EUMETSAT Headquarters, Darmstadt, Germany

Central Operations Report
for the period January to June 2013

Contents

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 first half of 2013 has been an eventful period in terms of the changes in the utilisation of our satellites:

21 January: Meteosat-10 became the prime satellite for the 0° Meteosat service, following a relocation from 3.4°W to 0°. Meteosat-9 was also relocated in the January/February timeframe from 0° to 9.5°E, and Meteosat-8 from 9.5°E to 3.5°E.

9 April: Meteosat-9 was made the prime satellite for the Rapid-Scanning Service.

24 April: Metop-B became the prime polar-orbiting satellite, formally taking over Metop data service coverage from Metop-A, with which it has been used in dual operations since its launch and commissioning phases.

7 May: Meteosat-8 ended the parallel Rapid-Scanning with Met-9 and was reconfigured as the backup to Met-10 (0° FES) and Met-9 (RSS), to be used in case of a problem occurring with either of these satellites, and otherwise (under nominal operational conditions), for rapid-scan imaging in the monthly/yearly service pauses for Met-9.

As explained on slides 8 and 17, the availability charts for the Meteosat and Metop services in the reporting period take into account the swap of the prime satellites in January and April, and thus show the continuity of service achieved.

In general, the reporting period has seen on-target performance for the majority of services with no major anomalies, except for the problem encountered with the GERB instrument onboard Meteosat-10 (see slide 8 for more info).

Introduction (continued)

In the period mid-May to the end of July, EUMETSAT Operations supported four 12-hour sessions of 'super rapid scanning' (2.5 minute Repeat Cycles) using Meteosat-8. These served to demonstrate the value of fast repeat rates for studying and nowcasting convective storms. The experience gained acts as an important input to the Meteosat Third Generation programme.

Three new EARS services have entered into operation during the reporting period:

- EARS-NWC on 24 April (cloud products via EUMETCast Europe)
- EARS-ATMS and EARS-CrIS on 15 May (sounder data via EUMETCast Europe and GTS-RMDCN)

These new services will be reported on in the next issue of this report. More information can be found on the EUMETSAT website (search for 'EARS').

Changes in this report: The Meteosat meteorological product charts have now been merged in with the ones for the corresponding image data services (see slides 9 to 11). This allows an easier comparison between the related services.

Last, but not least, Mikael Rattenborg has handed over the director's bâton to myself at the end of the reporting period. Mikael held the post of D/OPS since 1 July 2001 and was responsible for much evolution in EUMETSAT's operations arena. EUMETSAT thanks him for his large contribution to the success of the organisation's operational services in the last 12 years.

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 has, in addition, been helping to achieve full continuity of RS imaging since 7th May 2013 by operating in the RS pauses of Meteosat-9.

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 of relevance with respect to the Meteosat Services took place:

Swap of prime satellites for 0° FES and RSS:

(1) Meteosat-10 became the prime operational satellite for the 0° Full-Earth Scanning (FES) service on 21 January. All service availability statistics are based on Meteosat-9 data up to and including that date, and on Meteosat-10 data thereafter.

(2) Meteosat-9 became the prime operational satellite at 9.5°E for the Rapid-Scanning Service on 9 April. All service availability statistics are based on Meteosat-8 data up to and including that date, and on Meteosat-9 data thereafter.

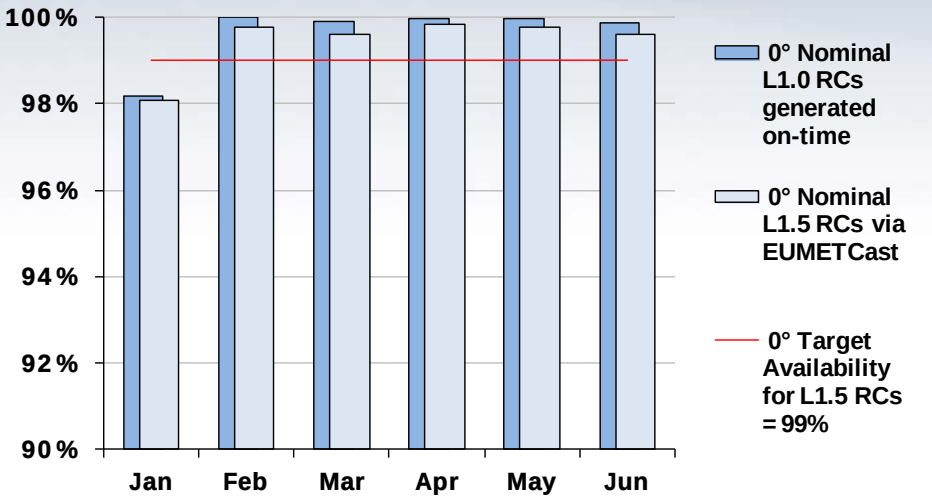
Meteosat-8 is now the backup satellite:

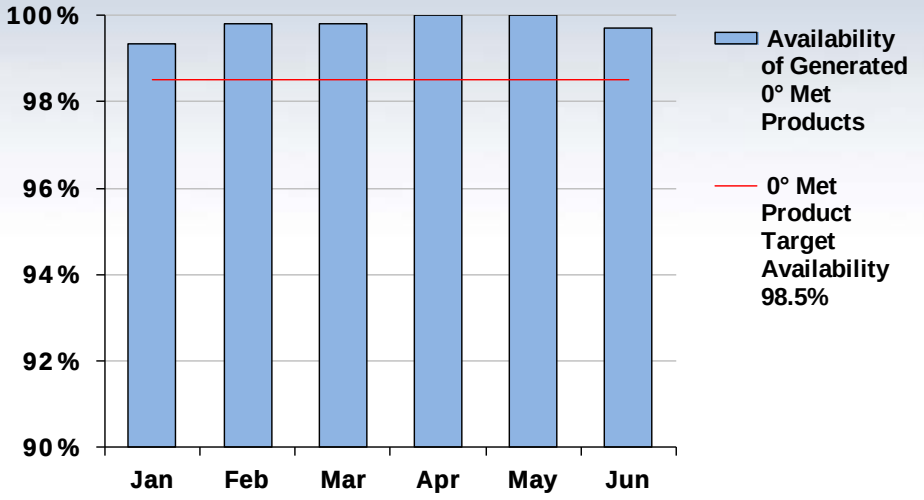
Since 7 May, Meteosat-8 (located at 3.5°E) has been configured as the 'hot standby' for the 0° FES and RSS services, to be used to support those services in the case of a problem with either of the prime satellites. Under nominal operations, however, Meteosat-8 will provide rapid-scan imaging in the monthly and yearly service pauses for Meteosat-9, thus ensuring a more continuous imaging service, albeit with no corresponding meteorological products in the monthly 48-hour pauses.

GERB instrument anomaly on Meteosat-10:

GERB-3 experienced an auto-safe mode on 27 April, from which it has not been possible to return it to normal operational status. Although the GERB service is not covered in this report, and the mission is supported by the GERB instrument on Meteosat-9, efforts are still ongoing to try and return the instrument to its normal operational state. See the EUMETSAT website for more info – search for 'GERB'.

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





Prime satellite was Met-9 until 21-Jan-2013, Met-10 thereafter.

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:

January: Geometric quality affected by the drift-start manoeuvre of Met-9 just prior to the transition of 0° service on 21st January and the drift-stop manoeuvre of Met-10 just after the transition.

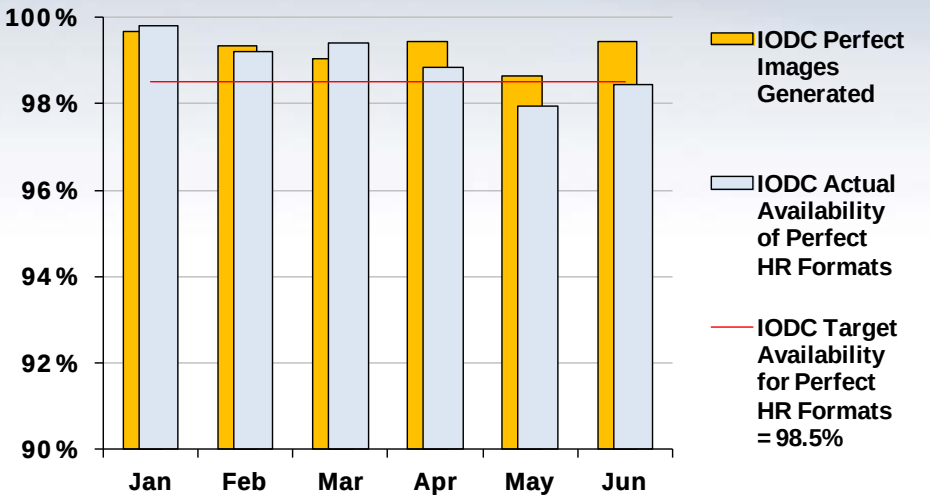
Performance measured in terms of the number of meteorological products which have been generated at EUMETSAT from the Full-Earth Scan images provided by Meteosat-10 (Meteosat-9 until 21-Jan-2013), as a percentage of those products scheduled.

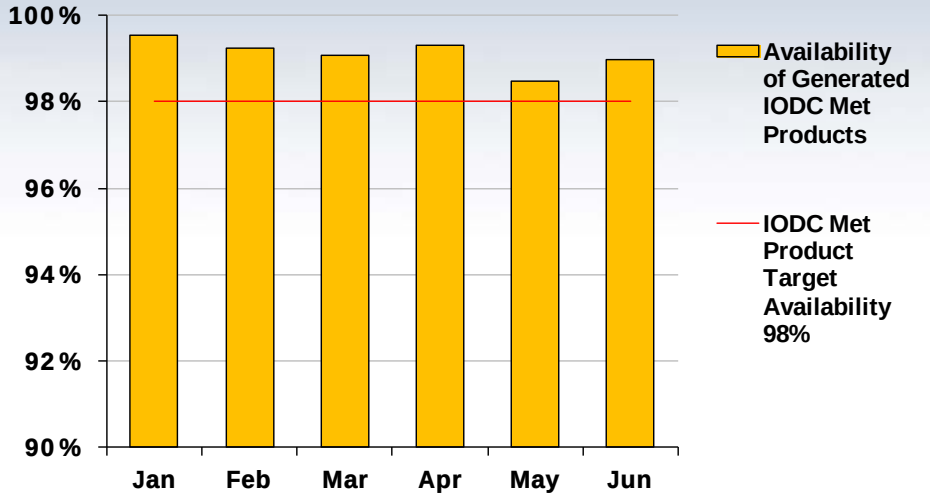
Note that the availability of products is only measured at the point of generation.

Events which impacted availability:

Some CRM products in January affected by the manoeuvres.

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:

1 May: Fucino ground station problems impacted a total of 9 RCs.

18-19 June: Problems with Comms link to Fucino ground station impacted a total of 32 dissemination formats.

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:

1 May: Fewer images (see box on left)

14 May: Activation of new software release on the product extraction facility resulted in a 9-hour outage of products.

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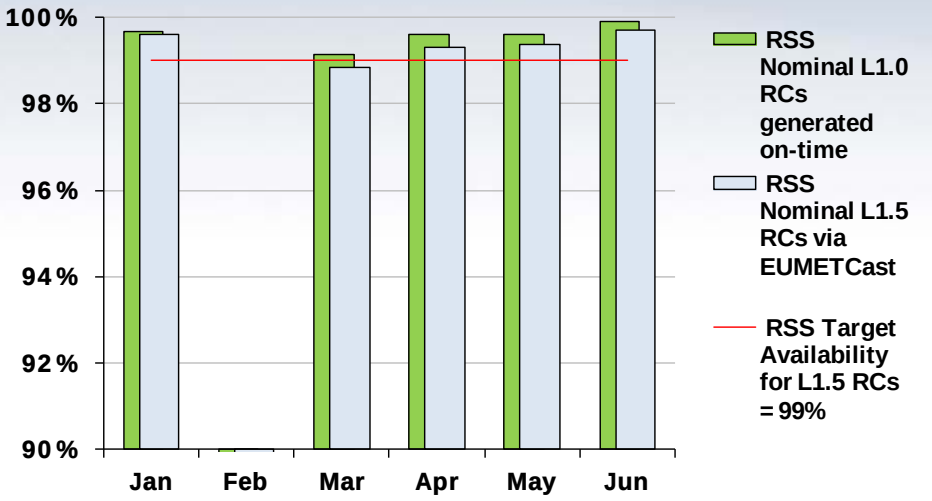
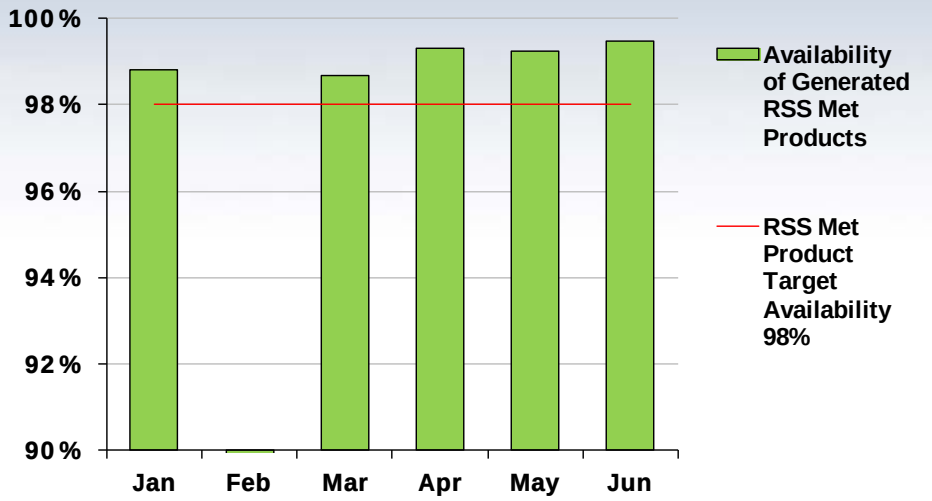
Meteosat Services → 9.5°E RSS Image Data & Derived Meteorological Products





Prime satellite was Met-8 until 9-April-2013, Met-9 thereafter.

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:

February: 1 month RSS service pause.

March: Geometric quality of several RCs per day impacted by a suspected thermal effect on Meteosat-8 during eclipses.

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:

February: 1 month RSS service pause.

March: Some AMV products also impacted by the eclipse-induced thermal effect.

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 (Meteosat-9 until 21-Jan-2013, Meteosat-10 thereafter).

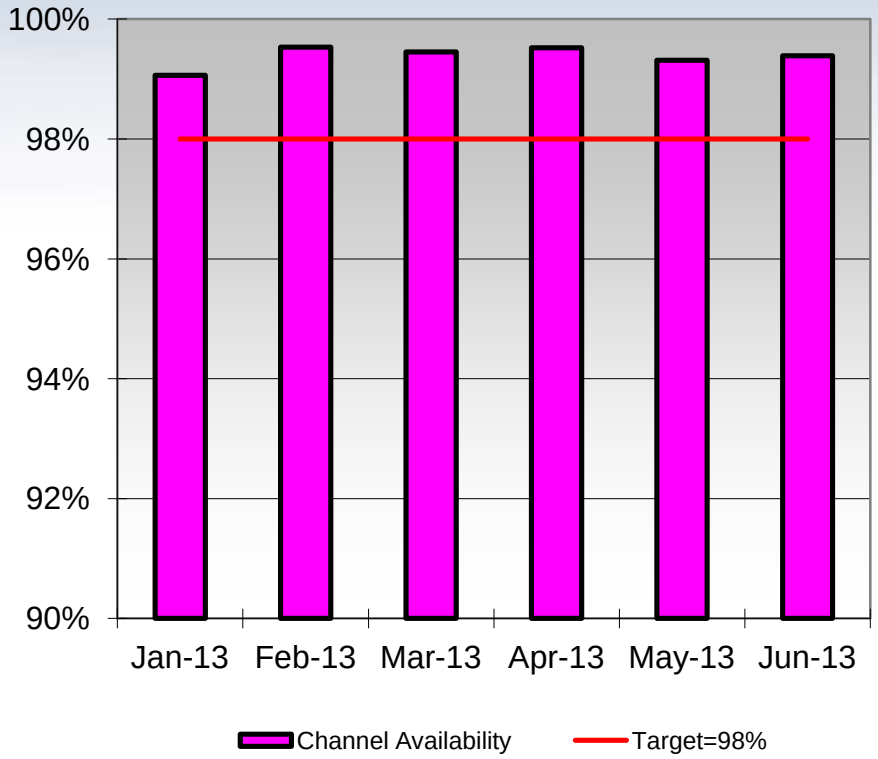
The chart shows the availability of the 0° DCP service. It is measured in terms of the number of hourly reference DCP messages on all operational regional channels which have been successfully received back by EUMETSAT, as a percentage of those sent.

(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.



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	115	↑	France	4	↑	Mauritania	1		Turkey
2		Armenia	1		Gambia	4		Mauritius	48		UK
3		Austria	45	↑	Germany	23		Mozambique	22		Ukraine
0	↓	Bangladesh	8		Ghana	2		Myanmar	1		Union des Comores
2		Belarus	1		Gibraltar	18		Namibia	62	↑	USA
3		Benin	1		Greece	23		Niger	0	↓	Vietnam
11		Botswana	11		Guinea	18	↑	Nigeria	1		Yemen
1		Brazil	2		Guinea-Bissau	10		Oman	15		Zambia
4		Bulgaria	19		Indonesia	4		Pakistan	13		Zimbabwe
6		Burkina Faso	2		Iran	3		Palestine			
61		Cameroon	139	↑	Iraq	3		Philippines			
1		Canada	8	↓	Ireland	11		Republic of Moldova			
4		Cap Verde	88	↓	Italy	10		Republic of Seychelles			
2	↑	Central African Republic	3		Ivory Coast	10	↓	Romania			
3		Chad	4		Kenya	12	↑	Senegal			
2		Congo	6		Lesotho	36	↑	South Africa			
3		Croatia	11		Libya	7		Spain			
1		Cyprus	2		Madagascar	3		Sri Lanka			
26		Dem. Rep. of the Congo	8		Malawi	2		Swaziland			
1	↓	Djibouti	1		Malaysia	10		Tanzania			
1		Egypt	3		Maldives	0	↓	Thailand			

Total = 1091 DCPs

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.

As of the end of June 2013:

1091 registered Data Collection Platforms (DCPs),

belonging to 130 operators,

deployed amongst the 77 countries shown in the table.

Out of the total number of registered DCPs, there were 641 units in active operation.

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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	M	M	M	M	M	M	M	M	M	M	M
Level 1	-	M+N	M	M	M+N	M	M	M+N	M	M+N	-
Level 2	-	-	-	M+N	-	-	-	-	M	-	-

(where 'M' = Metop, 'N' = NOAA)

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

Note: 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 data (Metop-A until 24-April, Metop-B thereafter) acquired via the Antarctic Data Acquisition ('ADA') service, currently supported in a demo phase, 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, it is expected that all passes will be supported in the operational phase.

On slide 18 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.

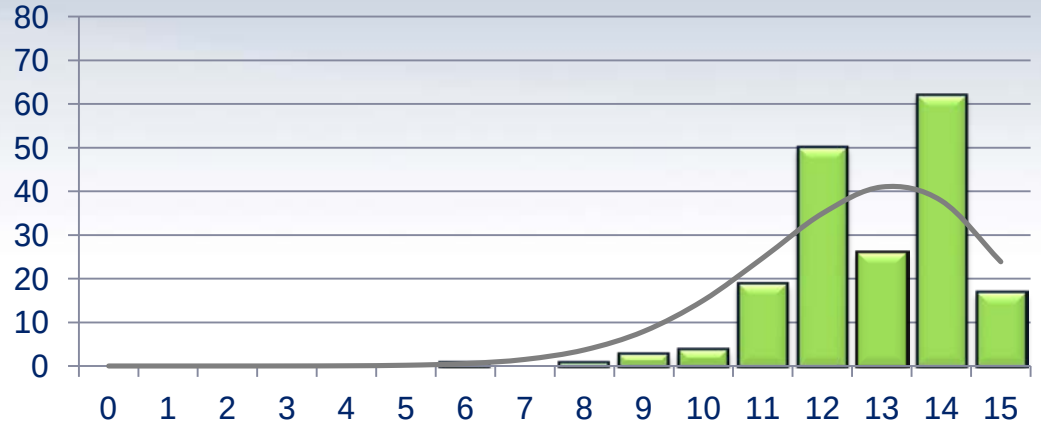
Note: There are cases where the availability of Level 2 products is indicated as being marginally higher than that of Level 1, and similarly, for Level 1 compared to Level 0. This arises because of the differences in time-logging between different stages of production, influencing the generation of statistics.

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.

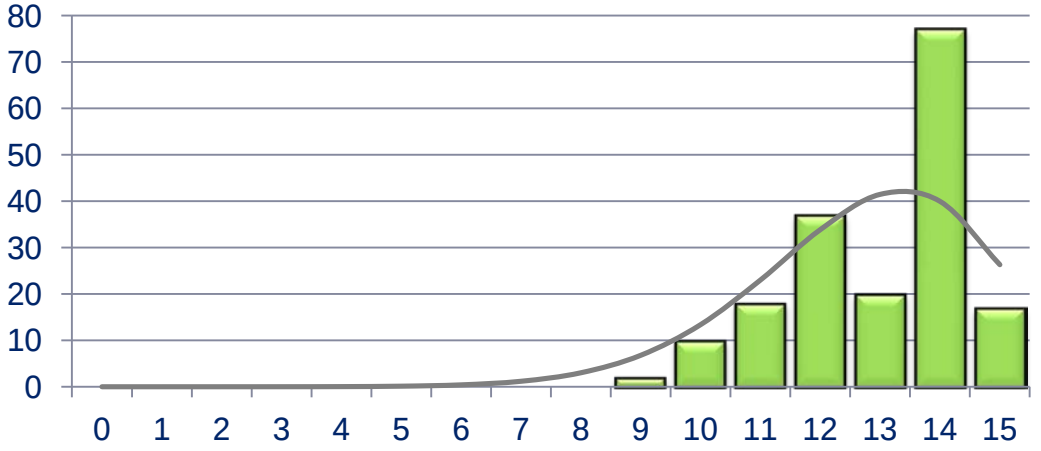
Each chart shows for the respective half-year period the numbers of days (y-axis) on which a given number of passes (x-axis) were successfully acquired at McMurdo and relayed to Darmstadt.

Overall average passes per day achieved for the last two half-years are calculated. Target is 9 passes per day (during demo phase until 2014/Q1), out of the 14-15 daily orbits of the prime Metop satellite.



2012/H2

Average passes/day = 12.8



2013/H1

Average passes/day = 13.0

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

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

The following events impacted the Metop/NOAA Global Data Service to the extents given:

<u>Metop-A Out-Of-Plane Manoeuvre on 20/21-March-2013:</u> Product processing for the following instruments was deactivated for periods of varying length between 08:14 on 2013-03-20 and 07:10 on 2013-03-21: AMSU, ASCAT, GOME-2, GRAS, HIRS, IASI and MHS.

SEM was put into manoeuvre mode.

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

<u>Swap of prime satellite:</u> Metop-B became the prime operational satellite on 24 April. All service availability statistics are based on Metop-A data up to and including that date, and on Metop-B data thereafter, with the exception of the following, for which the transition occurred on the indicated dates:

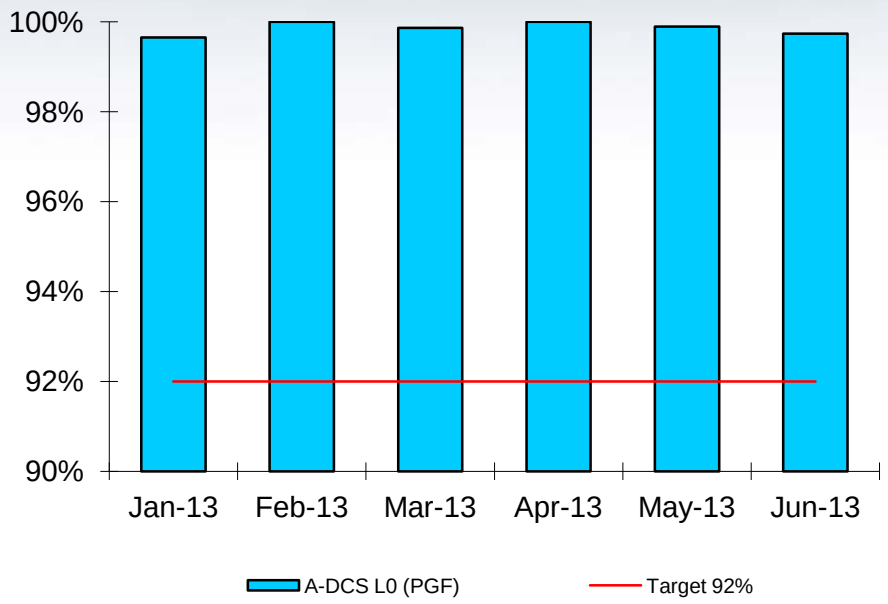
GOME-2 L0 and L1B (6 May), ATOVS L2 (18 June), IASI L2 (18 July)

The A-DCS instrument on Metop-B suffers degraded performance and thus the service continues to be based on data from the Metop-A instrument.

Metop Global Data Service → A-DCS Level 0 Data

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

Due to degraded A-DCS performance on Metop-B (not remediable), Metop-A continues to provide the prime Argos-3 A-DCS service, with Metop-B providing just Argos-2 mode. The availability statistics shown are for Metop-A.



<u>Events which impacted availability:</u>

None significant.

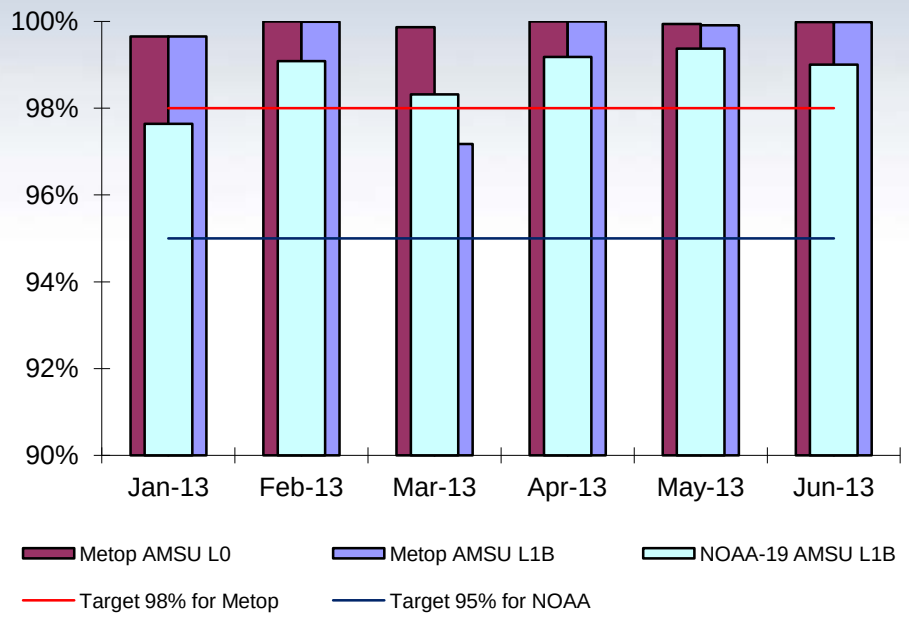
Metop/NOAA Global Data Service → AMSU Level 1B BUFR Products

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 both Metop-A (Metop-B after 24-April) and NOAA-19 satellites.

Events which impacted availability:

20/21-March: Metop-A OOP manoeuvre impacted L1B (see slide 17)



Notes: (1) Metop-A's AMSU: noise on channels 3 & 8 but both are still currently fully usable for higher-level products; channel 7 has failed completely.

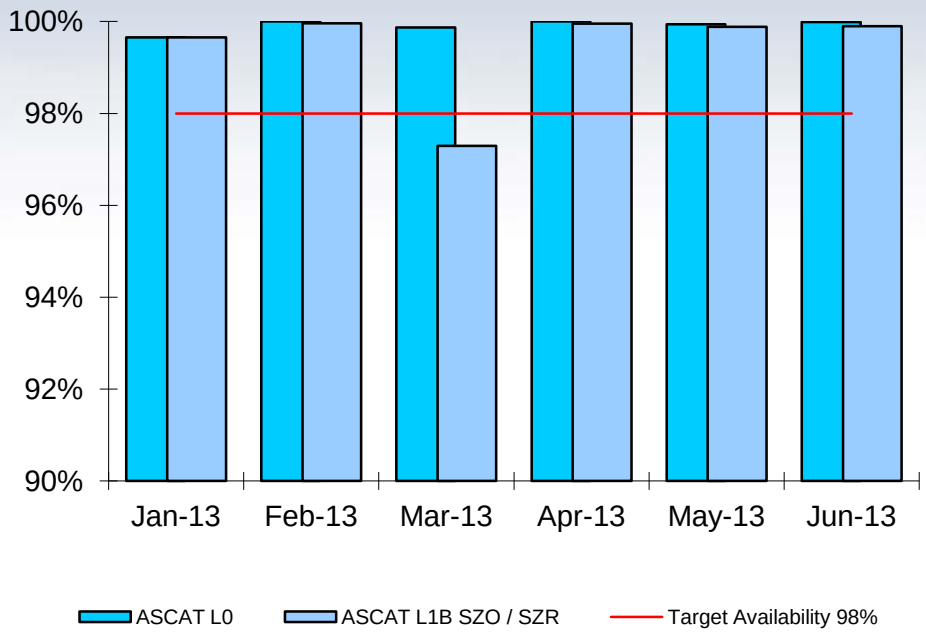
(2) Metop-B's AMSU: all channels well within specification

(3) NOAA-19's AMSU: channels 7 & 8: out of specification but the data is still considered usable for the time-being

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

The Advanced Scatterometer (ASCAT) is a C-band radar 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 soli moisture, sea-ice extent and permafrost boundary. EUMETSAT disseminates sampled Level 1B data 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:

20/21-March: OOP manoeuvre impacted L1B
(see slide 17)

Metop/NOAA Global Data Service → ATOVS Level 2 Products

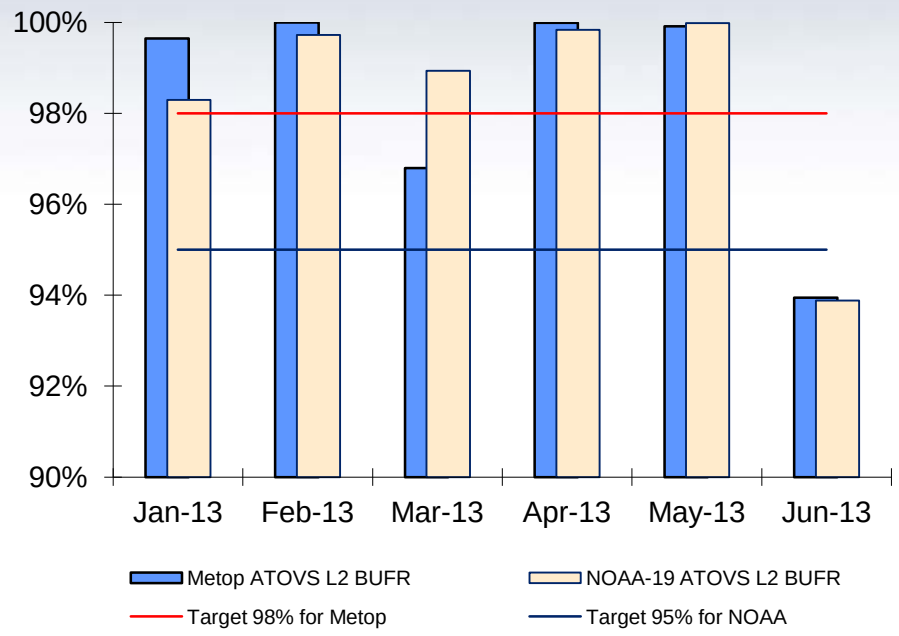
ATOVS Level 2 product processing transforms the calibrated radiance measurements from the AMSU-A, MHS and HIRS instruments (onboard Metop and NOAA-19 satellites) into information on the vertical distribution of atmosphere state parameters, on cloud and surface parameters and total atmosphere contents.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

20/21-March: **Metop-A OOP manoeuvre impacted L2 (see slide 17)**

25-27 June: **Problem with interpreting new forecast files from ECMWF impacted the product processing facility's generation of ATOVS L2, resulting in a 48-hour outage for both Metop and NOAA products.**



Note: **Statistics show availability of data for Metop-A up to and including 17 June, and for Metop-B thereafter.**

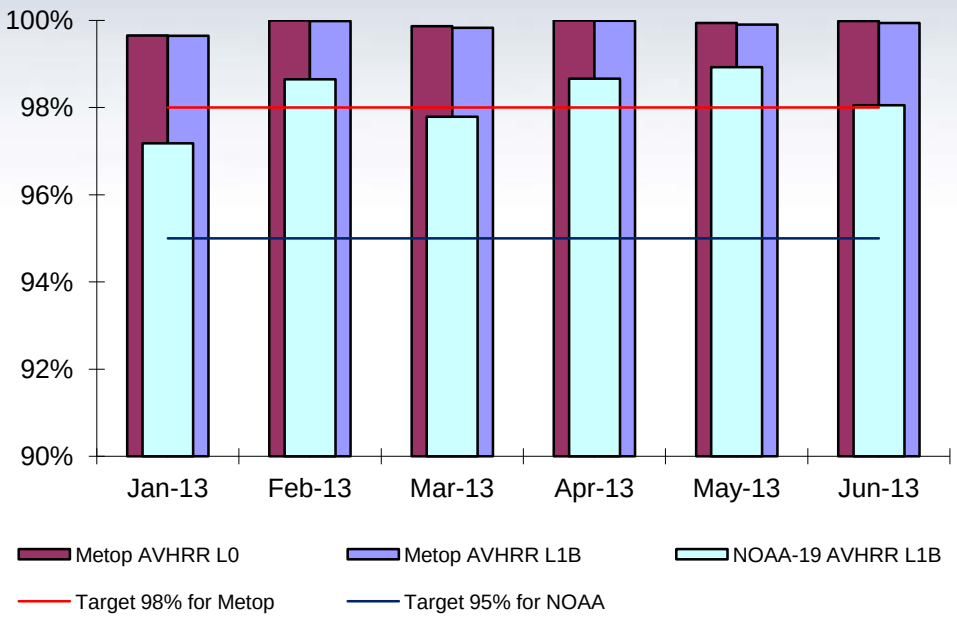
Note: Metop-A's AMSU channel 7 has failed and is thus no longer used for ATOVS L2 product processing.

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 both Metop-A/B and NOAA-19 satellites.

Events which impacted availability:

None significant for either Metop or NOAA products.



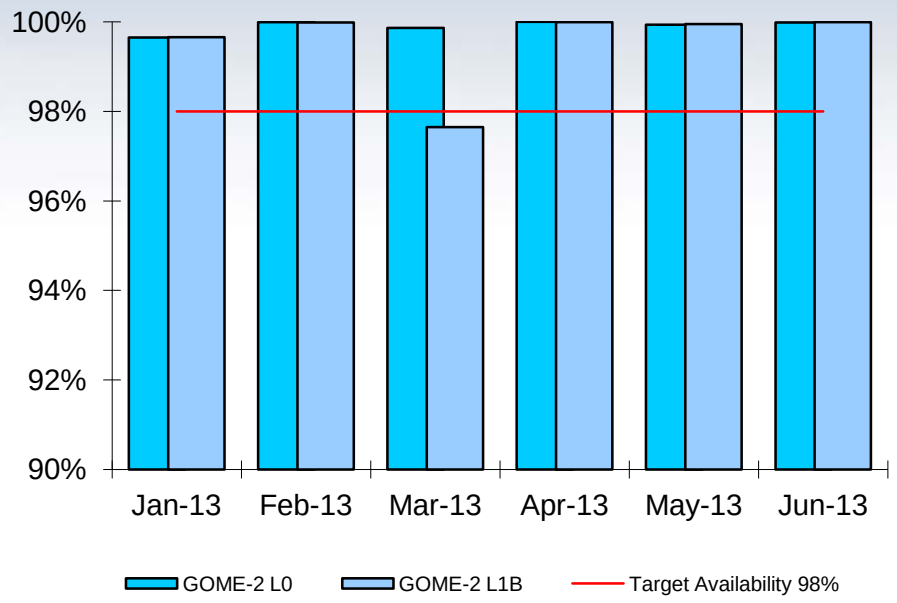
Metop Global Data Service → GOME-2 Level 1B Products

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:

20/21-March: Metop-A OOP manoeuvre impacted L2 (see slide 17)

Note: Statistics show availability of data for Metop-A up to and including 5 May, and for Metop-B thereafter.



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.

Metop Global Data Service → GRAS Level 1B Products

The GNSS Receiver for Atmospheric Sounding (GRAS) instrument which provides 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 produced (plus geolocation and quality flags)

(2) the proportion of them successfully disseminated

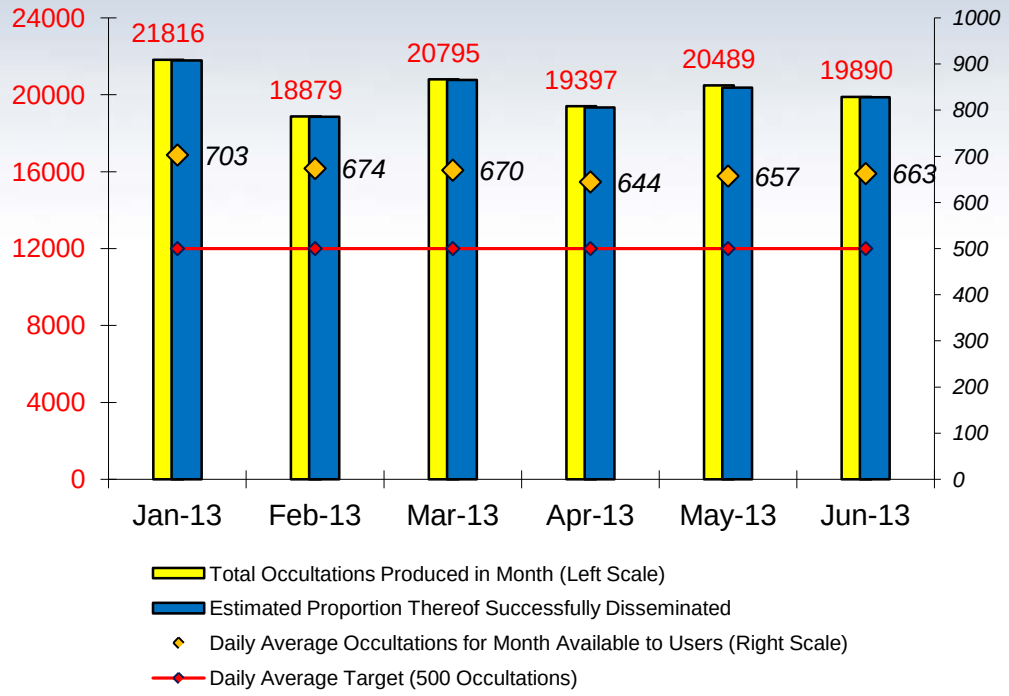
(3) the daily average number of occultations provided to users (in italics)

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

Events which impacted availability:

20/21-March: Metop-A OOP manoeuvre impacted measurements (see slide 17)

Note: Functional improvements have been achieved through refining the GRAS instrument's onboard software during Metop-B commissioning and the improved software version has also been applied to the Metop-A instrument on 25 June.



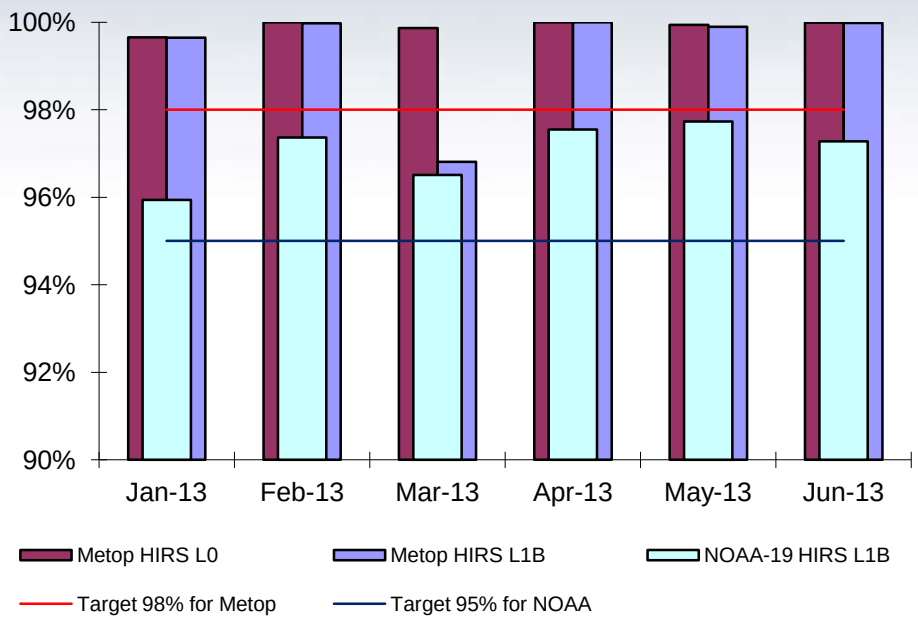
In addition to the outages associated with Metop manoeuvres, GRAS L1B data is flagged 'degraded quality' for a fixed 4 hours following any anomaly, regardless of the actual level.

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:

20/21-March: Metop-A OOP manoeuvre impacted L1B (see slide 17)



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

(2) Metop-B's HIRS: channels 5, 6 & 10 are out of specification but the data is still currently fully usable for higher-level products

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

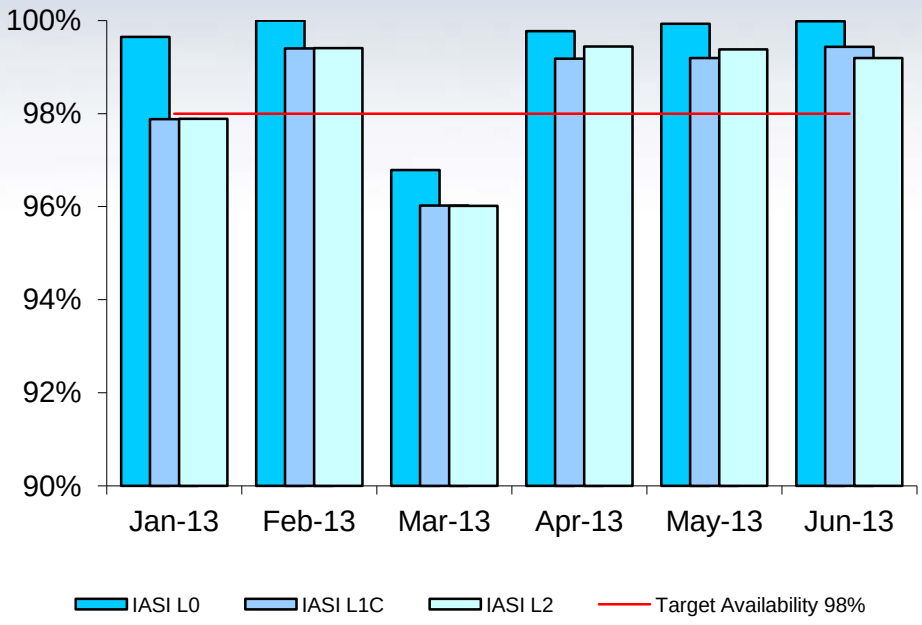
Metop Global Data Service → IASI Level 1C & Level 2 BUFR Products

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:

1-2 January:	**Moon intrusion avoidance impacted L1C and L2 data**
20/21-March:	**OOP manoeuvre impacted L0, L1C and L2 (see slide 17)**
24/25 April:	**A suspected SEU impacted the data from one pixel of Metop-B's IASI instrument, causing 20 % loss of data on that pixel for approximately 27 hours.**

Note: Statistics show availability of L2 data for Metop-A for the entire reporting period (data for Metop-B only became available operationally 18 July). L0 and L1C data, however, from Metop-A up to and including 24 April, from Metop-B thereafter.



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.

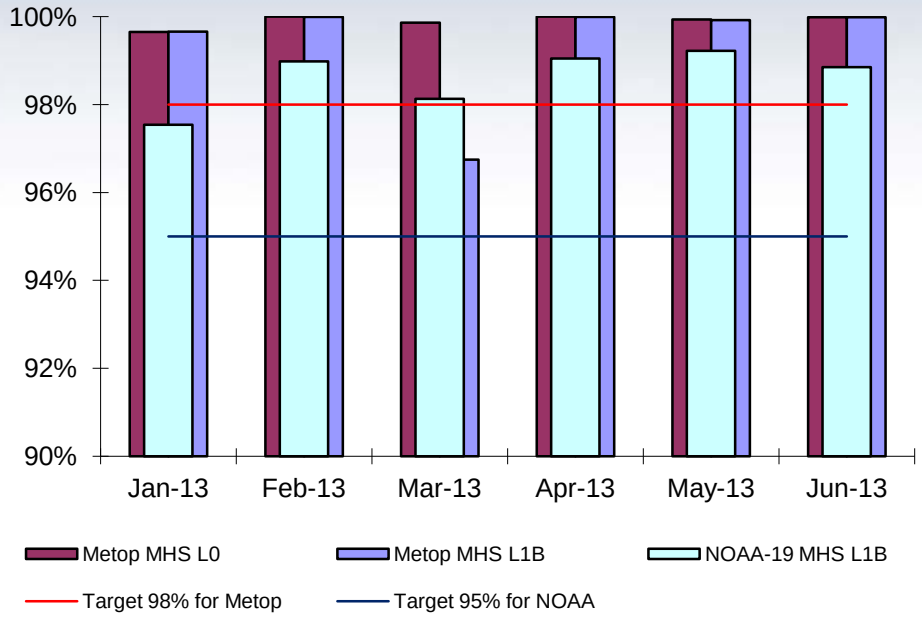
Metop/NOAA Global Data Service → MHS Level 1B BUFR Products

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:

20/21-March: Metop-A OOP manoeuvre impacted L1B (see slide 17)

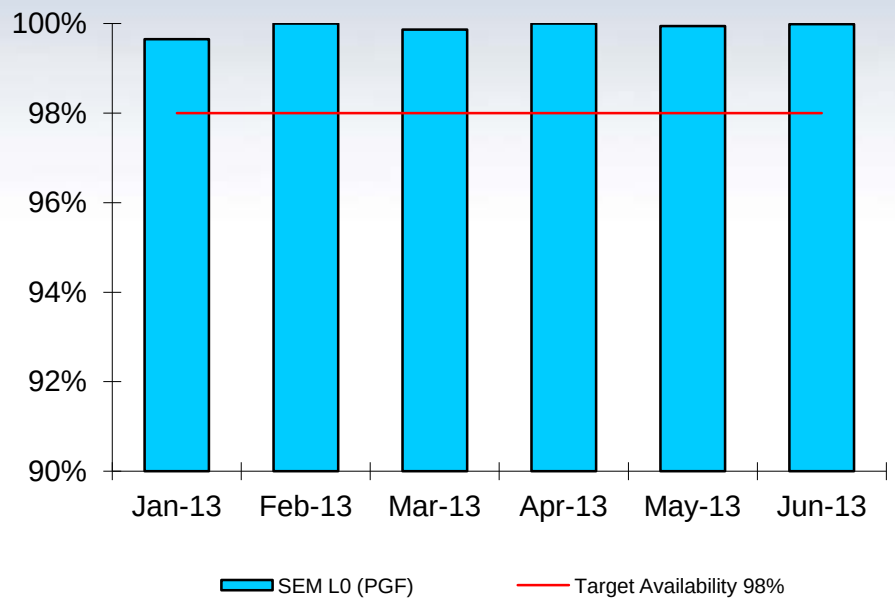


Notes:
- **NOAA-19's MHS instrument's channel 3 remains out of spec**
- **Metop-A and Metop-B instruments: all channels within specification**

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:

None significant.

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) has consisted of the following component instrument data services for the full reporting period:

EARS-ASCAT, EARS-ATOVS, EARS-AVHRR, EARS-IASI

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.

The RDS has been based on Metop-A data during the reporting period – Metop-B data has been included in the service as of 20-August, complementing Metop-A data on the 4 above-mentioned component services. Metop-B data has replaced that of Metop-A for EARS-NWC mentioned below.

Newly established are the following instrument services, for which reports will be available for the July-December 2013 period:

EARS-ATMS and EARS-CrIS (commenced 15 May)

EARS-NWC (commenced 24 April)

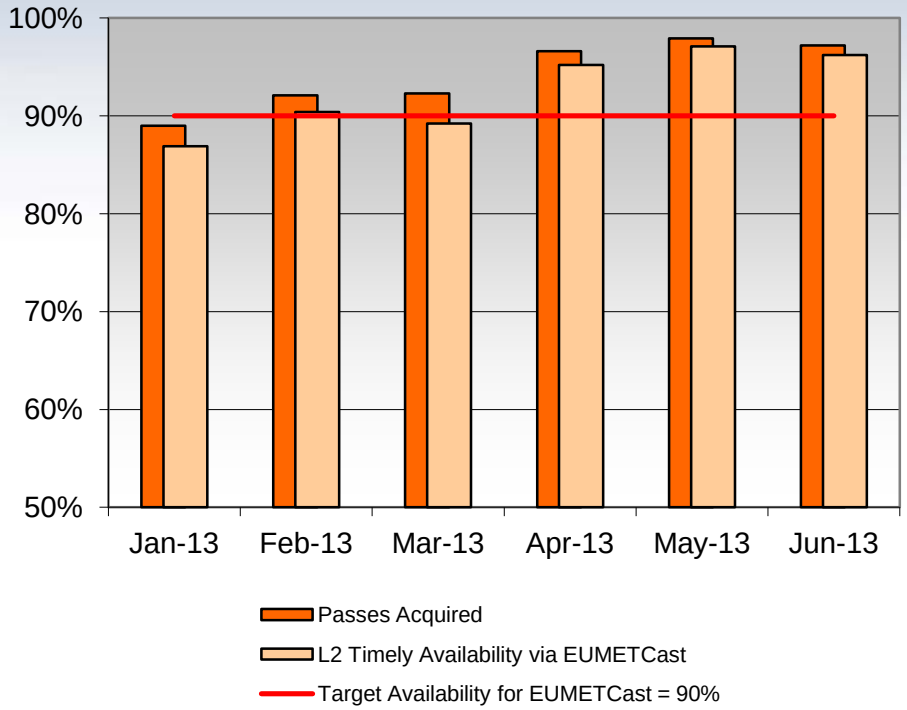
Metop / NOAA Regional Data Service → EARS-ASCAT

This service provides products derived from the data produced by the ASCAT instrument onboard the Metop-A satellite.

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:

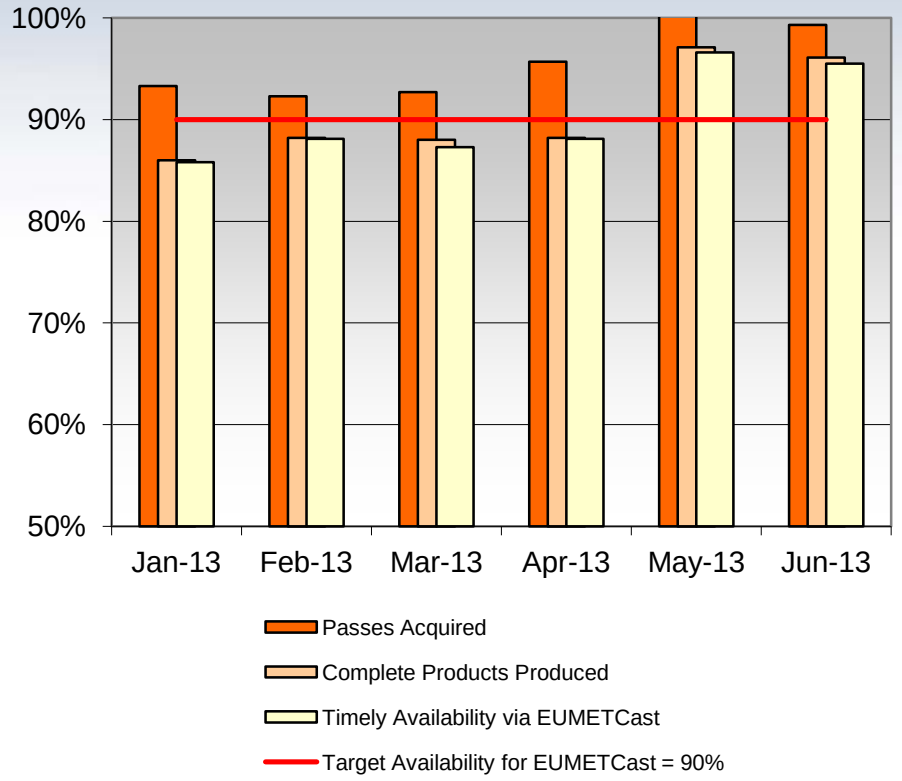
January - March: **Outages of several HRPT stations supporting the EARS-ASCAT service impacted data acquisition.**



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-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:

January - March: Outages of several HRPT stations supporting the EARS-ATOVS service impacted data acquisition.

April: System problems at the Ewa Beach station impacted the availability of products

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.

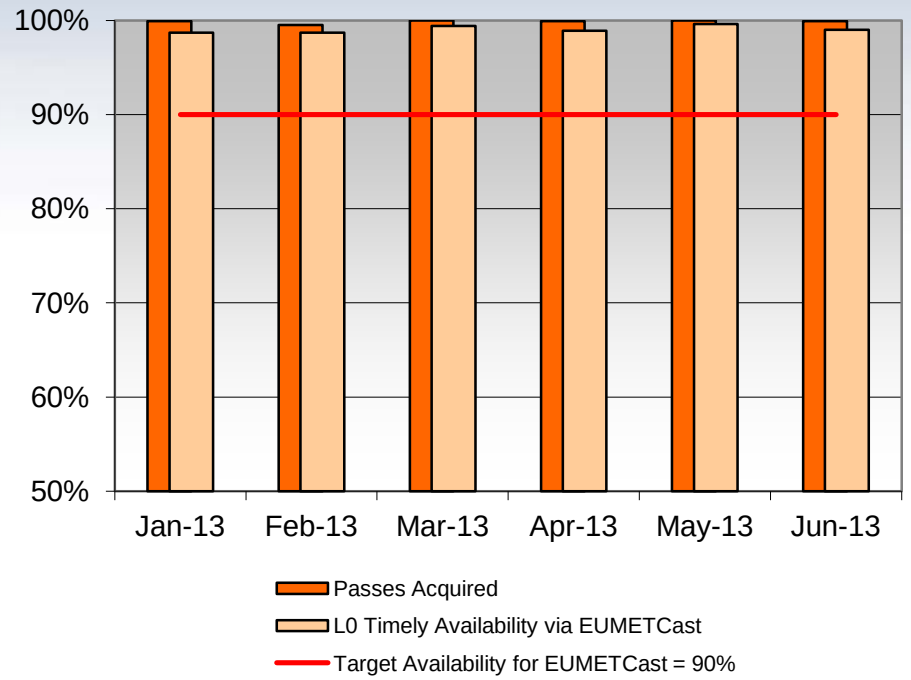
Metop / NOAA Regional Data Service → EARS-AVHRR

This service provides data from the AVHRR instruments onboard NOAA-19 and Metop-A (AHRPT partial coverage data and FDES).

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:

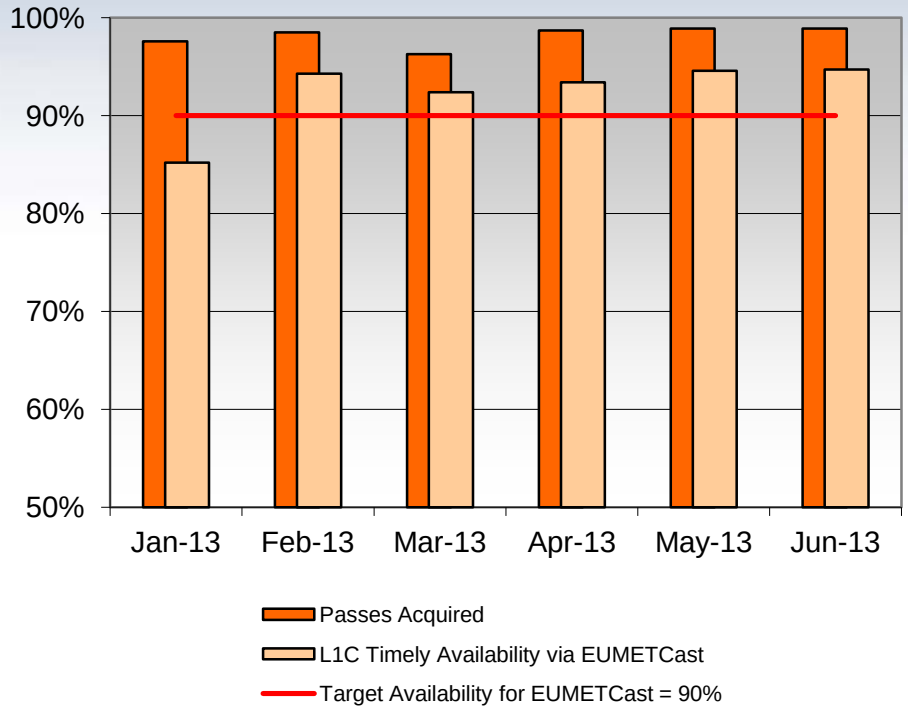
None significant.



Metop/NOAA Regional Data Service → EARS-IASI

This service provides products derived from the data produced by the IASI instrument onboard the Metop-A satellite.

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:

3-29 January: **Software problem on the Lannion processing node impacted L1C production.**

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

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:	**January: The 3 MSG satellites were relocated in accordance with the long-term planning for the 0° and RSS operational services. During these manoeuvres, SAR support was provided by the two satellites best positioned at any one time to provide the widest coverage.** **February onwards: Meteosat-9 and 10 have provided (and will continue to provide for the foreseeable future) the nominal SAR coverage, with Meteosat-8 as backup.**
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.

Jason-2 OGDR Service

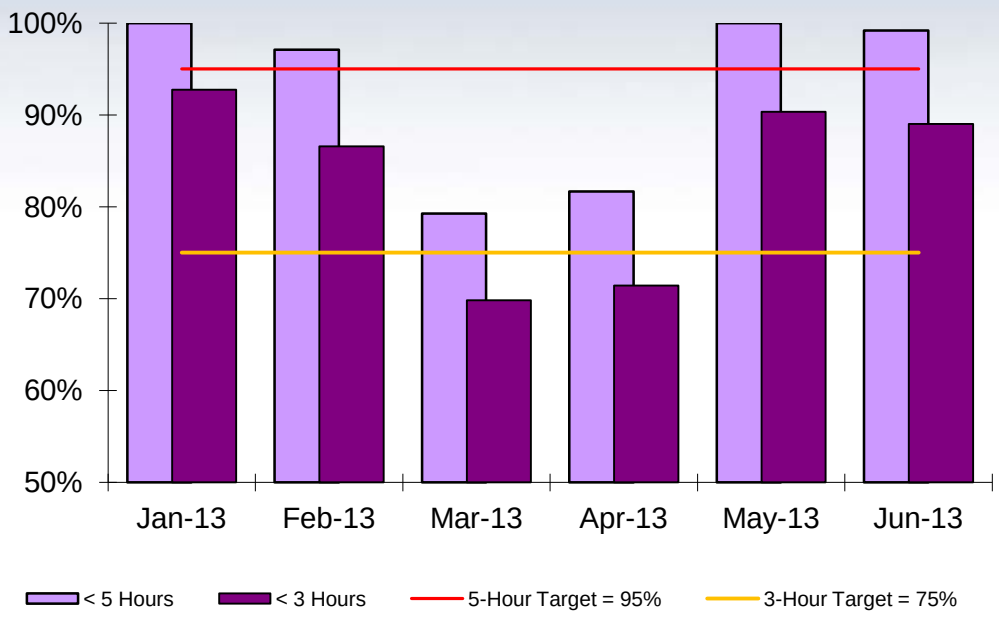
The chart shows the availability of the Jason-2 near real-time Operational Geophysical Data Record products disseminated via EUMETCast.

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.

<u>Events which impacted availability:</u>

March-April: 'Safe-Hold Modes' for periods 25-29 March and 30-March to 5-April gave outages of mission data.

(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

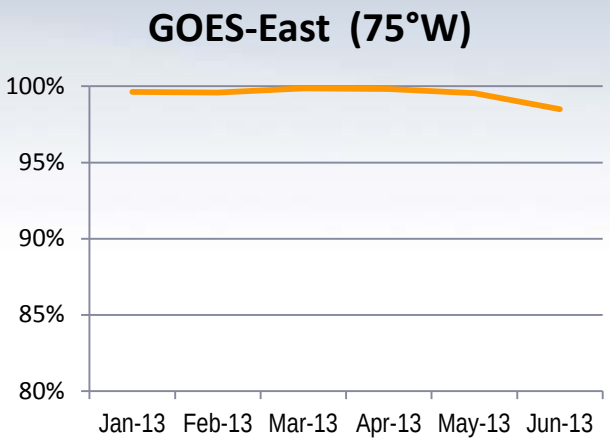
The charts on the following slides show the availability of the data via EUMETCast.

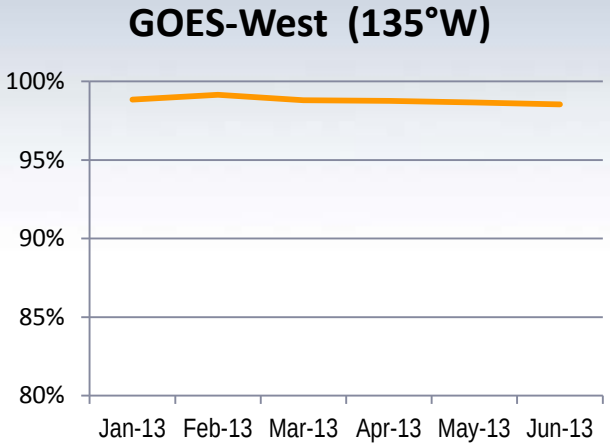
Third-Party Data Services → Geostationary Satellite Data & Products

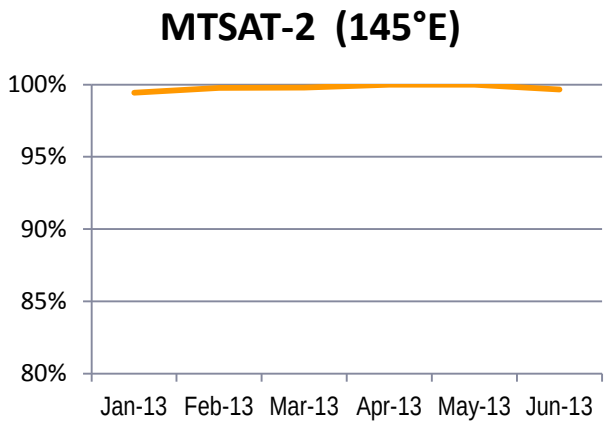
The charts on this slide show the timely availability (as a percentage of expected) of image data originating from geostationary satellites operated by NOAA and JMA (Japan Meteorological Agency), as disseminated via EUMETCast.

Events which impacted availability:

None significant.





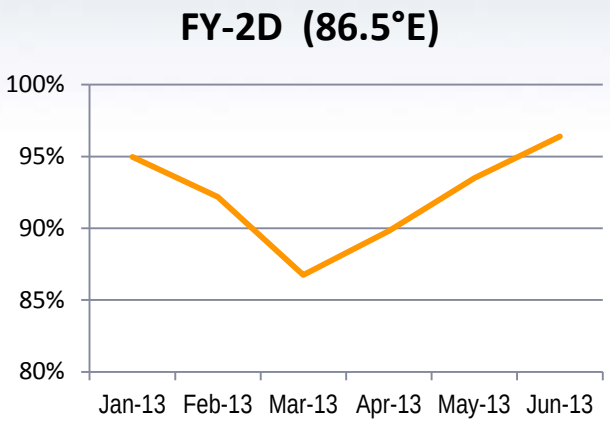


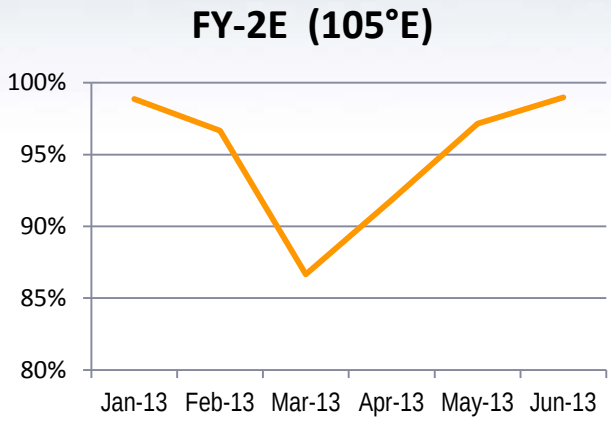
Third-Party Data Services → Geostationary Satellite Data & Products (cont.)

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:

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





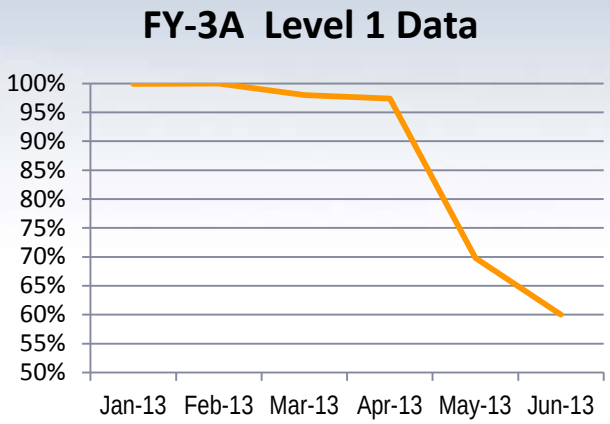
Third-Party Data Services → LEO Satellite Data & Products

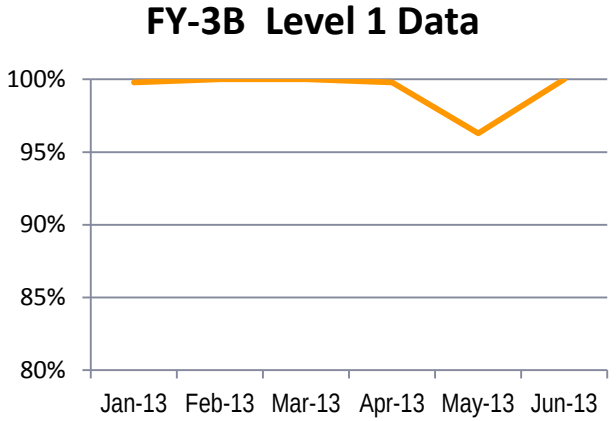
This slide presents charts which show the availability of data & products for LEO satellites operated by partner organisations, as disseminated via EUMETCast.

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:

May-June: Problem with the Microwave Temperature Sounder onboard FY-3A resulted in stoppage of flow of the corresponding product on 28 April, leaving just the data from the Humidity Sounder .





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

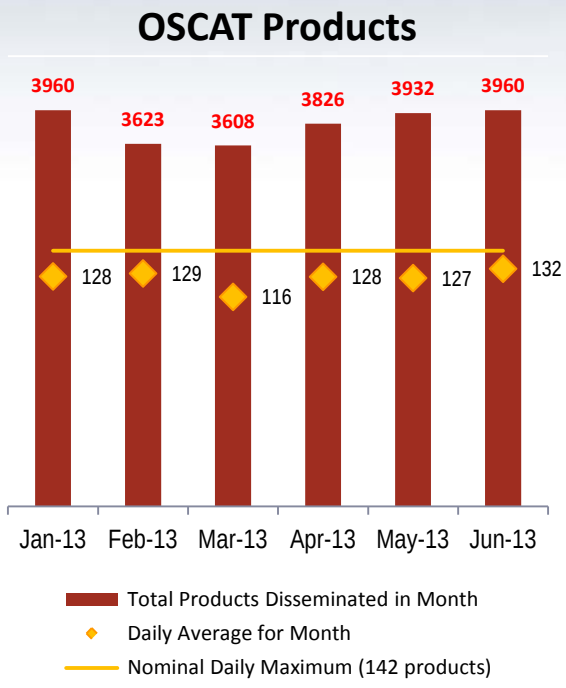
This slide presents further charts showing the availability of certain LEO satellite products from partner organisations, as disseminated via EUMETCast. Availability shown in terms of total products disseminated / month and equivalent daily average / month.

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:

2-5 March: A satellite data transmission system problem caused a 3-day OSCAT product outage.



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

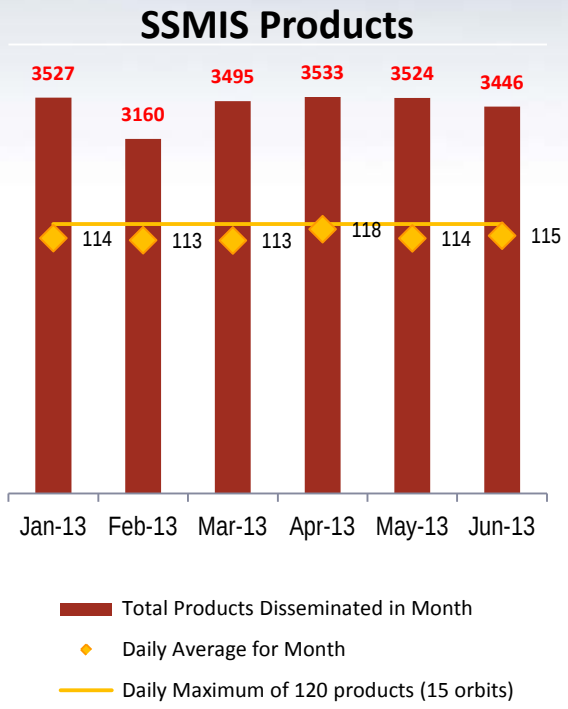
This slide presents two more charts showing the availability of two further types of LEO satellite product, as disseminated via EUMETCast. Availability again shown in terms of total products disseminated /month and equivalent daily average/month.

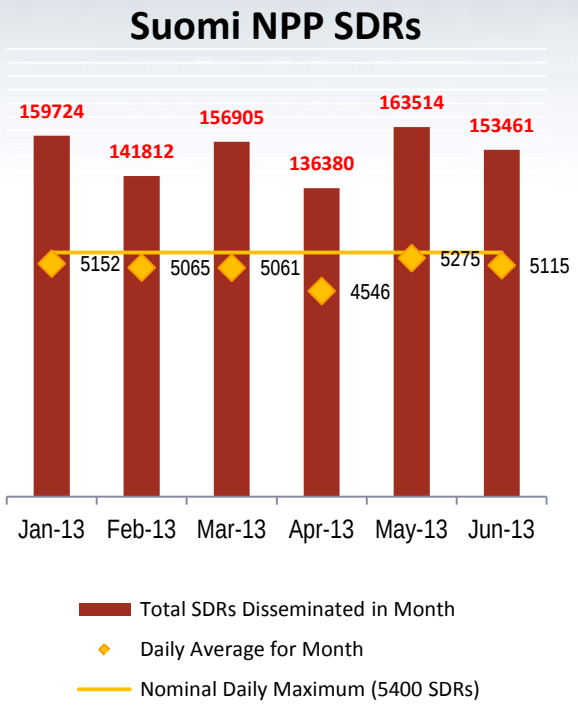
SSMIS Products: Extracted from SDR data from the 'Special Sensor Microwave Imager Sounder' microwave radiometer onboard the near-polar-orbiting, sun-synchronised DMSP satellites F16 and F17. Each product contains one orbit of data, comprising 4 BUFR component products: IMA, ENV, LAS and UAS.

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

Events which impacted availability:

April: Relocation of systems at NOAA resulted in outages of SDRs in the first half of the month.





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.

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.

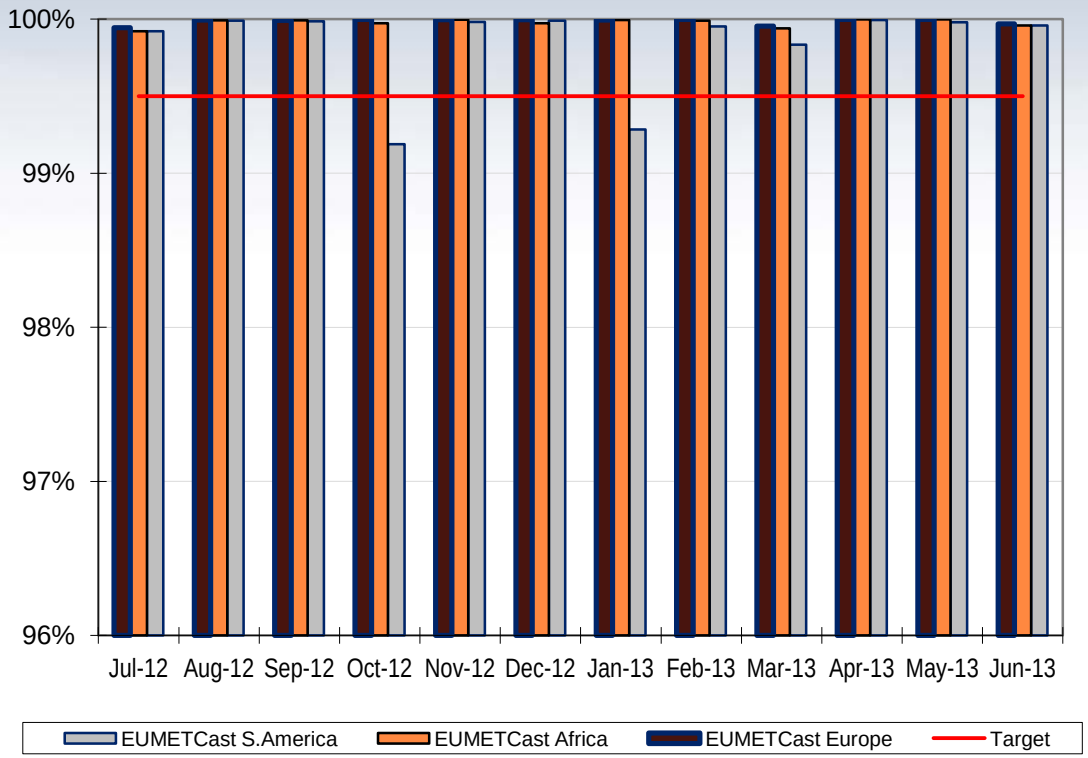
Events which impacted availability:

30 Oct 2012: Service provider bandwidth problem impacted the EUMETCast South America service.

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 March: Antenna – satellite – sun colinearity impacted EUMETCast South America service.

12 March: Power outage of 18 minutes at EUMETCast uplink station impacted all EUMETCast services.



EUMETCast → Registered User Stations

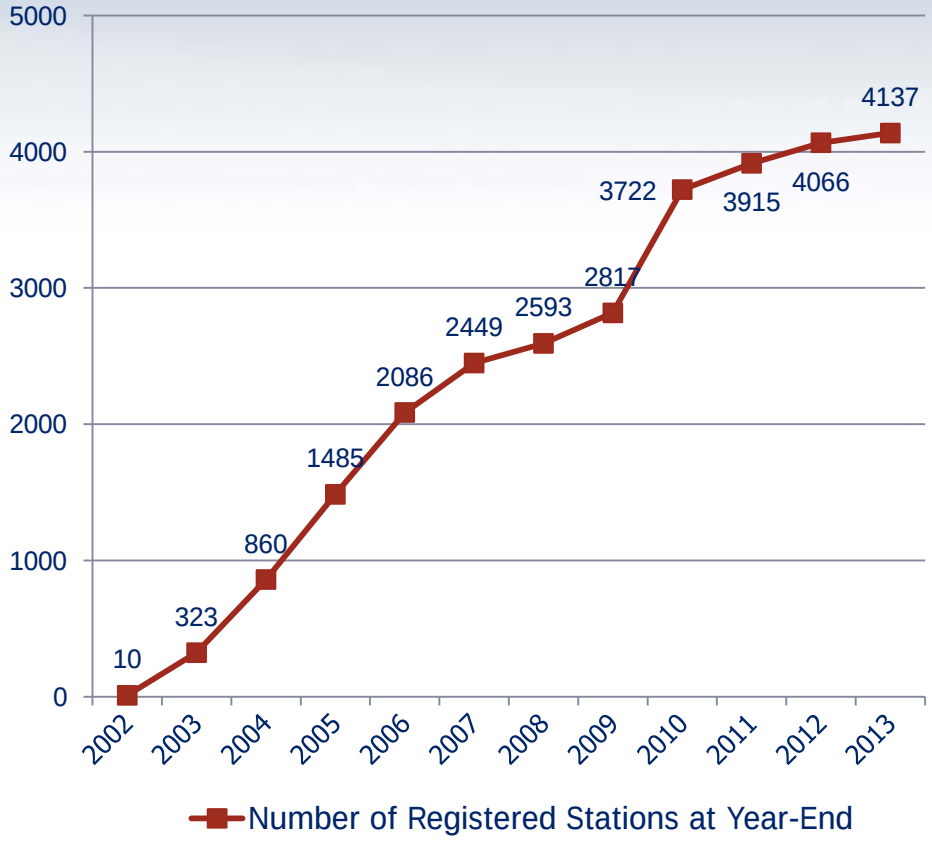
The chart shows the trend of registrations of EUMETCast user stations.

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

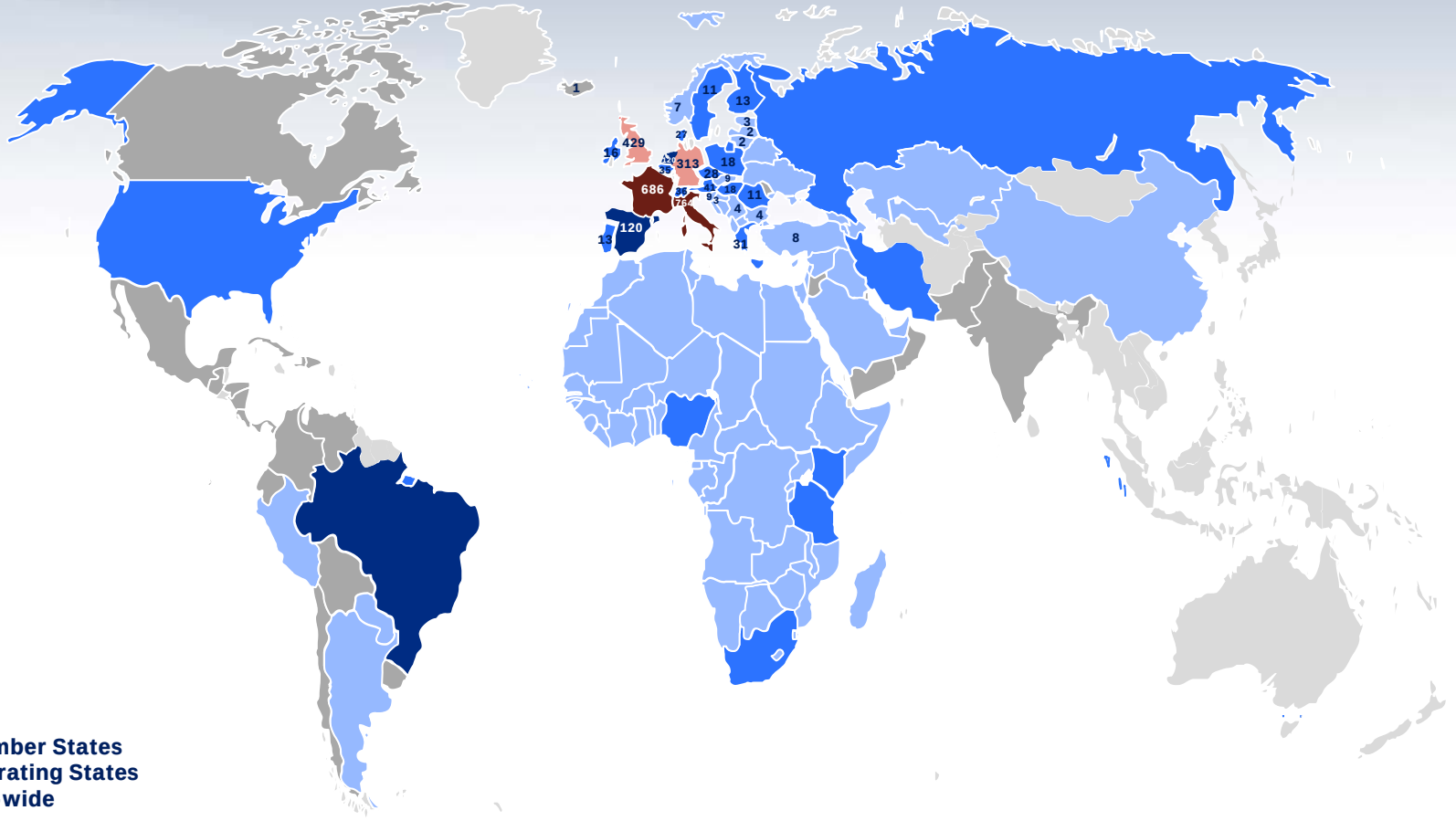
The significant increase in stations in 2010 shown on the chart was largely a result of the migration of the users of Météo-France's RETIM system to EUMETCast.

Note that the number of user stations is larger than the number of users (see next slide) due to some organisations possessing several user stations.

The figure of 4137 stations shown on the chart for 2013 is the total number as of the end of June.



EUMETCast → Users Worldwide as of 30 June 2013



500+
201-500
51-200
11-50
2-10
1 User
0 User

- **2769 users in Member States**
- **11 users in Cooperating States**
- **3273 users world-wide**

Use Adobe Reader's 'Zoom' function to view numbers of users in European countries

EUMETSAT

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:

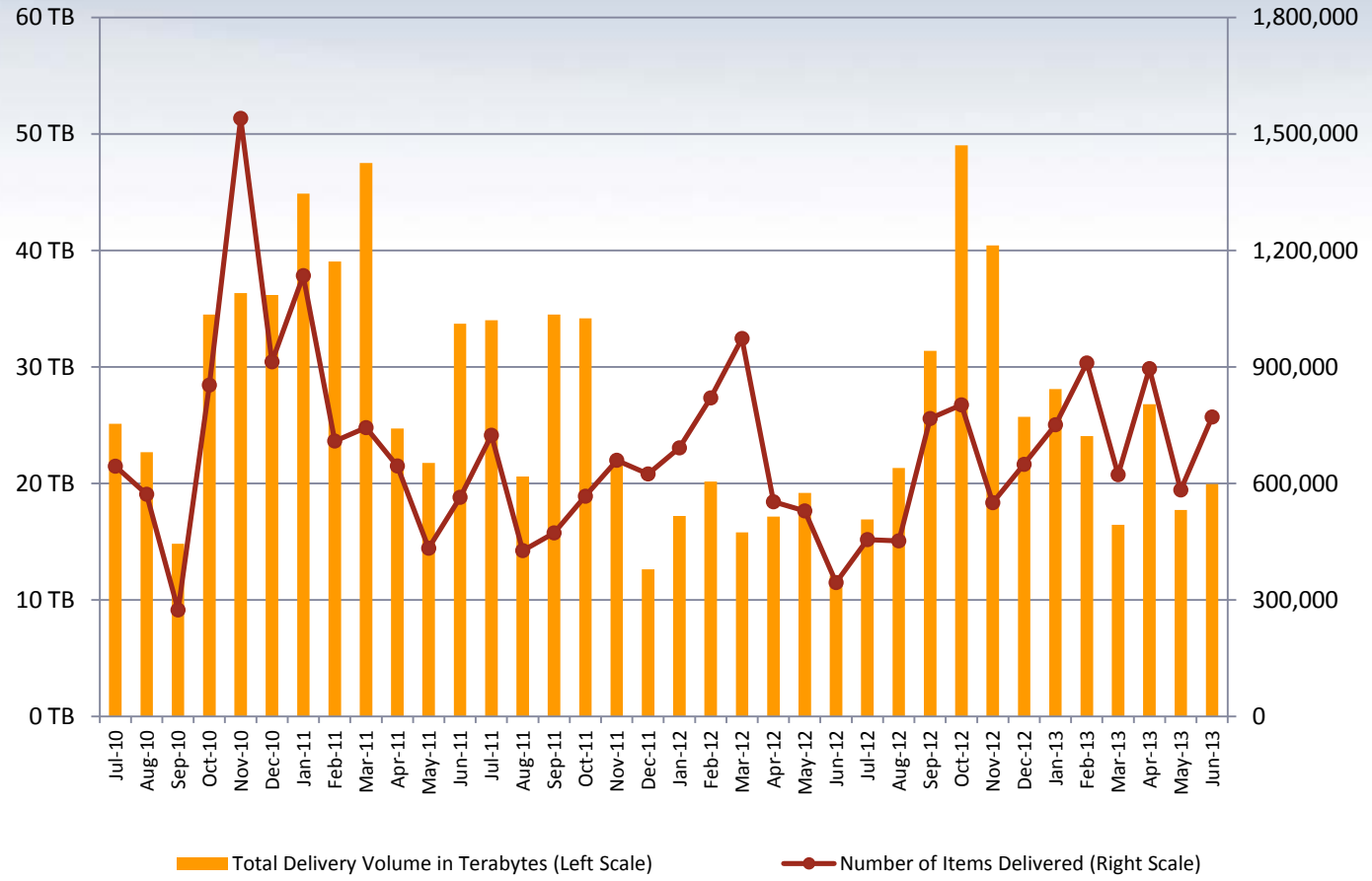
- **Data Delivered: Total Volume versus Items**
- **Archive Orders versus Data To Be Retrieved**
- **Archive Order Delivery-Time Trends**

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 last June.

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.

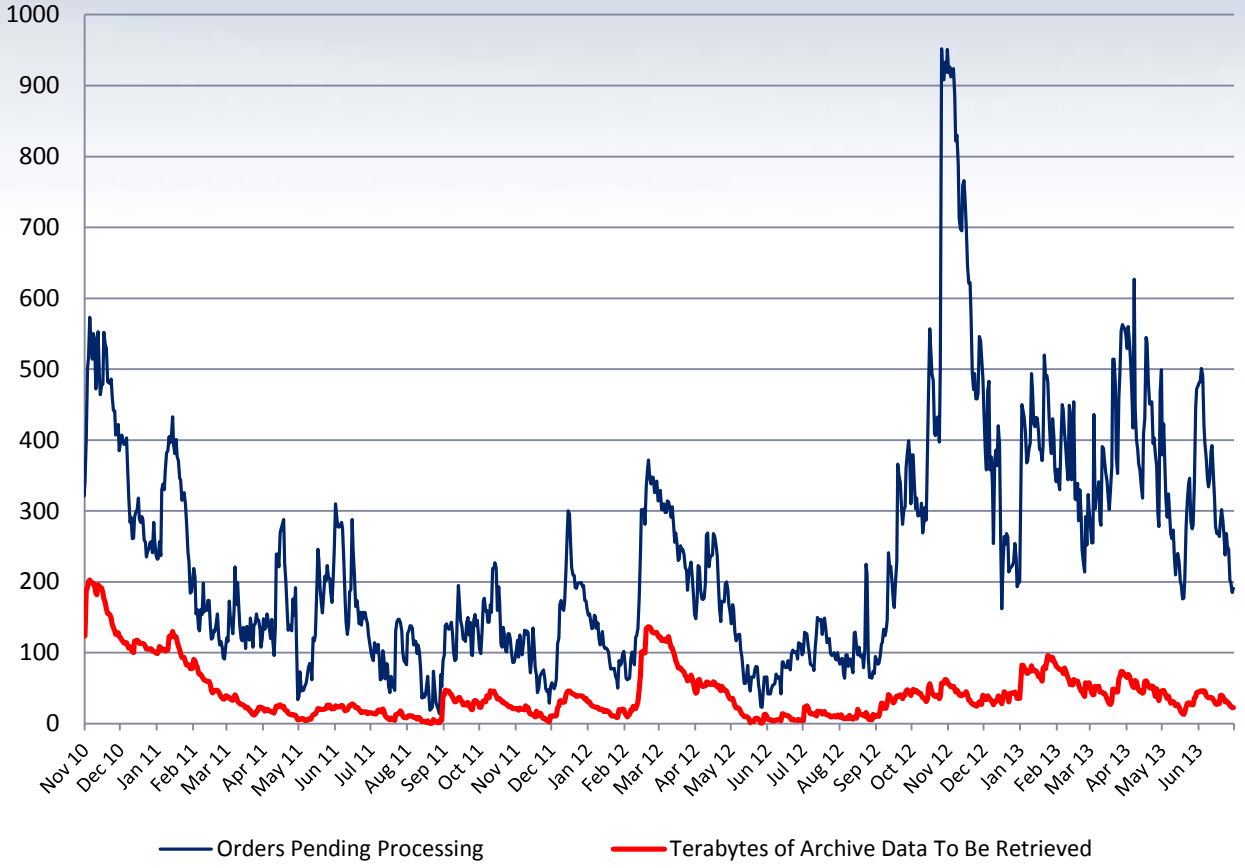


The EUMETSAT Data Centre → Archive Orders versus Data To Be Retrieved

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.



The EUMETSAT Data Centre → Archive Order Delivery-Time Trends

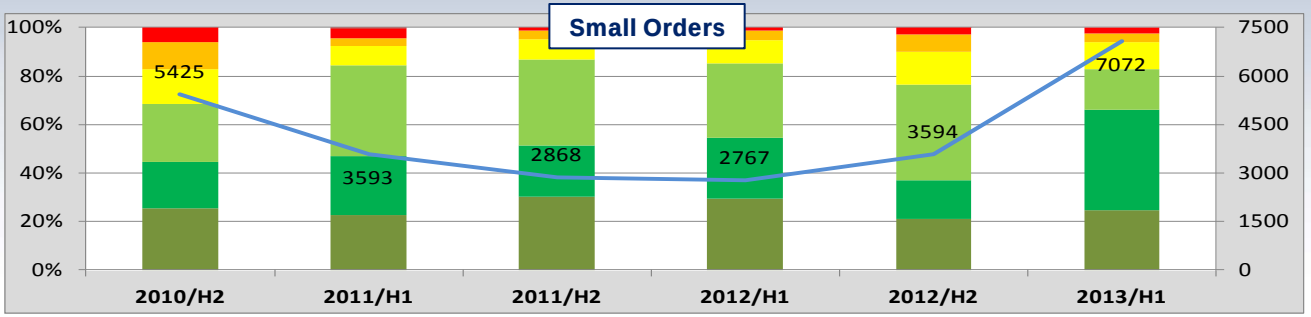
The 3 charts show delivery-time ranges for Data Centre orders according to 3 categories of order size (Small, Medium & Large), for each of the half-year periods shown on the horizontal axis. The left-hand scales help to show the proportions of the total orders delivered in the indicated time ranges (note: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

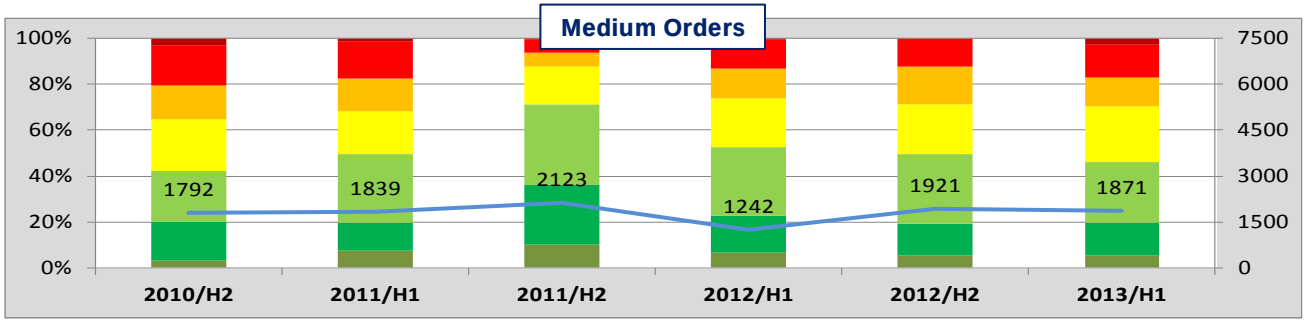
The colour-coding for the delivery-time bands on each of vertical bars on each chart is as follows:

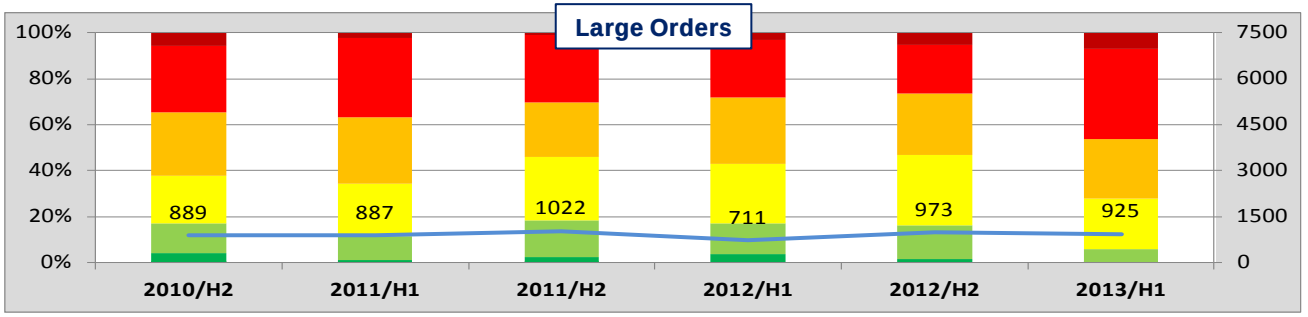
- > 1 month
- < 1 month
- < 1 week
- < 3 days
- < 1 day
- < 6 hours
- < 1 hour

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

2010/H2: 8106 2011/H1: 6319
2011/H2: 6013 2012/H1: 4720
2012/H2: 6488 2013/H1: 9868







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.

EUMETSAT Climate Services → Climate Data Record (CDR) Generation

Climate Data Records produced at EUMETSAT in the reporting period:

Meteosat-3 Surface Albedo

Periods: August 1991 - January 1993 (ADC, 50°W) and February 1993 - May 1995 (XADC, 75°W)
Available from the Data Centre as of June 2013 (final review to be held 2013/H2)

Meteosat-7 Surface Albedo

Period: November 2006 - December 2010 (IODC, 57 deg E)
Available from the Data Centre as of June 2013 (final review to be held 2013/H2)

As and when new CDRs are produced by EUMETSAT and its Satellite Application Facilities (SAFs), they will appear in the Product Navigator in the appropriate CDR category, and on the 'Climate Products' page of the EUMETSAT website, and will also be the subject of a corresponding news bulletin.

Helpdesk Service

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

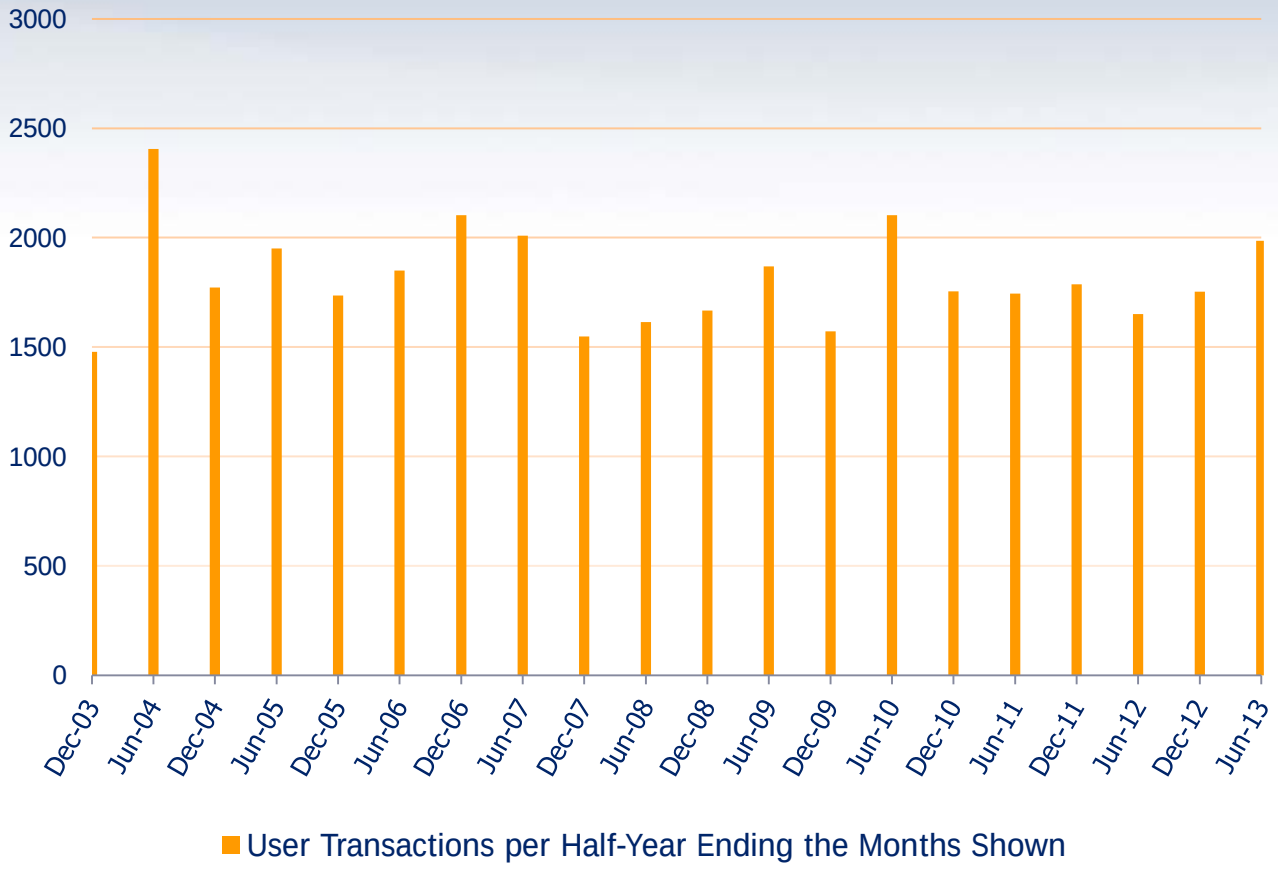
This section includes charts on the following subjects:

- 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

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 1986 interactions were handled.

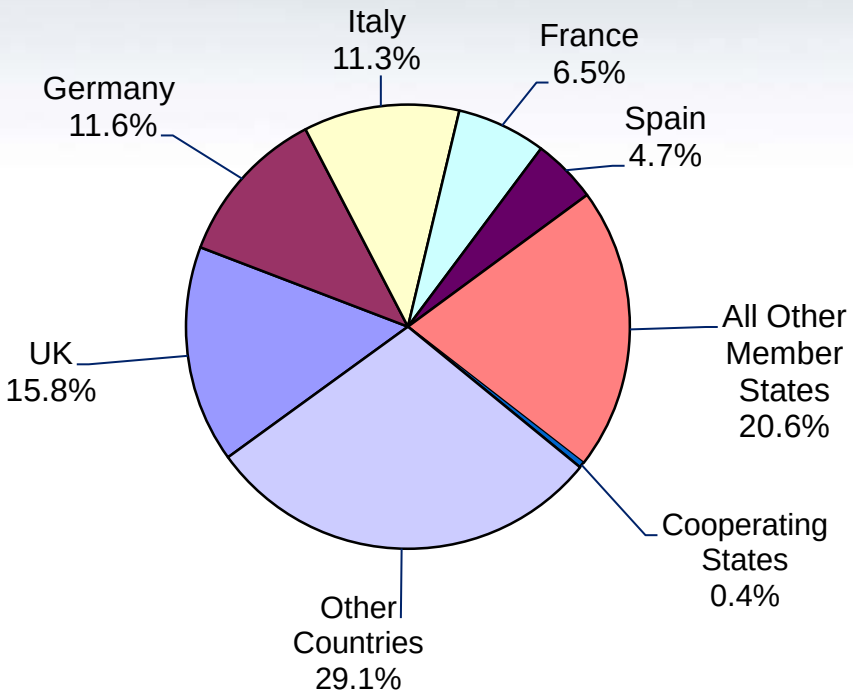


Helpdesk Service → User Interactions 2013/H1 by Country of Origin

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

(1) the 5 EUMETSAT Member States 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.



Helpdesk Service → User Interactions 2013/H1 by Category

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

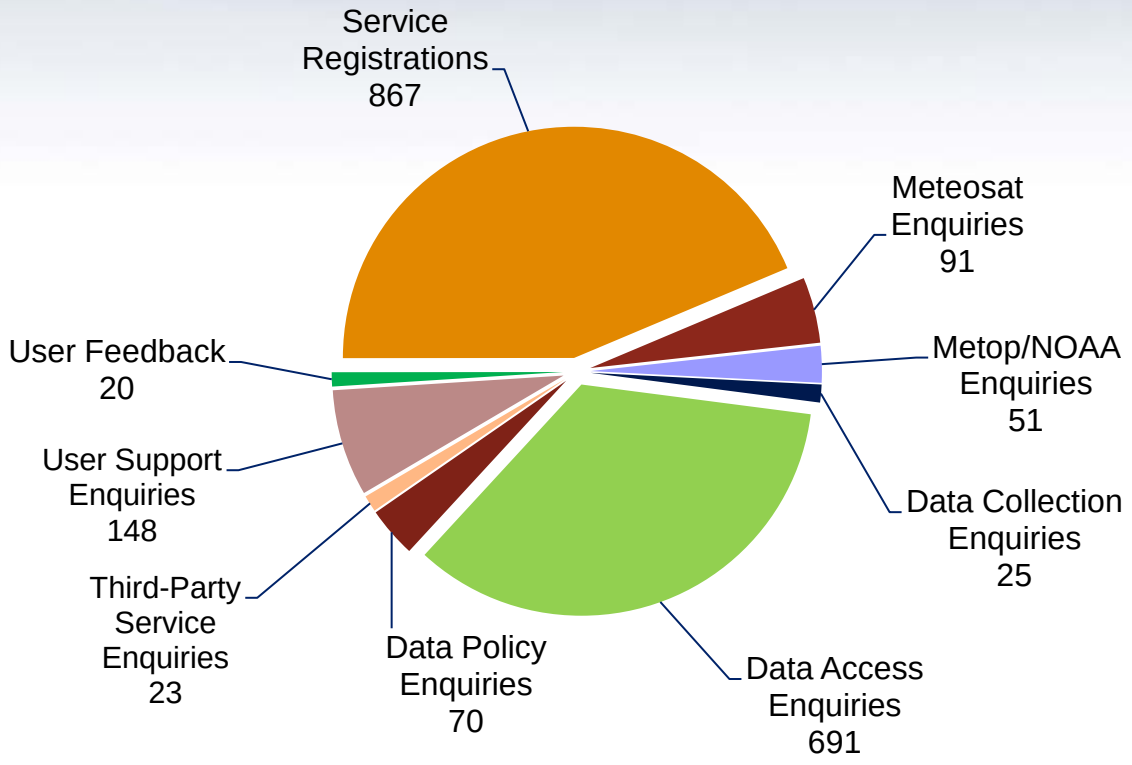
- **Service Enquiries (7 categories)**
- **Service Registrations**
- **User Feedback**

Total interactions for the half-year came to 1986.

Notes:

(1) 'User Support Enquiries' on the chart refer to those enquiries include 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.

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.

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)

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.

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.

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