EUMETSAT

EUMETSAT Headquarters
Darmstadt, Germany

Central Operations Report
for the period January to June 2018

EUMETSAT Central Operations Report for January - June 2018

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Contents

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 2018.

The availability of EUMETSAT's operational services in the reporting period was generally very good. Only the IODC service was below target during the period January to April, mainly due to Meteosat-8's operations at higher inclination requiring longer processing times on ground, resulting in the L1.5 data exceeding the strictly-set timeliness limits. To account for this satellite limitation, the target service availability has now been reduced from 99% to 97%.

As far as EPS was concerned, relatively minor impacts on service were due to a suspected SEU-induced fault-mode of Metop-A's MHS instrument in March, and a decontamination of Metop-B's IASI instrument at the end of June. Aside from these two events, availability of the EPS and NOAA Global Data Service was high.

As reported in the previous issue, Meteosat-11 was brought out of in-orbit storage in January, and Meteosats 9, 10 and 11 were relocated to different orbital positions and their service roles reassigned. Now that Meteosat-11 is in full operational use, the availability of the RSS service has increased as there is now a backup satellite (Meteosat-9) which, when available, is used to gap-fill the RSS when Meteosat-10 needs to be operated in Full-Earth Scan (FES) mode, to preserve the lifetime of its scan mechanism.

To better reflect service expectations, we now differentiate between a target of 92% for the RSS service when there is no backup satellite (as was the case up until February 2018), and a target of 99% with backup, as has been the case since March 2018.

Please refer to slide 10 for the overview of the current Meteosat satellite deployment.

Introduction (continued)

OGDR production for both Jason-2 and -3 suffered a 3-day outage in January, due to a software problem which affected both NOAA and EUMETSAT processing systems.

Jason-2: its LRO (Long Repeat Orbit) has been adjusted in July 2018 to give a new ground-track which is offset by 4km, interleaved with the previous ground-track. The orbit altitude nevertheless remains the same as before, i.e. 27 km lower than the reference orbit flown by Jason-3. A recurrence of the gyro anomaly caused a safe-hold mode on 20 February. Further investigation seeks to confirm that the gyros become more resilient after a period of rest. If this is confirmed, a regular gyro-swap strategy will be put in place, to mitigate the impact of the anomaly on the mission. Jason-2 experienced further safe-hold modes on 18-July and 25-October.

A series of Jason-2 fuel depletion maneouvres took place between 6 and 23 April, reducing the hydrazine to approximately 8 kg, a sufficient amount for several years to come.

Last, but not least, the EUMETCast Africa service has been fully migrated from EUTELSAT-5 to EUTELSAT-8 as of August 2018 and thus is now also based on the DVB-S2 standard. It had been successfully running in parallel to the old DVB-S system since May 2018.

Best regards,

Livio Mastroddi
Director of Operations and Services to Users

Performance Reporting: Categories

The charts on the service slides in this report 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 and Jason-3 OGDR Service
- Third-Party Data Services
- EUMETCast
- The EUMETSAT Data Centre
- EUMETSAT's Support to Climate Services
- Helpdesk Service

Several terms with special meaning (e.g. 'Nominal RCs') appear in the 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 outages due to special operations such as instrument calibration, decontamination 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

Jason Processing Outage (Operational Incident 76)

A software fault prevented any processing of the data from both Jason satellites, resulting in a total outage of NRT production for Jason-3 and Jason-2 from Saturday 20 January 00:00 UTC until Tuesday 23 January 17:42 UTC. No products were produced by either EUMETSAT nor NOAA for 49 and 47 passes for Jason-3 and Jason-2 respectively. The software anomaly (a counter overflow) was diagnosed on the Monday, and a correction was implemented on both EUMETSAT and NOAA systems on the Tuesday.

ADA Outages (Operational Incident 79)

From 15-March onwards, ADA data reception became intermittent, impacting the timeliness and completeness of the raw data relayed to EUMETSAT. The situation further deteriorated on 30-March, when effectively no ADA data could be used for data production. Data reception at EUMETSAT had to be disabled from 31-March to 4-April. In addition to the impact on the Metop-B level-0 data, higher-level products were also affected and dual-satellite Atmospheric Motion Vector (AMV) products for Metop-A were incomplete. Extensive investigation was followed by implementation of several workarounds, which alleviated the problem. An in-depth analysis continues to identify and implement long-term solutions.

EUMETCast Outage (Operational Incident 80)

EUMETCast-Europe and Africa services experienced a 2¼-hour outage on 4 April. All Basic and High Volume services on the first transponder were affected, but none on the second. The cause was traced to a misconfigured uplink carrier to the EUTELSAT satellite of another EUTELSAT customer which interfered with the EUMETCast uplink. There was another occurrence of satellite interference on the 1st transponder with the same root cause on 12 July. Thanks to mitigation actions put in place immediately after the first event, plus the quick reaction of the EUMETCast-Europe uplink service provider and EUTELSAT, the service was restored after 30 minutes.

Longer-Term Factors Impacting the Operational Services

Discrete events affecting the services appear on either the previous slide (when significant) or the slide for an individual service (when affecting only that service). This slide lists factors of an ongoing nature.

Fuel Migration on MSG Satellites

Each MSG satellite has four interconnected fuel tanks, which allow fuel to flow along the lines between them. Under conditions of thermal stability, this movement is gradual and has no effect on the satellite's attitude. During eclipses, even though the tank temperature is regulated, some variation in fuel temperature and density occurs. This gives rise to fuel migration between the tanks, causing a small resultant effect on the satellite's attitude, which manifests itself as variations in the geometric accuracy of the images. For Meteosat-8 and Meteost-9, ground commanding to augment the satellite's onboard thermal control system has partly mitigated the effect by timing the fuel migration to occur during scan mirror retraces. Even though the image-processing system incorporates algorithms to correct for these artefacts, not all images can be corrected to achieve the target specification for geometric accuracy. Currently, ~0.3% of the RCs for the 0° service are affected, and ~0.6% for IODC, with higher rates during eclipse seasons.

Dissemination System Anomalies

The upgrade of the multi-mission dissemination system which was implemented in March 2018 resolved the timeliness problems for the 0° and IODC services attributable to that system. A residual timeliness problem affecting IODC remains, caused at root by the lengthier processing time needed for the data from Meteosat-8 at its high-inclination. This is being monitored, with a view to potentially increasing bandwidth to alleviate the problem.

Meteosat Services

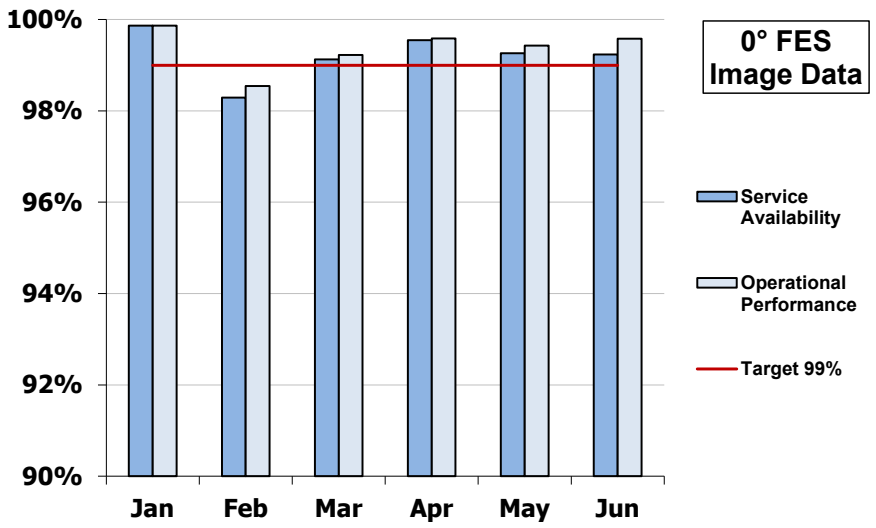
This service category comprises the data and products produced with the Meteosat Systems. The roles and locations of the MSG satellites Meteosat-9, -10 and -11 have changed in the reporting period: their new orbital locations and the services they now support are as follows:

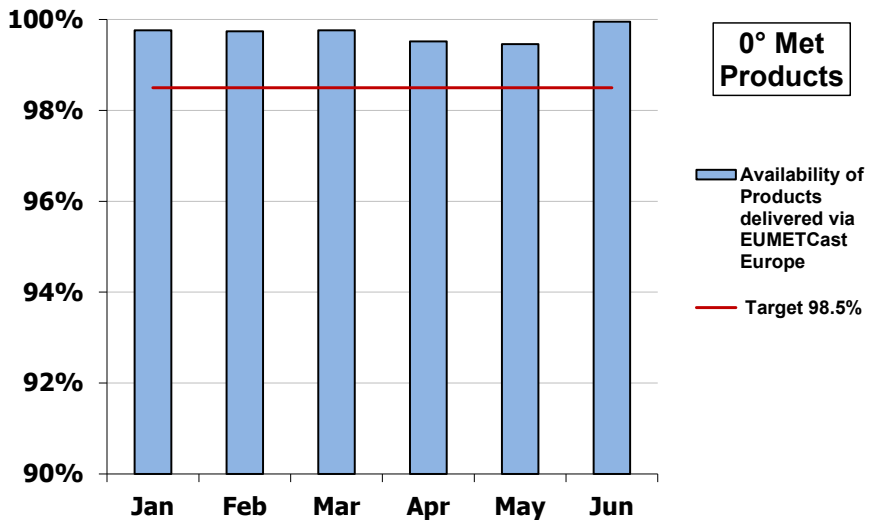
Meteosat-11 (at 0°):	**The satellite was taken out of in-orbit storage in January 2018 and prepared for the primary Full-Earth Scan (FES) 0° service. It became the prime FES satellite on 20-February, taking over from Meteosat-10.**
Meteosat-10 (9.5°E):	**This satellite took over the Rapid-Scan Service (RSS) from Meteosat-9 as of 20-March.**
Meteosat-9 (3.5°E):	**Now serves as the backup for the primary FES service and for RSS gap-filling.**
Meteosat-8 (41.5°E):	**Continues to provide Meteosat-8 IODC FES Service, on a best-effort basis.**

The individual services covered by the following slides 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





The prime satellite supporting the 0° service up to 20-February was Meteosat-10, and Meteosat-11 thereafter. Meteosat-9 continues as backup.

Service Availability and Operational Performance are measured in terms 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:

February:	33 RCs impacted by a dissemination timeliness problem; 7 RCs impacted by a Met-11 manoeuvre on 8-Feb.
March:	A further 17 RCs impacted by the dissemination timeliness problem, which was finally resolved on 6-March.
4-April:	10 RCs impacted by dissemination uplink interference (Operational Incident 80 – see slide 8).
6-May:	7 RCs impacted by a Met-11 Safe-Mode, suspected cause SEU.
5-6 June:	10 RCs impacted by a Met-11 manoeuvre.

Meteorological products derived from the Full-Earth Scan (FES) images produced nominally by the satellites supporting the 0° service.

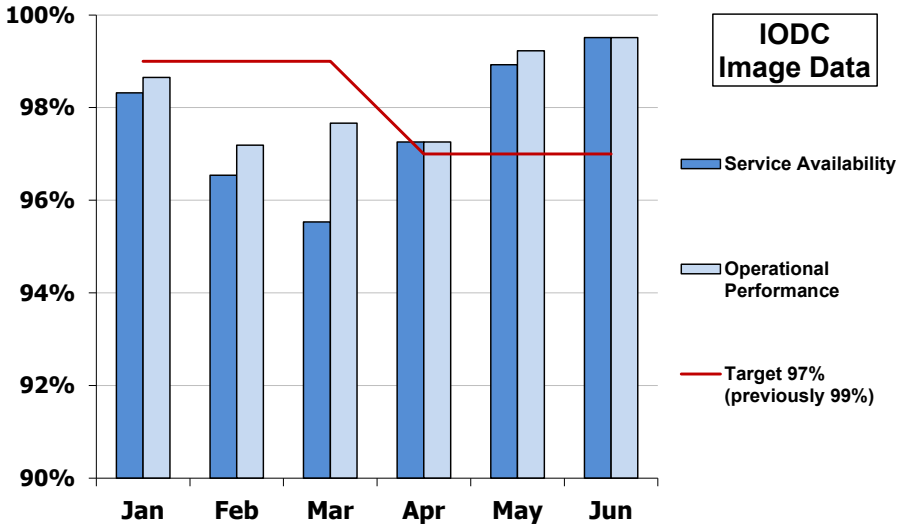
As of this reporting period, 'end-to-end Service Availability' is now presented instead of 'Products Generated', and this in terms of complete products disseminated 'on-time' via EUMETCast Europe.

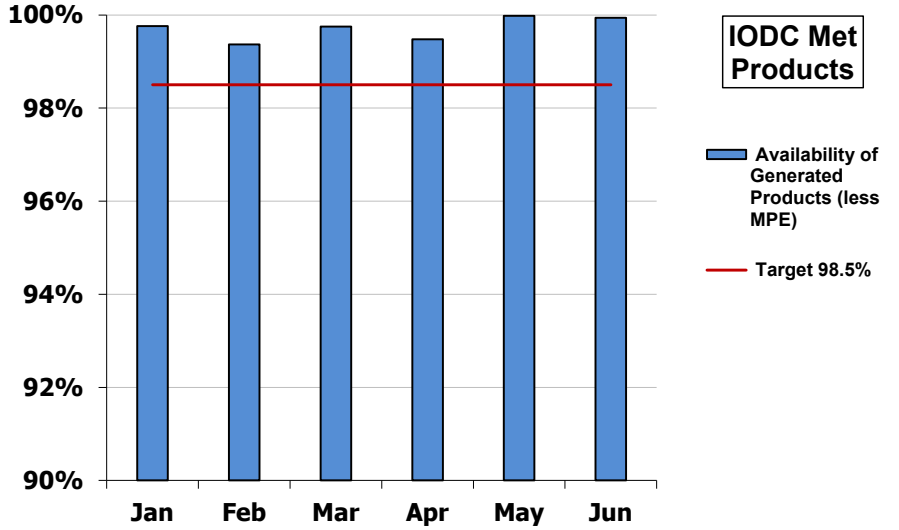
Events which impacted availability:

None significant.

NOTE: The availability of MPE products is measured and charted separately (see slide 14).

Meteosat Services → 41.5°E IODC Image Data & Meteorological Products





The prime satellite supporting the IODC service at 41.5°E (on a best-effort basis) is Meteosat-8. There is no 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. Due to Meteosat-8's increasing inclination, the target service availability was reduced from 99% to 97% as of April 2018.

Events which impacted availability:

Jan - May:	Timeliness of 203 RCs in total impacted by processing delays due to high inclination of satellite
Jan - June:	A total of 30 RCs impacted by 4 satellite maneouvres.
Feb - March:	Spring eclipse season – 74 RCs impacted.
4-April:	12 RCs impacted by dissemination uplink interference (Operational Incident 80 – see slide 8).

Note: only 6 RCs in total affected by fuel migration in this reporting period.

Meteorological products derived from Full-Earth Scan images produced by Meteosat-8 at 41.5°E.

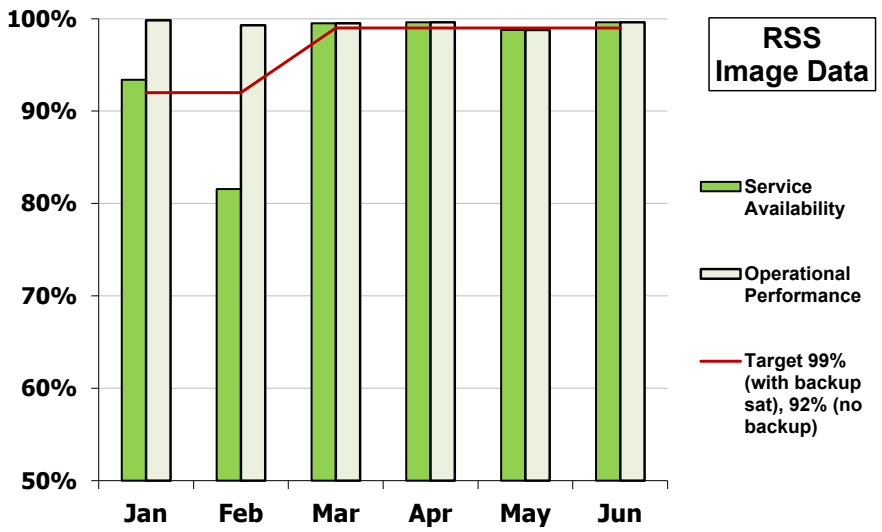
As of this reporting period, 'end-to-end Service Availability' is now presented instead of 'Products Generated', and this in terms of complete products disseminated 'on-time' via EUMETCast Europe.

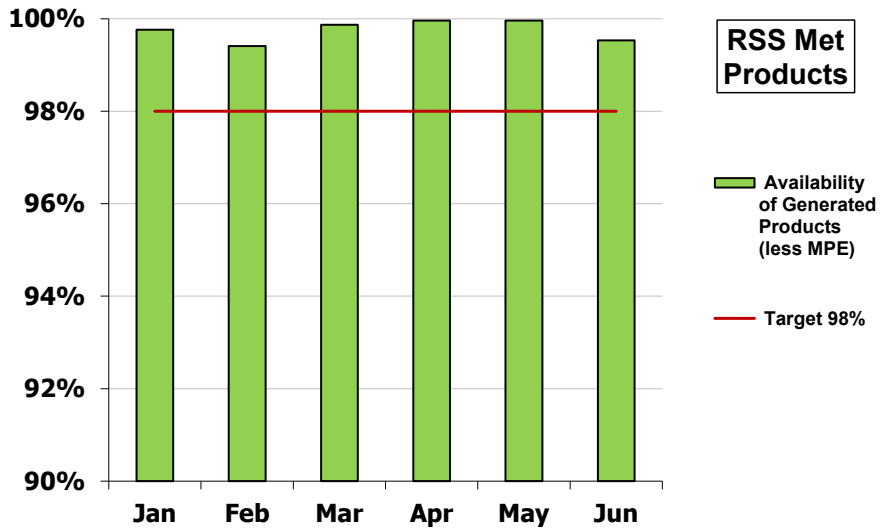
Events which impacted availability:

None significant.

NOTE: The availability of MPE products is measured and charted separately (see slide 14).

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





The prime satellite supporting the 0° service up to 20-March was Meteosat-9, and Meteosat-10 thereafter. Meteosat-9 is available as backup (if not supporting the 0° service), and as of April is being used to gap-fill when Meteosat-10's SEVIRI needs to be operated in full-scanning mode.

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:

January:	Scheduled 48-hour interruption for Full-Earth Scanning
February:	Scheduled 5-day interruption during satellite relocationing.
4-April:	18 RCs impacted by dissemination uplink interference (Operational Incident 80 – see slide 8).
14-15, 28-30 May:	Ground station problems impacted a total of 95 RCs

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

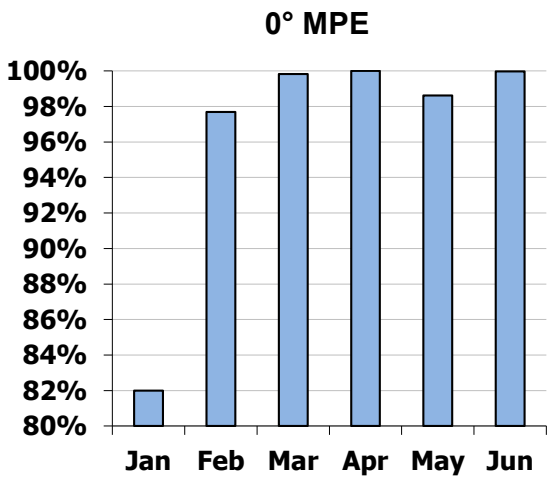
As of this reporting period, 'end-to-end Service Availability' is now presented instead of 'Products Generated', and this in terms of complete products disseminated 'on-time' via EUMETCast Europe.

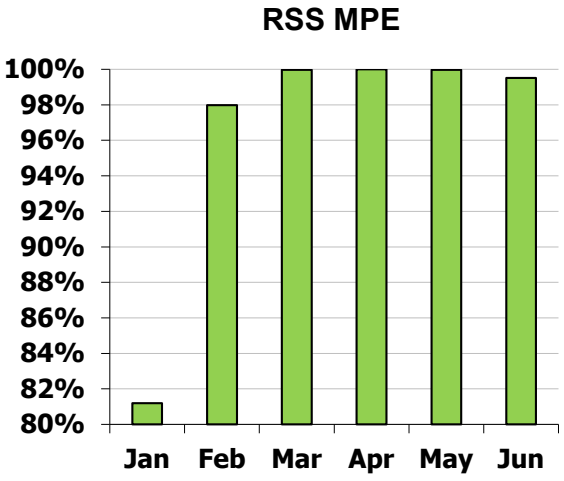
Events which impacted availability:

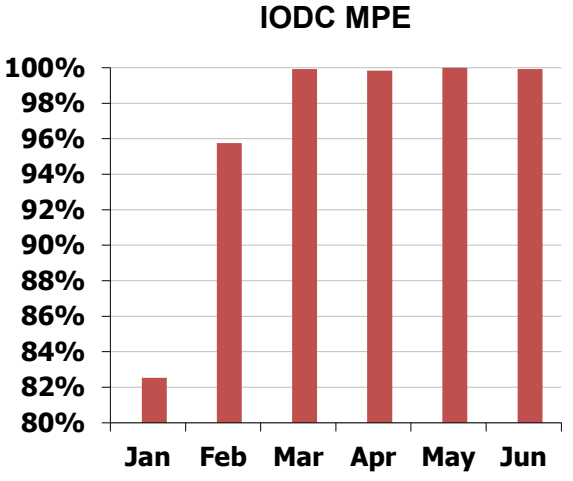
None significant.

NOTE: The availability of MPE products is measured and charted separately (see slide 14).

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.

Note that availability of these particular products is currently still 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:

26 Jan - 1 Feb: Interruption of SSMIS data reception, due to configuration change at source location.

23 - 24 Feb: Interruption of SSMIS data reception, mostly affecting IODC MPE production, but 0° and RSS marginally in addition.

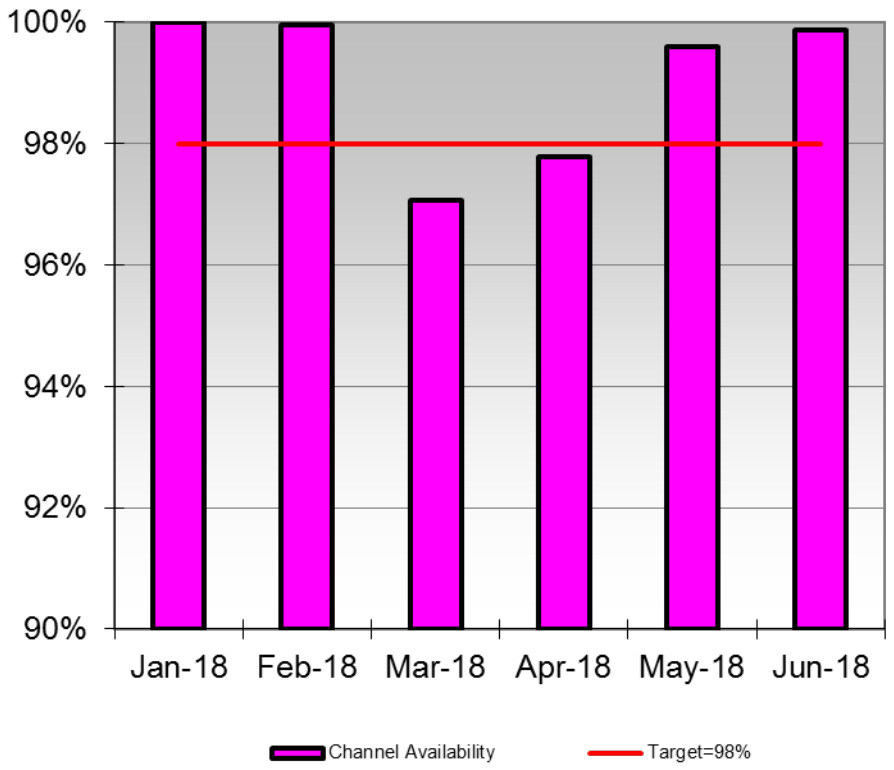
NOTE: The availability of MPE products is presented separately, to take account of their being derived from data from the US DoD's DMSP satellites, the availability of which is beyond EUMETSAT's control and provided by aging instruments.

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.

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



Events Which Impacted DCP Channel Availability:

10-19 March: Testing of DCP beacons prior to switch of operations from Usingen to Fucino.

25-26 April: HRDCP channel monitoring problem.

The above events concerned the channel-availability monitoring mechanisms, which impacted the statistics, but it is believed that there were no actual channel outages.

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 as of 30 June 2018

DCPs		Country
6		Albania
51		Algeria
13		Angola
2		Armenia
1		Austria
6		Belarus
2		Benin
5		Bhutan
14		Botswana
1		Brazil
1		Bulgaria
7		Burkina Faso
60		Cameroon
2	↑	Canada
4		Cap Verde
2		Central African Republic
3		Chad
3		Congo
1		Cyprus
30		Dem. Rep. of the Congo
8		Djibouti
1		Egypt

DCPs		Country
1		Falklands
1		Finland
134	↑	France
1		Gambia
27	↑	Germany
11		Ghana
1		Gibraltar
1		Greece
11		Guinea
2		Guinea-Bissau
9		Indonesia
2		Iran
200	↑	Iraq
8		Ireland
74		Italy
3		Ivory Coast
3		Kenya
6		Lesotho
11		Libya
6		Madagascar
9		Malawi
3		Maldives
19		Mali

DCPs		Country
1		Malta
4		Mauritania
4		Mauritius
23		Mozambique
29		Namibia
17		Niger
59		Nigeria
10		Oman
4		Pakistan
3		Philippines
11		Republic of Moldova
9		Republic of Seychelles
7		Romania
8		Rwanda
11		Senegal
13		Sierra Leone
1		Slovakia
41		South Africa
8		Spain
148	↑	Sri Lanka
3		Sudan
5		Southern Sudan

DCPs		Country
10		Tanzania
2		Togo
54		Uganda
50	↑	UK
24		Ukraine
1		Union des Comores
65		USA
1		Yemen
16		Zambia
13		Zimbabwe

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 2018, there were:

1,421 registered Data Collection Platforms (DCPs), belonging to 132 operators, deployed by the 77 countries shown in the table.

Of the total number of registered DCPs, there were 643 units in active operation.

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:	Current target: 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 by far exceeded 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 20 onwards, service availability and operational performance are presented for the data (mostly delivering Level 1) from instruments onboard Metop-A, Metop-B, NOAA 19 and Suomi-NPP. Please see slide 7 For explanation of the two metrics.

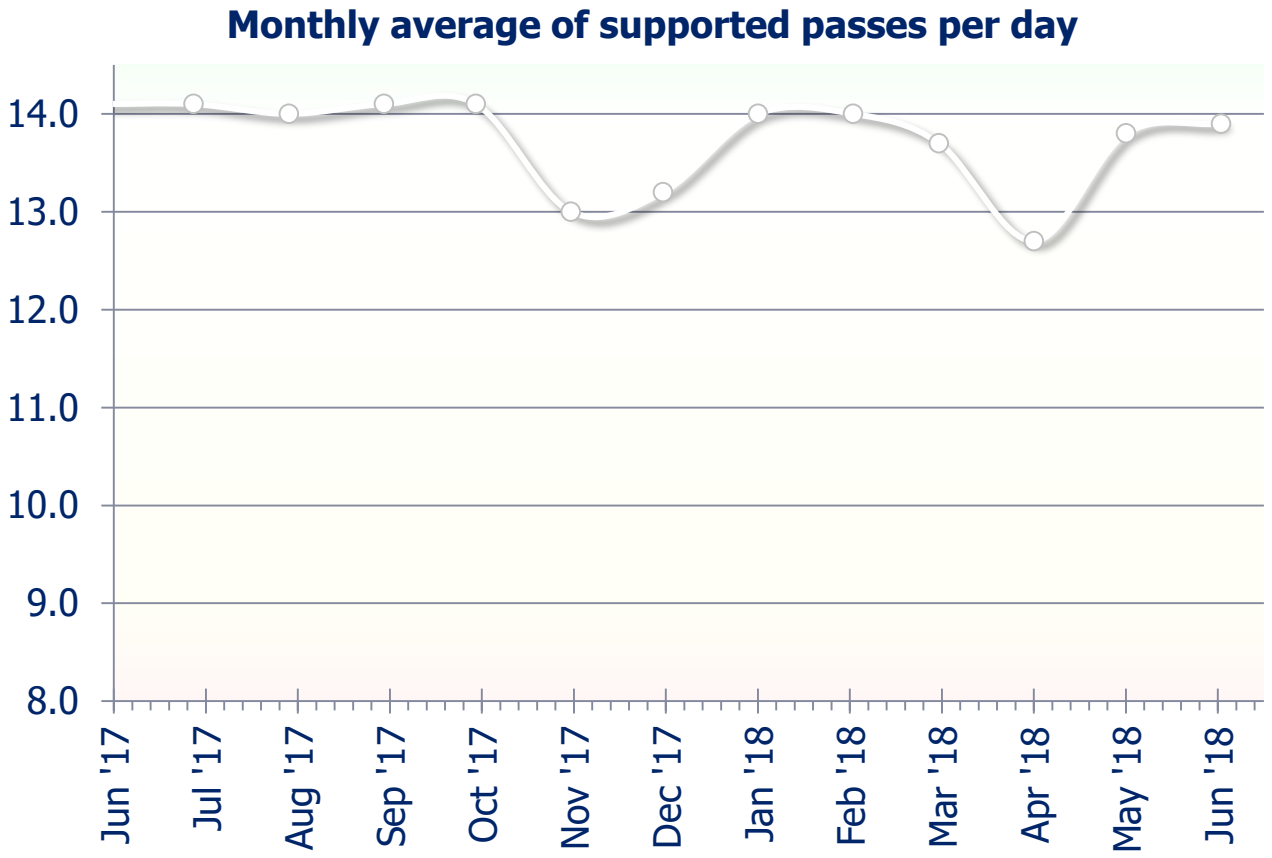
Metop, Suomi-NPP & NOAA GDS: Antarctic Data Acquisition (ADA)

Data from the primary Metop satellite, 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 in the last 12 months.

Average Metop-B orbits / day = 14.2

The overall daily average of supported passes in the 12 months shown on chart = 13.7



Events in the reporting period:

An intermittent ADA comms problem (first noticed 15-March) impacted the data relay in March and April. A workaround brought stability in May, but a permanent resolution is still being analyzed. (Incident 79 – see slide 8)

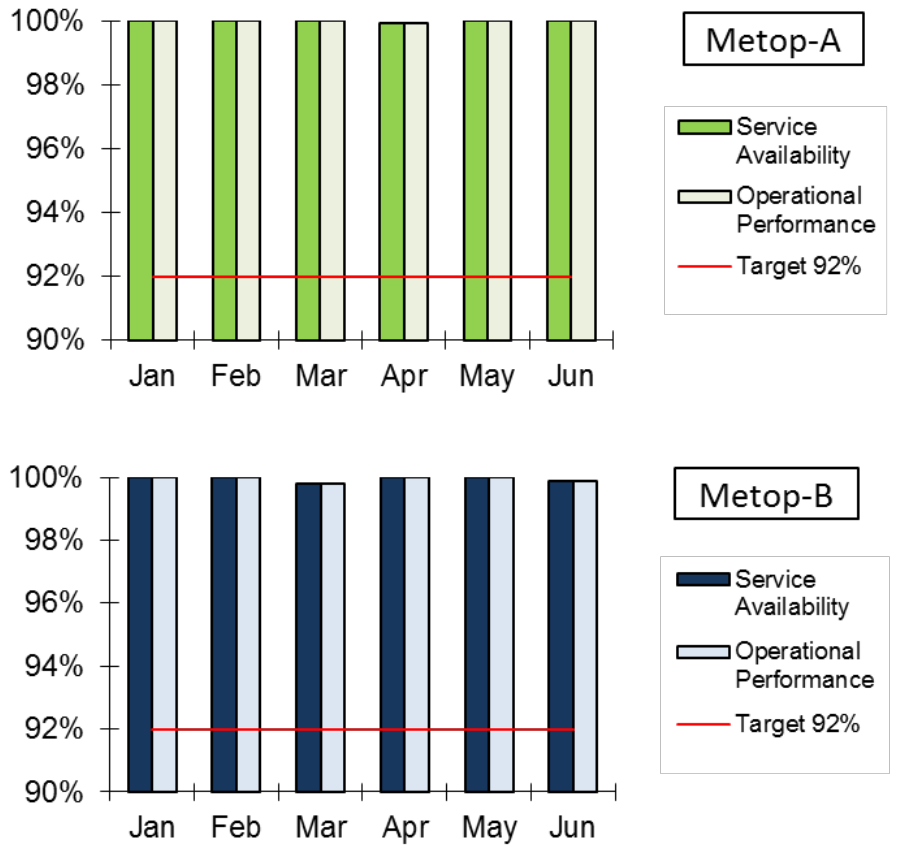
Metop, Suomi-NPP & NOAA GDS → A-DCS Level 0 Data

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 a 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.

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

None significant.



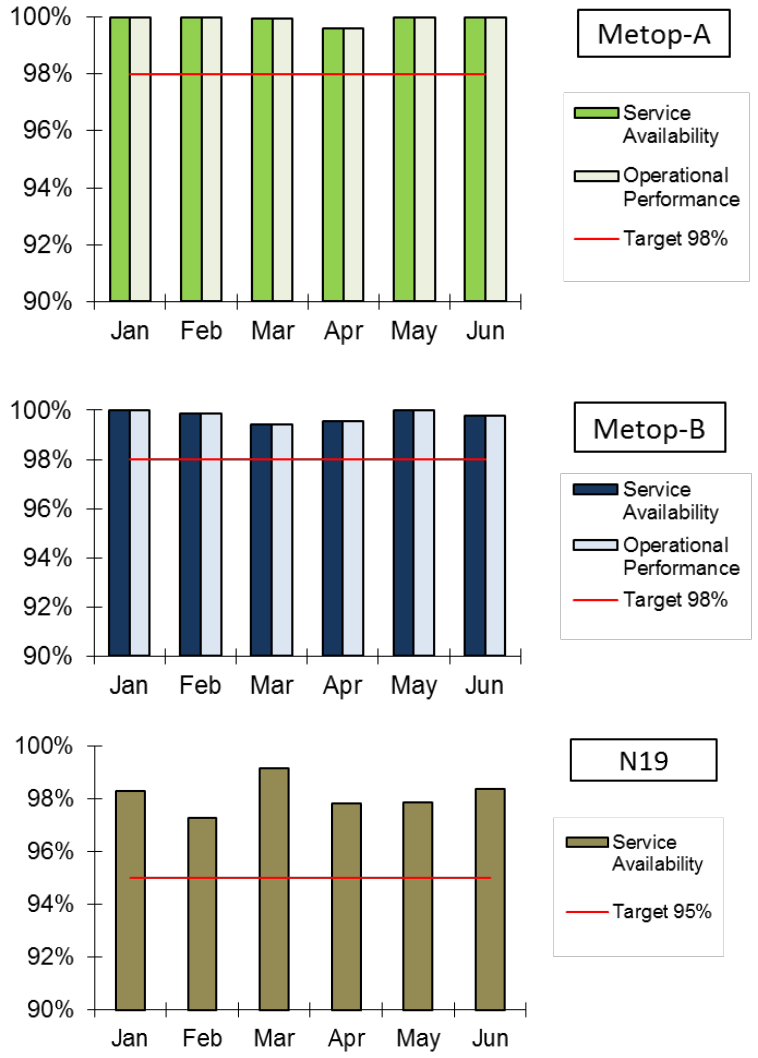
Metop, Suomi-NPP & NOAA GDS → AMSU Level 1B BUFR Products

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:

4-April: Dissemination uplink interference (Operational Incident 80 – see slide 8).



Notes:

(1) Metop-A 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 AMSU: channel 15 has failed completely; channel 7 still exhibiting transient spikes.

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

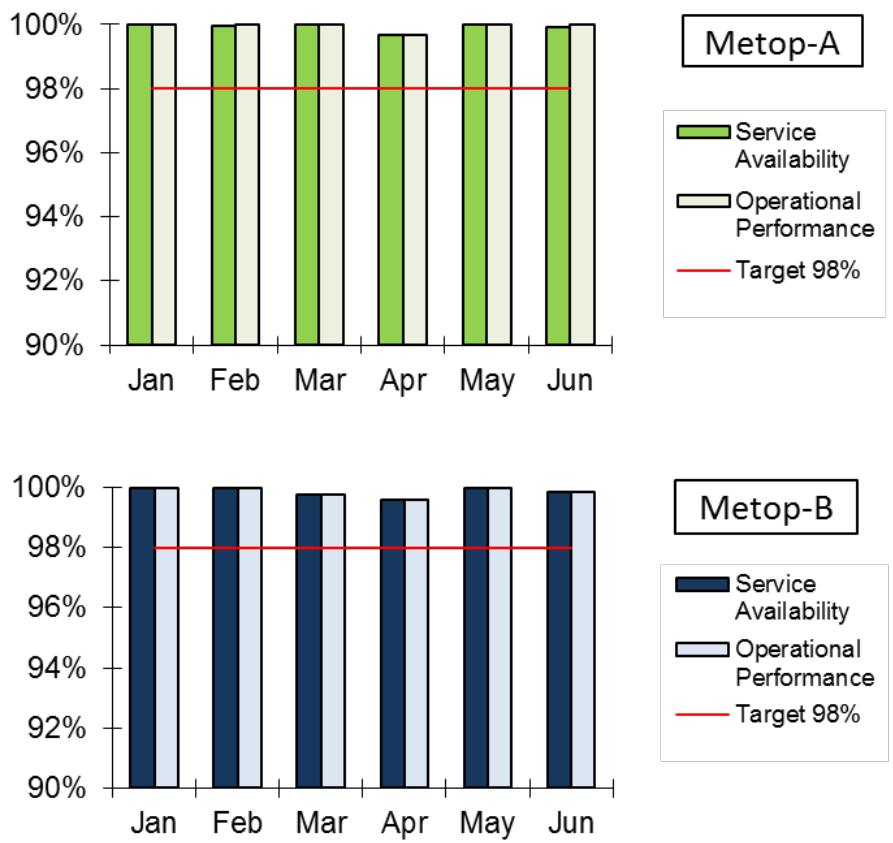
Metop, Suomi-NPP & NOAA GDS → ASCAT Level 1B (SZF) Products

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:

4-April: Dissemination uplink interference (Operational Incident 80 – see slide 8).



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

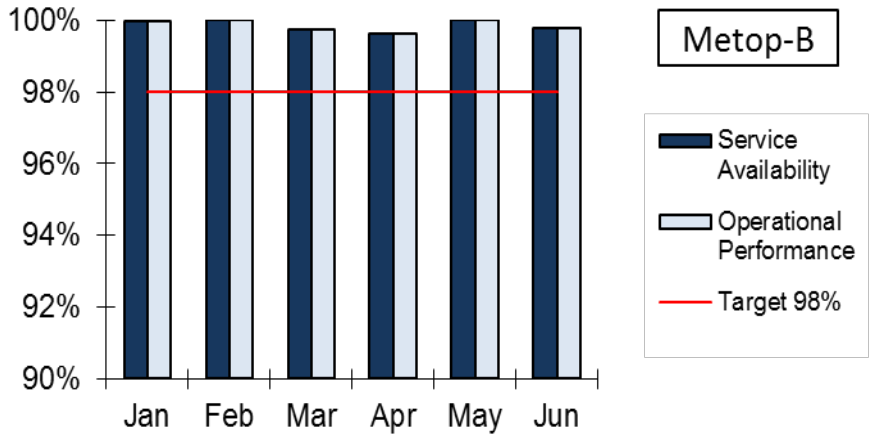
ATOVS Level 2 product processing transforms the calibrated radiance measurements from the AMSU-A, MHS and HIRS instruments (onboard Metop-B and NOAA-19 satellites) into information on the vertical distribution of atmosphere state parameters, on cloud and surface parameters and total atmosphere contents.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

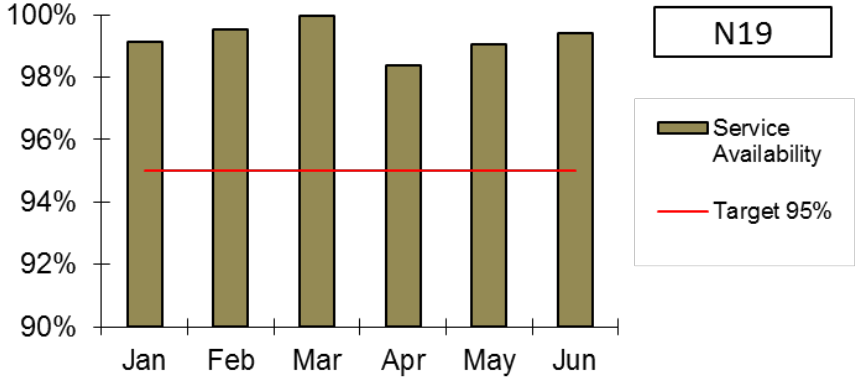
Performance of the Level 2 service is measured in terms of the timely availability of the BUFR-encoded products received on the EUMETCast reference user station (US).

Events which impacted availability:

4-April: **Dissemination uplink interference (Operational Incident 80 – see slide 8).**

Note: **Metop-A ATOVS L2 products discontinued as of 7 December 2015, due to the failure of AMSU channels 7 and 8.**



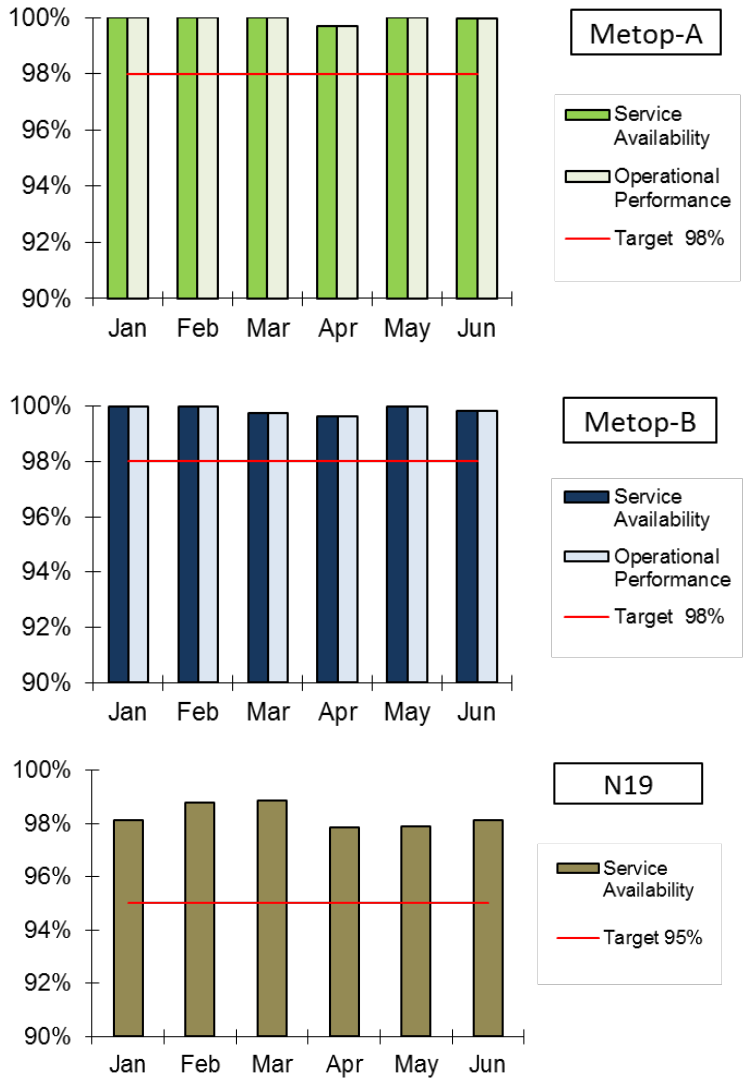


Metop, Suomi-NPP & NOAA GDS → AVHRR Level 1B Products

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:

4-April: **Dissemination uplink interference (Operational Incident 80 – see slide 8).**

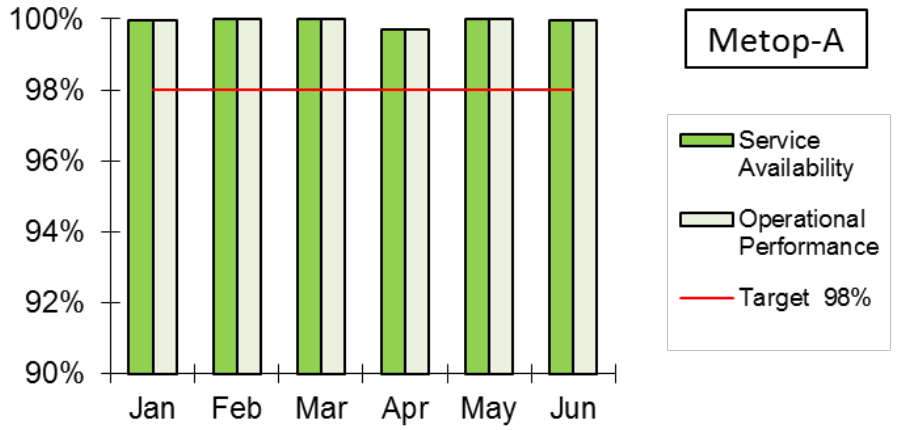


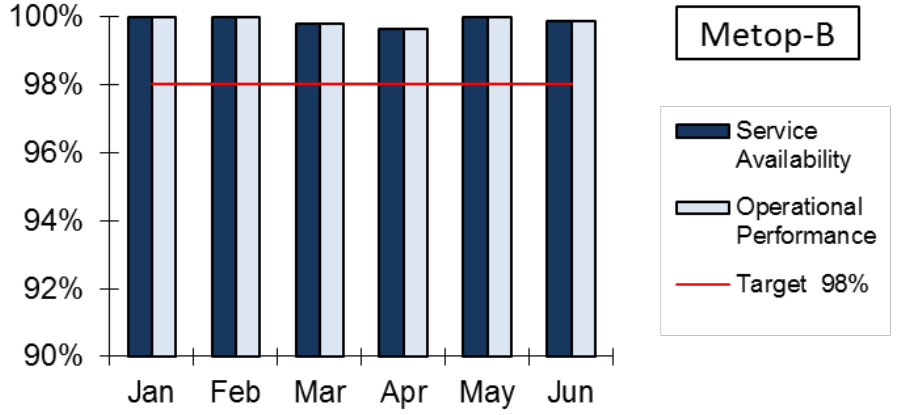
Metop, Suomi-NPP & NOAA GDS → GOME-2 Level 1B Products

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:

4-April: **Dissemination uplink interference (Operational Incident 80 – 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 in the Metop section 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)

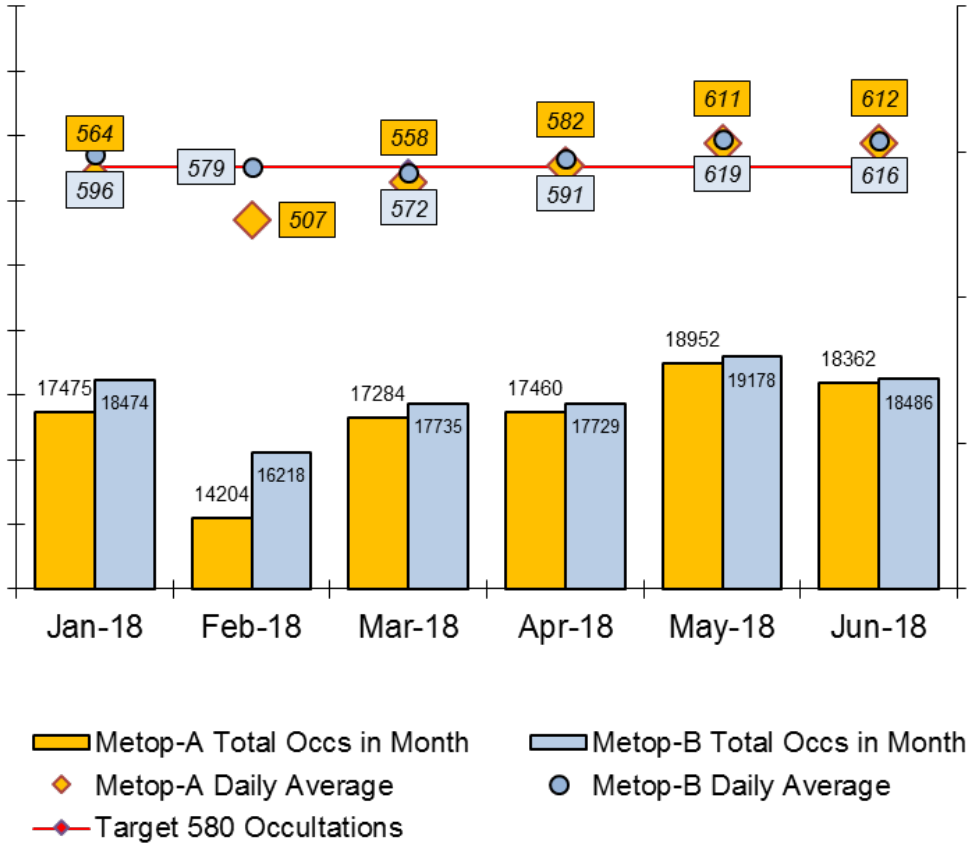
Note that all occultations produced are disseminated, along with appropriate quality flags (including those produced during manoeuvres and recovery from anomalies).

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

February

- **5 March:** Metop-A parameter-tuning exercise (which started on 19-December), seeked to improve performance of rising occultations: some impact on the number and quality of the occultations, as expected.

4-April: Dissemination uplink interference (Operational Incident 80 – see slide 8).



Note that, as of January 2018, the target number of occultations has been increased from 500 to 580, based on availability experienced to date.

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.

As can be seen from the note below, the instrument onboard Metop-A is suffering from 'old age', with data quite degraded.

Events which impacted availability:

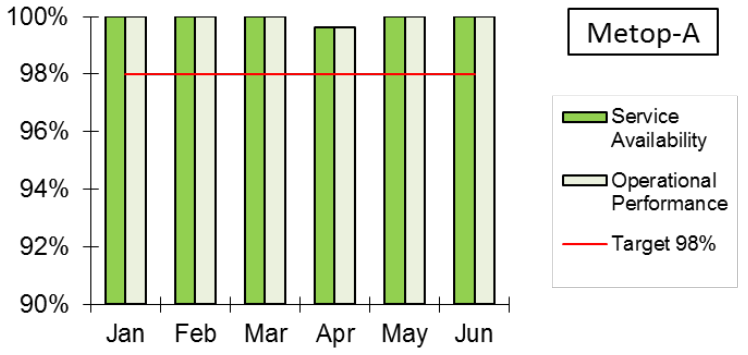
4-April: Dissemination uplink interference (Operational Incident 80 – see slide 8).

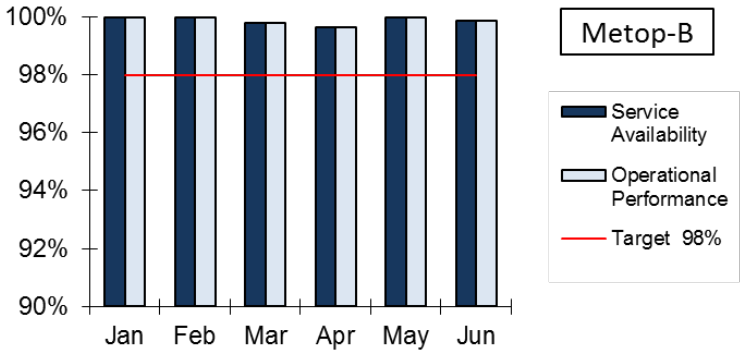
Notes on latest instrument status:

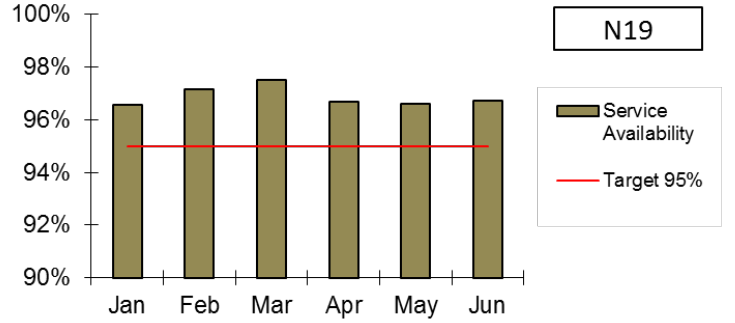
(1) Metop-A HIRS: channels 1-19 out of spec, with large, short-term fluctuations and further degradation likely.

(2) Metop-B HIRS: channels 5, 6, 10 and 14 slightly out of spec; instrument radiometric performance quite stable over the reporting period.

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







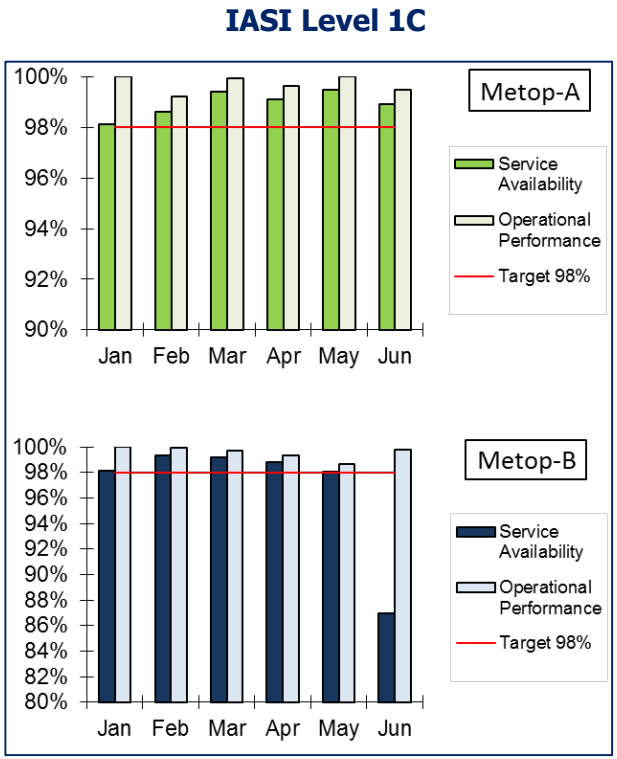
EUMETSAT

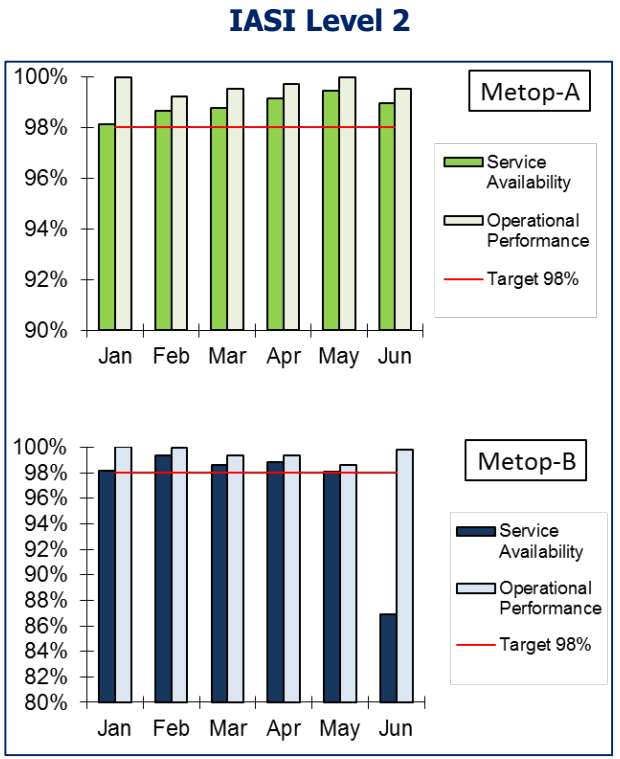
Metop, Suomi-NPP & NOAA GDS → IASI Level 1C & Level 2 BUFR Products

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:

5-6 Jan:	Both Metops: Extensive external calibration
6 February:	Metop-A: ~4 hour outage due to Standby-Refuse Mode
4-April:	Dissemination uplink interference (Operational Incident 80 – see slide 8).
30 June:	Metop-A: ~4.5 hour outage due to Heater-Refuse Mode
27 June to 2 July:	Metop-B: IASI decontamination





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.

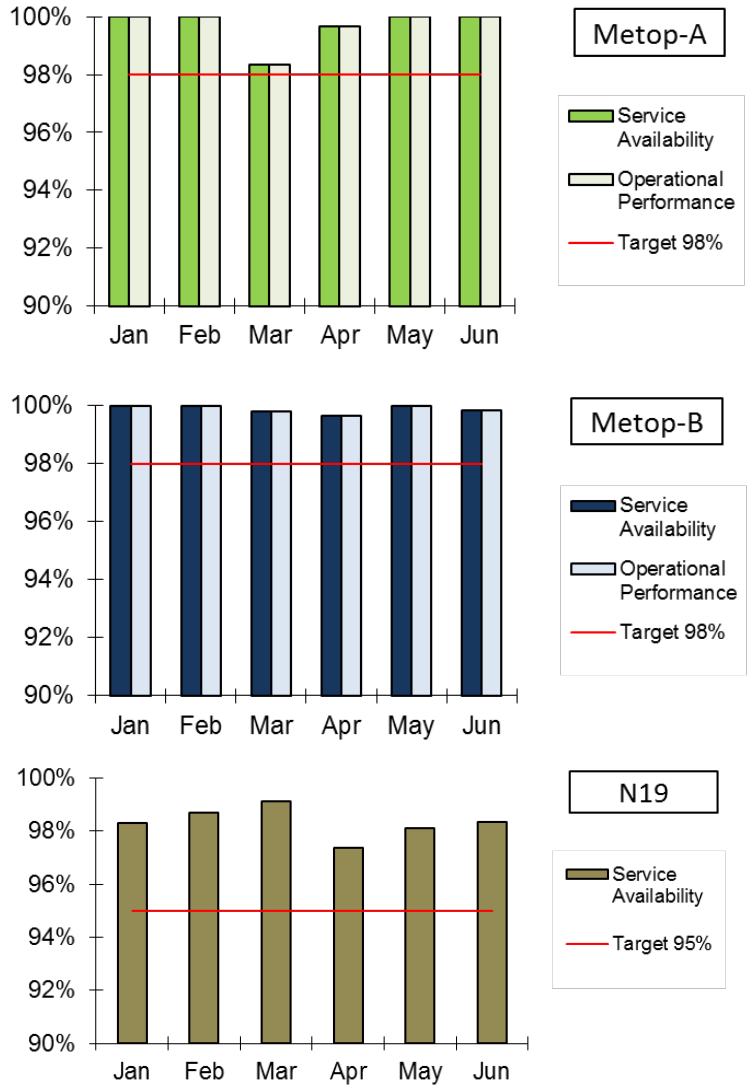
Events which impacted availability:

21 March: Metop-A: ~12-hour outage due to fault-mode (a spin-state anomaly, suspected as being caused by an SEU).

4-April: Dissemination uplink interference (Operational Incident 80 – see slide 8).

Notes on latest instrument status:

- NOAA-19 MHS: channel 3 remains out of spec.
- Metop-A MHS: spikes seen on channel 2 NEDT after local oscillator swap, but otherwise all channels within spec.
- Metop-B MHS: all channels within spec.



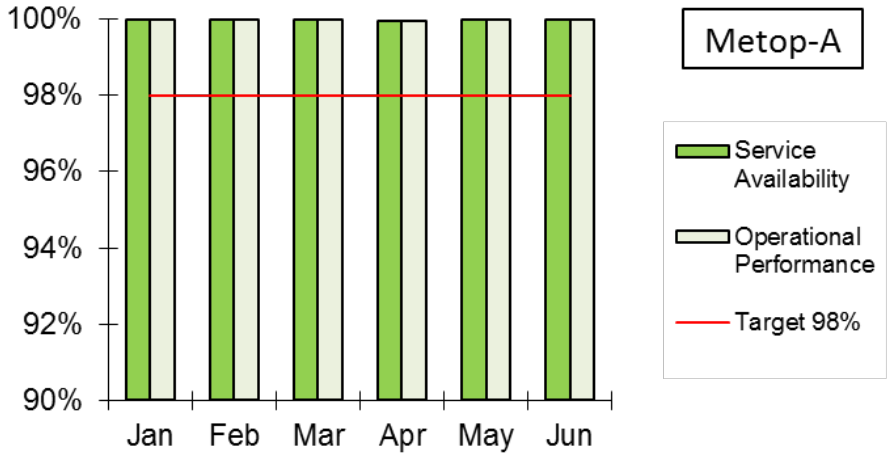
Metop, Suomi-NPP & NOAA GDS → SEM Level 0 Data

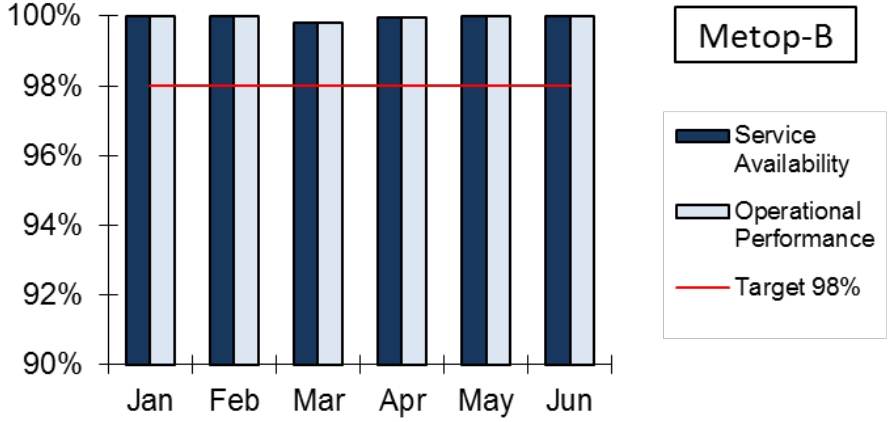
The Space Environment Monitor (SEM) consists of a pair of instruments on each Metop satellite which provide data to determine the intensity of the Earth's radiation belts and the flux of charged particles at the satellite's orbiting altitude.

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

Events which impacted availability:

None significant.



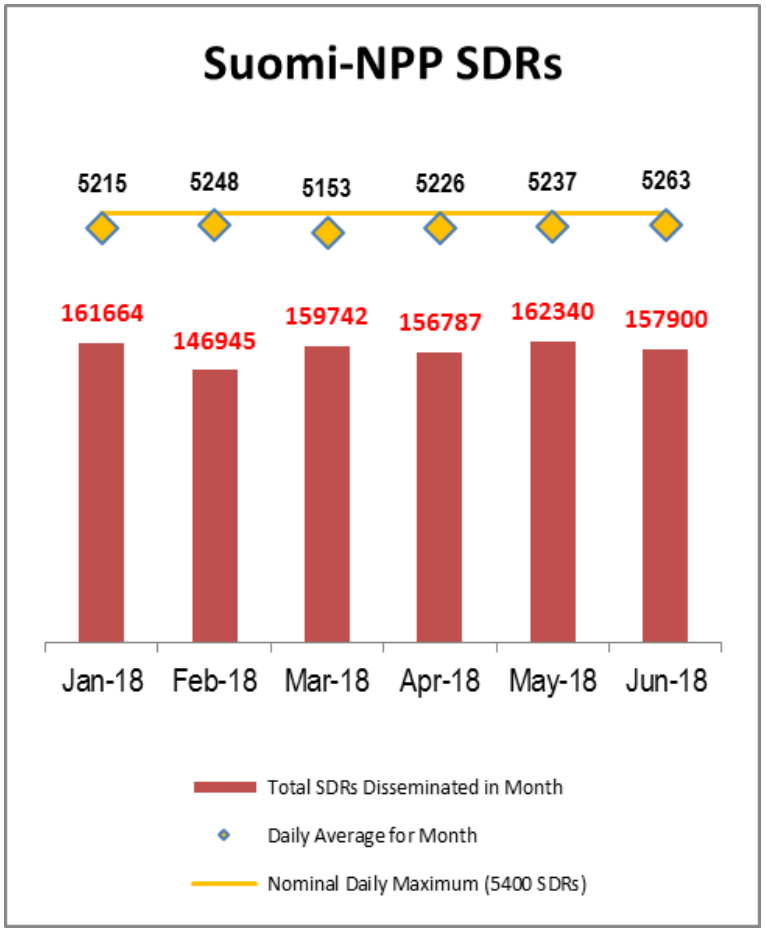


Metop, Suomi-NPP & NOAA GDS → Suomi-NPP Sensor Data Records

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-VASS and EARS-VIIRS

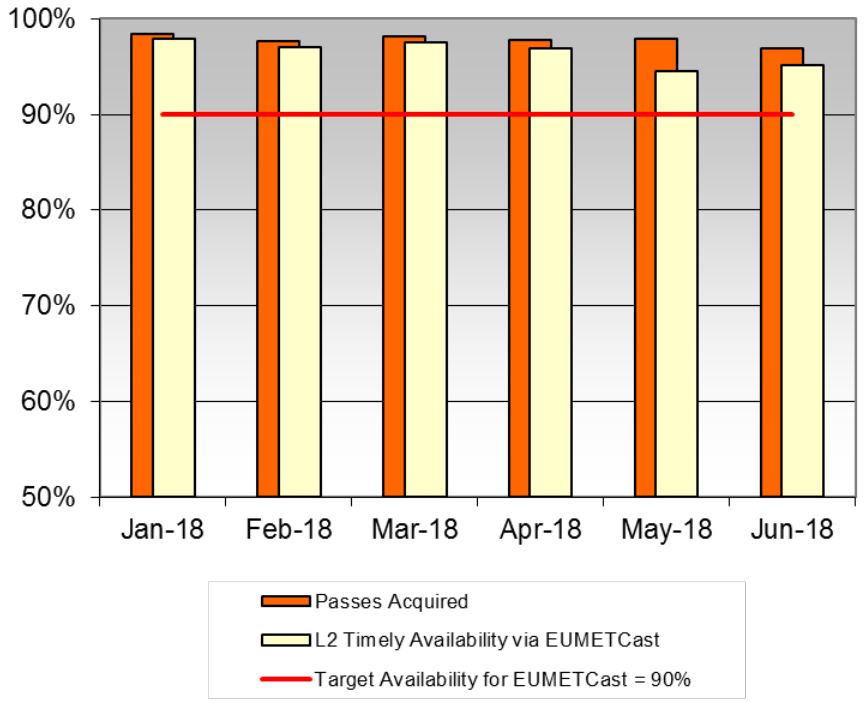
Service performance is measured in terms of the availability of the data on the EUMETCast user reception stations being within 30 minutes of the instrument's observations, unless specified otherwise in the following slides.

See EUMETSAT's document TD14, available from the 'Regional Data Services' page of EUMETSAT's website (see 'Related Links') for more general information 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:

26 May
- 10 June: Kangerlussuaq comms link outage

Regional Data Services → EARS-ATMS

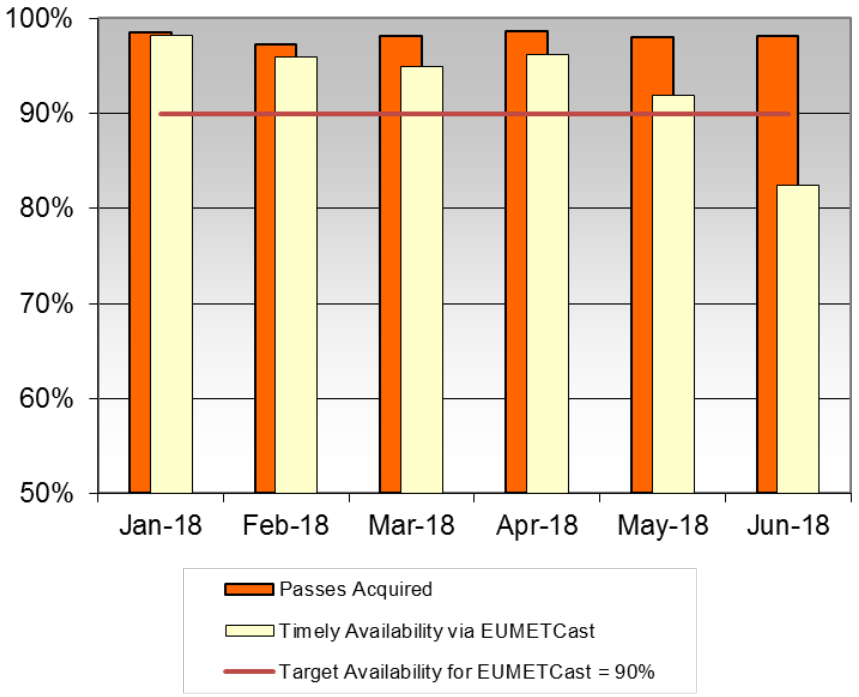
This service provides SDRs derived from the data produced by the ATMS (Advanced Technology Microwave Sounder) instrument onboard NASA-NOAA's Suomi-NPP satellite.

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

Events which impacted availability:

26 May
- 10 June: Kangerlussuaq comms link outage

5 – 9 June: Moscow antenna problem



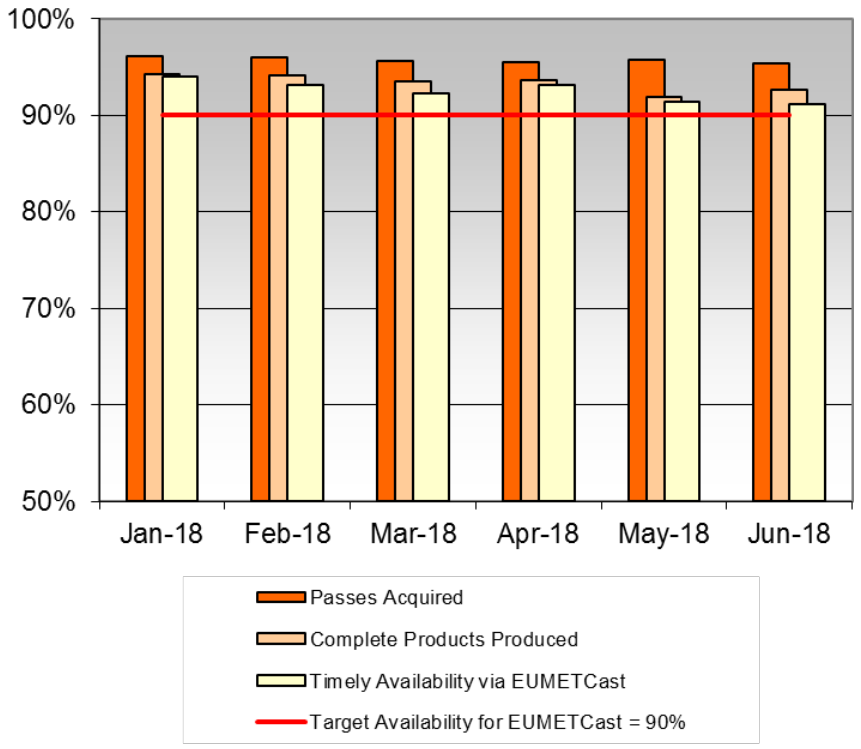
Regional Data Services → EARS-ATOVS

This service provides ATOVS products covering data-sparse areas, derived from AMSU, HIRS and MHS data received by all HRPT stations from the following satellites (listed in order of priority): Metop-B, Metop-A, NOAA's N19 and N18. 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 Level 1C and 1D products.

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

Edmonton, Gander, Miami & Monterey: 45 mins.



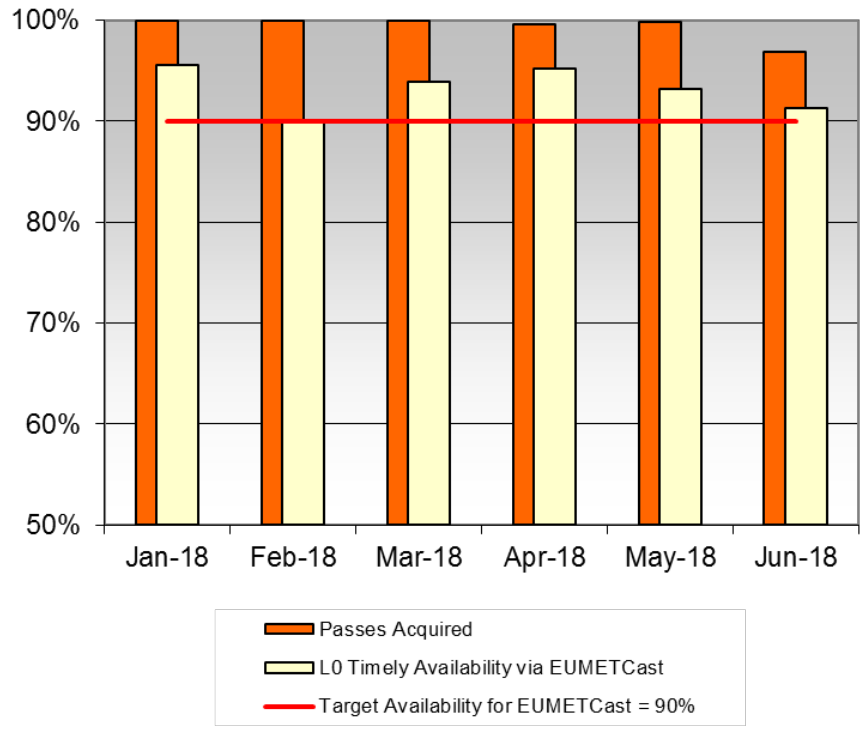
Events which impacted availability:

21 March:	Metop-A MHS in fault-mode
26 May - 10 June:	Kangerlussuaq comms link outage
5 – 9 June:	Moscow antenna problem

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:

2 – 5 Feb: Athens power-supply problem

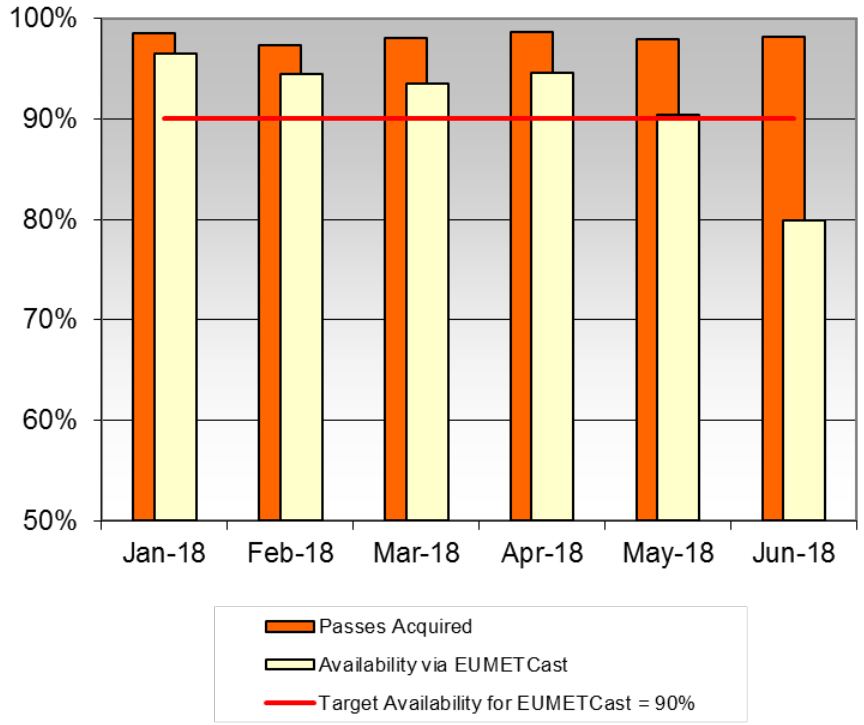
26 May - 10 June: Kangerlussuaq comms link outage

5 – 9 June: Moscow antenna problem

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:

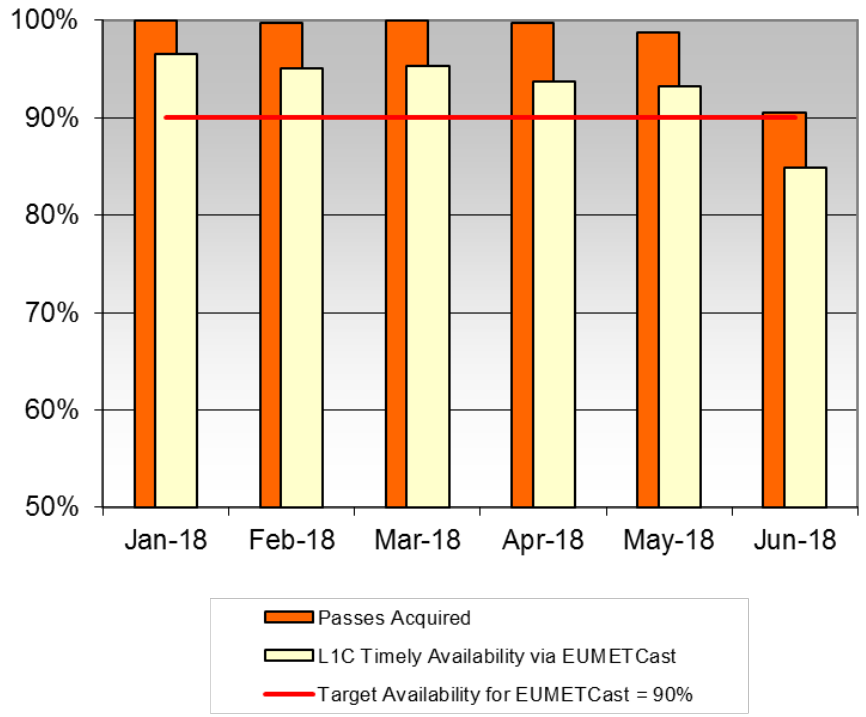
26 May
- 10 June: Kangerlussuaq comms link outage

5 – 9 June: Moscow antenna problem

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:

26 May
- 10 June: Kangerlussuaq comms link outage

5 – 9 June: Moscow antenna problem

27 June – 2 July: IASI instrument decontamination

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

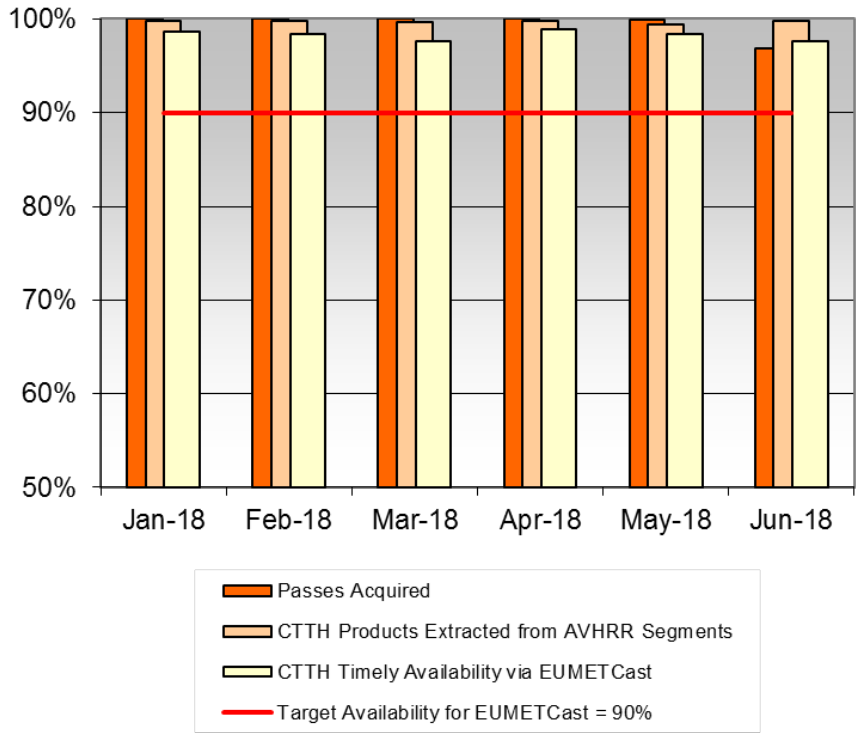
Regional Data Services → EARS-NWC

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).



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

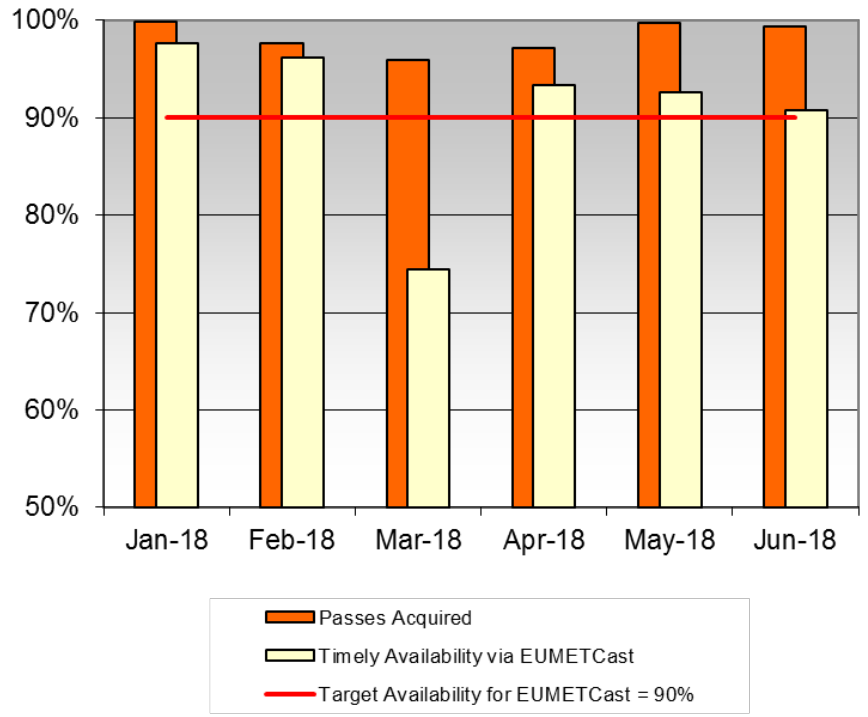
None significant.

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:

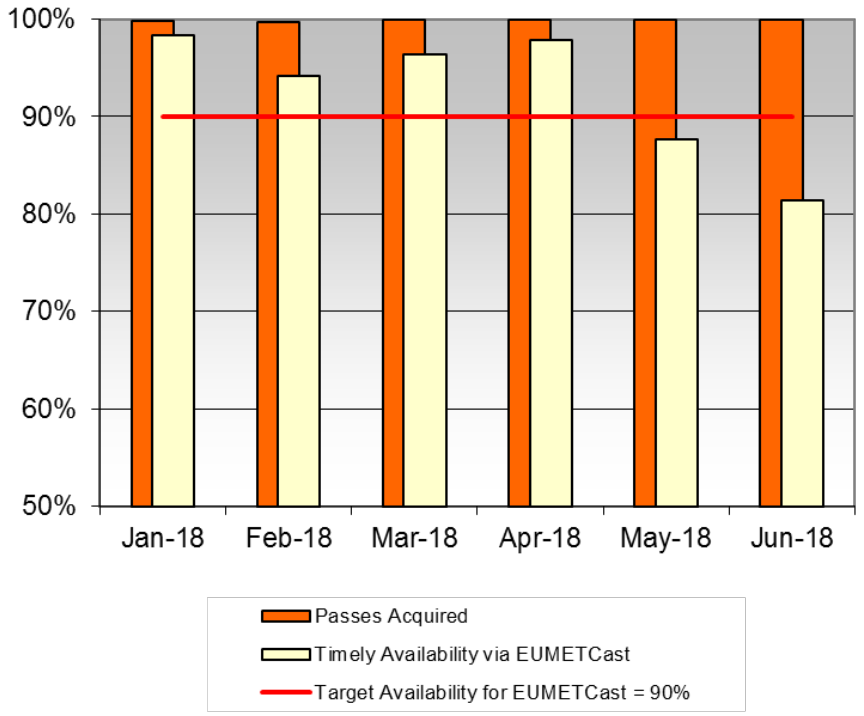
March:	Athens power-supply problems
10-12 Mar.:	Svalbard antenna problem
28-29 Mar.:	Dissemination system data transfer problem
26 May - 10 June:	Kangerlussuaq comms link outage

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).

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



Events which impacted availability:

2 – 5 Feb: Athens power-supply problem

26 May - 10 June: Kangerlussuaq comms link outage

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: The reporting period saw the relocation of Meteosats 9, 10 and 11, and this influenced the SAR coverage provided at the orbit positions indicated:

- 0°: Meteosat-10 up to 9-Feb, Meteosat-11 thereafter (**)
- 9.5°E: Meteosat-9 up to 23-Feb, Meteosat-10 thereafter.
- 41.5°E: Meteosat-8 provided continuous coverage throughout the reporting period.

(**) Meteosat-11 experienced a 16-hour outage 6/7-May, due to a spacecraft DNEL safe-mode.

Metop: Metop-A and Metop-B have provided full-time SAR support during the reporting period, with only one outage of ~9.5 hours on 14-February for Metop-A, and one of ~3 hours for Metop-B on 3-January, each suspected as being the result of an SEU.

Jason-2 and Jason-3 OGDR Service

This service delivers the 'Operation Geophysical Data Record' (OGDR) products, derived from the altimetry data acquired from the Jason-2 and Jason-3 satellites.

Both Jason missions are cooperative undertakings between EUMETSAT, NOAA, CNES and NASA. Jason-3 also involves the European Union, as a Copernicus mission. The European role in operations is funded by Copernicus.

Jason-3: has been supporting the primary service since 1 July 2016. EUMETSAT and NOAA process the data from the satellites in near real-time, and disseminate and archive the products. The chart on the next slide shows the availability of the products within the timeliness constraints of 3 hours and 5 hours respectively from the time of sensing.

Jason-2: has continued in its LRO (Long Repeat Orbit) at an altitude 27 km lower than the reference orbit of Jason-3. A recurrence of the gyro anomaly caused a safe-hold mode on 20 February. Further investigation seeks to confirm that the gyros become more resilient after a period of rest. If this is confirmed, a regular gyro-swap strategy will be put in place, to mitigate the impact of the anomaly on the mission. Jason-2 experienced further safe-hold modes on 18-July and 25-October.

A series of Jason-2 fuel depletion maneouvres took place between 6 and 23 April, reducing the hydrazine to approximately 8 kg, a sufficient amount for several years to come.

Jason-2 and Jason-3 OGDR Service

The charts show the availability of the Jason-2 and Jason-3 Operational Geophysical Data Record (OGDR) products disseminated via EUMETCast.

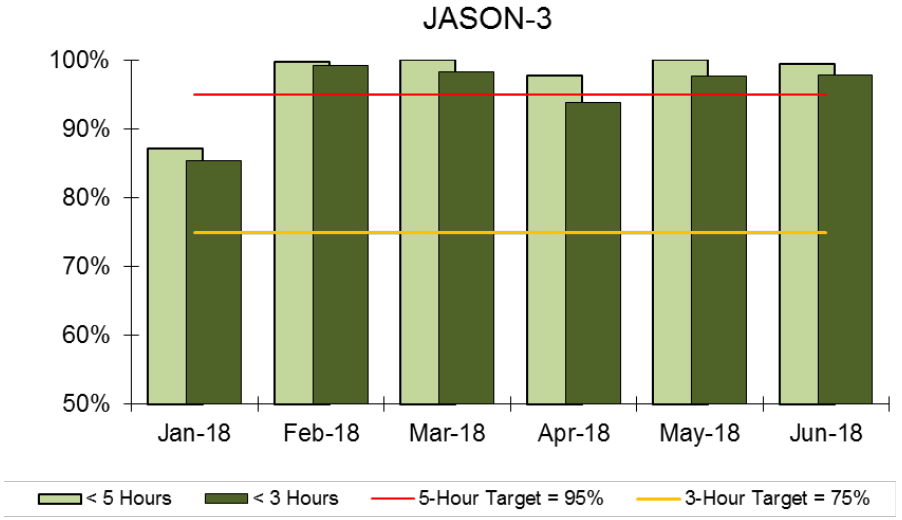
The target figure of 95% applies to the availability of data received on EUMETCast reception stations with a timeliness of 5 hours. The further target of 75% is for the more demanding objective of 3-hour timeliness.

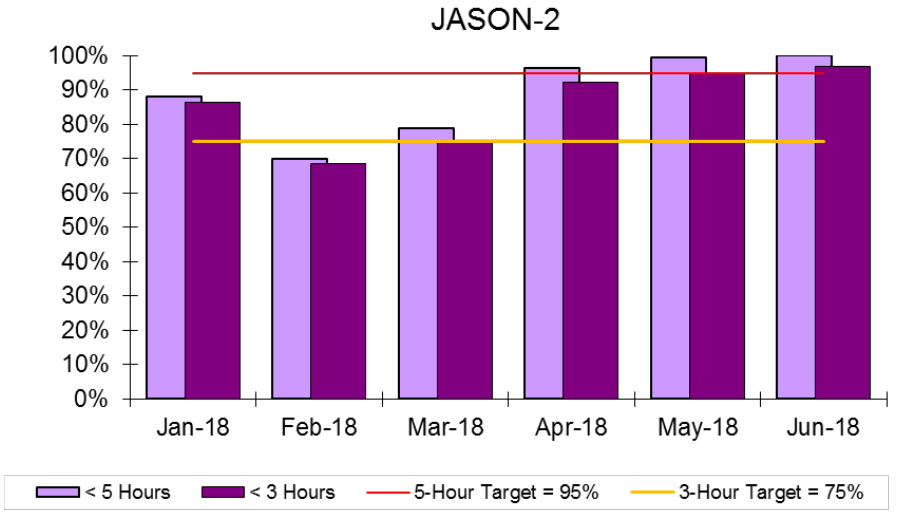
Events which impacted availability:

20-23 Jan: Ground processing outage due to a software failure (Op. Incident 76 – see slide 8) – 47 passes not processed.

Feb-Mar: Jason-2: further Safe-Hold-Mode (gyro fault) occurred on 20-Feb. Recovery took place on 5-March.

(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-16 ('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)

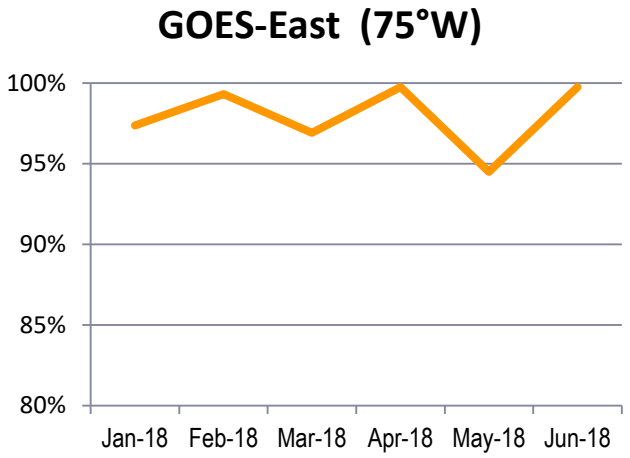
Meteorological products based on LEO satellite data are also disseminated:

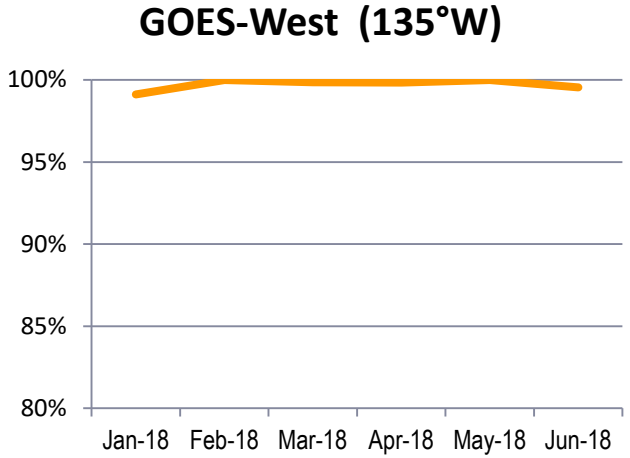
- Microwave Sounder products from CMA's FY-3B and FY-3C (only provided to National Met. Services)
- Level 1, 2 and 3 products derived from data of the MODIS instrument on NASA's Terra & Aqua satellites
- EUMETSAT SSMIS products derived from sounder data of the DoD's DMSP satellites (F16 – F19)
- Operational 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 the geostationary satellites operated by NOAA and JMA (Japan Meteorological Agency), as disseminated via EUMETCast.

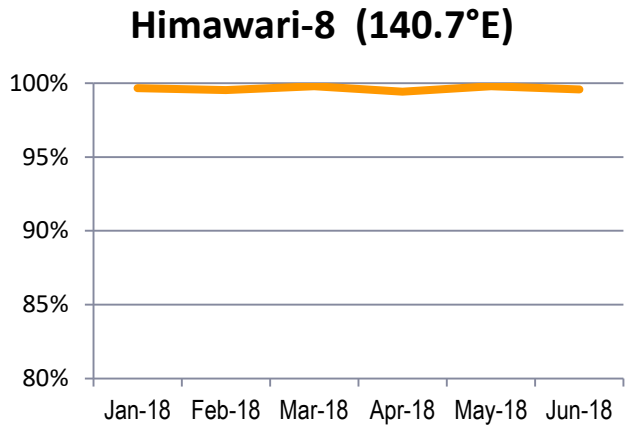




Events which impacted availability:

May: GOES-East data interrupted by NOAA PDA problems

Note: GOES-16 replaced GOES-13 as the GOES-East satellite at the end of 2017.

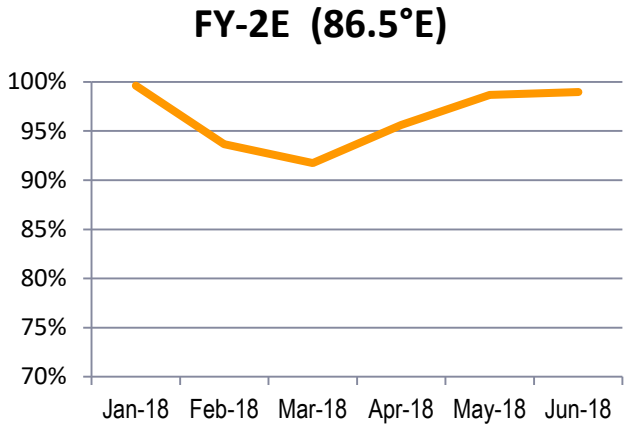


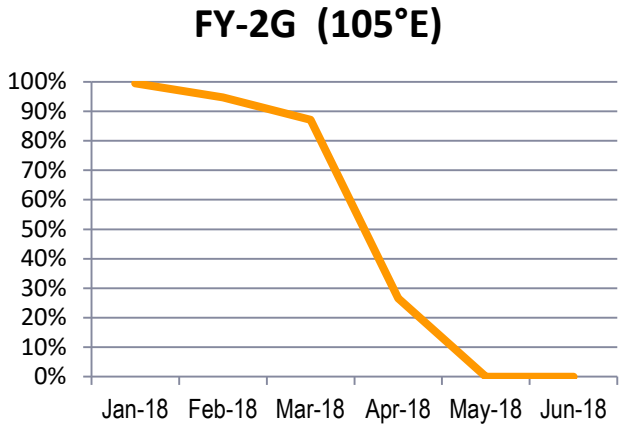
Third-Party Data Services → Geostationary Satellite Data & Products (cont.)

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-April:	Fewer products due to eclipse-season (FY-2E & FY-2G)
9-April:	FY-2G was relocated; no redistribution agreement in place, so service had to be suspended. It was reinstated 20-July.





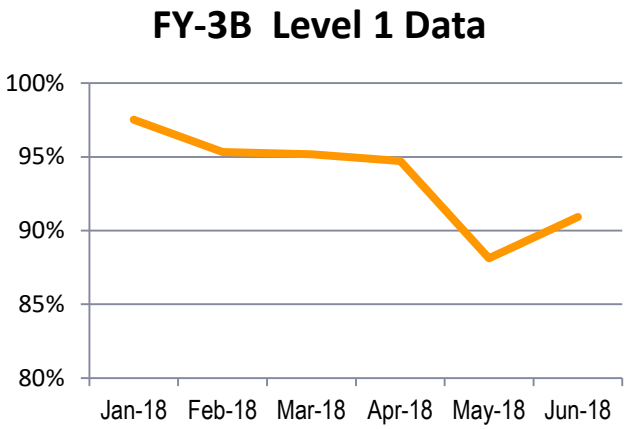
Third-Party Data Services → LEO Satellite Data & Products (1 of 3)

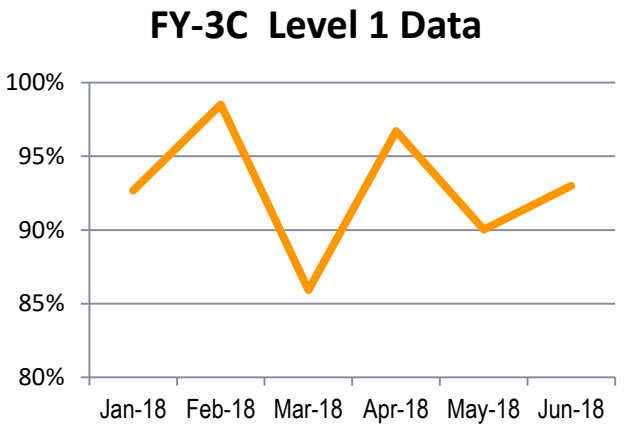
This section presents charts which show the availability of data and products for LEO satellites operated by partner organisations, as disseminated via EUMETCast.

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

Events Which Impacted Availability:

23-Mar - 1-Apr:	FY-3C: Scheduled manoeuvre, no data
6-13 May:	FY-3C: IRASX product not received
May & June:	Occasional periods in which dataflow from provider was erratic - either not all expected products were received or duplicates were sent.





Third-Party Data Services → LEO Satellite Data & Products (2 of 3)

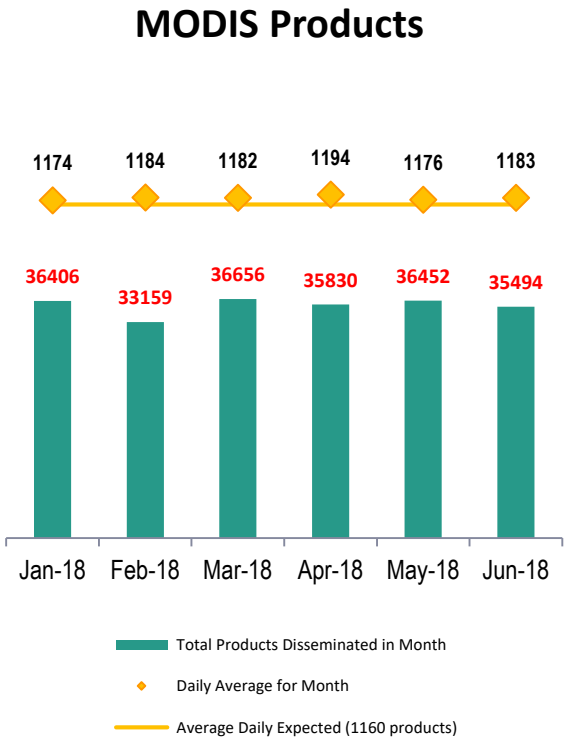
This slide presents further charts showing the availability of certain LEO satellite products from partner organisations, as disseminated via EUMETCast. Availability shown in terms of total products disseminated /month and equivalent daily average/month.

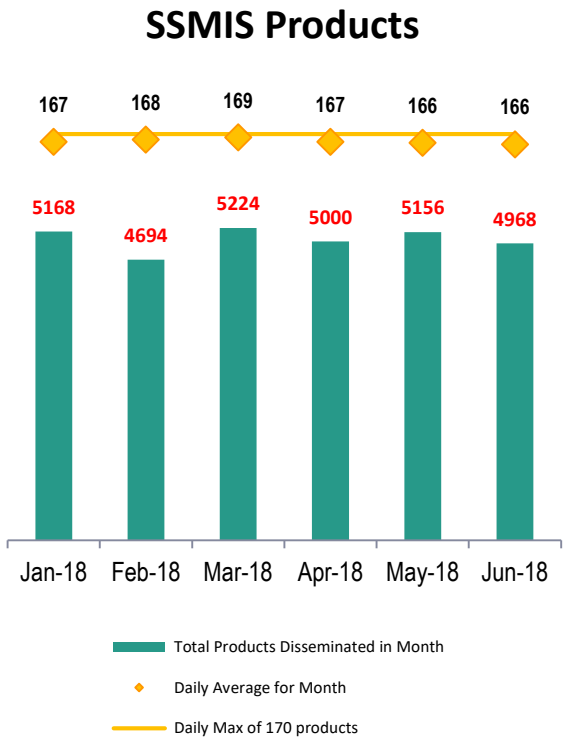
MODIS: Level 1, 2 and 3 regional products derived from the MODIS instruments hosted on NASA's Terra and Aqua LEO satellites.

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:

None significant.



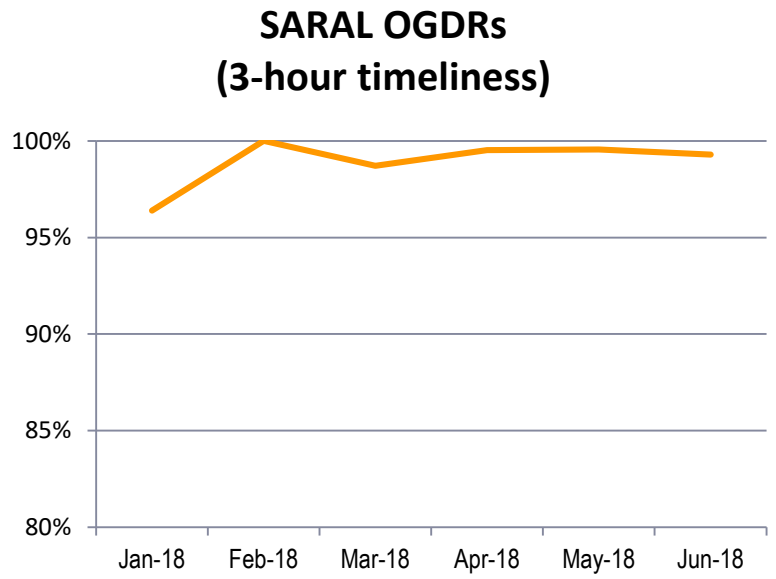


Third-Party Data Services → LEO Satellite Data & Products (3 of 3)

This slide presents a chart showing the availability via EUMETCast of near-real-time Operational Geophysical Data Records (OGDRs), which are produced at EUMETSAT 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 their availability is shown as a percentage of the scheduled passes.

75% of the OGDR products shall be made available to the users within 3 hours from data onboard acquisition and 95% of the products within 5 hours.



Events which impacted availability:

None significant.

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.

EUMETCast Europe has used a DVB-S2 platform since January 2015. The EUMETCast Africa service has been fully migrated from EUTELSAT-5 to EUTELSAT-8 as of August 2018 and thus is now also based on the DVB-S2 standard. It was successfully running in parallel to the old DVB-S system since May 2018.

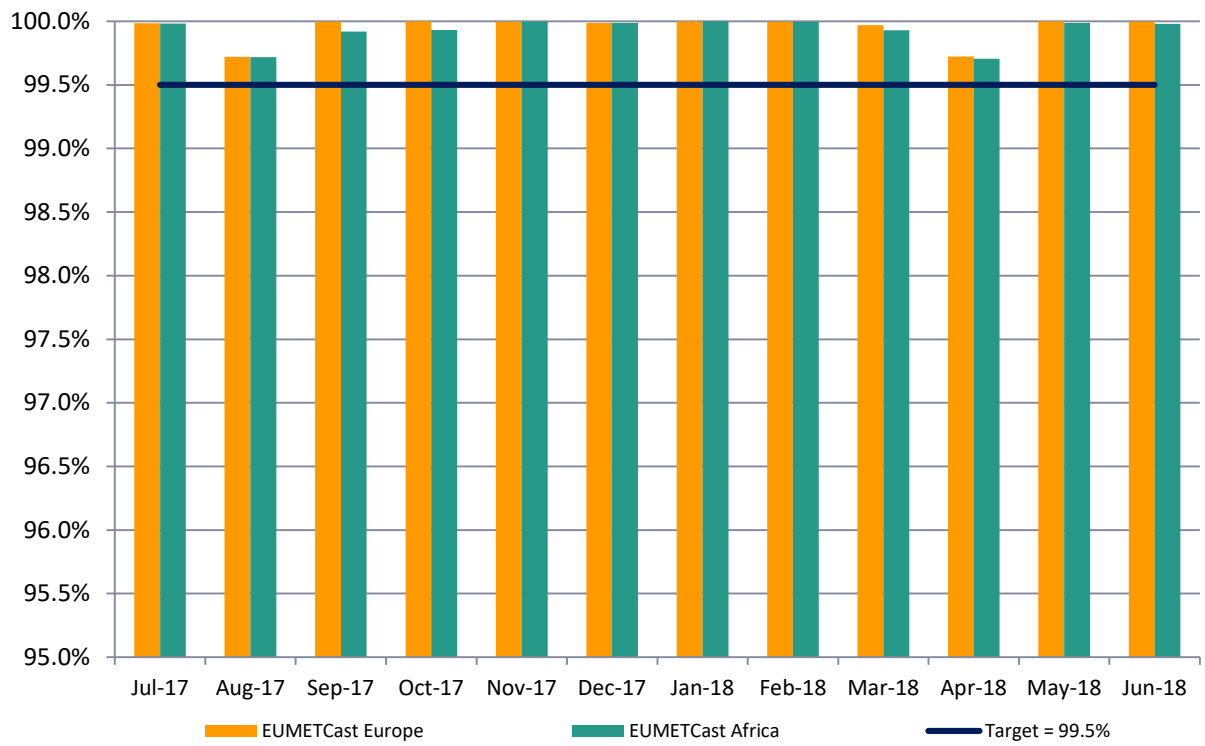
For more information about EUMETCast and the services which it supports, please visit the 'EUMETCast' page on the EUMETSAT website (via 'Data' → 'Data Delivery').

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 2 EUMETCast services covering Europe and Africa respectively.

Up until August 2018, the EUMETCast Africa system continued to be an extension of EUMETCast Europe and thus its end-to-end system availability has been calculated taking into account the availability of both systems. As of August 2018, EUMETCast Africa has been migrated to DVB-S2 and its availability is now measured independently.



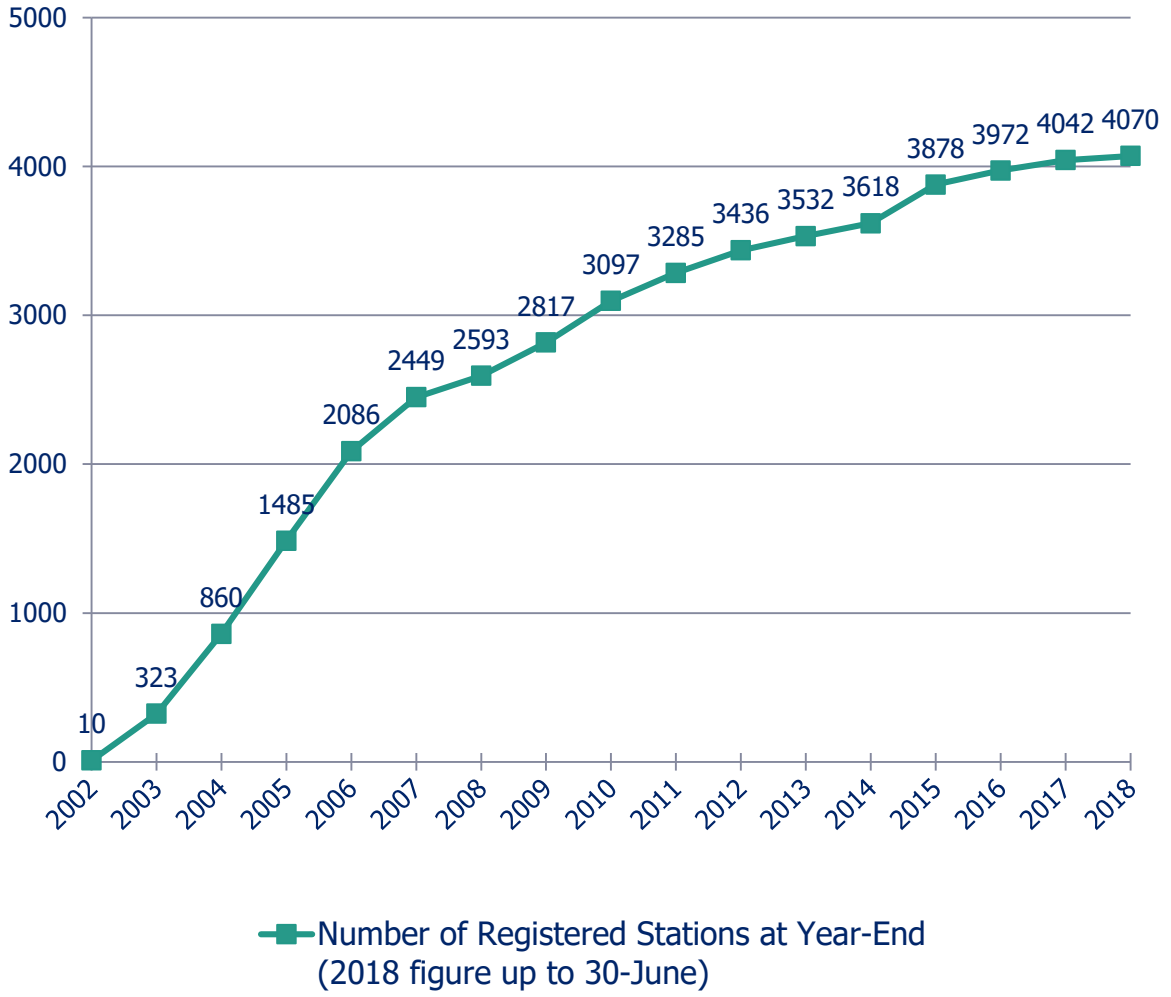
Events which impacted availability:

2-3 Aug 2017:	2¼-hour service provider outage caused by a hardware failure.
4 April 2018:	~2½-hour interference on transponder 1 corrupted EUMETCast basic and high-volume services (Operational Incident 80 – see slide 8).

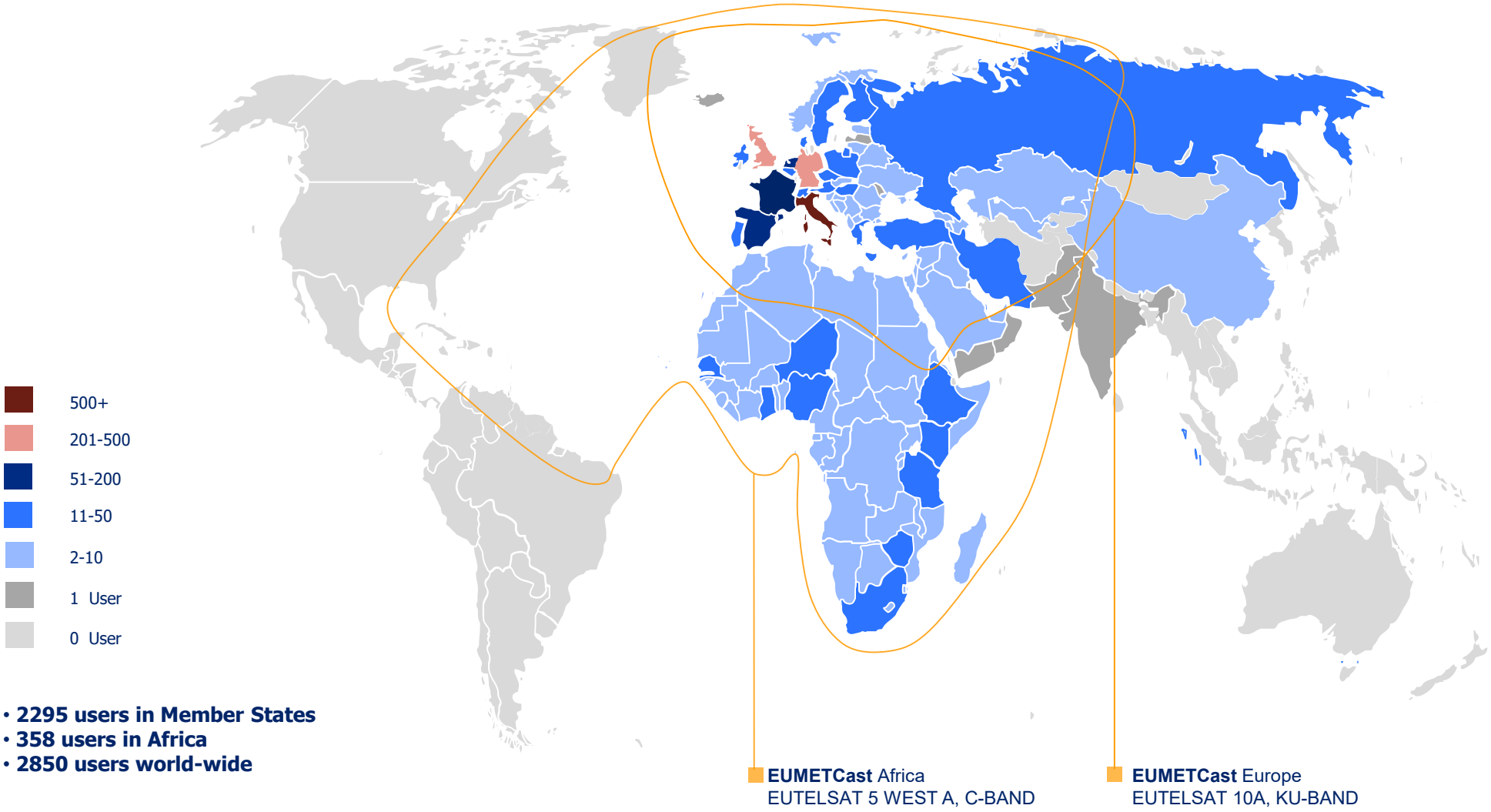
EUMETCast → Registered User Stations

The chart shows the trend of registrations of EUMETCast user stations since the establishment of the system in 2002, up until the end of the reporting period.

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 2018



- **2295 users in Member States**
- **358 users in Africa**
- **2850 users world-wide**

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.

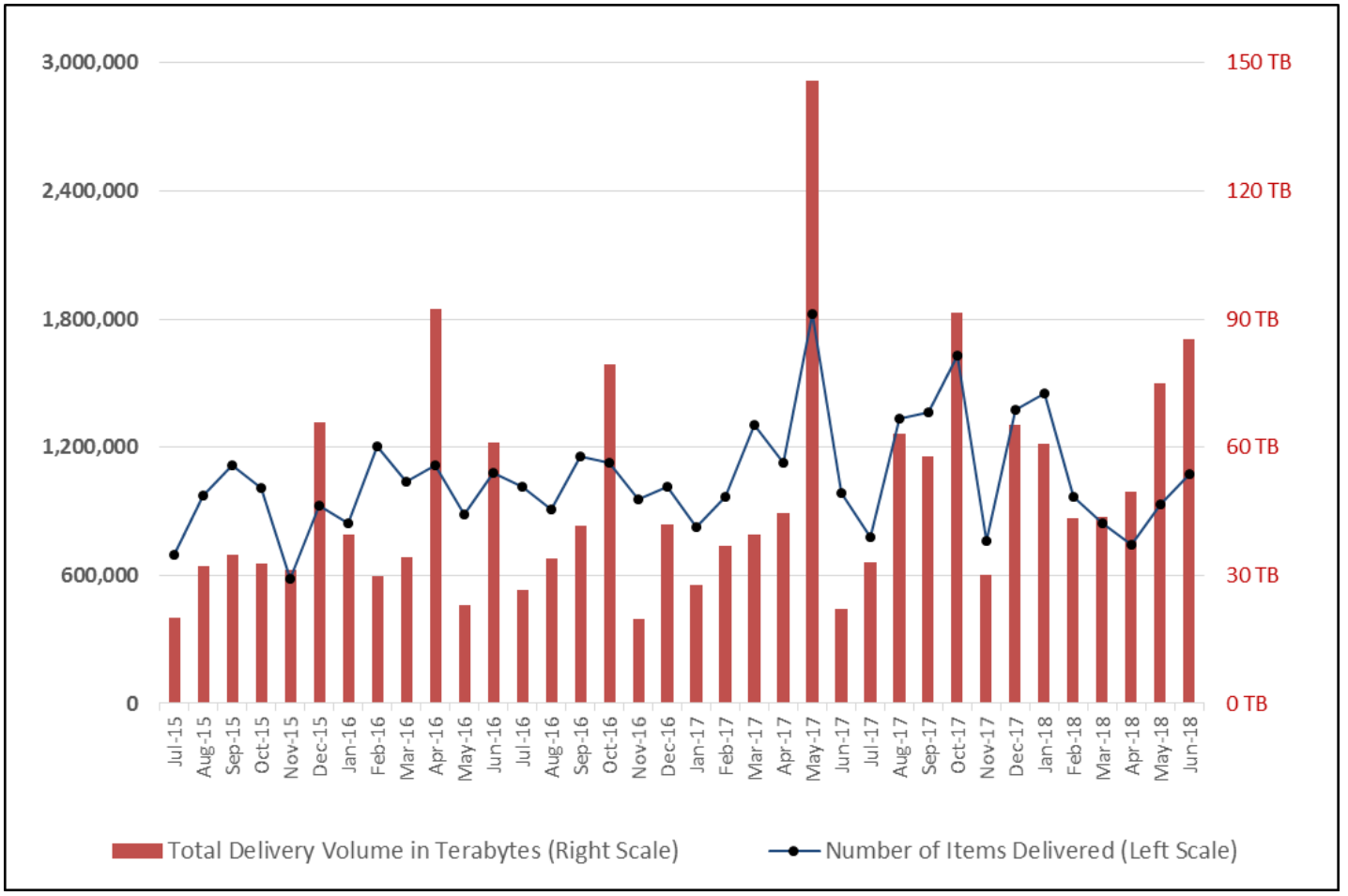
The EUMETSAT Data Centre → Data Delivered: Total Volume versus Items

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 2018.

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

Note for May 2017:

Highest ever delivery volume in a month was achieved (145 TB, ~1.8 million items), since records began.



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.

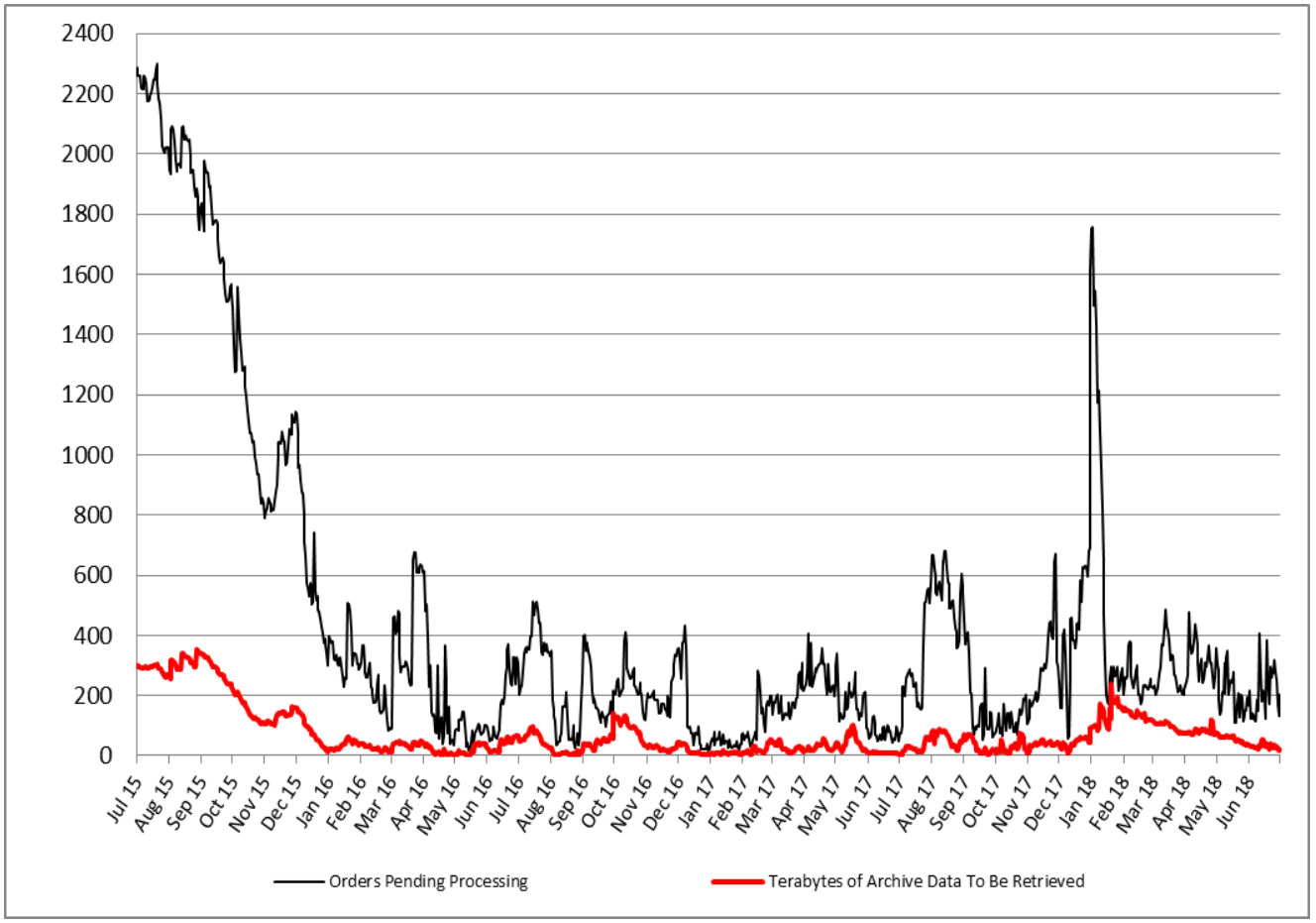
The chart is based on observed daily maximum orders and estimated retrieval volumes which are recorded automatically for each day of the year.

Peak Levels in March - August 2015:

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

Peak Level on 31 Dec 2017:

The year ended with a large order from the Spanish Met Service. This was processed in due course in the first weeks of 2018.



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).

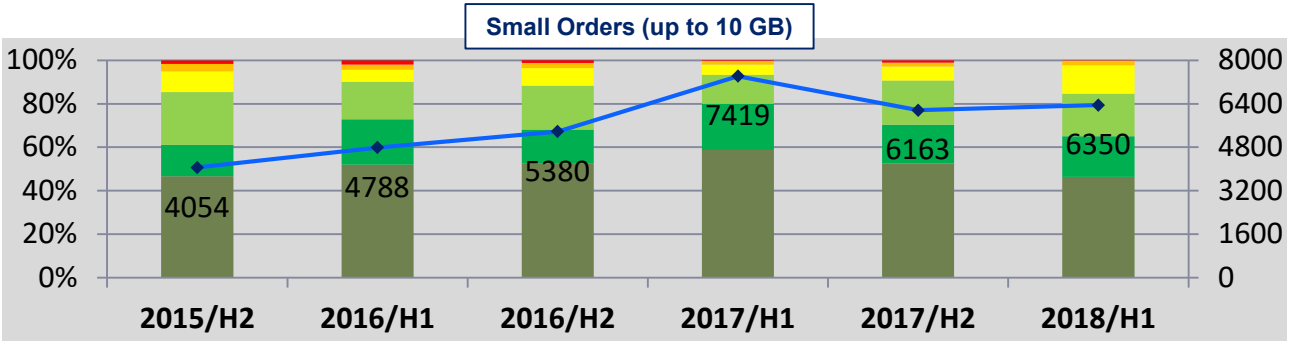
The colour-coding for the delivery-time bands on each of vertical bars on each chart is as follows:

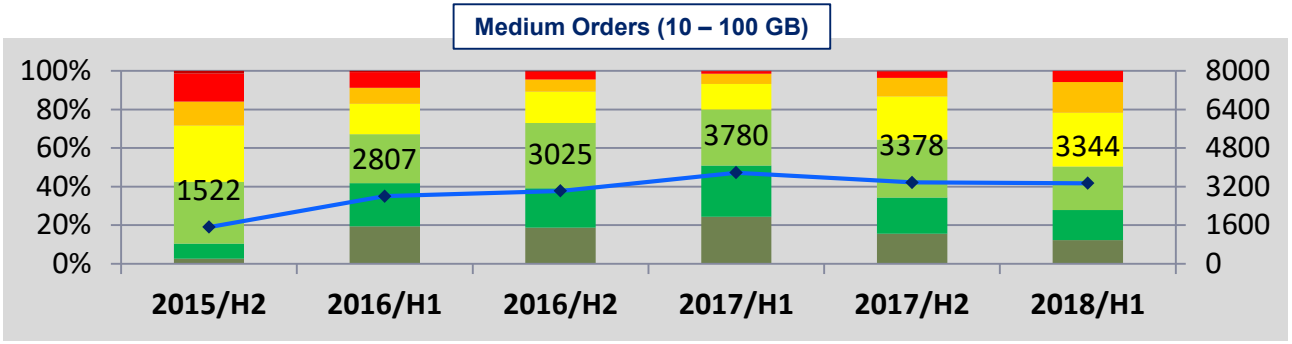
- > 1 month
- < 1 month
- < 1 week
- < 3 days
- < 1 day
- < 6 hours
- < 1 hour

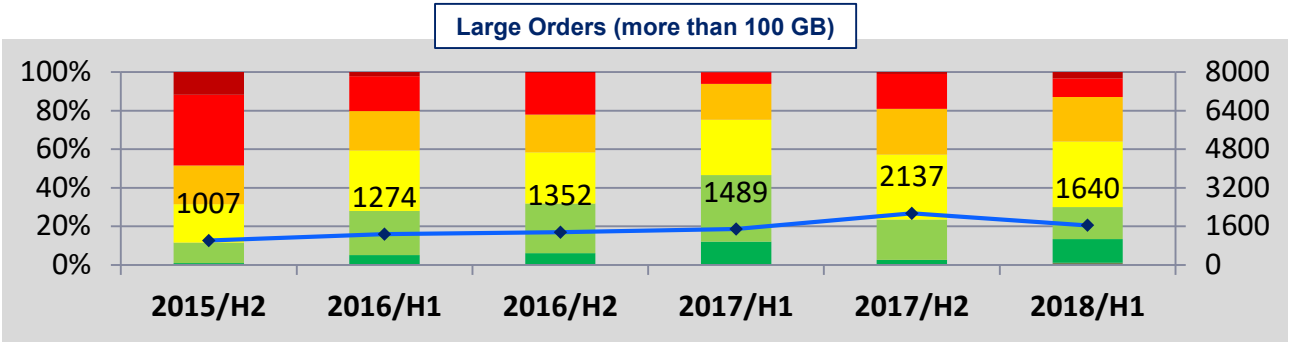
The blue lines indicate the total orders per half year for each category (right-hand scales apply).

Total orders across all 3 categories were:

2015/H2: 6583	2016/H1: 8869
2016/H2: 9757	2017/H1: 12688
2017/H2: 11678	2018/H1: 11334







EUMETSAT

EUMETSAT's Support to Climate Services

EUMETSAT contributes to climate monitoring and climate change analysis by recalibrating and 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's Support to Climate Services → Climate Data Record (CDR) Generation

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

Produced in 2018/H1:

- IASI level 1c FCDR
- GRAS bending-angle profiles FCDR for Metop-A and B, up to 2017

To be produced in 2018/H2:

- Meteosat 2-7 FCDR collating recalibrated IR and VIS channel data
- Meteosat 8 and 9 FCDR containing recalibrated IR channels
- Meteosat 8 and 9 surface albedo TCDR
- Meteosat 7-10 ASR, CSR, CLA and AMV TCDR extensions for C3S (data after 2014)
- Meteosat 2-9 ASR, CSR, CLA and AMV TCDR (1982-2014)
- Metop A/B Global and Polar AVHRR AMV TCDRs

Work-in-progress for later release (foreseen time-frame in parenthesis):

- ASCAT L1B FCDR (2019)
- GOME-2 L1B FCDR (2019)
- IASI level 2 TCDR (2019)
- Study on anomalies in MVIRI data (Sept 2018)

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.

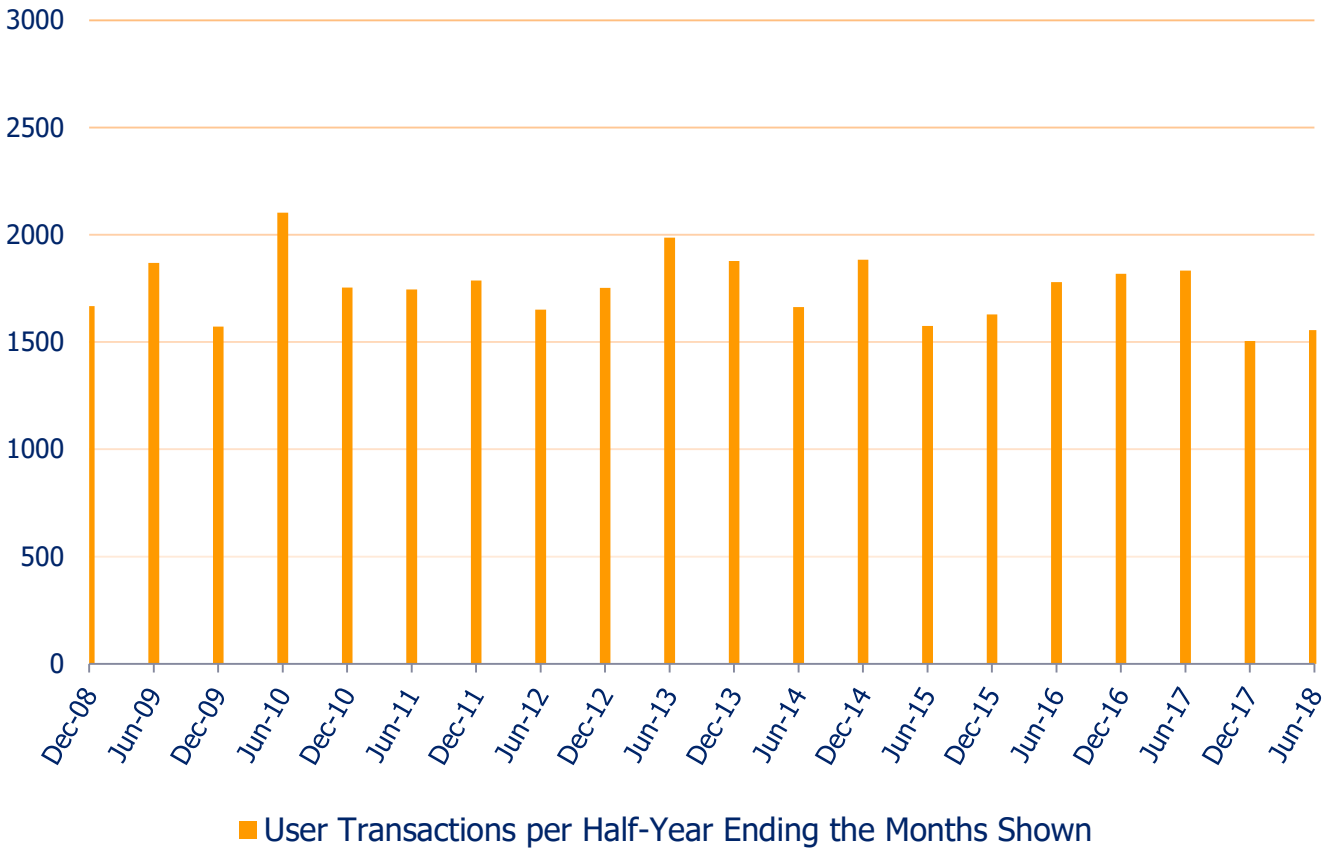
This section includes charts on the following subjects:

- **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 1556 interactions were handled.

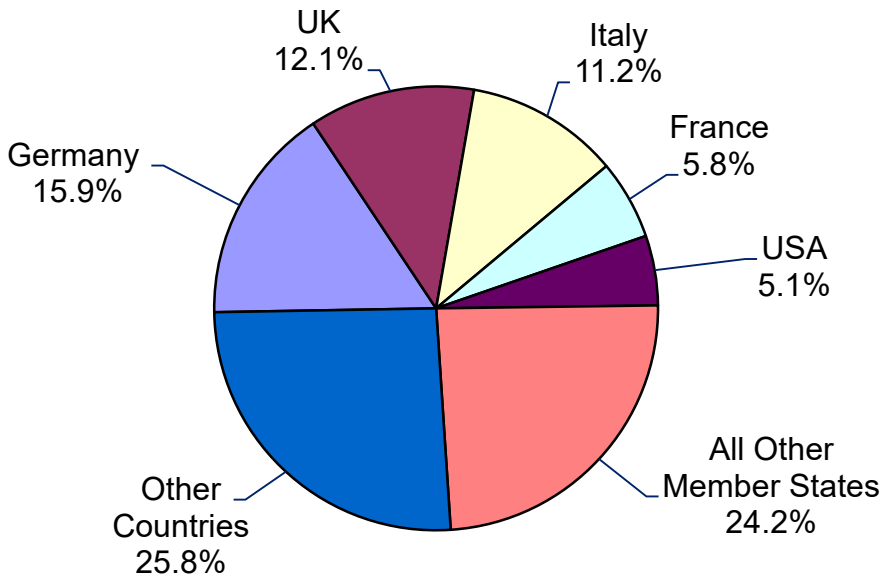


Helpdesk Service → User Interactions 2018/H1 by Country of Origin

The chart shows the interactions in the first half of 2018 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 and other countries.



Helpdesk Service → User Interactions 2018/H1 by Category

The chart shows the numbers of user interactions in the first half of 2018 for:

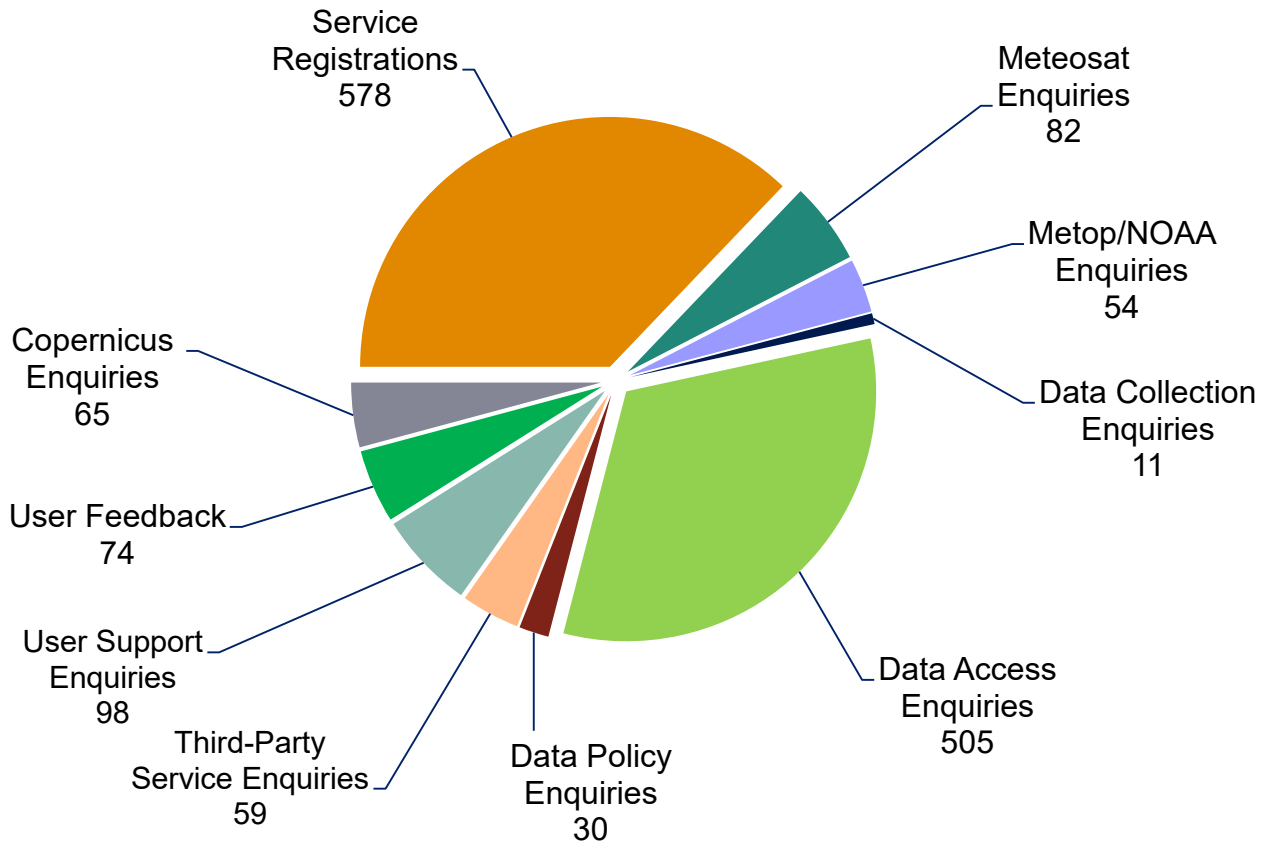
- **Service Enquiries (8 categories)**
- **Service Registrations**
- **User Feedback**

Total interactions for the half-year came to 1556.

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



Information on EUMETSAT's Services

The following information is available on the EUMETSAT website, www.eumetsat.int :

Under DATA on the menu-bar, links to sections on the following subjects:

- **Products, services and delivery mechanisms**
- **Training courses and materials**
- **Service Status, including a link to UNS, our User Notification Service**

In addition, details of all products can also 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.

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).
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. Bending angle / 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.
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.

Glossary (continued) (end of report)

Term	Context in which used	Description
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