

### HIGH-RESOLUTION SCATTEROMETER WINDS NEAR THE COAST

Ad Stoffelen, KNMI Anton Verhoef, KNMI Marcos Portabella, CSIC

scat@knmi.nl



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 Surge of 4,8 m; > 0.5 m underpredicted
ECMWF too low winds; HiRLAM direction wrong as verified by QuikScat
Small scales can make the difference



#### NWP SAF

- ERS scatterometer observes wave train
- HiRLAM model (and other NWP models) miss the wave train (too smooth)
- The MSG clouds are aligned with the wave train, but in themselves provide little dynamical information
- Next day a forecast bust occurred for cloud and precipitation in England and the Netherlands



### **Processing** SCAT, SeaWinds, ASCAT

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#### > MSS with 2DVAR to reduce noise

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## SeaWinds Data Processor

aniha

309N





#### Compromise between noise & meteorological detail





### Is this noise or geophysical variability?

GSCAT: 20060118 09:51Z HIRLAM:2006011806+3 at LAT LON:4.06 114.90 IR: 10:00

QSCAT: 20060118 09:51Z at LAT LON:4.06 114.90 IR: 10:00 (meteosat5 200601181000)



- Spectral analysis

10.0m/s

 Triple collocation of buoy, NWP, and scatterometer winds



# Buoy verification

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- ASCAT 25 compares best to buoys ; ASCAT 25 compares best to ECMWF as well
- SeaWinds 25 is slightly noisier than ASCAT 25 ; SeaWinds 100 compares much better to ECMWF winds than SeaWinds 25
- > Let's try ASCAT 12.5

ASCAT 25		SeaWinds 25		SeaWinds 100	
SD u [m/s]	SD v [m/s]	SD u [m/s]	SD v [m/s]	SD u [m/s]	SD v [m/s]
1.76	1.79	1.84	1.83	2.19	2.00







# 6-hourly ECMWF update



m√Ocean

6-hour variance of 10-meter wind (m/s) analysis increment; N.Hemis 0.49, S.Hemis 0.54, Tropics 0.58



ECMWF analysis increments modest wrt spatial deficit (1.2 m<sup>2</sup>s<sup>-2</sup>)
Most mesoscale scatterometer information remains unexploited



SAF Experimental 12.5-km product

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 New detail to be verified
Convective systems
SST



## SAF Experimental 12.5-km product

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Ike: highest ASCAT speed ever and we were right in there (75 knots)





## ASCAT coastal wind

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- Coastal wind versus Level 2 product:
  - Higher resolution (35-40 km)
  - Closer to the coast (up to 25 km)
  - No Hamming filter but box averaging
  - Adapted grid close to the coast (all valid triplets used)
  - Larger backscatter noise (tackled with MSS/2DVAR AR)
- Validation: collocations with
  - ASCAT Level 2 25-km resolution product
  - ECMWF forecast output
  - High resolution model output (e.g., HIRLAM)
  - Buoys (part of OSI SAF activities)



## Prototype at 25 km NWP







# Way forward

- Prototypes on higher resolution ASCAT winds (12.5 km) and for winds nearer to the coast exist
- Demo available; validation ongoing
- SAR hi-res winds using scatterometer methodology of MSS/2DVAR combined with current estimation by Doppler







### www.knmi.nl/scatterometer

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