



Current Status of EUMETSAT Operational Winds

Ken Holmlund

Meteorological Operations Division

+ Leo van de Berg, Jörgen Gustafsson, Arthur de Smet and
Rèégis Borde

Kenneth.holmlund@eumetsat.int

Content of talk:



Current spacecraft status and planned configurations

Current status of EUMETSAT winds

Major evolutions since last IWWS

LEO AMVs

ASCAT winds

GEO AMVs

Introduction of major changes

Example RTM

Reprocessing activities

Conclusions

EPS Operations Planning

- 2010:
 - Approach to Metop-A EOL operations to be agreed
 - Operational debris warning service from NOAA / USAF expected to be activated
 - Ops Prep for Metop-B to be performed.
- 2011:
 - Antarctic Data Acquisition Demonstration Service (McMurdo) to improve data timeliness (9 out of 14 orbits)
 - Validation of combined Metop-A/B operations
- 2012:
 - Metop-B launch, commissioning and routine ops start
- 2014:
 - ADA Operational Service Start (all orbits)



LEO Spacecraft Operations

Metop-A with instruments generally in very good health

Channel 7 on AMSU-A exhibits out of spec noise

Small spectral anomaly noted on IASI ground-processing affecting in particular detector 2 (for certain wavelengths up to 0.5 K bias). Cause identified (uncorrected Gibbs effect), improved PPF under development by CNES.

Metop-B launch planned for 2012

Parallel operations of Metop-A and –B foreseen until end of commission of Metop-C!

Final decision/configuration depends on instrument health

Metop ADA extraction service to start 2011, full service 2014

Metop-A Status



- **DHSA:** Redundant CCU I/O Board. Further investigation of I/O Board planned following a possible future PLSOL outage.
 - **Incident raised on ULFAR reception of unidentified command packet header**
- **HRPT:** B unit in restricted operation
- **AMSU A1:** Noise on Channel 7 exceeding specification
- **GOME-2:** Throughput testing performed August and September 2009.
- **IASI:** patch uploaded to allow autonomous recovery on certain SEUs (September 2009.)
- **A-DCS:** frequency complaints under investigation
- **In-plane manoeuvre** planned December 2009.

SVM	AOCS	POWER	DHSA
	COMMS	Housekeeping	
	Thermal	PMCIF	
PLM	PMC	TCU	PCU
	PDU	RTU	FMU
	SSR	XBS	
	HRPT	LRPT	
INST	ASCAT	MHS	ADCS
	AMSUA1	GRAS	SARR
	AMSUA2	GOME	SARP
	HIRS	IASI	
	AVHRR	SEM	

Polar winds status

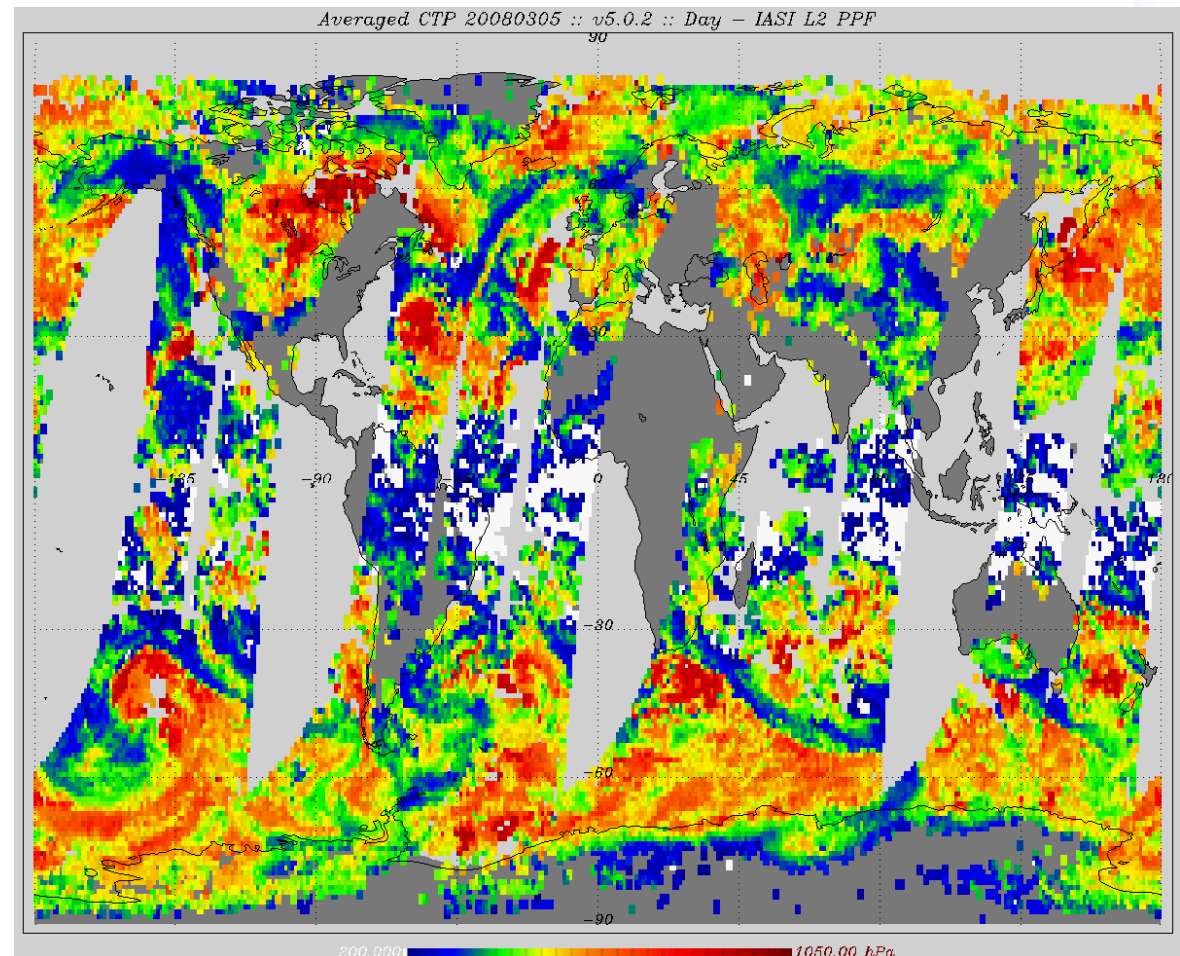


Support to MODIS wind dissemination on-going

Metop AVHRR winds

=> see Greg's talk

Taster =>





Scatterometer winds

Metop ASCAT winds

EUMETSAT derives sigma 0's

OSI SAF derives winds

Service availability and quality is HIGH

Improved orbit normalisation

Improved sigma-0's

Reduced requirements for frozen orbit => fuel savings!

Note: Fast extract service for Northern hemisphere is operational!

Oceansat-2

Discussion are ongoing with ISRO to secure NRT global data

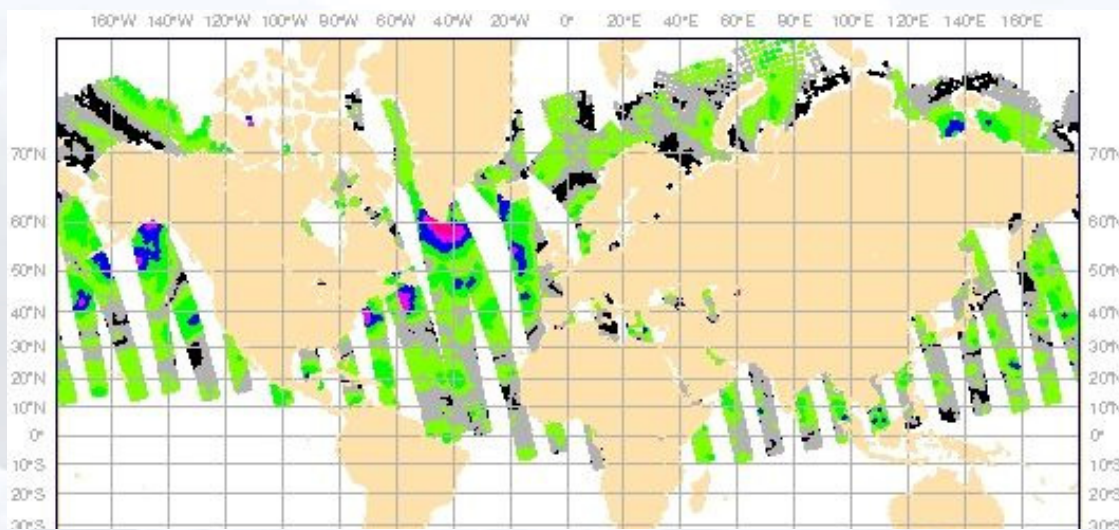
Coordinated effort with NOAA

Potential scenario includes data acquisition in Svalbard, L1 processing at EUMETSAT, and wind derivation by OSI SAF

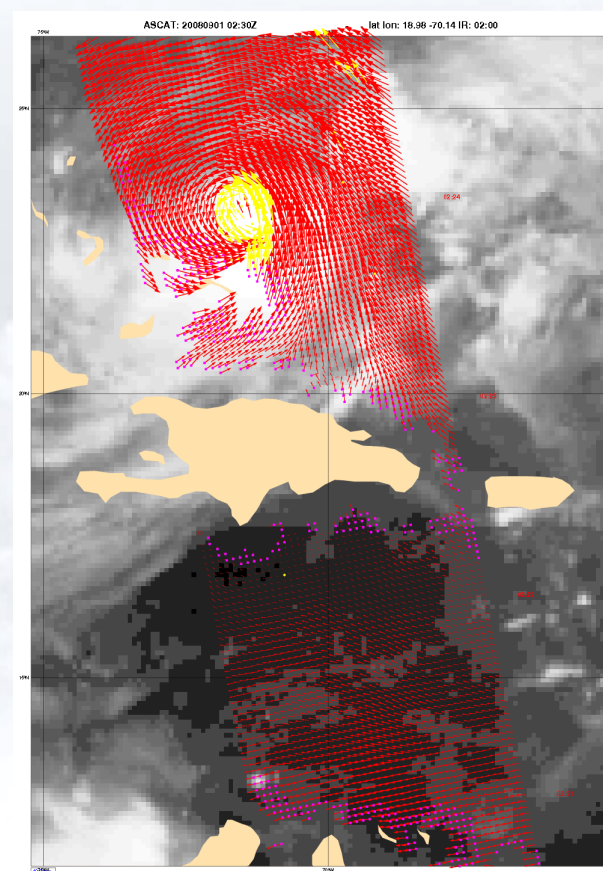


Metop-A HRPT Mitigation Activities

- EARS-ASCAT L2 products coverage from the X-Band Fast-Extract System:



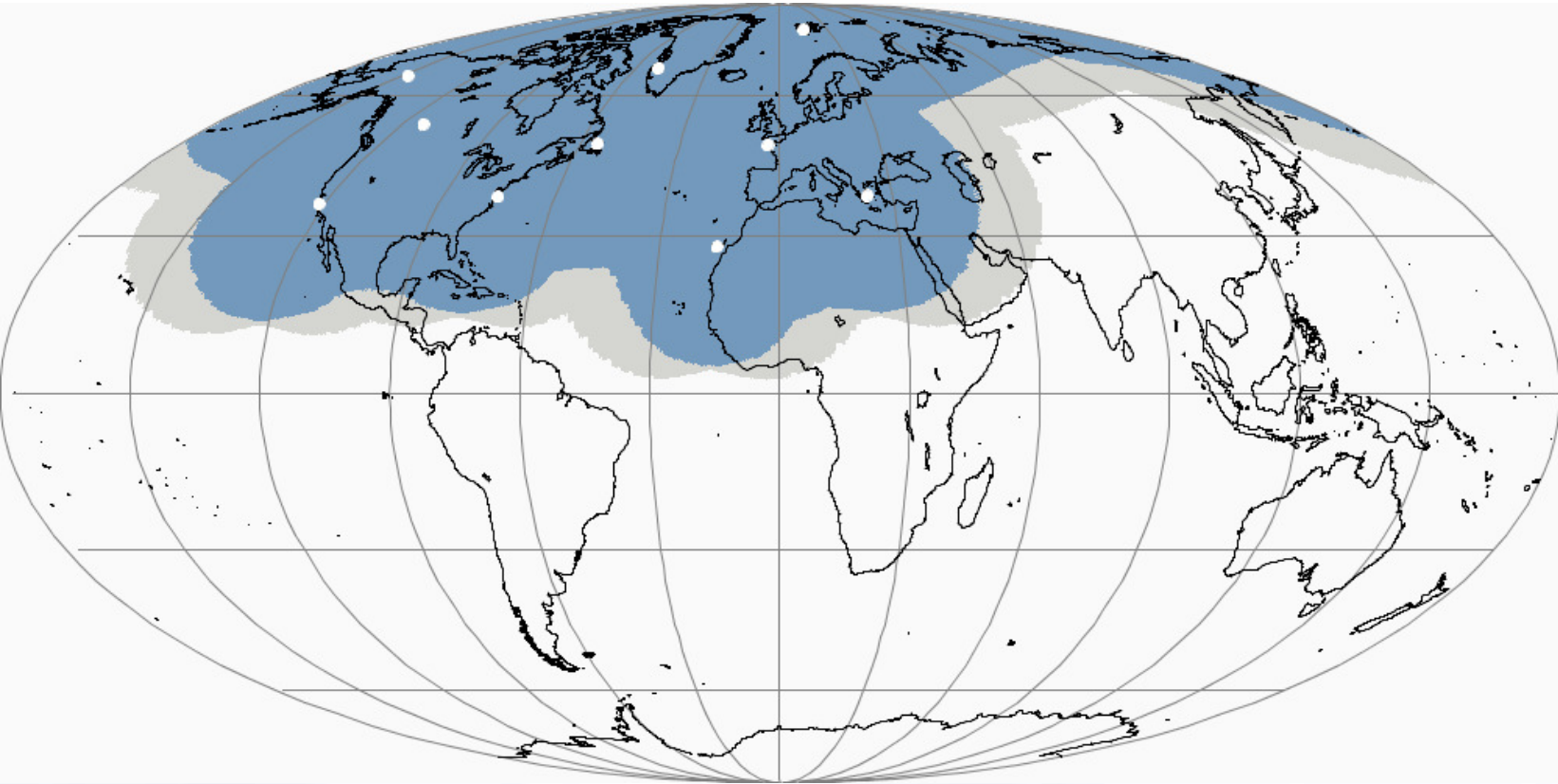
KNMI perform L2 processing of EARS-ASCAT products (wind speed and direction over the oceans at 12.5 and 25 km resolution).



Planned start of dissemination: 16 December 2008.



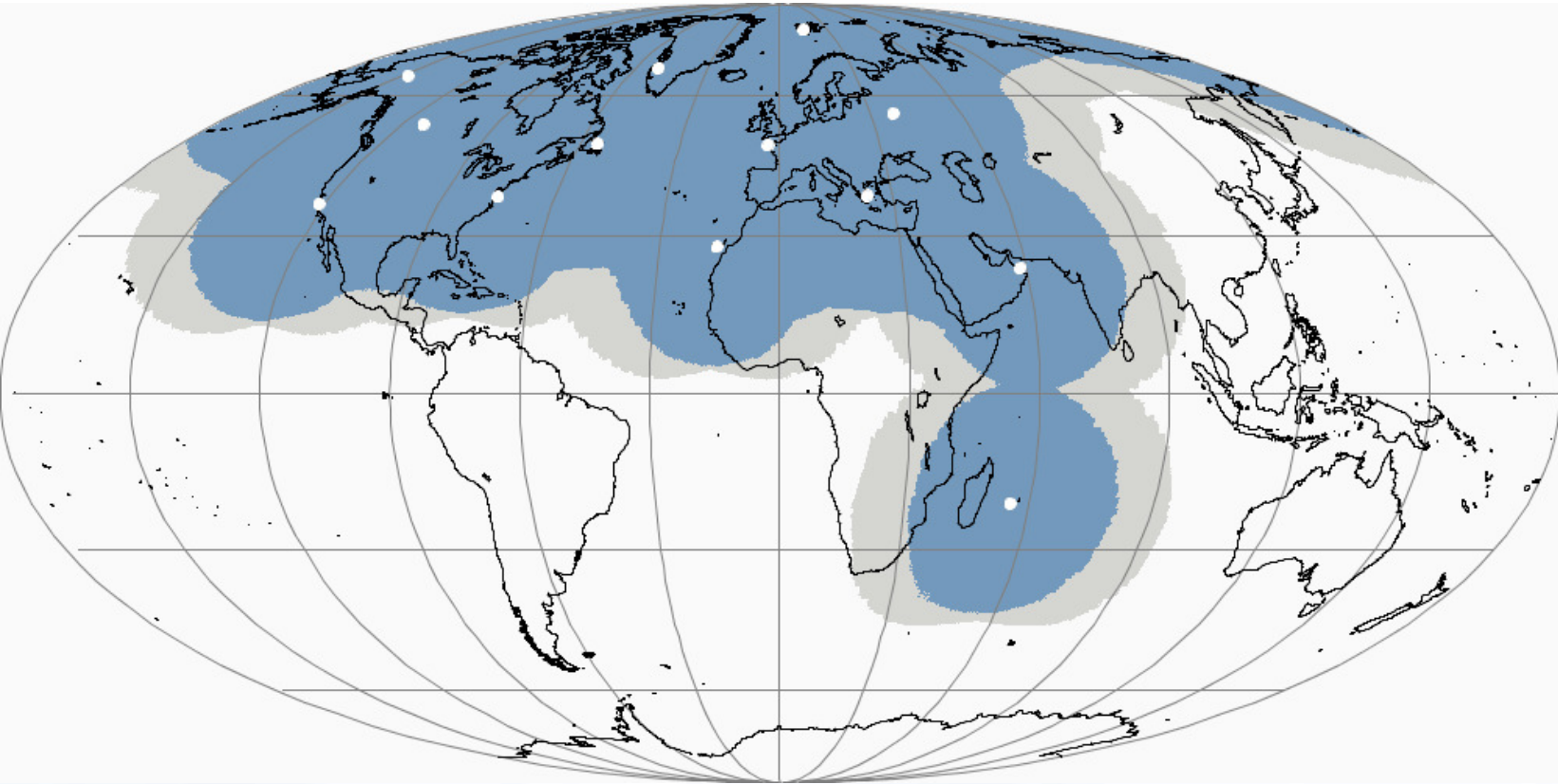
EARS Geographical Coverage: Current (24 %)



- Gilmore Creek
- Edmonton
- Monterey
- Kangerlussuaq
- Gander
- Wallops
- Svalbard
- Lannion
- Athens
- Maspalomas



EARS Geographical Coverage: Planned (32 %)



By Adding: Moscow • Muscat • La Reunion



GEO Spacecraft Operations

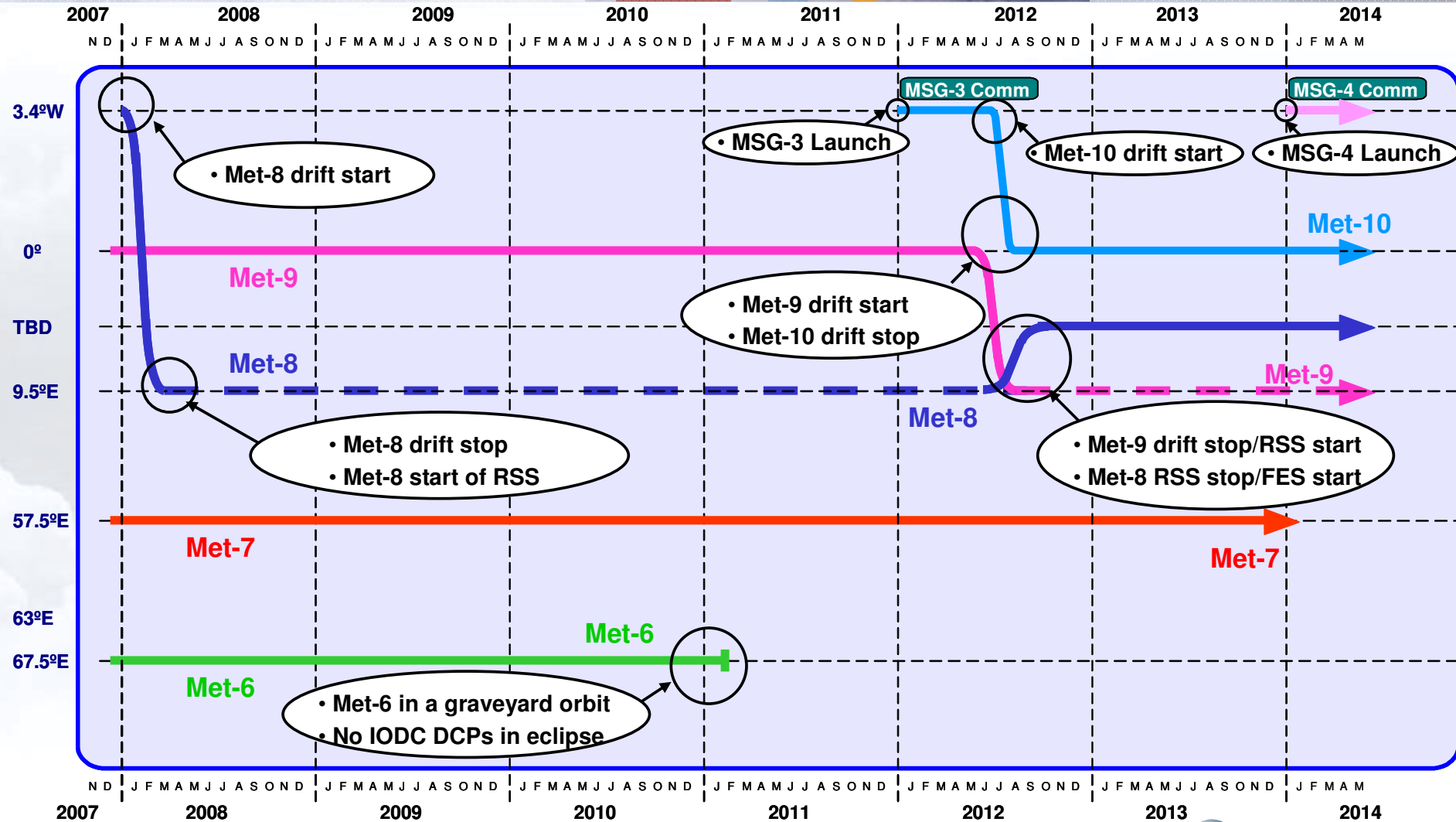
MET-9 at 0° → Prime mission. A Safe Mode in August 2009 (after the one in April 2009) due to a Single Event Upset (SEU) on the on board computer.

MET-8 at 9.5°E → Backup to Met-9 and RSS. No significant in-orbit anomalies to report. The S/C is beyond its specified lifetime (i.e. 7 years). Successful NS inclination manoeuvre in Oct 09.

MET-7 at 57.5°E → IODC service. No new in-orbit anomalies to report. A few tests to define a new S/C configuration are planned to support the IODC DCP mission during eclipse.

MET-6 at 67.5°E → IODC DCP and backup to Met-7. No new in-orbit anomalies. A re-orbiting date for Met-6 is under definition (worst case → Autumn 2010).

Space billiards!





Product	Satellite	Region	Bulletin header	Product times
Clear Sky Water Vapour Winds	Meteosat-7	IODC	IXCN01-IXCN03 IXCS01-IXCS03	Every 1.5 h 00:00,01:30...
Expanded Low Res Winds	Meteosat-7	IODC	IXCN05-IXCN11 IXCS05-IXCS11	Every 1.5 h 00:00,01:30...
High Res Water Vapour Winds	Meteosat-7	IODC	IXCN13-IXCN22 IXCS13-IXCS22	Every 1.5 h 00:00,01:30...
High Resolution Visible Winds	Meteosat-7	IODC	IXCN24-IXCN29 IXCS24-IXCS29	Every 1.5 h 00:00,01:30...
Atmospheric Motion Vectors	Meteosat-9	Africa/Europe	IUVA01-IUVA89 IUVD01-IUVD89 IUVE01-IUVE89 IUVH01-IUVH89 IUVI01-IUVI89 IUVL01-IUVL89	Hourly 00:45,01:45...
RSS AMVs	Meteosat-8	Europe		Every 20 mins 00:20,00:40...



Upcoming MPEF Changes

MSG MPEF transition to new hardware spring 2010

From HP to SUN, hence major undertaking, now on the last stretch

New release strategy (both MTP and MSG)

No more incremental releases, major releases 2-3 times a year (a'la ECMWF)

MTP Cross-calibration with MSG

To resolve outstanding MTP calibration issues, tests on-going

Long term (2011/12)

Transition from real-time processing to batch processing

⇒Simpler maintenance

⇒Simpler validation

⇒Small impact on timeliness (minutes)



Changes to AMVs in the near future

Small increase in processing area

65° => 67.5°

After new hardware => planned Q2/2010

Increase forecast levels for RTM & height assignment

Implementation Q4 2010

Operational Q1 2011

For rapid scan issues see Manuel's talk

For improvements in methodologies see Regis' talk



The RTM Change (+ surface emissivity maps)

Change from SYNSATRAD to RTTOV

Motivation

- Significant improvements in RTTOV since the start of MPEF operations
- Savings in processor time (particularly required for iterative retrievals)
- Synergies between data producer and users

Issues

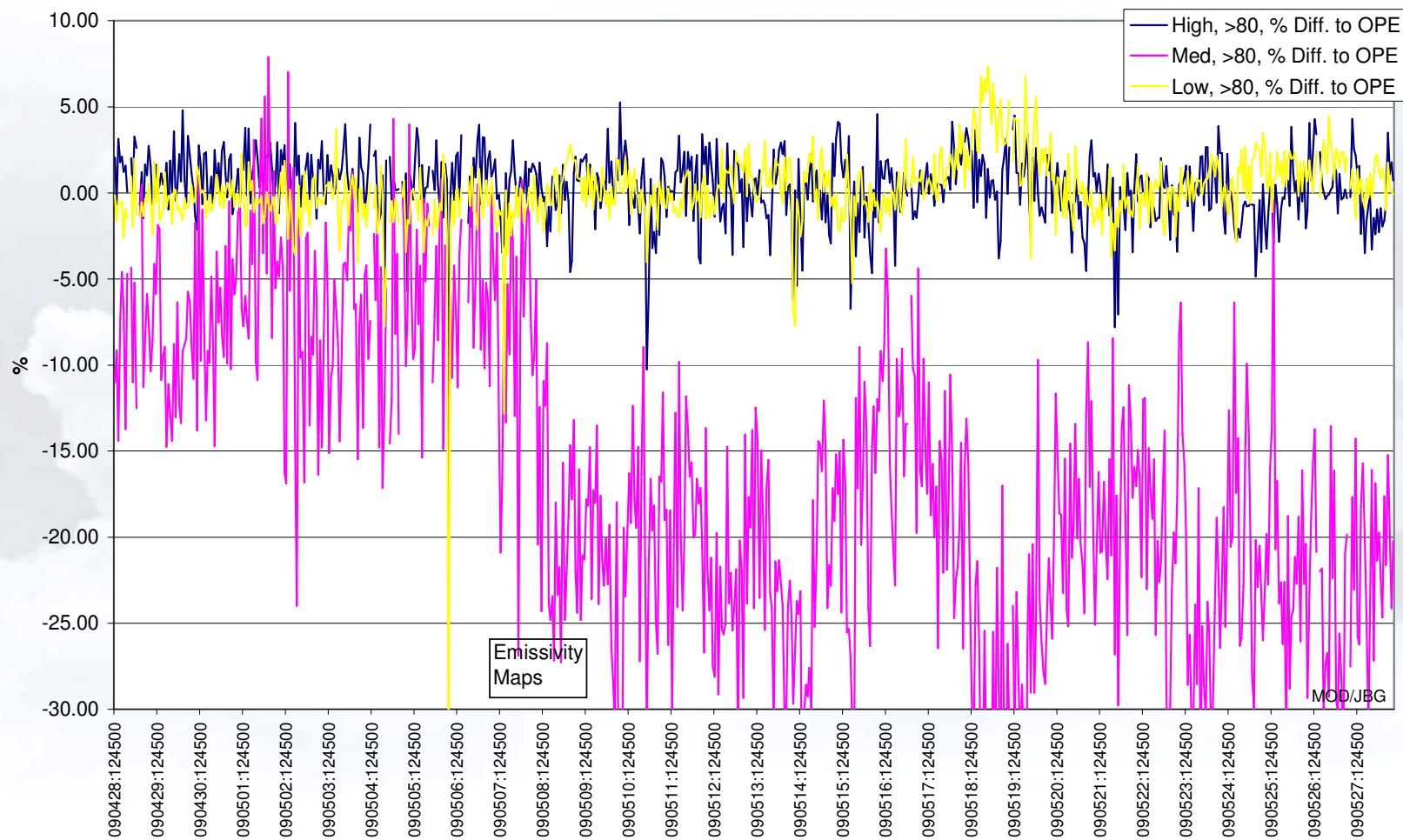
- RTMs are at the core of the MPEFs
- ⇒ All products are affected
- ⇒ Direct impact on AMV height assignment
- ⇒ Indirect impact via cloud detection

RTTOV Product Validation: AMV product, Daily Stats

	All AMV's				AQC			AMV's QI > 80%			
	TOT	HGH	MID	LOW	FCST	TVEC	SVEC	TOT	HGH	MID	LOW
WV 6.2											
OPE-B	11113	9057	2052		41.7	68.4	69.2	3880	3623	257	
Diff	-40	-326	287		0.0	-0.1	-0.3	-42	-57	15	
% of OPE	-0.4	-3.6	14.0		-0.1	-0.1	-0.5	-1.1	-1.6	5.9	
WV 7.3											
OPE-B	11710	5142	6117	451	39.5	74.8	70.3	4190	3217	831	142
Diff	-38	-4	-190	156	0.1	0.0	-0.3	-22	-24	-37	40
% of OPE	-0.3	-0.1	-3.1	34.5	0.2	0.0	-0.4	-0.5	-0.8	-4.5	28.1
IR 10.8											
OPE-B	10254	4629	998	4627	55.4	80.1	75.7	5056	2348	316	2392
Diff	29	58	-100	70	-0.1	0.0	-0.4	-23	8	-64	33
% of OPE	0.3	1.3	-10.0	1.5	-0.2	0.1	-0.5	-0.5	0.4	-20.2	1.4
VIS 0.8											
OPE-B	5916			3077	48.4	83.2	74.6	1724			1724
Diff	-5			21	-0.2	0.0	-0.9	6			6
% of OPE	-0.1			0.7	-0.4	0.1	-1.2	0.3			0.3
HRV											
OPE-B	14439			8362	53.2	83.0	80.3	5059			5059
Diff	-25			16	-0.5	0.3	-0.1	14			14
% of OPE	-0.2			0.2	-1.0	0.3	-0.1	0.3			0.3

RTTOV Product Validation: AMV product

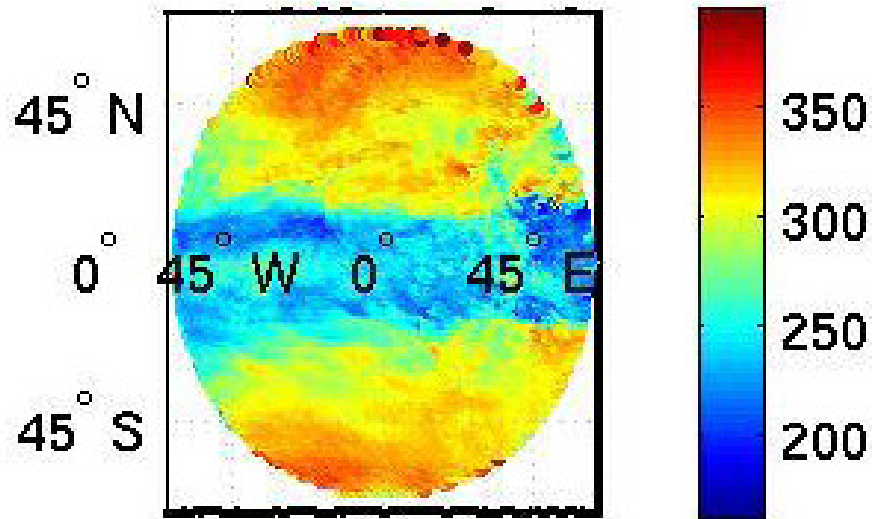
10.8 AMV's, QI > 80, % diff.



Changes in height assignment as noted by ECMWF

More by Iliana

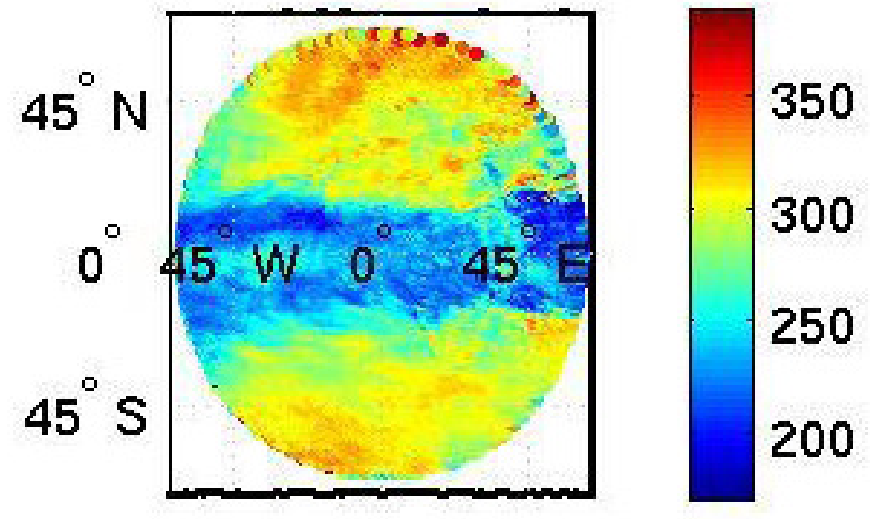
QI.GE.80



SYNSATRAD

Tendency to shift AMVs higher

QI.GE.80



RTTOV



What can we improve

Decoupling of product processing dependencies

The AMVs are complicated enough!

Also applicable to scene and cloud analysis

Independent SCE/CLA for AMVs or

Added information to SCE/CLA output such that follow-on processes can tailor the results

And again, see Greg's talk!

And how do we validate the impact of changes??

=> See Arthur's talk and join the special session!



Upcoming reprocessing activities

MSG L1.5 reprocessing to be concluded end 2010/early 2011 (Radiance definition change was introduced in May 2008 see previous IWWS processings)

⇒ Followed by MSG MPEF reprocessing in 2011

MTP reprocessing requires improved calibration

⇒ Is L1.5 reprocessing required for improved eclipse effect detection?

ASCAT reprocessing after the next calibration campaign

Improved calibration

Improved orbit normalisation

Current users in Europe

From 2008 Customer Satisfaction Survey



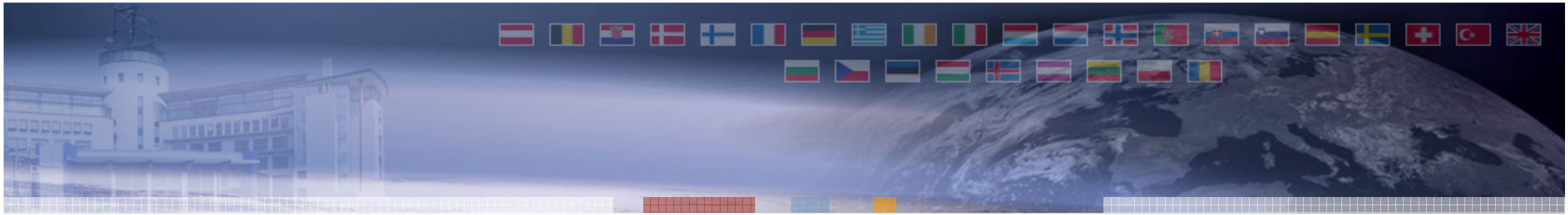
	In Use	Planned	In use	Planned
AMV	10	8	Austria (ZAMG), Denmark, ECMWF, France, Germany (DWD), Greece, Hungary, Italy, Norway, United Kingdom	Bulgaria, Estonia, Finland, Iceland, Ireland, Slovenia, Spain
ELW IODC	2	3	ECMWF United Kingdom	France, Hungary, Greece
HWW IODC	2	3	ECMWF United Kingdom	France, Hungary, Greece
WWW	0	9		Bulgaria, Estonia, Finland, France, Greece, Hungary, Slovenia, Spain



Current users outside Europe

From 2008 Customer Satisfaction Survey (only 9 replies)

	In Use or planned	Non-NMS users	NMSs
AMV	6+3	Algeria, Gambia, Malawi, Morocco, Niger,	JMA, Environment Canada, FNMOC USA (NWS)
ELW IODC	1+2	Morocco	JMA+ 1 Research Institute
HWW IODC	4+1	Algeria, Malawi, Morocco, Niger	JMA
WWW	5	Algeria, Malawi, Morocco, Niger	USA (NWS)



Conclusions:

Thank you

Anything else?