



# ASCAT services status

**Julia Figa-Saldaña**

# Acknowledgments



ASCAT teams at:

**EUMETSAT:** Craig Anderson, Hans Bonekamp, Leonid Butenko, Colin Duff, Jens Lerch, Christelle Ponsard, Arthur de Smet, Julian Wilson

**TU-Wien:** Zoltan Bartalis, Stephan Hassenauer, Vahid Naeimi, Wolfgang Wagner

**KNMI:** Maria Belmonte, Ad Stoffelen, Anton Verhoef, Jeroen Verspeek, Jur Vogelzang

**Met.no:** Lars-Anders Breivik, Steinar Eastwood, Thomas Lavergne

# Outline



**Services overview**

**Instrument**

**Processing**

**Re-processing**

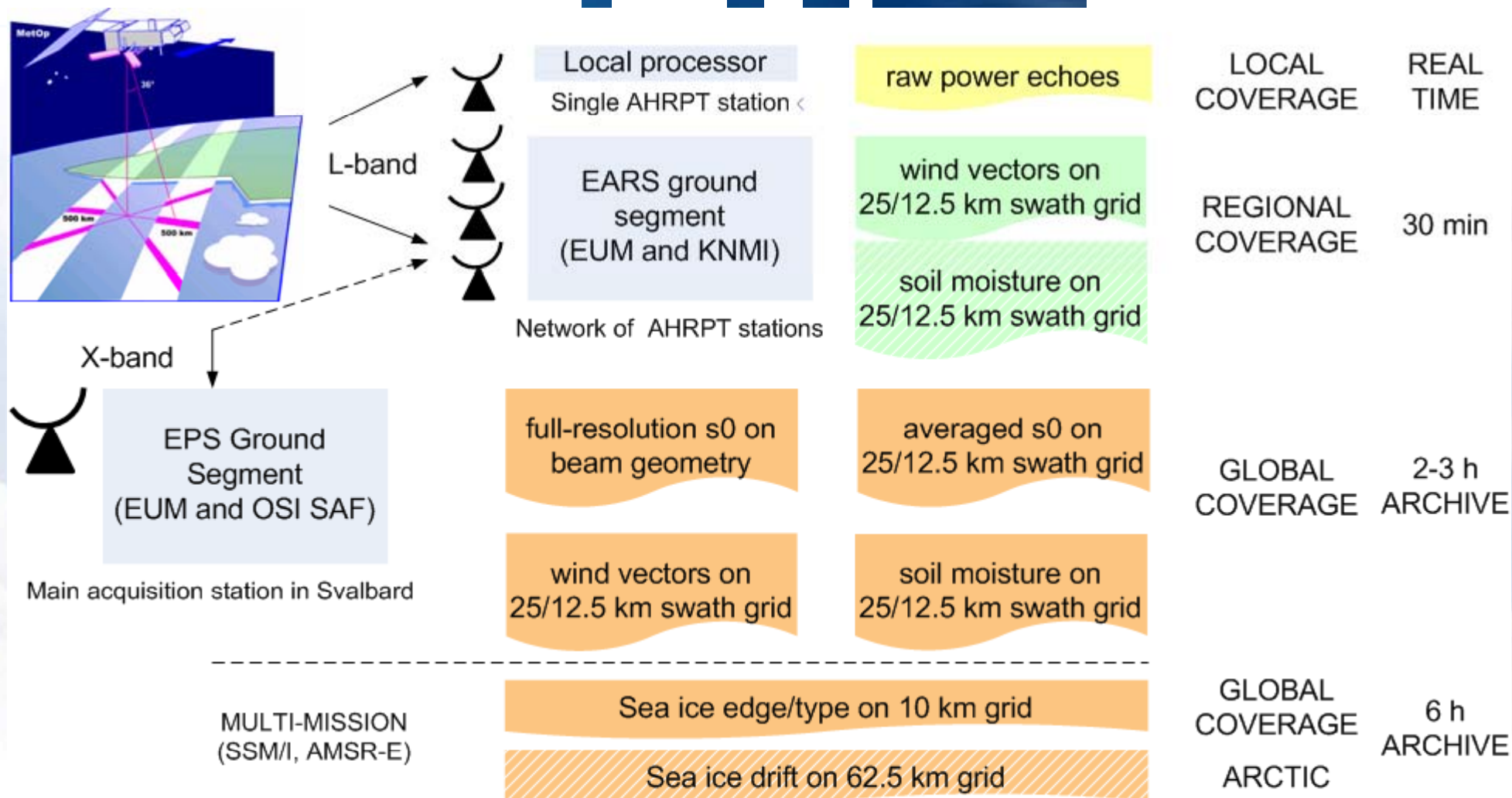
**Archiving and Dissemination**

**Outreach**

**News and developments since Boulder 2009**

**Current areas of work and future plans**

# ASCAT services in Europe - overview





# ASCAT products – where do I find what

Parameter	Description	EUMETCast	NOAA	GTS	FTP	EUM Archive	Other archive
		<i>3-min along track product length</i>					
s0	swath grid 25 (12.5) km	EPS native, BUFR	EPS native	BUFR	-	EPS native/HDF5 (ground station dumps)	-
s0	Full resolution, 256 samples along each of 6 beams	EPS native	EPS native	-	-	EPS native/HDF5 (ground station dumps)	-
s0 + wind	swath grid 25 (12.5) km	BUFR	-	BUFR	BUFR	BUFR (orbits from/to ascending crossing)	BUFR (KNMI)
wind	swath grid 25 (12.5) km	-	-	-	netCDF	netCDF (orbits from/to ascending crossing)	netCDF (orbits from/to ascending crossing) (KNMI, PODAAC)
soil moist.	swath grid 25 (12.5) km	BUFR	-	BUFR	-	EPS native/HDF5 (ground station dumps)	-
s0 + wind + soil moist.	swath grid 25 (12.5) km	BUFR	-	BUFR	-	BUFR (orbits from/to ascending crossing)	-
<i>Grided products (multi-mission SSM/I + ASCAT+ AMSR-E)</i>							
Sea ice edge, type	PolSter grids 10 km	GRIB	-	-	GRIB, HDF netCDF	GRIB	GRIB, HDF, netCDF (Met.no)
Sea ice drift	PolSter grids 62.5 km	-	-	-	netCDF	-	netCDF (Met.no)

# Instrument status



All functional and trending indicators are fine. All instrument components still have full redundancy.

Power consumption very stable, drops are traced to instrument switch-off events or other payload events affecting the temperature in the environment of the ASCAT (i.e., IASI heater refuse anomalies)

On 18/02/10, spontaneous ASCAT switch-off over North polar area – 6 hours measurement interruption

internal unit temperature

antenna temperature

voltages



**Last tuning of the calibration** on 09/12/08 as a reference to start adapting the existing ERS-based Level 2 models (winds, soil moisture and ice) to ASCAT data

Implementation of **dynamic (orbit-based) Power-to-s0 normalisation** on 10/09/09 and start of **non-frozen eccentricity orbit phase** on 17/09/09

**New transponder calibration campaign** 08/03 - 06/05

# Sigma0 current issues

## Impact of implementation of dynamic normalisation

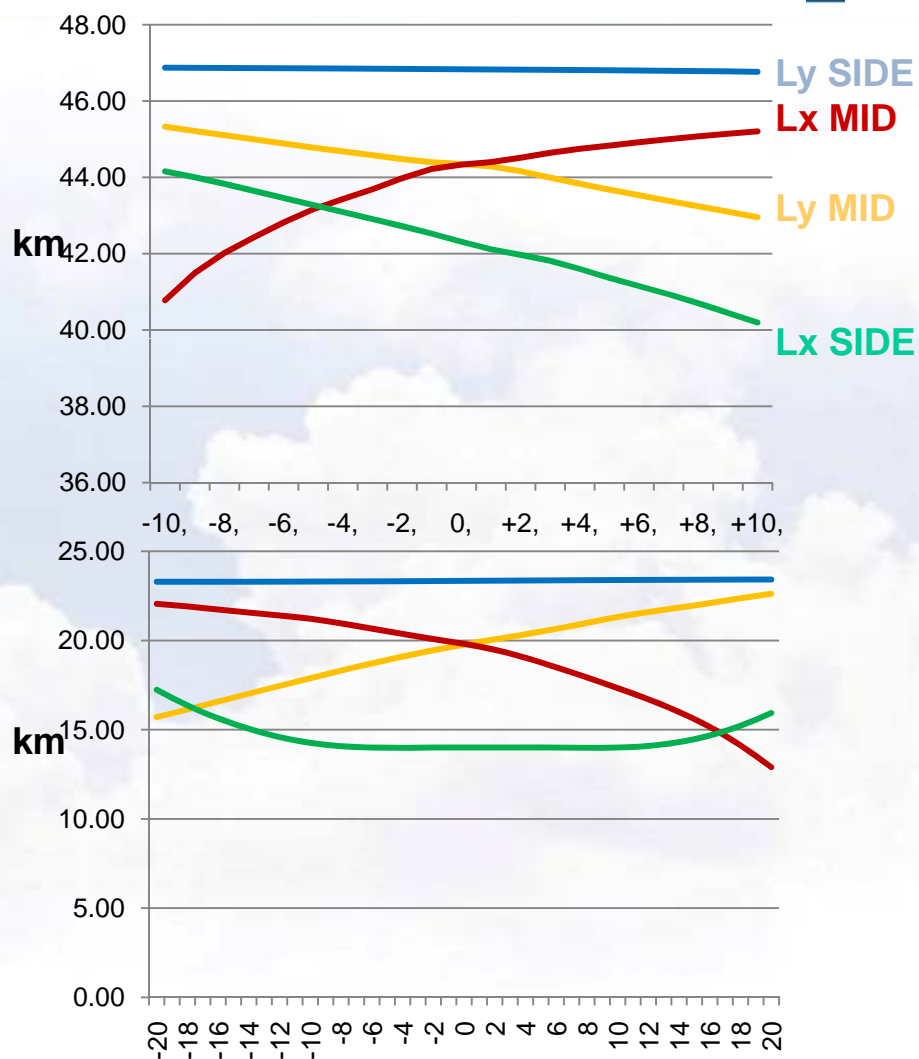
Our observed impact of the dynamic vs. static normalisation factors was of about 0.005 dB

Manoeuvre produced a jump of 0.002 dB and started their expected oscillation, of the same order of magnitude

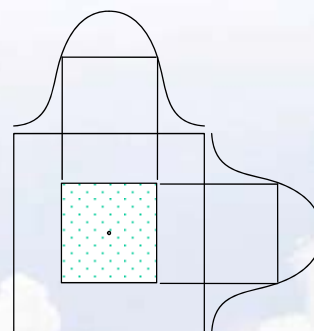
But ocean calibration reports a sudden bias of near 0.1 dB for the mid left beam, coinciding with the events above. So far we have not found the root cause of this sudden calibration change



# Sigma0 current issues



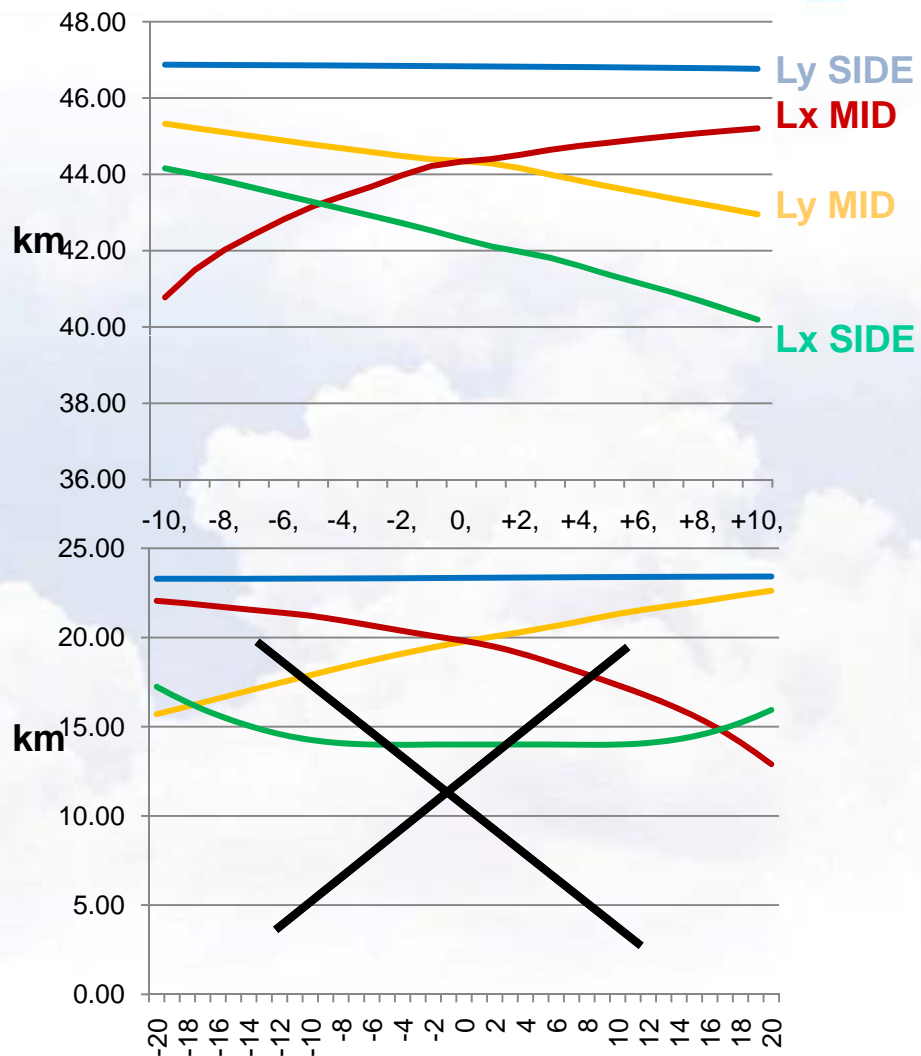
**sigma0 spatial averaging implementation error for the 12.5 km product**



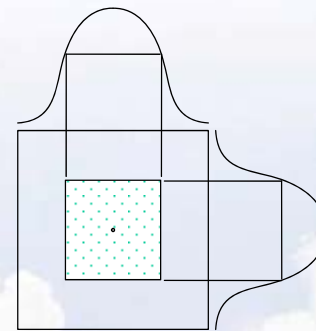
$$Wx = \alpha_x + (1 - \alpha_x) \cos\left(\frac{\pi x}{L_x}\right)$$

$$Wy = \alpha_y + (1 - \alpha_y) \cos\left(\frac{\pi y}{L_y}\right)$$

# Sigma0 current issues

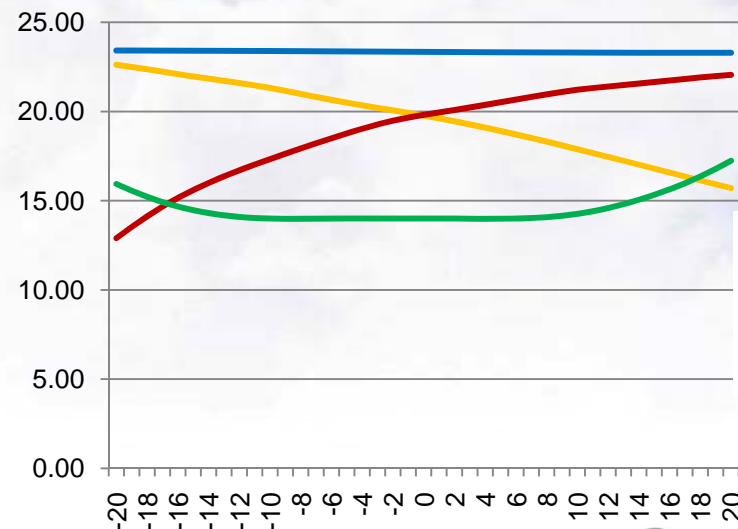


## sigma0 spatial averaging implementation error for the 12.5 km product



$$Wx = \alpha_x + (1 - \alpha_x) \cos\left(\frac{\pi x}{L_x}\right)$$

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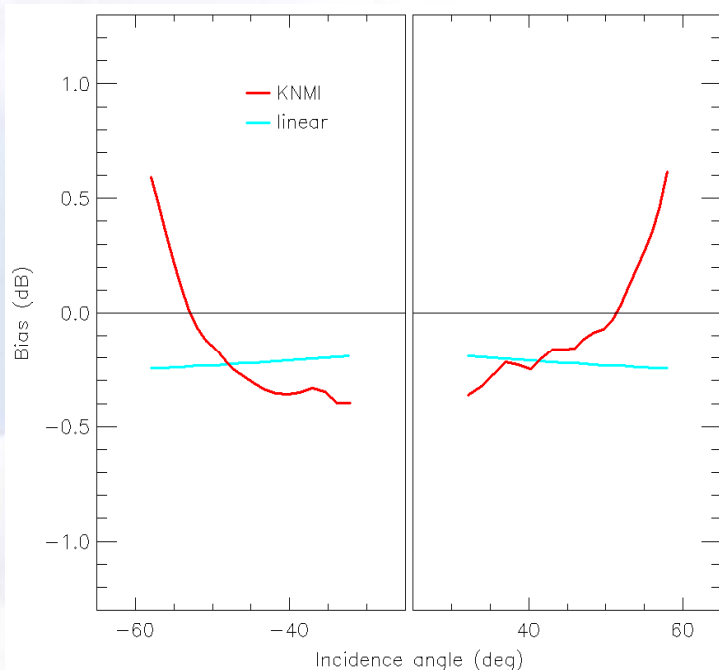
Slide: 10

OVWST Meeting, 18-20 May 2010, Barcelona

# Sigma0 current issues

## ERS/ASCAT $\sigma_0$ cross-calibration – incidence angle dependent bias

Use of ERS-based geophysical models requires  $\sigma_0$  bias corrections



- **Red** –  $\sigma_0$  bias correction derived for continuity of ocean winds record
- **Blue** – alternative  $\sigma_0$  bias correction achieving a better consistency of soil moisture record

The red curve is currently used for the retrieval of both ASCAT L2 operational products

ERS-ASCAT backscatter and soil moisture comparisons – first results, June 2009

Courtesy of IPF TU-Wien ([http://www.ipf.tuwien.ac.at/radar/ascat\\_ers\\_intercomparison.pdf](http://www.ipf.tuwien.ac.at/radar/ascat_ers_intercomparison.pdf))

# Winds



Development of ASCAT-based C-band wind GMF

On-going evaluation of spatial resolution issues

ASCAT coastal product – demonstration service available for evaluation in near real time

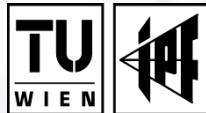


Royal Netherlands Meteorological Institute

# Soil moisture



New soil moisture parameter database, based on an ASCAT-only soil moisture time series was just delivered



Vienna University of Technology



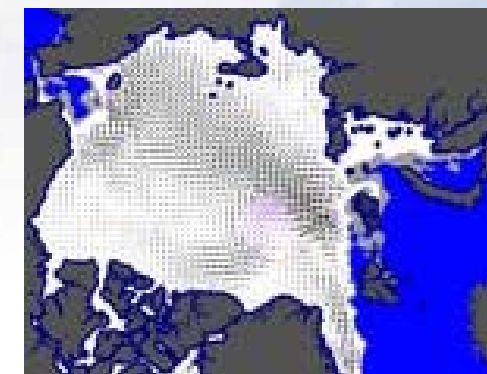
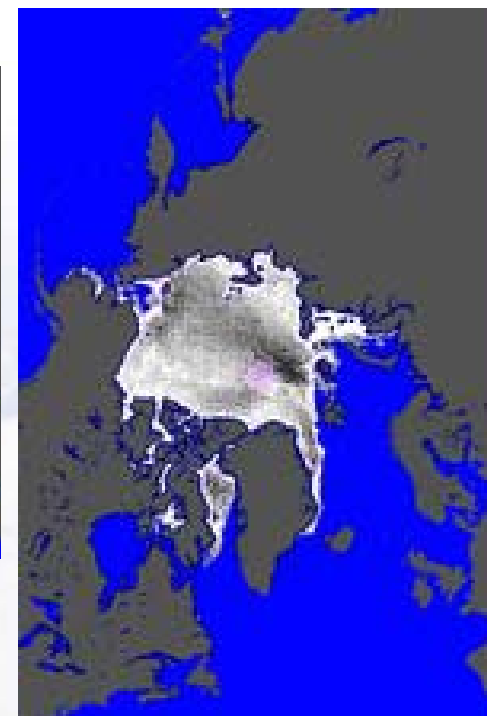
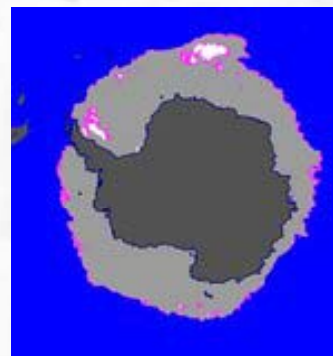
# Sea ice



## Sea ice edge and type

Daily maps every 6 h, on a 10 km polar stereographic grid

Bayesian approach combining SSM/I and ASCAT data to obtain an optimal estimation, its probability and uncertainty



## Sea ice drift

Ice motion vectors with time span of 48 h, on a 62.5 km polar stereographic grid

Advanced cross-correlation method on pairs of satellite images from SSM/I, AMSR-E and ASCAT



Meteorological Institute of Norway

OVWST Meeting, 18-20 May 2010, Barcelona

Slide: 14



# Reprocessing



**Phase 1** of ASCAT sigma0 and soil moisture reprocessing completed and delivered on 07/12/09

<http://www.eumetsat.int/Home/Main/News/OperationalNews/715844?l=en>

Consistent data records of ASCAT Sigma0 and soil moisture since June 2007 until present (impact of the mid left beam calibration change in Sept 2009 to be determined)

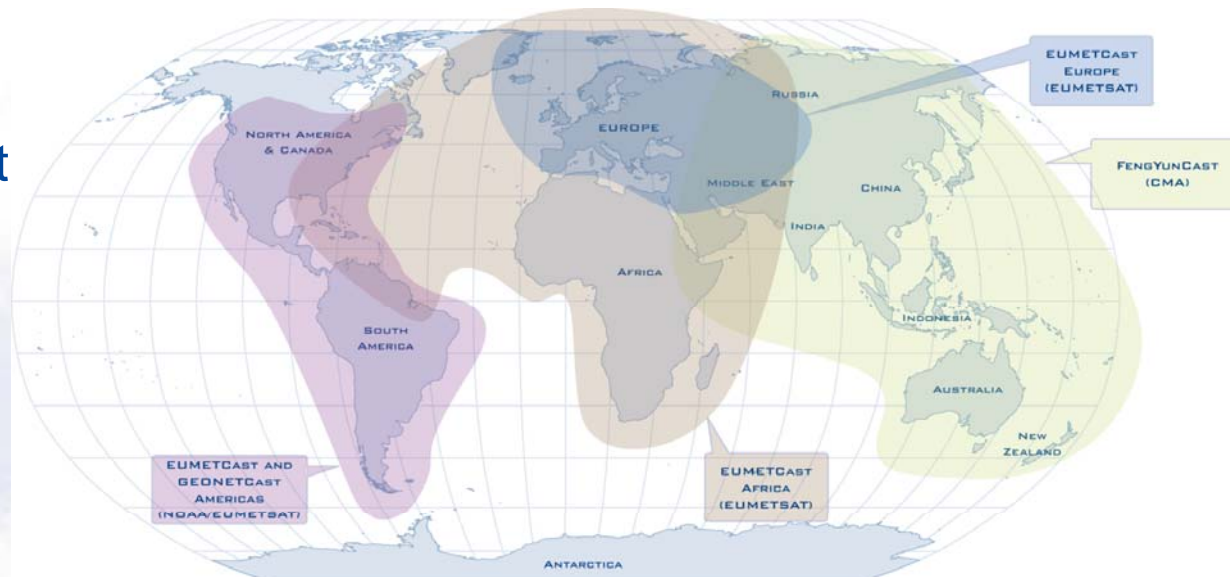
Winds not reprocessed, because they are consistent from beginning of mission

**Phase 2** reprocessing planned for sigma0, winds and soil moisture back to January 2007. When sigma0 calibration confirmed by second transponder campaign and new ASCAT-based GMFs available for winds and soil moisture

# Archiving and dissemination

All ASCAT wind products now available in all EUMETCast beams

ASCAT soil moisture now available in EUMETCast Europe and Africa



EARS ASCAT winds are now available on the GTS

ASCAT winds **netCDF products** now available in near real time (ftp), EUMETSAT archive and PODAAC

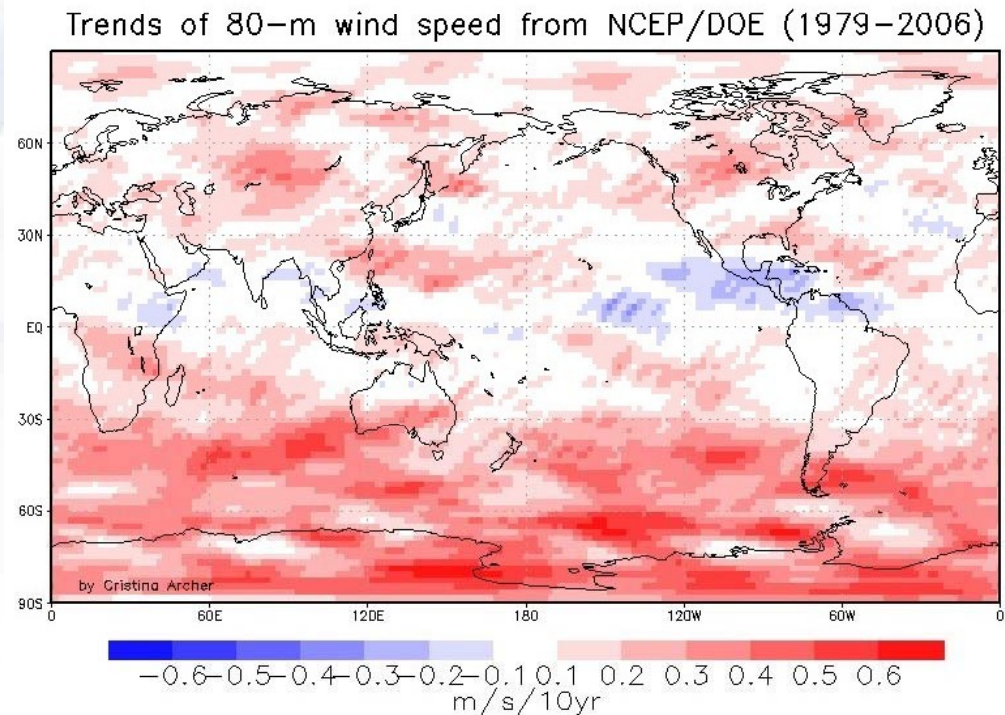
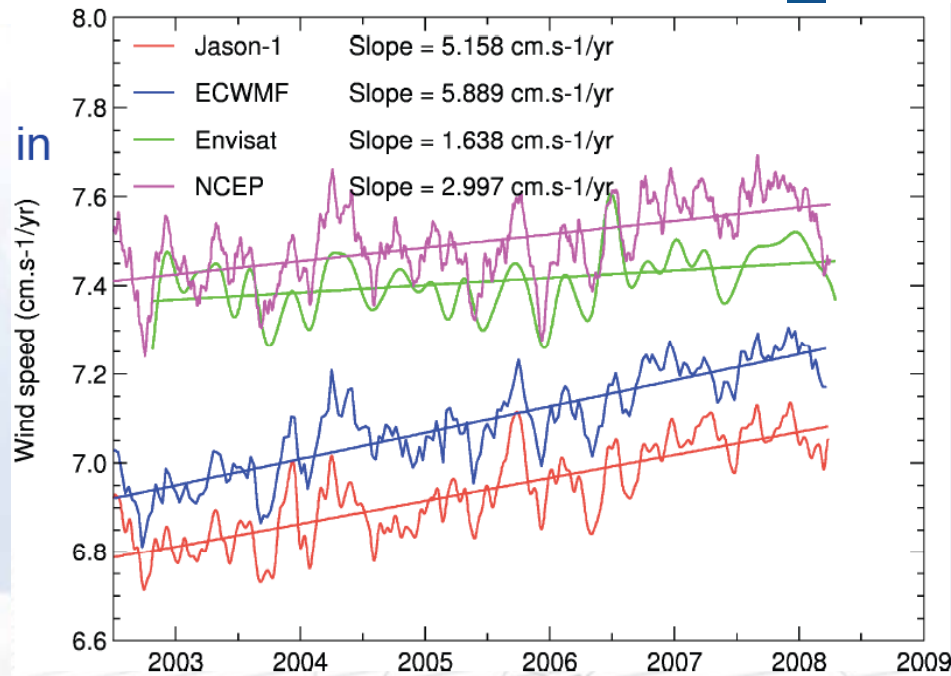
# Outreach



EUMETSAT and NOAA co-organised a training workshop on the use of scatterometer and altimeter wind and wave data in marine forecasting – see poster



# Looking at wind trends – what is the scatterometer point of view?





# Useful links



## **ASCAT Products guide**

[http://www.eumetsat.int/Home/Main/Publications/Technical and Scientific Documentation/EPS Product Guides/index.htm](http://www.eumetsat.int/Home/Main/Publications/Technical_and_Scientific_Documentation/EPS_Product_Guides/index.htm)

## **EUMETSAT User Services**

[www.eumetsat.int](http://www.eumetsat.int)

## **Contact directly the ASCAT team**

[ascat\\_calval@eumetsat.int](mailto:ascat_calval@eumetsat.int)

## **Ocean and Sea Ice SAF page**

[www.osi-saf.org](http://www.osi-saf.org)

## **The scatterometer page at KNMI**

[www.knmi.nl/scatterometer](http://www.knmi.nl/scatterometer)

## **The scatterometer soil moisture at TUWien**

<http://www.ipf.tuwien.ac.at/radar/>

## **The sea ice team at Met.no**

<http://saf.met.no/>

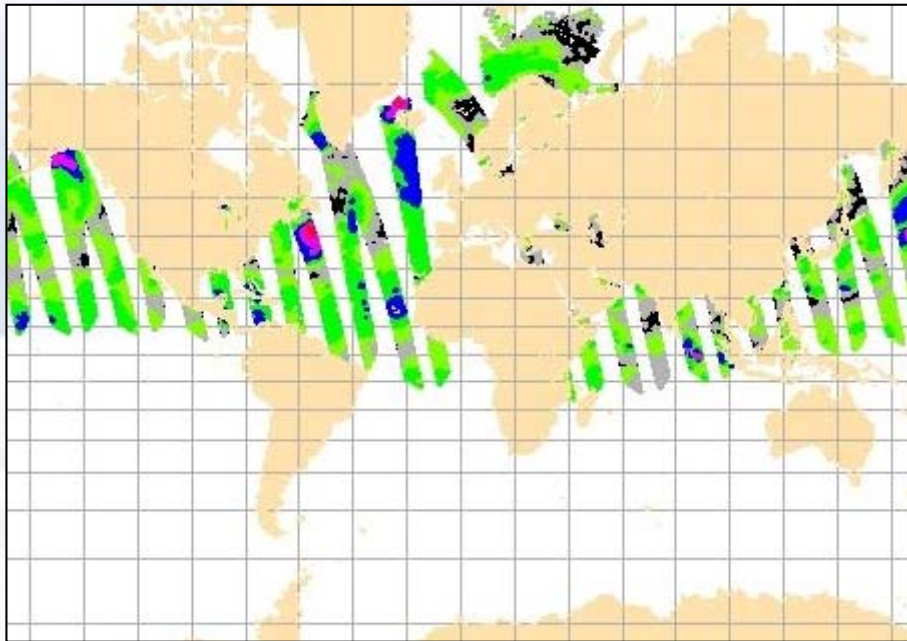


# Back-up slides

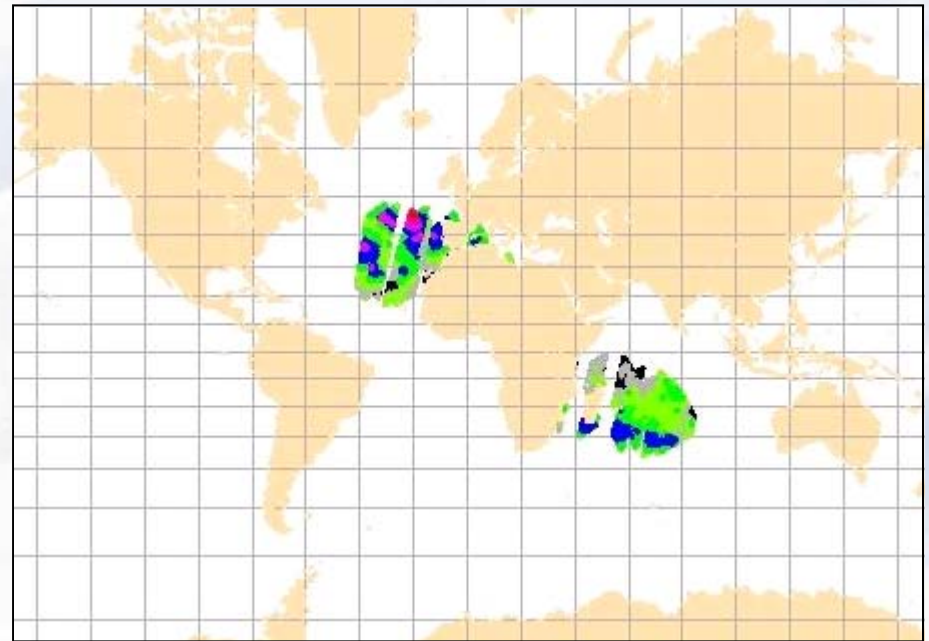
# EARS winds



Addition of AHRPT data to the coverage  
Addition of soil moisture values



Current coverage



Coverage of individual AHRPT stations

# EUMETSAT archive user interface

**EUMETSAT Data Centre Online Ordering**

Log in... Register Help Product Navigator About... **EUMETSAT** Not logged in

Query and Order Shopping Trolley Specific Product Order Order Follow-Up

Search Type: SAF Mode: Simple

Generic Attributes

Tree Management

Tree Sorting: Prod->Sat->Inst

- ☒ root
  - ☒ ASCAT 12.5 km wind (OSI)
  - ☐ ASCAT 25km wind (OSI)
  - ☐ Cloud Optical Thickness(CM)
  - ☐ Cloud Phase(CM)
  - ☐ Cloud Top Height(CM)
  - ☐ Cloud Top Pressure(CM)
  - ☐ Cloud Top Temperature(CM)
  - ☐ Cloud Type(CM)
  - ☐ Cloud Water Path(CM)
  - ☐ Downwelling Surface LW Fluxes(LSA)
  - ☐ Downwelling Surface SW Fluxes(LSA)
  - ☐ Evapotranspiration(LSA)
  - ☐ Fire Radiative Power (LSA)
  - ☐ Frac Absorbed PhotoSyn Act Rad(LSA)
  - ☐ Fractional Cloud Cover(CM)
  - ☐ Fractional Vegetation Cover(LSA)

Date/Time Range (UTC)

From: 2010/05/11 14:28:46 To: 2010/05/12 14:28:46

User Defined

Region of Interest

Upper Left corner Lat/Lon (deg)

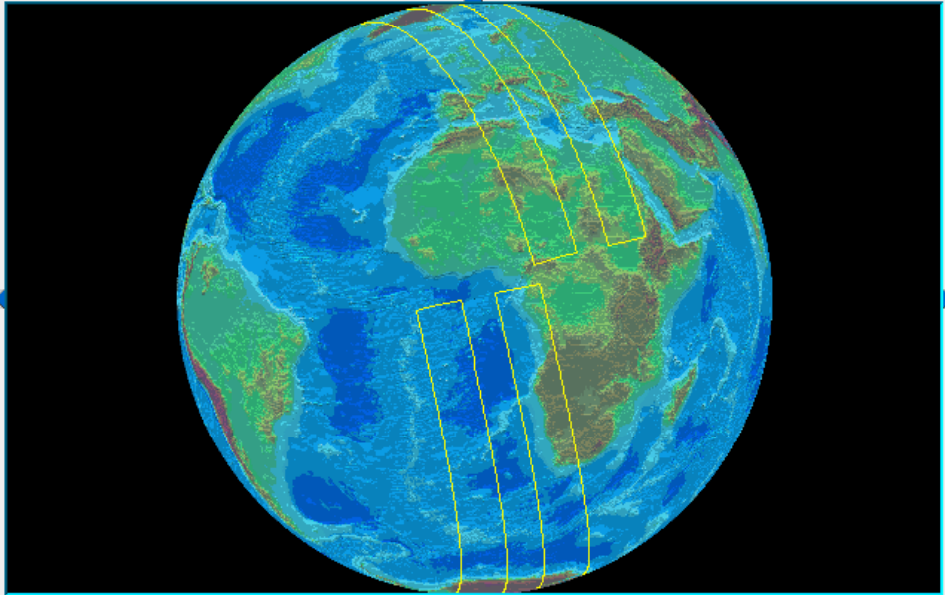
Lower Right corner Lat/Lon (deg)

Overall Quality: All

Query management... Search

Map Navigation Footprint Selection Area Selection

Map Layers...



Satellite	Instr/Category	Product Type	Start Date	Stop Date	Version ID	AREA
M02	ASCA	OASW012	2010/05/11 13:00:00	2010/05/11 14:41:59	0	
M02	ASCA	OASW012	2010/05/11 14:42:01	2010/05/11 16:23:59	0	
M02	ASCA	OASW012	2010/05/11 16:24:01	2010/05/11 18:05:59	0	
M02	ASCA	OASW012	2010/05/11 18:06:01	2010/05/11 19:47:58	0	
M02	ASCA	OASW012	2010/05/11 19:48:00	2010/05/11 21:26:59	0	
M02	ASCA	OASW012	2010/05/11 21:27:01	2010/05/11 23:08:59	0	
M02	ASCA	OASW012	2010/05/11 23:09:01	2010/05/12 00:50:59	0	
M02	ASCA	OASW012	2010/05/12 00:51:01	2010/05/12 02:32:58	0	

start Microsoft (r) Wind... Internet Explorer Microsoft PowerPoint ... EUMETSAT Data Cent... 22:31



# METOP-A Manoeuvre history

2006/10/21 18:58:08	OOP	GEO	performed by ESOC
2006/10/22 06:30:43	IP	GEO	double IP, performed by ESOC
2006/10/22 07:20:35	IP	GEO	double IP, performed by ESOC
2006/11/02 15:06:32	IP	YSM	
2007/04/19 14:05:56	IP	YSM	double IP
2007/04/19 14:56:40	IP	YSM	double IP
2007/07/12 14:48:18	IP	YSM	
2008/01/31 14:38:03	IP	YSM	
2008/04/08 13:26:21	OOP	GEO	
2008/04/09 03:48:39	OOP	GEO	
2008/04/24 14:46:31	IP	YSM	double IP
2008/04/09 03:48:39	IP	YSM	double IP
2008/10/23 14:30:02	OOP	GEO	
2008/10/30 14:11:05	IP	YSM	double IP
2008/10/30 15:01:42	IP	YSM	double IP
2009/01/22 14:11:17	IP	YSM	
2009/09/17 14:17:41	OOP	GEO	
2009/12/10 15:31:21	IP	YSM	





# L2 Soil moisture – status

## Product definition

Level 2: Surface soil moisture index (%) in orbit geometry, tailored for NWP assimilation

(Level 3 value-added products are also planned in partnership with the H-SAF)

## Service status

Operational since 10/12/08, a tuning of the retrieval for the left beam was introduced at the end of 04/09 Reprocessed data set available covering 2007-2008 available

## Next steps

Cross-calibration with ERS scatterometer and removal of s0 bias corrections will be addressed

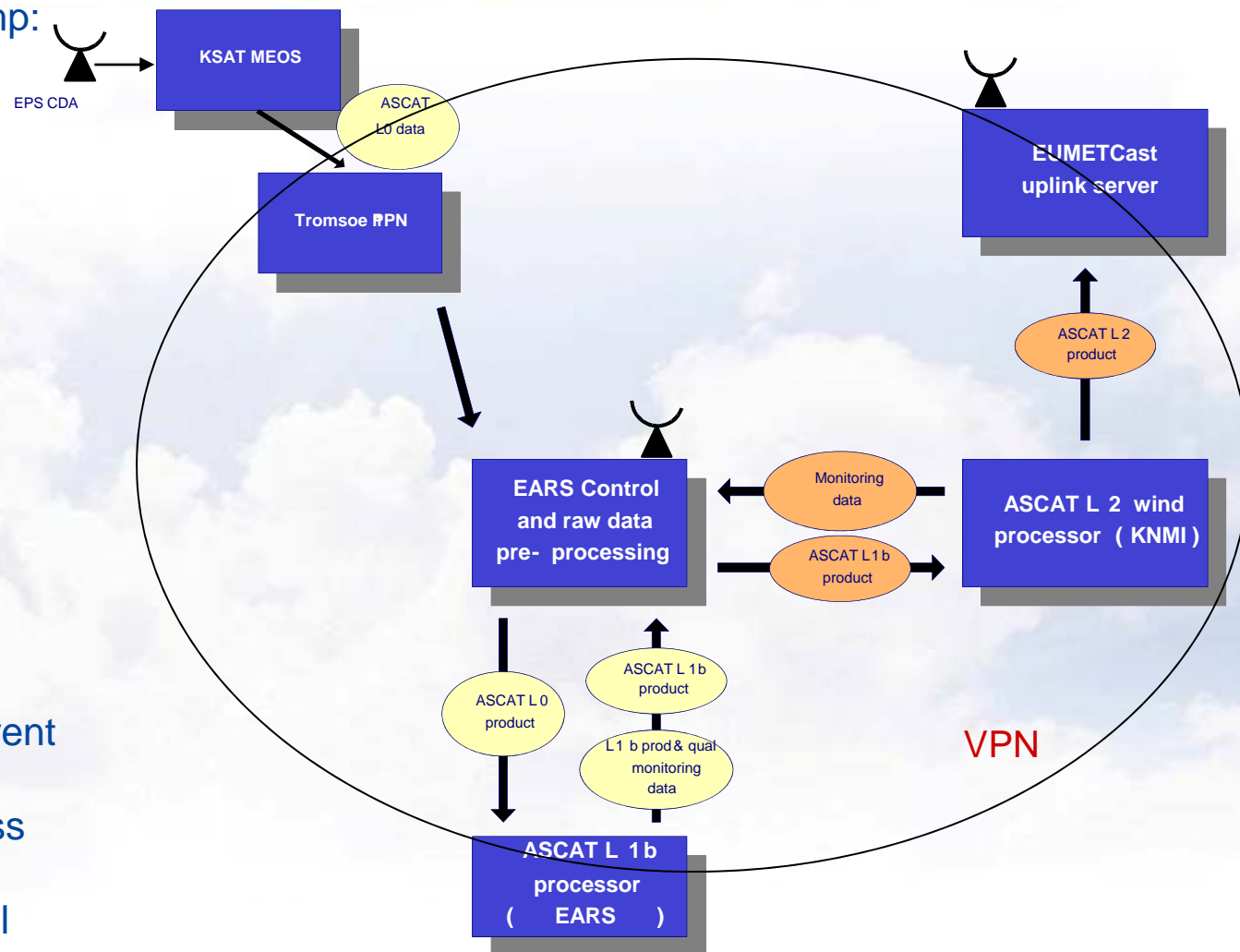
# EARS ASCAT L2 winds – overview and status

**Data feed** from global data dump:  
14 Metop dumps/day. Last 30 minutes of ASCAT extracted for further L1b + L2 processing

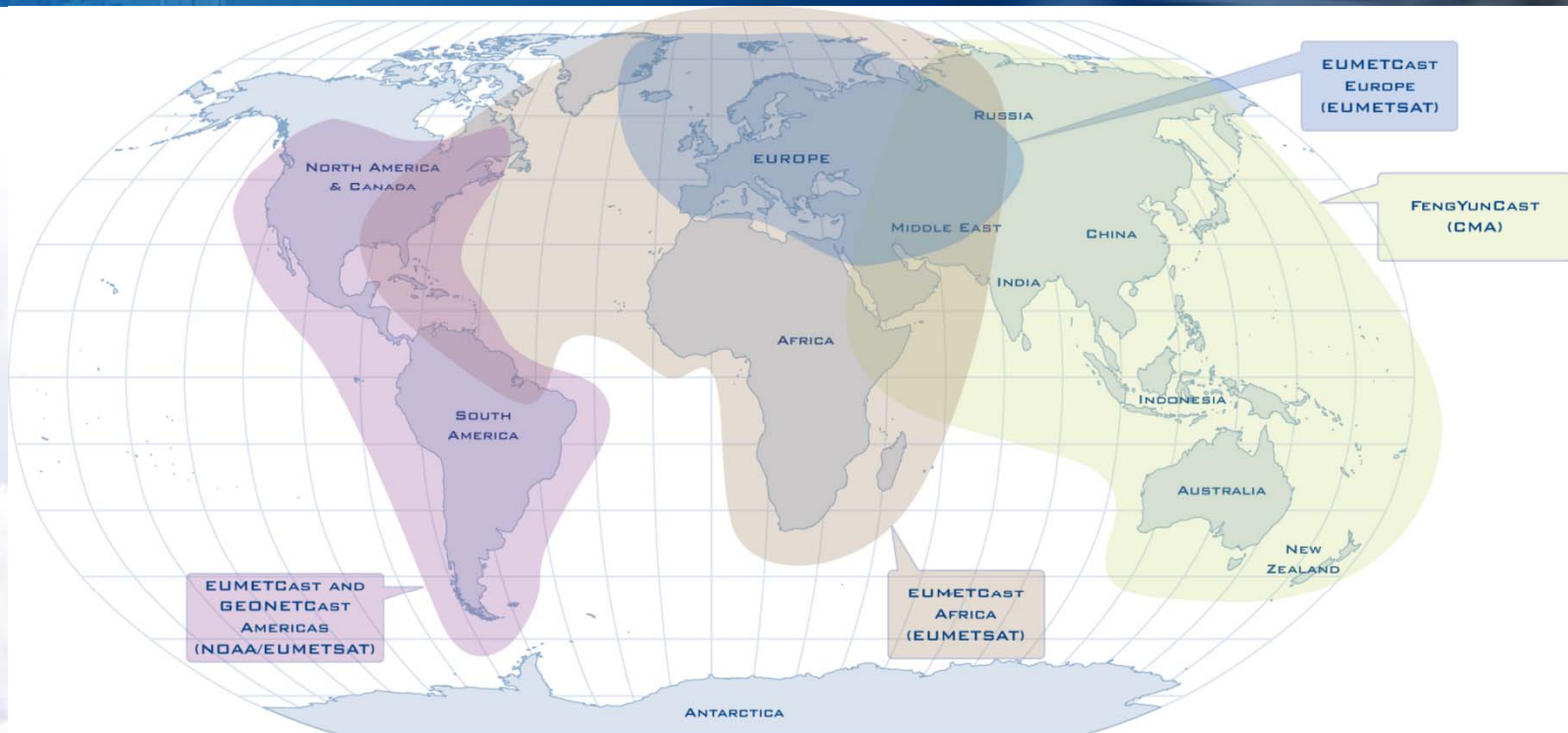
**Timeliness:** 40-45 min for data over equator, **15 minutes from sensing for data over high latitudes!**

**Service operational** since 14/12/08 and **EARS SCAT demonstration** service runs in parallel

On going work to adapt the current system to dynamic posser-to-sigma0 normalisation, to process available AHRPT data, and to produce L2 soil moisture as well



# Where can you receive EUMETCast data today?



Multi-service dissemination system based on standard Digital Video Broadcast (DVB) technology. It uses commercial telecommunication geostationary satellites to multicast files (data and products) to a wide user community.

Part of a bigger picture: **GEONETCast**

[http://www.eumetsat.int/Home/Main/What\\_We\\_Do/Technical\\_Cooperations/GEONETCast/index.htm](http://www.eumetsat.int/Home/Main/What_We_Do/Technical_Cooperations/GEONETCast/index.htm)