

MONITORING WEATHER AND CLIMATE FROM SPACE



**EUMETSAT Headquarters
Darmstadt, Germany**

**Central Operations Report
for the period July to December 2013**



EUMETSAT Central Operations Report for July – December 2013

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The Central Operations Reports can be found under 'Data' → 'Service Status' on www.eumetsat.int

For a full account of service enhancements, please refer to the Product History, also on the Service Status webpage.

Introduction

The second half of 2013 has seen on-target performance for the majority of services. It was the first complete half-year period in which both Metop-A and Metop-B were in dual operation with data and products from both satellites being provided to the user community. The Metop GDS charts in this issue have been changed to reflect the availability of the 'dual service'. Metop-B continues to be the prime operational polar-orbiting satellite.

As reported in the previous issue of this report, the Meteosat Rapid-Scanning Service (RSS) has been effectively extended since June 2013 by the use of the backup satellite, Meteosat-8, to provide continuity of imaging during the planned RSS gaps. These gaps are necessary in order to allow the SEVIRI instrument onboard the prime RSS satellite, Meteosat-9, to be switched to Full-Earth Scanning (FES), to fully exercise its mechanics. Provided it is available and no operational situation dictates otherwise, then Meteosat-8 is put into rapid-scanning mode just ahead of the Meteosat-9 FES periods and the ground segment is switched to acquire and process its data for the duration of those periods and to disseminate the images to EUMETSAT's users. Due to operational constraints, no meteorological products can currently be generated for the 48-hour monthly gaps, only the annual 28-day gaps.

One third-party service of note which has become operational in the reporting period is the one delivering Operational Geophysical Data Records (OGDRs) from the AltiKa instrument of ISRO/CNES's SARAL mission. See [slide 46](#) for more information.

5 operational incidents occurred in the reporting period – two of these concerned satellites (Meteosat-9 and both Metops) and the remaining three concerned MSG Ground Segment facilities. These incidents impacted services, although the severity was generally well-contained by use of established contingency / recovery procedures. See [slide 9](#) for the Meteosat-related incidents and [slide 18](#) for the one concerning the Metop.



Introduction (continued)

Provision of Jason-2 OGDRs was below target in September due to the satellite entering a safe-hold mode for the third time in the year, this time triggered by a transient memory error, resulting in a mission data outage of about 7½ days.

Last but not least, I am happy to inform of the following changes in content in this issue of the report:

- New charts have been added for the following services:
 - [EARS-NPP \(CrIS & ATMS\)](#) - operational since 24-April
 - [EARS-NWC](#) - operational since 15-May
 - [SARAL OGDRs](#) - operational since 16-September
- To reflect dual Metop operations, the Metop GDS charts now show both Metop-A and Metop-B Level 1 / Level 2 product availability, that for Metop-A replacing the previous Metop-B Level 0 component.

Best regards,

Livio Mastroddi

Director of Operations and Services to Users

Performance Reporting: Categories

The charts on the following slides present a summary view of the performance of the services within the categories listed here:

- [Meteosat Services](#)
- [Metop/NOAA Global Data Service](#)
- [Metop/NOAA Regional Data Service \(EARS\)](#)
- [Search and Rescue Support](#)
- [Jason-2 OGDR Service](#)
- [Third-Party Data Services](#)
- [EUMETCast](#)
- [The EUMETSAT Data Centre](#)
- [EUMETSAT Climate Services](#)
- [Helpdesk Service](#)

Several terms with special meaning (e.g. ‘Nominal RCs’) appear in the following slides. A [glossary](#) is provided at the end of the report.

Performance Reporting: Conventions

Availability of EUMETSAT Services:

The availability of most operational services provided by EUMETSAT is measured monthly against service-specific targets. This report presents the performance of the individual services in the form of charts showing their month-by-month availability, accompanied by commentary identifying any significant events or factors (whether satellite or ground-segment in nature) which may have had impact on the provision of them.

Events with General Impact:

Any event which significantly affected the availability of a single service (e.g. the malfunction of a single instrument) is indicated on the relevant slide for that service.

Some events impact the availability of more than one individual service (e.g. an outage of EUMETCast). Such events are described on separate slides near the start of the [‘Meteosat Services’](#) and [‘Metop/NOAA Global Data Service’](#) sections. Where needed, slides concerning other services make reference to one or the other.

Meteosat Services

This service category comprises the data and products produced with the Meteosat System, which comprises geostationary satellites positioned at longitudes 0°, 9.5°E and 57°E. These satellites nominally support the Full-Earth Scan (FES), Rapid-Scan (RSS) and 'Indian Ocean Data Coverage' (IODC) services respectively. A further satellite at 3.5°E provides backup for the FES and RSS services and is used for RSS 'image gap-filling' in the rapid-scan pauses of Meteosat-9, when operational constraints permit.

The individual services addressed in this section are as follows:

- Meteosat 'Full-Earth Scan' image data acquired at 0° and 57°E
- Meteosat 'Rapid Scan' image data acquired at 9.5°E
- Meteorological products derived from that image data
- Data Collection and Retransmission (the DCP service)

Meteosat Services: Events with General / Significant Impact

The following events were of relevance with respect to the Meteosat Services:

Operational Incident #53

18-Aug-2013: Slow running of the MSG Mission Control Facility led to a series of problems which eventually caused a 3-hour outage of images and meteorological products for the 0° and RSS services. Some procedural improvements are being put into place to prevent recurrence.

Operational Incident #54

25-Oct-2013: A Processor Module safe-mode occurred onboard Meteosat-9, suspected as being caused by a radiation particle. The RSS service was swapped to the backup satellite, Meteosat-8, and thus only a 3-hour imaging outage was sustained. Due to operational constraints, meteorological products were unavailable for a longer period (approx. 3 days). Meteosat-9 operations were recovered without any issue.

Operational Incident #56

22-Nov-2013: Due to mechanical failure, one of the MSG antennae at the Usingen was put out of action. Although Meteosat operations can continue safely with the remaining antennae, using Meteosat-8 for the RSS service during those periods when Meteosat-9 is 'Full-Earth Scanning' is on-hold until further notice. Investigation into the failure has identified several potential causal factors which are under review.

Operational Incident #57

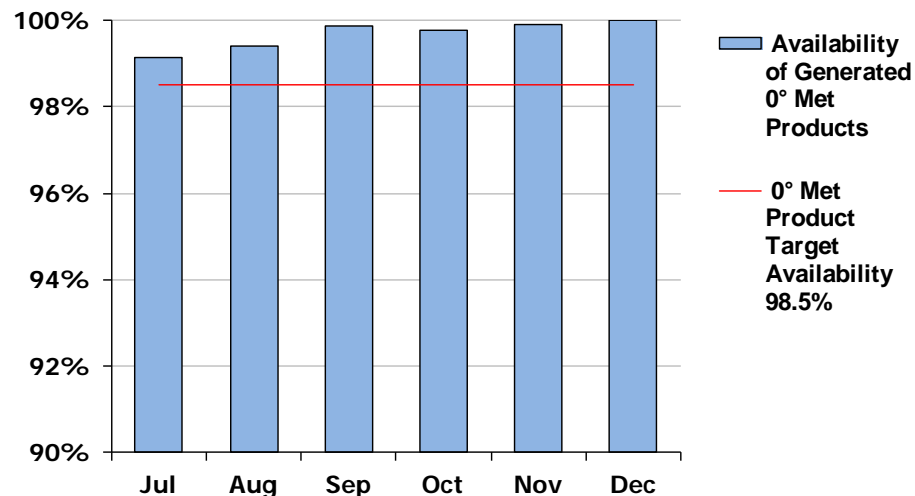
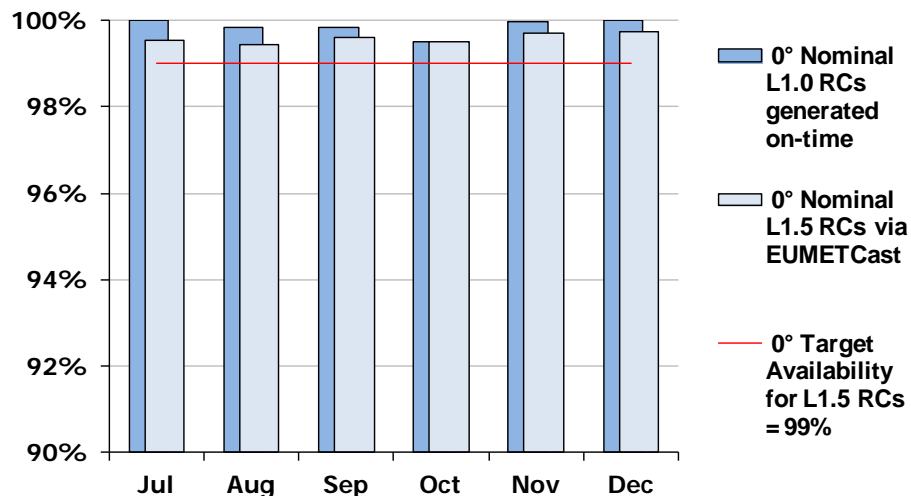
1-Dec-2013: Slow running of the MSG Mission Control Facility led to procedure-execution failures which triggered a SEVIRI calibration section switch-off, resulting in a 5-hour outage of images and meteorological products for the RSS service. Several software mitigation measures are being implemented to reduce the likelihood of recurrence.

RSS Gap-Filling: increased service July - November

Use of the backup satellite Meteosat-8 was made to support RSS during the 48-hour gaps normally present July through to October and the monthly gap starting in November. This meant effectively an increase of about 7% in the Repeat Cycles scanned and delivered to users. The percentages for those months on the left-hand chart on slide 12 are relative to 'no gap scanning', whereas that for December is relative to a 48-hour gap in that month due to Incident #56.

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Meteosat Services → 0° FES Image Data & Derived Meteorological Products



Prime satellite supporting the service is Meteosat-10.

Service performance is measured in terms of:

- 1) The number of Nominal Level 1.0 Repeat Cycles (RCs) which are generated 'on-time', as a percentage of those scheduled
- 2) The timely availability of nominal HRIT Level 1.5 RCs via EUMETCast

Events which impacted availability:

August: 9 FES L1.5 RCs impacted by Incident 53

October: Tank-Heater switching, sun-satellite colinearity and wrong manoeuvre parameters impacted a total of 15 FES L1.0 RCs

(see [slide 9](#) for info on Incidents)

Performance measured in terms of the number of meteorological products which have been generated at EUMETSAT from the Full-Earth Scan images provided for the 0° service, as a percentage of those products scheduled.

Note that the availability of products is only measured at the point of generation.

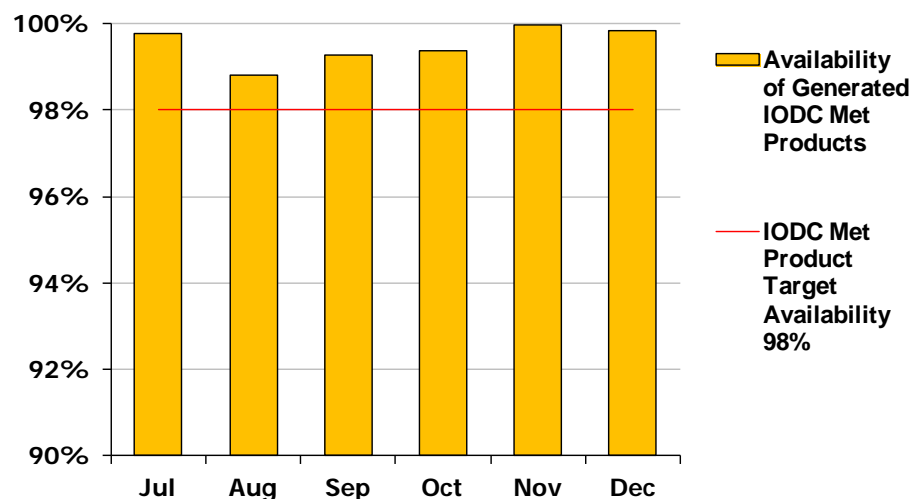
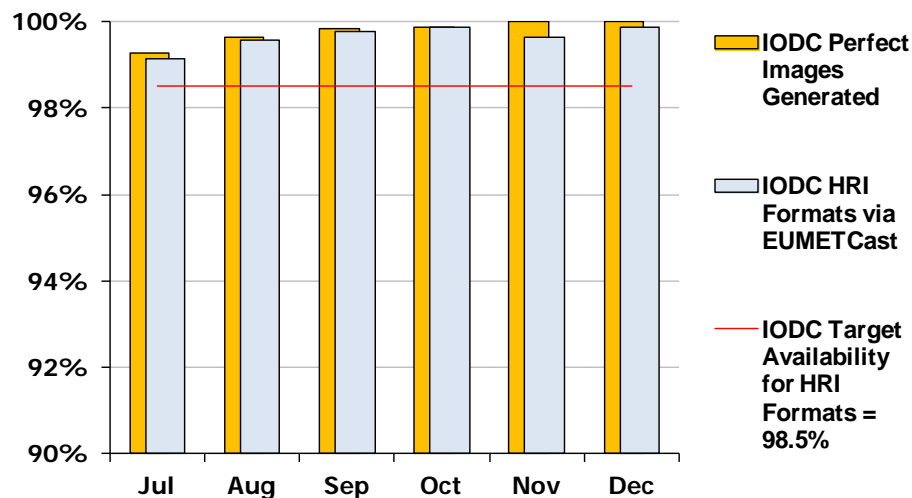
Events which impacted availability:

July: Decontamination of Meteosat-10 necessitated switching operations to Meteosat-8, requiring a usual several hours of data capture by the algorithms before the generation of certain meteorological products could resume.

August: Approx. 6 hours of products impacted by Incident 53

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Meteosat Services → IODC 57°E Image Data & Derived Meteorological Products



Service supported by Meteosat-7 in the reporting period.

Performance is measured in terms of:

- (1) the number of Perfect Images which have been generated, as a percentage of the total number of images scheduled,
- (2) the availability of Perfect Formats directly disseminated via Meteosat-7, as a percentage of the formats scheduled.

Events which impacted availability:

5-31 July: 11 images in total impacted by satellite downlink losses.

Performance of this component of the IODC service is measured in terms of the number of meteorological products which have been generated at EUMETSAT, as a percentage of those scheduled.

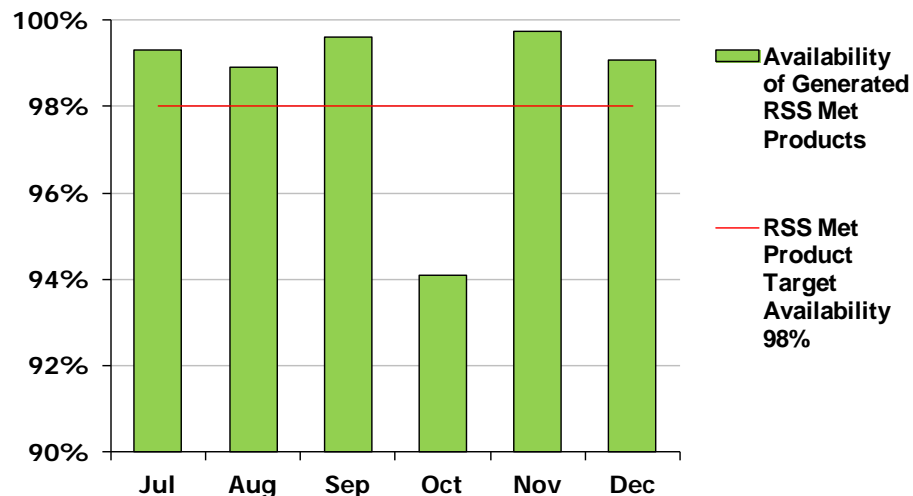
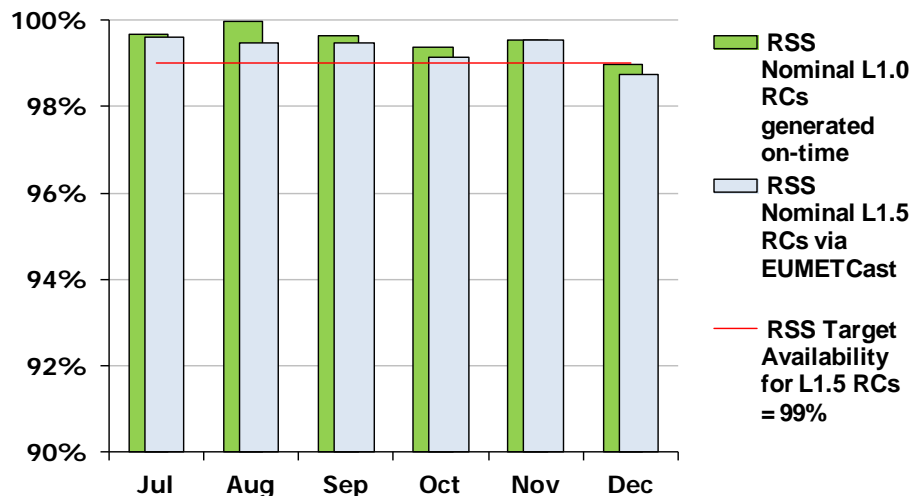
Note that the availability of products is only measured at the point of generation.

Events which impacted availability:

Aug - Sept: Eclipse effects impacted wind products. The increasing inclination of Meteosat-7 suspected as exacerbating the effect in the recent eclipse seasons.

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Meteosat Services → 9.5°E RSS Image Data & Derived Meteorological Products



Prime satellite supporting the service is Meteosat-9.

For more info on RSS: www.eumetsat.int --> [Rapid-Scanning Service](#).

Performance is measured in terms of the number of nominal Level 1.0 Repeat Cycles (RCs) which are generated 'on-time', as a percentage of those scheduled, plus the availability of Level 1.5 RCs disseminated via EUMETCast.

Events which impacted availability:

August: 41 RSS L1.5 RCs impacted by Incident 53

October: 36 RSS L1.0 RCs impacted by Incident 54

December: (1) 62 RSS L1.0 RCs lost due to Incident 57

(2) Landmark detection problems resulted in non-nominal geometric quality of a further 49 RCs.

(See [slide 9](#) for further information on the Incidents, and details of the extra service achieved July – November by the 'gap-filling' activity)

Meteorological products derived from RSS Repeat Cycle images.

Performance of this service is measured in terms of the number of meteorological products which have been generated at EUMETSAT, as a percentage of those scheduled.

Note that the availability of products is only measured at the point of generation.

Events which impacted availability:

All Incidents referenced in the comment box on the left-hand side led to impacts on meteorological products comparable to those on the images.

Incident 54 in October impacted meteorological products to a greater degree because of operational constraints as regards product generation with an unplanned satellite swap.

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Meteosat Services → DCP Channel Availability at 0°

Data Collection and Retransmission operations at 0° utilise the international and regional DCP channels of the satellite supporting the service (nominally Meteosat-10).

The chart shows the availability of the 0° DCP service. It is measured in terms of the number of hourly reference DCP messages on all operational regional channels which have been successfully received back by EUMETSAT, as a percentage of those sent.

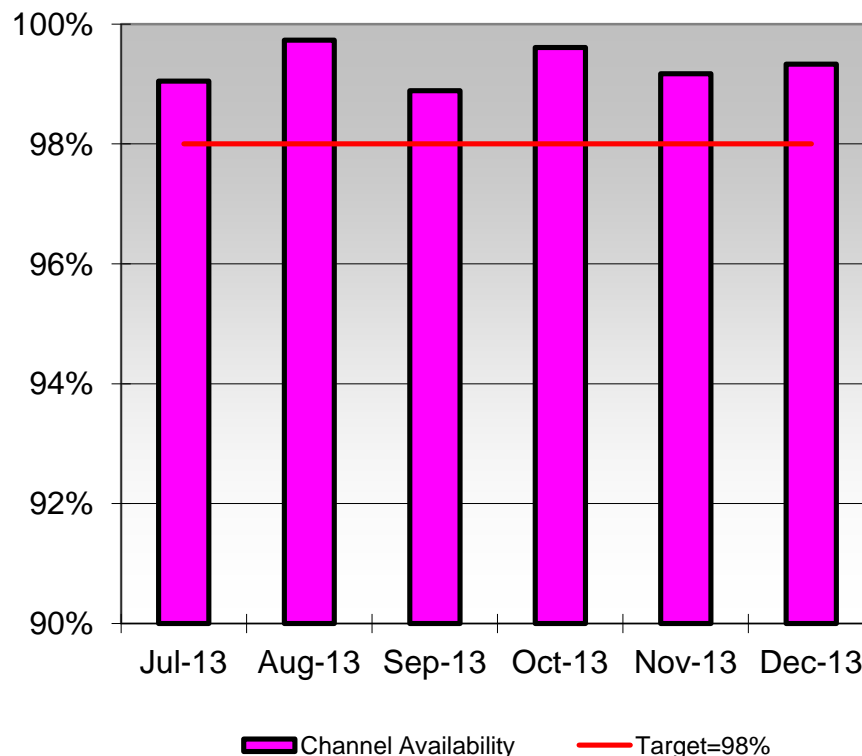
(Note that the availability of the 4 DCP channels supported by Meteosat-7 as part of the Indian Ocean Tsunami Warning System (IOTWS) is not included)

For information concerning the geographical distribution of registered DCPs, please see the next slide.

Events Which Impacted DCP Channel Availability:

None significant.

Note: Although DCP channel availability was above target in all months of the period, some DCP operators reported loss and/or corruption of DCP messages. Investigation pointed to two causes: a radio frequency interference on the satellite link and a hardware issue in a reception unit at the ground station. The latter has now been corrected and investigation continues in order to identify the radio frequency interference source.



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Meteosat Services → Geographical Distribution of DCPs

DCPs	Country	DCPs	Country	DCPs	Country	DCPs	Country
6	Albania	5	Falklands	19	Mali	2	Togo
51	Algeria	1	Finland	1	Malta	4	Tunisia
11	Angola	117 ↑	France	4	Mauritania	1	Turkey
2	Armenia	1	Gambia	4	Mauritius	49 ↑	UK
2 ↓	Austria	43 ↓	Germany	23	Mozambique	24 ↑	Ukraine
		8	Ghana	2	Myanmar	1	Union des Comores
3 ↑	Belarus	1	Gibraltar	18	Namibia	62	USA
2 ↓	Benin	1	Greece	22 ↓	Niger		
11	Botswana	11	Guinea	18	Nigeria	1	Yemen
1	Brazil	2	Guinea-Bissau	10	Oman	15	Zambia
4	Bulgaria	19	Indonesia	3 ↓	Pakistan	13	Zimbabwe
6	Burkina Faso	2	Iran	0 ↓	Palestine		
60 ↓	Cameroon	158 ↑	Iraq	3	Philippines		
1	Canada	8	Ireland	11	Republic of Moldova		
4	Cap Verde	74 ↓	Italy	11 ↑	Republic of Seychelles		
2	Central African Republic	3	Ivory Coast	8 ↓	Romania		
3	Chad	3 ↓	Kenya	12	Senegal		
3 ↑	Congo	6	Lesotho	37 ↑	South Africa		
3	Croatia	11	Libya	7	Spain		
1	Cyprus	2	Madagascar	35 ↑	Sri Lanka		
26	Dem. Rep. of the Congo	9 ↑	Malawi	2	Swaziland		
1	Djibouti	1	Malaysia	10	Tanzania		
1	Egypt	3	Maldives				

As of the end of December 2013:

1125 registered Data Collection Platforms (DCPs),

belonging to 134 operators,

deployed amongst the 76 countries shown in the table.

Out of the total number of registered DCPs, there were 612 units in active operation.

Larger numbers of DCPs are highlighted with darker colours.

Table entries in green = new.
Country name in red = DCPs no longer registered.

↑ ↓ = indicates an increase /decrease in DCPs registered, compared with previous report.

Metop/NOAA Global Data Service

This service comprises the provision of Level 0, 1 and 2 products derived from Metop and NOAA instrument data as shown in the following table:

	A-DCS	AMSU	ASCAT	ATOVS	AVHRR	GOME-2	GRAS	HIRS	IASI	MHS	SEM
Level 0	Mx2 ⁽¹⁾	-	-	-	-	-	-	-	-	-	Mx2
Level 1	-	Mx2, N	Mx2	Mx2	Mx2, N	Mx2 ⁽²⁾	Mx2	Mx2, N	Mx2	Mx2, N	-
Level 2	-	-	-	Mx2, N	-	-	-	-	Mx2	-	-

Legend: 'Mx2' = Metop-A (secondary) and Metop-B (prime) - dual data & products, with the following exceptions:

⁽¹⁾ Due to degraded performance of Metop-B's A-DCS instrument, Metop-A provides the prime Argos-3 A-DCS service, and Metop-B provides just Argos-2 mode.

⁽²⁾ GOME-2 Tandem operations: Metop-A instrument has swath width of 960 km, Metop-B's has full width of 1920 km.

'N' = NOAA-19 - data and products from the AMSU, AVHRR, HIRS and MHS instruments

The charts on the following slides show the month-by-month availability of the products, identifying any significant events which impacted the service.

Unless otherwise indicated, the availability figures are derived as shown here:

For Level 0: production statistics from EUMETSAT's EPS Product Generation Facility (PGF)

For Level 1: reception statistics from EUMETSAT's reference EUMETCast User Station (US)

For Level 2: as for Level 1

Metop/NOAA Global Data Service: Definition of Availability

Unless otherwise indicated in the availability slides, the monthly figures are those for ‘timely availability’, where ‘timely’ is used to mean the following:

Level 0 & 1: available within 2 hours 15 minutes of sensing

Level 2: available within 3 hours of sensing

The above timeliness targets are those originally specified for the Global Data Service and delivery is currently measured against them. These targets will be modified to take into account the improved timeliness achieved with ‘ADA’ (see below), once its operational phase has commenced.

The next slide shows the profile of Metop-B data acquired via the Antarctic Data Acquisition (‘ADA’) service, supported in demo phase in 2013, with a target of acquiring 9 of the potential 14 or 15 passes per day. The significance of ADA lies in the positive impact that it has on the timeliness of the data and products being made available to users. From 2014/Q2 onwards (precise date under discussion), it is expected that almost all passes will be supported in the operational phase.

On [slide 19](#) onwards, availability figures are given per instrument and for one or more data levels thereof. It is measured in terms of the data / products that have been generated / disseminated for each of the months in the reporting period, as a percentage of that which would nominally have been generated/disseminated in the month had continuous nominal operations been achieved.

Note: There are cases where the availability of Level 2 products is indicated as being marginally higher than that of the Level 1 data. This arises because of the differences in time-logging between different stages of production, influencing the generation of statistics.

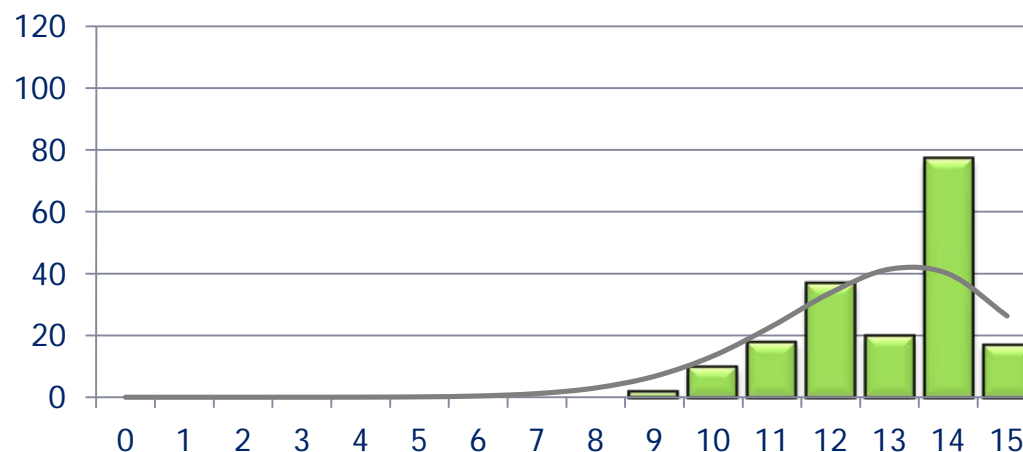
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Metop/NOAA Global Data Service: Antarctic Data Acquisition (ADA)

Metop data is acquired at NOAA-NSF's ground station on McMurdo Sound in Antarctica and routed to EUMETSAT HQ. This acquisition complements that of Svalbard, and allows data to be processed and disseminated earlier, thus improving data timeliness of Metop-based products.

Each chart shows for the respective half-year period the numbers of days (y-axis) on which a given number of passes (x-axis) were successfully acquired at McMurdo and relayed to Darmstadt.

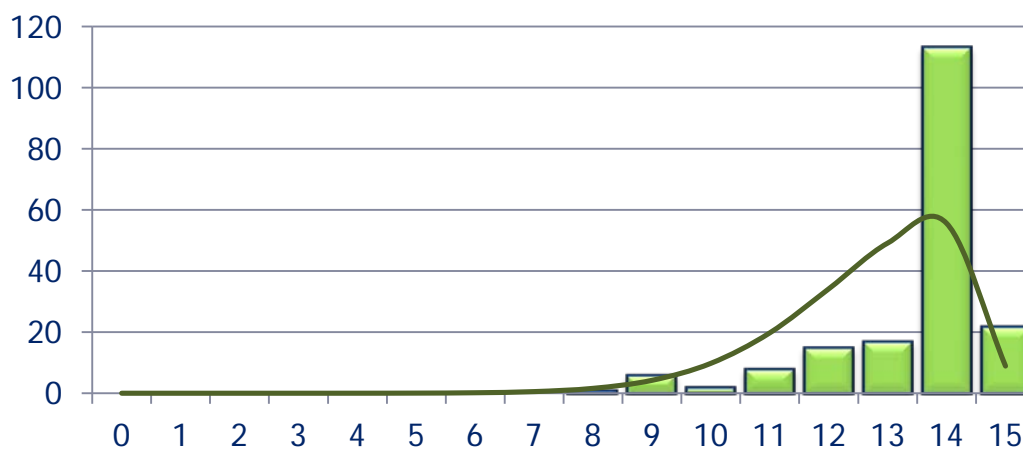
Overall average passes per day achieved for the last two half-years are provided. Target continues to be 9 passes per day (out of the 14-15 daily orbits of the prime Metop satellite) until plans for the operational phase are finalised.



2013/H1

Average passes/day = 13.0

(Metop-A up to 24-April, Metop-B thereafter)



2013/H2

Average passes/day = 13.5

Metop/NOAA Global Data Service: Operational Events with General Impact

The following events were of relevance with respect to the Metop/NOAA GDS:

Metop-B Out-Of-Plane Manoeuvre on 5-Nov-2013: Product processing for the following instruments was deactivated for periods of varying length between 08:00 and 14:30: AMSU, ASCAT, ATOVS, GOME-2, GRAS, HIRS, IASI, MHS and SEM.

Product availability was thus reduced for the data sensed during the respective periods.

Operational Incident #55: Metop Solid-State Recorder (SSR) anomalies: Suspected Single Event Upsets (SEUs, caused by heavy radiation particles) caused Metop-B's SSR to enter a wait state on 29-Oct-2013 and Metop-A's similarly on 12-Nov-2013. These events resulted in the loss of approximately 4.3 hours and 5 hours-worth of data respectively. After investigation, the recoveries were performed without problem.

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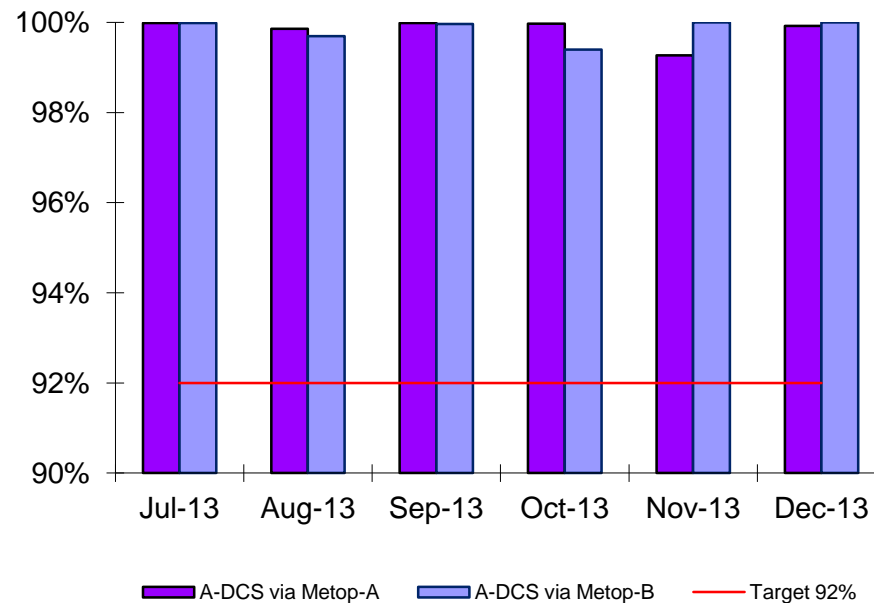
Metop Global Data Service → A-DCS Level 0 Data

Metop A & B carry instruments for supporting the Argos Advanced Data Collection System (A-DCS). Environmental data is transmitted by measurement platforms on land or sea, or in the atmosphere, and this is relayed via the Metop satellites and EUMETSAT to CLS in Toulouse, in accordance with an cooperation agreement with CNES.

Metop-A provides the prime Argos-3 A-DCS service, with Metop-B providing just Argos-2 mode, due to degraded performance of its instrument.

Events which impacted availability:

Oct & Nov: Incident 55 (see [slide 18](#))



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Metop/NOAA Global Data Service → AMSU Level 1B BUFR Products

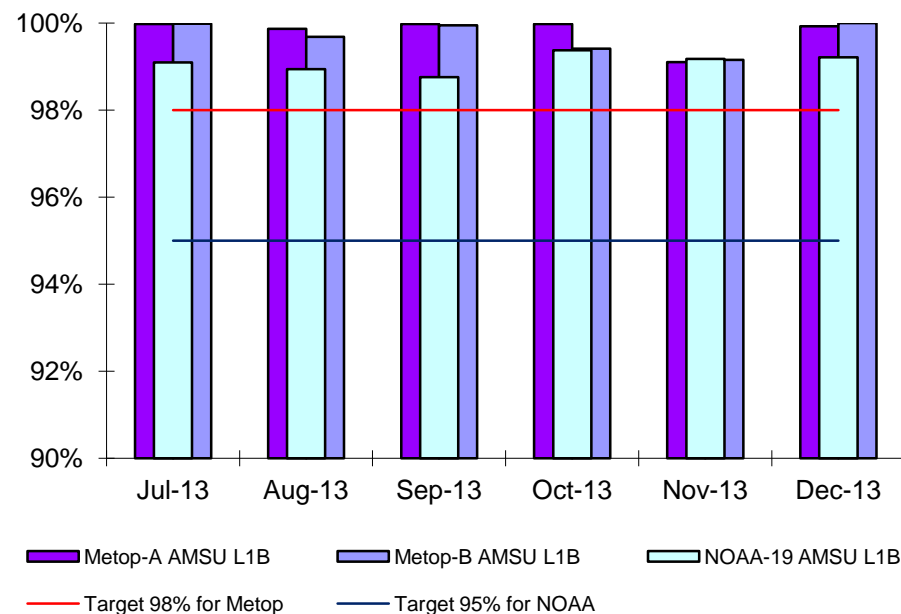
The Advanced Microwave Sounding Unit (AMSU) is a 15-channel microwave radiometer supplied by NOAA which provides information on atmospheric temperature profiles.

Level 1B products are derived from the data generated by the instruments onboard the Metop-A, Metop-B and NOAA-19 satellites.

Events which impacted availability:

Oct & Nov: Incident 55 (see [slide 18](#))

November: Metop-B OOP manoeuvre (see [slide 18](#))



- Notes:**
- (1) Metop-A's AMSU: channels 3 & 8: out of specification but both are still currently fully usable for higher-level products; channel 7 has failed completely.
 - (2) Metop-B's AMSU: all channels well within specification
 - (3) NOAA-19's AMSU: channels 7 & 8: out of specification but the data is still considered usable for the time-being

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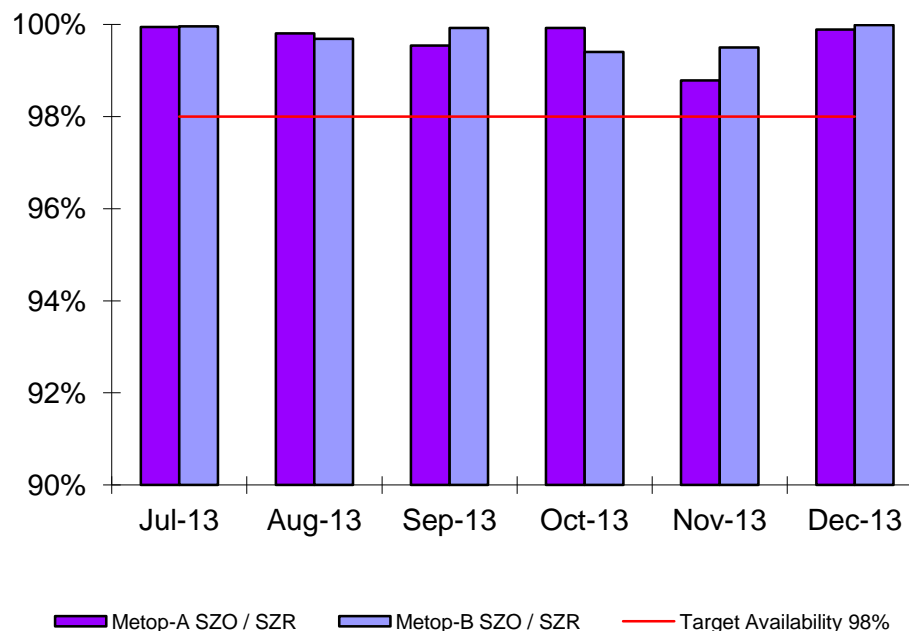
Metop Global Data Service → ASCAT Level 1B (SZO & SZR) Products

The Advanced Scatterometer (ASCAT) is a C-band radar on the Metop satellites which measures normalised backscatter from the Earth's surface. The prime objective of ASCAT is to measure wind speed and direction over the oceans, as an input to NWP models. ASCAT data is also used to extract information on soil moisture, sea-ice extent and permafrost boundary. EUMETSAT disseminates sampled Level 1B data from both Metop-A and Metop-B over EUMETCast and full resolution is available from the Data Centre on request.

Performance of the Level 1B service is measured in terms of the timely availability of the 'SZO' and 'SZR' products (swath grid sampling resolutions of 25 and 12.5 km respectively) on the EUMETCast reference user station.

Events which impacted availability:

Oct & Nov: Incident 55 (see [slide 18](#))



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Metop/NOAA Global Data Service → ATOVS Level 2 Products

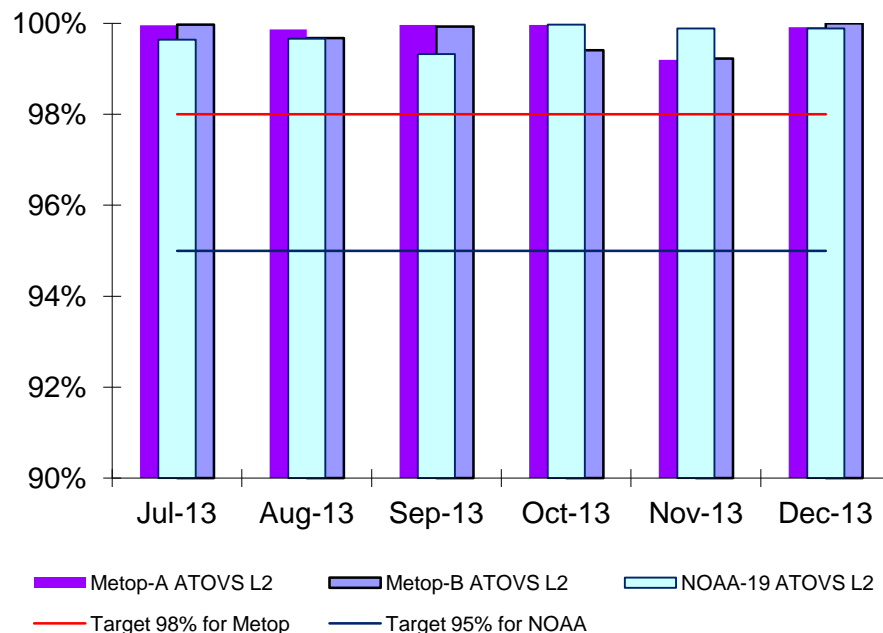
ATOVS Level 2 product processing transforms the calibrated radiance measurements from the AMSU-A, MHS and HIRS instruments (onboard Metop and NOAA-19 satellites) into information on the vertical distribution of atmosphere state parameters, on cloud and surface parameters and total atmosphere contents. All the parameters derived are assembled into one ATOVS L2 sounding product for each satellite.

Performance of the Level 2 service is measured in terms of the timely availability of the BUFR-encoded products received on the EUMETCast reference user station (US).

Events which impacted availability:

Oct & Nov: Incident 55 (see [slide 18](#))

5-November: Metop-B OOP manoeuvre (see [slide 18](#))



Note: Metop-A's AMSU channel 7 has failed and is thus no longer used for ATOVS L2 product processing.

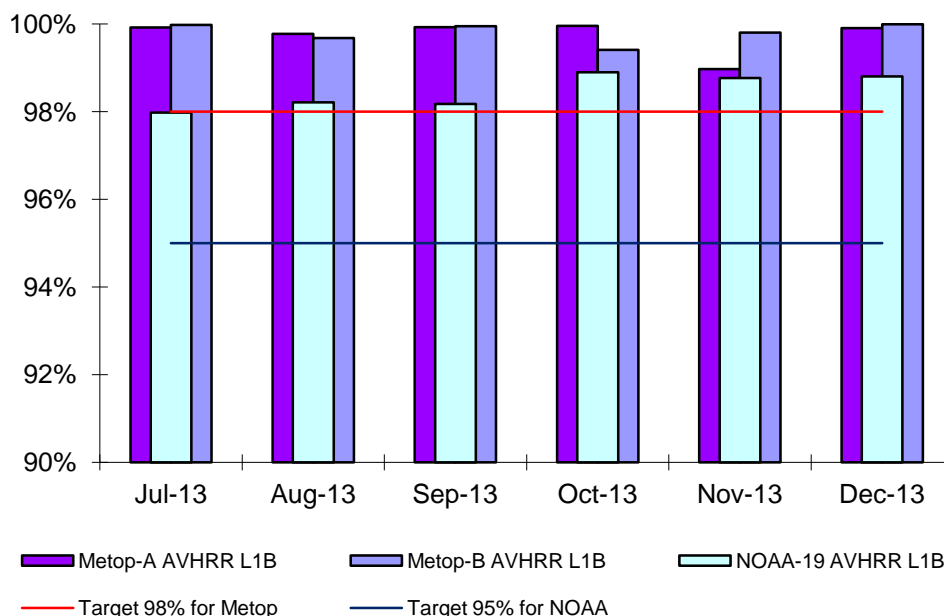
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Metop/NOAA Global Data Service → AVHRR Level 1B Products

The Advanced Very High Resolution Radiometer (AVHRR) is a multi-spectral imaging instrument provided by NOAA which produces global cloud imagery and information on land and sea surfaces. Level 1B products are derived from the data generated by the instruments onboard the Metop and NOAA-19 satellites.

Events which impacted availability:

Oct & Nov: Incident 55 (see [slide 18](#))



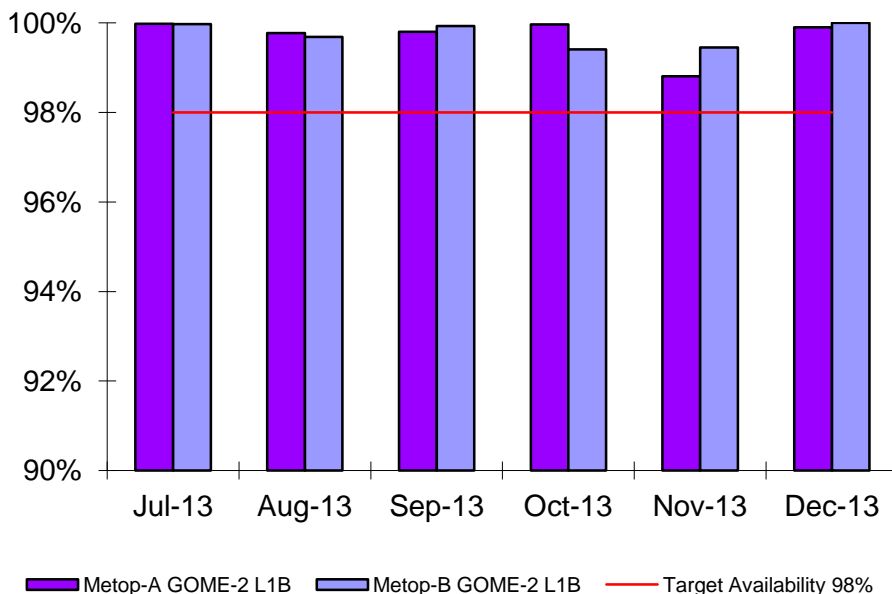
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Metop Global Data Service → GOME-2 Level 1B Products

The Global Ozone Monitoring Experiment-2 (GOME-2) is a scanning spectrometer used to measure profiles and total columns of atmospheric ozone and other trace gases.

Events which impacted availability:

Oct & Nov: Incident 55 (see slide 18)



GOME-2 on Metop-B suffers degradation of throughput similar, but not identical, to that seen on Metop-A. The performance of the GOME-2 instruments on Metop-A and Metop-B and the evolution of their degradation will continue to be monitored.

See the 'Product Quality Monitoring Reports' via dedicated links on the '[Service Status](#)' page of www.eumetsat.int for further performance information. The GOME-2 Newsletter can be found under either of the two report sections.

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Metop Global Data Service → GRAS Level 1B Products

The GNSS Receiver for Atmospheric Sounding (GRAS) instruments provide information on atmospheric profiles using radio occultation of GPS signals from typically between 28 and 30 GPS navigation satellites in operational use.

The chart shows for each month:

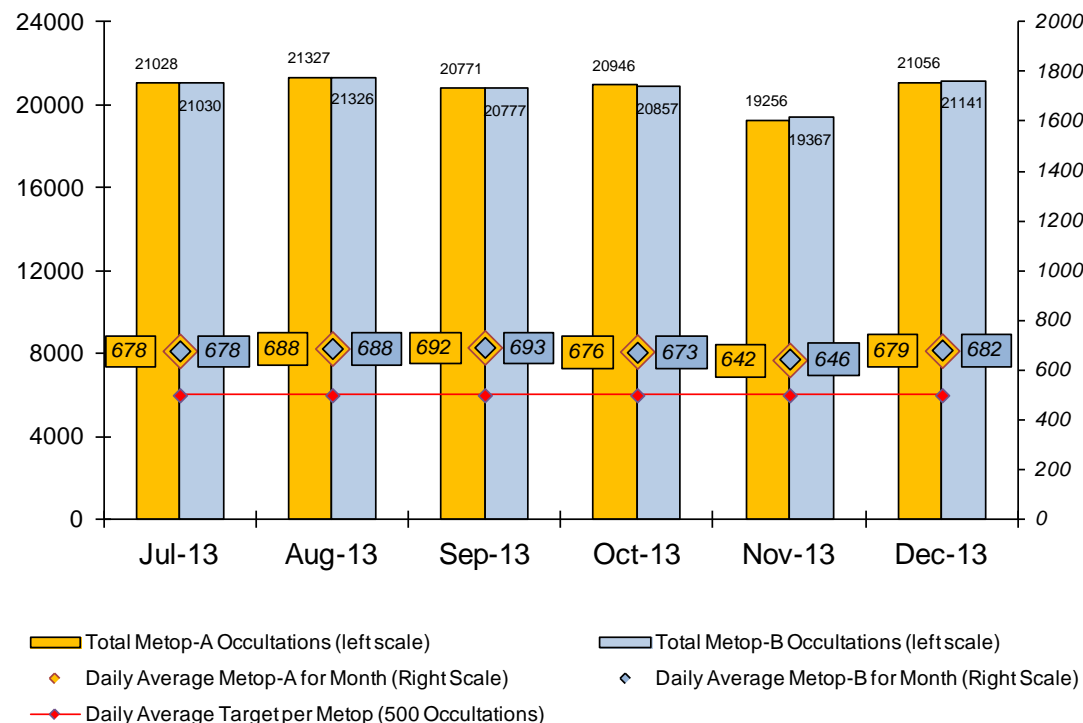
- (1) the total numbers of GRAS Level 1B occultations (plus geolocation and quality flags) from Metop-A and Metop-B disseminated via EUMETCast
- (2) the daily average number of occultations from each Metop provided to users (numbers in italics)

Note that all occultations produced are disseminated (with appropriate quality flags, including those produced during manoeuvres and recovery from anomalies).

Events which impacted availability:

Oct & Nov: Incident 55 (see slide 18)

November: (1) Reduced availability of clock and orbit data impacted the processing of both Metop-A and Metop-B occultations.
(2) Metop-B manoeuvre (see [slide 18](#))



In addition to the outages associated with Metop manoeuvres, GRAS L1B data is flagged 'degraded quality' for a fixed 4 hours following any anomaly, regardless of the actual level.

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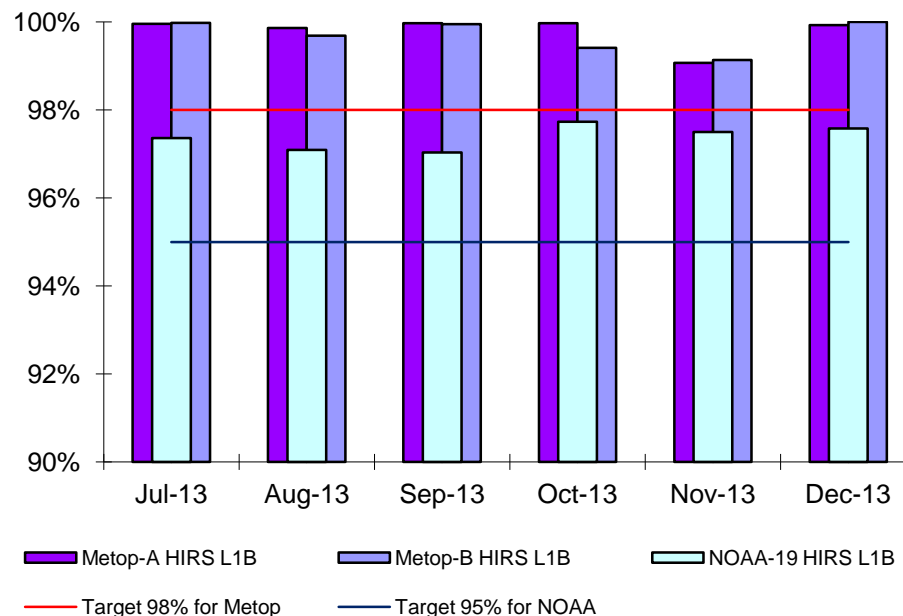
Metop/NOAA Global Data Service → HIRS Level 1B BUFR Products

The High Resolution Infrared Radiation Sounder (HIRS) measures incident radiation using 19 infrared channels and 1 visible channel, providing information on the atmosphere's vertical temperature profile and water vapour from the Earth's surface to an altitude of about 40 km. Level 1B products are derived from the data generated by the instruments onboard both Metop-A/B and NOAA-19 satellites.

Events which impacted availability:

Oct & Nov: Incident 55 (see [slide 18](#))

November: Metop-B OOP manoeuvre (see [slide 18](#))



Notes: (1) Metop-A's HIRS: all channels well within specification

(2) Metop-B's HIRS: Multiple channels (mainly long wave) have been out of specification but have reverted to lower levels within the reporting period, with only channel 10 currently oscillating about the noise threshold. All data is currently fully usable for higher-level products, however.

(3) NOAA-19's HIRS: channels 1-12: close to, or out of specification, but the data is still considered usable for the time-being

EUMETSAT Central Operations Report for July – December 2013

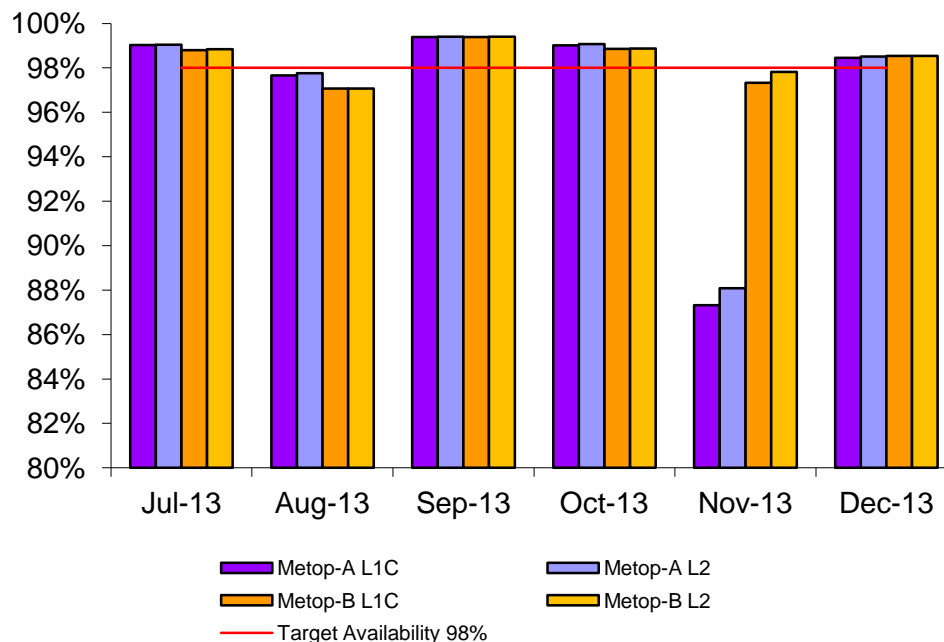
Metop Global Data Service → IASI Level 1C & Level 2 BUFR Products

The Infrared Atmospheric Sounding Interferometer (IASI) measures the spectrum of infrared radiation in 6000 channels, providing information on atmospheric profiles of temperature, water vapour and trace gases, as well as surface temperature, surface emissivity and cloud characteristics.

Events which impacted availability:

- August:** Moon intrusion avoidance impacted L1C and L2 data
- Oct & Nov:** Incident 55 (see [slide 18](#))
- November:**
- (1) Metop-A IMS onboard software patching: approx. 3-day outage of data
 - (2) Metop-B OOP manoeuvre impacted L1C & L2 (see [slide 18](#))
 - (3) Two instances of hardware problem impacted L1C and L2 dissemination (of data for both satellites) on 17-Nov and 23-Nov

Note: L2 data for Metop-B operational from 18 July onwards.



Note that external calibrations are performed typically on a monthly basis and these reduce the availability of Level 1 / Level 2 data (relative to that of Level 0) by approximately 0.5 to 0.6% of the scheduled availability.

EUMETSAT Central Operations Report for July – December 2013

Metop/NOAA Global Data Service → MHS Level 1B BUFR Products

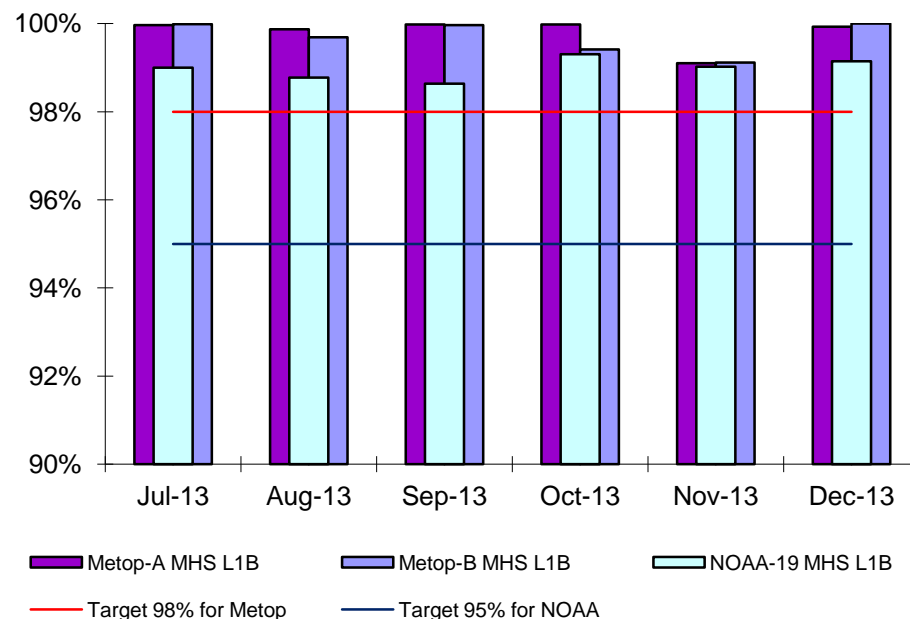
The Microwave Humidity Sounder (MHS) is a 5-channel microwave radiometer providing information on atmospheric humidity profiles primarily, but also cloud liquid water content and precipitation.

Level 1B products are derived from the data generated by the instruments onboard both Metop-A/B and NOAA-19 satellites.

Events which impacted availability:

Oct & Nov: Incident 55 (see slide 18)

November: Metop-B OOP manoeuvre (see [slide 18](#))



Notes:

- NOAA-19's MHS instrument's channel 3 remains out of spec
- Metop-A and Metop-B instruments: all channels within specification

EUMETSAT Central Operations Report for July – December 2013

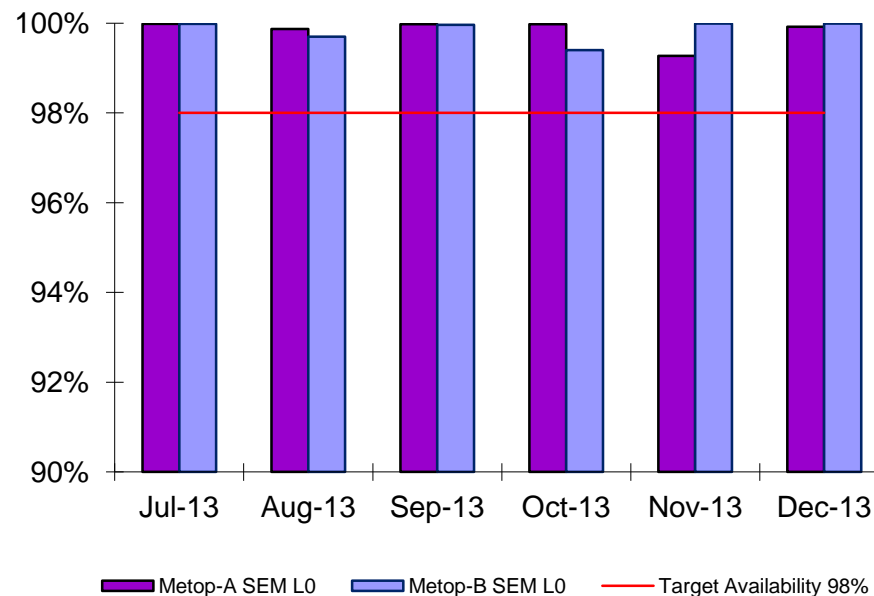
Metop/NOAA Global Data Service → SEM Level 0 Data

The Space Environment Monitor (SEM) consists of a pair of instruments on each Metop satellite which provide data to determine the intensity of the Earth's radiation belts and the flux of charged particles at the satellite's orbiting altitude.

Level 0 data (consisting of the SEM instrument source packets in EPS native format) is provided to NOAA via dedicated terrestrial line.

Events which impacted availability:

Oct & Nov: Incident 55 (see slide 18)



Metop/NOAA Regional Data Service

The Regional Data Service is based on direct acquisition of data from Metop and NOAA satellites by a network of HRPT stations, known as the EARS system. At each station, an EARS node processes the data locally and then relays it on to EUMETSAT for very timely distribution to the user community via EUMETCast and the GTS.

The Regional Data Service (RDS) now consists of the following component services :

EARS-ASCAT, EARS-ATOVS, EARS-AVHRR, EARS-IASI , EARS-NPP (CrIS and ATMS), EARS-NWC

Service performance is measured in terms of the availability of the data on the EUMETCast user reception stations being within 30 minutes of the instrument's observations, unless specified otherwise in EUMETSAT's document TD14, available from the ['Regional Data Service'](#) page of EUMETSAT's website (see 'Related Links'). That page and the document provide more information generally on the various EARS services, including which HRPT stations contribute to each of the services.

Metop-B data has been included in the RDS as of 20-August-2013, complementing Metop-A data on the ASCAT, ATOVS, AVHRR and IASI services. Metop-B data has replaced that of Metop-A for EARS-NWC.

EUMETSAT Central Operations Report for July – December 2013

Metop/NOAA Regional Data Service → EARS-ASCAT

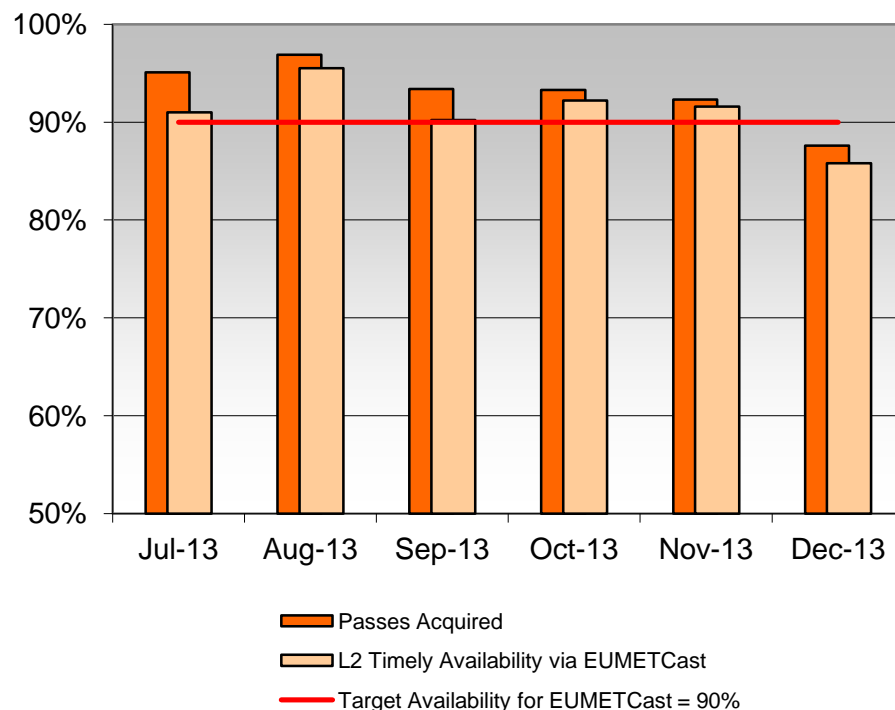
This service provides products derived from the data produced by the ASCAT instrument onboard Metop-A , and from 20 August, also from Metop-B.

Level 1 data is produced by the EARS system, and then forwarded to KNMI (Netherlands) for the generation of Level 2 data. Availability shown on the chart is that of the Level 2 data received by users (relative to scheduled passes).

Events which impacted availability:

Sept – Nov: First months with dual Metop data – processing undergoing tuning.

December: Outage of Muscat HRPT station impacted data acquisition.



EUMETSAT Central Operations Report for July – December 2013

Metop/NOAA Regional Data Service → EARS-ATOVS

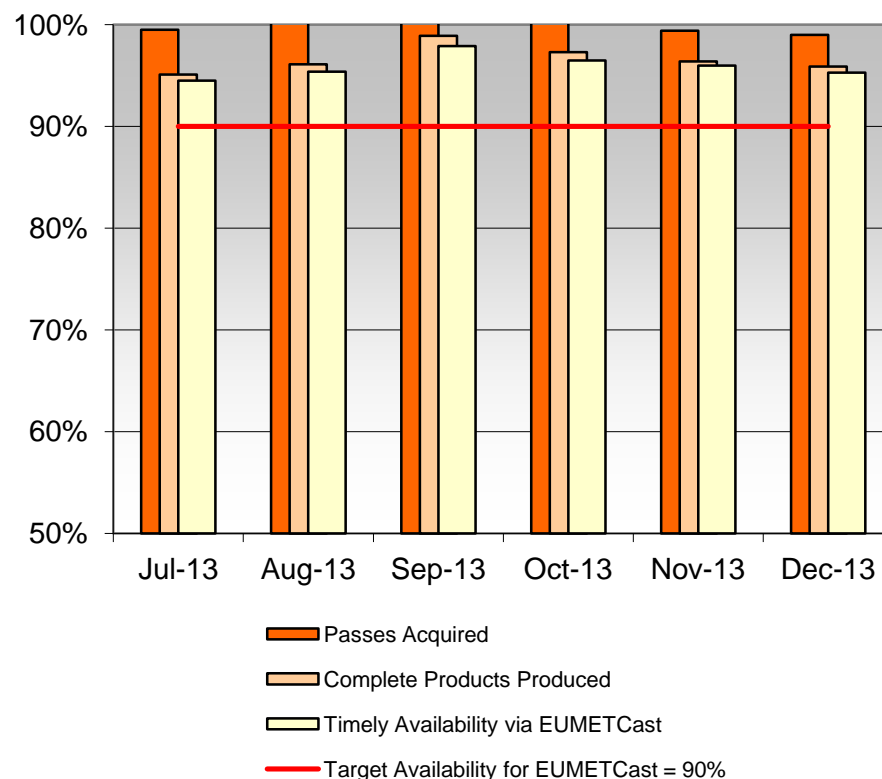
This service provides ATOVS products covering data-sparse areas, derived from data received by the HRPT stations from the following satellites (listed in order of priority): Metop-B (as of 20-August), Metop-A, NOAA's N19, N16, N18 and N15 (Metop's AHRPT partial coverage data is used).

The availability target shown in red on the chart is that for the products received by users (relative to scheduled ground station passes) and covers Levels 1A, 1C and 1D products.

Events which impacted availability:

None significant.

General Issue: Problems with the HRPT transponder onboard NOAA's N15 satellite impacts the operation of the ATOVS service generally, resulting in fewer products overall.



EUMETSAT Central Operations Report for July – December 2013

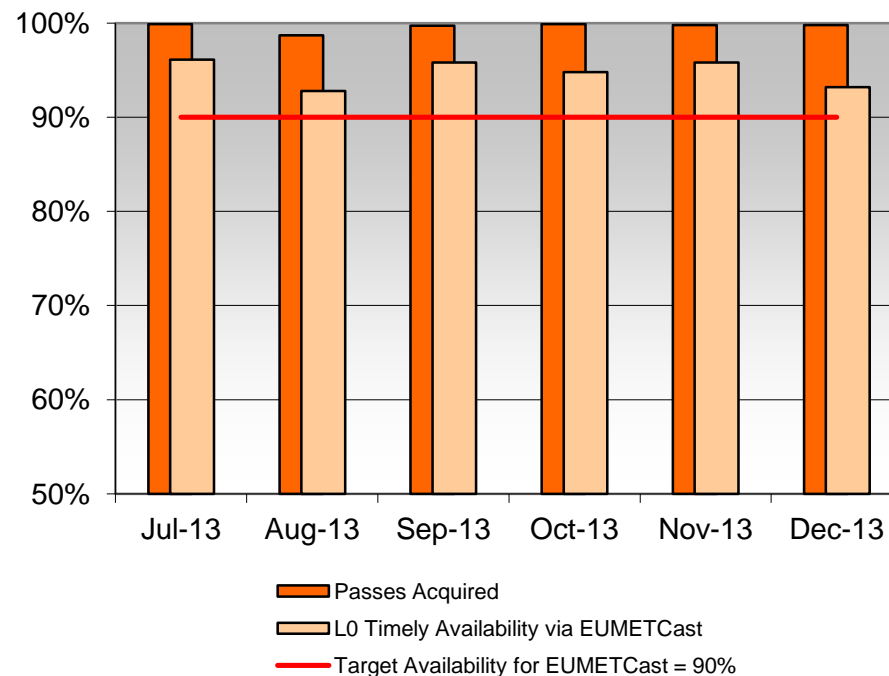
Metop/NOAA Regional Data Service → EARS-AVHRR

This service provides data from the AVHRR instruments onboard NOAA-19 and the Metop satellites (Metop-B as of 20-August onwards). AHRPT partial coverage data and FDES are used from the Metops.

Availability shown on the chart is for Level 0 data received by users (relative to scheduled regional passes). Note that no higher-level products are generated.

Events which impacted availability:

None significant.



EUMETSAT Central Operations Report for July – December 2013

Metop/NOAA Regional Data Service → EARS-IASI

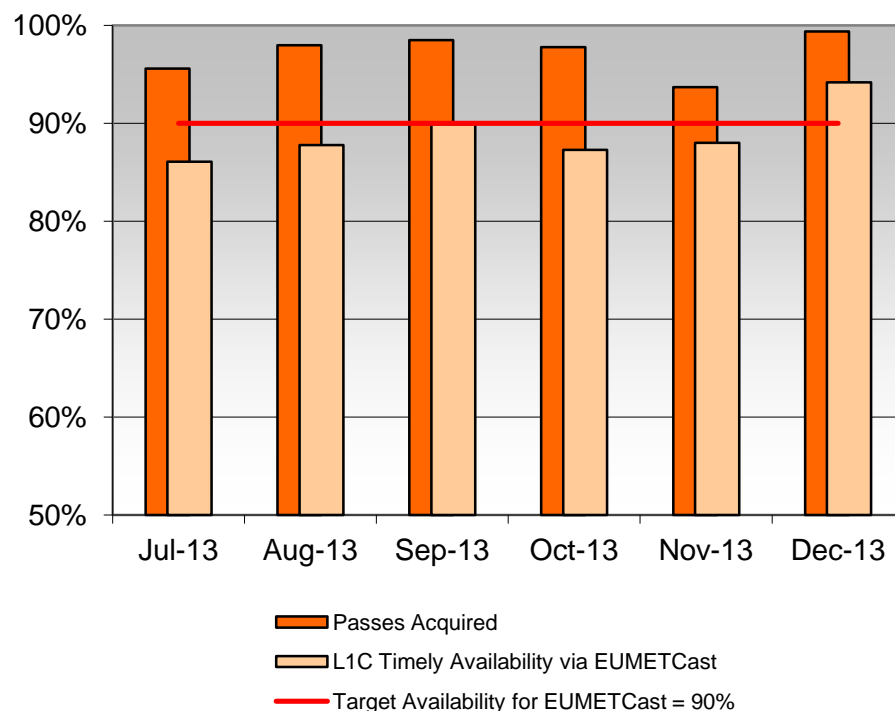
This service provides products derived from the data produced by the IASI instrument onboard the Metop satellites (plus Metop-B from 20-Aug onwards).

Availability shown on the chart is that of the Level 1C data received by users (relative to scheduled passes). The products comprise calibrated and geolocated IASI observations containing both 300 Principle Component Scores and 366 original IASI channels, cloud/scene analysis information, BUFR formatted, suitable for nowcasting applications.

Events which impacted availability:

July - Nov: Addition of new services and dataflows (Metop-B and SNPP), link bandwidth tuning and processing issues at some stations impacted timeliness of data, hence the marked difference between passes acquired and L1C timely availability. Problems since resolved.

General Issue: Incomplete passes in the HRPT zone cannot be processed, hence the marginally lower availability of products compared to the passes.



EUMETSAT Central Operations Report for July – December 2013

Metop/NOAA Regional Data Service → EARS-NPP (CrIS and ATMS)

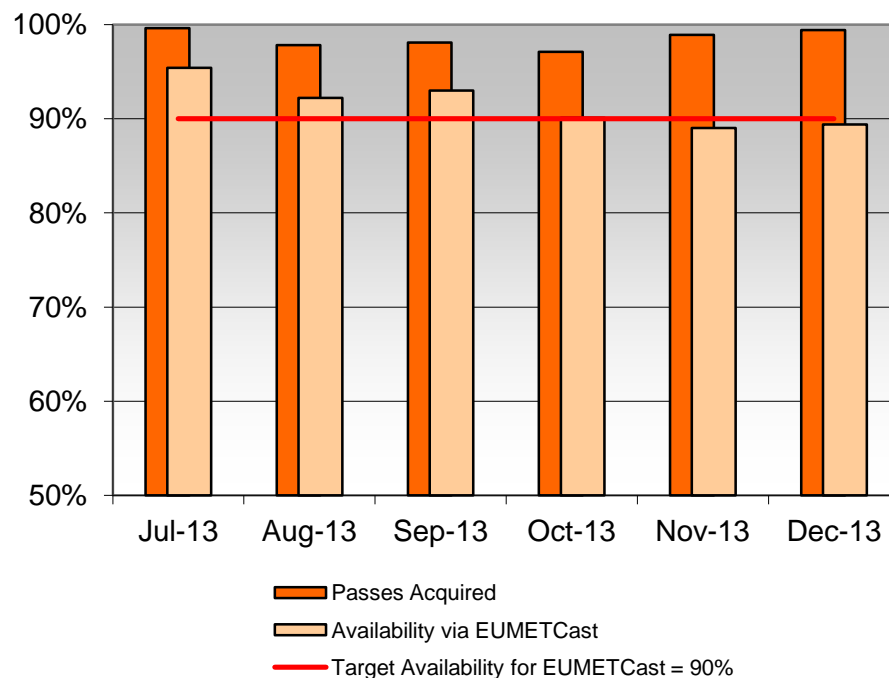
This service provides SDRs derived from the data produced by the ATMS (Advanced Technology Microwave Sounder) and CrIS (Cross-track Infrared Sounder) instruments onboard NASA's Suomi NPP satellite.

Availability shown on the chart is that of the BUFR-formatted SDRs received by users (relative to scheduled passes).

Events which impacted availability:

Oct - Dec : Addition of new services and dataflows and link bandwidth tuning impacted timeliness of NPP data.

Note: Monitoring & reporting constraints mean that only composite statistics for ATMS and CrIS currently available.



EUMETSAT Central Operations Report for July – December 2013

Metop/NOAA Regional Data Service → EARS-NWC

This service delivers Level 2 cloud products derived from data produced by the AVHRR instruments onboard Metop-B and NOAA-19. The service via EUMETCast Europe commenced on 24 April.

Three types of product are delivered:

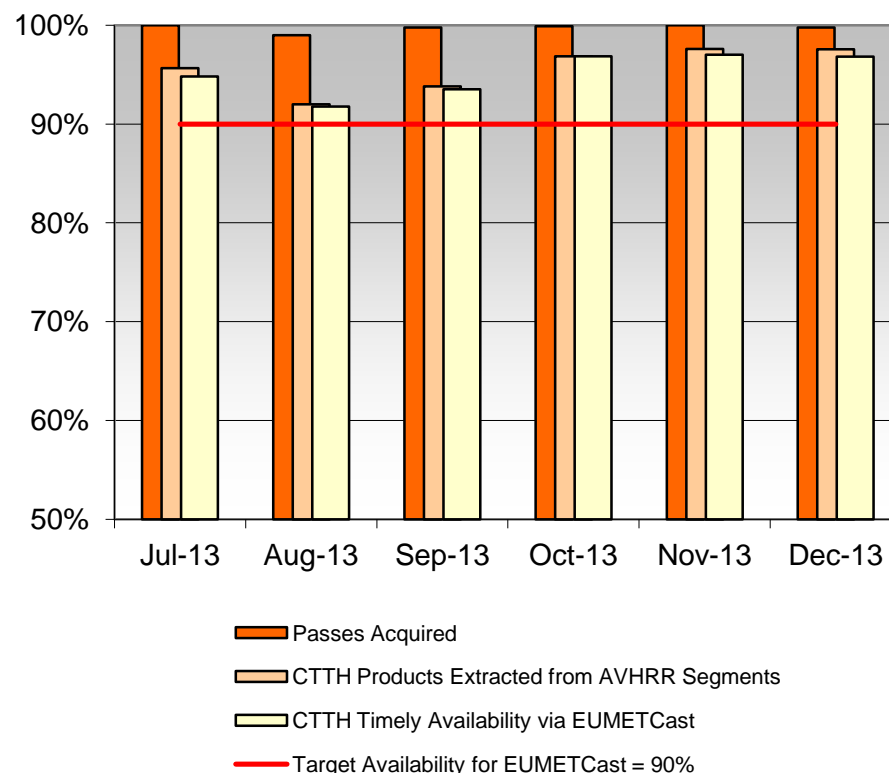
- Cloud-Top Temperature and Height (CTTH)
- Cloud Mask (CM)
- Cloud Type (CT)

Availability shown on the chart is currently only that of the CTTH products received by users (relative to scheduled passes).

Events which impacted availability:

None significant.

Note: EARS switched to providing Metop-B data on 20-Aug-2013. Metop-A data had been provided up until that date.



Search & Rescue Support

EUMETSAT supports the Cospas-Sarsat System for Search and Rescue (SAR) by flying transponders onboard its MSG and Metop satellites.

The Cospas-Sarsat System is designed to provide distress alert and location data to assist SAR operations, using a constellation of geostationary and low-altitude Earth-orbiting satellites to relay signals from distress beacons to ground terminals. More information concerning the system can be found on www.cospas-sarsat.org.

MSG: Meteosat-9 and 10 have provided nominal SAR coverage, albeit with 16 hours of outage for Meteosat-9, due to a safe-mode on 25-Oct-2014. Meteosat-8's SAR remained off during the reporting period.

Metop: Both satellites, Metop-A and Metop-B, have provided full-time SAR support during the reporting period.

Jason-2 OGDR Service

This service delivers the ‘Operation Geophysical Data Record’ products, derived from the altimetry data acquired from the Jason-2 satellite.

Jason-2 is the second satellite of the space segment of the Ocean Surface Topography Mission (OSTM), a cooperation between EUMETSAT, NOAA, CNES and NASA. EUMETSAT and NOAA process the data from the Jason-2 satellite in near real-time and archive and disseminate the products.

The chart on the next slide shows the availability of the products within timeliness constraints of 3 hours and 5 hours from the time of sensing.

EUMETSAT Central Operations Report for July – December 2013

Jason-2 OGDR Service

The chart shows the availability of the Jason-2 near real-time Operational Geophysical Data Record products disseminated via EUMETCast.

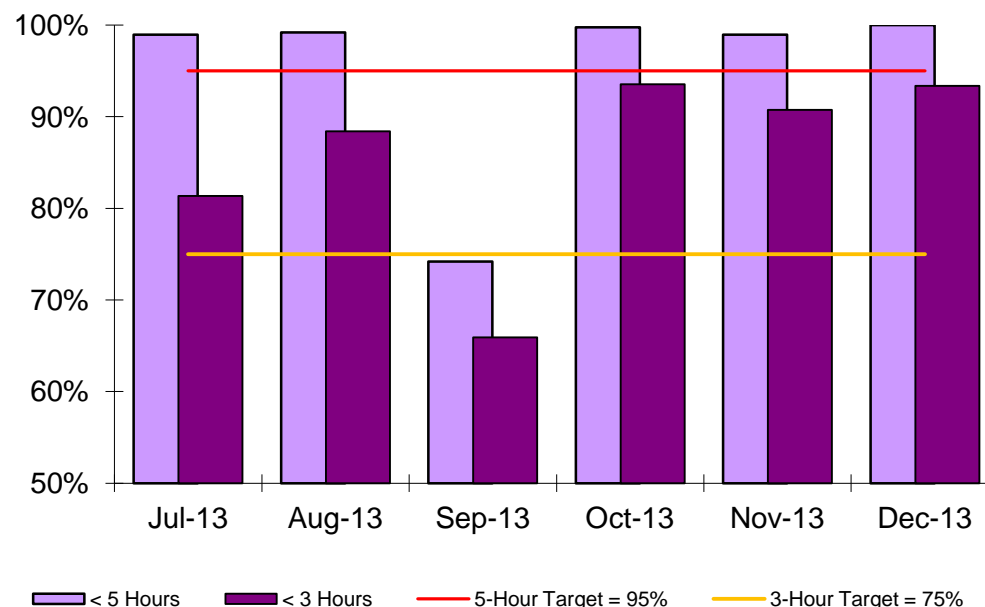
The target figure of 95% applies to the availability of data received on EUMETCast reception stations with a timeliness of 5 hours. The further target of 75% is for the more demanding objective of 3-hour timeliness.

Events which impacted availability:

July: Above-average no. of redumps necessary due to problems at the Usingen Earth Terminal, which impacted 3-hour timeliness.

5-12 Sept: 'Safe-Hold Mode' gave rise to ~7.5-day mission data outage.

(In general, redumps are taken at next visibility (or by other ground station) in cases of problematic passes and connection problems – this ensures minimisation of data loss, although some impact on timeliness occurs)



Third-Party Data Services

In addition to its own satellite data and meteorological products, EUMETSAT also distributes data and products from partner organisations as part of an international cooperation.

Image data from the following **geostationary satellites** is made available via EUMETCast, Direct Dissemination and the Internet:

- NOAA's GOES-13 ('GOES-East'), at 75°W, and GOES-15 ('GOES-West'), at 135°W
- JMA's MTSAT-2, at 145°E
- CMA's FY-2D, at 86.5°E, and FY-2E, at 105°E (also selected meteorological products)

Meteorological products based on LEO satellite data are also disseminated:

- Microwave Sounder products from CMA's FY-3A and FY-3B (only provided to National Met. Services)
- Level 1, 2 and 3 products derived from data of the MODIS instrument on NASA's Terra & Aqua satellites
- Level 2A and 2B OSCAT products derived from SCAT instrument data of ISRO's Oceansat-2 satellite
- EUMETSAT SSMIS products derived from sounder data of the DoD's DMSP satellites F16 and F17
- Sensor Data Records from NOAA's Suomi NPP satellite
- Operational Geophysical Data Records (OGDRs) from the AltiKa instrument of ISRO/CNES's SARAL mission.

The charts on the following slides show the availability of the data via EUMETCast.

EUMETSAT Central Operations Report for July – December 2013

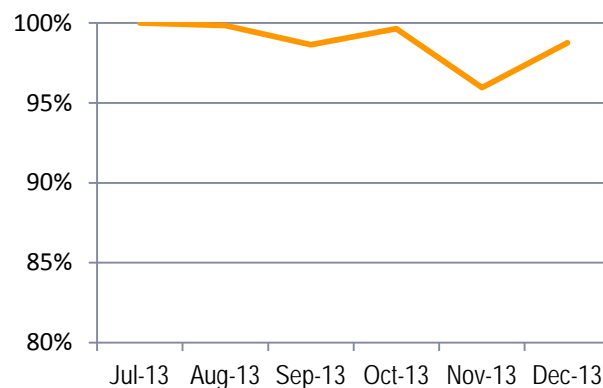
Third-Party Data Services → Geostationary Satellite Data & Products

The charts on this slide show the timely availability (as a percentage of expected) of image data originating from geostationary satellites operated by NOAA and JMA (Japan Meteorological Agency), as disseminated via EUMETCast.

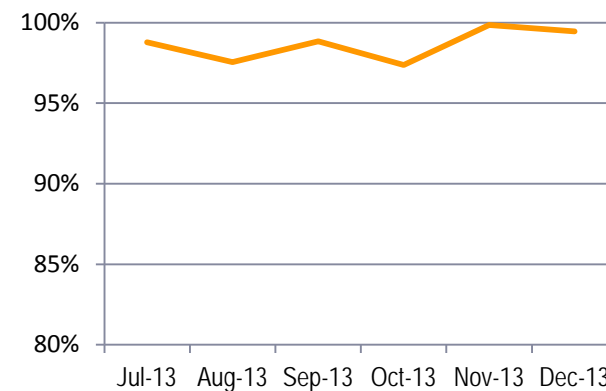
Events which impacted availability:

None significant.

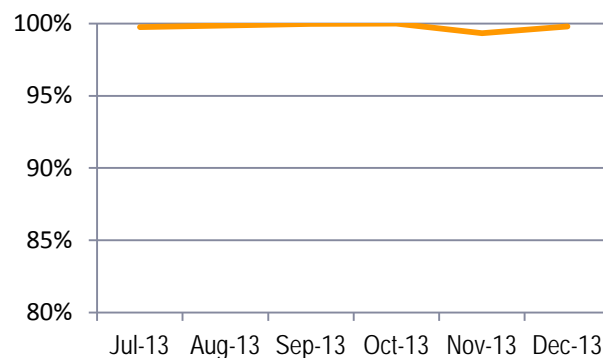
GOES-East (75°W)



GOES-West (135°W)



MTSAT-2 (145°E)



EUMETSAT Central Operations Report for July – December 2013

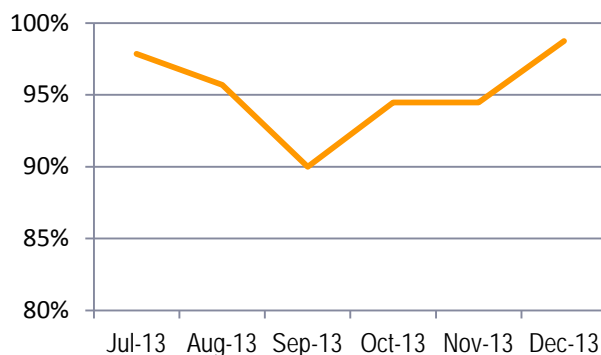
Third-Party Data Services → Geostationary Satellite Data & Products (cont.)

The charts here show the timely availability (as percentage of expected) of selected meteorological products generated from the data acquired by the Fengyun geostationary satellites operated by the China Meteorological Agency (CMA), as disseminated via EUMETCast.

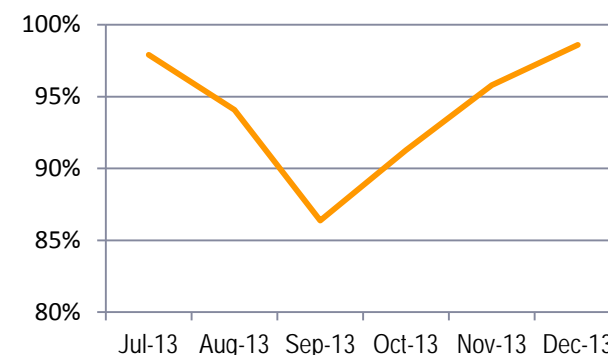
Events which impacted availability:

September: For both FY-2D & FY-2E satellites: fewer products due to eclipse-season.

FY-2D (86.5°E)



FY-2E (105°E)



Third-Party Data Services → LEO Satellite Data & Products

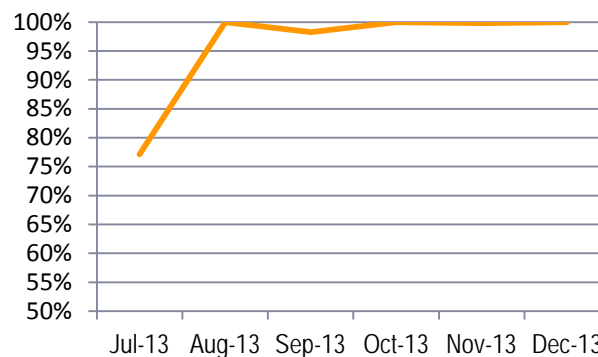
This slide presents charts which show the availability of data & products for **LEO satellites** operated by partner organisations, as disseminated via EUMETCast.

FY-3A and FY-3B: Level 1 data from microwave sounder instruments onboard Fengyun LEO satellites (currently made available only to National Met. Services and ECMWF). Availability shown as percentage of expected.

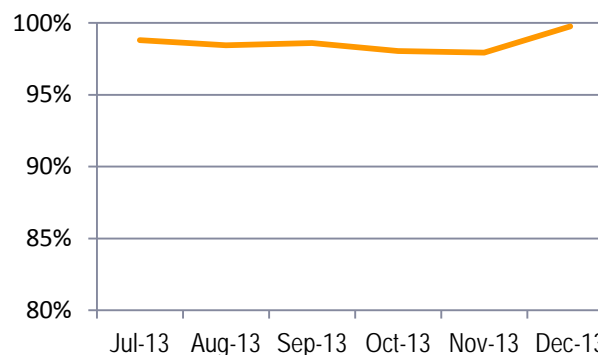
Events Which Impacted Availability:

July: Unavailability of FY-3A Microwave Temperature Sounder products (not available since April) still covered by the chart in July, but from August onwards, chart focuses on just the data from the Humidity Sounder.

FY-3A Level 1 Data



FY-3B Level 1 Data



EUMETSAT Central Operations Report for July – December 2013

Third-Party Data Services → LEO Satellite Data & Products (cont.)

This slide presents further charts showing the availability of certain LEO satellite products from partner organisations, as disseminated via EUMETCast. Availability shown in terms of total products disseminated /month and equivalent daily average/month.

MODIS: Level 1, 2 and 3 regional products derived from the MODIS instrument hosted on NASA's Terra and Aqua LEO satellites.

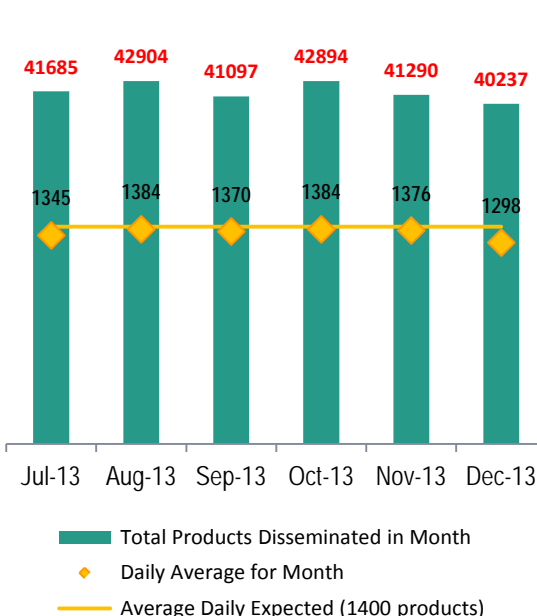
OSCAT Products: Level 2A and 2B products are generated from data from ISRO's (The Indian Space Research Organisation) Oceansat-2 satellite.

Events which impacted availability:

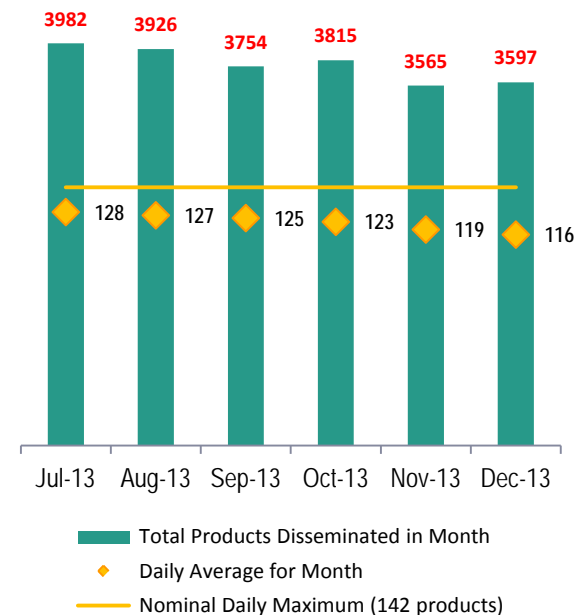
None significant.

Note: Daily average products for OSCAT shows a gradual negative degradation – this is under investigation.

MODIS Products



OSCAT Products



EUMETSAT Central Operations Report for July – December 2013

Third-Party Data Services → LEO Satellite Data & Products (cont.)

This slide presents two more charts showing the availability of two further types of LEO satellite product, as disseminated via EUMETCast. Availability again shown in terms of total products disseminated /month and equivalent daily average/month.

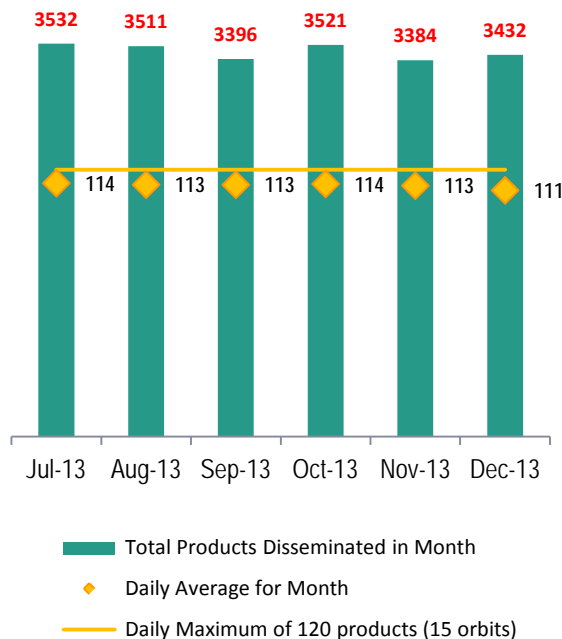
SSMIS Products: Extracted from SDR data from the 'Special Sensor Microwave Imager Sounder' microwave radiometer onboard the near-polar-orbiting, sun-synchronised DMSP satellites F16 and F17. Each product contains one orbit of data, comprising 4 BUFR component products: IMA, ENV, LAS and UAS.

Suomi NPP SDRs: Sensor Data Records from the CrIS and ATMS instruments onboard NOAA's Suomi NPP satellite.

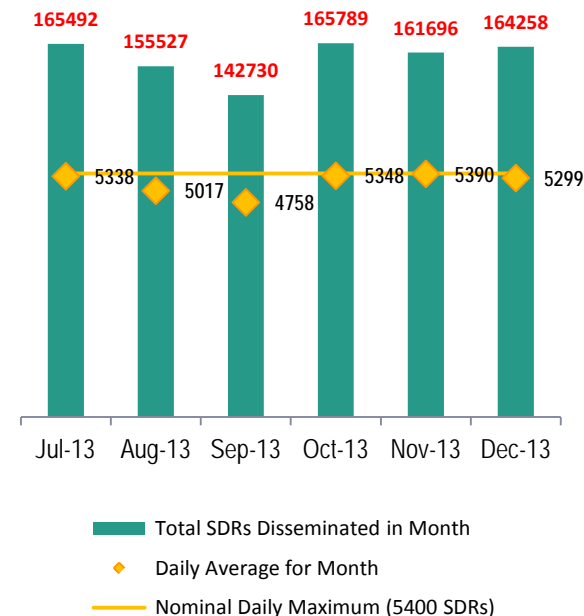
Events which impacted availability:

Aug & Sept: NPP SDRs: Final months of NOAA's pre-operational testing – some intermittent interruptions.

SSMIS Products



Suomi NPP SDRs



EUMETSAT Central Operations Report for July – December 2013

Third-Party Data Services → LEO Satellite Data & Products (cont.)

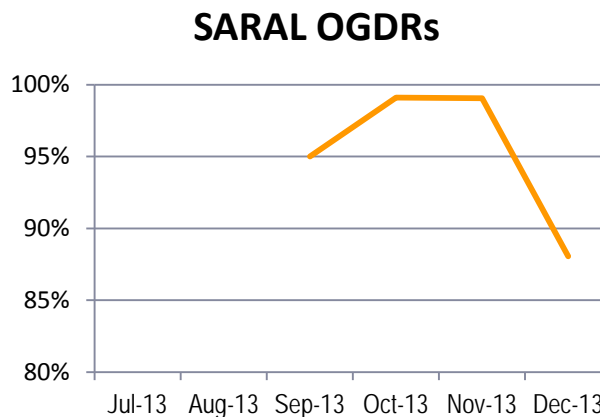
This slide presents a chart showing the availability via EUMETCast of near-real-time Operational Geophysical Data Records (OGDRs), which are produced from the data from the 'AltiKa' Ka-band altimeter instrument of ISRO/CNES's SARAL mission.

Each OGDR corresponds to one orbit of data, and availability is shown as a percentage of the scheduled passes.

Events which impacted availability:

December: Several days of reception problems at Inuvik ground station reduced the number of passes acquired.

Note that the service was declared operational on 16-Sept-2013. Monitoring mechanisms were not finally established until later in that month, and therefore the 95% given for the second half of September is a conservative estimate.



EUMETCast

EUMETCast is EUMETSAT's primary dissemination mechanism for the near real-time delivery of satellite data and products generated by the EUMETSAT Application Ground Segment. Third-party data and products from partner organisations are also delivered by the system, which is based on Digital Video Broadcast (DVB) technology.

For more information about EUMETCast and the services which it supports, please visit the [‘EUMETCast’](#) page on the EUMETSAT website (via ‘Data’ → ‘Data Delivery’).

The chart on the following slide shows the availability of the system for the last 12 months, which includes the half-year reporting period.

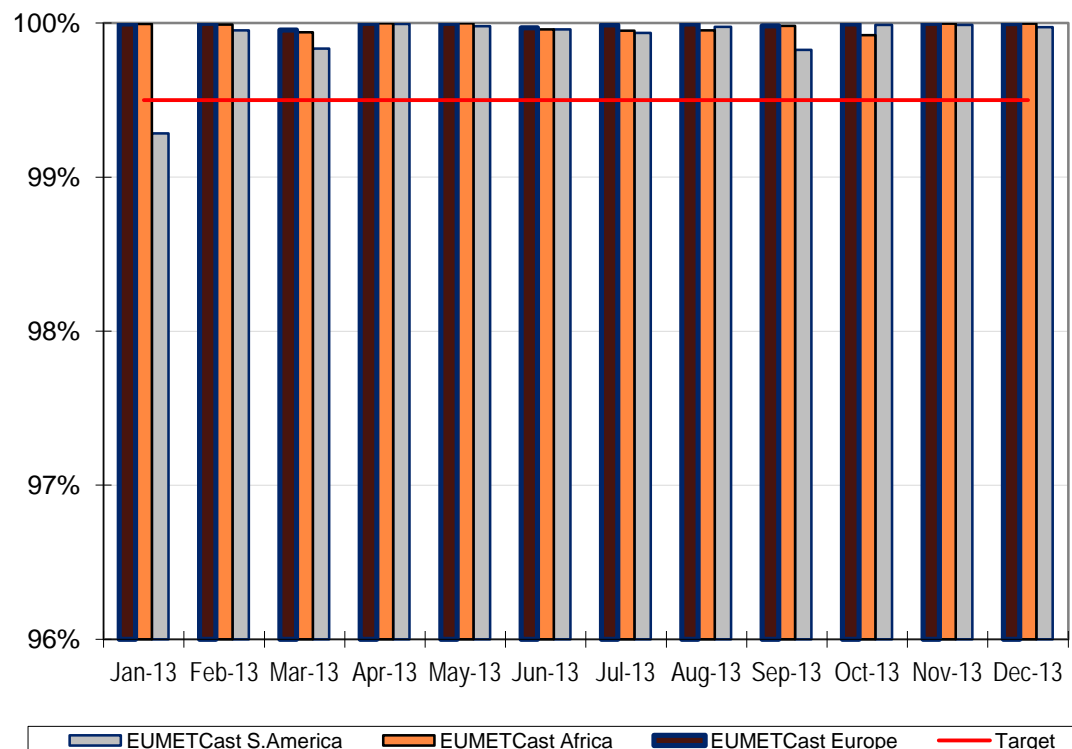
EUMETSAT Central Operations Report for July – December 2013

EUMETCast → System Availability for the Year-To-Date

The chart here shows the monthly system availability for the 3 EUMETCast services covering Europe, Africa and South America respectively. Both EUMETCast Africa and EUMETCast South America systems are, in effect, extensions of EUMETCast Europe and thus the end-to-end system availability is calculated taking due account of the availability of EUMETCast Europe and of the respective extensions.

Events which impacted availability in 2013:

- 19 January:** Heavy storm damaged reception antenna at Madrid relay station, resulting in 4.5 hour outage of EUMETCast South America service.
- 27 Feb - 4 Mar:** Antenna – satellite – sun colinearity impacted EUMETCast South America service.
- 12 March:** Power outage of 18 minutes at EUMETCast uplink station impacted all EUMETCast services.
- 5 September:** 44-minute outage of service provider's uplink station impacted EUMETCast South America service.



EUMETSAT Central Operations Report for July – December 2013

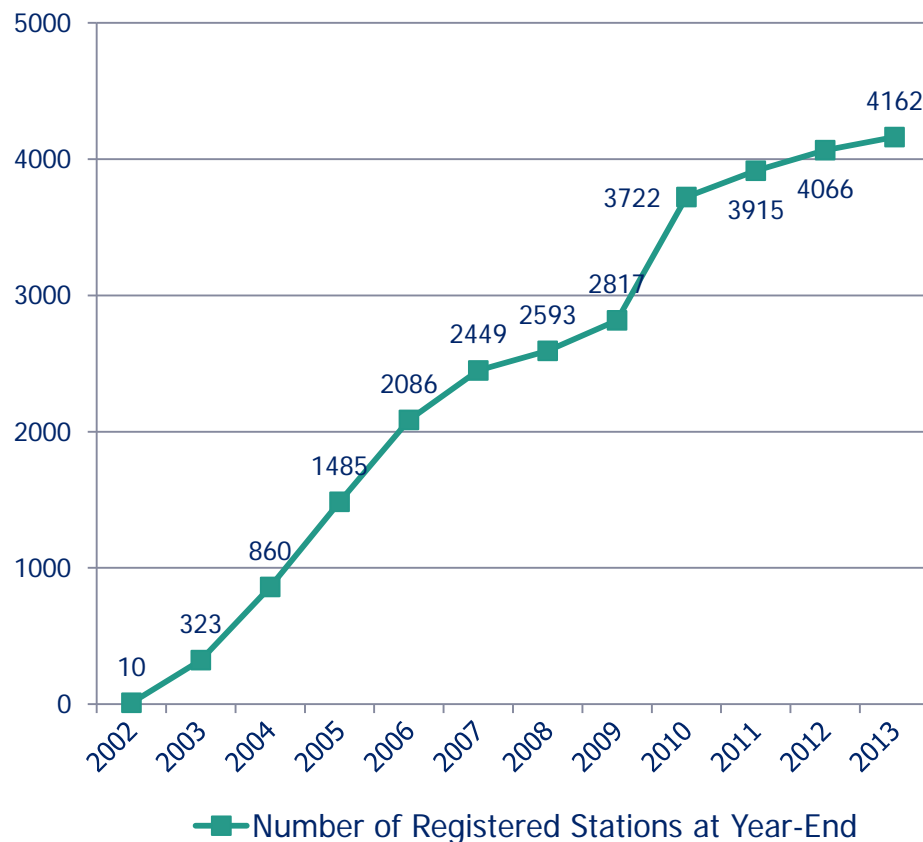
EUMETCast → Registered User Stations

The chart shows the trend of registrations of EUMETCast user stations.

The EUMETCast system had its 10th anniversary in April 2013.

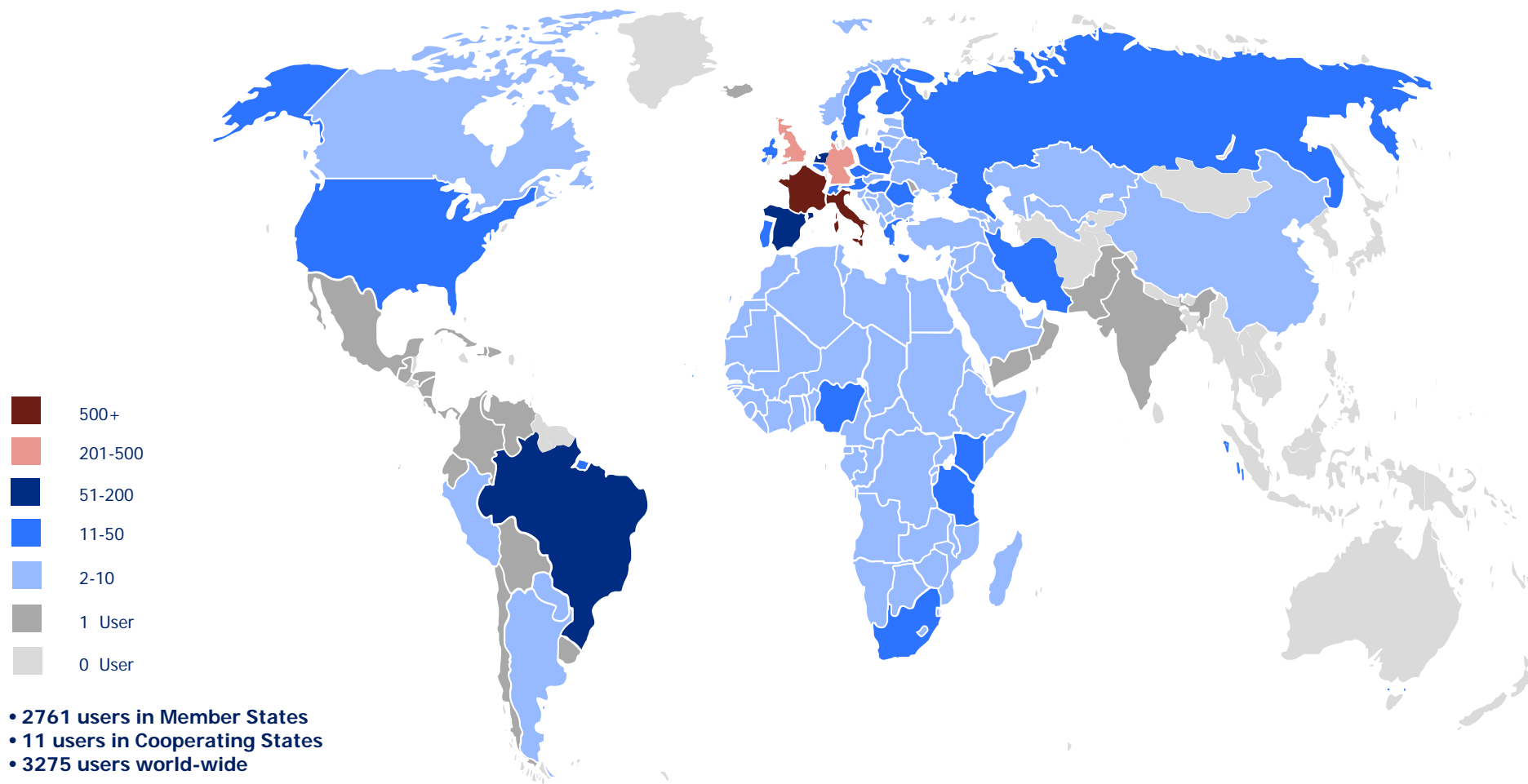
The significant increase in stations in 2010 shown on the chart was largely a result of the migration of the users of Météo-France's RETIM system to EUMETCast.

Note: The number of registered user stations is larger than the number of users (shown on the next slide) due to some organisations possessing several user stations.



EUMETSAT Central Operations Report for July – December 2013

EUMETCast → Users Worldwide as of 31 December 2013



The EUMETSAT Data Centre

EUMETSAT's Data Centre archives all payload data acquired from EUMETSAT's operational satellites and most of the products derived from that data.

The Data Centre allows registered users to request data and products from the archive by use of its online 'self-service' ordering mechanism and supplies the requested items via physical media and the Internet. It also allows 'bulk orders' for long time-periods of data and 'standing orders' for repeated delivery of data / products over specified time periods to be requested for special needs.

Charts on the following themes appear on the next 3 slides:

- Data Delivered: Total Volume versus Items
- Archive Orders versus Data To Be Retrieved
- Archive Order Delivery-Time Trends

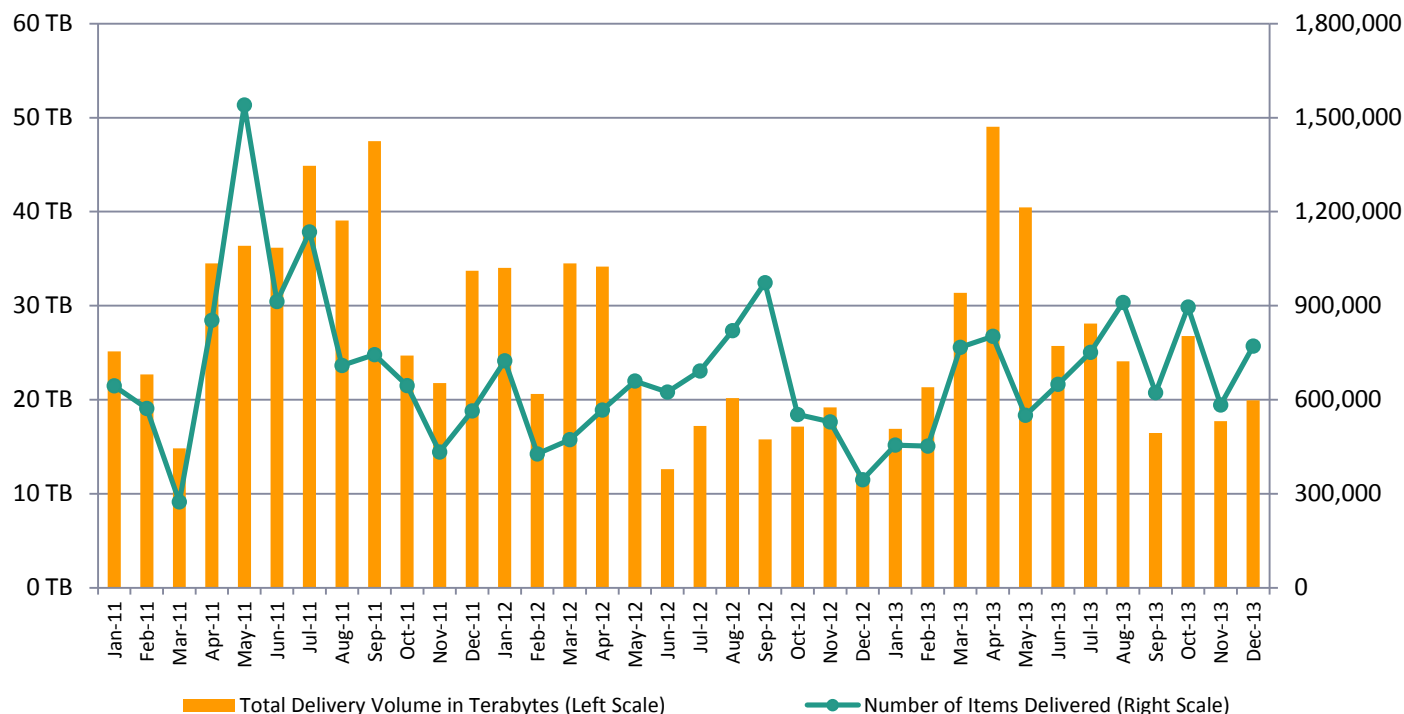
EUMETSAT Central Operations Report for July – December 2013

The EUMETSAT Data Centre → Data Delivered: Total Volume versus Items

The chart shows the number of items delivered monthly to the users by the Data Centre, and the corresponding monthly total volumes of data delivered, in the 3 years up to the end of 2013.

Items comprise images, products and ancillary files, and the statistics include all items supplied for all types of orders (regular, bulk and standing).

The peaks in delivery volumes in October and November 2012 were partly attributable to orders for newly-available Metop-B data.



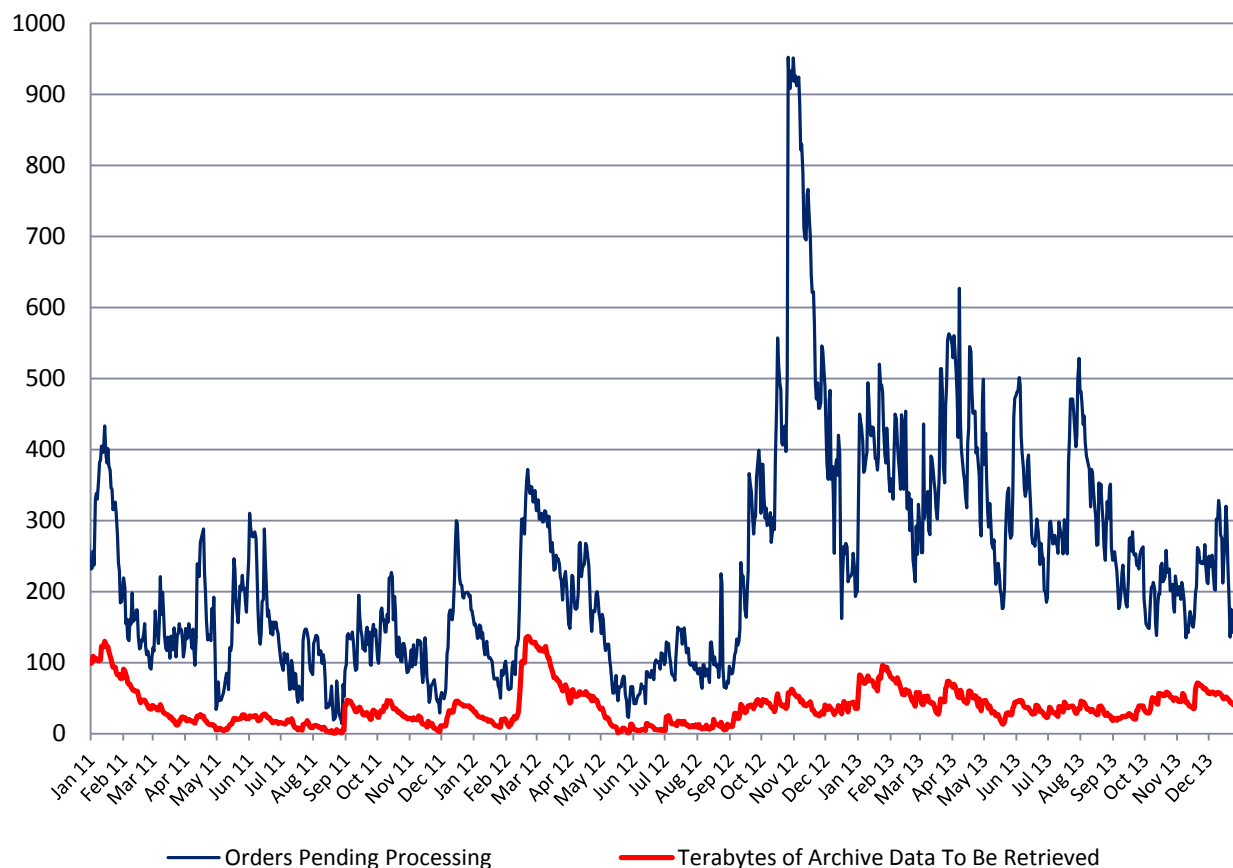
EUMETSAT Central Operations Report for July – December 2013

The EUMETSAT Data Centre → Archive Orders versus Data To Be Retrieved

The chart shows the day-by-day profile of archive orders awaiting processing, against the related volume of data needing to be retrieved from the archive and processed to satisfy the queued orders.

The chart is based on observed daily maximum orders and estimated retrieval volumes that are now automatically recorded for each day of the year.

Note: The exceptional peak seen in October/November 2012 was due to a large number of orders of few items being placed, many requiring media delivery, competing for system resources.



EUMETSAT Central Operations Report for July – December 2013

The EUMETSAT Data Centre → Archive Order Delivery-Time Trends

The 3 charts show delivery-time ranges for Data Centre orders according to 3 categories of order size (Small, Medium & Large), for each of the half-year periods shown on the horizontal axis. The left-hand scales help to show the proportions of the total orders delivered in the indicated time ranges (note: standing orders not included).

The colour-coding for the delivery-time bands on each of vertical bars on each chart is as follows:



The blue lines indicate the total orders per half year for each category (right-hand scales apply). Total orders across all 3 categories were:

2011/H1: 6319	2011/H2: 6013
2012/H1: 4720	2012/H2: 6488
2013/H1: 9868	2013/H2: 6894



EUMETSAT Climate Services

EUMETSAT contributes to climate monitoring and climate change analysis by reprocessing sensor data and products from Meteosat and Metop satellites held in its archive. Improved processing algorithms are applied to the data collected since the 1980's, producing data records with improved overall consistency, with artefacts introduced during past satellite lifetimes corrected.

The following slide gives an overview of the new Climate Data Records made available in EUMETSAT's archive in the reporting period.

For further information on EUMETSAT's role in Climate Monitoring and the European Climate Projects in which it is involved, please see the '[Monitoring Climate](#)' page whose link can be found on the 'What We Do' section under 'About Us' on the EUMETSAT website.

Climate Data Records produced at EUMETSAT in the reporting period:

Metop-A AVHRR Atmospheric Motion Vectors

Period: March 2007 – December 2012

Data has been processed, but is still under evaluation
(that for 2013 will be added during 2014)

Metop-A ASCAT L1

Period: January 2007 – June 2013

Data has been processed, but is still under evaluation

Meteosat-8 and 9 SEVIRI Atmospheric Motion Vectors, Clear and All Sky Radiance

Period: January 2004 – December 2007

Data has been processed, but is still under evaluation
(that for 2007 is still being processed)

Integration of EUMETSAT CM SAF CDRs in the Product Navigator has commenced.

Helpdesk Service

EUMETSAT's User Helpdesk provides support to the users of EUMETSAT's services, handling enquiries, registrations, user feedback comments, problems experienced and enhancement requests.

This section includes charts on the following subjects:

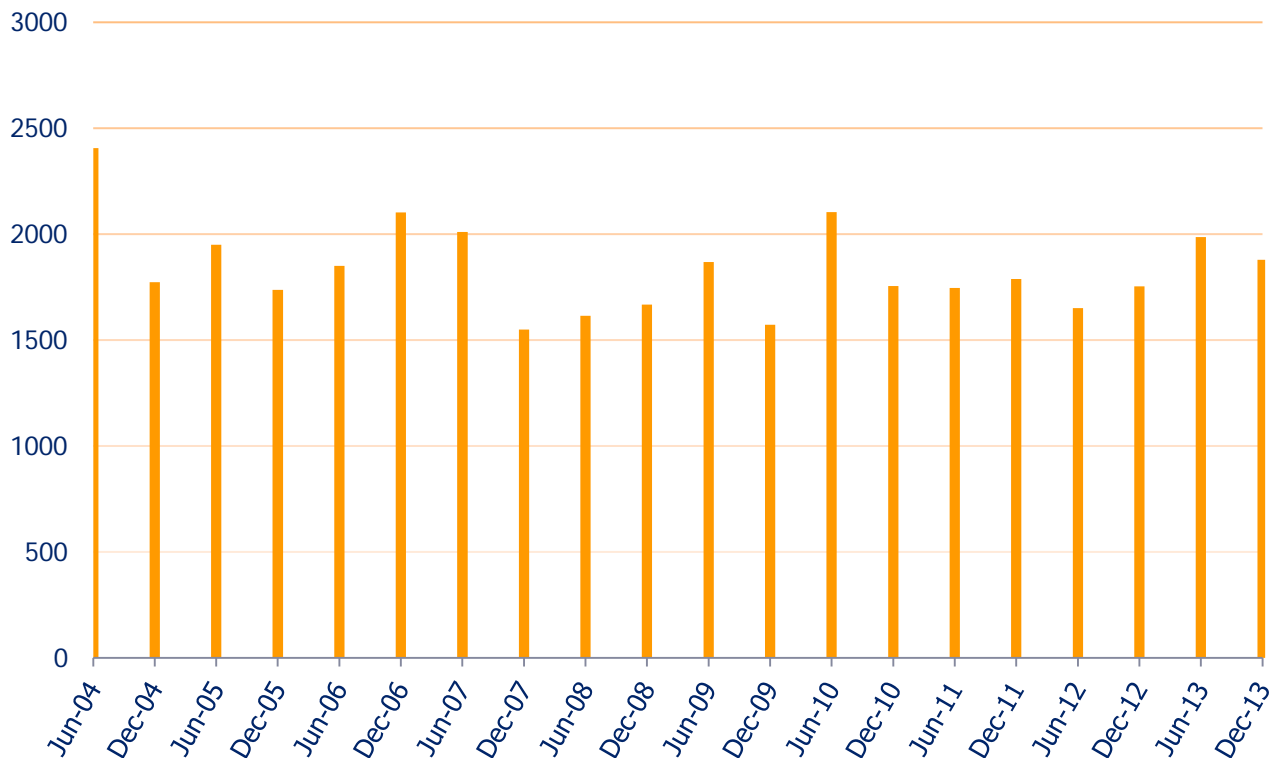
- User interaction history from 2002 onwards
- The countries and groups that gave rise to the largest numbers of user interactions in the reporting period
- Breakdown of those user interactions by category

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Helpdesk Service → User Interaction History

The chart shows the number of user interactions handled by EUMETSAT's User Helpdesk in each half-year of the last 10 years.

The next 2 slides focus on the user interactions for the current reporting period, in which a total of **1878** interactions were handled.



■ User Transactions per Half-Year Ending the Months Shown

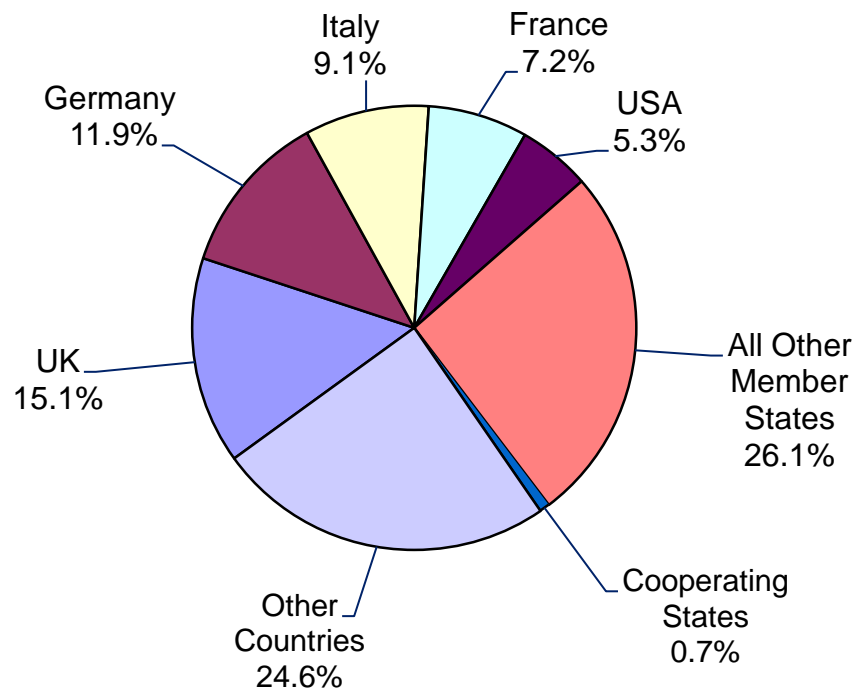
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Helpdesk Service → User Interactions 2013/H2 by Country of Origin

The chart shows the interactions in the second half of 2013 from:

(1) the 5 countries that gave rise to the largest numbers of interactions, and

(2) the split of the remainder of the interactions between other Member States, the Cooperating States and other countries.



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Helpdesk Service → User Interactions 2013/H2 by Category

The chart shows the numbers of user interactions in the second half of 2013 for:

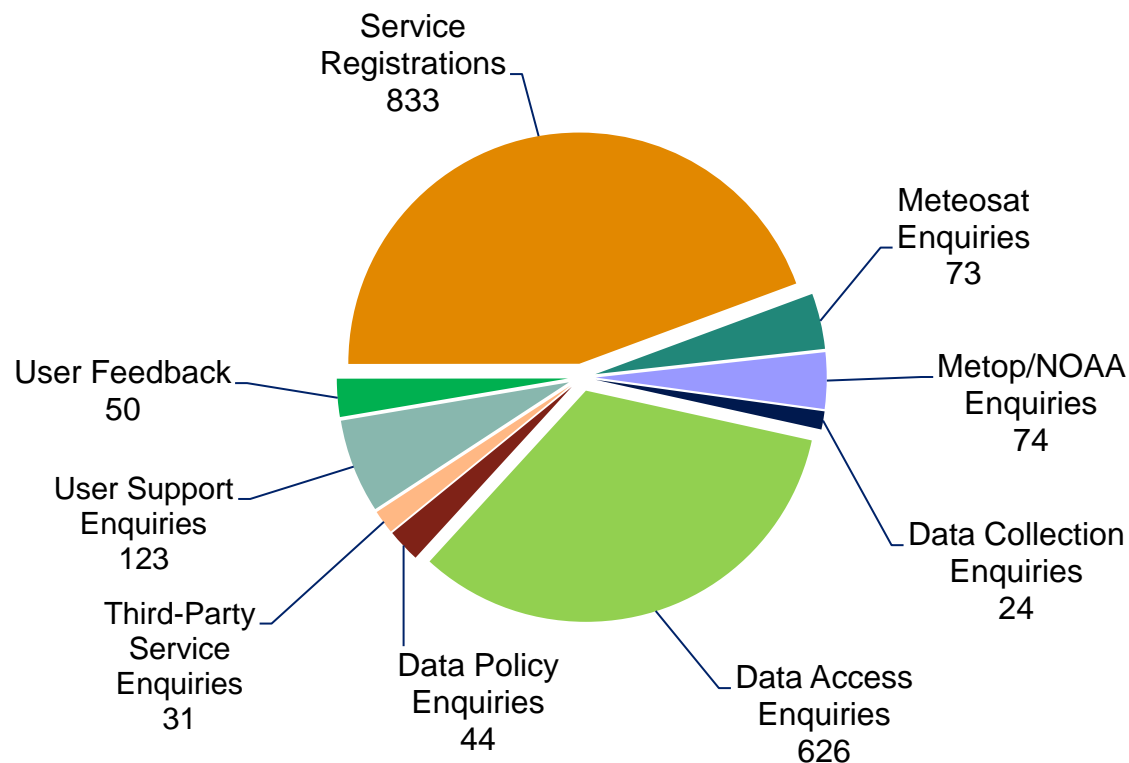
- Service Enquiries (7 categories)
- Service Registrations
- User Feedback

Total interactions for the half-year came to **1878**.

Notes:

(1) 'User Support Enquiries' on the chart refer to enquiries related to service messages, web information and training.

(2) 'User Feedback' includes comments on our services and suggestions for improvement



Changes to EUMETSAT's Services

Please see the following on the EUMETSAT website, www.eumetsat.int :

- For new releases: from the menu-bar: [Data](#) → 'Related News' on left, use 'View All' at foot of section
- For past releases: 'Data' → 'Service Status' (scroll down) → [Product History](#)

Details of all products can be found in EUMETSAT's Product Navigator, accessible under 'Quick Links' from the website's menu-bar.

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Glossary

Special terms used in this report are explained in the table below (continued on several subsequent slides).

Term	Context in which used	Description
A-DCS	Metop/NOAA Global Data	ADVANCED DATA COLLECTION SYSTEM. Metop instruments contributing to Argos programme. Acquisition and transmission of signals from transmitters on buoys, ships, land sites and mobiles.
AMSU-A	Metop/NOAA Global Data	ADVANCED MICROWAVE SOUNDING UNIT-A. Multi-channel microwave radiometer used in combination with the HIRS instrument for measuring global atmospheric temperature profiles.
ASCAT	Metop/NOAA Global Data	ADVANCED SCATTEROMETER. C-band radar which measures near-surface wind speed and direction over the global ocean, and soil moisture.
ATOVS	Metop/NOAA Global Data	ADVANCED TIROS OPERATIONAL VERTICAL SOUNDERS. Calibrated radiance measurements from the AMSU-A, MHS and HIRS instruments are transformed into various parameters and assembled in the ATOVS L2 product.
AVHRR	Metop/NOAA Global Data	ADVANCED VERY HIGH RESOLUTION RADIOMETER. Multi-spectral imaging instrument which produces global visible, near-infrared and infrared imagery of clouds, oceans and land surfaces.
CMA	Third-Party Data	China Meteorological Administration (http://2011.cma.gov.cn/en/aboutcma/)
Colinearity	Meteosat	Sun, satellite and ground station come into alignment twice a year, giving rise to disruption of uplink and downlink signals, resulting in partial loss of some images.
DCP	Meteosat	A 'Data Collection Platform' measures and transmits environmental data which is relayed by Meteosat satellite first to EUMETSAT's central operations, and then forwarded on to the DCP operator via direct, EUMETCast or GTS dissemination.

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Glossary (continued)

Term	Context in which used	Description
FES	Meteosat	Full-Earth Scanning, where the SEVIRI instrument scans the full Earth disc (c.f. RSS).
Formats	Meteosat (IODC)	This refers to the High-Resolution Image (HRI) formats disseminated via Meteosat-7's direct dissemination broadcasts.
GOME-2	Metop/NOAA Global Data	GLOBAL OZONE MONITORING EXPERIMENT-2. Scanning spectrometer instrument used to measure profiles and columnar amounts of ozone and other atmospheric constituents.
GRAS	Metop/NOAA Global Data	GNSS RECEIVER FOR ATMOSPHERIC SOUNDING. Radio occultation instrument for temperature profiling in the troposphere and stratosphere with high vertical resolution.
GTS	General	The 'Global Telecommunications System', established by the WMO, is used by national meteorological services to exchange meteorological data and products. See also 'RMDCN'.
HIRS	Metop/NOAA Global Data	HIGH-RESOLUTION INFRARED RADIATION SOUNDER. Heritage atmospheric soundings of temperature and humidity in cloud-free conditions.
IASI	Metop/NOAA Global Data	INFRARED ATMOSPHERIC SOUNDING INTERFEROMETER. A multi-purpose sounding instrument used for enhanced atmospheric soundings of temperature, humidity and trace gases in cloud-free and partly-cloudy conditions, as well as surface temperature, cloud characteristics and surface emissivity.
JMA	Third-Party Data	Japan Meteorological Agency (http://www.jma.go.jp/jma/indexe.html)

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Glossary (continued)

Term	Context in which used	Description
Level 0	Metop/NOAA Global Data	An instrument's raw data which has been demultiplexed from the total set of data dumped from one orbit of the Metop satellite.
Level 1.0	Meteosat	The raw image data acquired from a Meteosat satellite and preprocessed at the ground station, which is then received by a EUMETSAT image-processing facility, to be geometrically rectified and radiometrically corrected.
Level 1.5	Meteosat	Level 1.0 image data that has been corrected for radiometric and geometric non-linearity and is accompanied by the appropriate ancillary information that allows the user to calculate the geographical position and radiance of any pixel.
Level 1A	Metop/NOAA Global Data	Instrument data in full resolution with radiometric and geometric (i.e. Earth location) calibration computed and appended but not applied.
Level 1B	Metop/NOAA Global Data	Calibrated, earth-located and quality-controlled product, in the original pixel location, packaged with ancillary, engineering and auxiliary data.
Level 1C	Metop/NOAA Global Data	In the case of the IASI spectra, Level 1B data after the application of the apodization function.
Level 1D	Metop/NOAA Regional Data	For EARS-ATOVS, AVHRR derived cloud information on HIRS grid.
Level 2	Metop/NOAA Global Data	Earth-located values converted to geophysical parameters at the same spatial and temporal sampling as the Level 1B and 1C data.

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Glossary (continued)

Term	Context in which used	Description
MHS	Metop/NOAA Global Data	MICROWAVE HUMIDITY SOUNDER. 5-channel microwave instrument for atmospheric humidity sounding in all weather conditions.
NOAA	Metop/NOAA Global Data and Third-Party	National Oceanic and Atmospheric Administration (http://www.noaa.gov/)
Nominal RCs	Meteosat (0° SEVIRI)	SEVIRI repeat cycles consisting of geometrically and radiometrically-corrected data in all 12 channels, with less than 18 missing detector lines in the scanned Earth area for any given spectral channel (54 for HRV), where less than 12 of those lines (36 for HRV) are adjacent to each other.
‘On-Time’	All	The data or product has been generated or received ‘on-time’ at a specified location (e.g. at generation facility or EUMETCast user station respectively) within the relevant timeliness constraint.
OOP	Metop	‘Out-Of-Plane’ manoeuvre, i.e. one conducted with a Metop satellite in order to adjust the inclination of its orbit.
Perfect Formats	Meteosat (IODC)	High-Resolution Image (HRI) formats which have no missing lines and are based on the latest scanned image according to schedule.
Perfect Images	Meteosat (IODC)	Rectified images which are 100% complete.

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Glossary (continued)

(end of report)

Term	Context in which used	Description
PGF	On Metop performance charts	The Metop 'Product Generation Facility' is the part of the EPS CGS (Core Ground System) which generates Level 0 data and controls the generation of Level 1 and 2 products by the relevant PPFs (Product Processing Facilities).
Repeat Cycles (or RCs)	Meteosat (0° SEVIRI)	The period in which the MSG SEVIRI instrument performs one scan and then is repositioned ready for the next repeat cycle. A nominal repeat cycle (a scan of the entire Earth disc) has a duration of 15 minutes.
RMDCN	General	The 'Regional Meteorological Data Communication Network' is used by WMO Region VI to carry GTS traffic within Europe. See also 'GTS'.
RSS	Meteosat (9.5° SEVIRI)	Rapid-Scan Service (for MSG), where the repeat cycle has a duration of only 5 minutes, covering the latitude range of 15 to 70°N.
SEM	Metop/NOAA Global Data	The 'Space Environment Monitor' consists of a pair of instruments which provide data to determine the intensity of the Earth's radiation belts and the flux of charged particles at the satellite's orbiting altitude.
SEU	Satellite or instrument outages	'Single Event Upset', the term used to refer to an effect on onboard electronics caused by charged particles (e.g. solar), possibly resulting in a switch-off of an electronic system.
SEVIRI	Meteosat Second Generation (MSG)	Spinning Enhanced Visible and Infra-Red Imager