

**EUMETSAT Headquarters
Darmstadt, Germany**

**Central Operations Report:
January to June 2019**



EUMETSAT Central Operations Report for January - June 2019

EUMETSAT Member States



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

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

EUMETSAT Central Operations Report for January - June 2019

Introduction

Welcome to the Central Operations Report for the first half of 2019.

The availability of EUMETSAT's operational services in the reporting period was on target or above for all services, with the following exceptions:

- **Meteosat MPEF products for IODC and RSS services:** a product-encoding problem impacted the IODC Global Instability Index (GII) products and processing failures impacted RSS Regional Instability Index (RII) products. See slides [12](#) and [13](#) respectively for more information.
- **The EARS-ATOVS service continued from November 2018 to be considered below target, mostly due to the failure of NOAA-18's MHS instrument.** NOAA attempted to recover the instrument, but did not succeed. As of 25th March, N18 has been excluded from the statistics.
- **The Jason-3 satellite experienced a safe-hold mode on 24 February, resulting from a Single Event Upset impact on a gyro which caused a change in the spacecraft's attitude.** The mission was recovered on 6 March 2019. Another SEU caused another safe-hold mode on 6 April, with recovery on 12 April.
- **Jason-2 experienced two safe-hold modes in February, both triggered by the known gyro anomaly.** In accordance with the agreed mitigation strategy, the spacecraft was kept in hibernation until 22 May. See [slide 44](#).
- **A significant problem with a widespread service impact occurred on 12th March.** An unexpected network anomaly occurred during a planned maintenance activity which caused several hours of outage of Meteosat and Metop services. More information is provided on [slide 8](#). Despite the severity of the problem, a concentrated response from the on-call teams helped to minimize the overall service impact.



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Introduction (continued)

- From January 21st to 27th, a SEVIRI decontamination was performed for Meteosat-11. Meteosat-9 was used to support the Prime 0° FES mission during the period, and also provided parallel imaging during the weeks preceding and following the activity.
- The Metop-C spacecraft, launched on 7 November 2018, was fully commissioned by the end of March and handed over to the Operations department. It was declared operational on 3 July, following the successful completion of the Level-1 product verification reviews in June. Commissioning of the IASI and GOME-2 Level-2 products will continue until later this year. The next issue of this report will reflect the inclusion of Metop-C in the relevant GDS and RDS service availability slides.

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

Major Network Outage in the TIB (Operational Incident 85)

On 12 March 2019, a planned network maintenance activity in the Technical Infrastructure Building (TIB) to install out-of-band monitoring equipment resulted in unforeseen impact on mainly the MSG and Metop operational services. A complex combination of factors prevented the failover of applications to redundant systems as per design. The impact varied between 1 and 2 hours for MSG services, up to around 9 hours for Metop Level 1 (please see the individual service slides for specific impact). Metop Level 0 was unaffected, however, as was Jason OGDR processing. Dissemination of SARAL data was later than normal, but still within timeliness limits.

At the time of writing, the formal incident review is concluding, and various recommendations have been formulated. Several improvements are foreseen, namely (1) better configuration of systems relevant to the redundancy and failover strategy, (2) the elimination of obsolete items, and (3) resolution of any known deficiencies in manufacturers' software, firmware and hardware.

MSG Ground Segment Processing Delays

Image-processing for all Meteosat services (0° FES, RSS and IODC) was delayed on 12 April, and 6 and 24 May, caused by exceptional loads on the multi-mission network-storage infrastructure. The problem was eventually diagnosed, an adjustment of the priorities of storage services between different facilities was made, and the problem has not occurred again. In the long-term, planned increase of storage capacity in preparation for future missions will reduce the risk of recurrence further.

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, in contrast, lists factors of an ongoing nature.

Fuel Migration on MSG Satellites

Each MSG satellite has four fuel tanks interconnected in pairs, which allow fuel to flow along the lines between them. Under conditions of thermal stability, this movement is gradual and has negligible effect on the satellite's attitude. During eclipses, even though the tank temperature is regulated, some variation in fuel temperature and density occurs, which on Met-8 and Met-9 is exacerbated by the degraded thermal insulation. 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 Meteosat-9, ground commanding is performed to partly mitigate the effect, by augmenting the satellite's onboard thermal control system to minimize the tanks' temperature variations and by timing the fuel migration to occur during scan mirror retraces. Even though the image-processing system incorporates algorithms to correct for the effects of the fuel migrations on the image quality, not all images can be corrected to achieve the target specification for geometric accuracy. Typically, around 0.4% of the RCs for the IODC service are affected, with higher rates during eclipse seasons.

Timeliness of Dissemination of IODC L1.5 Data

A timeliness problem affecting the IODC service is sometimes seen, impacting the dissemination of L1.5 image data. It is caused by the lengthier processing time needed for the data from Meteosat-8 at its high-inclination. This continues to be monitored, with a view to potentially increasing bandwidth on EUMETCast Europe to alleviate the problem if possible.

Meteosat Services

This service category comprises the data and products produced with the Meteosat Systems.

The orbital locations of and the services supported by the MSG satellites are as follows:

Meteosat-11 (at 0°): Prime FES satellite.

Meteosat-10 (9.5°E): Rapid-Scan Service (RSS).

Meteosat-9 (3.5°E): Serves as the backup for the primary FES service and for RSS gap-filling.

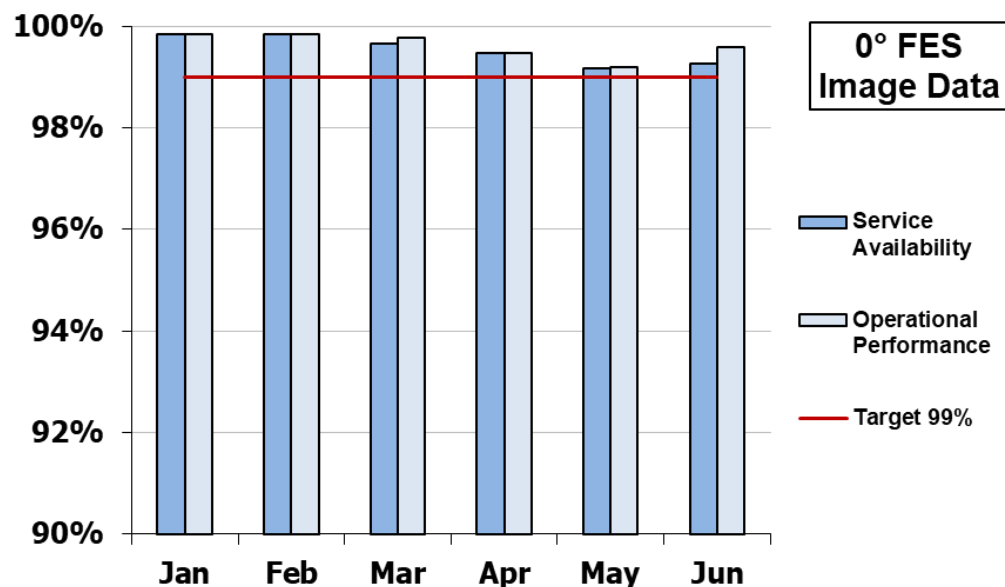
Meteosat-8 (41.5°E): Indian Ocean Data Coverage FES Service, on a best-effort basis.

The individual services covered by the following slides are as follows:

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

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

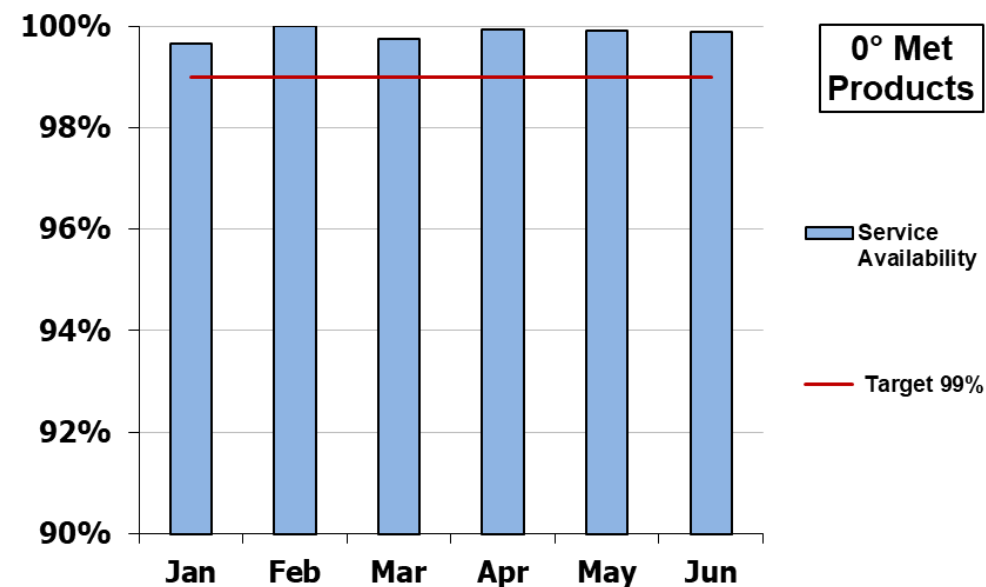


The prime satellite supporting the 0° Full-Earth Scan (FES) service is Meteosat-11. Meteosat-9 has the role of backup.

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:

- 12 April: 13 RCs impacted by ground segment processing delays (see [slide 8](#)).
6 & 24 May: 17 RCs impacted by similar delays.
June: 9 RCs impacted by a manoeuvre on 4 June, and a further 9 RCs impacted by tank-heater switching.



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

The chart shows 'end-to-end Service Availability' in terms of complete products disseminated 'on-time' via EUMETCast Europe. Note that the target availability has been raised from 98.5% to 99% for January 2019 onwards.

Events which impacted availability:

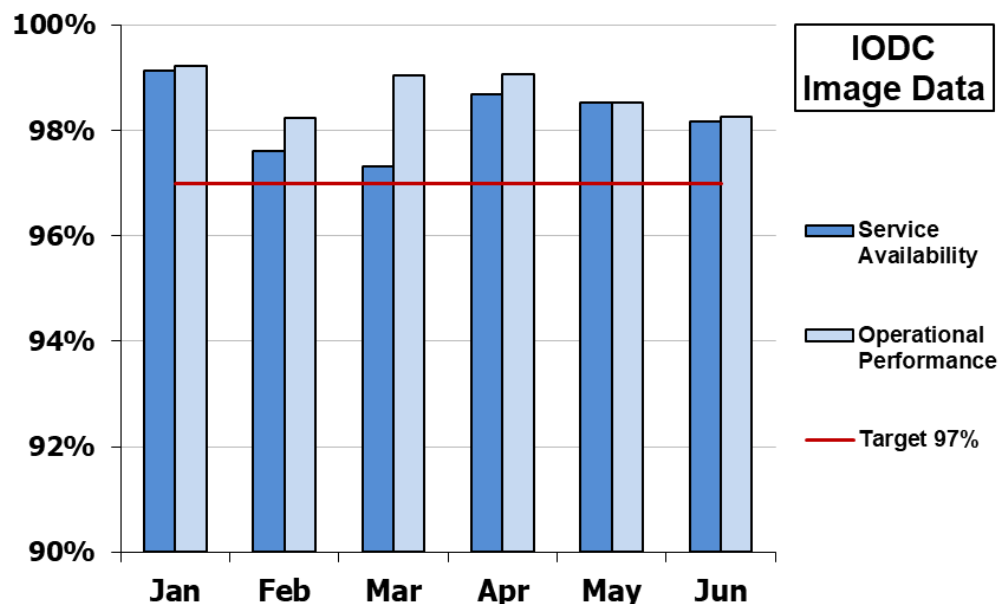
None significant.

Note:

The availability of MPE products is measured and charted separately (see [slide 14](#)).

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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.

Events which impacted availability:

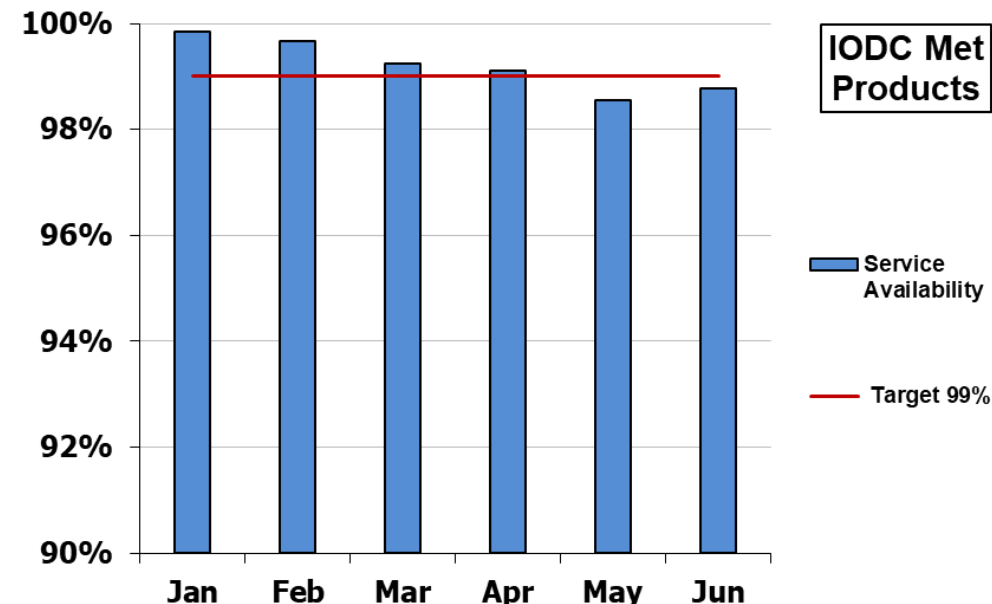
February: 10 RCs impacted by eclipse effects, 7 by sun-satellite collinearity, 7 by a SEVIRI standby (26-Feb), and 30 RCs by a horizon-timing problem.

March: 49 RCs impacted by eclipse effects and 8 by Incident 85 (see [slide 8](#))

April: 11 RCs impacted by a manoeuvre on 24-April

April / May: Total of 17 RCs impacted by ground processing delays (see [slide 8](#))

Note: Due to Meteosat-8's increasing inclination, image-processing cycles can sometimes take longer and timeliness be exceeded. This was particularly noticeable in **February, May & June**.



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

The chart shows 'end-to-end Service Availability' in terms of complete products disseminated 'on-time' via EUMETCast Europe. Note that the target availability has been raised from 98.5% to 99% for January 2019 onwards.

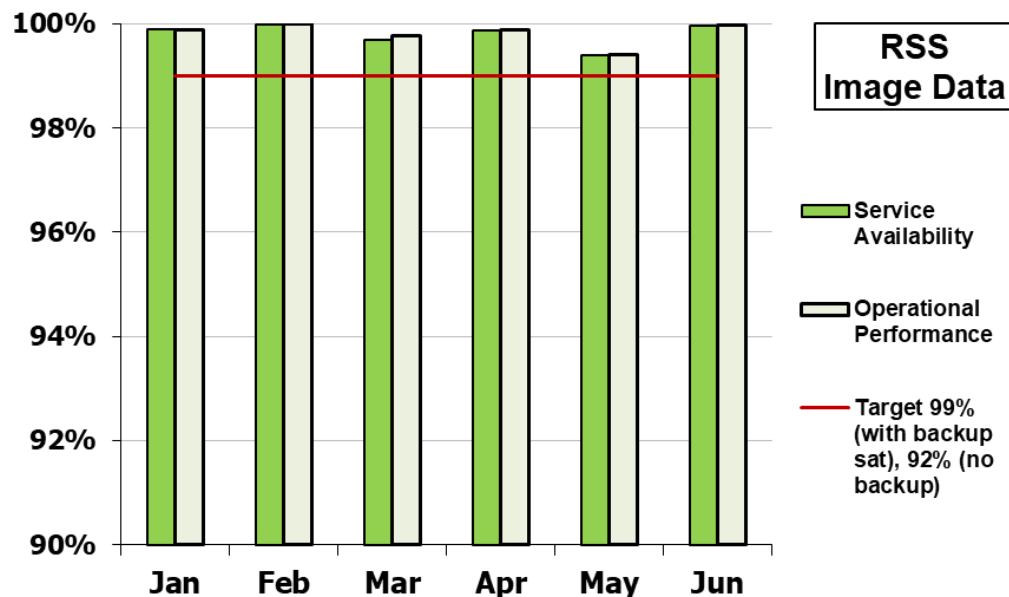
Events which impacted availability:

May/June: A problem with encoding impacted a number of GII (Global Instability Index) products on various days. Problem was resolved 11-June.

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

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



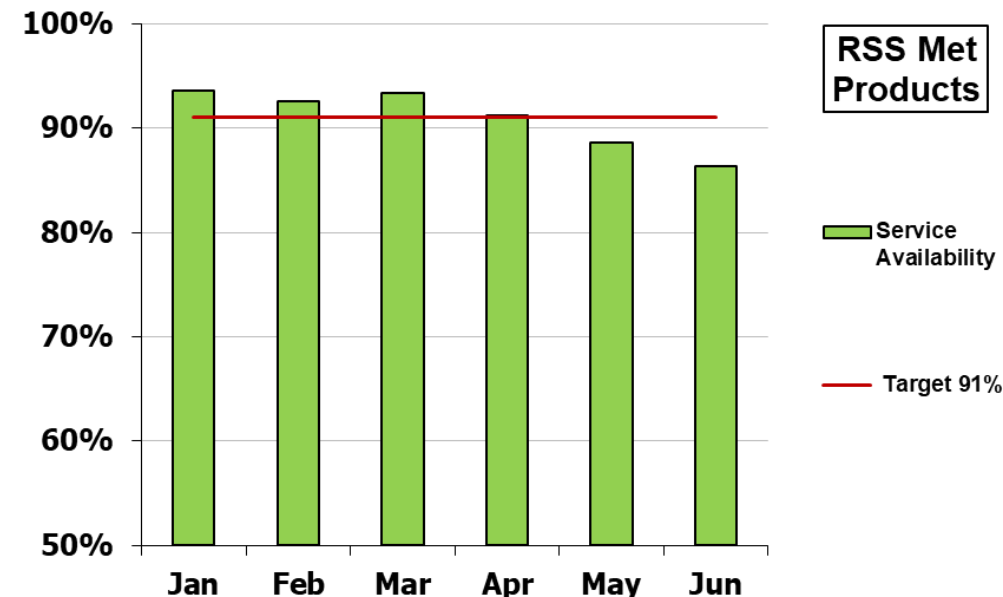
The prime satellite supporting RSS is Meteosat-10. Meteosat-9 is foreseen as a backup and is used to gap-fill when Meteosat-10's SEVIRI needs to be operated in full-scanning mode, provided it is not being used to support the 0° service, which takes priority.

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 March: 13 RCs impacted by Incident 85 (see [slide 8](#))
- 12 April: 6 RCs impacted by ground segment processing delays (see [slide 8](#))
- 6 & 24 May: 44 RCs impacted by similar delays (see [slide 8](#))



Meteorological products derived from Rapid-Scanning images produced at 9.5°E. The chart shows 'end-to-end Service Availability' in terms of complete products disseminated 'on-time' via EUMETCast Europe.

Events which impacted availability:

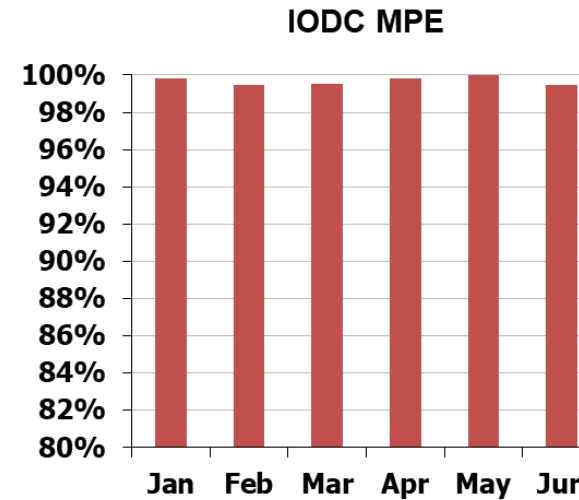
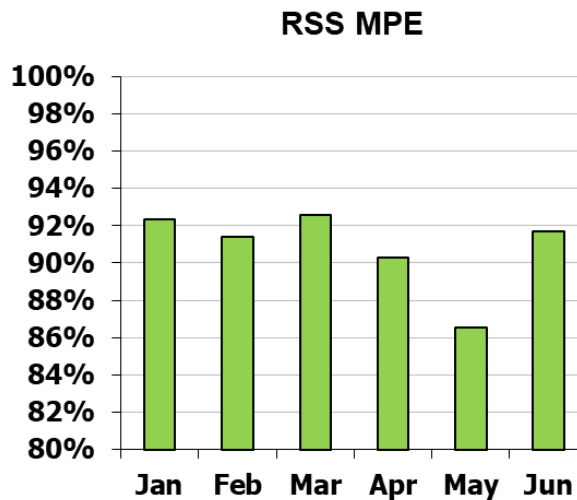
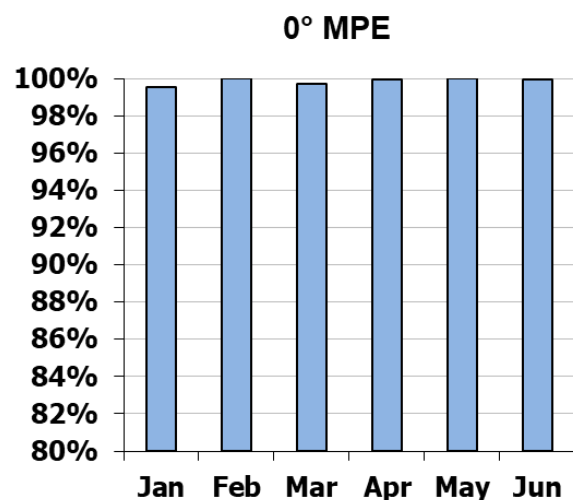
- May:** Exceptionally, May saw the best part of two 48-hour pauses (81 hours impact). Image-processing delays on 6-May (see [slide 8](#)) had indirect impact (L1.5 RCs unavailable).
- June:** Processing of RII (Regional Instability Index) products failed frequently. Problem occurs with less cloudy skies – solution is complex, an interim one is being assessed.

NOTES:

- 48-hour RSS pauses occur in a 28-day cycle and an annual 28-day pause typically occurs in the winter months - the last one took place mid-November to mid-December 2018.
- See [slide 14](#) for the availability of RSS MPE products.

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



Multi-sensor Precipitation Estimate (MPE) products are derived from infrared data in Meteosat 0°, RSS and IODC imagery, and passive microwave imager data 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 products is measured in terms of the number of products which have been generated in EUMETSAT, as a percentage of those scheduled.

Events which impacted availability:

May: Exceptionally for RSS, due to the timing of the cycles, two 48-hour pauses impacted met. product generation in the month, each to a different degree, resulting in a total of 81 hours of non-availability of service. Image-processing delays on 6-May (see [slide 8](#)) also had indirect impact (no L1.5 RCs).

NOTES:

- 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.
- RSS Service availability reflects the RSS pauses, in which no met. products are produced.

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Meteosat Services → DCP Channel Availability at 0°

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

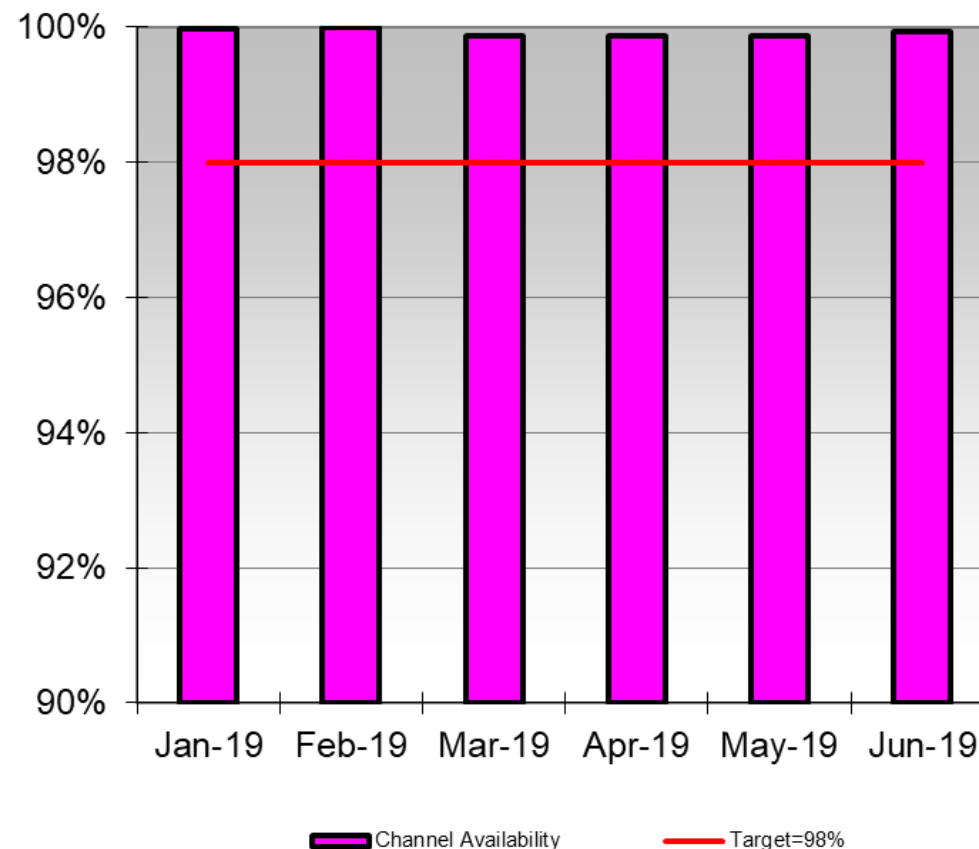
The chart shows the availability of the 0° DCP service. It is measured in terms of the number of hourly reference DCP messages on all operational regional channels which have been successfully received back by EUMETSAT, as a percentage of those sent.

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

Events which impacted DCP Channel Availability:

None.

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.



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Meteosat Services → Geographical Distribution of DCPs as of 30 June 2018

DCPs	Country	DCPs	Country	DCPs	Country	DCPs	Country
6	Albania	1	Falklands	1	Malta	10	Tanzania
51	Algeria	1	Finland	4	Mauritania	2	Togo
13	Angola	134	France	4	Mauritius	70	↑ Uganda
2	Armenia	1	Gambia	23	Mozambique	52	↑ UK
1	Austria	27	Germany	29	Namibia	24	Ukraine
6	Belarus	13	↑ Ghana	17	Niger	1	Union des Comores
2	Benin	1	Gibraltar	108	↑ Nigeria	66	USA
5	Bhutan	1	Greece	10	Oman	1	Yemen
14	Botswana	11	Guinea	4	Pakistan	16	Zambia
1	Brazil	2	Guinea-Bissau	3	Philippines	13	Zimbabwe
1	Bulgaria	9	Indonesia	11	Republic of Moldova		
7	Burkina Faso	2	Iran	9	Republic of Seychelles		
60	Cameroon	200	Iraq	7	Romania		
2	Canada	8	Ireland	8	Rwanda		
4	Cap Verde	74	Italy	11	Senegal		
2	Central African Republic	3	Ivory Coast	13	Sierra Leone		
3	Chad	3	Kenya	1	Slovakia		
3	Congo	6	Lesotho	41	South Africa		
		11	Libya	8	Spain		
1	Cyprus	6	Madagascar	148	Sri Lanka		
51	↑ Dem. Rep. of the Congo	9	Malawi	3	Sudan		
8	Djibouti	3	Maldives	5	Southern Sudan		
1	Egypt	19	Mali				

As of the end of June 2019, there were:

1,512 registered Data Collection Platforms, belonging to 136 DCP operators, deployed by the 77 countries shown in the table.

Of the total number of registered DCPs, there were 489 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 the 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. **Note that Metop-C data will be added to the service as of July 2019 onwards.**

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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.

Note that Metop-C data will be added to the service as of July 2019 onwards.

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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.

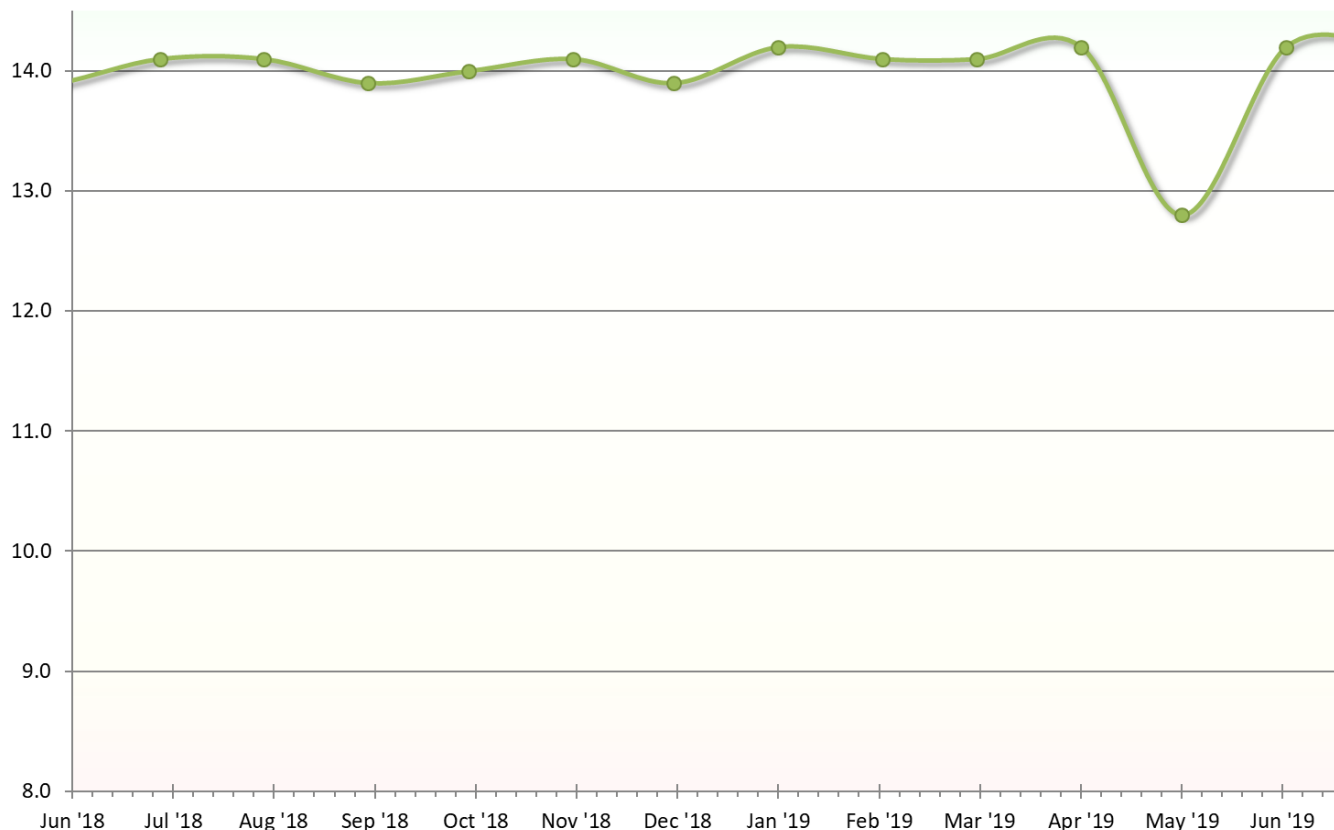
Average Metop-B orbits / day = 14.2

The overall daily average of supported passes in the 12 months shown on chart = 14.0

Events in the reporting period:

4-8 May: Faulty antenna control unit led to approx. 3.5 days of outage of Metop-B data from McMurdo.

Monthly average of supported passes per day



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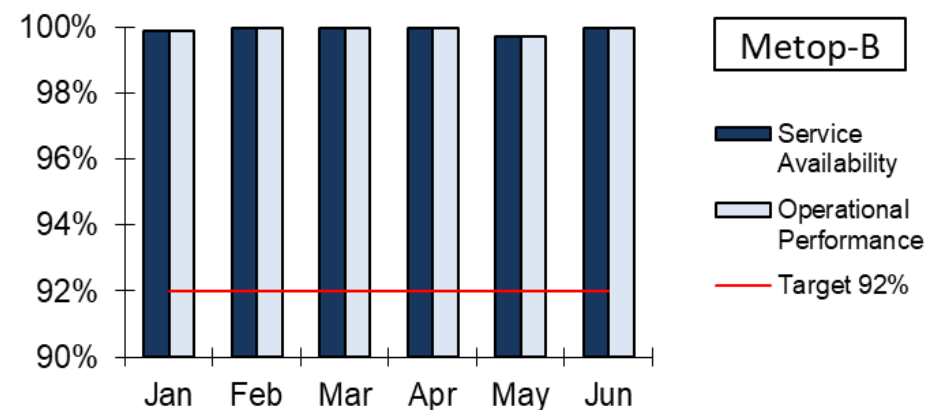
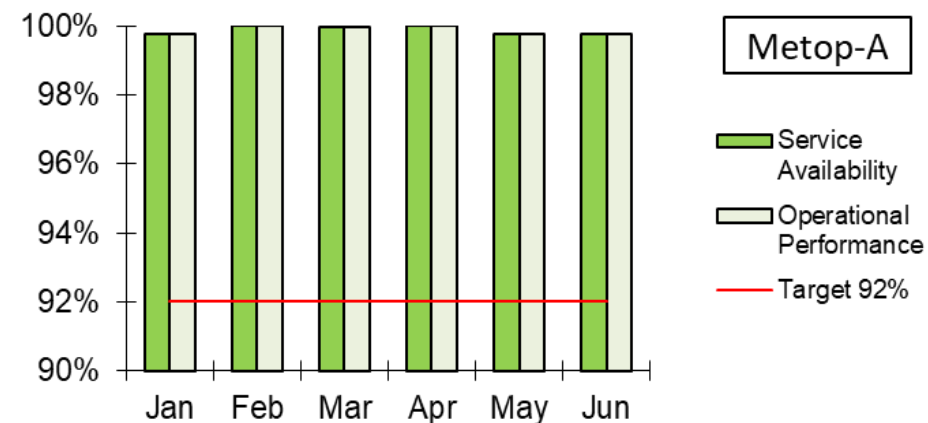
Metop, Suomi-NPP & NOAA GDS → A-DCS Level 0 Data

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.

Events which impacted availability:

None significant.



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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:

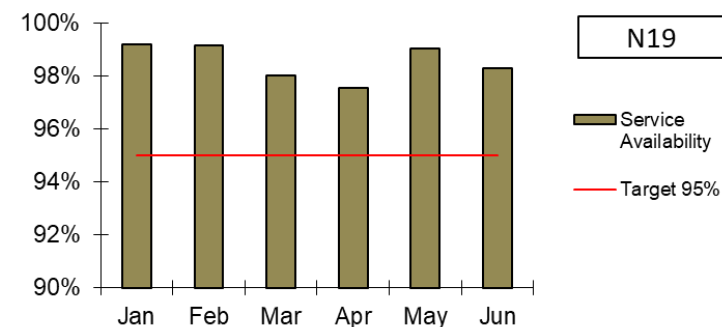
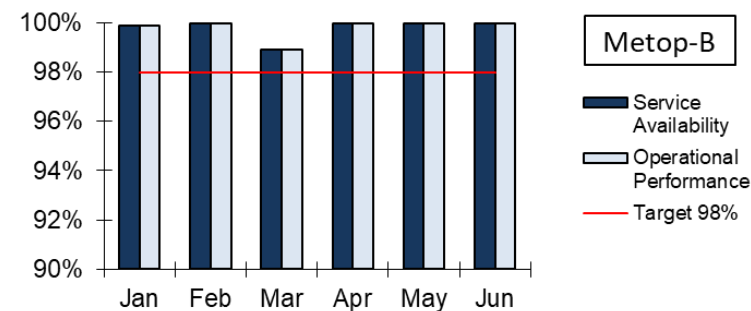
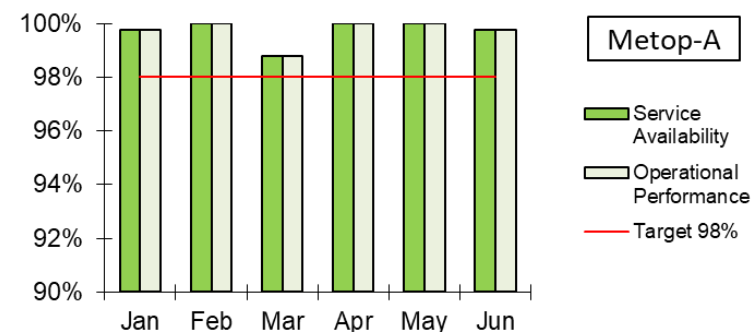
12 March: Metop-A, -B and N19: approx. 8 hours of data impacted by Op. Incident 85 – see [slide 8](#)).

4 & 23 April: N19 data impacted by data transmission problems.

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 and channel 3 is degrading and close to specifications.

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



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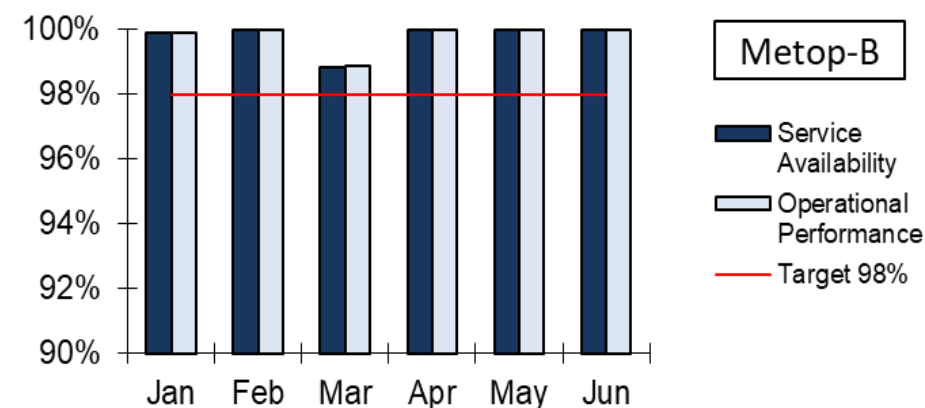
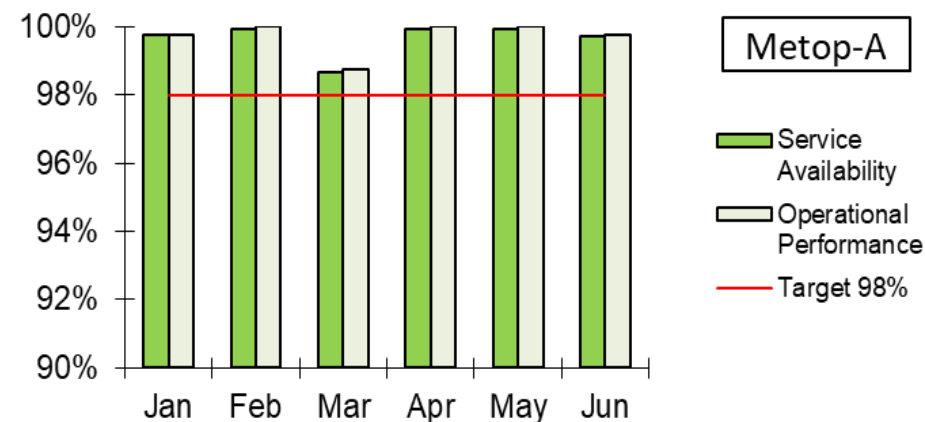
Metop, Suomi-NPP & NOAA GDS → ASCAT Level 1B (SZF) Products

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 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:

12 March: Approx. 9.5 hours of Metop-A and approx. 8 hours of Metop-B data impacted by Op. Incident 85 – see [slide 8](#).



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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.

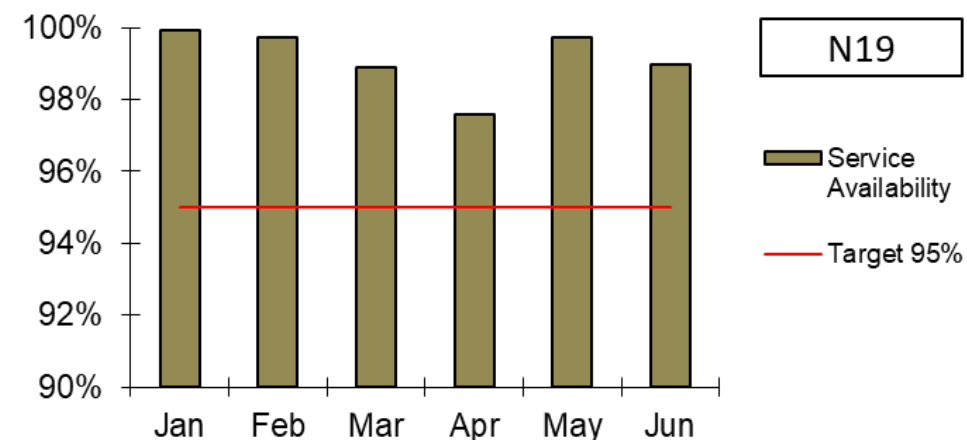
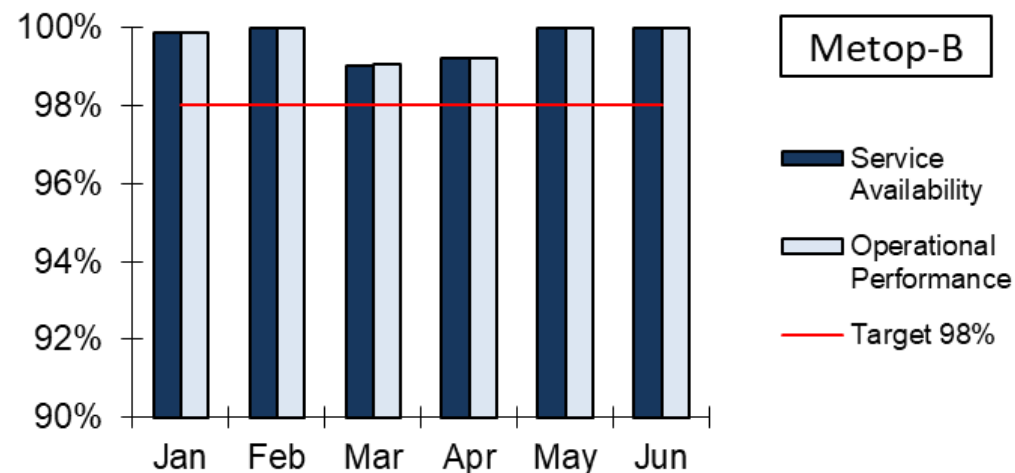
Performance of the Level 2 service is measured in terms of the timely availability of the BUFR-encoded products received on the EUMETCast reference user station (US).

Events which impacted availability:

12 March: Approx. 7 hours of Metop-B and approx. 8 hours of N19 data impacted by Op. Incident 85 – see [slide 8](#).

4 & 23 April: N19 data impacted by data transmission problems.

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



EUMETSAT Central Operations Report for January - June 2019

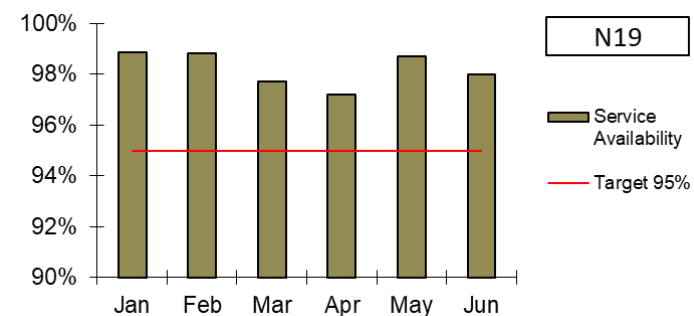
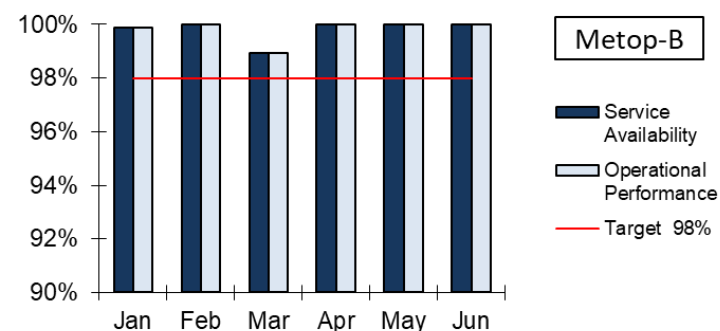
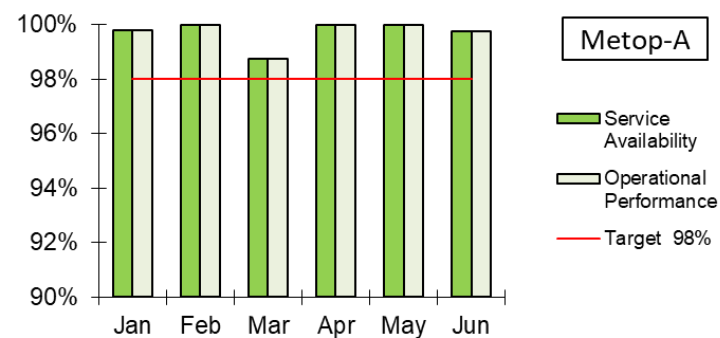
Metop, Suomi-NPP & NOAA GDS → AVHRR Level 1B Products

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:

12 March: Approx. 9 hours of Metop-A and N19, and approx. 8 hours of Metop-B data impacted by Op. Incident 85 – see [slide 8](#).

4 & 23 April: N19 data impacted by data transmission problems.



EUMETSAT Central Operations Report for January - June 2019

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

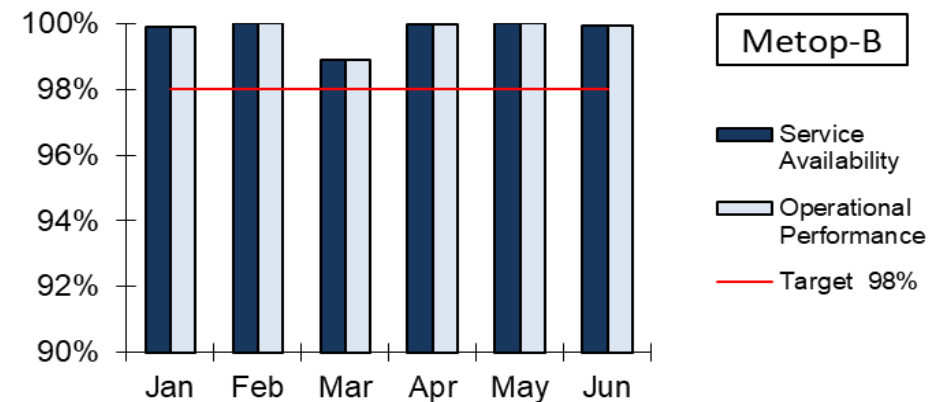
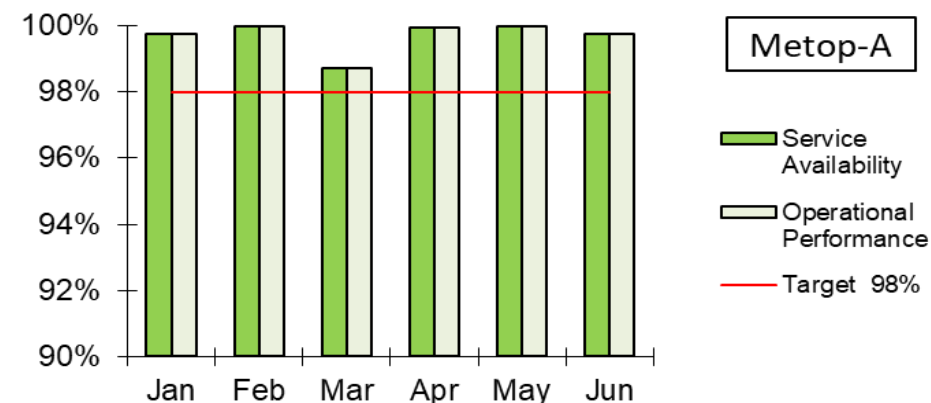
The Global Ozone Monitoring Experiment-2 (GOME-2) is a scanning spectrometer used to measure profiles and total columns of atmospheric ozone and other trace gases.

Events which impacted availability:

12 March: Approx. 9 hours of Metop-A and approx. 8 hours of Metop-B data impacted by Op. Incident 85 – see [slide 8](#).

GOME-2 on Metop-B suffers degradation of throughput which is 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 are continually 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.



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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:

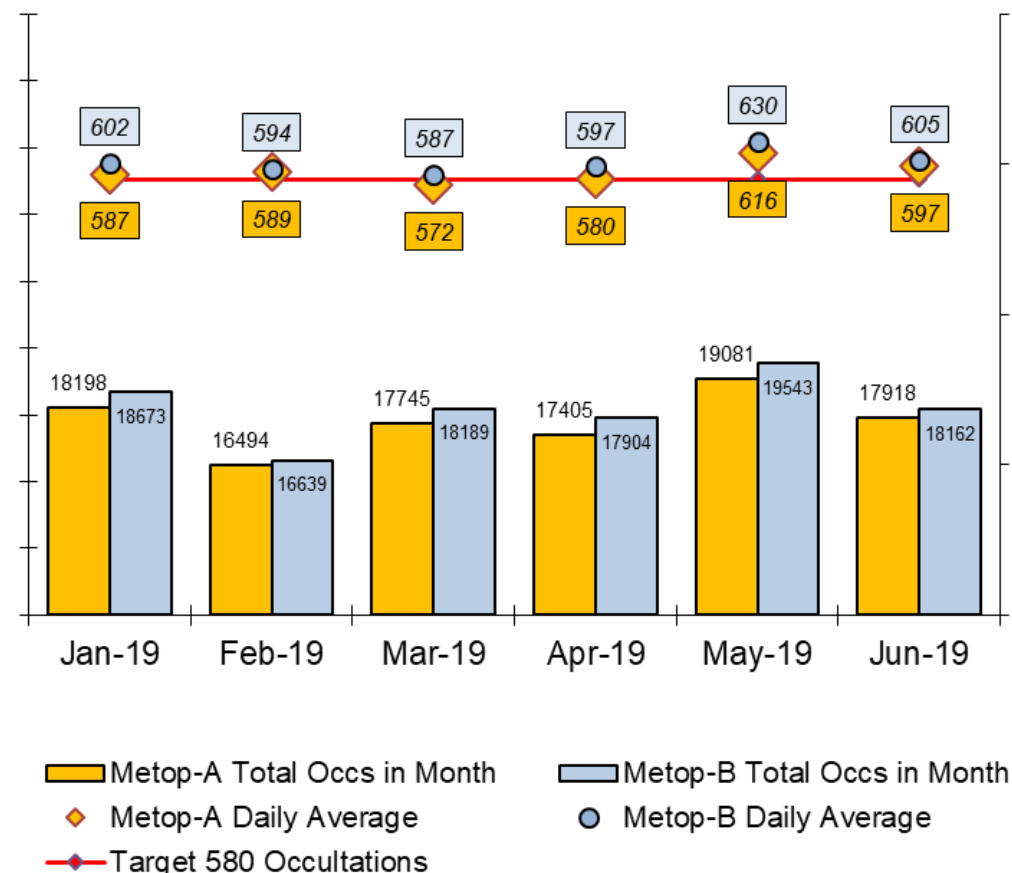
- (1) the total numbers of GRAS Level 1B occultations (plus geolocation and quality flags) from Metop-A and Metop-B disseminated via EUMETCast
- (2) the daily average number of occultations from each Metop provided to users (numbers in italics)

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

Events which impacted availability:

- 12 March:** Approx. 5 hours of Metop-A and Metop-B data impacted by Op. Incident 85 – see [slide 8](#).
- 22/23 April:** Approx. 11 hours of Metop-A and Metop-B data impacted by a ground segment data transfer problem.

Note: The number of occultations is dependent on the number of GPS navigation satellites in view but also on various orbital factors.



EUMETSAT Central Operations Report for January - June 2019

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.

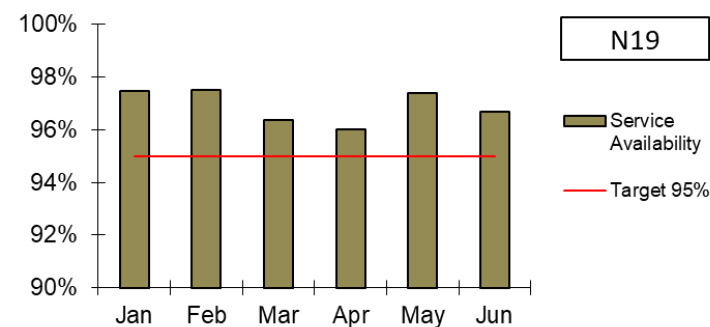
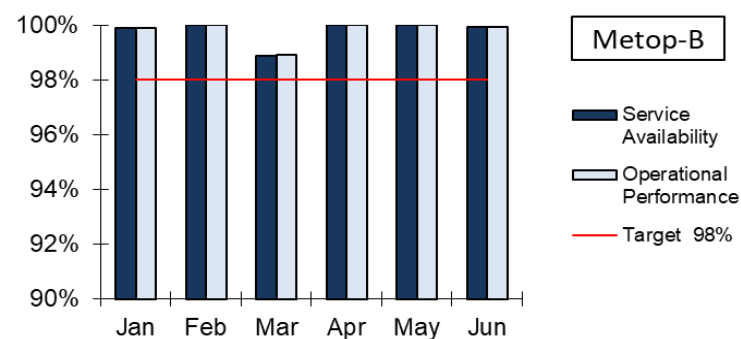
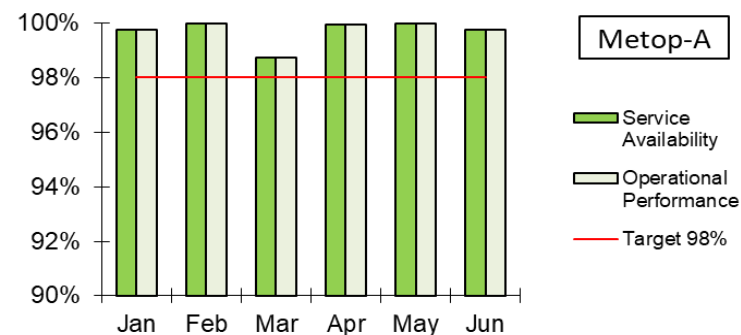
Events which impacted availability:

12 March: Approx. 9 hours of Metop-A and N19, and approx. 8 hours of Metop-B data impacted by Op. Incident 85 – see [slide 8](#).

4 & 23 April: N19 data impacted by data transmission problems.

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 Central Operations Report for January - June 2019

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.

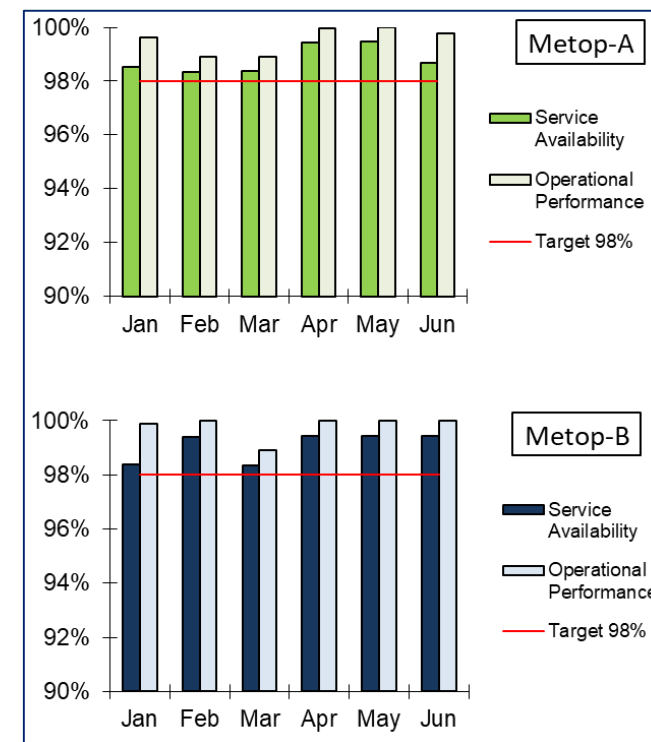
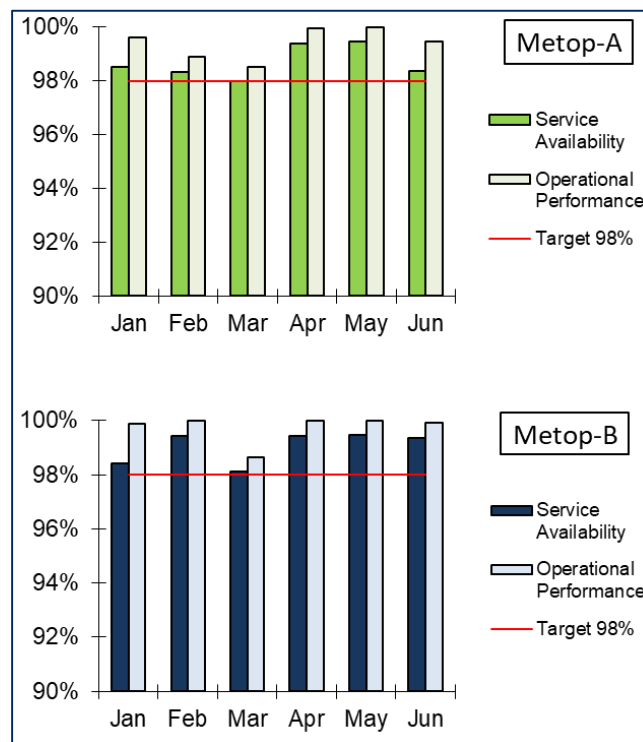
Events which impacted availability:

January: Both Metops: Extensive external calibration activity

25-Feb: Metop-A: approx. 7.5 hours of L1 and L2 data IASI Standby Refuse Mode

12 March: Approx. 11 hours of L1 data and 8 hours of L2 for both Metop-A and Metop-B impacted by Op. Incident 85 – see [slide 8](#).

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.



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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.

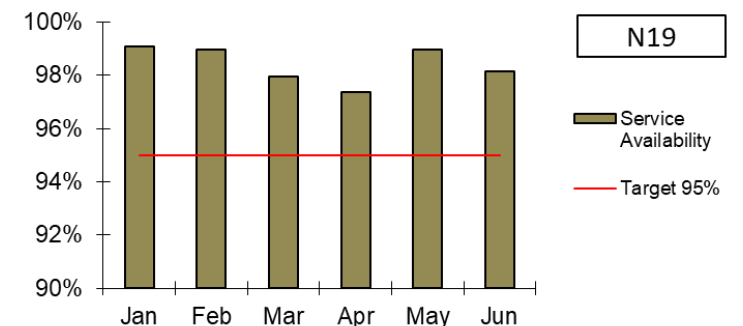
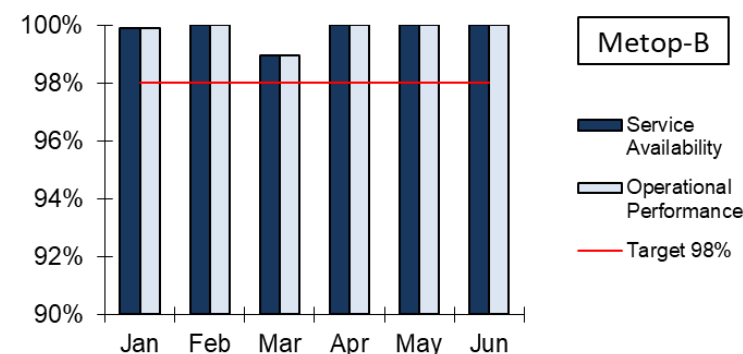
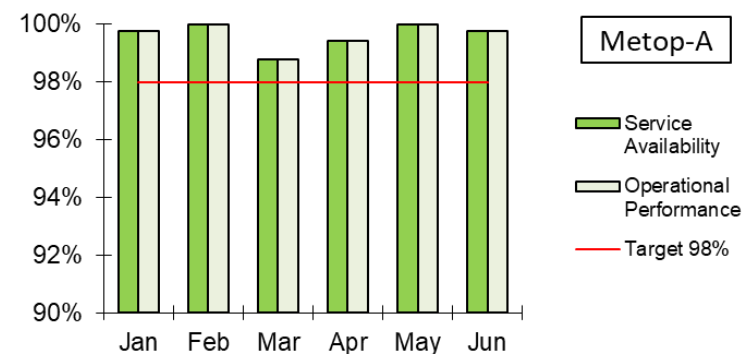
Events which impacted availability:

12 March: Approx. 8 hours of Metop-A, 7 hours of Metop-B and 10 hours of N19 data impacted by Op. Incident 85 – see [slide 8](#).

4 & 23 April: N19 data impacted by data transmission problems.

Notes on latest instrument status:

- NOAA-19 MHS: channel 3 remains out of spec.
- Metop-A MHS: channel 2 out of spec since 15-April-2019 with a trend of further degradation.
- Metop-B MHS: all channels within spec.



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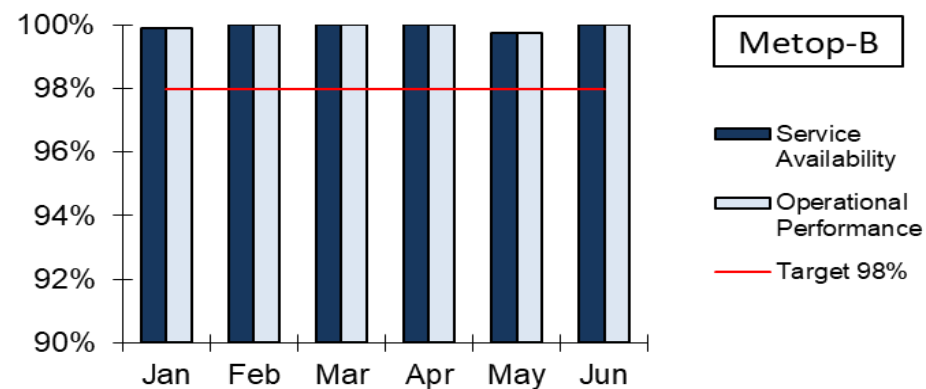
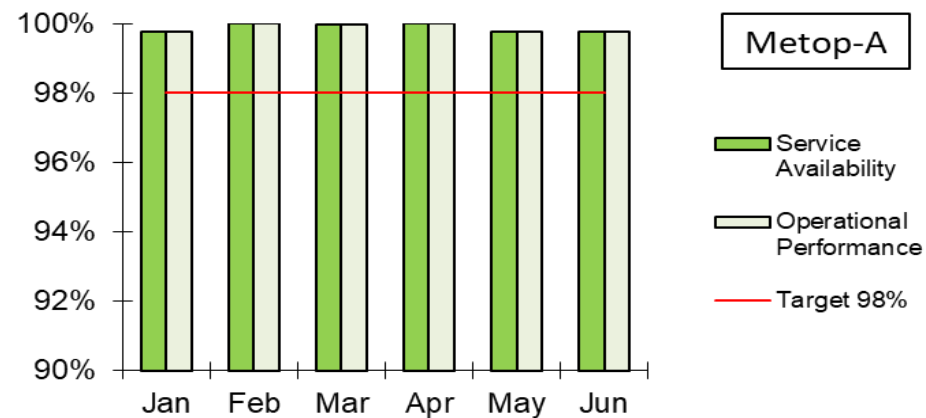
Metop, Suomi-NPP & NOAA GDS → SEM Level 0 Data

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.



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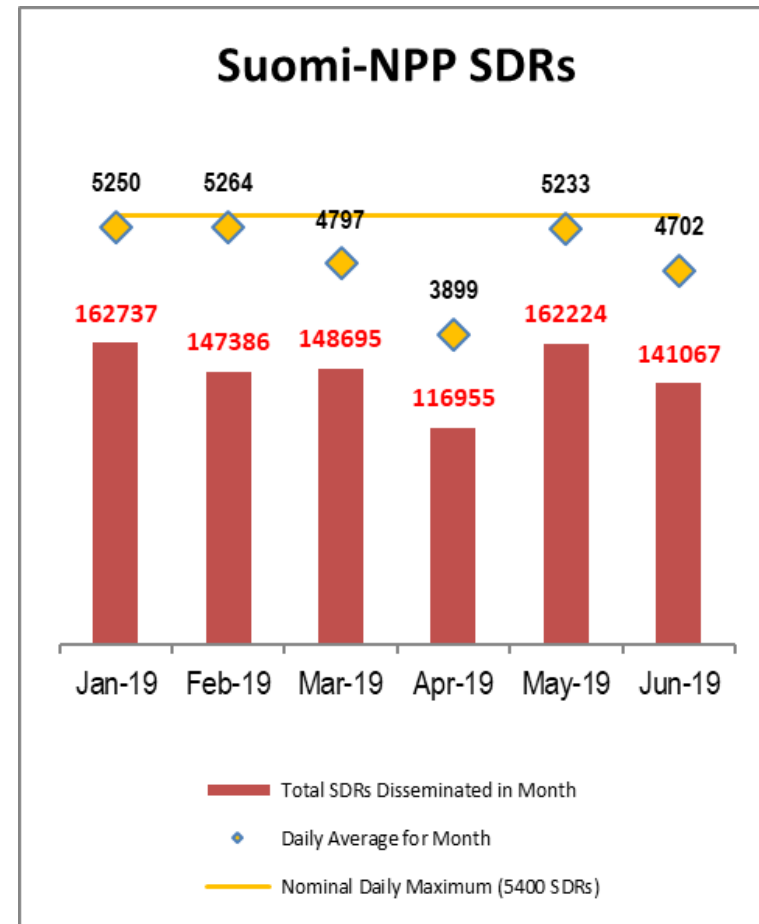
Metop, Suomi-NPP & NOAA GDS → Suomi-NPP Sensor Data Records

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:

26 March - 16 April: Data outage due to instrument anomaly; after recovery, midwave channels were not available.

26 June onwards: Planned outage for instrument maintenance, in order to recover from the midwave signal processor failure.



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.

Note: trial dissemination of Metop-C data is ongoing and is expected to become operational in September 2019. At that point, EARS service reporting will then include Metop-C data as appropriate for the instruments concerned.

EUMETSAT Central Operations Report for January - June 2019

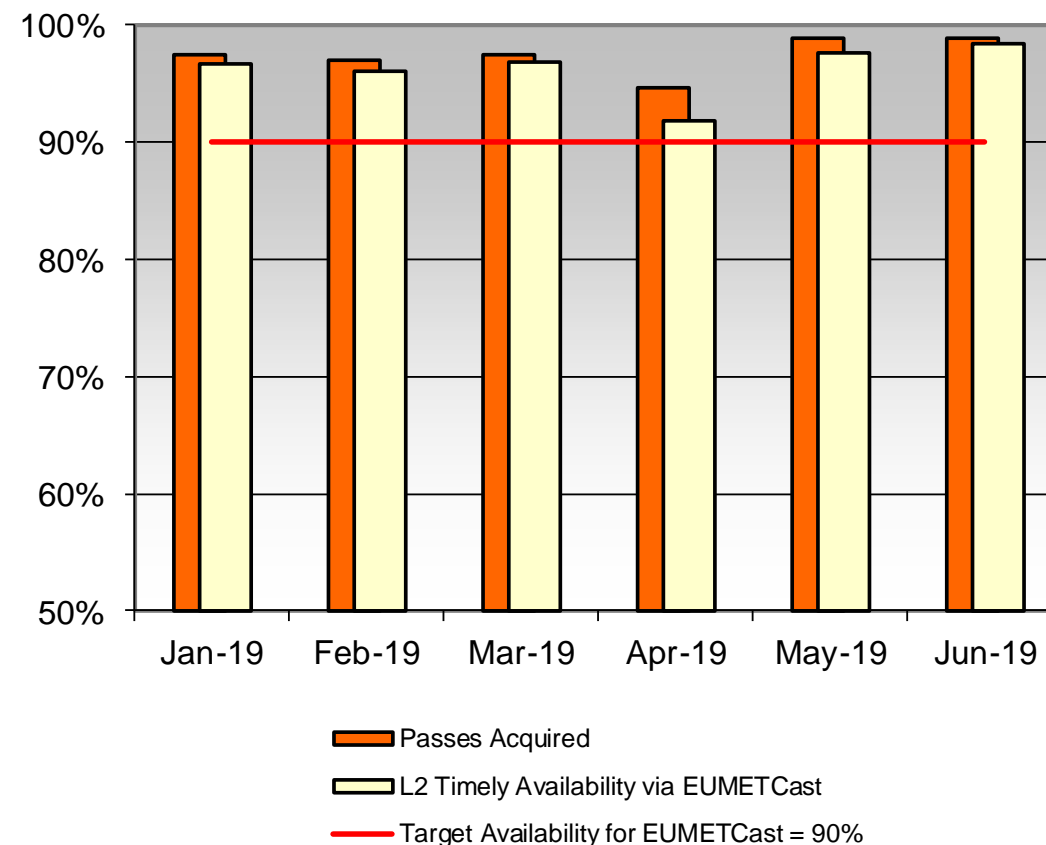
Regional Data Services → EARS-ASCAT

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:

April: Availability impacted by outages of several days at Muscat and Novosibirsk stations.



EUMETSAT Central Operations Report for January - June 2019

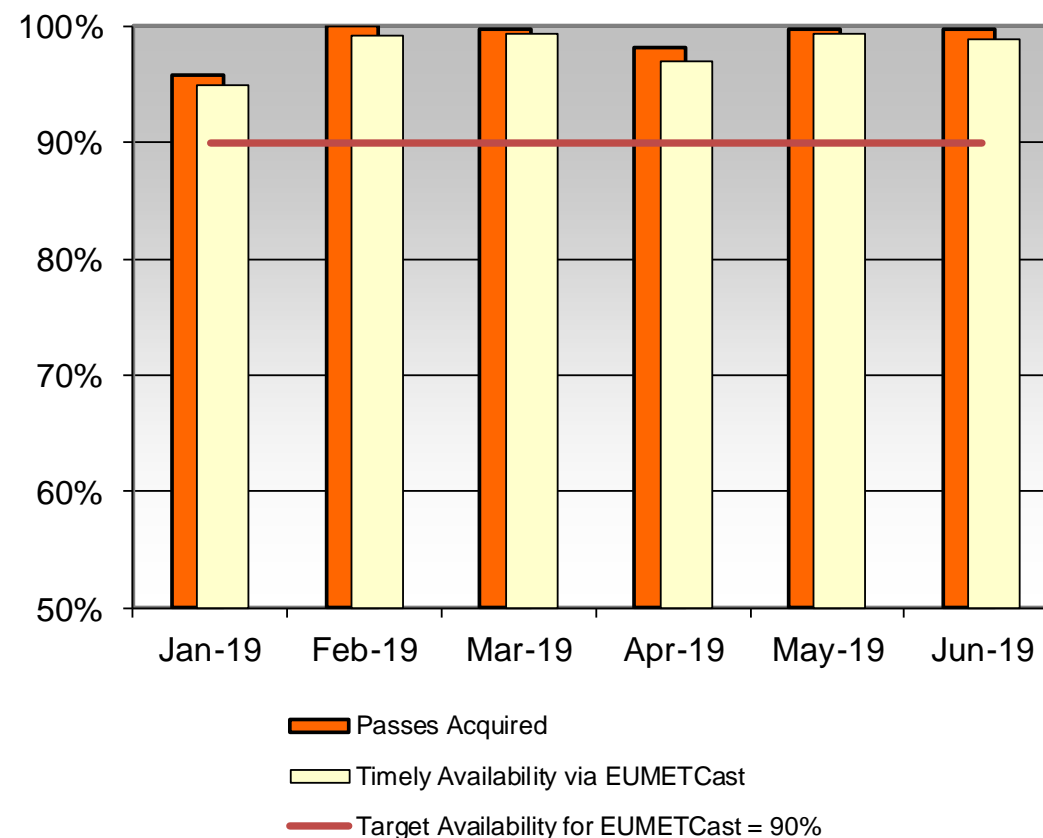
Regional Data Services → EARS-ATMS

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.



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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-19 and NOAA-18. 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.

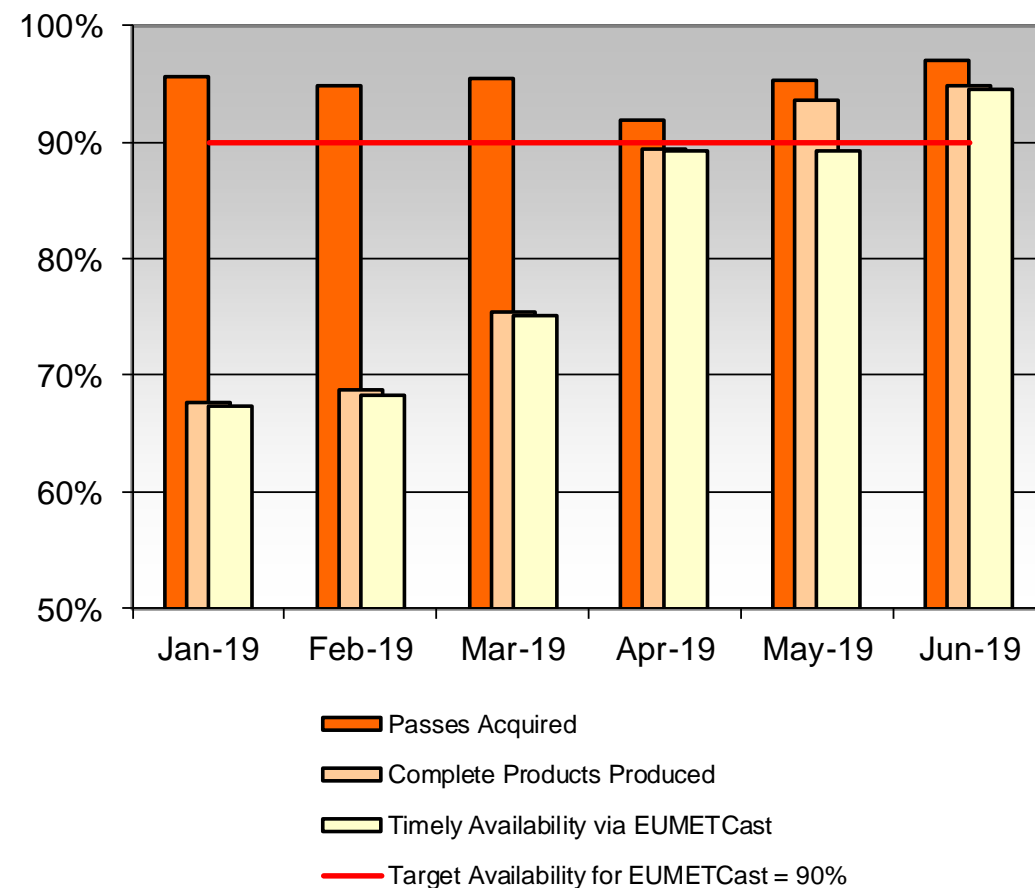
Events which impacted availability:

Jan - April: (1) Degraded NOAA-18 MHS data (excluded from statistics in late March)

(2) Gander station system problems.

April: Availability impacted by outages of several days at Muscat, Novosibirsk and Kangerlussuaq stations.

May: Various periods of outage for Monterey, Miami, Wallops, Ford Island and Gilmore Creek stations.



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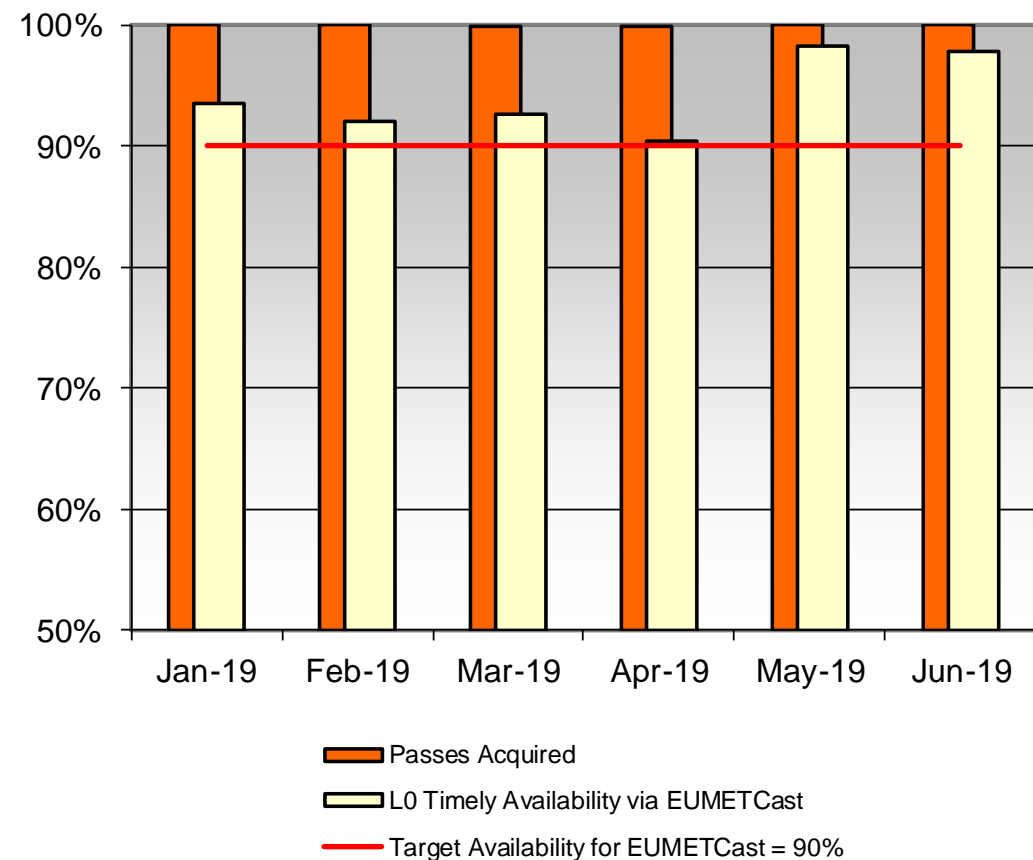
Regional Data Services → EARS-AVHRR

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:

Jan - April: Availability impacted by Gander station system problems.



EUMETSAT Central Operations Report for January - June 2019

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.

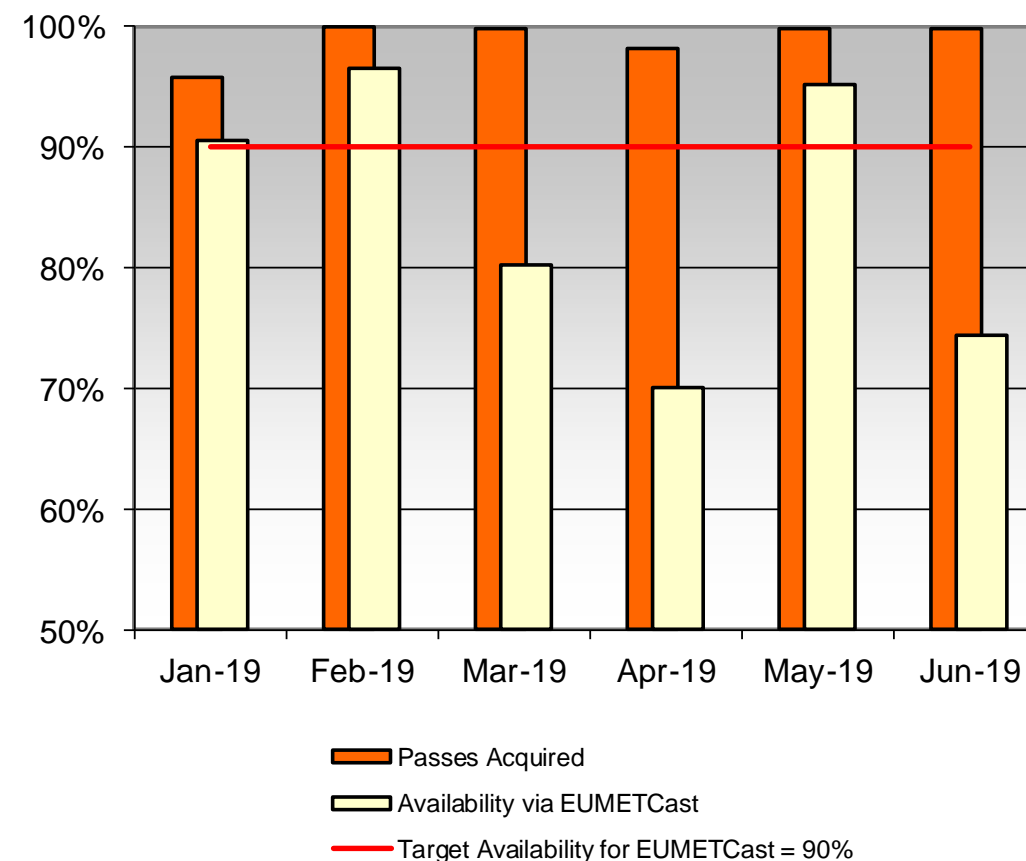
Availability shown on the chart is that of the BUFR-formatted SDRs received by users (relative to scheduled passes).

Events which impacted availability:

January: No data from the Moscow station in the first 10 days of the month.

26 March - 16 April: Data outage due to instrument anomaly; after recovery, midwave channels were not available.

26 June onwards: Planned outage for instrument maintenance, in order to recover from the midwave signal processor failure.



EUMETSAT Central Operations Report for January - June 2019

Regional Data Services → EARS-IASI

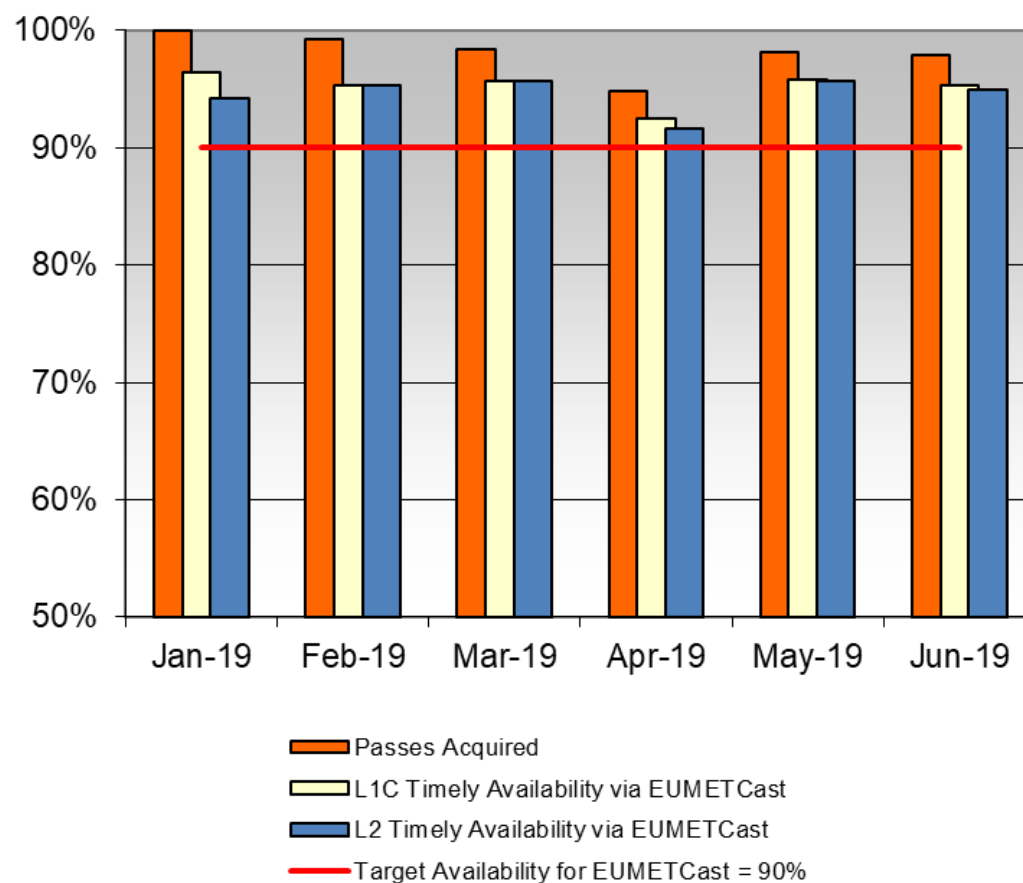
This service provides products derived from the data produced by the IASI instruments onboard the Metop-A and B satellites.

Availability shown on the chart is that of the Level 1C and (as of 2018/H2) L2 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:

27-29 April: No data from the Kangerlussuaq station due to an antenna problem.

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



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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.

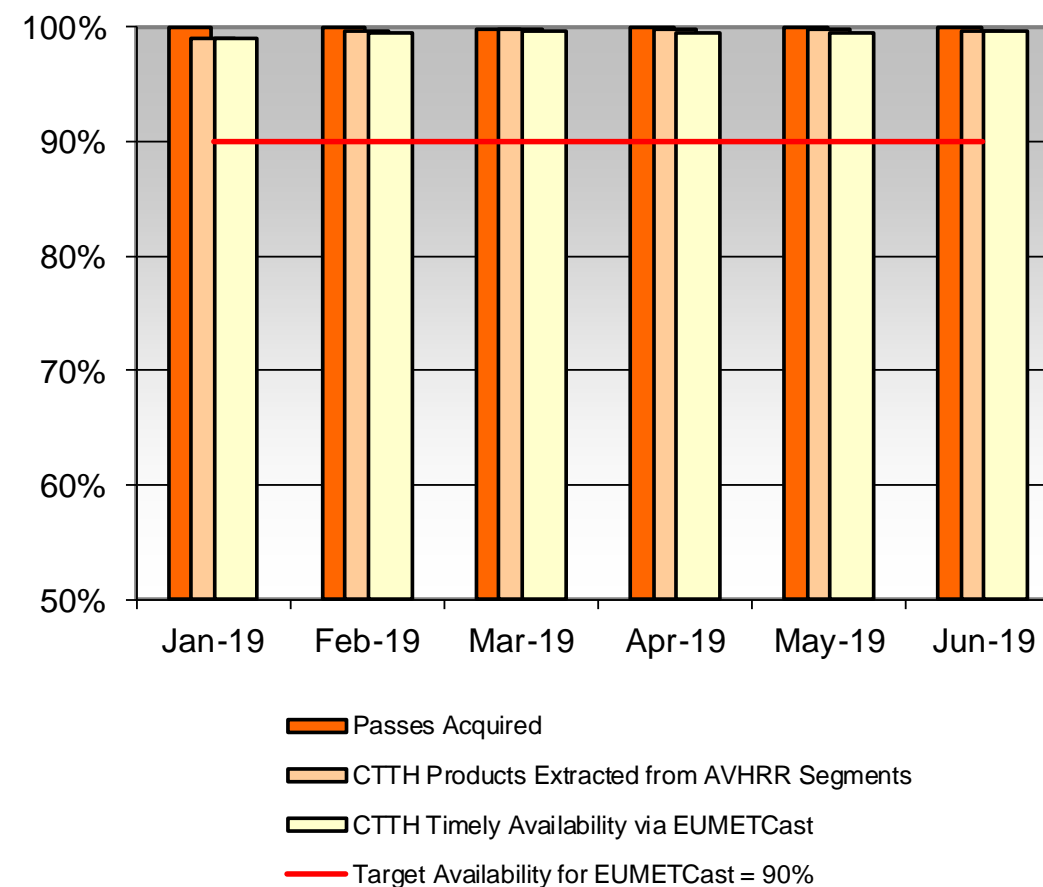
Three types of product are delivered:

- 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:

None significant.



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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).

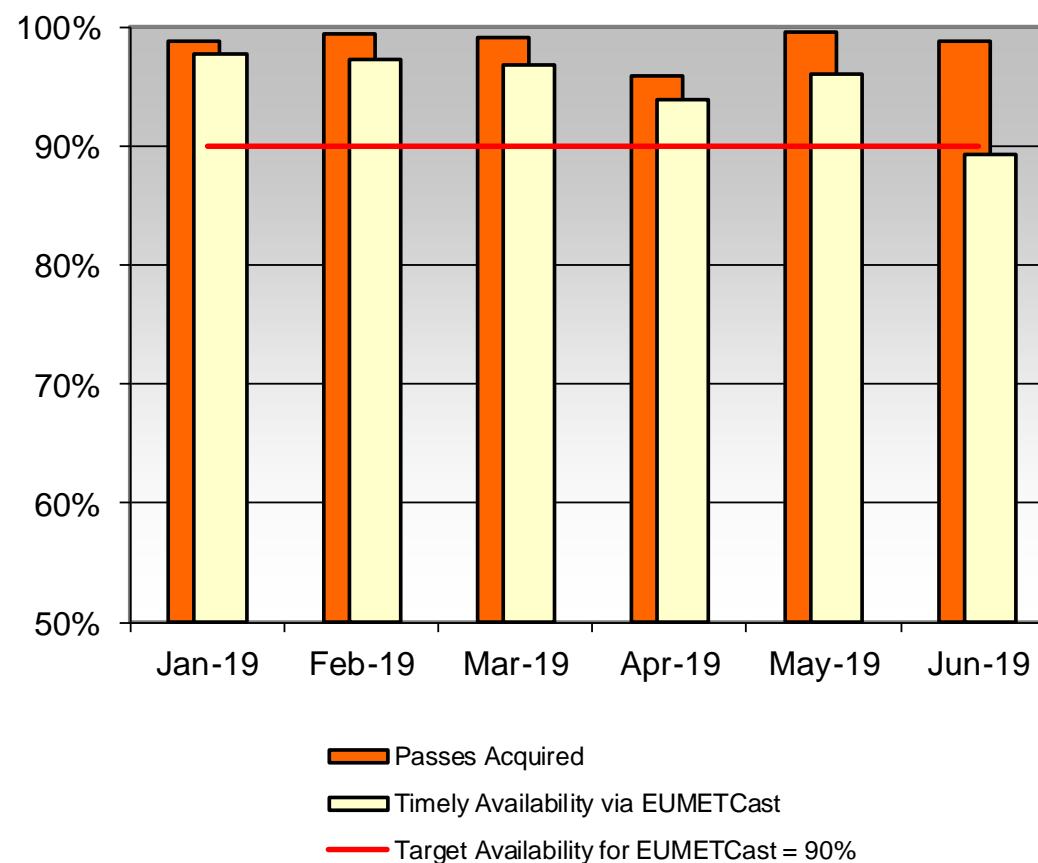
Availability shown on the chart is that of the BUFR-formatted L1B data relayed via EUMETCast.

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

Events which impacted availability:

27-29 April: No data from the Kangerlussuaq station due to an antenna problem.

June: Some FY-3C data not processed due to outdated antenna-pointing information.



EUMETSAT Central Operations Report for January - June 2019

Regional Data Services → EARS-VIIRS

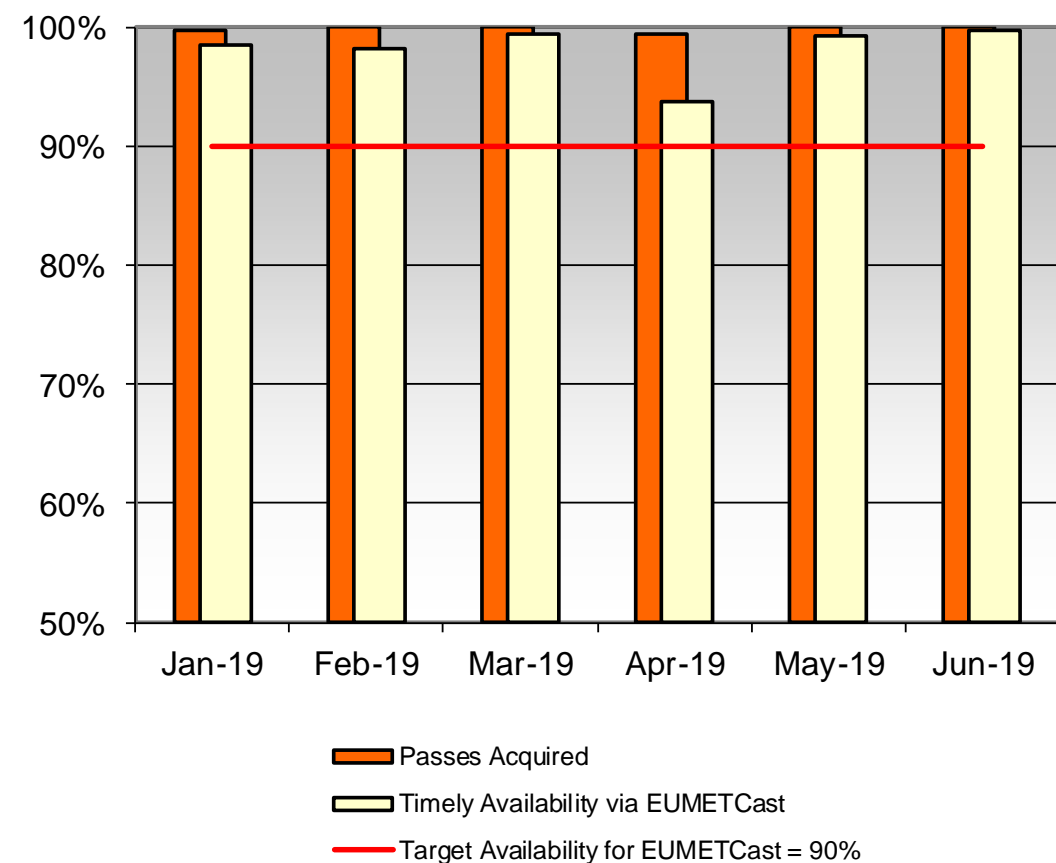
This service delivers products based on M-Band data from the Visible Infrared Imaging Radiometer Suite (VIIRS) instrument onboard NASA-NOAA's Suomi-NPP satellite.

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:

27-29 April: No data from the Kangerlussuaq station due to an antenna problem.



Search & Rescue Support

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

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: During the reporting period, SAR coverage was provided as follows:

0°: Meteosat-11 (continuous coverage)

3.5°E: Meteosat-9 (switched off – available as backup)

9.5°E: Meteosat-10 (continuous coverage)

41.5°E: Meteosat-8 (continuous coverage)

Metop: Metop-A and Metop-B have provided full-time SAR support during the reporting period, with only one outage of ~18.25 hours on 14-February for Metop-B, 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 Jason-3 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: A strategy of regular pre-emptive gyro-swapping is now being followed, seen as the best form of anomaly mitigation. This makes use of the observed gyro behaviour where the longer a gyro remains off, the longer it remains functioning when returned to operation. A cycle of ~6 months of operational scanning (which incorporates the pre-emptive gyro swapping strategy), is followed by a rest period of ~3 months. It is hoped that this approach will achieve a level of service availability of around 70% annually.

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.

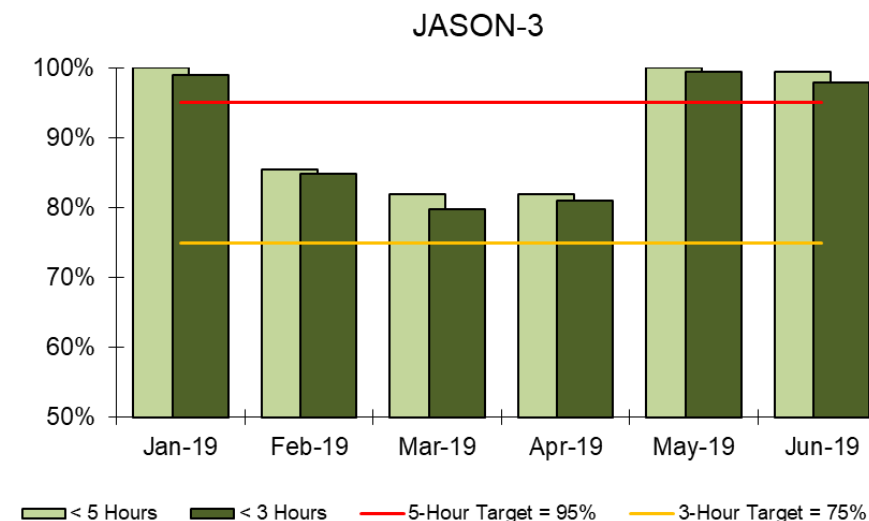
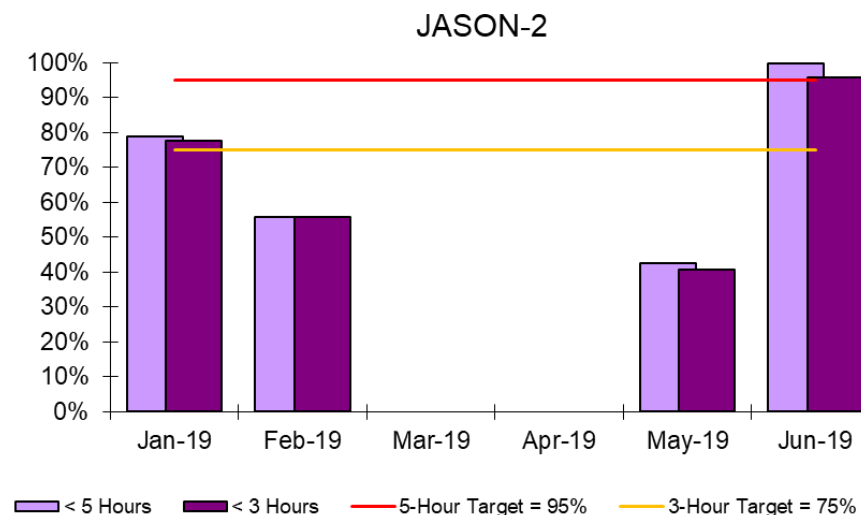
Events which impacted availability:

February: Jason-2: Safe-Hold-Modes on 16- and 19-Feb due to the known gyro anomaly led to the decision to stay in hibernation mode until 22 May. Recovery was then performed, gyros were swapped and OGDR production successfully resumed.

24 Feb: Jason-3: A Safe-Hold Mode was triggered, suspected by an SEU – recovered 6-March.

6 April: Jason-3: Another Safe-Hold Mode triggered by an SEU. Recovery activities successfully completed on 12-April. No permanent damage observed.

Note: In general, redumps are taken at next visibility (or by other ground station) in cases of problematic passes and connection problems – this minimises 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 agreement.

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 as of 14-Feb-2019, GOES-17 ('GOES-West') at 137.2°W
- JMA's Himawari-8 at 140.7°E
- CMA's FY-2G at 105°E (also selected meteorological products). Note that FY-2E was discontinued at the end of 2018.

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.

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Third-Party Data Services → Geostationary Satellite Data & Products (1 of 2)

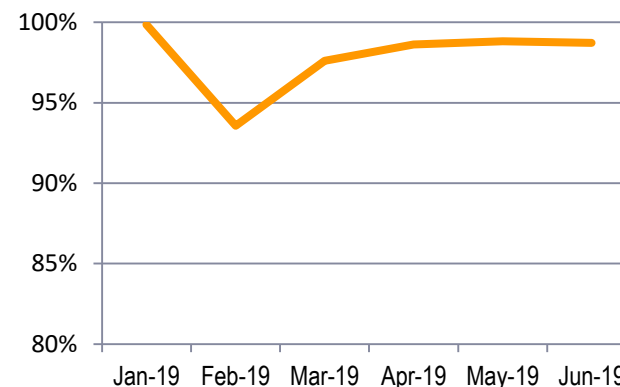
The charts on this slide show the timely availability (as a percentage of expected) of image data originating from the geostationary satellites operated by NOAA and JMA (Japan Meteorological Agency), as disseminated via EUMETCast.

Events which impacted availability:

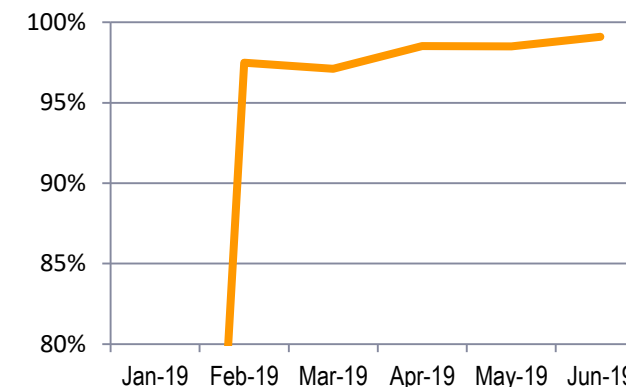
February: GOES-East: eclipse-season effects.

14-Feb: GOES-West: GOES-17 satellite at 137.2°W took over from GOES-15 (was at 135°W) on 12-February, and EUMETSAT commenced relay two days later.

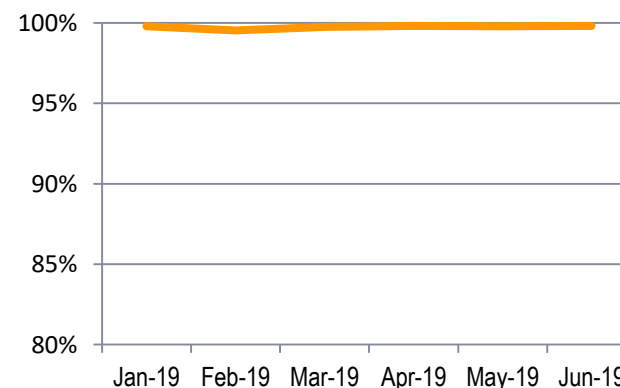
GOES-East (75°W)



GOES-West (137.2°W)



Himawari-8 (140.7°E)



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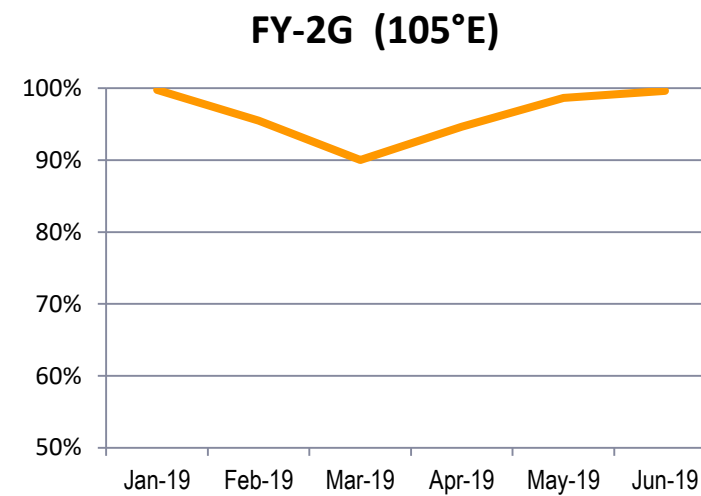
Third-Party Data Services → Geostationary Satellite Data & Products (2 of 2)

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

Events which impacted availability:

March: FY-2G: Fewer products due to eclipse-season

Note that FY-2E was replaced in January by FY-2H. The EUMETSAT service for the latter started on 13-June and availability will be provided in the next issue of this report.



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

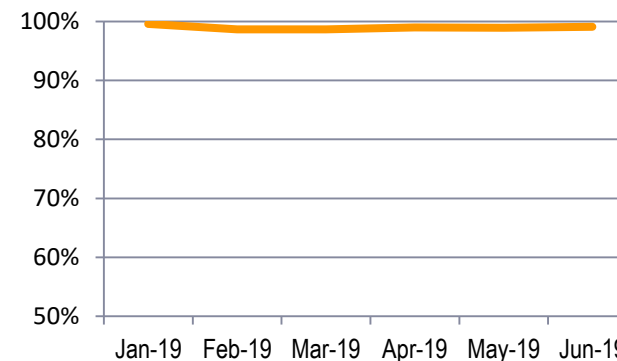
This section presents charts which show the availability of data and products for LEO satellites operated by partner organisations, as disseminated via EUMETCast.

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.

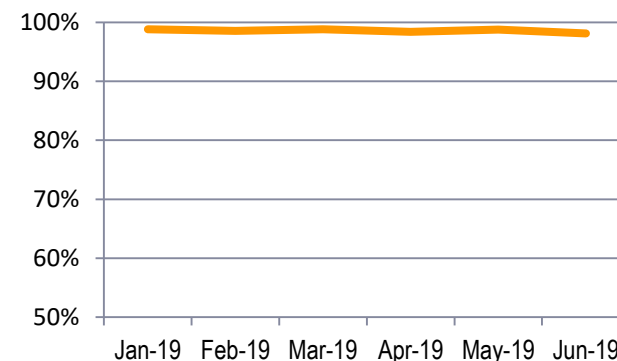
Events Which Impacted Availability:

None significant.

FY-3B Level 1 Data



FY-3C Level 1 Data



EUMETSAT Central Operations Report for January - June 2019

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.

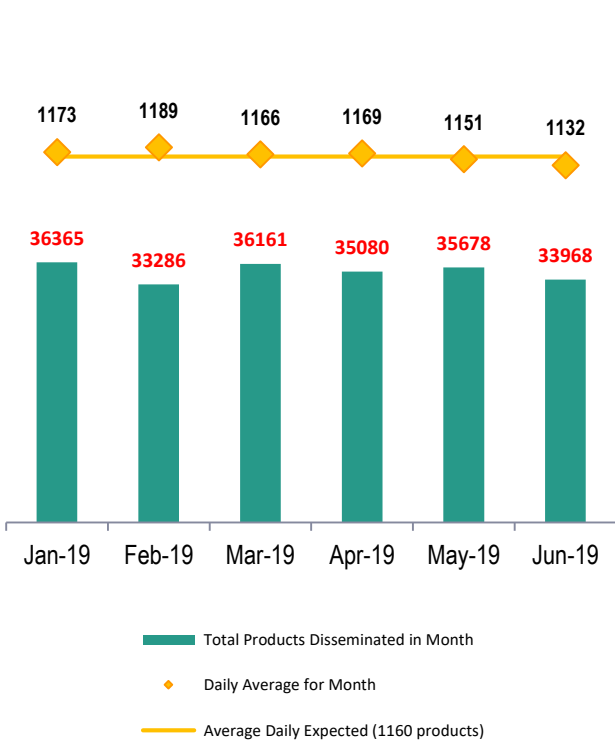
MODIS: Level 1, 2 and 3 regional products derived from the MODIS instruments hosted on NASA's Terra and Aqua LEO satellites.

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.

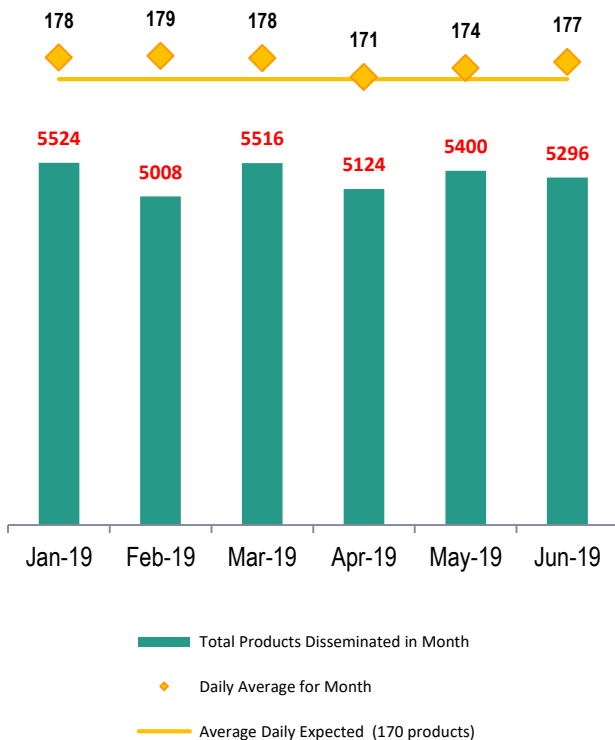
Events which impacted availability:

None significant.

MODIS Products



SSMIS Products



EUMETSAT Central Operations Report for January - June 2019

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.

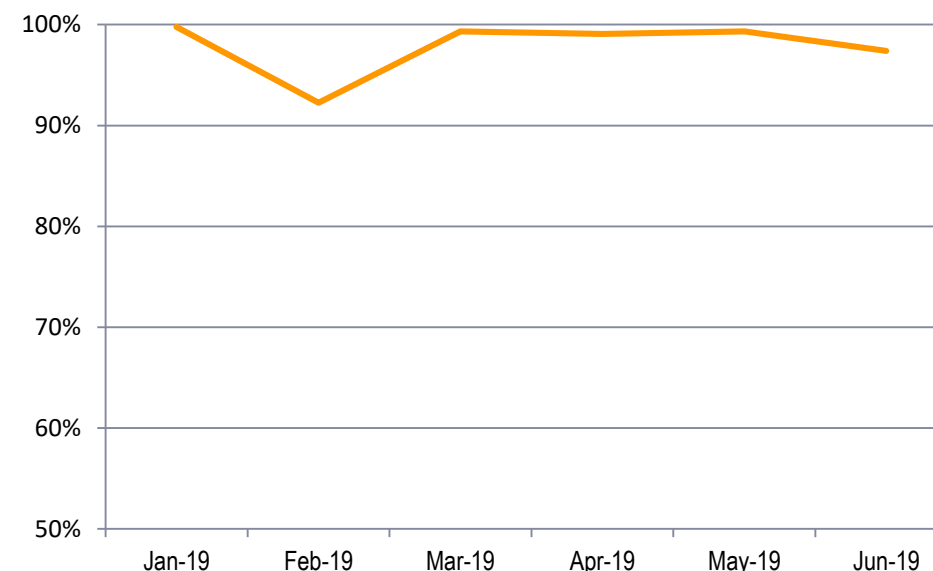
75% of the OGDR products shall be made available to the users within 3 hours from data onboard acquisition and 95% of the products within 5 hours.

Events which impacted availability:

February: A star tracker problem occurred on 3-February which impacted the spacecraft attitude, resulting in intermittent OGDR production outages and bad quality of products.

March: No outage of product generation, but continued bad quality of products until problem was resolved on 28-March.

**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.

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.

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

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

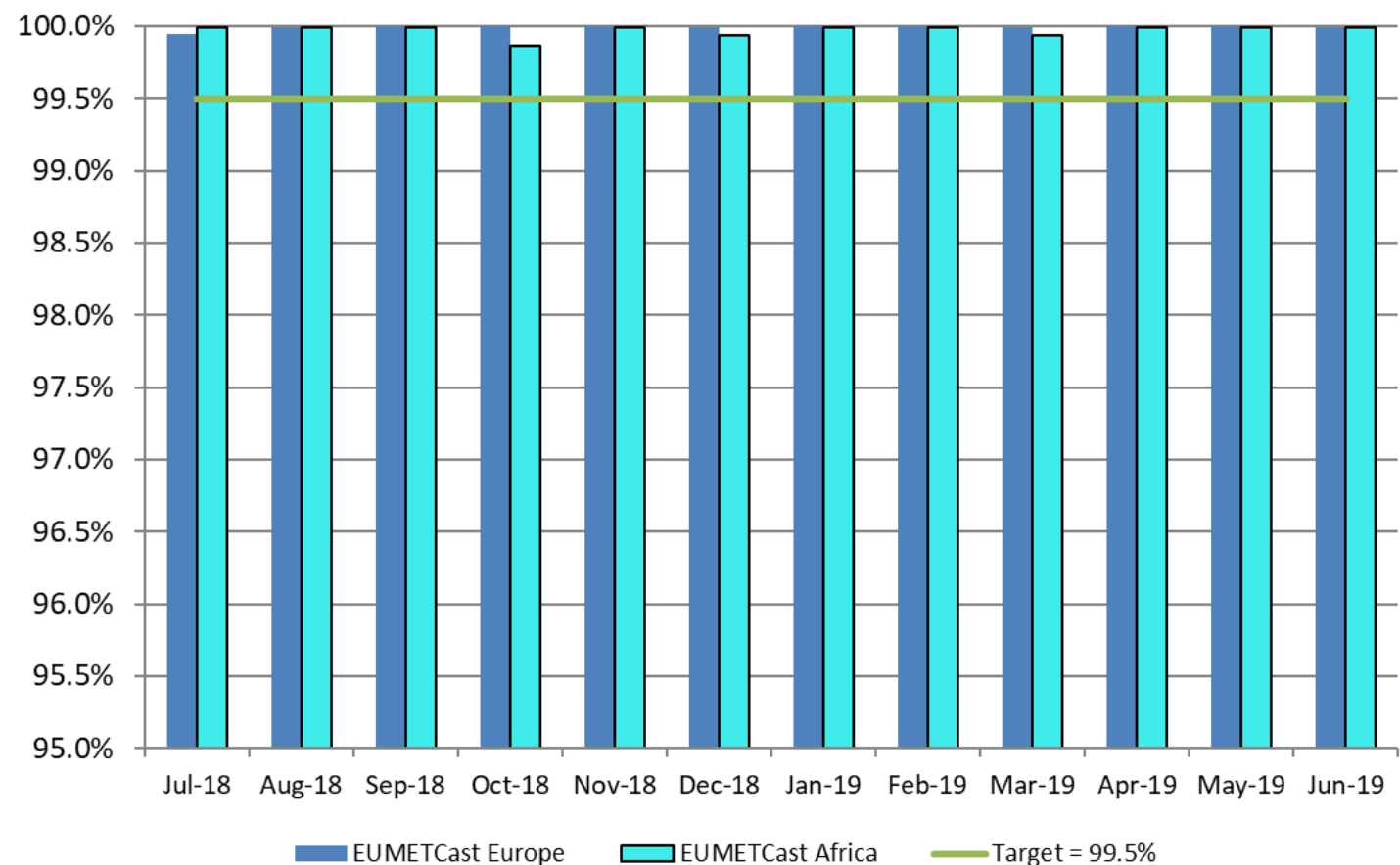
EUMETSAT Central Operations Report for January - June 2019

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.

EUMETCast Africa was migrated to DVB-S2 in August 2018. Performance has been well above-target since its debut, as has the continued good performance of EUMETCast Europe.

Events which impacted availability:
None significant.

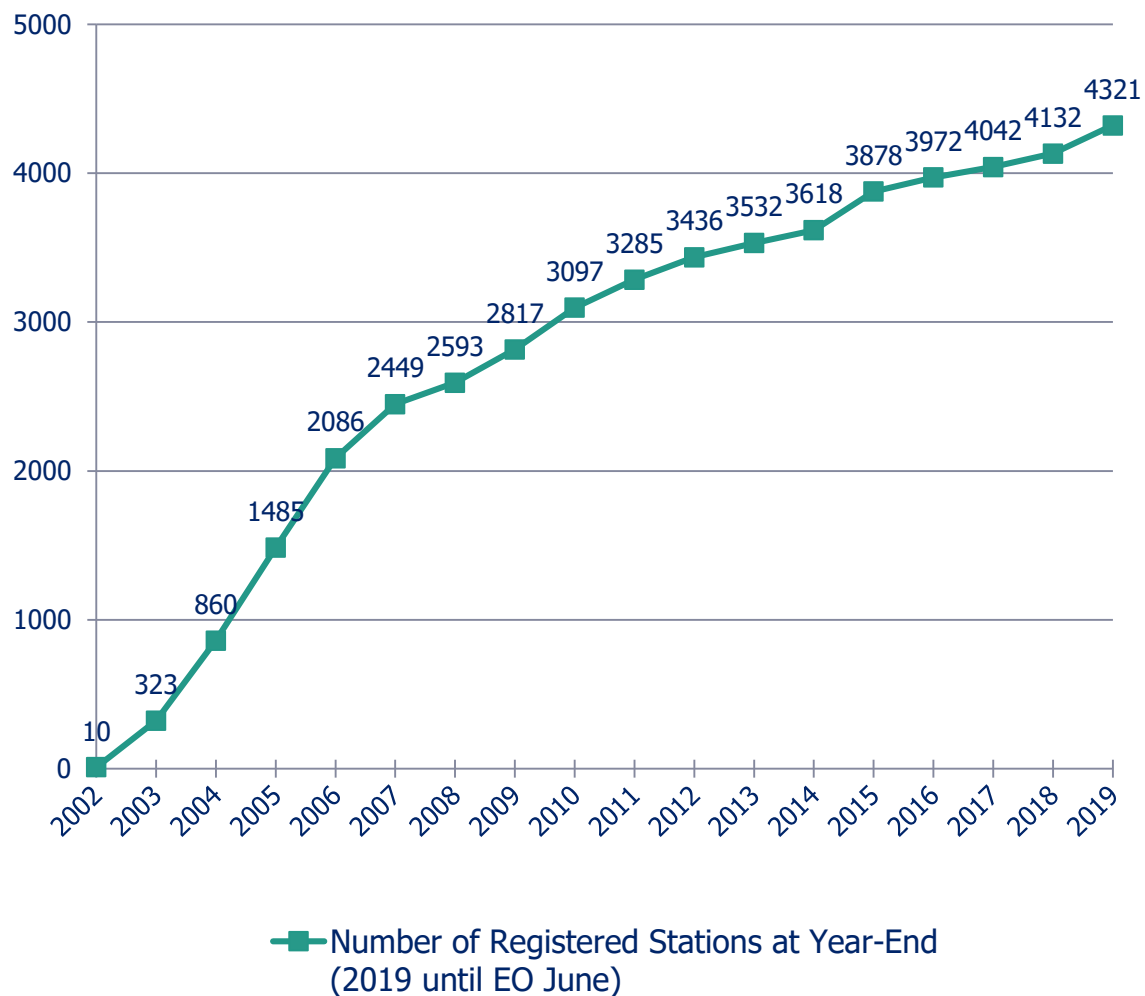


EUMETSAT Central Operations Report for January - June 2019

EUMETCast → Registered User Stations

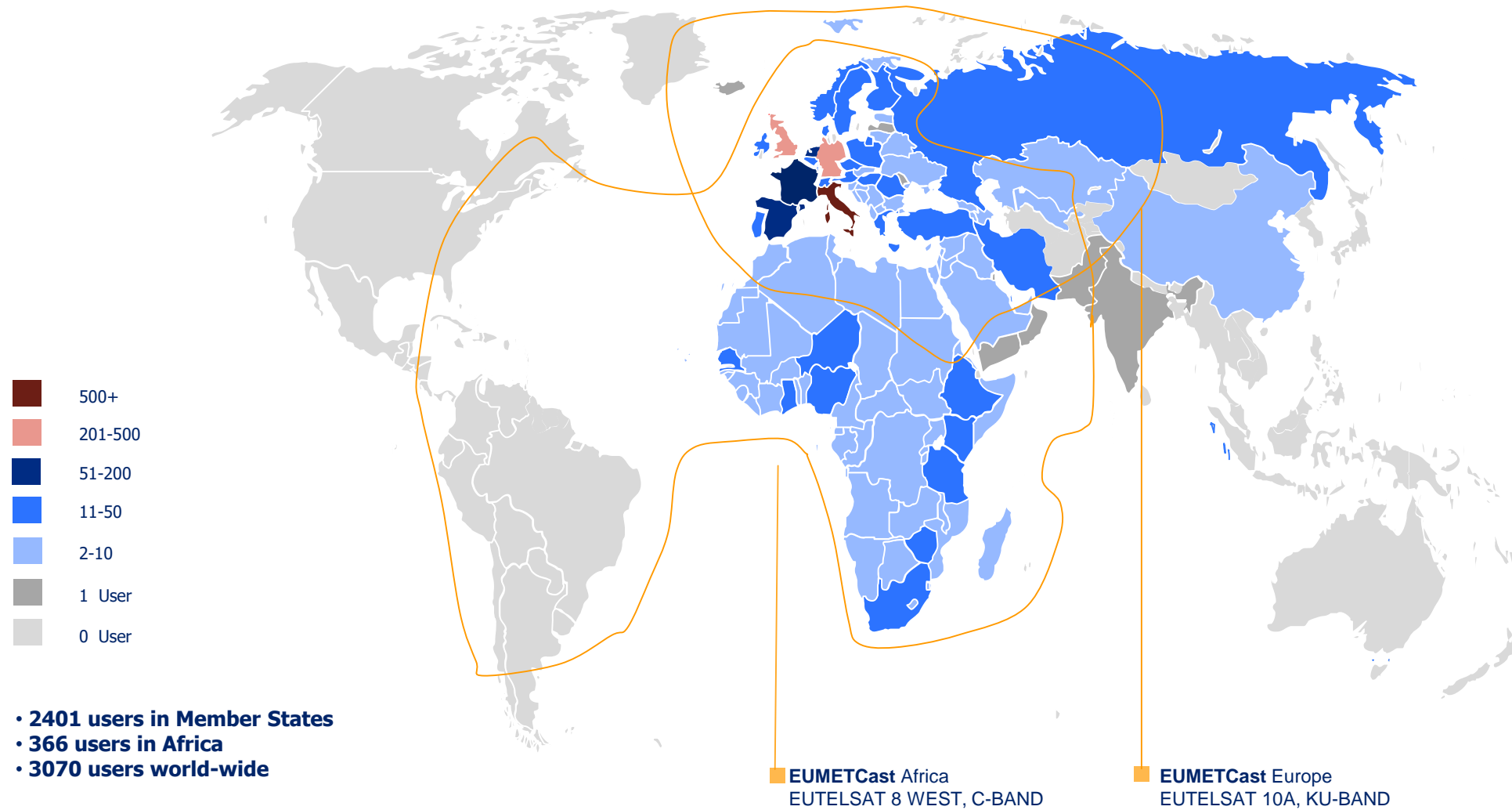
The chart shows the trend of registrations of EUMETCast user stations since the establishment of the system in 2002, up until the end of the reporting period.

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.



EUMETSAT Central Operations Report for January - June 2019

EUMETCast → Users Worldwide as of 30 June 2019



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.

EUMETSAT Central Operations Report for January - June 2019

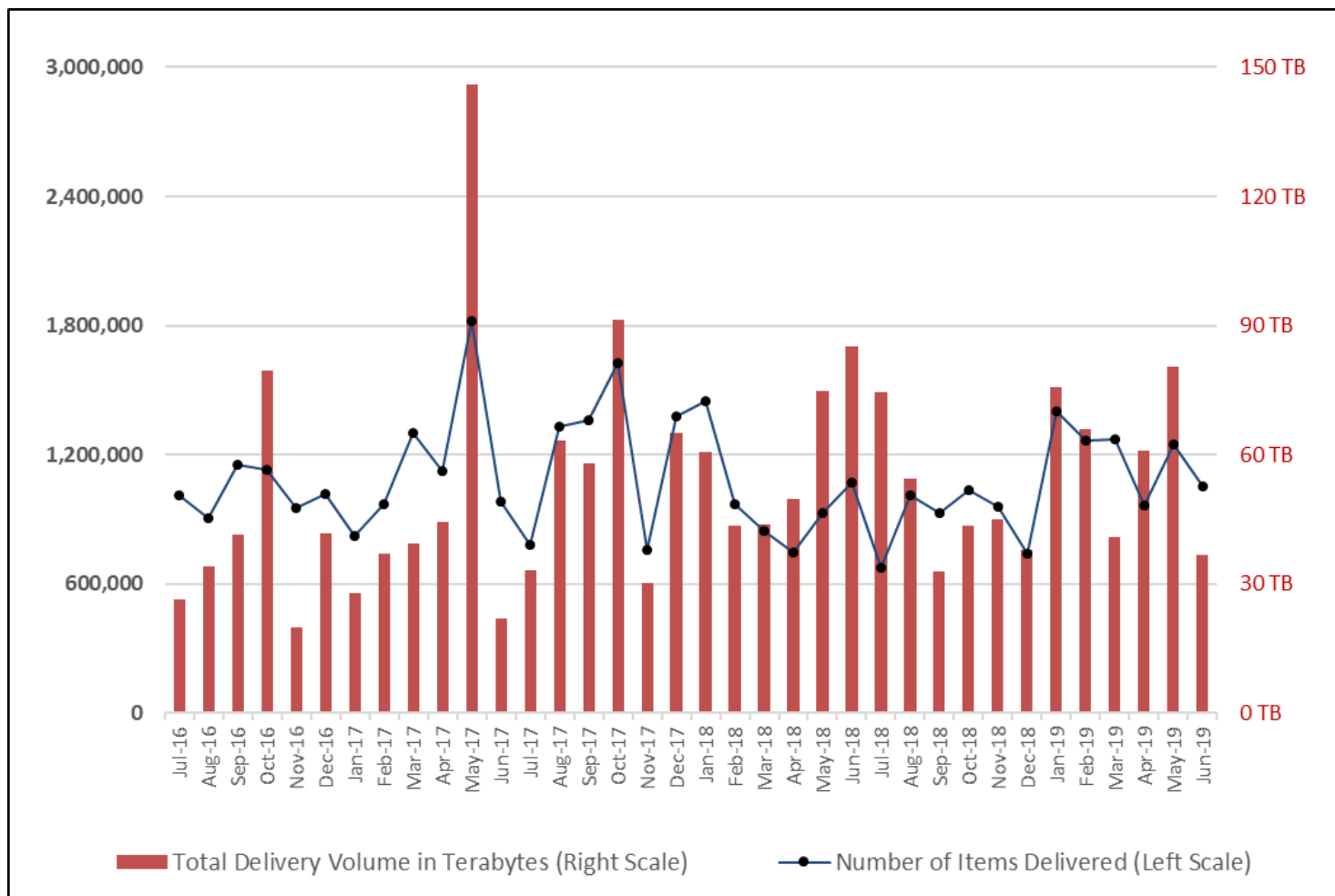
The EUMETSAT Data Centre → Data Delivered: Total Volume versus Items

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 and including June 2019.

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.



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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.

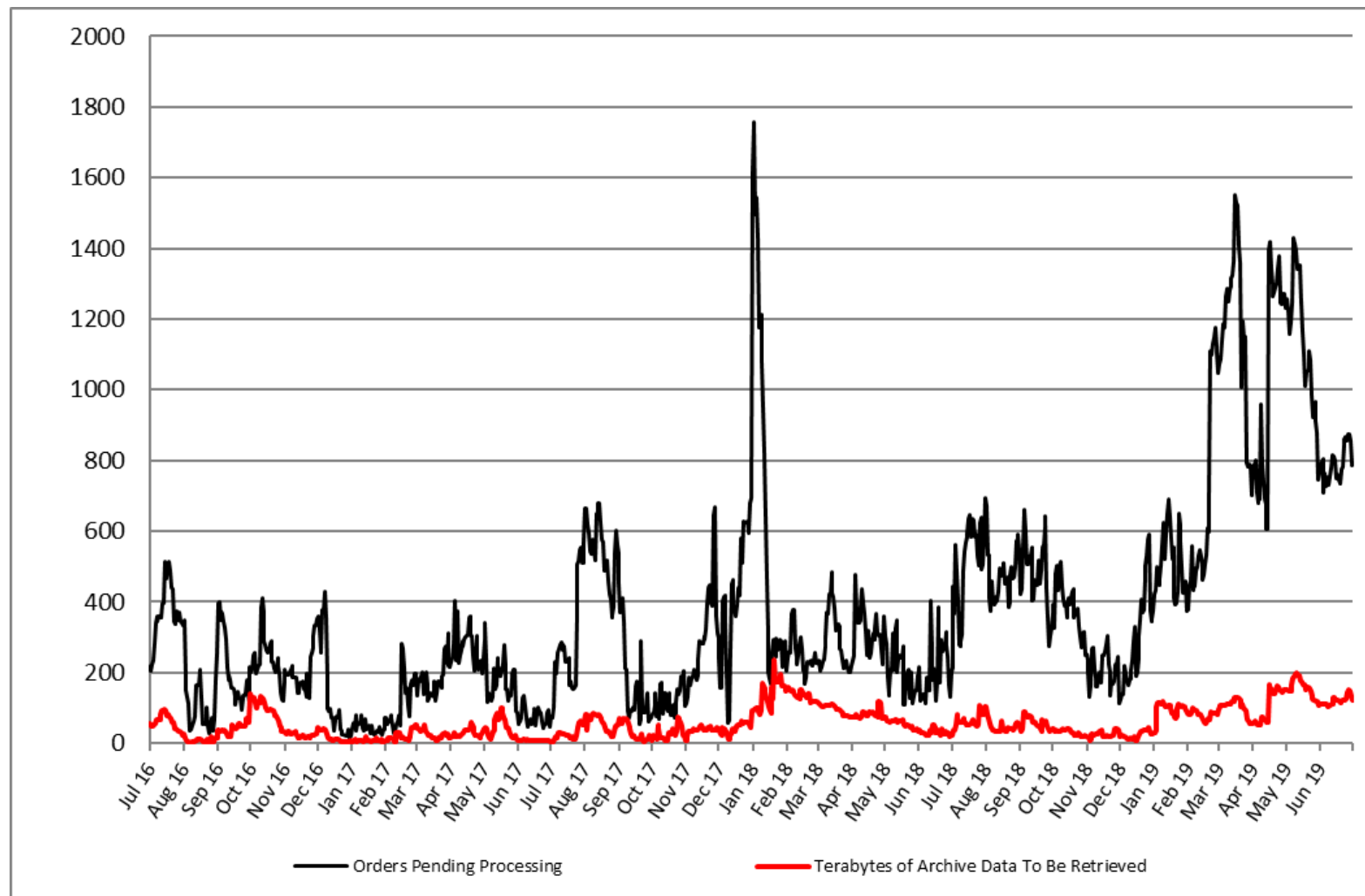
The chart is based on observed daily maximum orders and estimated retrieval volumes which are recorded automatically for each day of the year.

Peak Level of Pending Orders at the end of 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.

High Levels of Pending Orders in the reporting period:

A high number of orders were received in the half-year, and the queuing was compounded by a software problem which caused orders to be temporarily suspended in the period Jan – May 2019.



EUMETSAT Central Operations Report for January - June 2019

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).

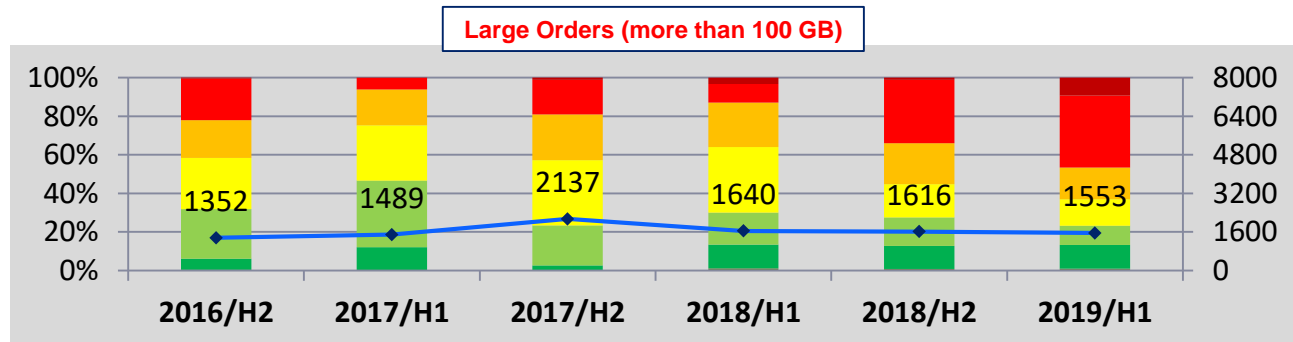
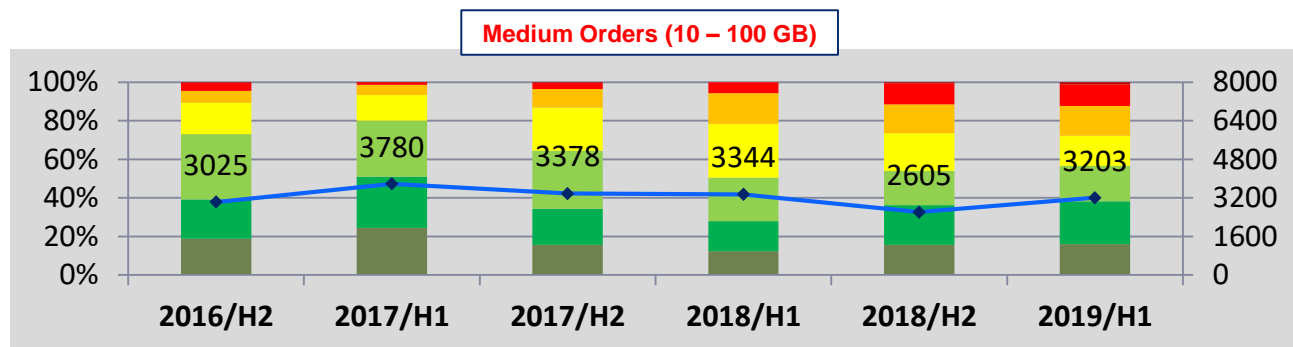
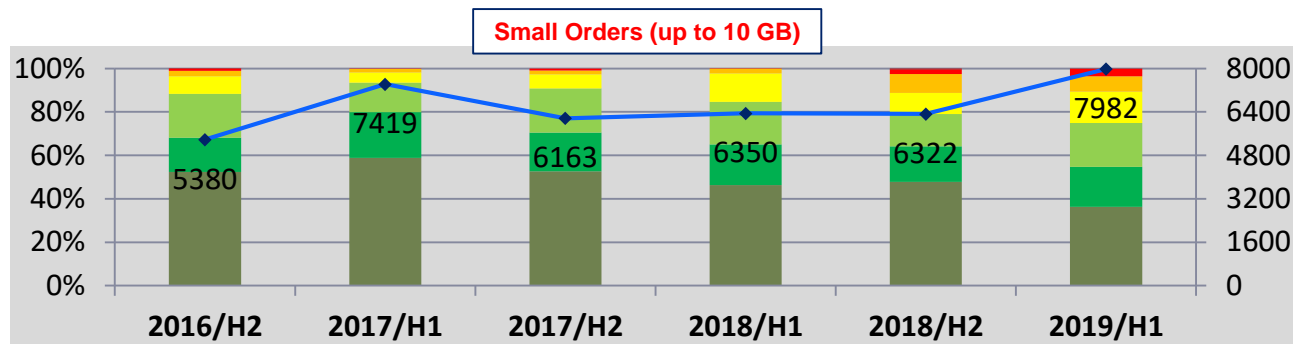
The colour-coding for the delivery-time bands on each of vertical bars on each chart is as follows:



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

Total orders across all 3 categories of order-size were:

2016/H2: 9757	2017/H1: 12688
2017/H2: 11678	2018/H1: 11334
2018/H2: 10543	2019/H1: 12738



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 Central Operations Report for January - June 2019

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 2019/H1:

- Metop A/B MHS, S-NPP ATMS, FY-3A/B MWHS-1, FY-3C MWHS-2 Microwave Sounder FCDRs
- Metop A/B AVHRR Global and Polar AMV TCDRs
- Metop A/B IASI L2 TCDR for temperature and humidity profiles
- Meteosat 8 and 9 surface albedo TCDR
- Meteosat 2-10 ASR, CSR, CLA and AMV TCDR

Previously produced, pending publication:

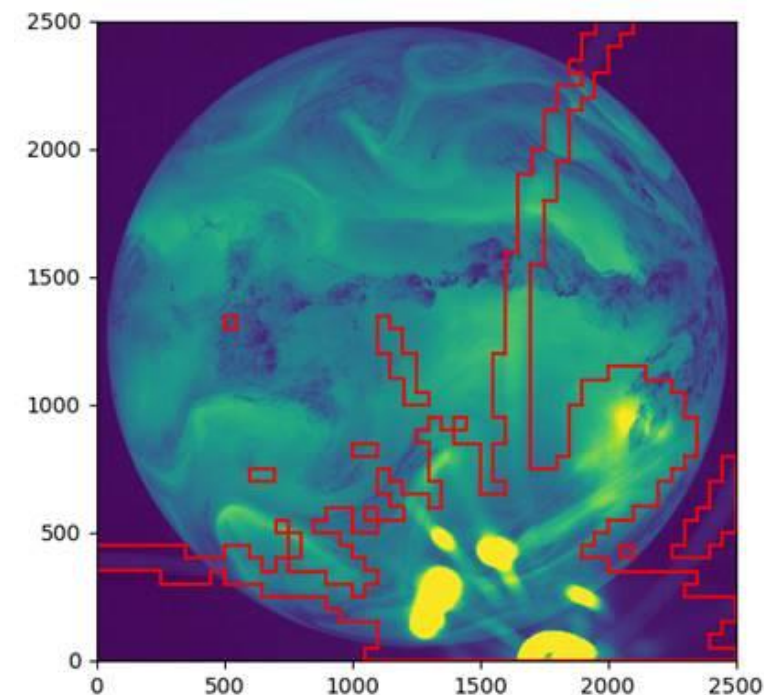
- Metop-A IASI level 1c FCDR – DRR complete
- Metop-A GRAS bending-angle profiles FCDR (up to 2017) – released
- Metop-A/B GRAS bending-angle profiles FCDR (up to 2018) – DRR Oct
- Meteosat FCDR (recalibrated IR M2-9 and VIS M2-7) – DRR Oct

To be produced in 2019/H2:

- Nimbus-6, TIROS-N, NOAA-6, Metop-B HIRS FCDR
- NOAA AVHRR GAC Polar AMV TCDR

Work-in-progress (ETA) for later release:

- GOME-2 L1B FCDR (2019/20)
- MVIRI full image reprocessing: Release 2 FCDR, 2020 (see note to the right)



An example from the MVIRI anomaly study, showing the areas (inside red boxes) where a direct stray light affected the image. The database resulting from the anomaly study will be used to improve the quality of the upcoming MVIRI Release 2 reprocessing by excluding, flagging or directing correction of affected images and pixels.

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:

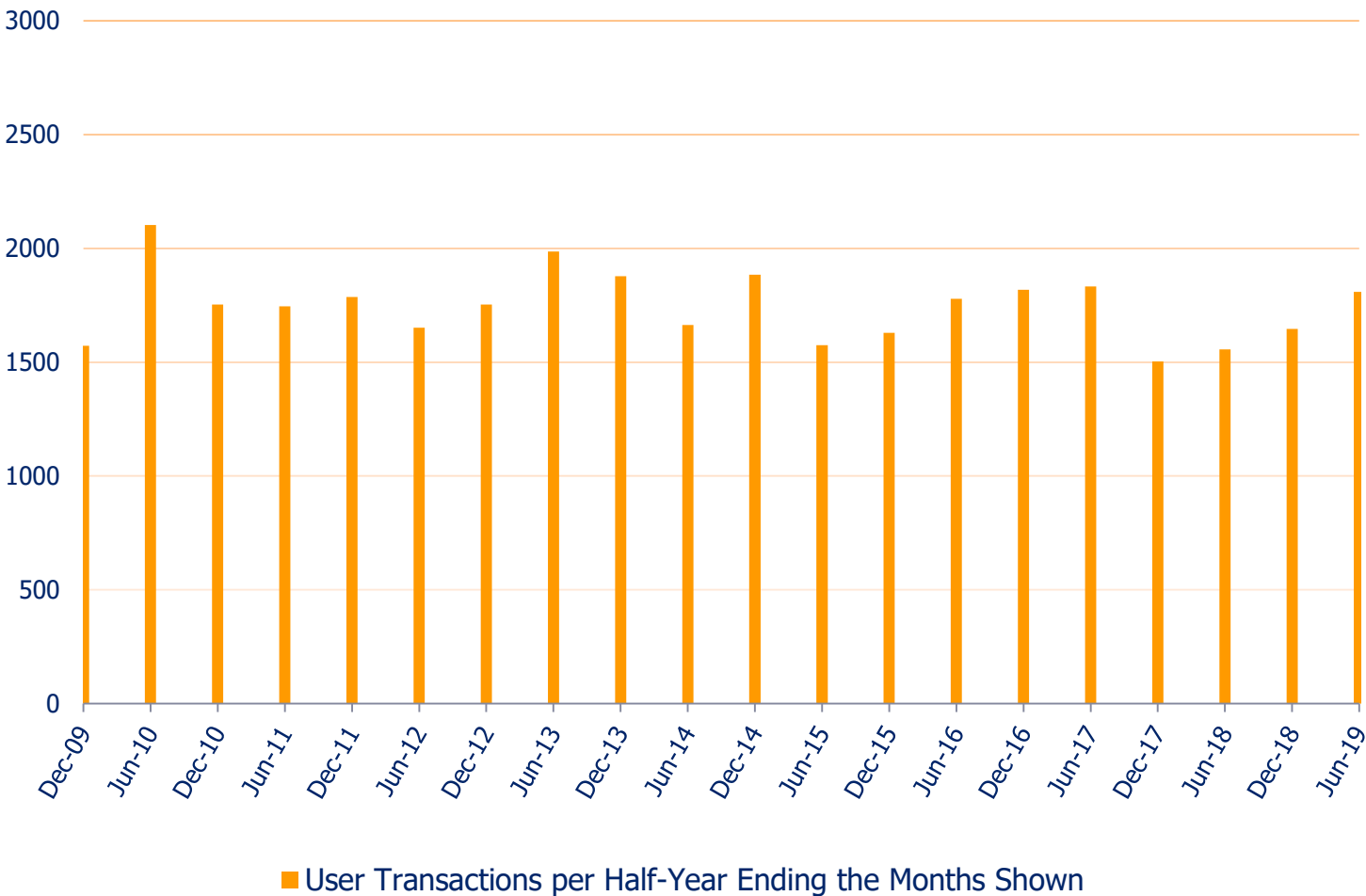
- User interaction history of the last 10 years
- The countries and groups that gave rise to the largest numbers of user interactions in the reporting period
- Breakdown of those user interactions by category

EUMETSAT Central Operations Report for January - June 2019

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.

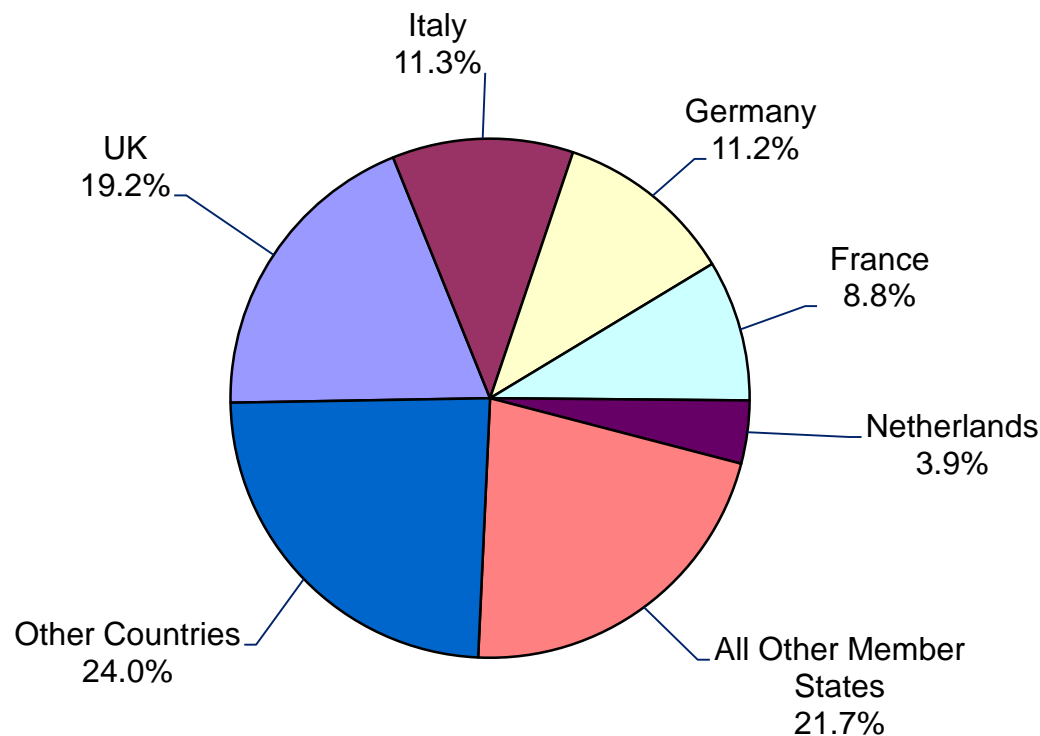
The next two slides focus on the user interactions for the current reporting period, in which a total of 1809 interactions were handled.



The chart shows the interactions in the first half of 2019 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.



EUMETSAT Central Operations Report for January - June 2019

Helpdesk Service → User Interactions 2019/H1 by Category

The chart shows the numbers of user interactions in the first half of 2019 for:

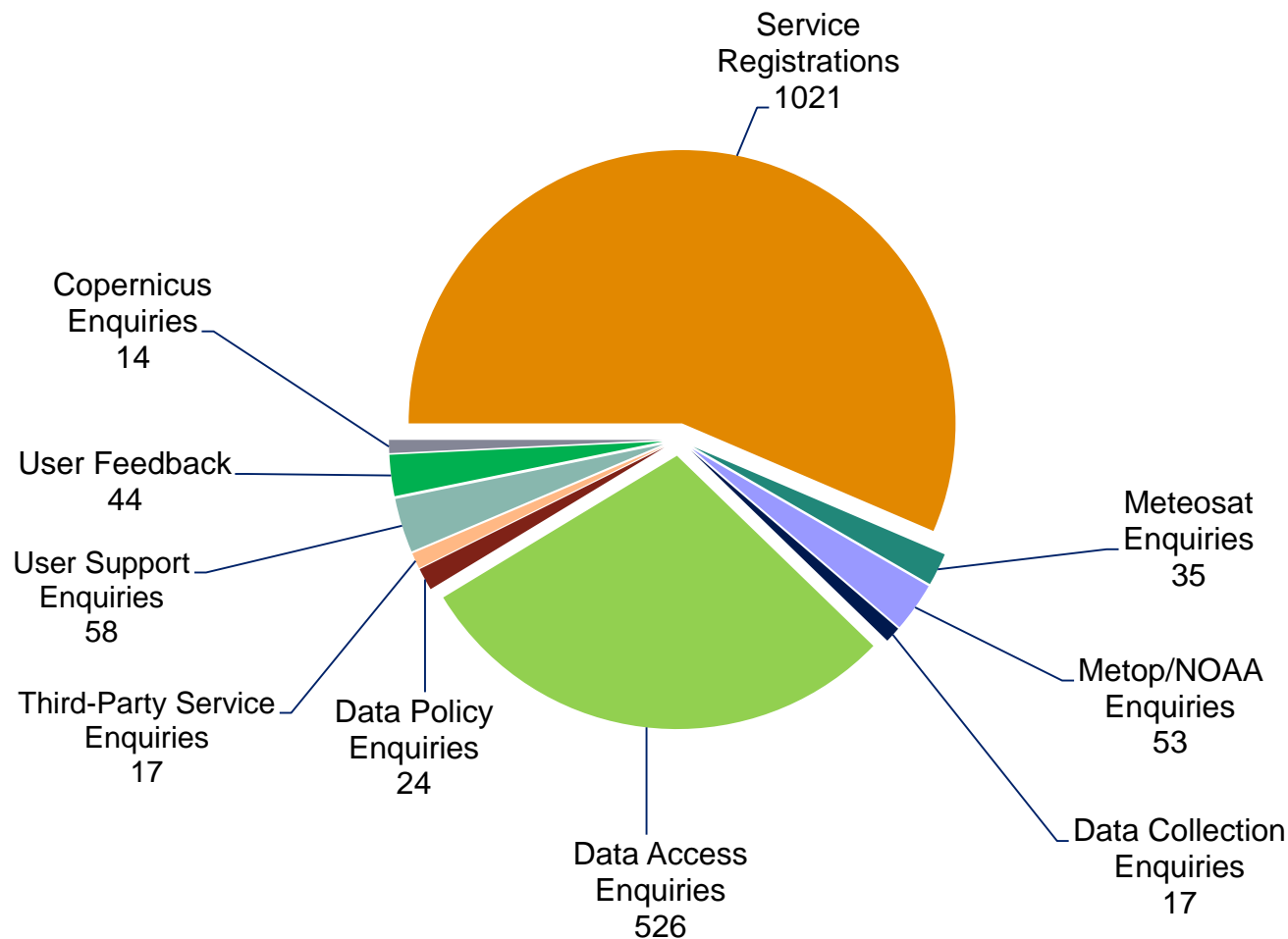
- Service Enquiries (8 categories)
- Service Registrations
- User Feedback

Total interactions for the half-year came to 1809.

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.

EUMETSAT Central Operations Report for January - June 2019

Glossary (1 of 5)

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.

EUMETSAT Central Operations Report for January - June 2019

Glossary (2 of 5)

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.
IODC	Meteosat	Indian Ocean Data Coverage: FES L1.5 image data, met products and DCPs, from Met-8 at 41.5°E.
JMA	Third-Party Data	Japan Meteorological Agency (http://www.jma.go.jp/jma/indexe.html)

EUMETSAT Central Operations Report for January - June 2019

Glossary (3 of 5)

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.

EUMETSAT Central Operations Report for January - June 2019

Glossary (4 of 5)

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	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.

EUMETSAT Central Operations Report for January - June 2019

Glossary (5 of 5)

(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