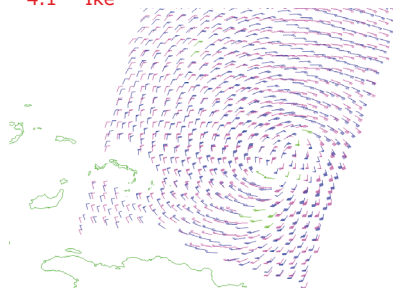## 4. Gridding examples

4.1 Ike

Figure A. *Tropical cyclone Ike: L2 ASCAT 25km wind vectors in blue (good measurements) and green (KNMI Quality Control flag set), L3 wind vectors in magenta.*
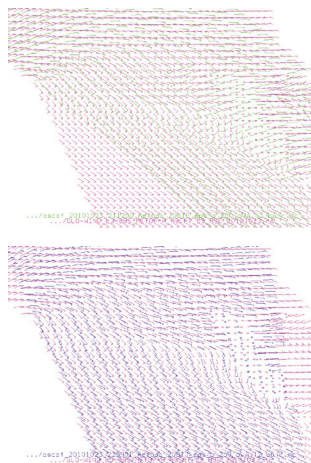
4.2 Overlapping passes

Figure B. *23 October 2010, 60° North -28° West*
top: L2 at 21h12 in green, L3 in magenta
down: L2 at 22h54 in green, L3 in magenta

5. Calibration and Validation

The L3 Wind product is purely based on the extensively calibrated and validated L2 ASCAT Wind products produced by KNMI in the context of the Ocean and Sea-Ice SAF of EUMETSAT. The L3 Wind product is validated by comparing the results of the L3 - buoy collocations with the results of L2 - buoy collocations for one year of data.
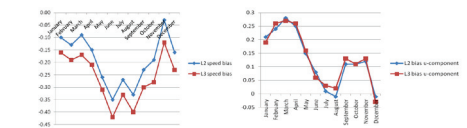

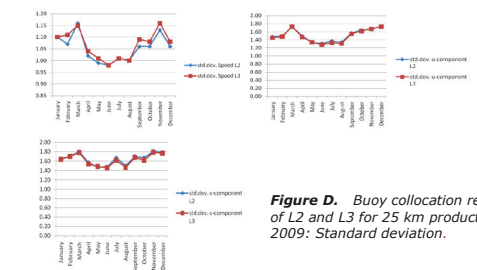**Figure C.** *Buoy collocation results of L2 and L3 for 25 km product for 2009: Average bias.*

Figure D. *Buoy collocation results of L2 and L3 for 25 km product for 2009: Standard deviation.*

A direct collocation comparison between L2 and L3 winds for one day shows that the interpolation performance is high.
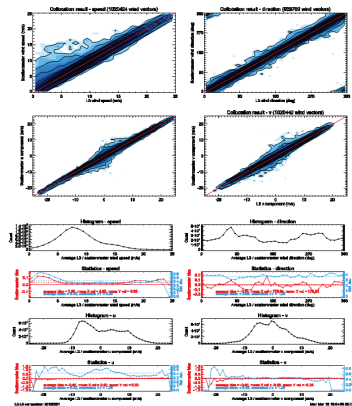

Figure E. *L2-L3 collocation results 1 Feb. 2012:*
Speed: bias 0.03, std.dev. 0.42
U-comp: bias 0.00, std.dev. 0.42
V-comp: bias 0.00,std.dev. 0.43