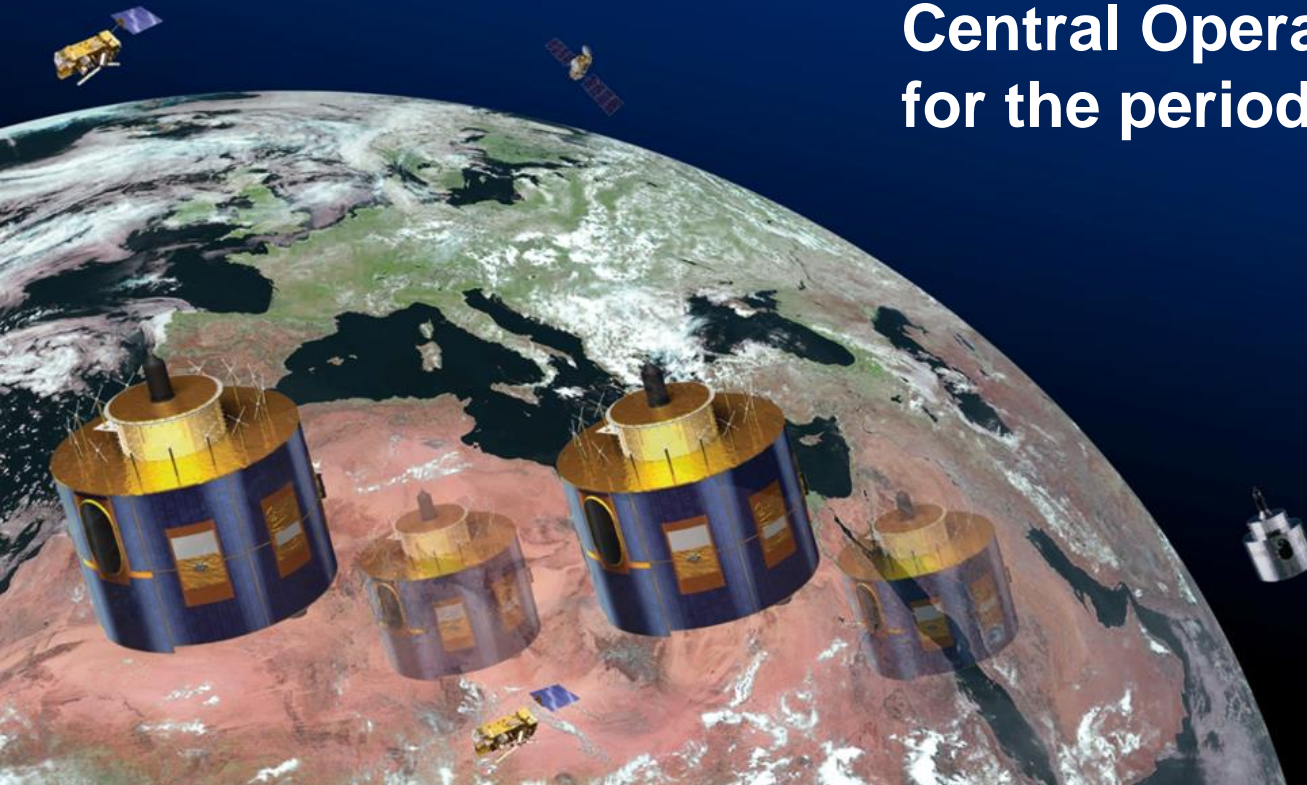


EUMETSAT Headquarters Darmstadt, Germany

Central Operations Report for the period January to June 2016



EUMETSAT Central Operations Report for January - June 2016

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SERBIA



Contents

- Introduction
- Performance Reporting covering EUMETSAT's Services
- Glossary

Any service changes introduced in the reporting period are presented on our website:

www.eumetsat.int, under 'Data' → 'Service Status' → 'Product History'

Introduction

Welcome to the Central Operations Report for the first half of 2016.

Most services in every month of the reporting period achieved above-target availability. We experienced a safe-mode of the Meteosat-9 satellite on 31 March, caused by an SEU, but the availability of Meteosat-8 as a backup meant that the imaging component of the Rapid-Scanning Service could be resumed within a short time. Please see [slide 8](#) for further information.

In early July 2016, Meteosat-8 started its relocation journey to 41.5°E, to be used as EUMETSAT's contribution to multi-partner IODC (Indian Ocean Data Coverage) services. IODC Services will commence in Q1/2017 and will be on a best effort basis. Meteosat-8 is thus no longer available as a backup for the 0° and Rapid-Scanning services delivered by Meteosat-10 and Meteosat-9, respectively. IODC Imaging with Meteosat-8 will commence in October, in parallel with Meteosat-7, which continues to provide the operational service until all preparations for its end-of-life de-orbiting are complete.

Jason-3 was successfully launched on 17 January and following successful commissioning, trial dissemination of NRT OGDR products via EUMETCast commenced on 8 March. The operational data service, delivering OGDRs and IGDRs, started on 1 July.



Introduction (continued)

A new EARS Regional Data Service commenced operational dissemination on 17 February: the Vertical Atmospheric Sounding Service (VASS). Please see [slide 39](#) for further information.

A survey was conducted from 1 April to 31 May, to gauge user satisfaction with the new web-based archive-ordering client, which was redesigned to incorporate a more intuitive user-interface with an embedded help function, and the EUMETSAT's Data Centre Ordering Service in general. The survey itself was carried out using a web-based application, also recently improved. Overall, the feedback – 60 responses in total - was positive and compared favourably to that from a similar survey conducted in 2014. The feedback received confirmed that the upgrade of the archive-ordering interface has improved the user experience.

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, Suomi-NPP & NOAA Global Data Services \(GDS\)](#)
- [Regional Data Services \(EARS\)](#)
- [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

This report presents an overview of EUMETSAT's operational services in the half-year reporting period by means of the following two indicators:

Service Availability:

The availability of the operational services to users is measured monthly against the maximum amount of products/data which theoretically could be delivered each calendar month of the reporting period, i.e. from a “perfect” satellite system.

Operational Performance:

This quantifies how well EUMETSAT has performed operationally with respect to its service targets, taking into account all planned routine operational activities such as instrument calibration and spacecraft manoeuvres, i.e. the intrinsic limitations of the satellite system.

These two indicators are used for Meteosat and Metop services as delivered over the prime dissemination mechanism, namely EUMETCast Europe. Where statistics are available, they are presented in the charts on the following slides. Comments are provided alongside, which identify any significant events or factors (satellite or ground-segment in nature) that have had impact on the service availability and/or operational performance. Currently, only product generation statistics are available for the Meteosat meteorological products.

Note: Events having significant impact on operational services are described on a dedicated slide following this one.

Events Leading To Significant Operational Impacts

The following events and their impacts occurred during the reporting period:

Operational Incident 67: MTP Comms Outage

On 22 March 2016, intermittent errors on the Ground Station prime comms link were observed. When the errors started to impact telemetry data quality on the 23rd March, a switch to the backup link was attempted, but was unsuccessful. Multiple issues masked the real cause of the problem, but it was eventually localized to a hardware fault in transmission equipment in Zurich, which supported a comms service between Milan and Frankfurt. All issues were resolved by 15:15 UTC on the 25th March. A total of 24 slots were lost or degraded by missing lines.

Operational Incident 68: Meteosat-9 PMB Safemode

On 31 March 2016, Meteosat-9 entered a PMB safe-mode at 14:01 UTC, suspected due to an SEU. The RSS service was swapped to Meteosat-8, resulting in an image-data outage of 2 hours (24 RSS Repeat Cycles). Once the satellite manufacturer had confirmed the probable root cause, recovery of the operational configuration of Meteosat-9 commenced. Operational stability was confirmed on 4 April, and the RSS service was swapped back at 09:00 UTC on that day. Once operations were stable again on the prime RSS satellite, generation of meteorological products was resumed (total outage

Out-Of-Plane Manoeuvres for Metop-B

Two routine single-burn out-of-plane manoeuvres were performed: one on 16 March and another on 27 April. Level 0 and level 1 data for all instruments was affected (with exception of A-DCS), i.e. degradation of data for a period of approximately 6 hours or less for both Metop GDS and relevant EARS services was experienced. The non-nominal data is not counted towards the service availability statistics.

Meteosat Services

This service category comprises the data and products produced with the Meteosat Systems, which utilise the following geostationary satellites for the services listed:

- Meteosat-10 (at 0°):** the Full-Earth Scan (FES) service
- Meteosat-9 (9.5°E):** the Rapid-Scan Service (RSS)
- Meteosat-7 (57°E):** Indian Ocean Data Coverage (IODC)

Two further satellites are available in orbit:

- Meteosat-8 (3.5°E):** has continued to provide backup for the FES and RSS services, and has been used for RSS 'image gap-filling' in the monthly rapid-scan pauses of Meteosat-9.

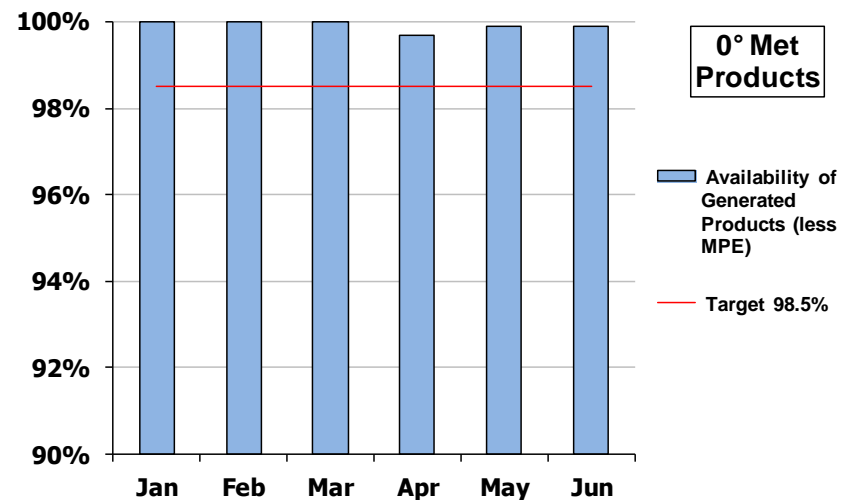
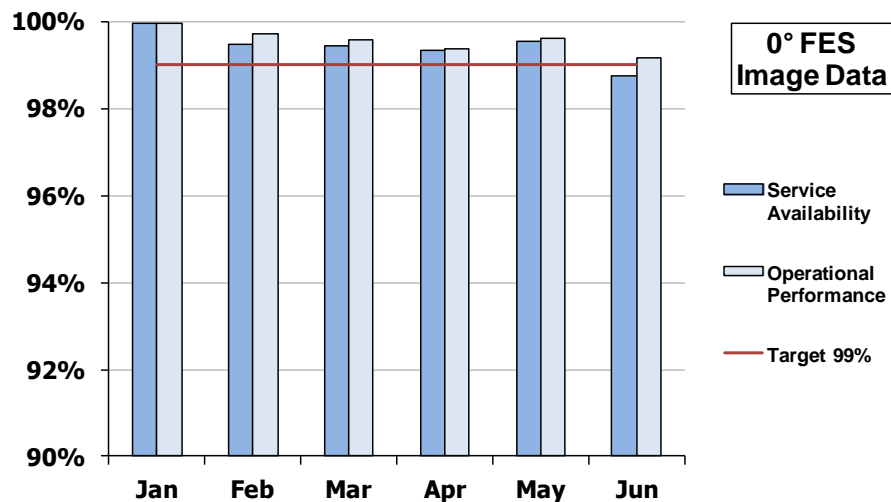
As of 4 July: Meteosat-8 is being relocated to 41.5°E, in order to support the new MSG-IODC service foreseen to start in 2017/Q1. Meteosat-9 becomes the backup for the FES service, with priority over RSS.

- Meteosat-11 (3.4°W):** currently 'stored in-orbit' for operational deployment in 2018.

The individual services covered in the following slides this section are as follows:

- Meteosat L1.5 image data and derived meteorological products for FES, IODC and RSS
- Data Collection and Retransmission (the DCP service)

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



Prime satellite supporting the service is Meteosat-10, with Meteosat -8 as backup.

Service Availability and Operational Performance are measured on the basis of nominal Level 1.5 Repeat Cycles (RCs) disseminated 'on-time' via EUMETCast Europe. See [slide 7](#) for an explanation of the two indicators.

Events which impacted availability:

June: Combination of various factors brought the service availability below target: tank-heater switching (9 RCs), manoeuvre on 21-June (16 RCs), and several minor ground station and dissemination problems (11 RCs).

Meteorological products derived from the Full-Earth Scan (FES) images produced nominally by Meteosat-10 at 0°.

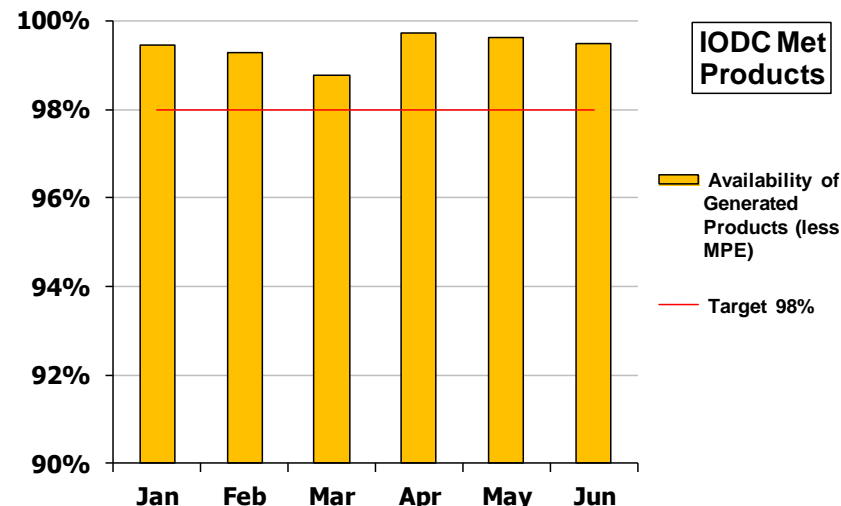
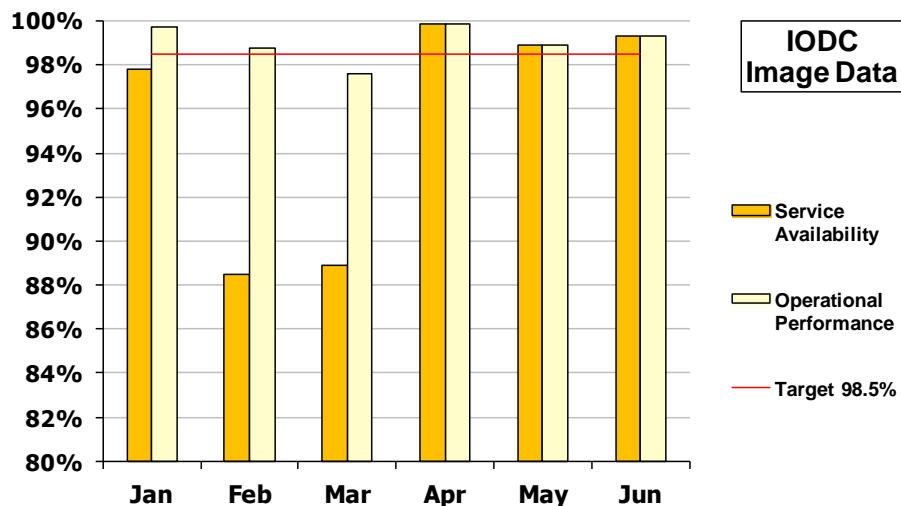
Performance of this service is still currently measured in terms of the number of meteorological products which have been generated at source in EUMETSAT, as a percentage of those scheduled.

Events which impacted availability:

None significant.

NOTE: The availability of MPE products is measured and charted separately (see [slide 13](#)).

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



Meteosat-7 supports the IODC service.

Service Availability and Operational Performance are measured on the basis of perfect formats disseminated 'on-time' via EUMETCast Europe. See [slide 7](#) for an explanation of the two indicators.

Events which impacted availability:

- 25-Jan to 28 March: Spring eclipse season: Service Availability reduced by up to 5 slots per day.
- 23-24 March: 24 slots impacted by comms service problem (see [slide 8](#): Operational Incident 67).

Meteorological products derived from Full-Earth Scan images produced by Meteosat-7 at 57°E.

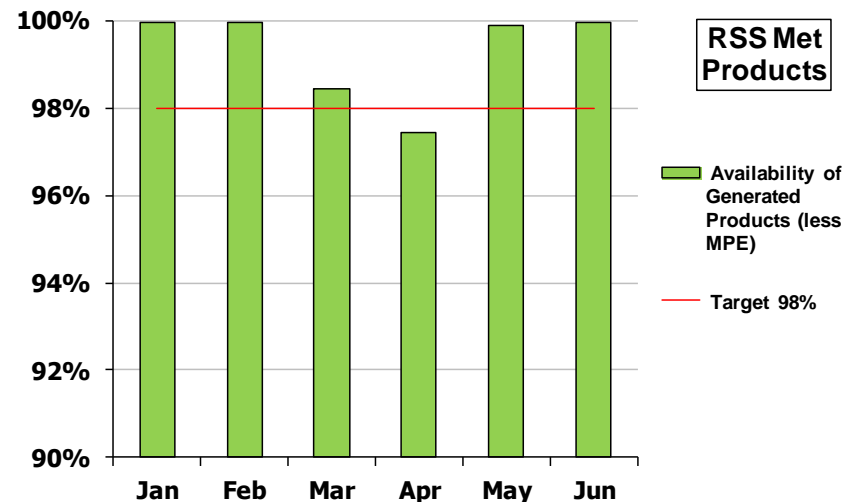
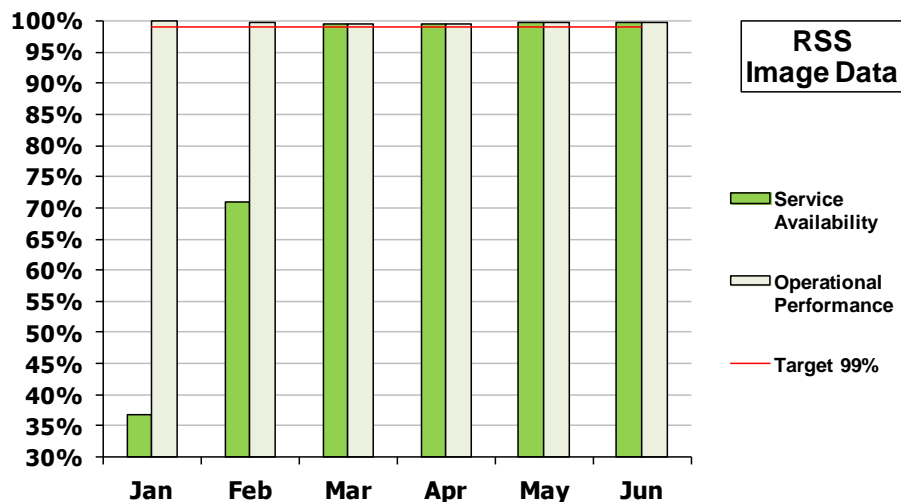
Performance of this service is still currently measured in terms of the number of meteorological products which have been generated at source in EUMETSAT, as a percentage of those scheduled.

Events which impacted availability:

- March: Degraded quality of some HWW (High-resolution WV Wind) products due to image quality related to the satellite's high inclination.

NOTE: The availability of MPE products is measured and charted separately (see [slide 13](#)).

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



Prime satellite supporting the service is Meteosat-9, with Meteosat-8 as backup, when available.

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

Service Availability and Operational Performance are measured on the basis of nominal Level 1.5 Repeat Cycles (RCs) disseminated 'on-time' via EUMETCast Europe. See [slide 7](#) for an explanation of the two indicators.

Events which impacted availability:

12-Jan – 9-Feb: Yearly interruption of the RSS service, to allow Full-Earth Scanning and ground segment maintenance (Meteosat-8 no longer useable for long-duration gap-filling).

Note: Meteosat-8 was used for the short-duration (48-hour) 'gap-fillings' in April, May and June.

Meteorological products derived from Rapid-Scanning images produced at 9.5°E.

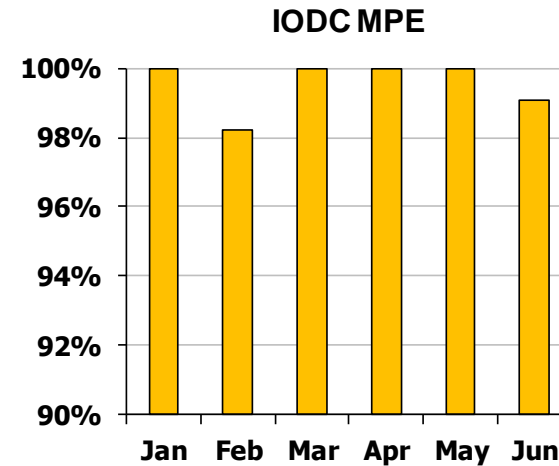
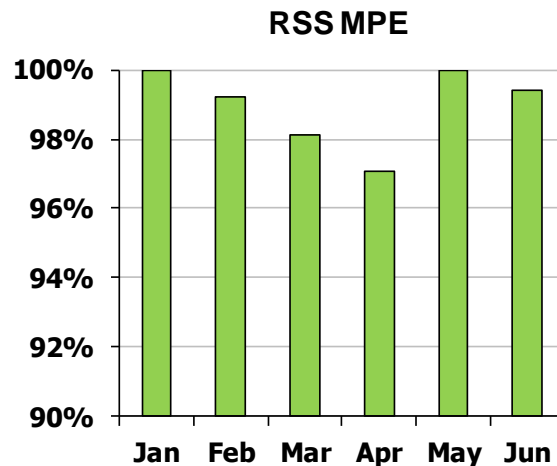
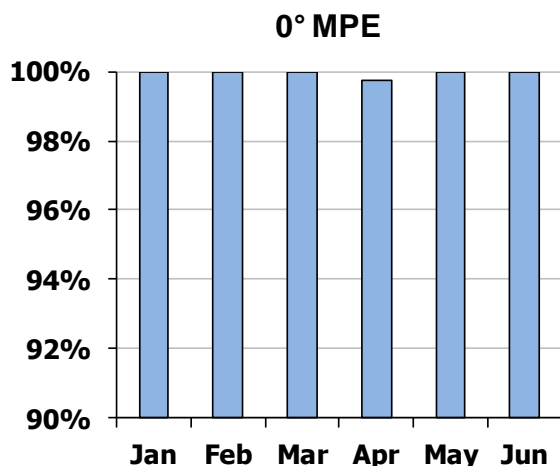
Performance of this service is still currently measured in terms of the number of meteorological products which have been generated at source in EUMETSAT, as a percentage of those scheduled.

Events which impacted availability:

31-Mar - 1 April: Operational Incident 68 (see [slide 8](#)) resulted in loss of products for a total of 25 Hours.

Note: The availability of MPE products is measured and charted separately (see [slide 13](#)).

Meteosat Services → MPE Products for 0°, RSS and IODC



Multi-sensor Precipitation Estimate (MPE) products are derived from infrared data present in Meteosat 0°, RSS and IODC imagery, and passive microwave imager measurements from the US DoD's DMSP satellites. MPE products are used for nowcasting and short-term forecasting, especially useful for regions for which there is no rainfall radar data, such as in Africa and Asia.

Availability of these particular products delivered as one type of the corresponding meteorological product services is measured in terms of the number of products which have been generated at source in EUMETSAT, as a percentage of those scheduled.

Events which impacted availability:

31-Mar - 1 April: Operational Incident 68 (see [slide 8](#)) resulted in loss of RSS MPE products for a total of 25 Hours.

19-Feb & 19-Jun: Outages of SSMIS data needed for IODC MPE products.

NOTE: The availability of MPE products are presented separately, to take account of their being derived from data from the US DoD's DMSP satellites, the availability of which, although secured in the form of an operational commitment under the Defence Weather Satellite System (DWSS) programme, is beyond EUMETSAT's control.

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.

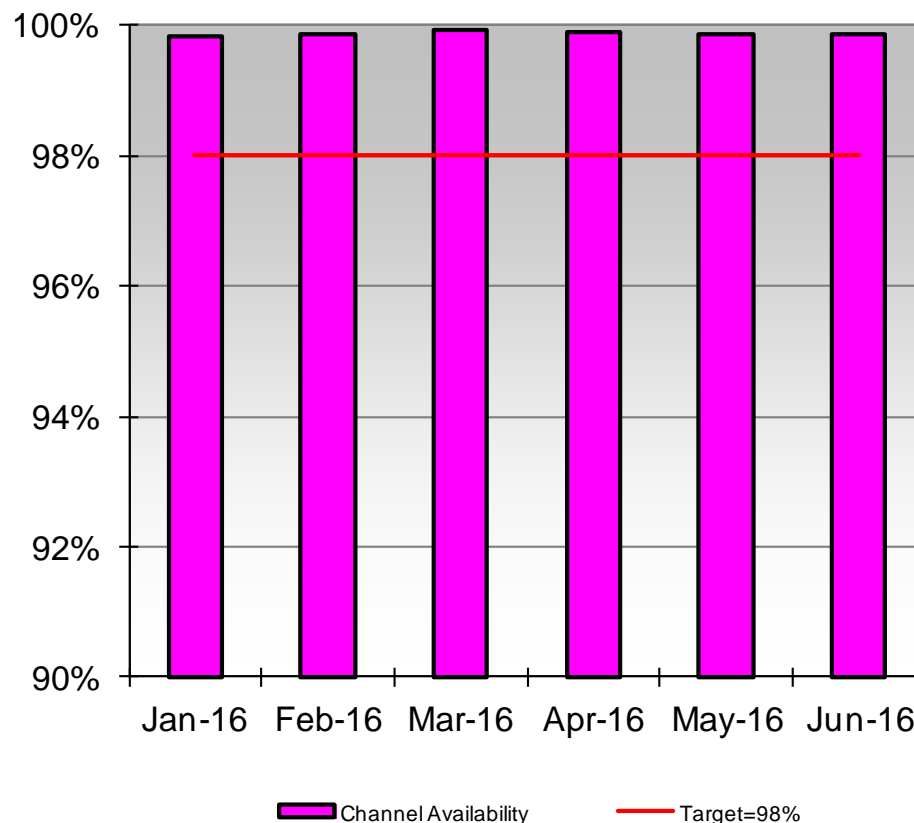
(Note that the availability of the 4 DCP channels supported by Meteosat-7 as part of the Indian Ocean Tsunami Warning System (IOTWS) is not included)

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

Events Which Impacted DCP Channel Availability:

None significant.

Note: Some DCP messages continue to be corrupted/lost due to interference on the satellite link. It is not expected that the cause will be resolvable. EUMETSAT continues to monitor the situation.



Meteosat Services → Geographical Distribution of DCPs

DCPs	Country	DCPs	Country	DCPs	Country	DCPs	Country
6	Albania	5	Falklands	1	Malta	24	Ukraine
51	Algeria	1	Finland	4	Mauritania	1	Union des Comores
13	Angola	131	France	4	Mauritius	64	USA
2	Armenia	1	Gambia	23	Mozambique	1	Yemen
2	Austria	25	Germany	28	Namibia	16	Zambia
6	Belarus	11	Ghana	19	Niger	13	Zimbabwe
2	Benin	1	Gibraltar	18	Nigeria		
5	Bhutan	1	Greece	10	Oman		
14	Botswana	11	Guinea	4	Pakistan		
1	Brazil	2	Guinea-Bissau	3	Philippines		
1	Bulgaria	9	Indonesia	11	Republic of Moldova		
7	Burkina Faso	2	Iran	11	Republic of Seychelles		
60	Cameroon	192	Iraq	7	Romania		
1	Canada	8	Ireland	11	Senegal		
4	Cap Verde	73	Italy	41	South Africa		
2	Central African Republic	3	Ivory Coast	8	Spain		
3	Chad	3	Kenya	124	Sri Lanka		
3	Congo	6	Lesotho	3	Sudan		
3	Croatia	11	Libya	5	Southern Sudan		
1	Cyprus	6	Madagascar	2	Swaziland		
30	Dem. Rep. of the Congo	9	Malawi	10	Tanzania		
8	Djibouti	3	Maldives	2	Togo		
1	Egypt	19	Mali	49	UK		

As of the end of June 2016:

1276 registered Data Collection Platforms (DCPs), belonging to 131 operators,

deployed amongst the 75 countries shown in the table.

Of the total number of registered DCPs, there were 639 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, Suomi-NPP & NOAA Global Data Services (GDS)

These services refer to the dissemination of global data and products produced as part of the Initial Joint Polar System (IJPS) and the Joint Transition Activities (JTA) agreements between EUMETSAT and NOAA. The JTA is an interim agreement, providing continuity between the Initial Joint Polar System (IJPS) and future Joint Polar System (JPS).

The services provide Level 0, 1 and 2 products derived from the data from instruments onboard the satellites Metop-A & -B, Suomi-NPP and NOAA-19, as summarised in the following table:

	A-DCS	AMSU	ASCAT	ATOVS	AVHRR	GOME-2	GRAS	HIRS	IASI	MHS	SEM	ATMS & CrIS
Level 0	Mx2 ⁽¹⁾	-	-	-	-	-	-	-	-	-	Mx2	-
Level 1	-	Mx2, N	Mx2	-	Mx2, N	Mx2 ⁽²⁾	Mx2	Mx2, N	Mx2	Mx2, N	-	SDR
Level 2	-	-	-	M(B), N	-	-	-	-	Mx2	-	-	-

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

(1) Due to reduced capability of A-DCS on Metop-B, Metop-A provides the prime Argos-3 A-DCS service (Metop-B provides 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.

'M(B)' = ATOVS L2 products based on Metop-B (products for Metop-A discontinued – see ATOVS slide)

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

'SDR' = Sensor Data Records from the ATMS and CrIS instruments onboard Suomi-NPP.

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

Metop, Suomi-NPP & NOAA GDS: 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:

- Levels 0 & 1: Available within 2 hours 15 minutes of sensing (Metop and NOAA)
- Level 2: Available within 3 hours of sensing (Metop and NOAA)
- SDRs: Currently: available within 2 hours of sensing, will be refined (Suomi-NPP)

The above timeliness targets are those originally specified for the Metop and NOAA-19 data and delivery is currently measured against them. The Level 0 and 1 targets for the primary Metop are easily met since the introduction of (1) the Antarctic Data Acquisition (ADA) service which improved the timeliness of the data, and (2) the multiplexed data transfer between the Svalbard Ground Station and Darmstadt which gave a further timeliness improvement for the data of both Metops.

Availability figures are based on the following:

- Level 0: Production statistics from EUMETSAT’s EPS Product Generation Facility
- Levels 1 & 2: Reception statistics from EUMETSAT’s reference EUMETCast User Station

The next slide shows the profile of Metop-B passes acquired via the ADA service, which relays half-orbits’-worth of data for most of the 14 to 15 passes possible per day, delivering the first half of each orbit approximately 50 minutes earlier than that via Svalbard.

On [slide 19](#) onwards, service availability and operational performance are presented for the data (mostly delivering Level 1) from instruments onboard Metop-A, Metop-B, N19 and Suomi-NPP. Please see [slide 7](#) For explanation of the two metrics.

Metop, Suomi-NPP & NOAA GDS: Antarctic Data Acquisition (ADA)

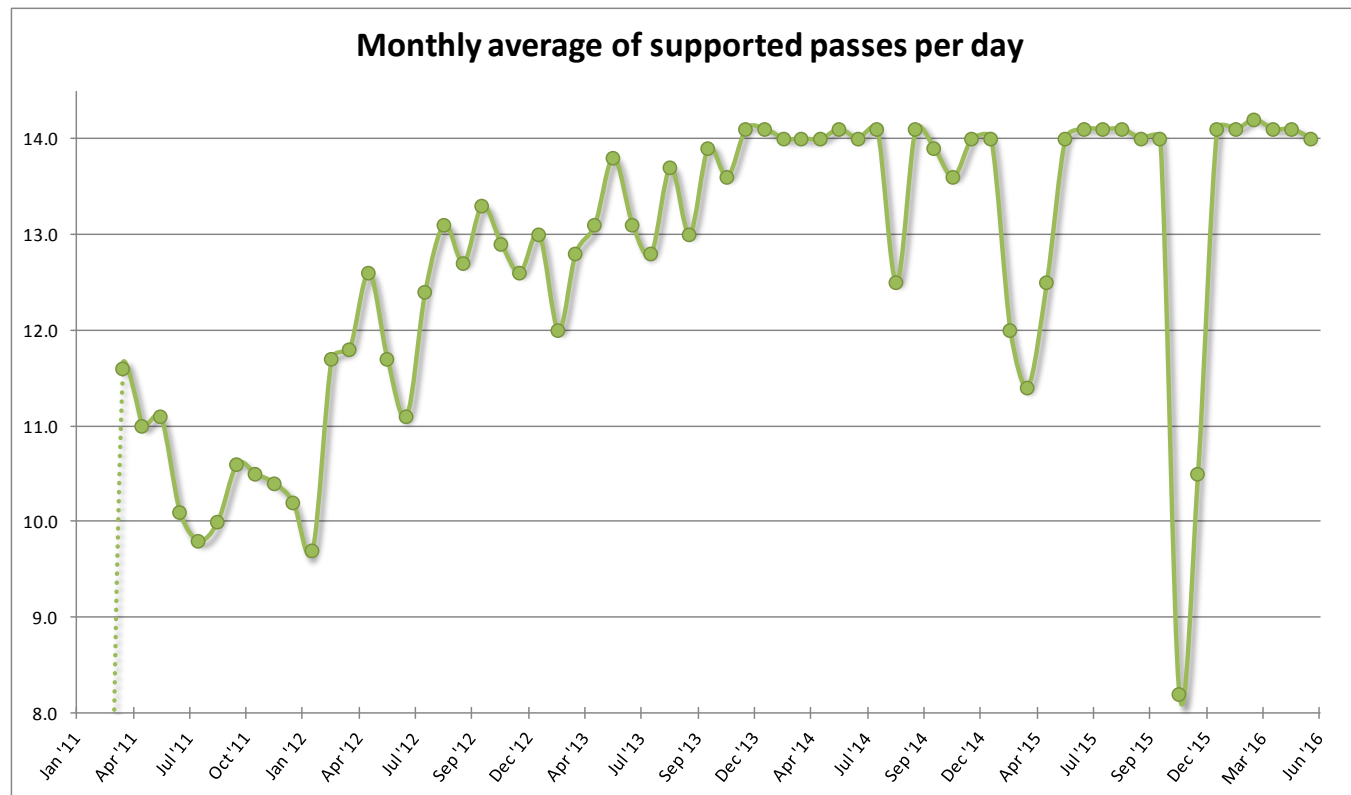
Data from the primary Metop satellite (currently Metop-B) is acquired at NOAA-NSF's ground station on McMurdo Sound in Antarctica and routed to EUMETSAT HQ. This acquisition complements that of Svalbard, and allows the data of the first half of each orbit to be processed and disseminated earlier, thus improving data timeliness of Metop-based products.

The chart shows the average daily passes per month that have been successfully acquired at McMurdo and relayed to Darmstadt since the system was established in early 2011.

The daily average number of passes of Metop-B is 14.2. The majority of them have been acquired since the start of the operational phase in 2014.

Events in the reporting period:

None significant.



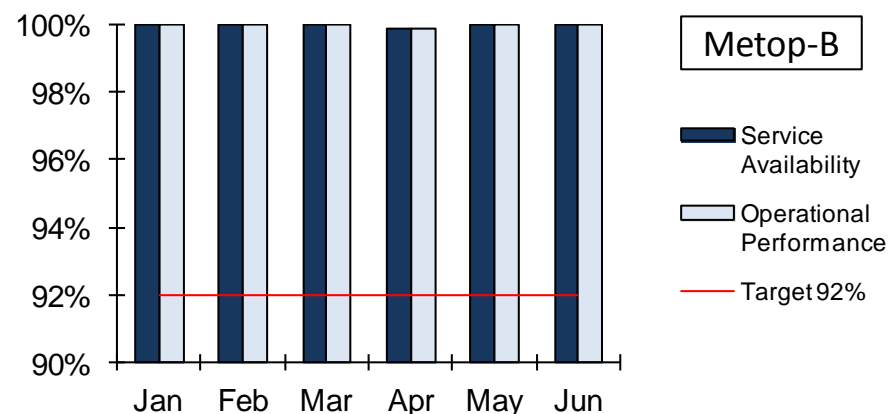
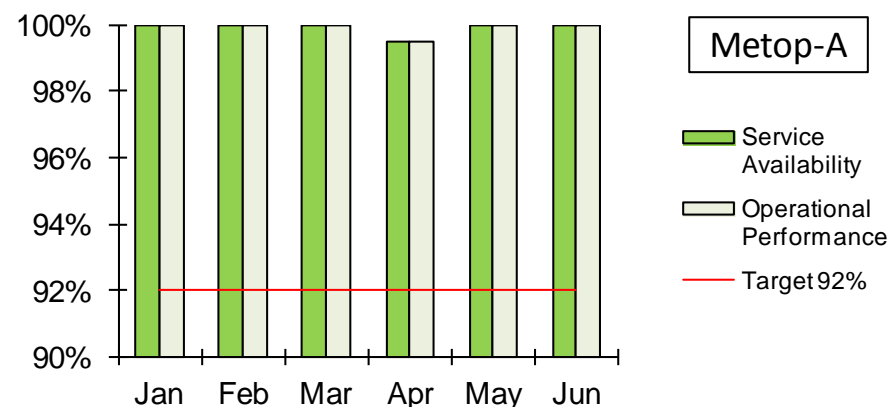
Metop, Suomi-NPP & NOAA GDS → A-DCS Level 0 Data

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 the reduced capability of A-DCS onboard that satellite.

Events which impacted availability:

None significant.



Metop, Suomi-NPP & NOAA GDS → 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.

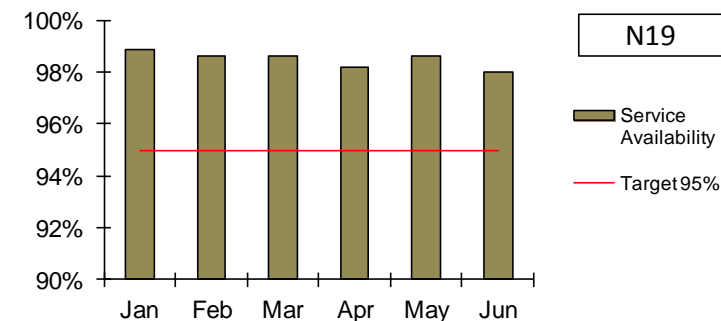
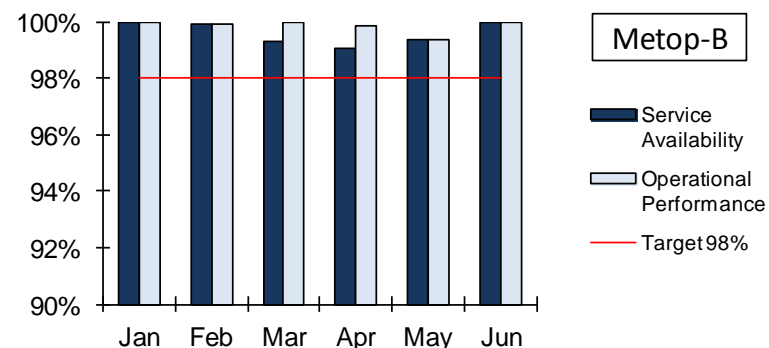
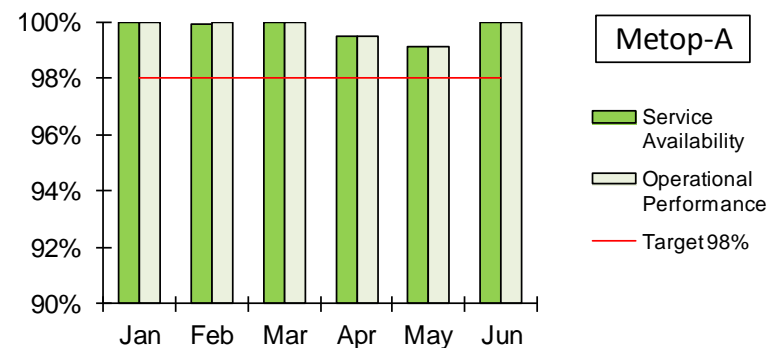
Level 1B products are derived from the data generated by the instruments onboard the Metop-A, Metop-B and NOAA-19 satellites.

Events which impacted availability:

16 March

& 27 April: Metop-B: OOP manoeuvres (see [slide 8](#))

- Notes:**
- (1) Metop-A's AMSU: channels 7 & 8 have failed completely; channel 3 continues to degrade, but the remaining 12 channels remain in spec and are fully usable.
 - (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, Suomi-NPP & NOAA GDS → ASCAT Level 1B (SZF) Products

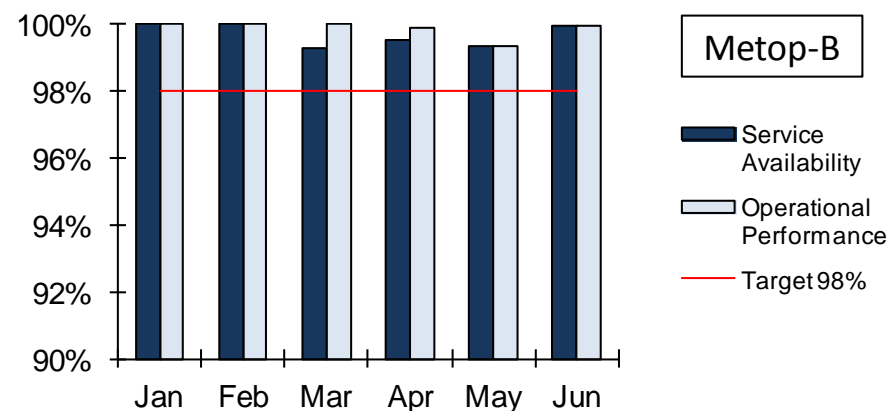
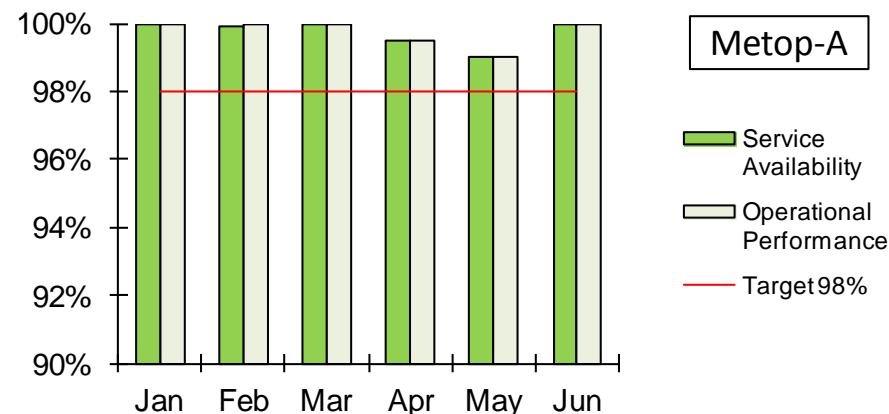
The Advanced Scatterometer (ASCAT) is a C-band radar on the Metop satellites which measures normalised backscatter from the Earth's surface. The prime objective of ASCAT is to measure wind speed and direction over the oceans, as an input to NWP models. ASCAT data is also used to extract information on soil moisture, sea-ice extent and permafrost boundary. EUMETSAT disseminates sampled Level 1B data from both Metop-A and Metop-B and derived Level 2 products over EUMETCast.

Performance of the Level 1B service is now measured in terms of the timely availability of the 'SZF' products (full resolution - original instrument sampling) on the EUMETCast reference user station.

Events which impacted availability:

16 March

& 27 April: Metop-B: OOP manoeuvres (see [slide 8](#))



Metop, Suomi-NPP & NOAA GDS → ATOVS Level 2 Products

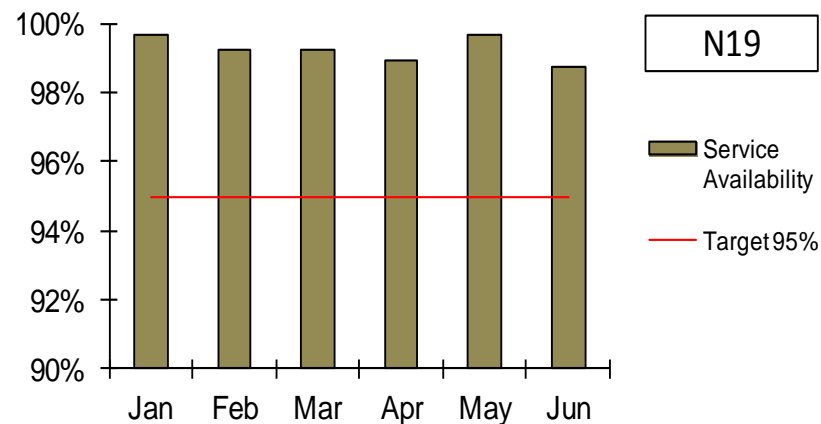
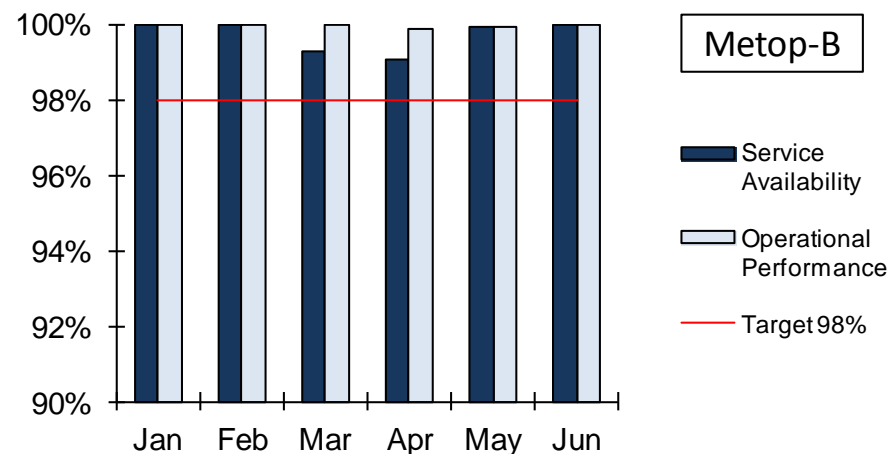
ATOVS Level 2 product processing transforms the calibrated radiance measurements from the AMSU-A, MHS and HIRS instruments (onboard Metop-B and NOAA-19 satellites) into information on the vertical distribution of atmosphere state parameters, on cloud and surface parameters and total atmosphere contents.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

16 March
& 27 April: Metop-B: OOP manoeuvres (see [slide 8](#))

Note: Metop-A ATOVS L2 products discontinued as of 7 December, due to failure of AMSU channels 7 and 8.

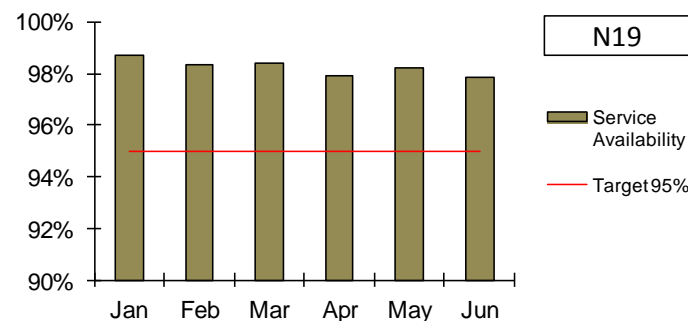
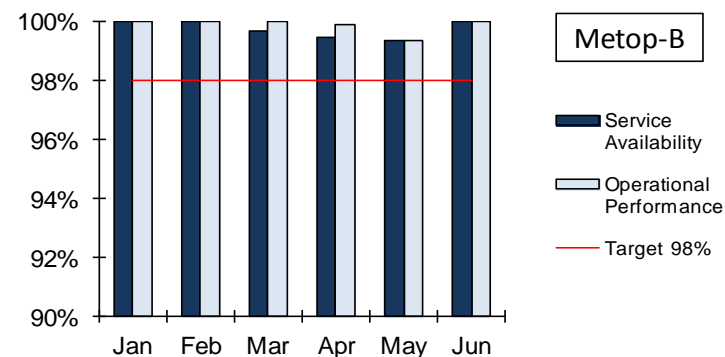
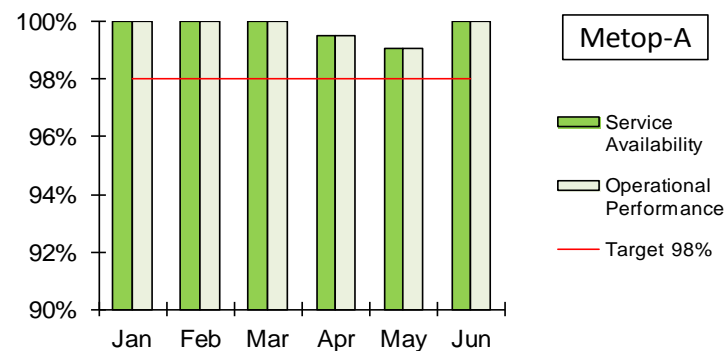


Metop, Suomi-NPP & NOAA GDS → AVHRR Level 1B Products

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:

16 March
& 27 April: Metop-B: OOP manoeuvres (see [slide 8](#))



Metop, Suomi-NPP & NOAA GDS → 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.

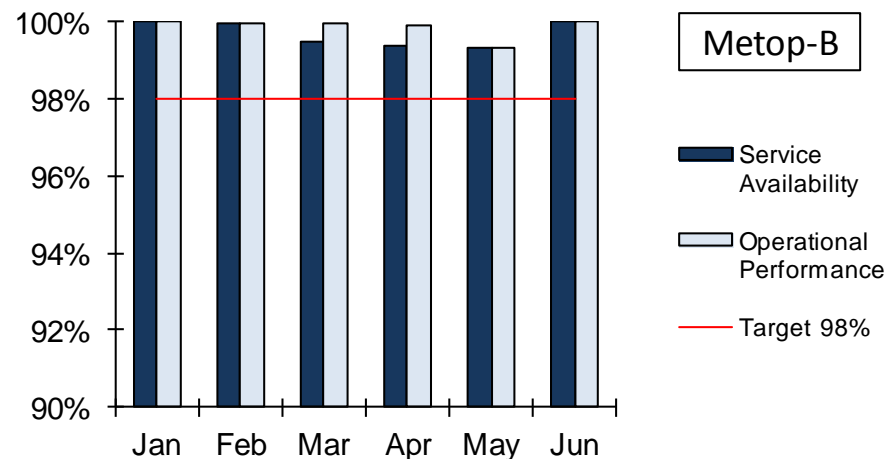
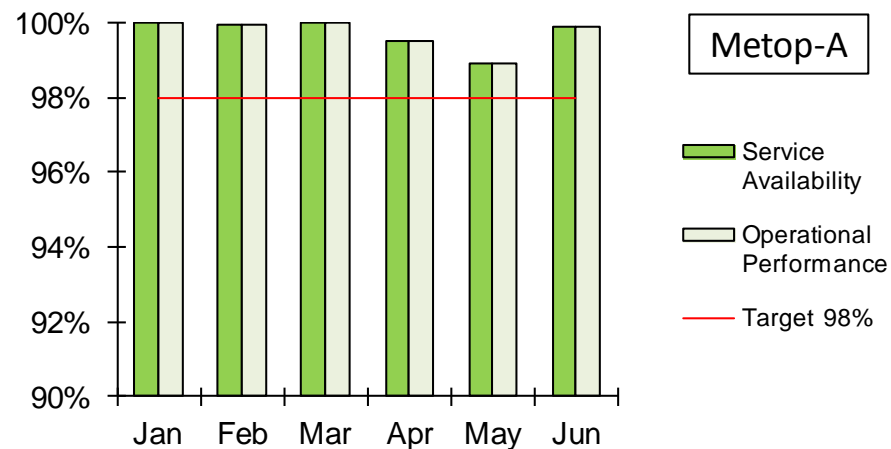
Events which impacted availability:

16 March

& 27 April: Metop-B: OOP manoeuvres (see [slide 8](#))

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, Suomi-NPP & NOAA GDS → 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 31 GPS navigation satellites in operational use.

The chart shows for each month:

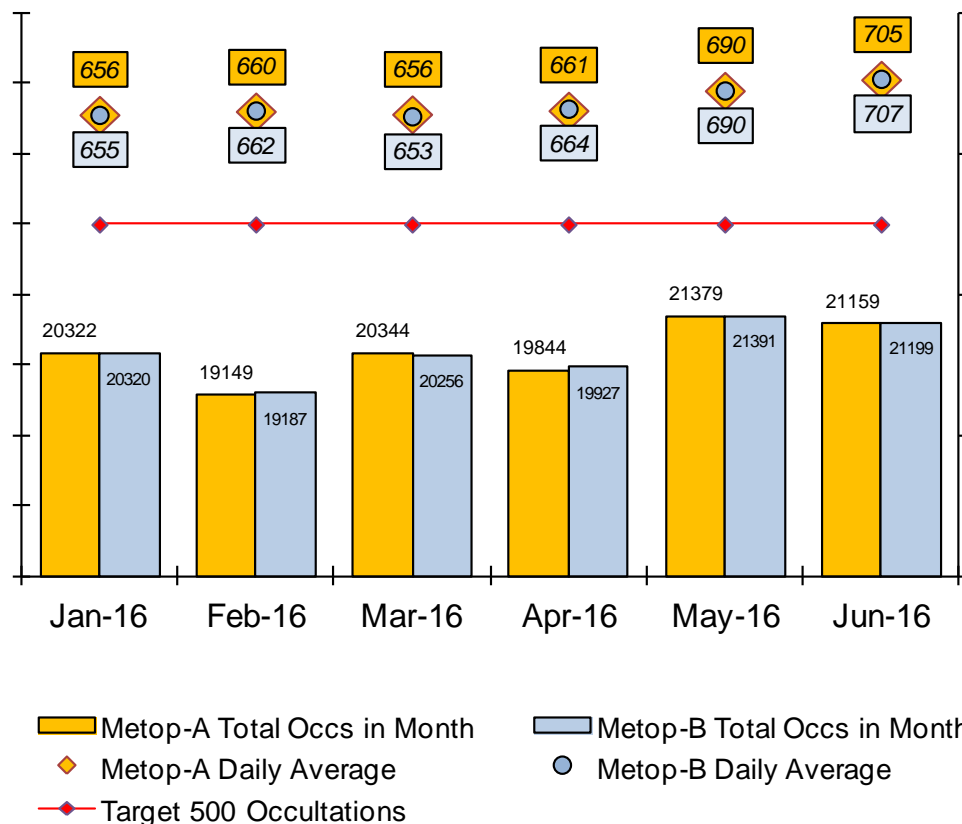
- (1) the total numbers of GRAS Level 1B occultations (plus geolocation and quality flags) from Metop-A and Metop-B disseminated via EUMETCast
- (2) the daily average number of occultations from each Metop provided to users (numbers in *italics*)

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

Events which impacted availability:

16 March
& 27 April: Metop-B: OOP manoeuvres (see [slide 8](#))

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, Suomi-NPP & NOAA GDS → HIRS Level 1B BUFR Products

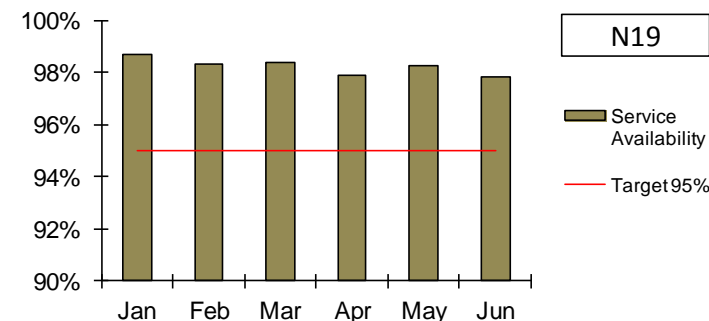
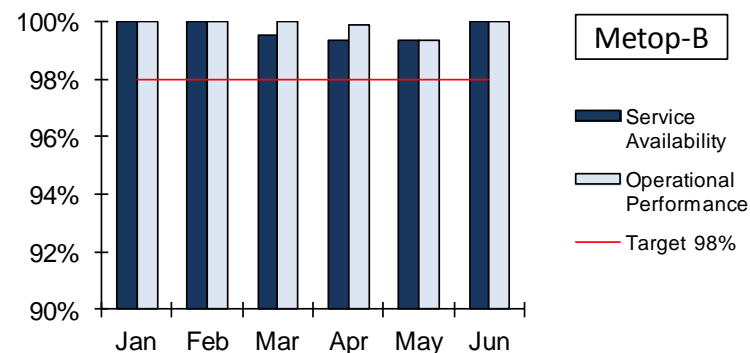
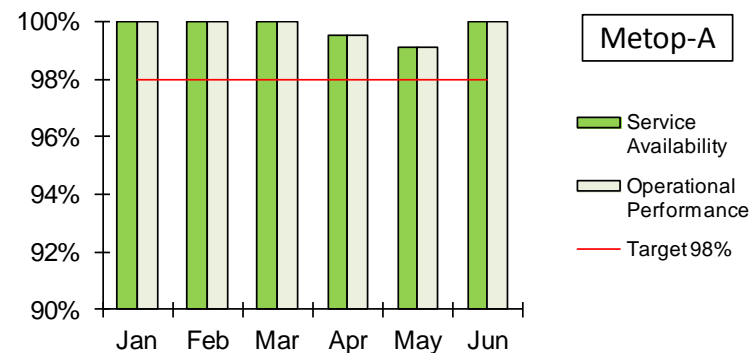
The High Resolution Infrared Radiation Sounder (HIRS) measures incident radiation using 19 infrared channels and 1 visible channel, providing information on the atmosphere's vertical temperature profile and water vapour from the Earth's surface to an altitude of about 40 km. Level 1B products are derived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

Events which impacted availability:

16 March
& 27 April: Metop-B: OOP manoeuvres (see [slide 8](#))

Notes:

- (1) Metop-A's HIRS: all channels within specification.
- (2) Metop-B's HIRS: channels 1-12 and 14 are out of spec and thus the data has limited usability.
- (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.



Metop, Suomi-NPP & NOAA GDS → IASI Level 1C & Level 2 BUFR Products

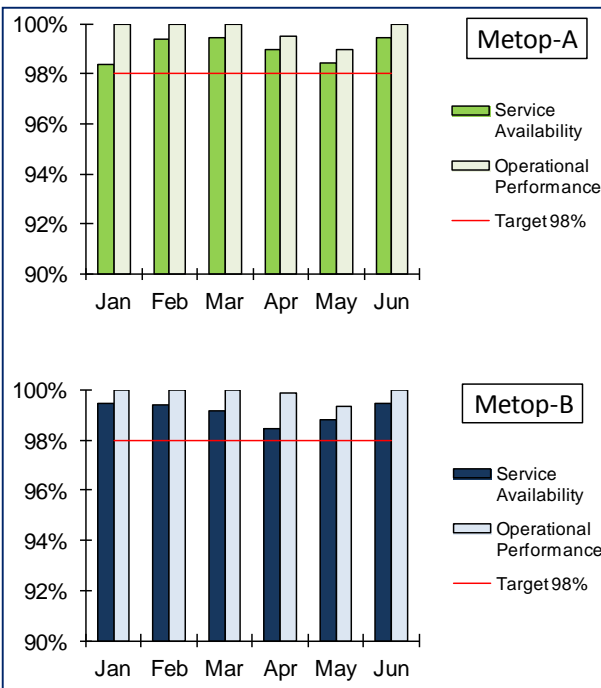
The Infrared Atmospheric Sounding Interferometer (IASI) measures the spectrum of infrared radiation in 6000 channels, providing information on atmospheric profiles of temperature, water vapour and trace gases, as well as surface temperature, surface emissivity and cloud characteristics.

Events which impacted availability:

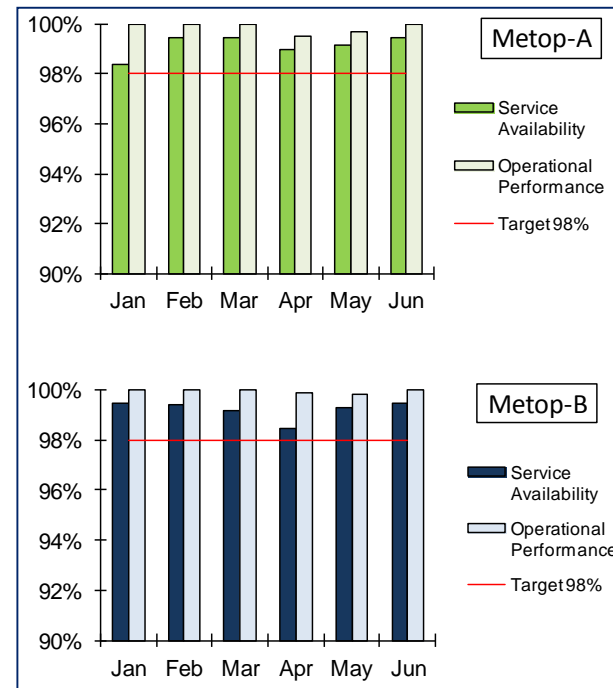
January: Metop-A: 3 external calibrations performed.

16 March & 27 April: Metop-B: OOP manoeuvres (see [slide 8](#))

IASI Level 1C



IASI Level 2



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, Suomi-NPP & NOAA GDS → 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.

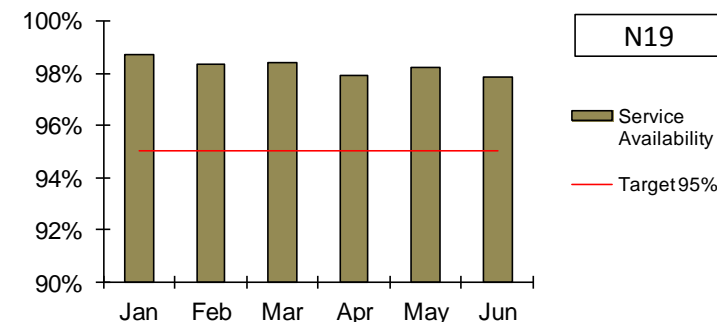
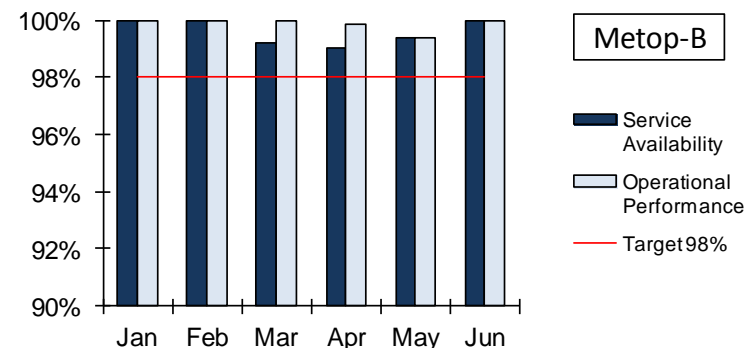
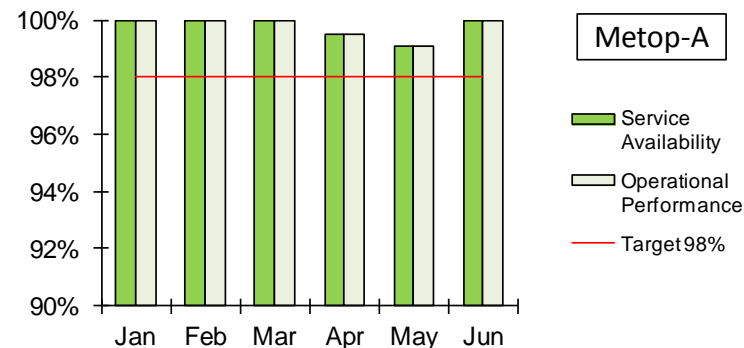
Events which impacted availability:

16 March

& 27 April: Metop-B: OOP manoeuvres (see [slide 8](#))

Notes:

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



Metop, Suomi-NPP & NOAA GDS → SEM Level 0 Data

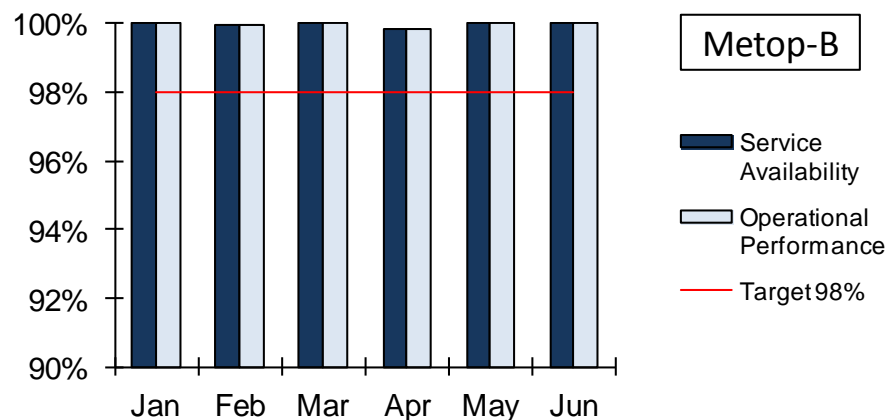
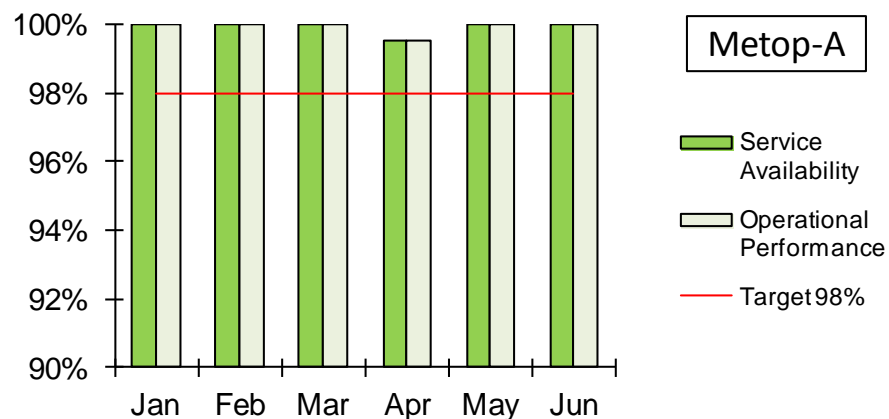
The Space Environment Monitor (SEM) consists of a pair of instruments on each Metop satellite which provide data to determine the intensity of the Earth's radiation belts and the flux of charged particles at the satellite's orbiting altitude.

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:

16 March

& 27 April: Metop-B: OOP manoeuvres (see [slide 8](#))

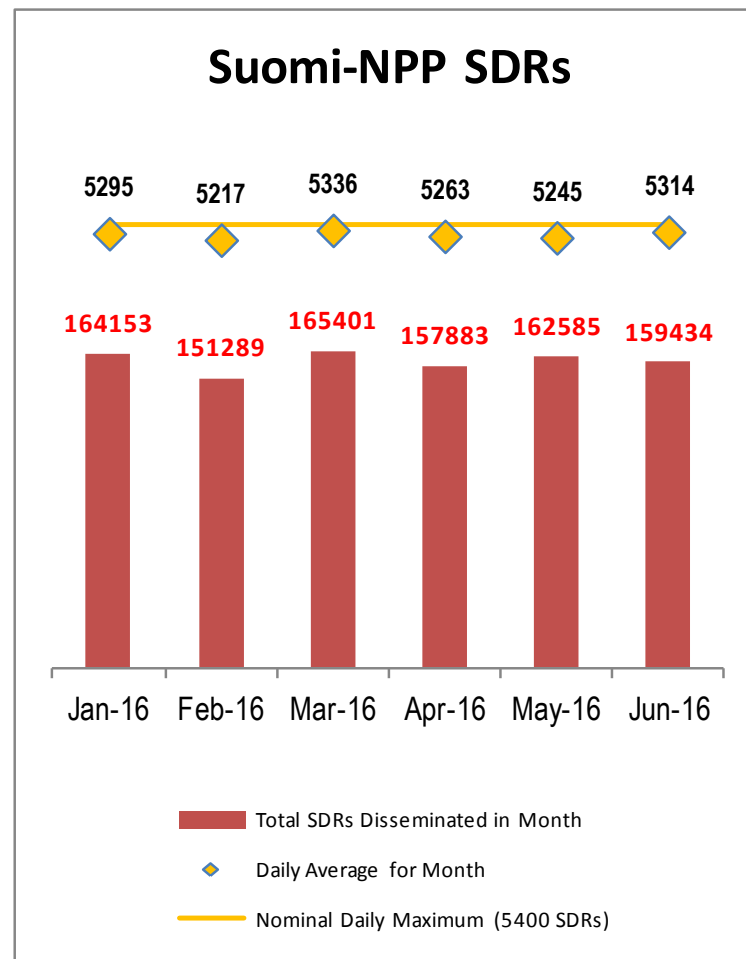


Metop, Suomi-NPP & NOAA GDS → Suomi-NPP Sensor Data Records

The Global Data Service delivers Sensor Data Records from the ATMS and CrIS instruments (Advanced Technology Microwave Sounder and Cross-track Infrared Sounder respectively) onboard NASA-NOAA's Suomi-NPP (National Polar-orbiting Partnership) satellite.

Events which impacted availability:

None significant.



Regional Data Services

The Regional Data Services (RDS) are based on direct acquisition of data from Metop and NOAA satellites by a network of HRPT stations, known as EARS (EUMETSAT Advanced Retransmission 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 RDS comprises the following services :

EARS-ASCAT, EARS-ATMS, EARS-ATOVS, EARS-AVHRR, EARS-CrIS,
EARS-IASI, EARS-NWC, EARS-VIIRS, and as of 17-Feb-2016, EARS-VASS

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 the following slides.

See EUMETSAT's document TD14, available from the ['Regional Data Services'](#) page of EUMETSAT's website (see 'Related Links') for more information generally on the various EARS services, including which HRPT stations contribute to each of the services.

Regional Data Services → EARS-ASCAT

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

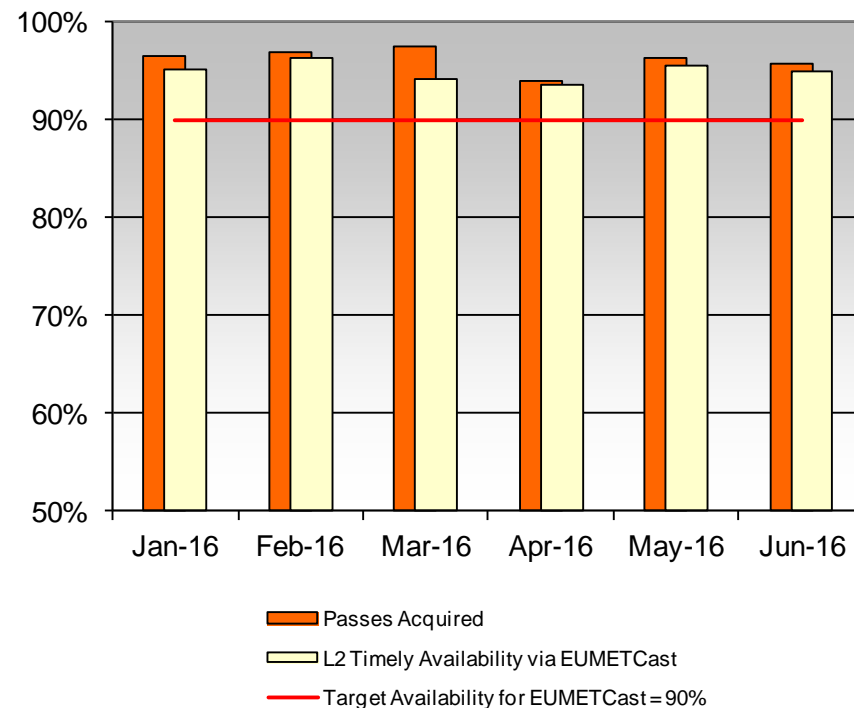
Level 1 data is produced by the EARS system, and then forwarded to KNMI (Netherlands) for the generation of Level 2 data. Availability shown on the chart is that of the Level 2 data received by users (relative to scheduled passes).

Events which impacted availability:

2-3 March: EUM – KNMI 23-hour link outage – no L2 data available.

16 March

& 27 April: Metop-B: OOP manoeuvres (see [slide 8](#))



Regional Data Services → EARS-ATMS

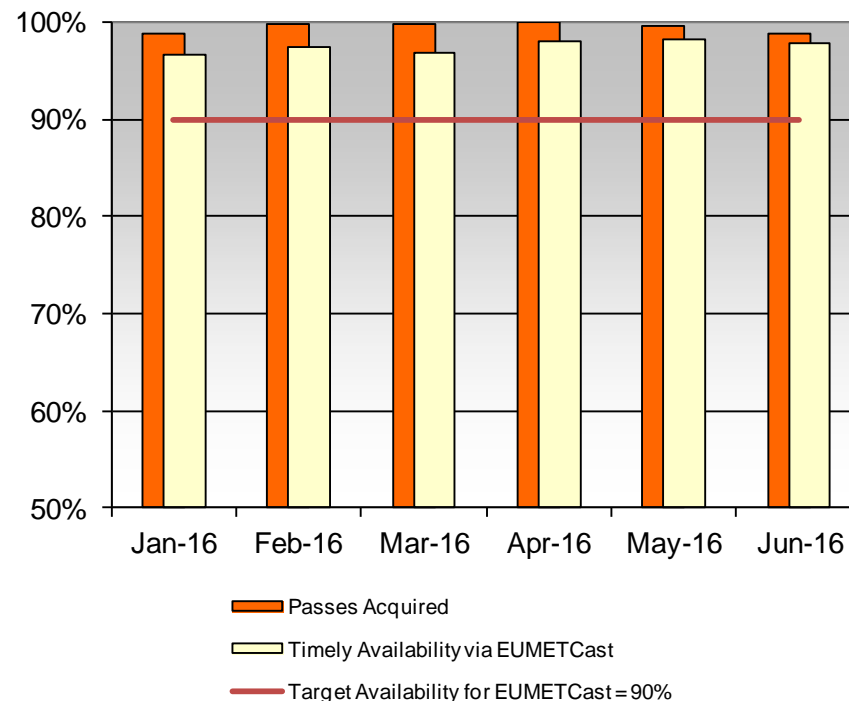
This service provides SDRs derived from the data produced by the ATMS (Advanced Technology Microwave Sounder) instrument onboard NASA-NOAA's Suomi-NPP satellite.

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

Events which impacted availability:

None significant.

Note: Moscow became a contributing station as of 6-April.



Regional Data Services → 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, Metop-A, NOAA's N19, N18 and N15. Note that 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.

Note the less-stringent timeliness target for data from the following HRPT stations:

Edmonton, Gander, Miami & Monterey: 45 mins.

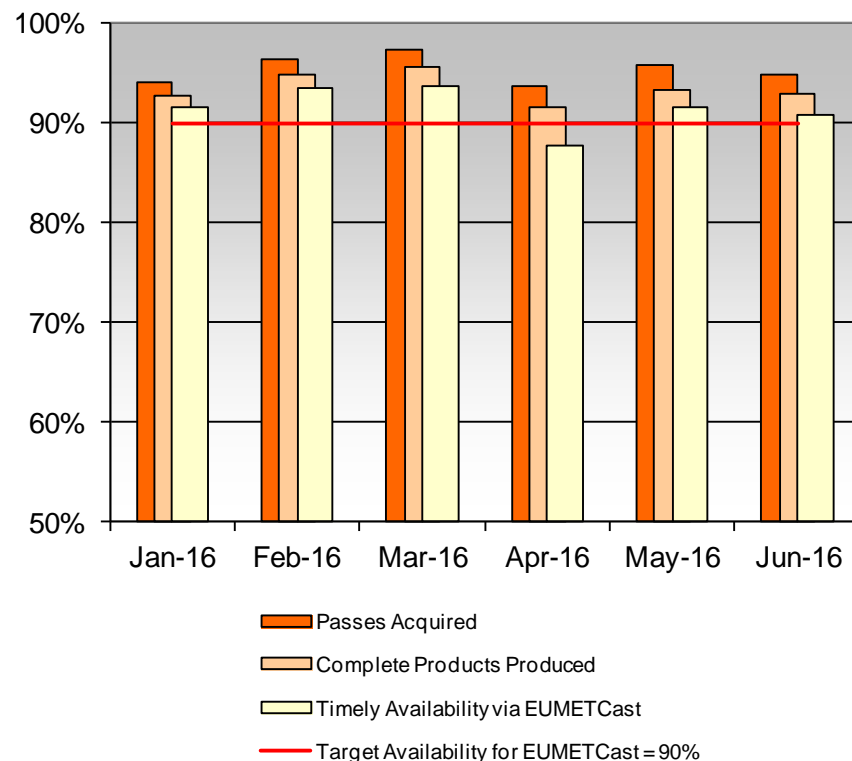
Events which impacted availability:

16 March

& 27 April: Metop-B: OOP manoeuvres (see [slide 8](#))

8-11 April: Miami, Gilmore Creek, Wallops & Monterey data not available, due to comms problem

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.



Regional Data Services → EARS-AVHRR

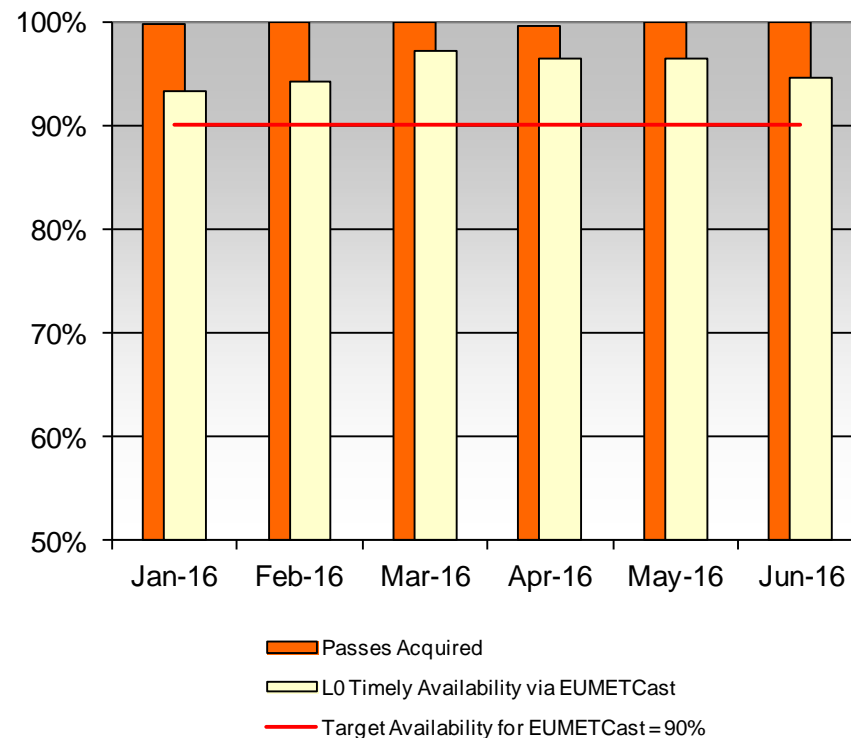
This service provides data from the AVHRR instruments onboard NOAA-19 and the Metop satellites. AHRPT partial coverage data and data from the Fast Dump Extract System (FDES) are used from the Metops.

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:

16 March

& 27 April: Metop-B: OOP manoeuvres (see [slide 8](#))



Regional Data Services → EARS-CrIS

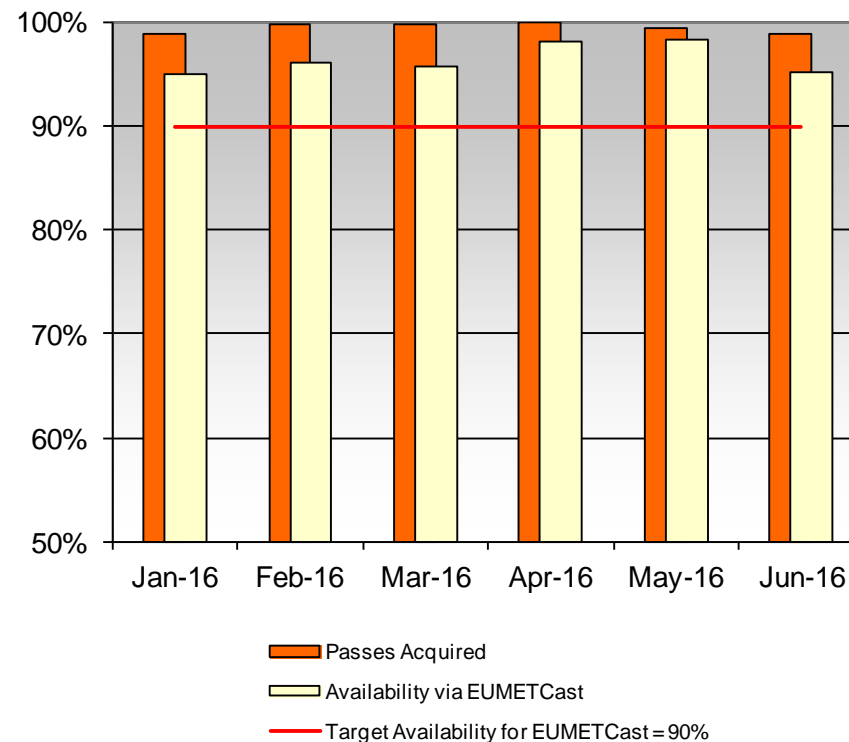
This service provides SDRs derived from the data produced by the CrIS (Cross-track Infrared Sounder) instrument onboard NASA-NOAA's Suomi-NPP satellite.

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

Events which impacted availability:

None significant.

Note: Moscow became a contributing station as of 6-April.



Regional Data Services → EARS-IASI

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

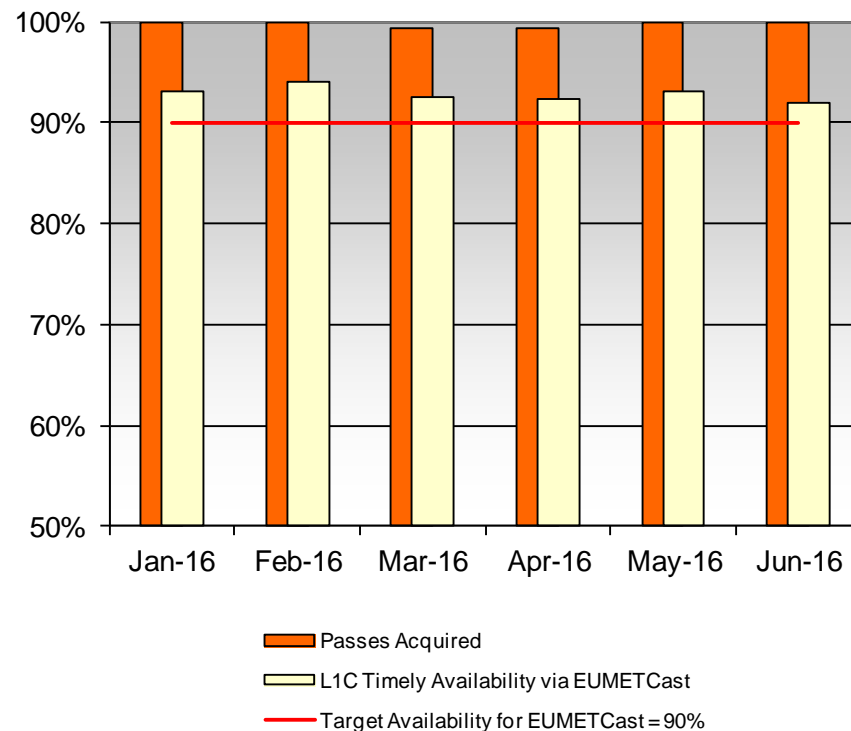
Availability shown on the chart is that of the Level 1C data received by users (relative to scheduled passes). The products comprise calibrated and geolocated IASI observations containing both 300 Principle Component Scores and 500 original IASI channels, cloud/scene analysis information, BUFR formatted, suitable for nowcasting applications.

Events which impacted availability:

16 March

& 27 April: Metop-B: OOP manoeuvres (see [slide 8](#))

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



Regional Data Services → EARS-NWC

This service delivers Level 2 cloud products derived from data produced by the AVHRR instruments onboard Metop-B and NOAA-19.

Three types of product are delivered:

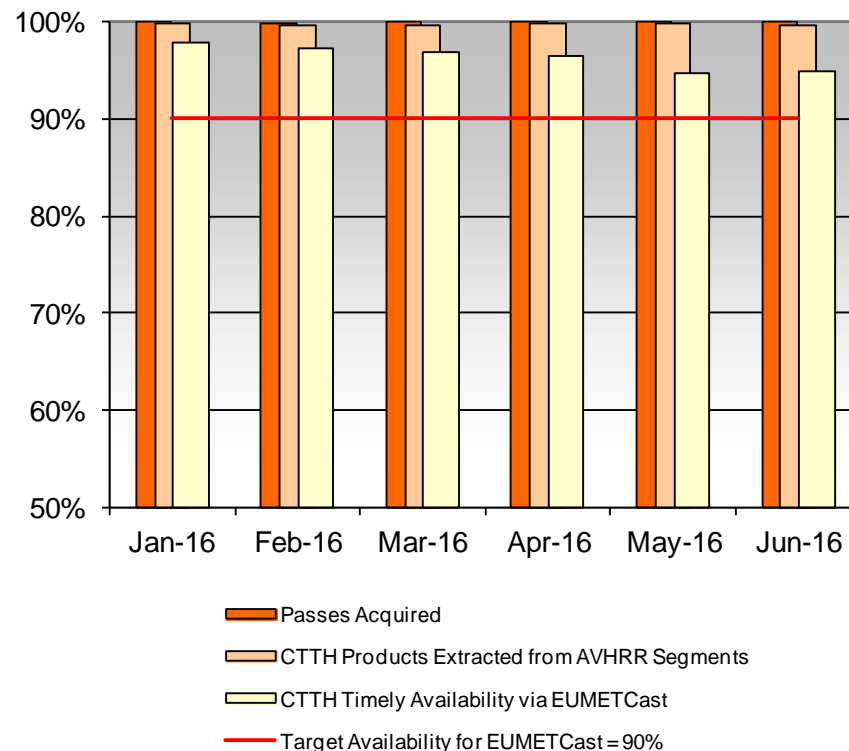
- Cloud-Top Temperature and Height (CTTH)
- Cloud Mask (CM)
- Cloud Type (CT)

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

Events which impacted availability:

16 March

& 27 April: Metop-B: OOP manoeuvres (see [slide 8](#))



Regional Data Services → EARS-VASS

The EARS Vertical Atmospheric Sounding Service (VASS) delivers data processed to L1B from the MWHS-II (Microwave Humidity Sounder II) and IRAS (Infra-Red Atmospheric Sounder) instruments onboard the FY-3C satellite from the China Meteorological Administration (CMA).

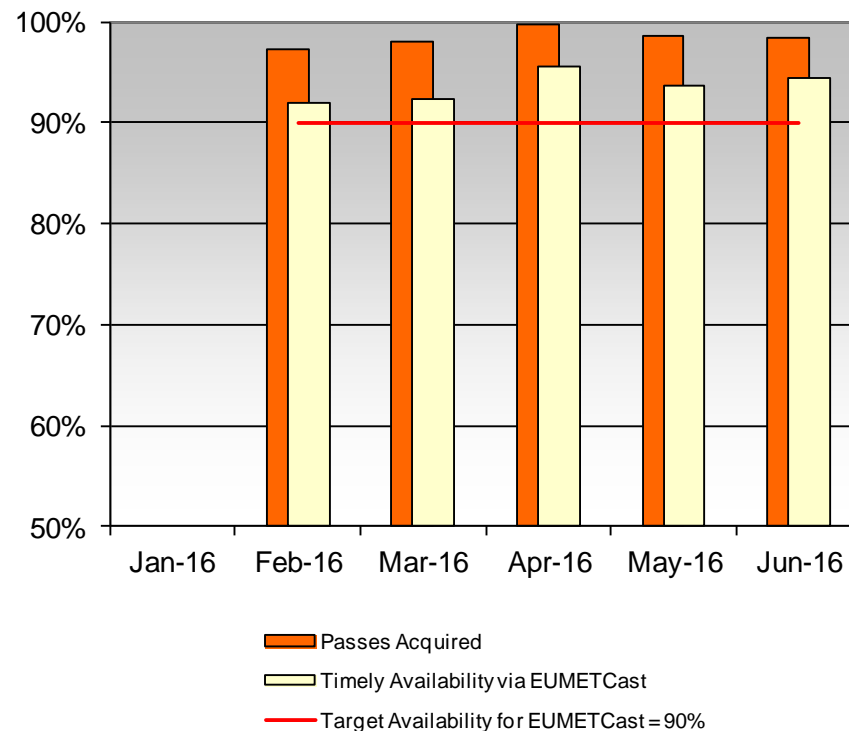
Availability shown on the chart is that of the BUFR-formatted L1B data relayed via EUMETCast.

The HRPT stations contributing to the VASS service are Athens, Kangerlussuaq, Lannion, Maspalomas, and Svalbard.

Events which impacted availability:

None significant.

The operational service commenced 17-Feb-2016 (bars on chart for that month correspond to period 17-29 February).



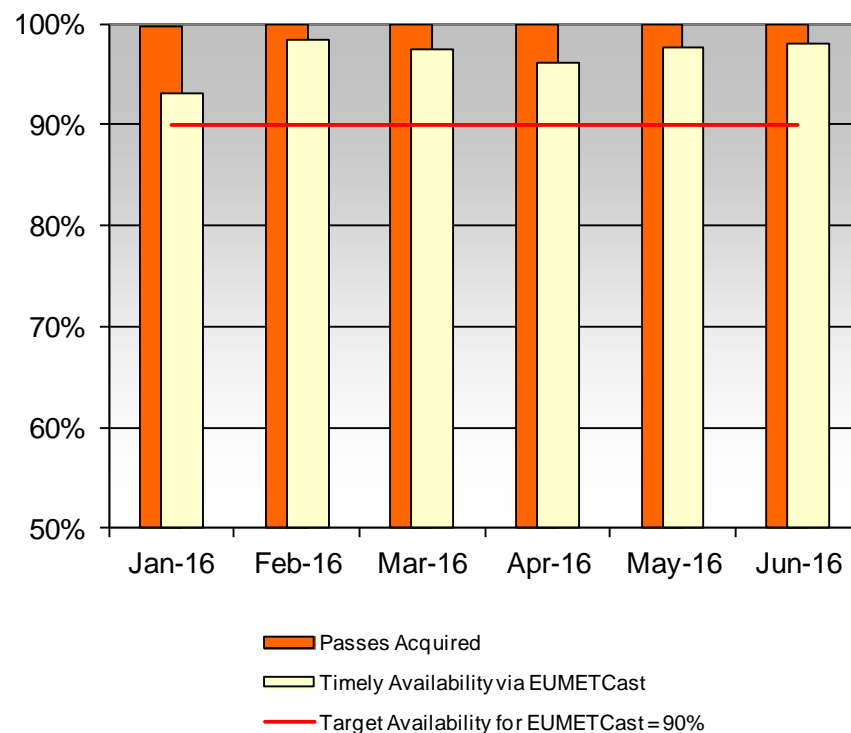
Regional Data Services → EARS-VIIRS

This service delivers products based on M-Band data from the Visible Infrared Imaging Radiometer Suite (VIIRS) instrument onboard NASA-NOAA's Suomi-NPP satellite.

Availability shown on the chart is that of the L1 SDR products received by users (relative to scheduled passes).

Events which impacted availability:

None significant.



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 for the duration of the reporting period, with the exception of a period of ~23 hours for Meteosat-9 following the safe-mode experienced on 31-March. Meteosat-8's transponder was successfully tested in the period 8-13 June, prior to the start of its relocation to over the Indian Ocean, but otherwise remained off. Meteosat-11's SAR transponder remained off during its In-Orbit Storage.

Metop: 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.

Latest news regarding Jason-3:

The satellite was successfully launched on 17 January 2016. It has undergone a successful commissioning period, and the Near-Real-Time (NRT) Operational Geophysical Data Records (OGDRs) and the Short-Time-Critical (STC) Interim Geophysical Data Records (IGDRs) have been made available to all users as of 1 July onwards. The next issue of this report will report on the first six months of the Jason-3 operational data service.

Jason-2 OGDR Service

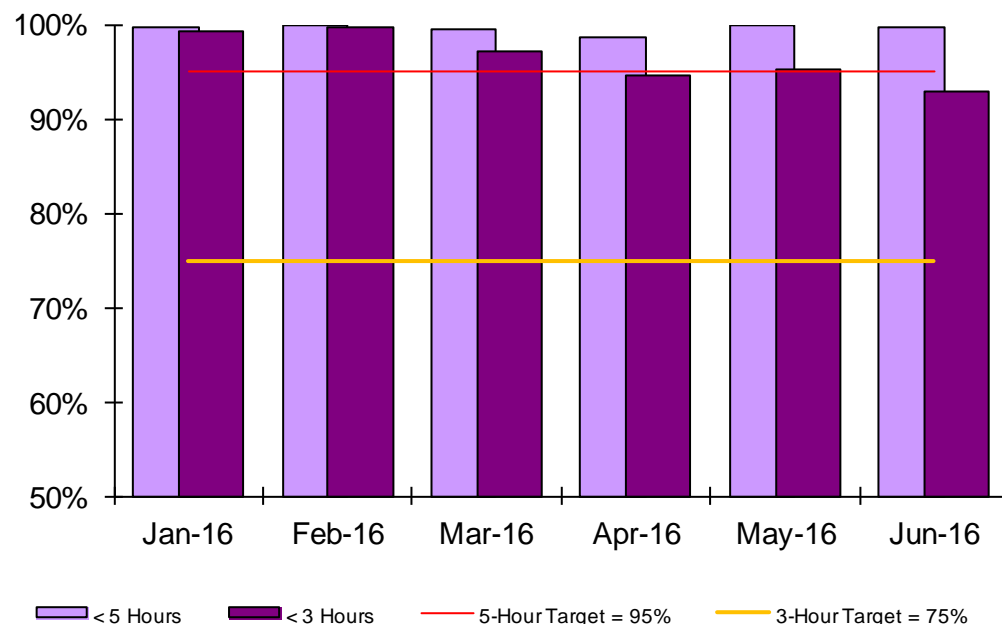
The chart shows the availability of the Jason-2 near real-time Operational Geophysical Data Record (OGDR) products disseminated via EUMETCast.

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:

5-6 April: An onboard update of the GPS software to reestablish coherence of onboard timing data and to eliminate related instrument instabilities (observed since January) resulted in a 22.5 hour mission 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 Himawari-8 at 140.7°E
- CMA's FY-2E, at 86.5°E, and FY-2G, at 105°E (also selected meteorological products)

Meteorological products based on LEO satellite data are also disseminated:

- Microwave Sounder products from CMA's FY-3B and FY-3C (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
- EUMETSAT SSMIS products derived from sounder data of the DoD's DMSP satellites (F16 – F19)
- 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.

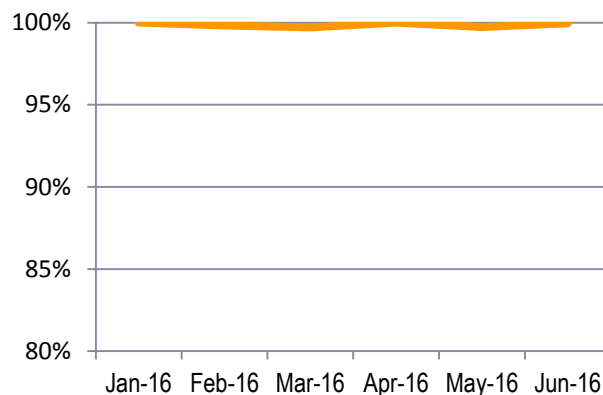
Third-Party Data Services → Geostationary Satellite Data & Products

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.

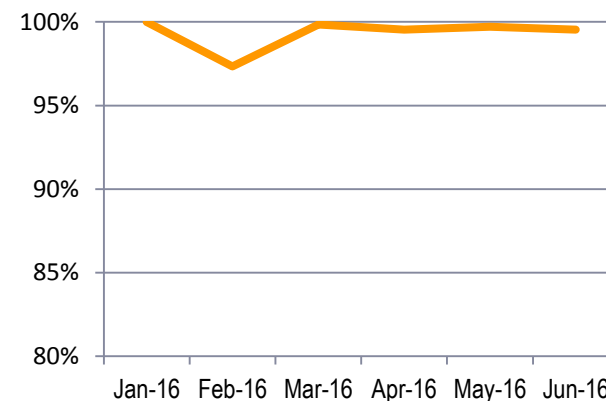
Events which impacted availability:

None significant.

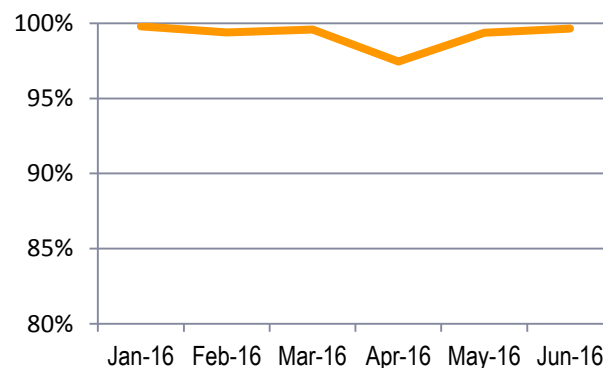
GOES-East (75°W)



GOES-West (135°W)



Himawari-8 (140.7°E)



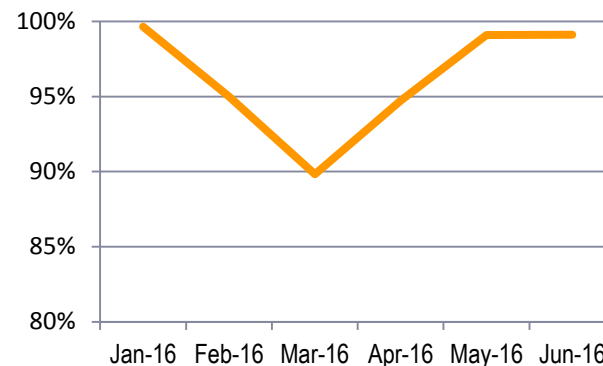
Third-Party Data Services → Geostationary Satellite Data & Products (cont.)

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.

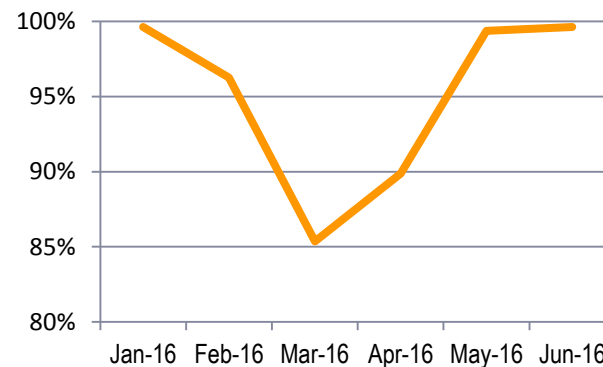
Events which impacted availability:

Feb-Apr: For both FY-2E & FY-2G:
Fewer products due to eclipse-season

FY-2E (86.5°E)



FY-2G (105°E)



Third-Party Data Services → LEO Satellite Data & Products

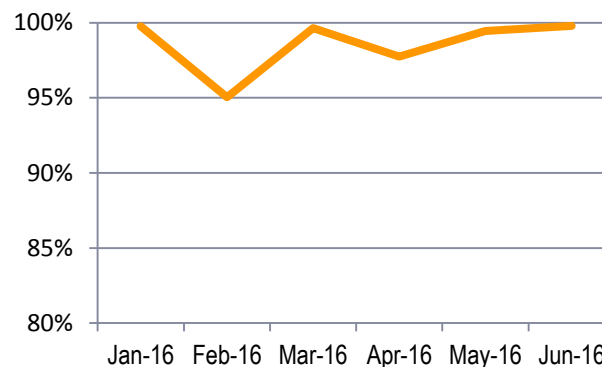
This slide presents charts which show the availability of data & products for **LEO satellites** operated by partner organisations, as disseminated via EUMETCast.

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

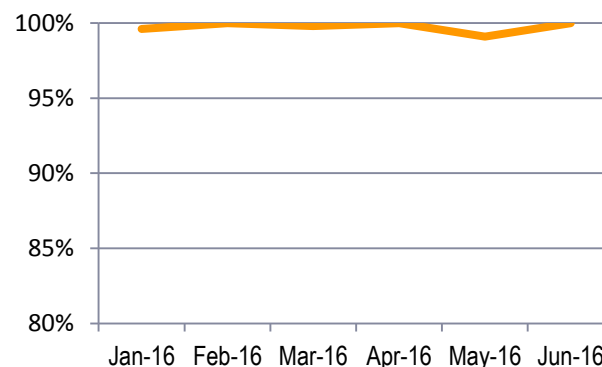
Events Which Impacted Availability:

None significant.

FY-3B Level 1 Data



FY-3C Level 1 Data



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 instruments hosted on NASA's Terra and Aqua LEO satellites.

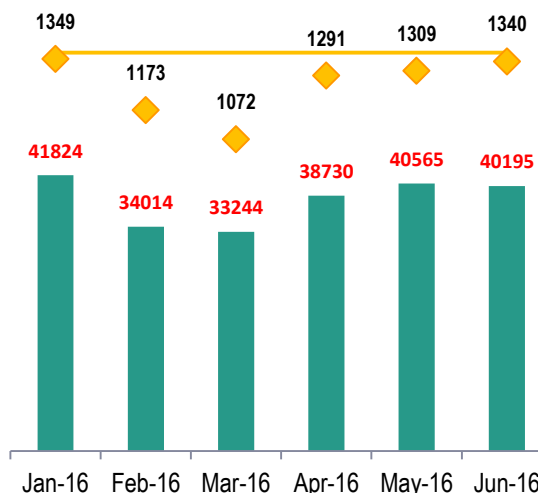
SSMIS Products: Extracted from SDR data from the 'Special Sensor Microwave Imager Sounder' radiometer onboard the near-polar-orbiting, sun-synchronised DMSP satellites (one of the F16 – F18 series). Each product contains one orbit of data, comprising 4 BUFR component products: IMA, ENV, LAS and UAS.

Events which impacted availability:

18-24 Feb: Terra satellite safe-mode impacted availability of MODIS data.

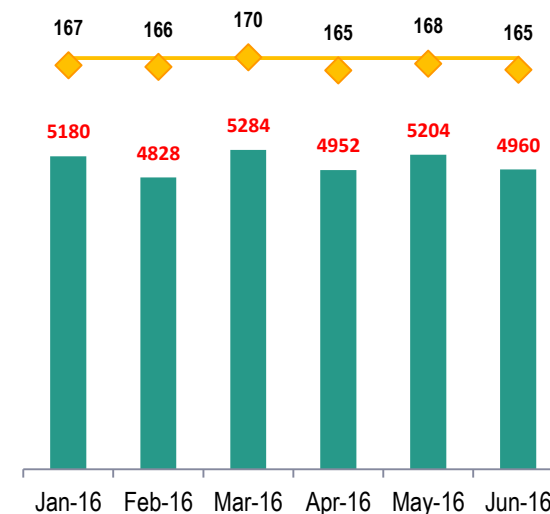
Mar-April: Several processing problems impacted availability of MODIS products.

MODIS Products



■ Total Products Disseminated in Month
◆ Daily Average for Month
— Average Daily Expected (1370 products)

SSMIS Products



■ Total Products Disseminated in Month
◆ Daily Average for Month
— Daily Max of 170 products

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

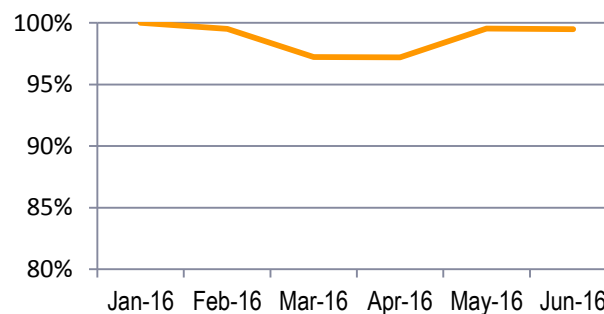
This slide presents a chart showing the availability via EUMETCast of near-real-time Operational Geophysical Data Records (OGDRs), which are produced from the data from the 'AltiKa' Ka-band altimeter instrument of ISRO/CNES's SARAL mission.

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

Events which impacted availability:

None significant.

**SARAL OGDRs
(3-hour timeliness)**



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. Since 1 January 2015, EUMETCast Europe has been implemented with the second generation DVB-S2 standard, whereas the Africa and South America services currently remain on DVB-S.

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

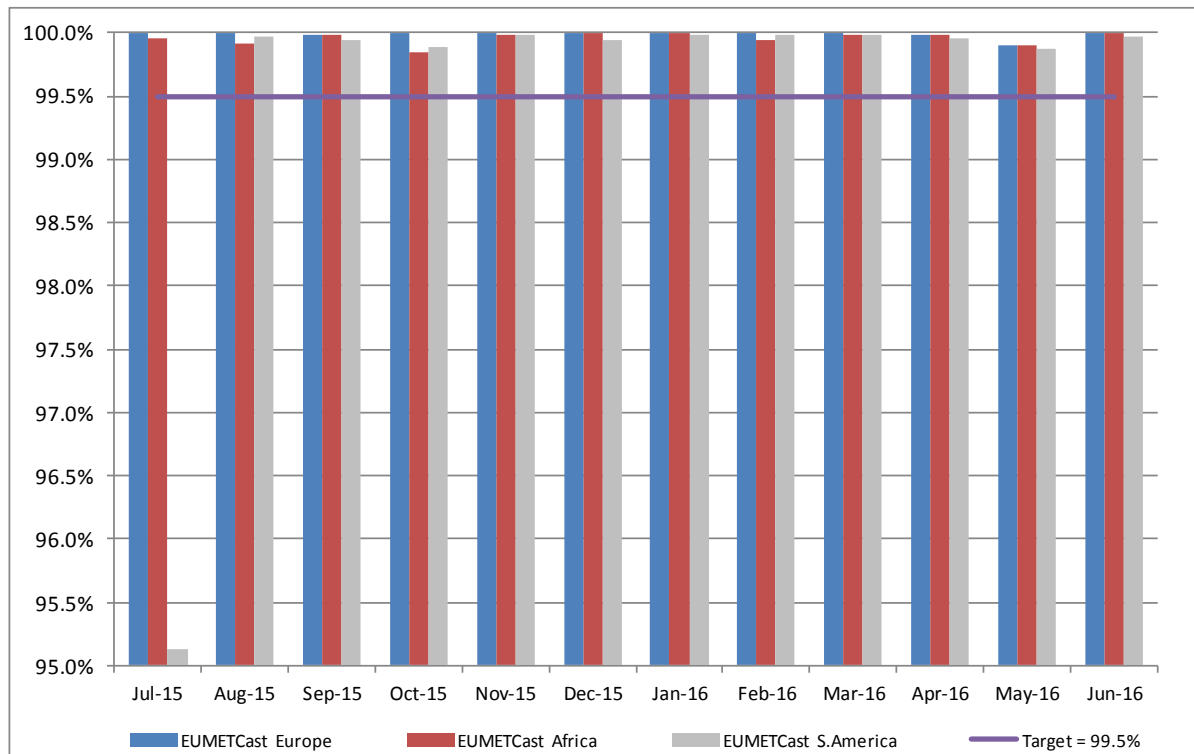
The chart on the following slide shows the availability of the system for the last 12 months, which includes the half-year reporting period.

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:

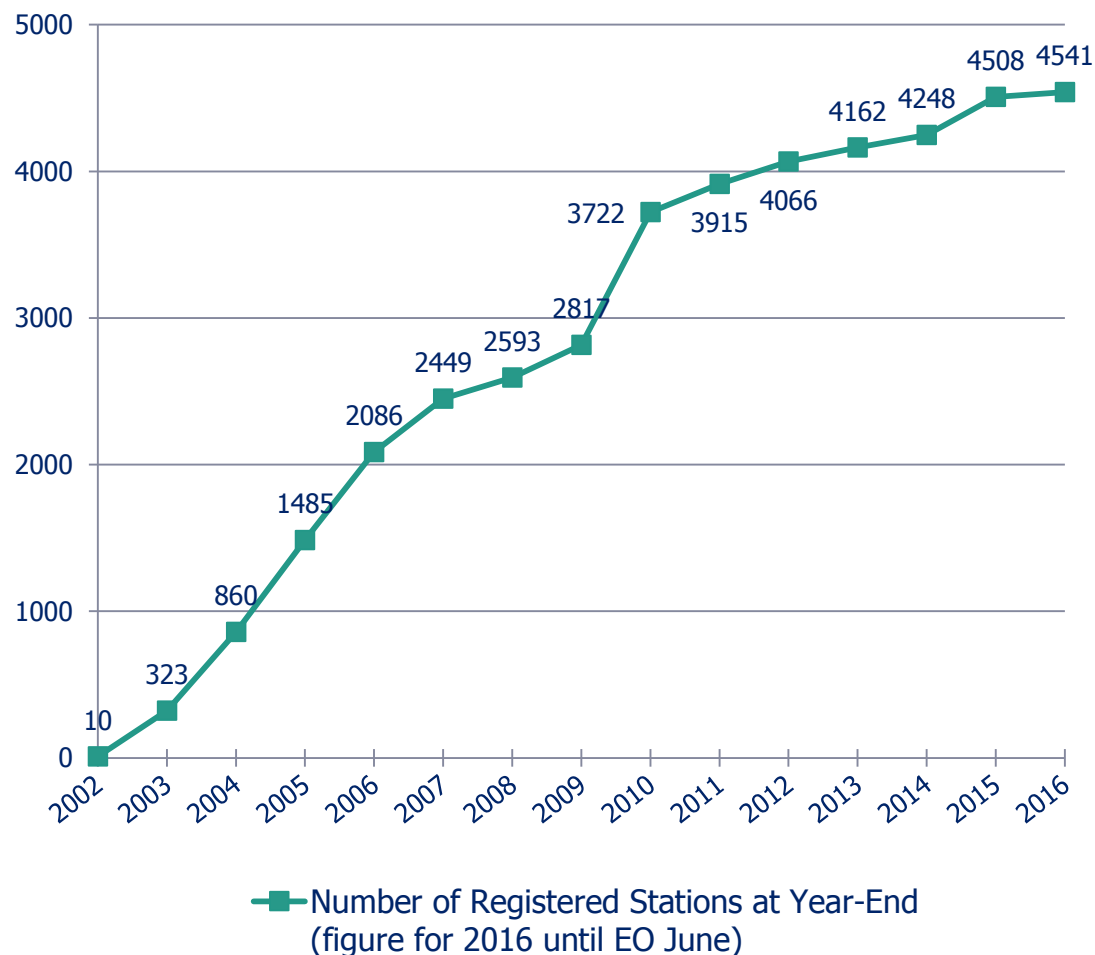
July 2015: EUMETCast South America impacted by interference at the turnaround site – eventually resolved by relocating the Ku-band reception antenna.



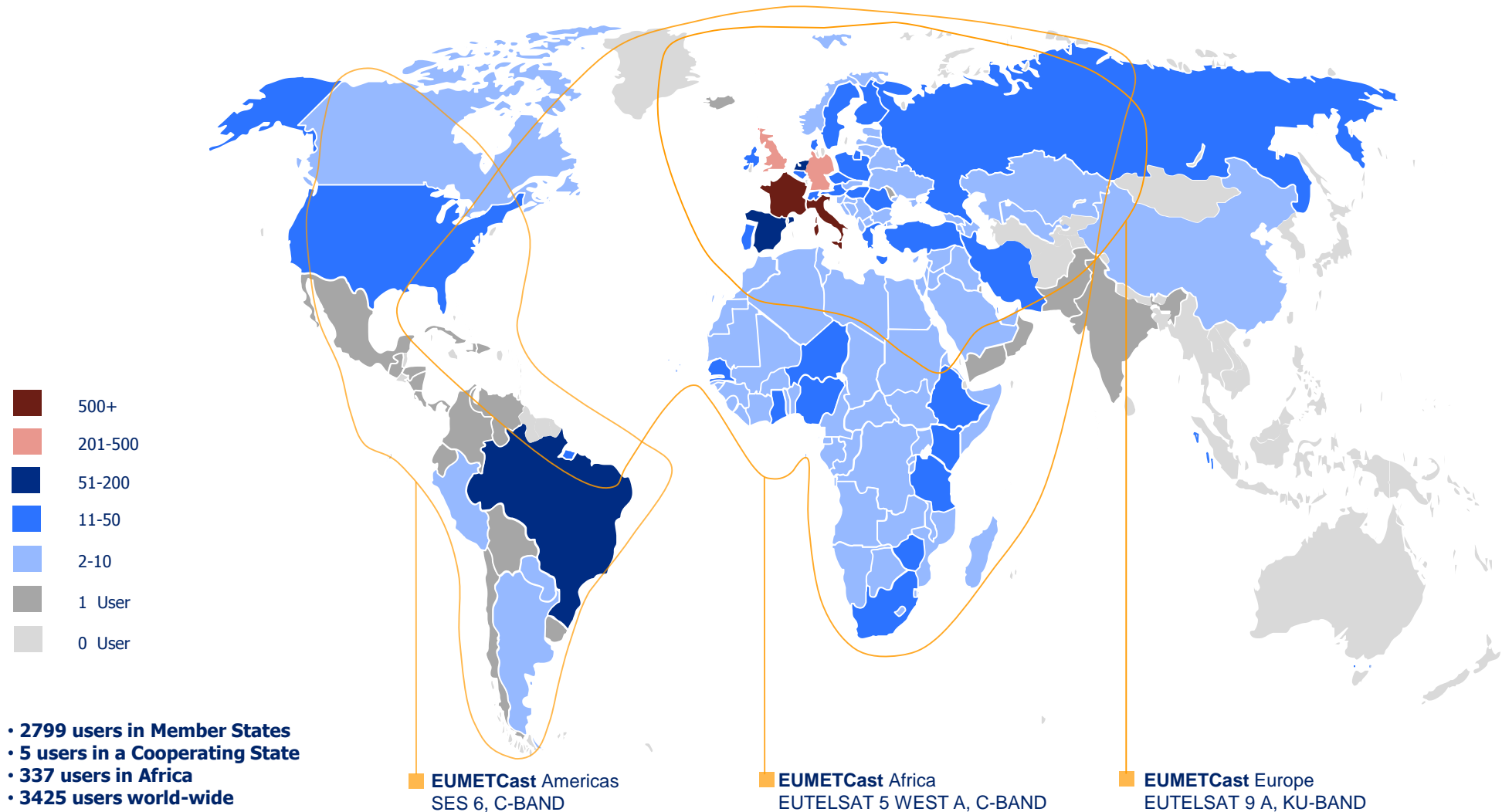
EUMETCast → Registered User Stations

The chart shows the trend of registrations of EUMETCast user stations since the establishment of the system in 2002.

Note that 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.



EUMETCast → Users Worldwide as of 30 June 2016



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

Note that the charts do not include orders and deliveries of Climate Data Records (CDRs). Although the volumes of CDR deliveries are large (typically many TBs), they are not logged in the automated statistics provided by EUMETSAT's Data Centre.

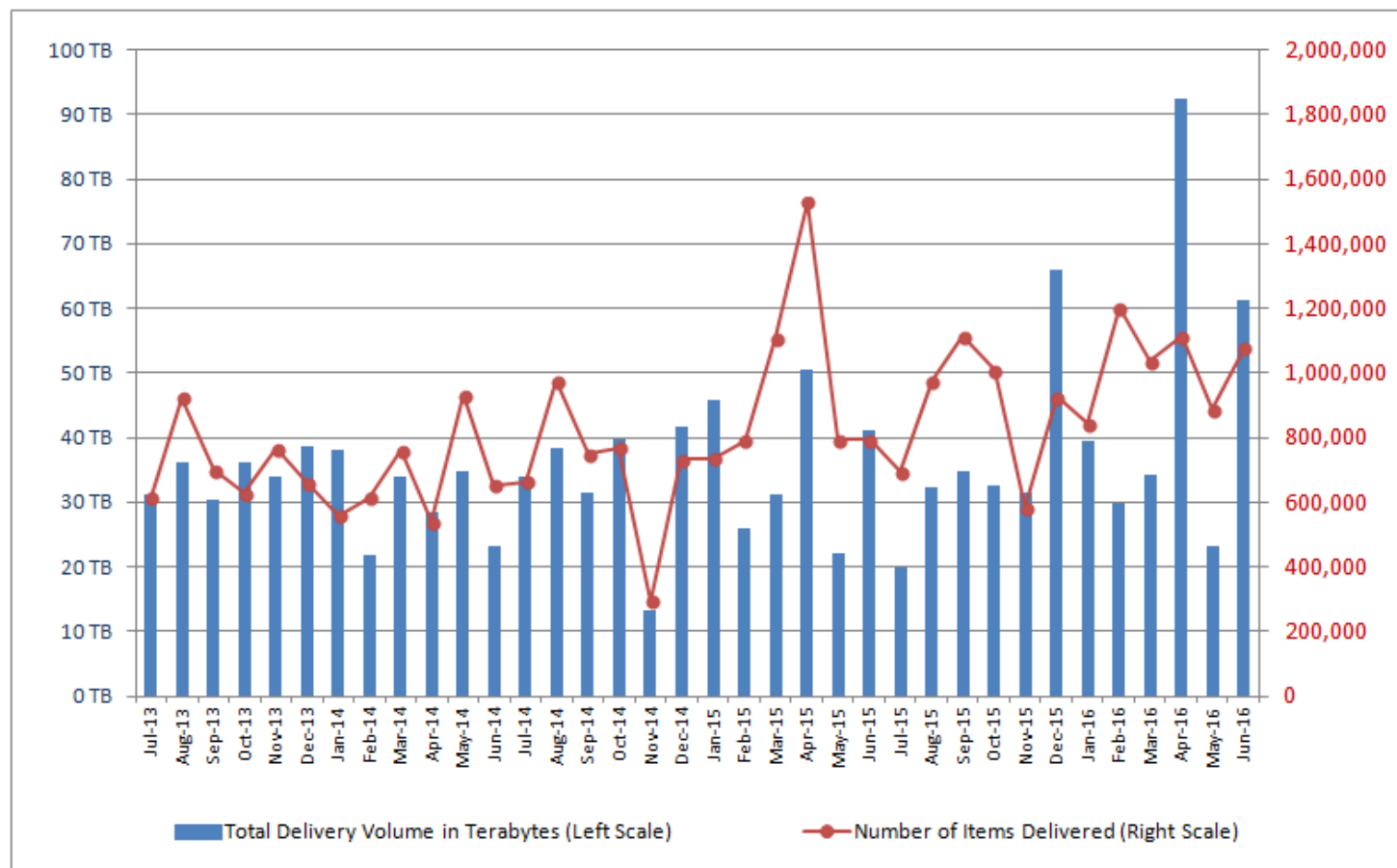
The EUMETSAT Data Centre → Data Delivered: Total Volume versus Items

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 2015.

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

Notes for the reporting period:

- (1) April 2016: A record high delivery volume due to orders of first Sentinel-3 data for commissioning and internal load-testing purposes.
- (2) June 2016: High delivery volume resulting from four exceptionally-large orders for IASI L1C native 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.

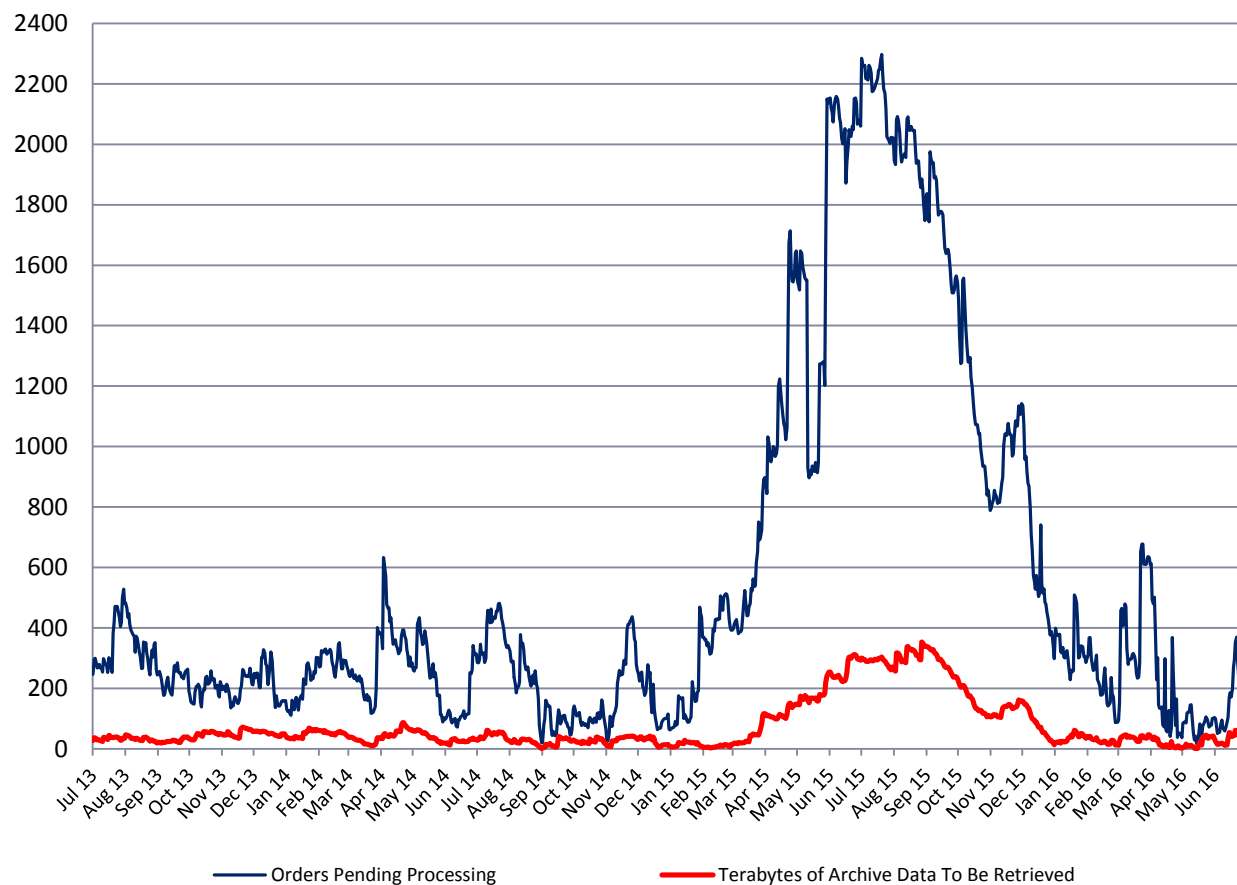
The chart is based on observed daily maximum orders and estimated retrieval volumes which are recorded automatically for each day of the year.

Peak levels March - August 2015:

As reported in the last issue, the large increase in orders-pending was attributable to exceptionally high interest in archived data and a few exceptionally large orders from specialist users.

January - June 2016:

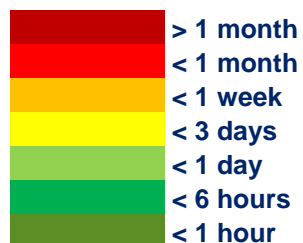
Orders-pending increased as a result of the Sentinel-3 activity in April and the IASI L1C in June.



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).

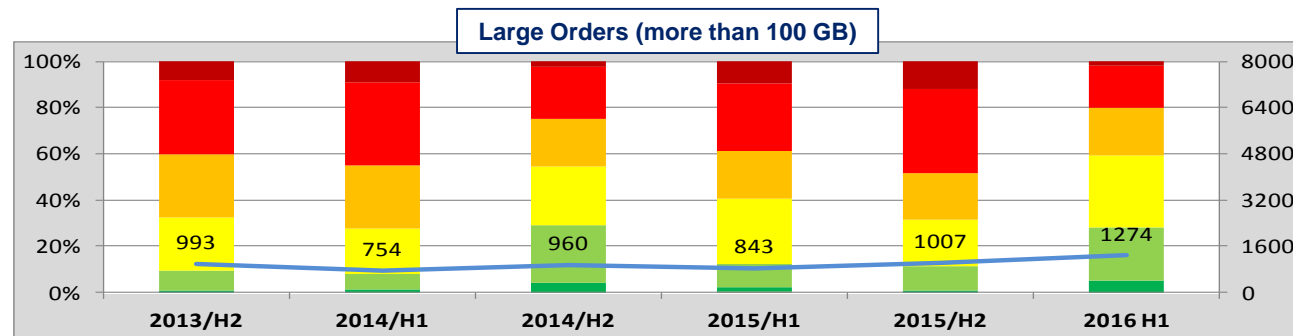
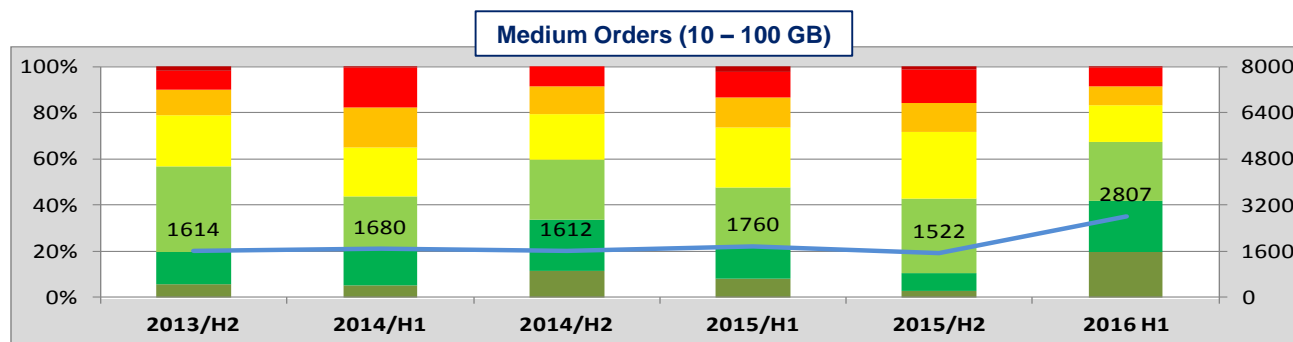
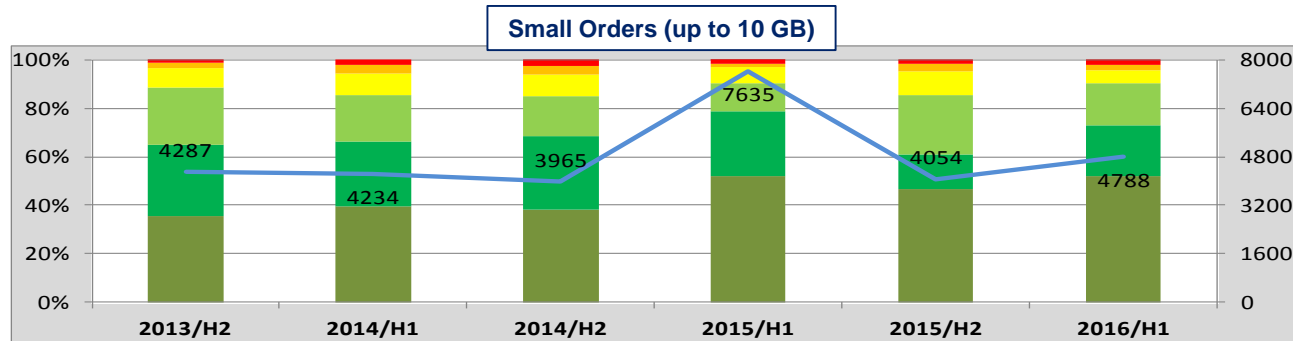
The colour-coding for the delivery-time bands on each of vertical bars on each chart is as follows:



The blue lines indicate the total orders per half year for each category (right-hand scales apply).

Total orders across all 3 categories were:

2013/H2: 6894	2014/H1: 6668
2014/H2: 6537	2015/H1: 10238
2015/H2: 6583	2016/H1: 8869



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 Record (CDR) production status at the end of the reporting period:

Metop-A AVHRR Polar Atmospheric Motion Vectors

Period: March 2007 – December 2014:

Final Delivery Review planned for 2016/Q4, data available on request via Helpdesk.

Metop-A GRAS L1b (Release 0: Geometric Optics approach)

Period: January 2007 – March 2014:

Evaluation was finalised, but due to an error discovered later in the processing software, the data has been withdrawn.

Metop-A GRAS L1b (Release 1: Wave Optics approach)

Period: March 2007 – December 2014:

Evaluation was finalised, but due to the above-mentioned error, this data has also been withdrawn. A solution for this error has now been found and the reprocessing (with the wave optics method only) will be repeated in 2016/Q4.

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.

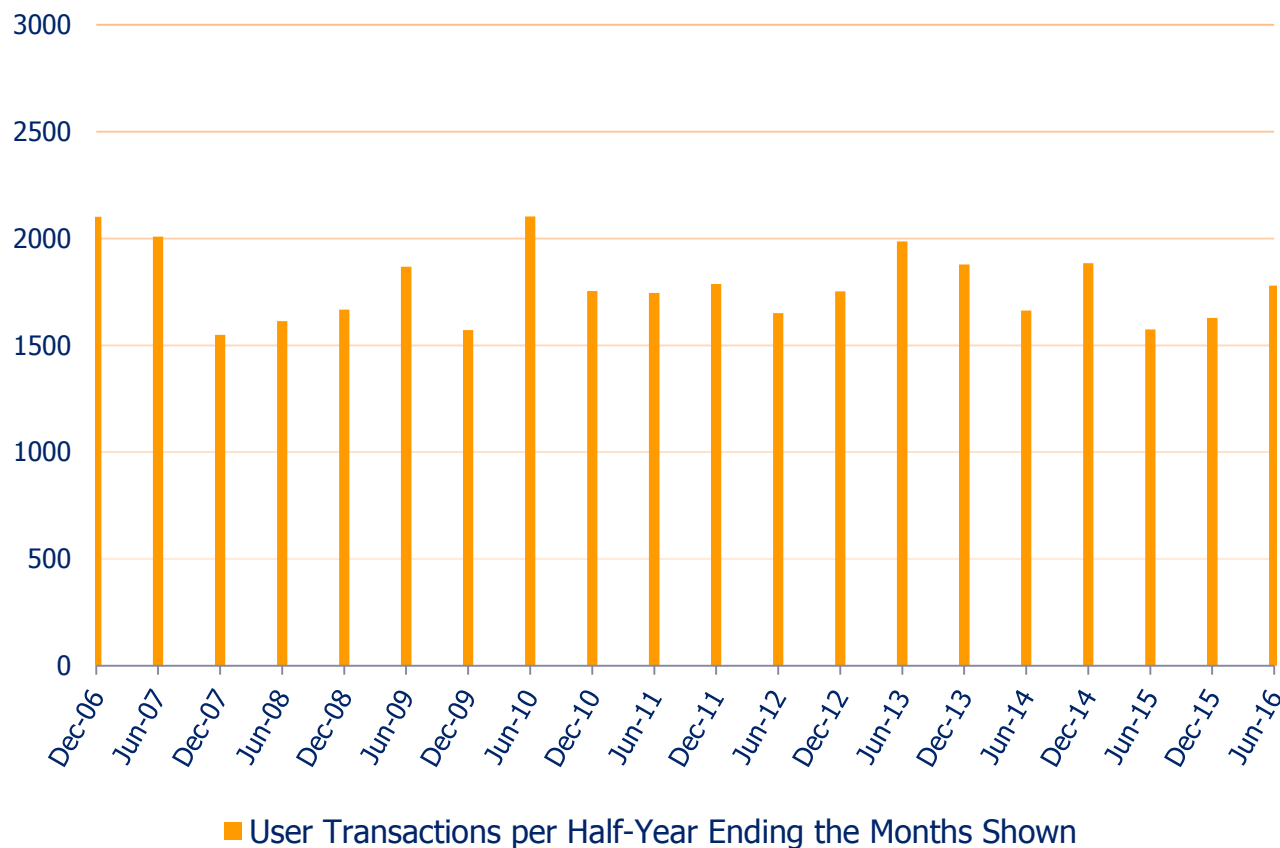
This section includes charts on the following subjects:

- User interaction history of the last 10 years
- 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 two slides focus on the user interactions for the current reporting period, in which a total of 1779 interactions were handled.

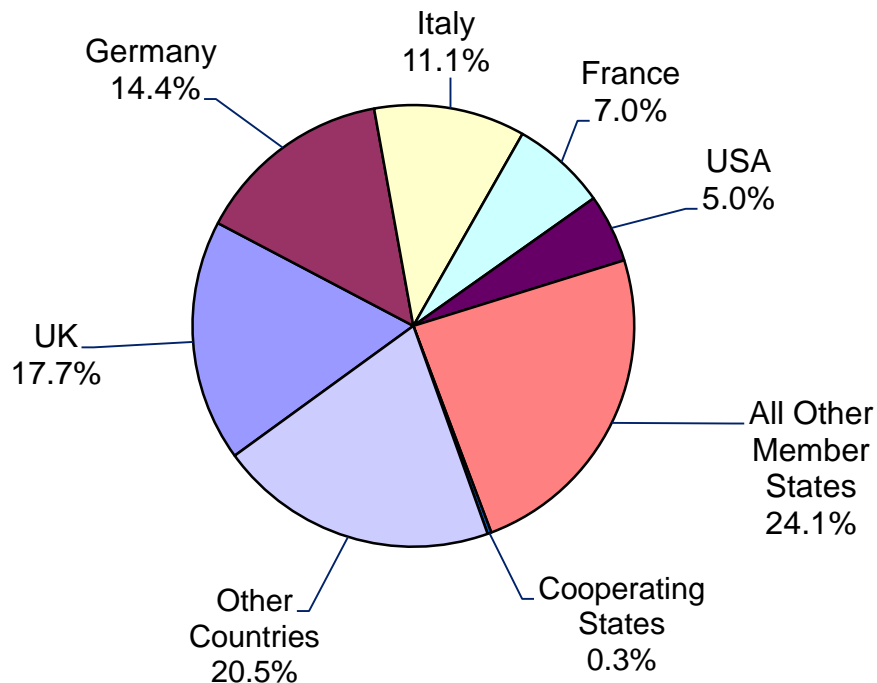


Helpdesk Service → User Interactions 2016/H1 by Country of Origin

The chart shows the interactions in the first half of 2016 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.



Helpdesk Service → User Interactions 2016/H1 by Category

The chart shows the numbers of user interactions in the first half of 2016 for:

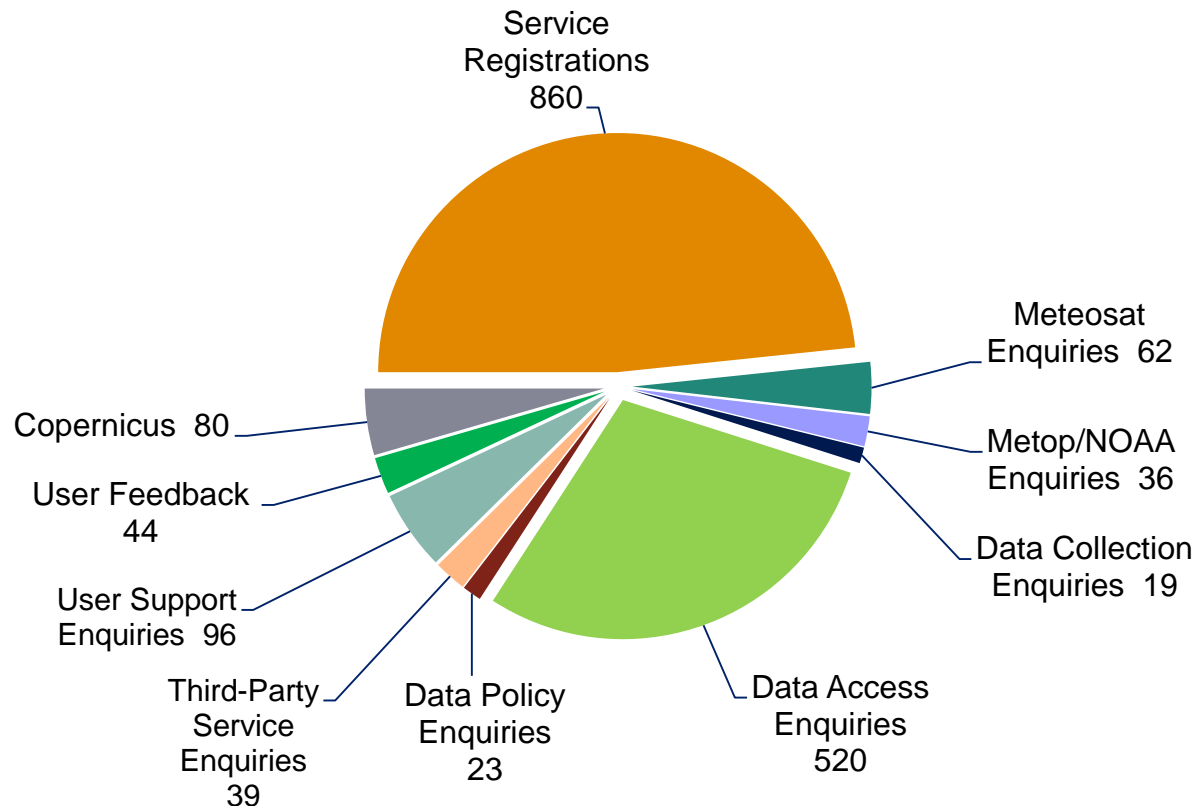
- Service Enquiries (8 categories)
- Service Registrations
- User Feedback

Total interactions for the half-year came to 1779.

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 the foot of the 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-SNPP-NOAA GDS	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-SNPP-NOAA GDS	ADVANCED MICROWAVE SOUNDING UNIT-A. Multi-channel microwave radiometer used in combination with the HIRS instrument for measuring global atmospheric temperature profiles.
ASCAT	Metop-SNPP-NOAA GDS	ADVANCED SCATTEROMETER. C-band radar which measures near-surface wind speed and direction over the global ocean, and soil moisture.
ATOVS	Metop-SNPP-NOAA GDS	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-SNPP-NOAA GDS	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.
FDES	Regional Data Services	Fast Dump Extract System: This mechanism provides fast access to the most recent part of each X-band dump and transfers the relevant data to the EARS system for Level 1 processing.
FES	Meteosat	Full-Earth Scanning, where the SEVIRI instrument scans the full Earth disc (c.f. RSS).

Glossary (continued)

Term	Context in which used	Description
Formats	Meteosat (IODC)	This refers to the High-Resolution Image (HRI) formats disseminated via Meteosat-7's direct dissemination broadcasts.
GDS	Metop-SNPP-NOAA GDS	GLOBAL DATA SERVICE. This is EUMETSAT's service delivering L0, L1 and L2 data and products based on instrument data acquired from the Metop, S-NPP and NOAA Low-Earth-Orbiting satellites.
GOME-2	Metop-SNPP-NOAA GDS	GLOBAL OZONE MONITORING EXPERIMENT-2. Scanning spectrometer instrument used to measure profiles and columnar amounts of ozone and other atmospheric constituents.
GRAS	Metop-SNPP-NOAA GDS	GNSS RECEIVER FOR ATMOSPHERIC SOUNDING. Radio occultation instrument for temperature and water-vapour 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-SNPP-NOAA GDS	HIGH-RESOLUTION INFRARED RADIATION SOUNDER. Heritage atmospheric soundings of temperature and humidity in cloud-free conditions.
IASI	Metop-SNPP-NOAA GDS	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-SNPP-NOAA GDS	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-SNPP-NOAA GDS	Instrument data in full resolution with radiometric and geometric (i.e. Earth location) calibration computed and appended but not applied.
Level 1B	Metop-SNPP-NOAA GDS	Calibrated, earth-located and quality-controlled product, in the original pixel location, packaged with ancillary, engineering and auxiliary data.
Level 1C	Metop-SNPP-NOAA GDS	In the case of the IASI spectra, Level 1B data after the application of the apodization function.
Level 1D	Metop-SNPP-NOAA Regional Data	For EARS-ATOVS, AVHRR derived cloud information on HIRS grid.
Level 2	Metop-SNPP-NOAA GDS	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-SNPP-NOAA GDS	MICROWAVE HUMIDITY SOUNDER. 5-channel microwave instrument for atmospheric humidity sounding in all weather conditions.
NOAA	Metop-SNPP-NOAA GDS 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-SNPP-NOAA GDS	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