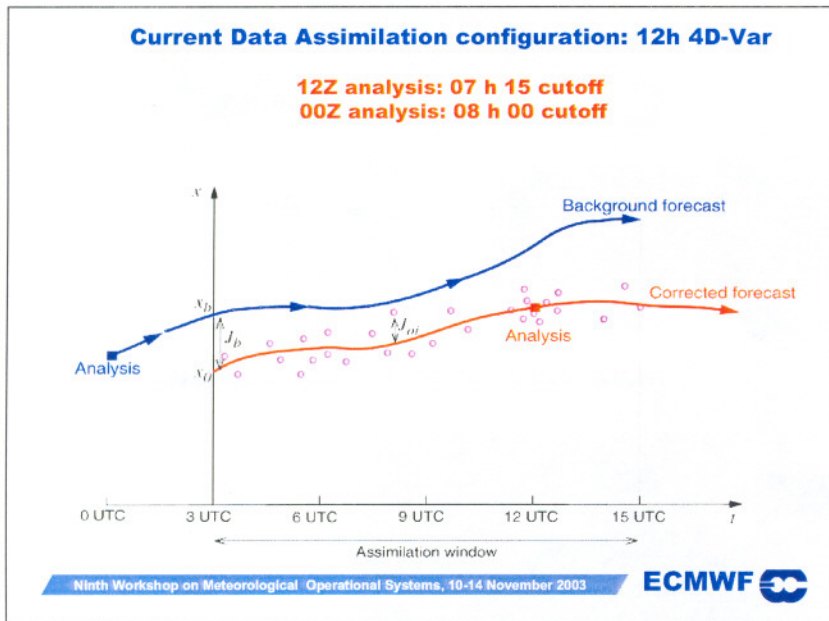


Requirements for timely data reception at ECMWF

Jean-Noël Thépaut, ECMWF

(with thanks to: Milan Dragosavac, John Hodkinson, Jan Haseler, Horst Böttger)



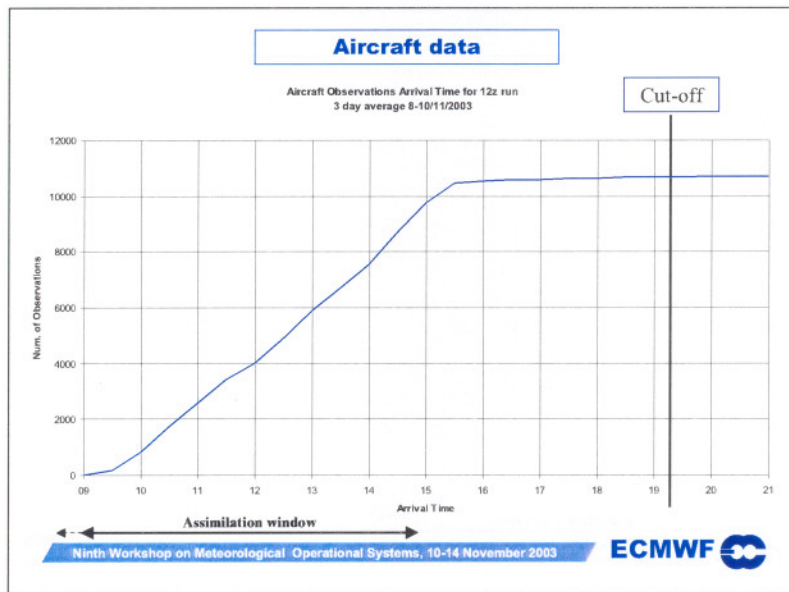
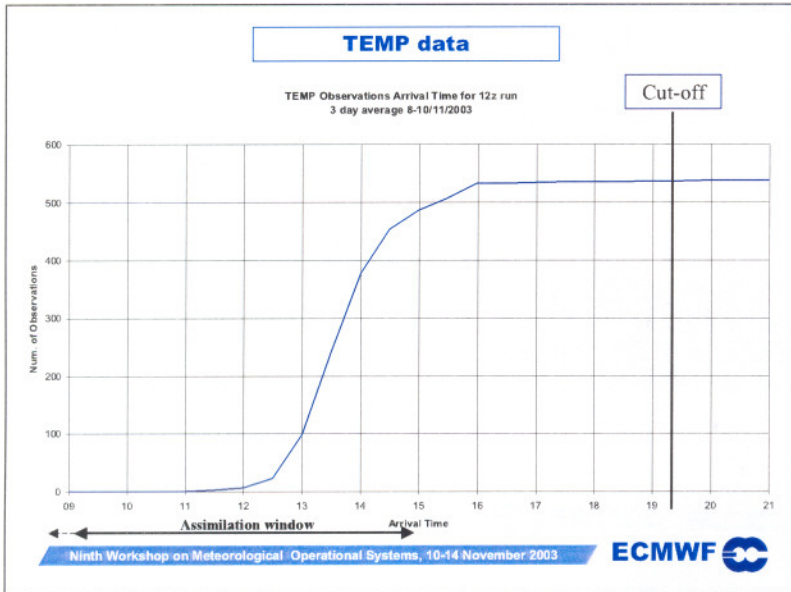
ECMWF operations October 2003 (26R3) – 27 satellite data sources

- AQUA AIRS
- 3 x AMSUA (NOAA-15/16/17) + AQUA AMSUA
- 3 SSMI (F-13/14/15)
- 2 x HIRS (NOAA-16/17)
- 2 x AMSU-B (NOAA-16/17)
- Radiances from 5xGEOS (Met-5/7 GOES-9/10/12)
- Winds from 4 x GEOS (Met-5/7 GOES-10/12) and MODIS/TERRA
- SeaWinds from QuiKSCAT
- ERS-2 Altimeter / SAR (limited coverage)
- SBUV (NOAA 16)
- ENVISAT OZONE (MIPAS)

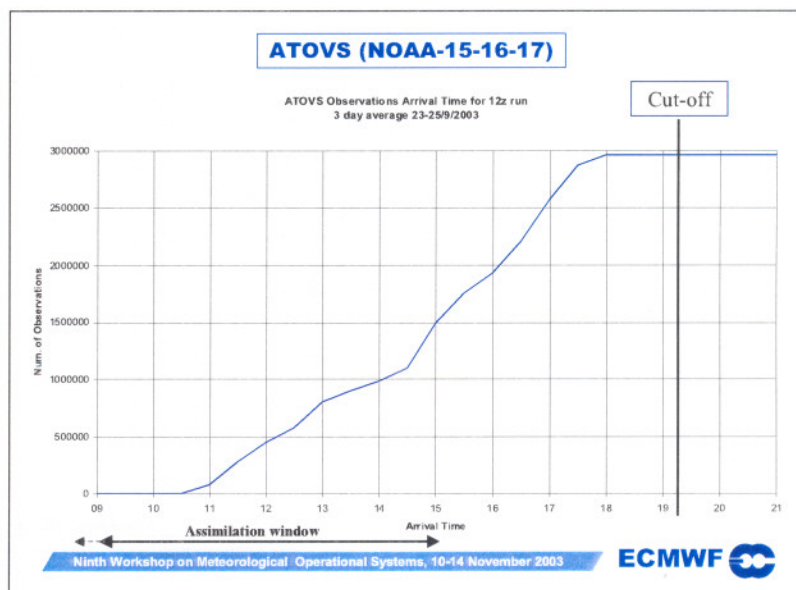
Screened			Assimilated		
Synop	190370	(0.27%)	Synop	38112	(1.06%)
Aircraft	233306	(0.33%)	Aircraft	146749	(4.07%)
Satob	543340	(0.78%)	Satob	71220	(1.97%)
Dribu	15081	(0.02%)	Dribu	4381	(0.12%)
Temp	110998	(0.16%)	Temp	63763	(1.77%)
Pilot	98364	(0.14%)	Pilot	56324	(1.56%)
UpperSat	68358565	(97.97%)	UpperSat	3107200	(86.19%)
PAOB	530	(0.00%)	PAOB	185	(0.00%)
Scat	222410	(.32%)	Scat	117196	(3.25%)
TOTAL	69 772 964		TOTAL	3 605 130	
99% of screened data are Sat. Data			91% of assimilated data are Sat. Data		

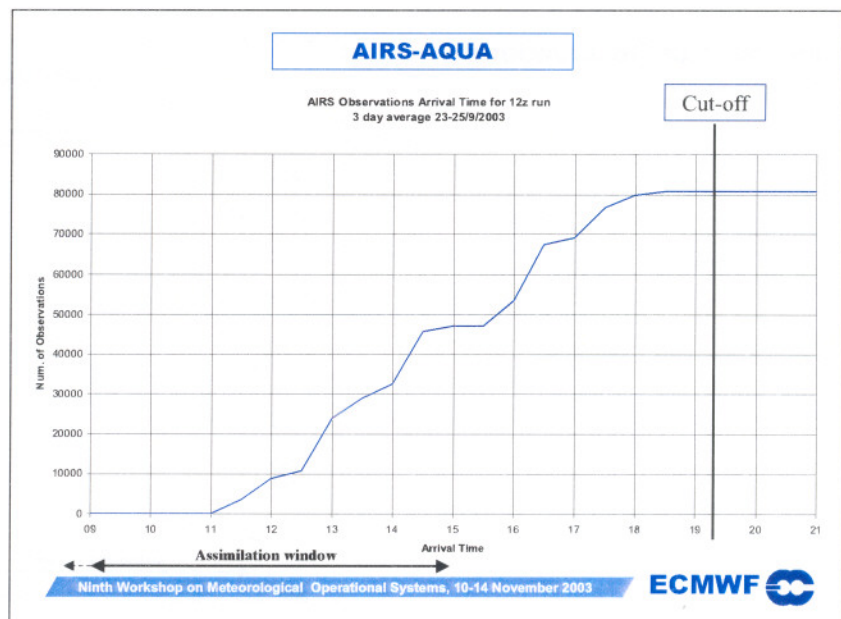
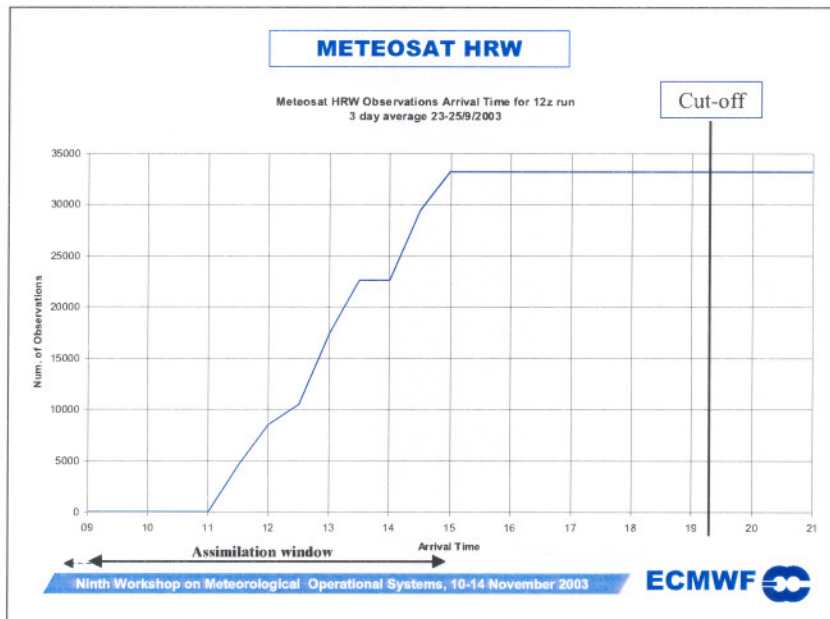
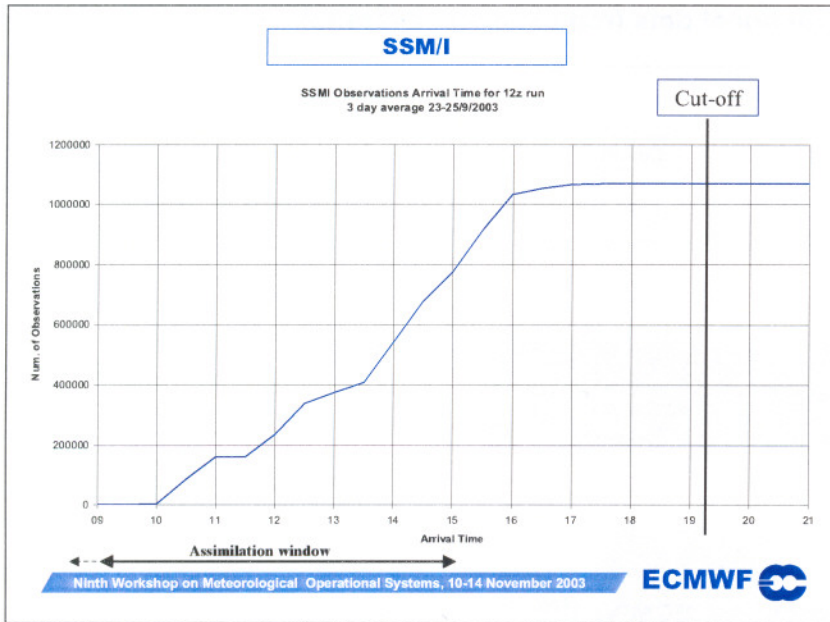
Current data count 26r3
(18/06/03 00Z)

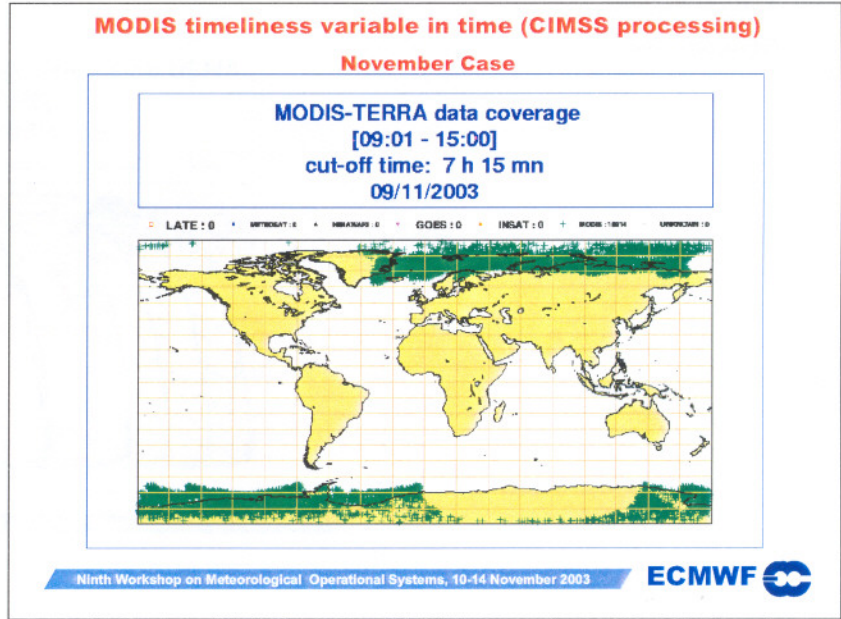
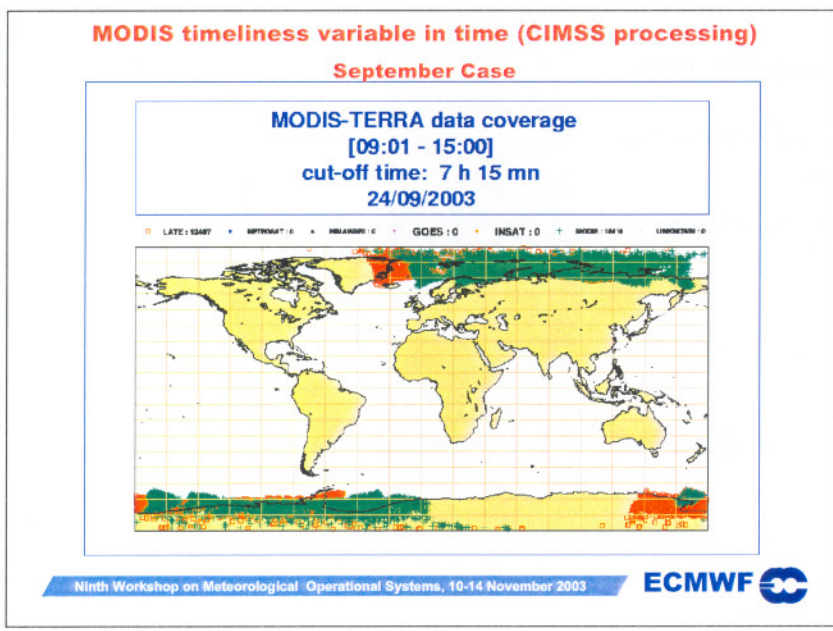
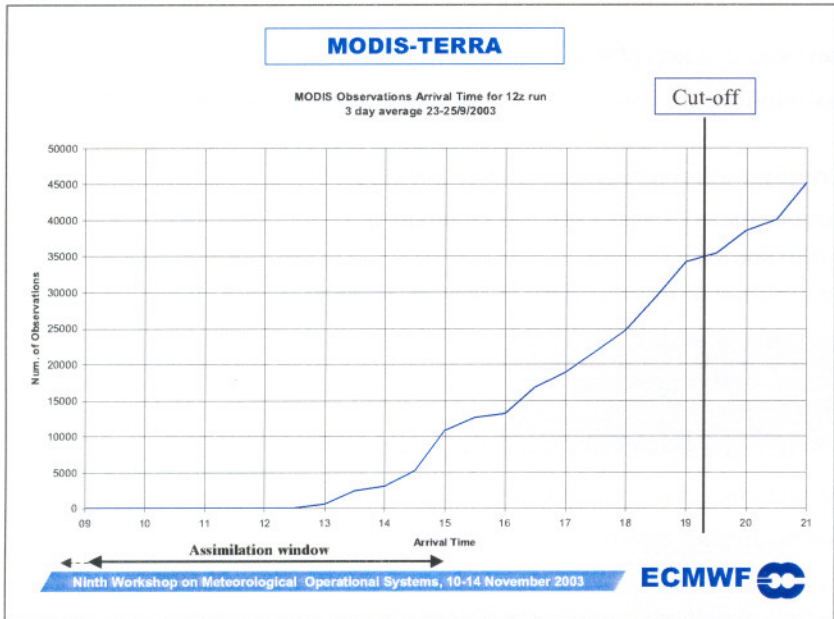
Timeliness of Observations – Conventional data (radiosondes, aircrafts)



Timeliness of Observations – Satellite Data







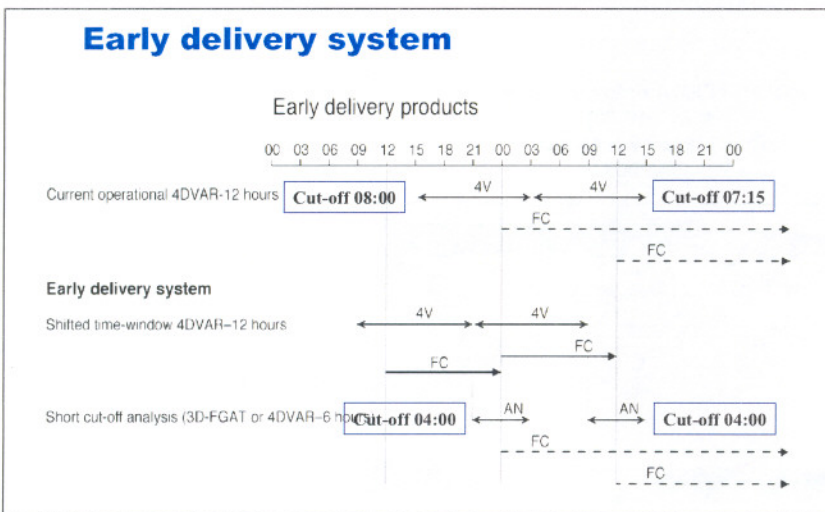
Timeliness of observations

- The timeliness of conventional observations is acceptable
- The ECMWF observation timeliness requirements are driven by the satellite requirements (more than 90% of the data currently assimilated)
- With the current data assimilation configuration (generous 7 to 8 h Cut-Off)
- The current timeliness of satellite observations is acceptable for the main run
 - Blind Orbit problem at 00 UTC (not shown)
 - Except for MODIS wind products (although improvement in the last weeks)

Early delivery project

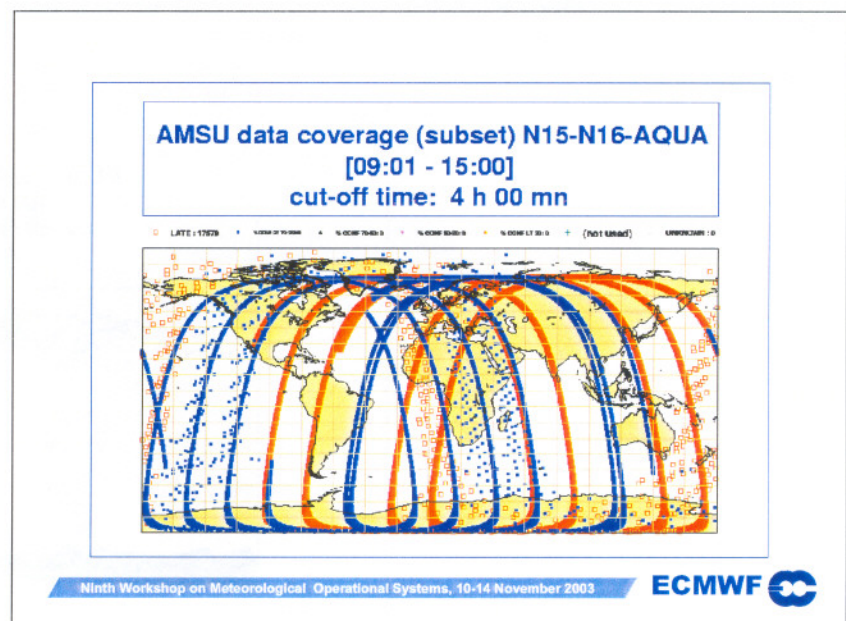
Context

- Interest from a number of Member States to access ECMWF products earlier
- A new configuration of the operational suite is being tested
 - Long cut-off assimilation coupled with short cut-off production analyses
 - 'rapid update cycle' twice a day
 - Shares common features with current practices in national NWP Centres

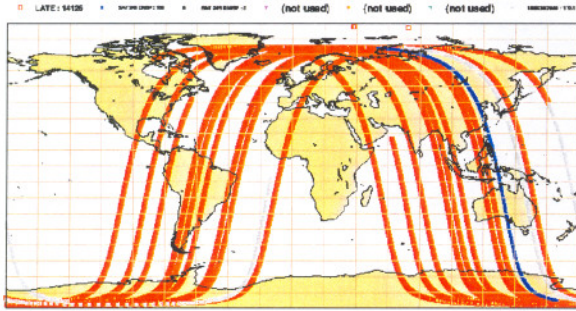


Impact of envisaged scenario

- Data coverage
- Meteorology



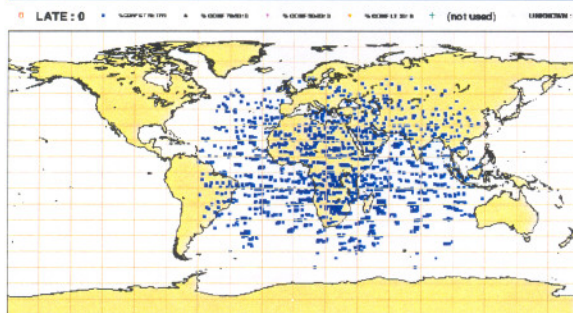
SSM/I data coverage (subset)
[09:01 - 15:00]
cut-off time: 4 h 0 mn



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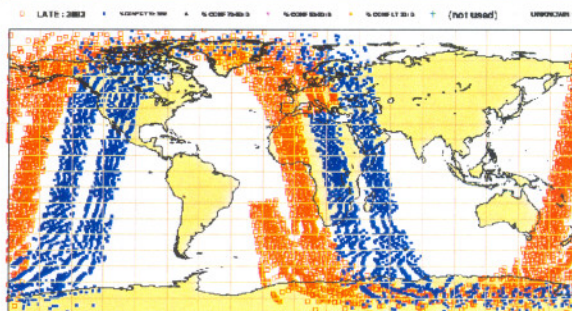
METEOSAT data coverage
[09:01 - 15:00]
cut-off time: 4 h 00 mn



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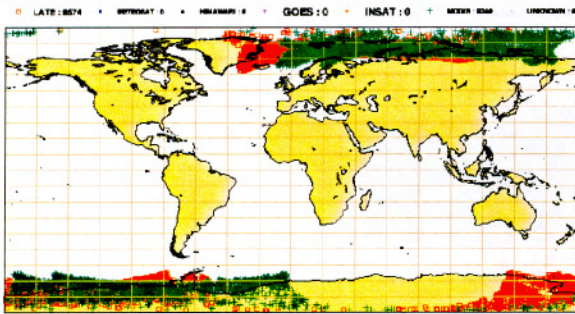
AIRS data coverage
[09:01 - 15:00]
cut-off time: 4 h 00 mn



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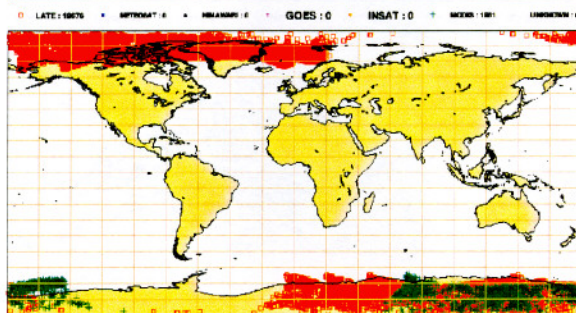
MODIS-TERRA data coverage
[09:01 - 15:00]
cut-off time: 4 h 00 mn



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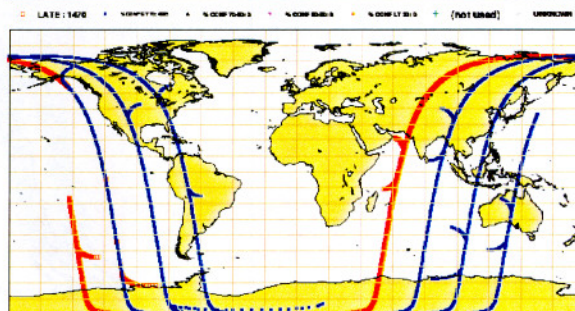
MODIS-AQUA data coverage
[09:01 - 15:00]
cut-off time: 4 h 00 mn



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QUIKSCAT data coverage
[09:01 - 15:00]
cut-off time: 4 h 00 mn

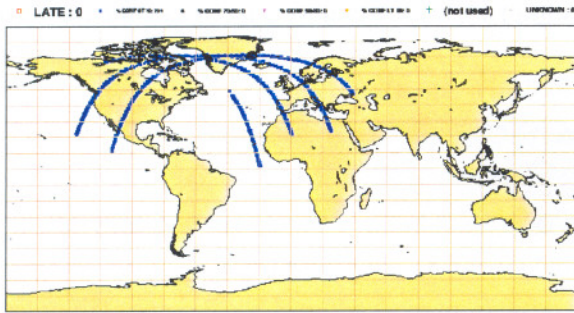


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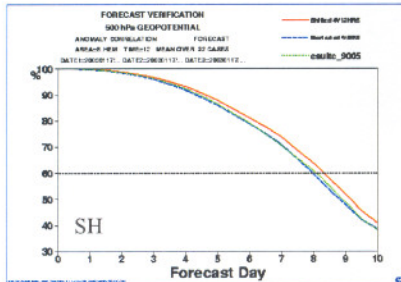
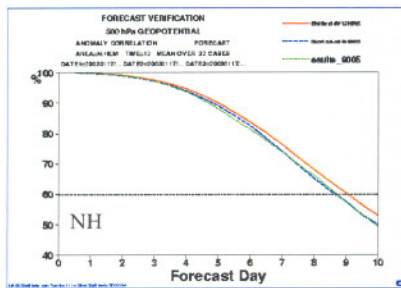


Potential benefit of the Eumetsat Atovs Retransmission Service

EARS data coverage (subset)
[09:01 - 15:00]
cut-off time: 4 h 0 mn



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Meteorology
(mean scores Z500)

control

Shifted window 4V-12h

Short cut-off 4V-6h

- Shifted window 4V-12h performs best (uses additional 6h worth of data)
- Short cut-off forecasts overall perform similarly to the control

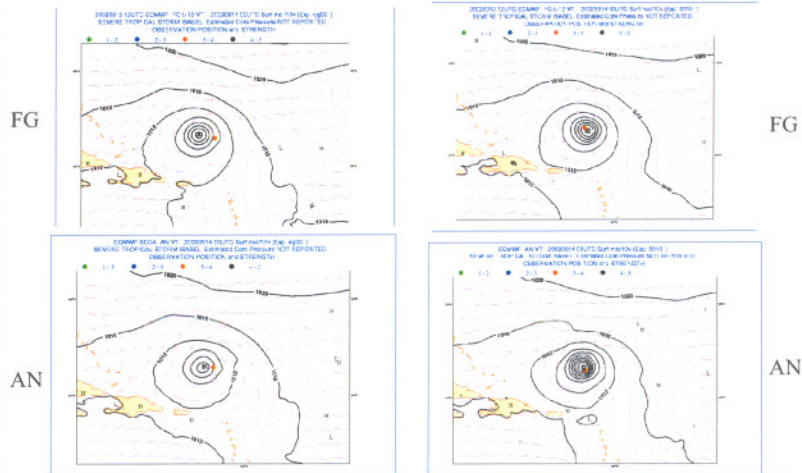
10-14 November 2003



Meteorology (Tropical cyclone ISABEL)

Short cut-off 4V6h

Control



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Discussion

The current timeliness of satellite data is acceptable with the current data assimilation configuration although:

- Modis winds are irregular
- Blind orbits are missing for the 00Z run

The situation will radically change if/when a new data assimilation configuration is in place

- Short-cut off (4h = 1h after the end of the window) analyses will miss a lot of satellite data – in particular SSM/I and MODIS
- A global extension of EARS could solve the problem (~30mn)

The impact of the short-cut-off strategy developed at ECMWF is under evaluation

- The quality of the assimilation cycle seems essential
- On average, short cut-off 4V6h performs reasonably well (too limited number of cases yet to be conclusive)
- Synoptically, differences between short cut-off 4V6h and 4V12h can be large

The ECMWF requirements will converge towards those from most national NWP centres (1h or less)

The definition of the 'Near Real Time = 3 hours' should be revisited by regional and global NWP community