

# EUMETSAT Headquarters Darmstadt, Germany

## Central Operations Report: January to June 2020



# EUMETSAT Central Operations Report for January - June 2020

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

[www.eumetsat.int](http://www.eumetsat.int), under 'Data' → 'Service Status' → 'Product History'

# EUMETSAT Central Operations Report for January - June 2020

## Introduction

Welcome to the Central Operations Report for the first half of 2020.

The most significant event of the reporting period was, without doubt, the arrival of COVID-19 in Europe in late February / early March. By the end of the first week of March, EUMETSAT enacted various restrictions and, by the end of the second week (13 March), a contingency plan had been drawn up, which identified core teams and foresaw arrangements for teleworking, with a proof-of-capability test-day in the following week (18 March) for a majority of EUMETSAT staff and contractors to work from home, in line with advice from the German authorities. However, the situation evolved quickly across Europe, which forced EUMETSAT's Management Board to instruct staff and contractors to commence teleworking already on Monday, 16 March. Operations-critical personnel were arranged in two separate teams with a 14-day alternating arrangement, whereby at any time, one team works on site and the other is teleworking. This ensures critical operations can be performed and at the same time, high resilience by segregating personnel.

Considering the exceptional circumstances, it is rewarding to report that EUMETSAT's operational services were maintained with no measured degradation in the reporting period due to the unusual working conditions for the Operations department and its supporting teams.

The availability of the services was generally on target or above for all services, with the following exceptions:

- On 27 May, the HIRS instrument onboard Metop-B developed a fault (see [slide 8](#)). At the time of writing, the fault persists thus no HIRS L1 data, ATOVs L2 products or EARS-ATOVS is available for Metop-B.
- On 27 June, another anomaly occurred on Metop-B, this time concerning the Solid-State Recorder, that prevented the downlink of data at McMurdo, thus resulting in the loss of ADA timeliness. This was a recurrence of a problem seen before, whereby an SEU



# EUMETSAT Central Operations Report for January - June 2020

## Introduction (continued)

impacted onboard memory. Tests confirmed the anomaly and downlink capability and ADA timeliness were restored on 30 June.

- The annual pause of 28 days in rapid-scanning for Meteosat-10 was carried out in January / February. This time around, the RSS service was stopped, due to the decision not to use Meteosat-9 to support the service - see [slide 8](#) for more information.

We reported in the last issue that a manoeuvre for Metop-C was completed on 19 February, to bring it into a 'trident' configuration with Metop-A and Metop-B. The performance of the new satellite and all its instruments has been very good throughout the period, with only two very minor transient anomalies, one affecting the A-DCS instrument and the other the AMSU.

A growing trend has been observed over the last year or more with respect to the delivery times for medium and large orders for data and products from the EUMETSAT Data Centre. This is the consequence of the increasing number of orders overall, as shown in [slides 57 and 58](#) in this report. As an initiative to improve data access in the longer-term, EUMETSAT is developing a new portfolio of data access services which will significantly enhance the range of data and imagery available via the Internet. These new services will start a pilot phase later this year and open to all users. It should be noted, however, that no 'operational-level' service will be guaranteed, although the user helpdesk will be on hand to help users with any queries.

For more information, please see '[New Pilot Data Services](#)' on the EUMETSAT website.

I wish all readers safe times for the rest of 2020 and beyond.

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-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.

# EUMETSAT Central Operations Report for January - June 2020

## 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.

# EUMETSAT Central Operations Report for January - June 2020

## Events Leading To Significant Operational Impacts

### Annual RSS scanning pause in January/February

To prolong the lifetime of Meteosat-10's SEVIRI scanning mechanism, rapid-scanning operation includes a switch to Full-Earth Scanning (FES) mode for 48 hours every 28 days, and a 28-day period of FES once a year (usually in the winter months). Up until last year, Meteosat-9 was used to ensure service continuity by performing rapid scanning during all Meteosat-10 FES periods. There are a finite number of rapid scans which can be performed as recommended by the instrument's manufacturer and, in order to prolong the lifetime of SEVIRI on Meteosat-9, it has been decided to discontinue the use of it for the annual 28-day FES periods; hence there has been no service from 6 January to 3 February this year. The 48-hour periods from March onwards, however, have been 'filled' by Meteosat-9.

### Metop-B HIRS Instrument Anomaly in May

On 27 May 2020, telemetry indicated that current and temperature of the filter wheel of the HIRS instrument onboard Metop-B went out of limits. Analysis pointed to a stall of the filter wheel, possibly due to mechanical degradation of the bearing race. Based on NOAA's experience of previous HIRS instruments, recovery attempts to restart it were made, but without success. On the advice of NOAA and the manufacturer, a commanding procedure has been applied to toggle the filter wheel motor switch, in the hope that the filter wheel may be eventually rocked free in time, a strategy that has worked for the HIRS instruments on NOAA-15 and NOAA-18, which suffered similar problems. Currently, HIRS data is unusable - dissemination of GDS L1, ATOVs L2 and EARS-ATOVS, has thus been stopped.

### Metop-B ADA Timeliness Outage

The Solid-State Recorder onboard Metop-B suffered an anomaly caused by an SEU on 27 June. This prevented data from being downlinked to the McMurdo ground station in the Antarctic for 45 orbits, resulting in the loss of ADA timeliness for that period. Following investigation of the root problem, the recovery was performed and successful downlinking resumed on 30 June.

## 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 Meteosat-8 and Meteosat-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.

### Problem with BUFR Encoding of RSS RII products

The BUFR encoding of the RII (Regional Instability Index) meteorological products for the RSS service suffers a software processing problem that occurs with the less-cloudy skies typically seen in summer months. The processing algorithm generates significant data for clear-sky segments, and cloud-free weather causes processing overflows. In the interim, the geographical processing area for the product has been reduced, ahead of a permanent solution later in the year.

## 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 also for RSS, operational constraints permitting (annual 28-day service gaps no longer supported, but the monthly 48-hour gaps are currently filled).

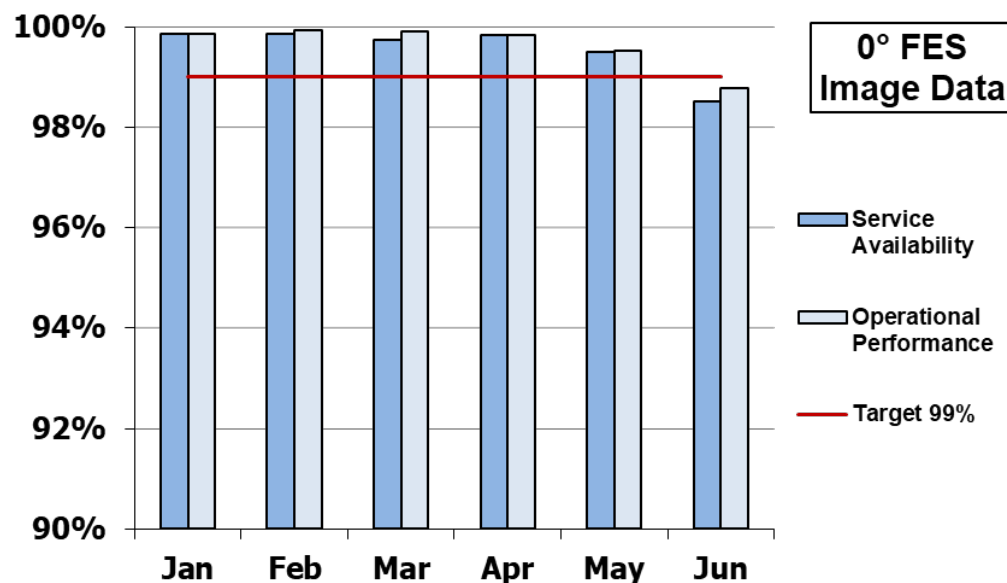
**Meteosat-8 (41.5°E):** Indian Ocean Data Coverage FES Service, on a best-effort basis.

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)

# EUMETSAT Central Operations Report for January - June 2020

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

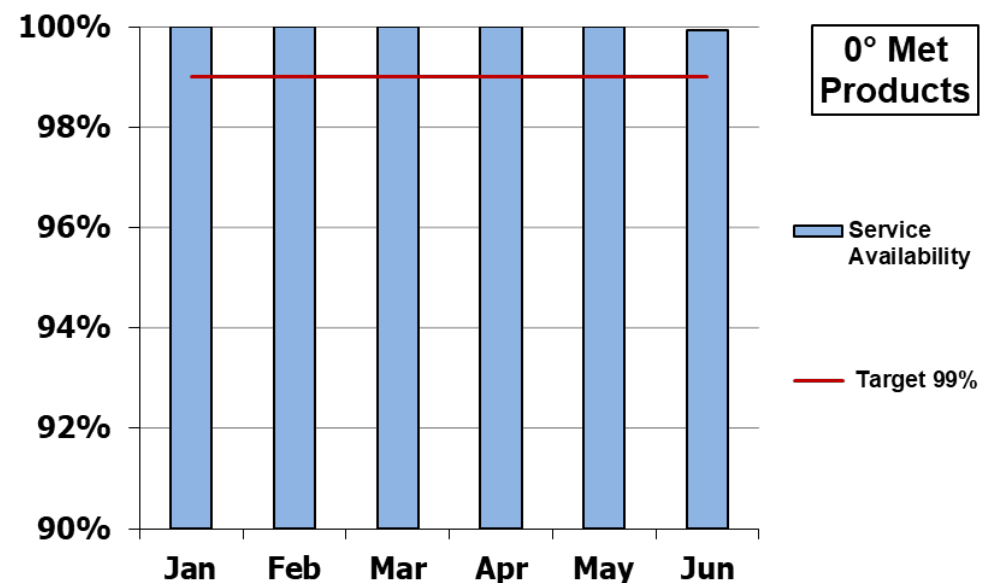


The prime satellite supporting the 0° Full-Earth Scan (FES) service is Meteosat-11. Meteosat-9 has the role of backup.

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:

June: 9 RCs impacted by a Meteosat-11 manoeuvre on 3-June, and 25 RCs impacted by tank-heater switching on various days of the month.



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

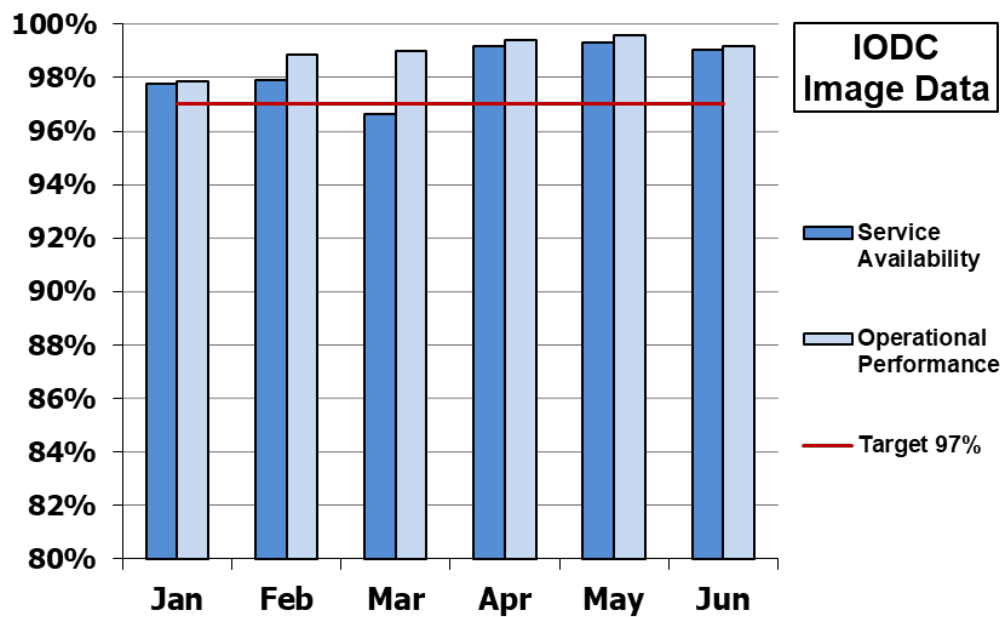
The chart shows 'end-to-end Service Availability' in terms of complete products disseminated 'on-time' via EUMETCast Europe.

### Events which impacted availability:

None significant.

# EUMETSAT Central Operations Report for January - June 2020

## Meteosat Services → 41.5°E IODC Image Data & Derived 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.

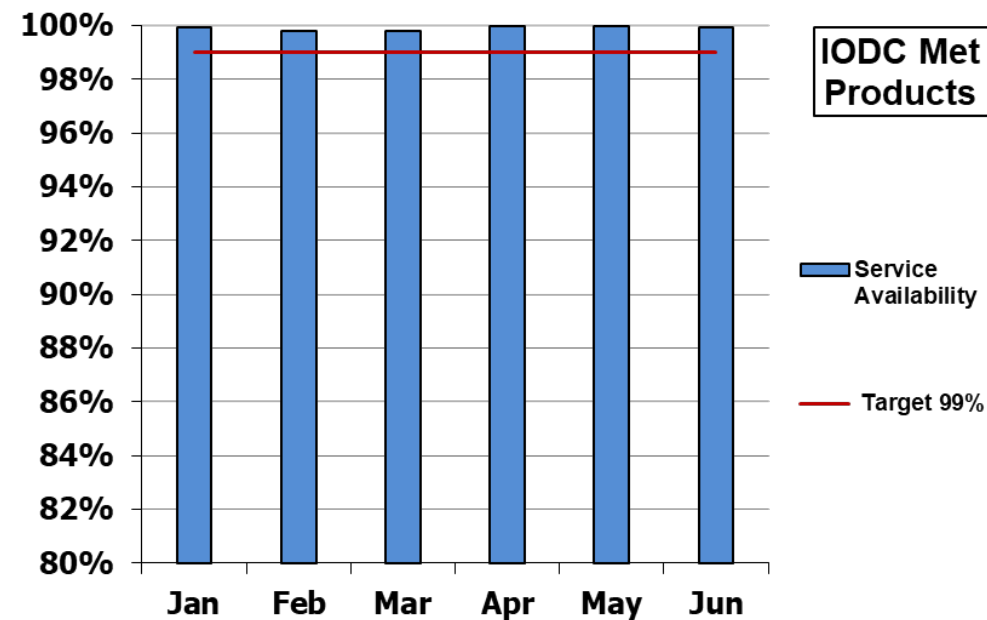
### Events which impacted availability:

February: 21 RCs impacted by eclipse effects.

March: 68 RCs impacted by eclipse effects.

Jan, Feb & March: significant timeliness degradation in these months (\*\*)

(\*\*): Due to Meteosat-8's increasing inclination, image-processing cycles can sometimes take longer and timeliness be exceeded.



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.

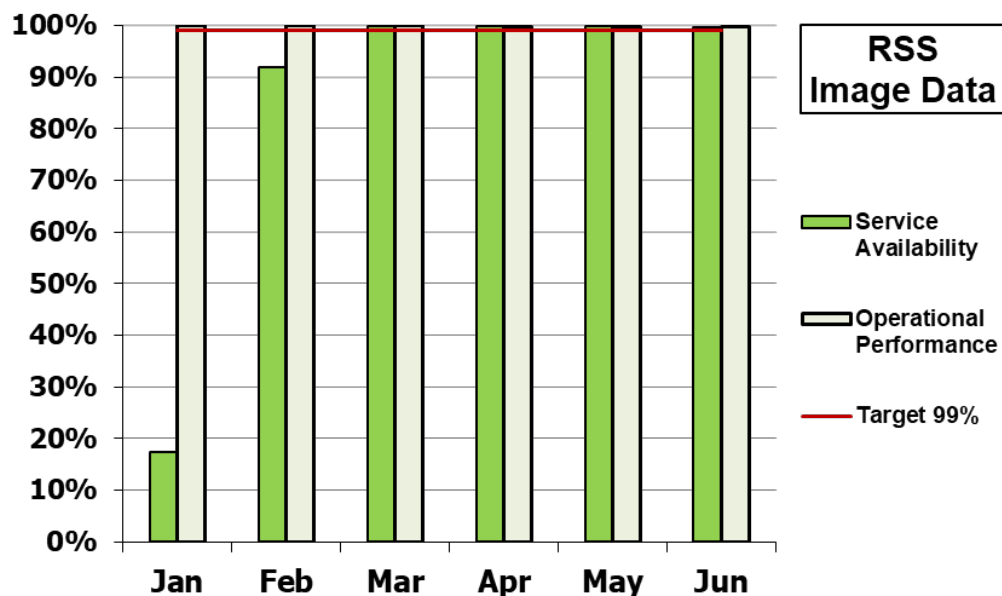
### Events which impacted availability:

None significant

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



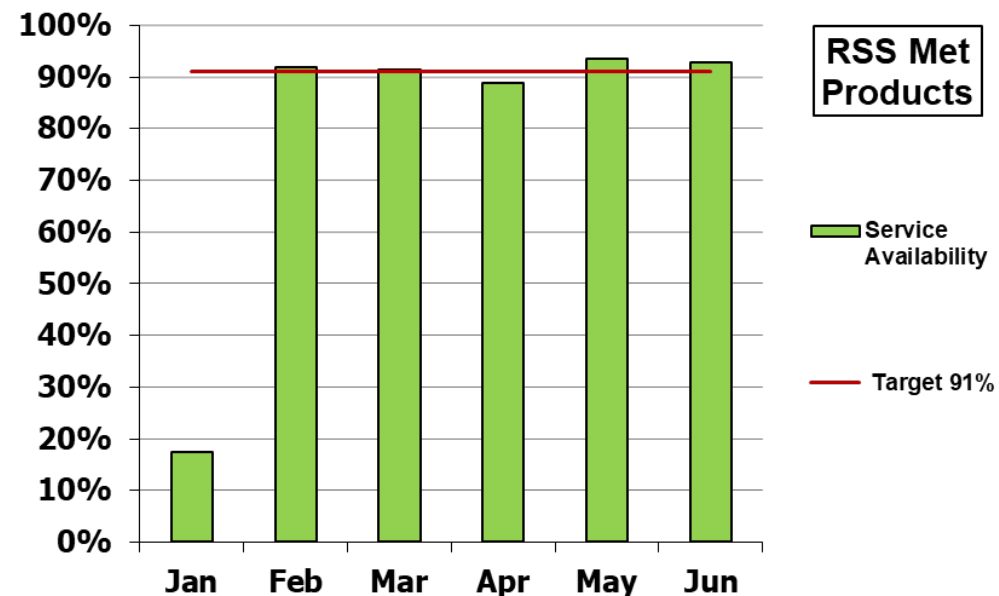
The prime satellite supporting RSS is Meteosat-10. Meteosat-9 is foreseen as a backup for the RSS service when Met-10 is unavailable, all operational constraints permitting. Currently, Met-9 is used to 'gap-fill' during the monthly SEVIRI Full-Earth Scanning 'rests' for Met-10, but not the annual 28-day FES periods.

For more info on RSS: [www.eumetsat.int](http://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:

6-Jan to 3-Feb: No Rapid-Scanning Service due to annual 28-day period of full-Earth scanning for Meteosat-10. See [slide 8](#).



Meteorological products (except MPE) 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. See [slide 14](#) for the availability of RSS MPE products.

### Events which impacted availability:

6-Jan to 3-Feb: No Rapid-Scanning Service due to annual 28-day period of full-Earth scanning for Meteosat-10 (see [slide 8](#)).

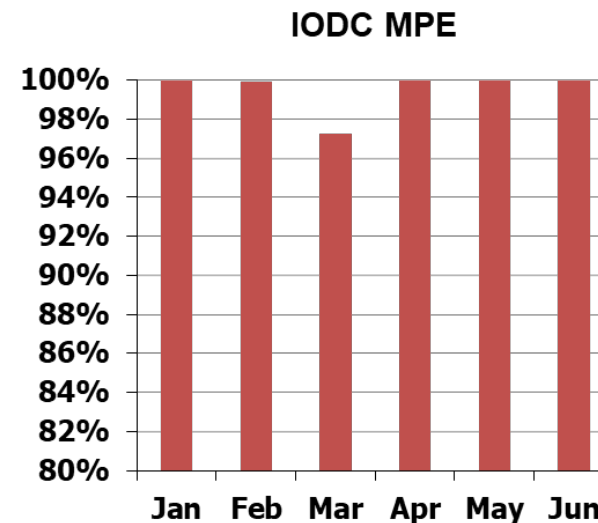
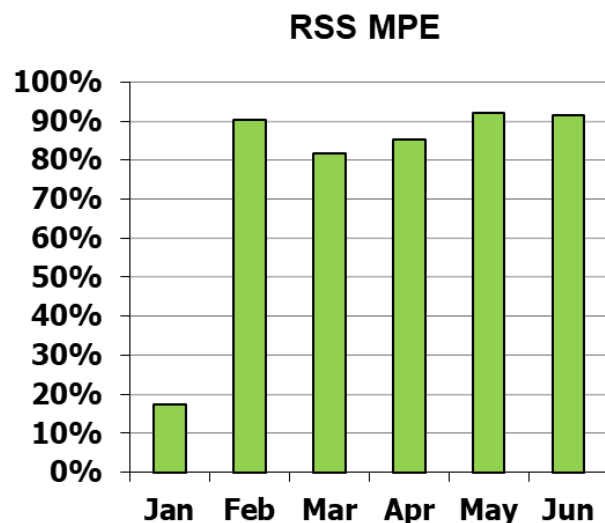
April: There were two 48-hour RSS pauses affecting April's service: from 31-March to 2-April, and 28-30 April. This meant a total reduction of service of 81 hours in April.

### NOTES:

- 48-hour RSS pauses occur in a 28-day cycle and an annual 28-day pause typically occurs in the winter months. During these periods no meteorological products are generated, even if a backup satellite is used to continue RSS imaging.

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## Meteosat Services → MPE Products for the RSS and IODC Services



Multi-sensor Precipitation Estimate (MPE) products are derived from infrared data in Meteosat 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 MPE products is measured in terms of the number of products disseminated via EUMETCast, as a percentage of those scheduled.

### Events which impacted availability:

6-Jan to 3-Feb: No Rapid-Scanning Service due to annual 28-day period of full-Earth scanning for Meteosat-10 (see [slide 8](#)).

### 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, during which no met. products are produced.
- The dissemination of MPE products derived from 0° imagery data was discontinued as of 10-July-2019.

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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-11).

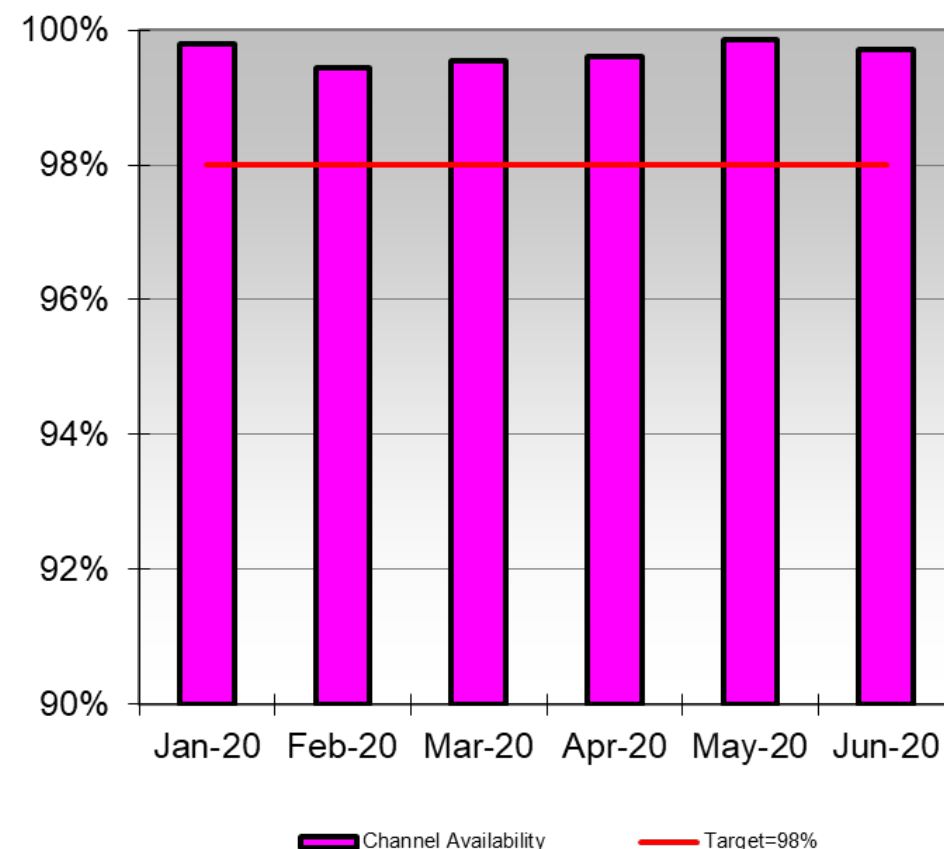
The chart shows the availability of the 0° DCP service. It is measured in terms of the number of hourly reference DCP messages on all operational regional channels which have been successfully received back by EUMETSAT, as a percentage of those sent.

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

### Events which impacted DCP Channel Availability:

None significant.

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



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## Meteosat Services → Geographical Distribution of DCPs as of 30 June 2020

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	135 ↑	France	4	Mauritius	70	Uganda
2	Armenia	1	Gambia	23	Mozambique	58 ↑	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	67	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	30 ↑	Sierra Leone		
3	Chad	3	Kenya	1	Slovakia		
3	Congo	6	Lesotho	42 ↑	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 2020, there were:

1,538 registered Data Collection Platforms, belonging to 138 DCP operators, deployed by the 77 countries shown in the table.

Of the total number of registered DCPs, there were 401 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 3 Metop satellites (Metop-C since July 2019), 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	ABC <sup>(1)</sup>	-	-	-	-	-	-	-	-	-	ABC	-
Level 1	-	ABC, N	ABC	-	ABC, N	ABC <sup>(2)</sup>	ABC	AB, N	ABC	ABC, N	-	S
Level 2	-	-	-	B <sup>(3)</sup> , N	-	-	-	-	ABC	-	-	-

**Legend:** ‘A’, ‘B’ and ‘C’ = Indicates products extracted from the data from the Metop-A, Metop-B (prime) and Metop-C (secondary) satellites, respectively.

Note the following exceptions:

<sup>(1)</sup> Reduced capability of A-DCS on Metop-B, i.e. only Argos-2 mode.

<sup>(2)</sup> GOME-2 Trident operations: Metop-A instrument has swath width of 960 km, Metop-B and C have full width of 1920 km.

<sup>(3)</sup> ATOVS L2 products only for Metop-B (further info – see ATOVS slide )

‘N’ = Level 1 products from the AMSU, AVHRR, HIRS and MHS instruments onboard NOAA-19, and also Level 2 products (ATOVS).

‘S’ = Sensor Data Records for the ATMS and CrIS instruments onboard Suomi-NPP.

The following slides show the monthly availability of the products, identifying any significant events which impacted the service.

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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: Available within 2 hours of sensing (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 all 3 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 the 3 Metops, NOAA 19 and Suomi-NPP. Please see [slide 7](#) For explanation of the two metrics.

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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.

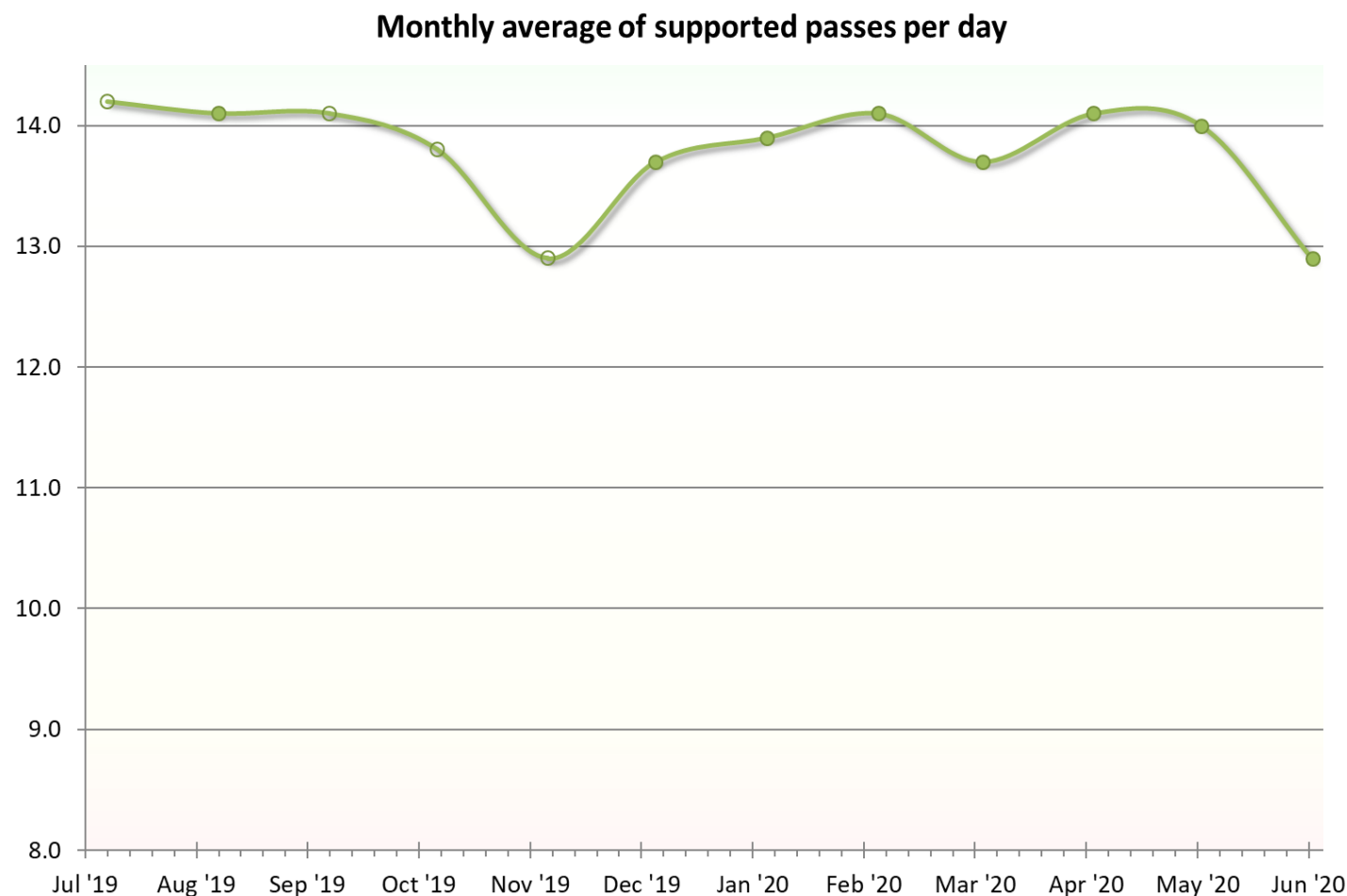
The chart shows the average daily passes per month that have been successfully acquired at McMurdo and relayed to Darmstadt in the last 12 months.

Maximum average orbits / day possible = 14.2

The overall daily average of supported passes in the 12 months shown on chart = **13.8**

### Events in the reporting period:

**27-30 June:** A Solid-State Recorder anomaly onboard Metop-B caused by an SEU prevented data from being downlinked to McMurdo for 45 orbits and thus loss of ADA timeliness for that period.



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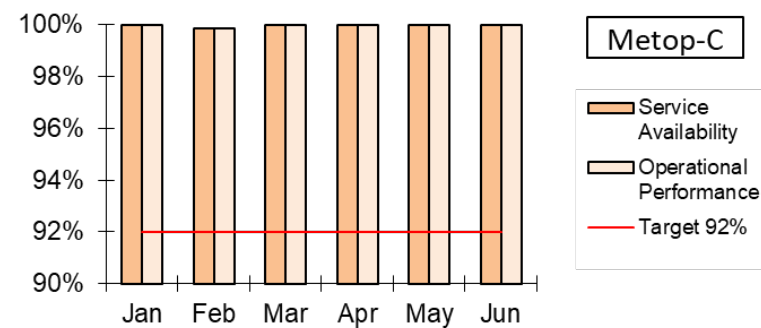
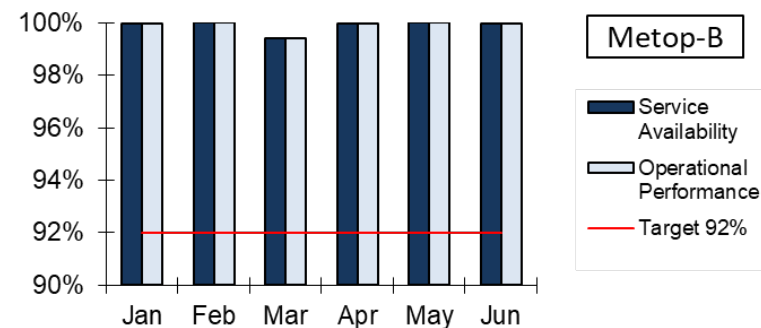
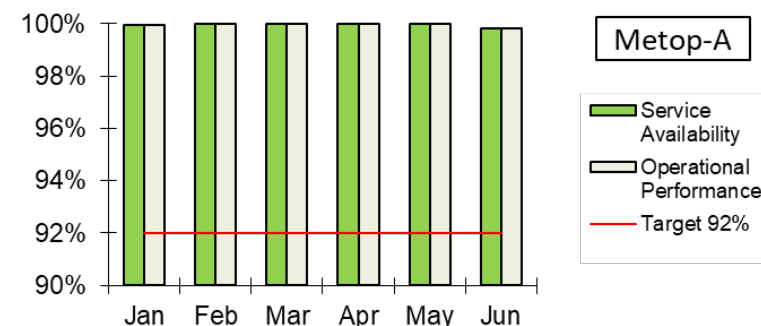
## Metop, Suomi-NPP & NOAA GDS → A-DCS Level 0 Data

The Metop satellites 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, Metop-B just Argos-2 mode (due to the reduced capability of A-DCS onboard that satellite), and Metop-C supports Argos-3.

### Events which impacted availability:

None significant



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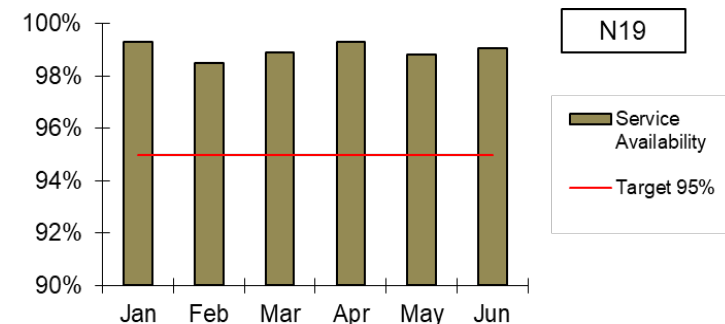
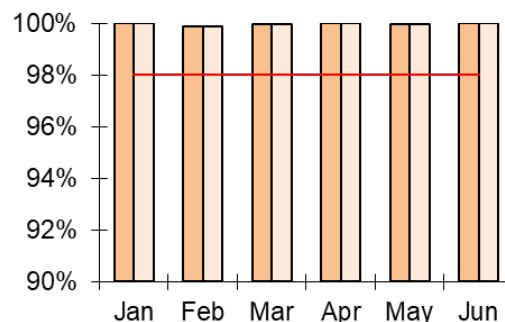
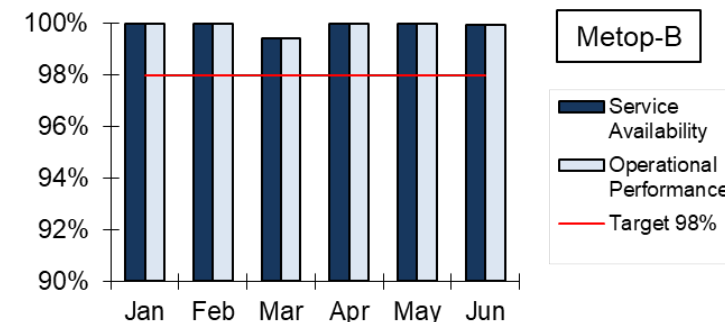
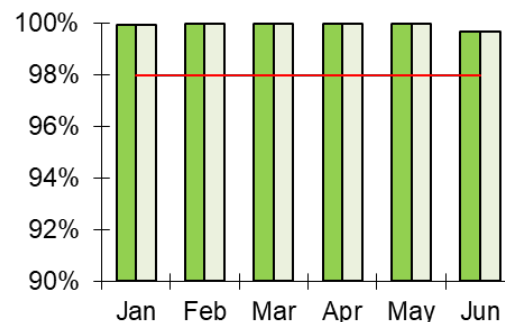
## Metop, Suomi-NPP & NOAA GDS → AMSU Level 1B BUFR Products

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 3 Metop satellites and also NOAA-19.

### Events which impacted availability:

None significant



### Notes:

**Metop-A:** Channels 7 & 8 have failed completely; channel 3 continues to degrade, but the remaining 12 channels remain in spec and are fully usable.

**Metop-B:** Channel 15 has failed completely; channel 7 still exhibiting transient spikes and channel 3 is now out of specification.

**NOAA-19:** Channels 7 & 8: out of specification, but the data is still considered usable for the time-being.

# EUMETSAT Central Operations Report for January - June 2020

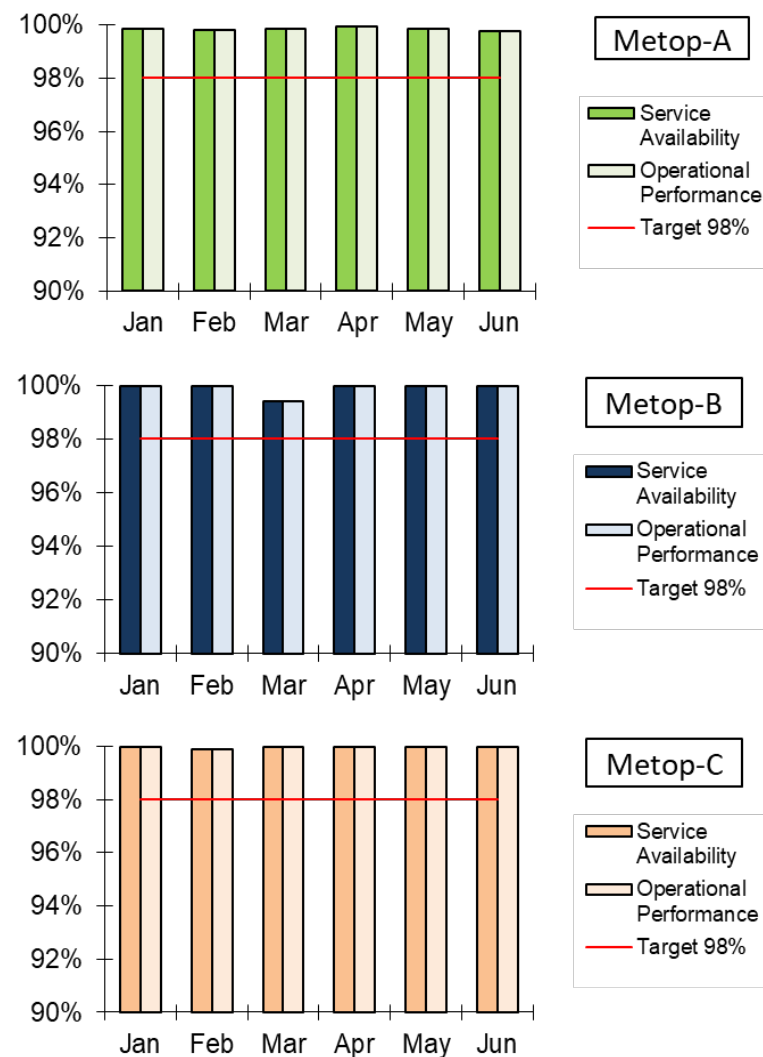
## Metop, Suomi-NPP & NOAA GDS → ASCAT Level 1B (SZF) Products

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 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:

None significant



# EUMETSAT Central Operations Report for January - June 2020

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

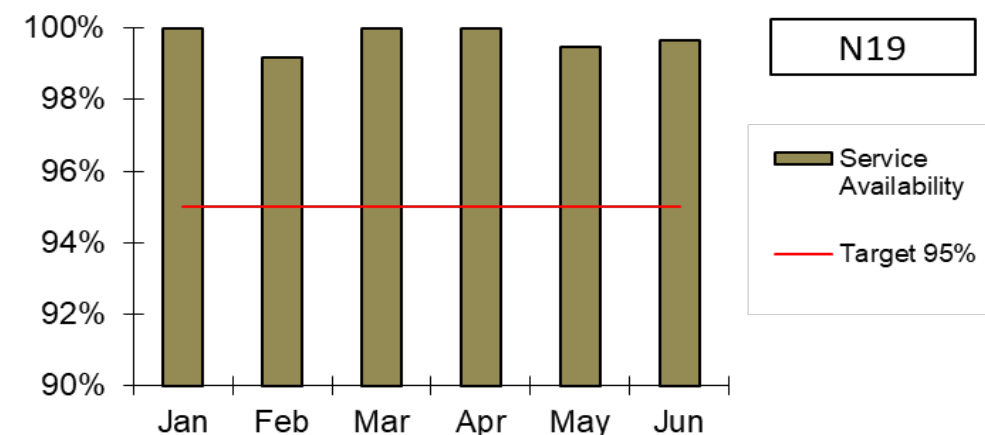
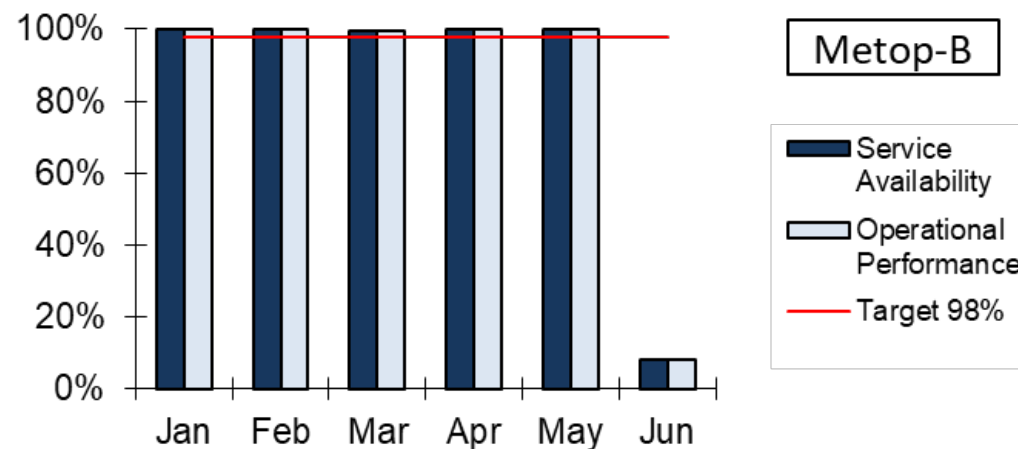
ATOVS Level 2 product processing transforms the calibrated radiance measurements from the AMSU-A, MHS and HIRS instruments (onboard Metop-B and NOAA-19 satellites) into information on the vertical distribution of atmosphere state parameters, on cloud and surface parameters and total atmosphere contents.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

**27-May onwards:** Metop-B: HIRS telemetry suggests that the instrument's filter wheel has stalled. All recovery attempts have so far failed. Data is unusable.

**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. Metop-C does not host a HIRS instrument.



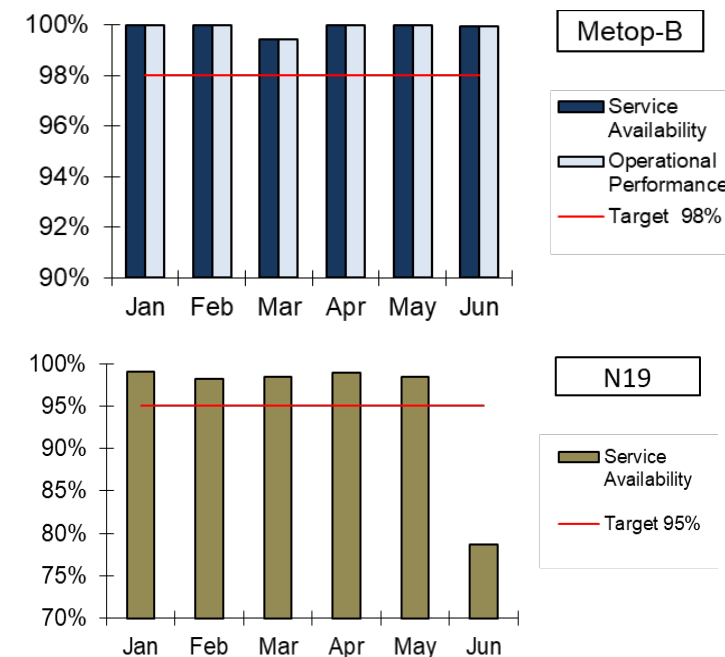
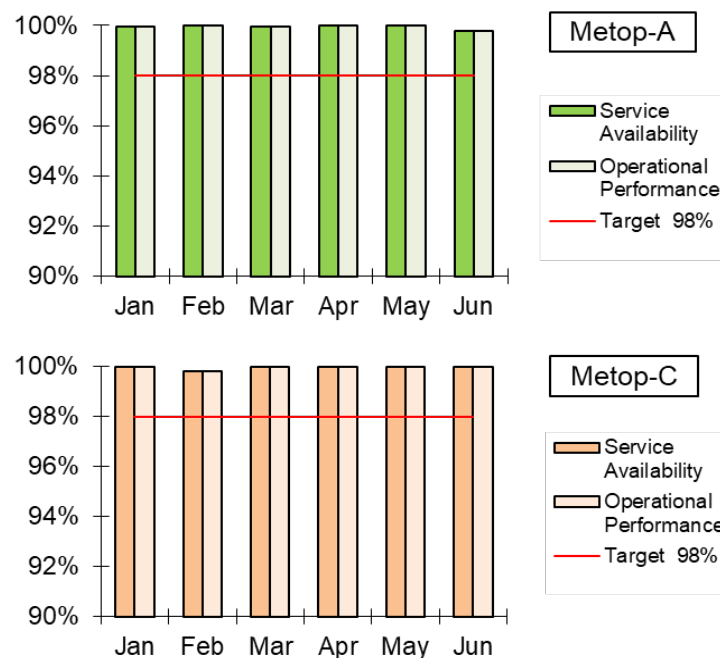
# EUMETSAT Central Operations Report for January - June 2020

## 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:

**23 - 29 June:** A EUMETSAT ground segment anomaly impacted the dissemination of N19 AVHRR L1B files via EUMETCast.



# EUMETSAT Central Operations Report for January - June 2020

## 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. There is an instrument onboard each of the Metop satellites.

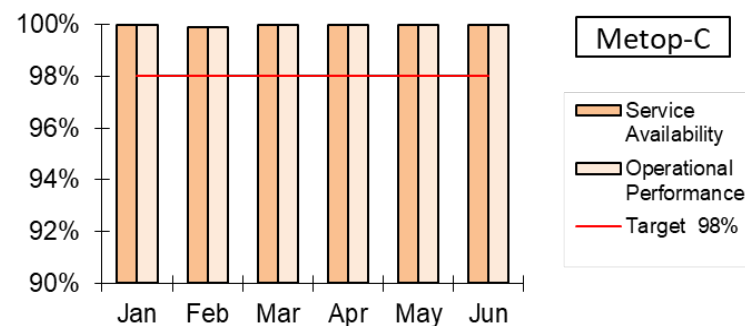
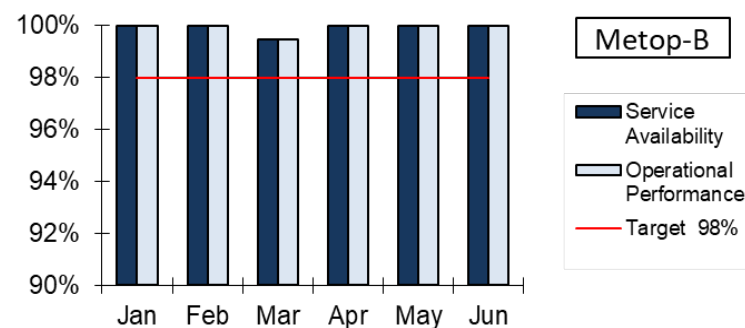
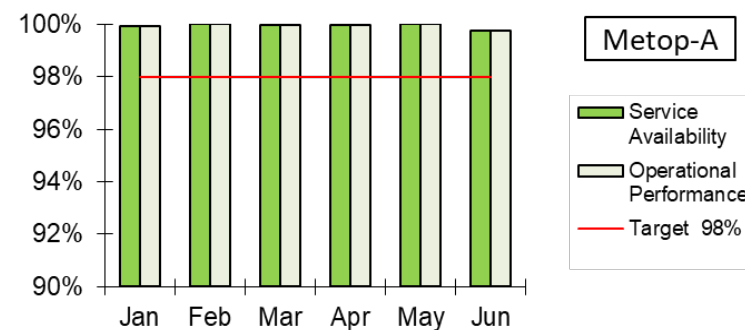
### Events which impacted availability:

None significant.

The performance of the GOME-2 instruments on all three satellites and the evolution of any degradation are continually monitored.

GOME-2 on Metop-B suffers degradation of throughput which is similar, but not identical, to that seen on Metop-A. GOME-2 on Metop-C has been performing well since the beginning of the mission in November 2018.

See the 'Product Quality Monitoring Reports' via dedicated links in the Metop section on the '[Service Status](http://www.eumetsat.int)' page of [www.eumetsat.int](http://www.eumetsat.int) for further performance information. Links to the GOME-2 Newsletter can be found in the reports.



# EUMETSAT Central Operations Report for January - June 2020

## 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:

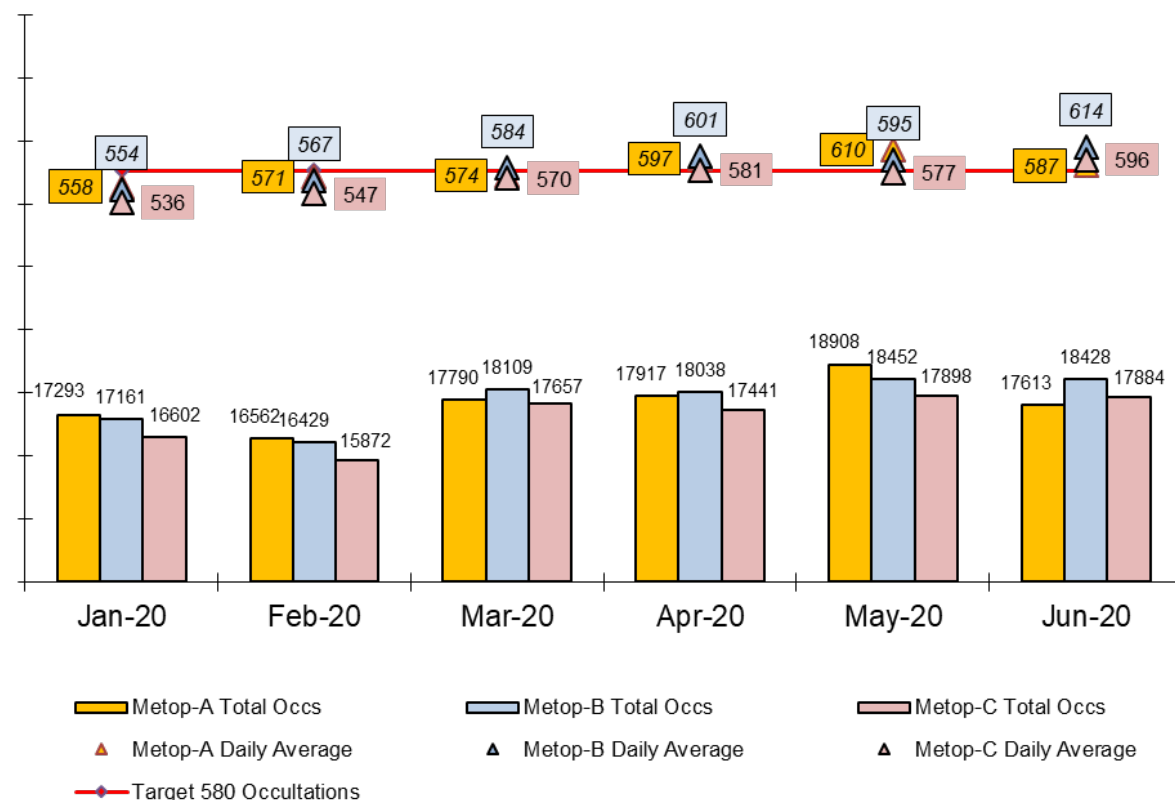
- (1) the total numbers of GRAS Level 1B occultations (plus geolocation and quality flags) from the 3 Metop satellites disseminated via EUMETCast
- (2) the daily average number of occultations from each Metop provided to users (numbers in italics)

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:

**January-March:** Marginally below-target daily averages for all instruments due to changes in the constellation of GPS satellites. The latter required ground processing changes to be implemented, to handle the new 'GPS Block III' satellites. The changes were implemented in April and June.

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



# EUMETSAT Central Operations Report for January - June 2020

## 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 the Metop-A, Metop-B and NOAA-19 satellites (no HIRS on Metop-C).

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:

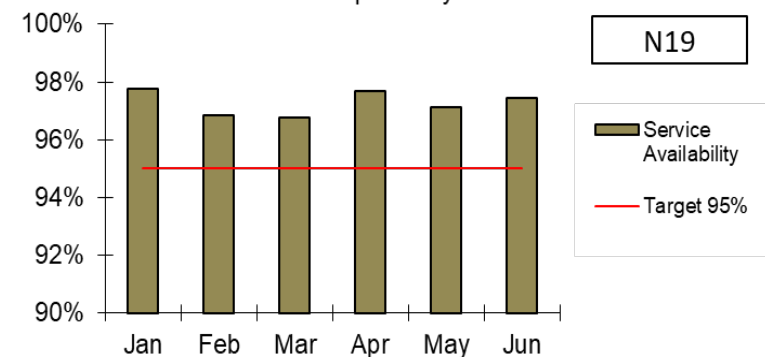
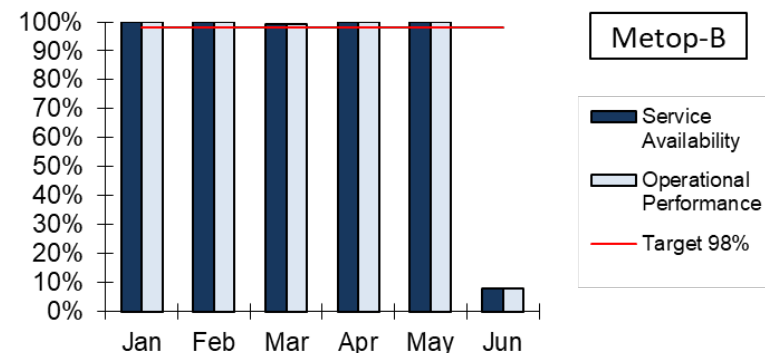
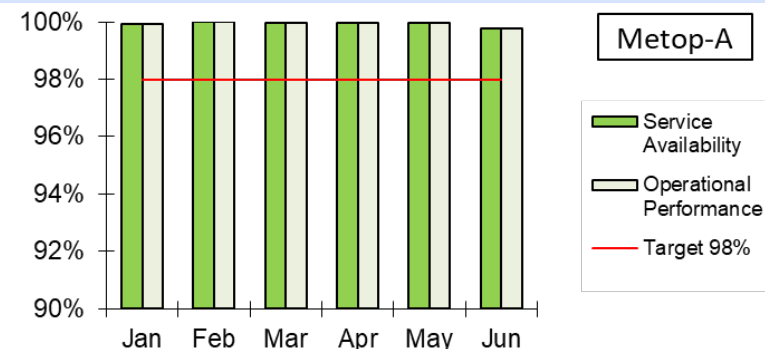
**27-May onwards:** Metop-B: telemetry indicated that the instrument's filter wheel stalled. All recovery attempts have so far failed. Data is unuseable.

#### Notes on latest instrument status:

**Metop-A:** Channels 1-19 out of spec, with large, short-term fluctuations and further degradation likely.

**Metop-B:** No useable data since 27 May 2020 due to an instrument anomaly

**NOAA-19:** 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 2020

## 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:

**26-Feb to 3-March:** Metop-C: instrument decontamination

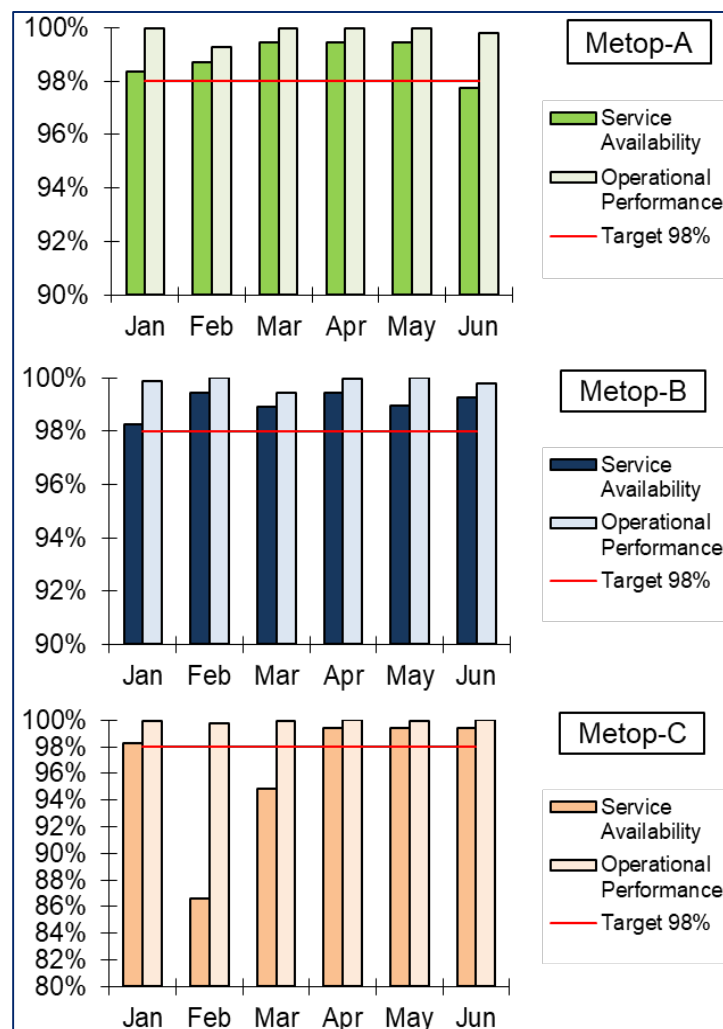
**17 - 18 Feb:** Metop-A: L2 production delay (processor problem)

**12 & 24 June:** Metop-A: extensive calibration

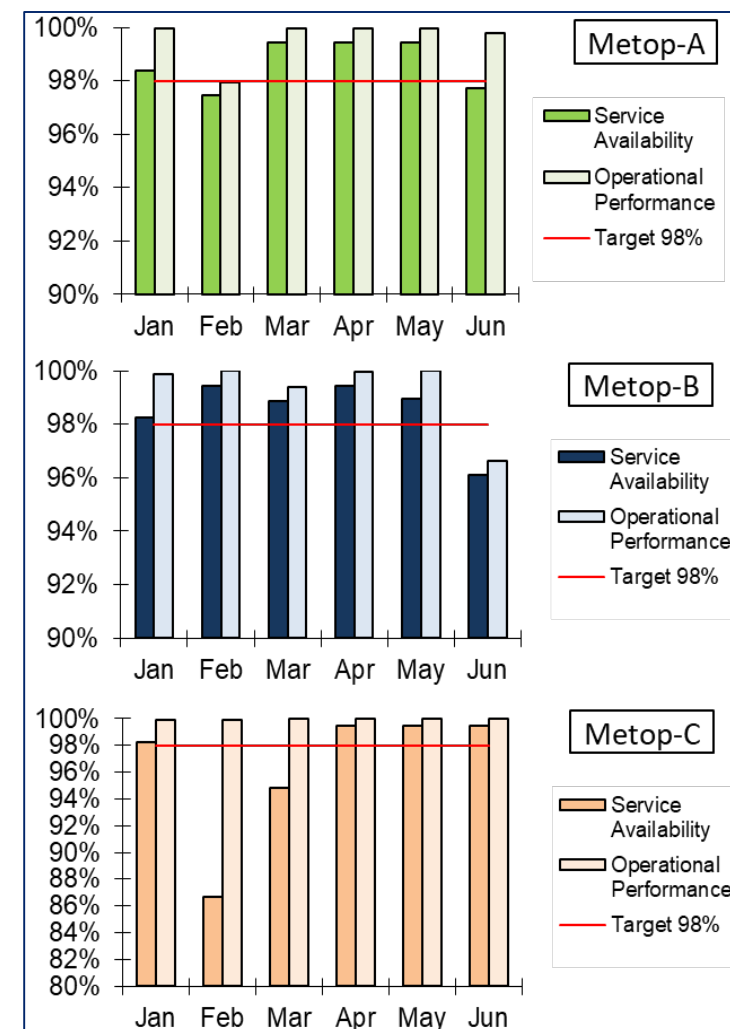
**25 - 26 June:** Metop-B: ground segment L2 processing problem

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.

Level 1C



Level 2



# EUMETSAT Central Operations Report for January - June 2020

## 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.

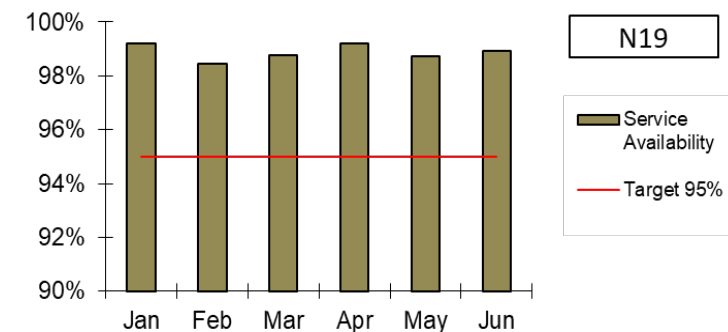
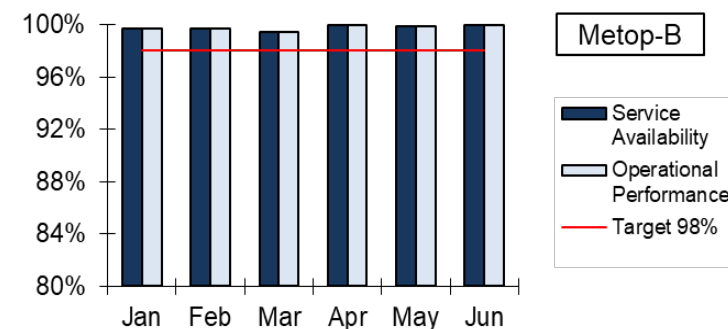
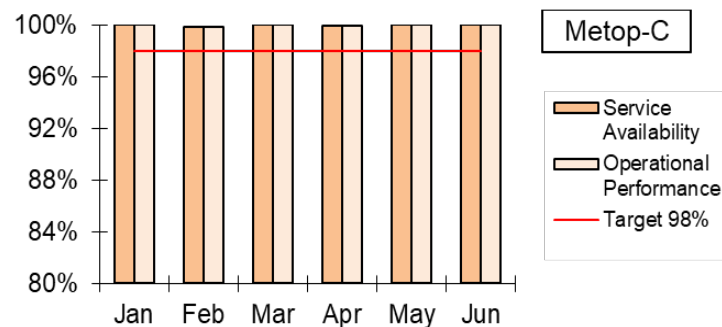
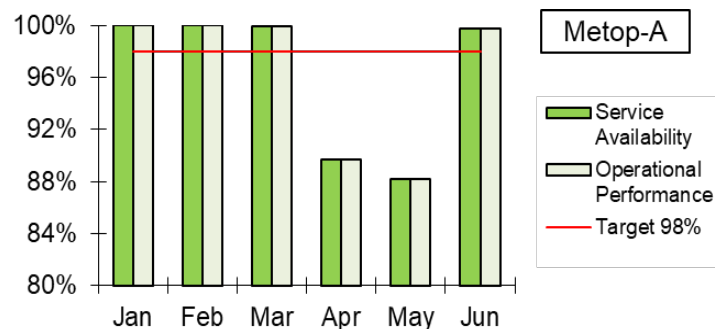
Level 1B products are derived from the data generated by the instruments onboard the 3 Metop satellites and NOAA-19.

### Events which impacted availability:

**22 April – 5 May:** Metop-A: further channel 2 degradation caused BUFR encoding to fail.

#### Notes on latest instrument status:

**Metop-A:** Channel 2 has failed completely.  
**Metop-B:** All channels within spec.  
**Metop-C:** All channels within spec.  
**NOAA-19:** Channel 3 remains out of spec.



# EUMETSAT Central Operations Report for January - June 2020

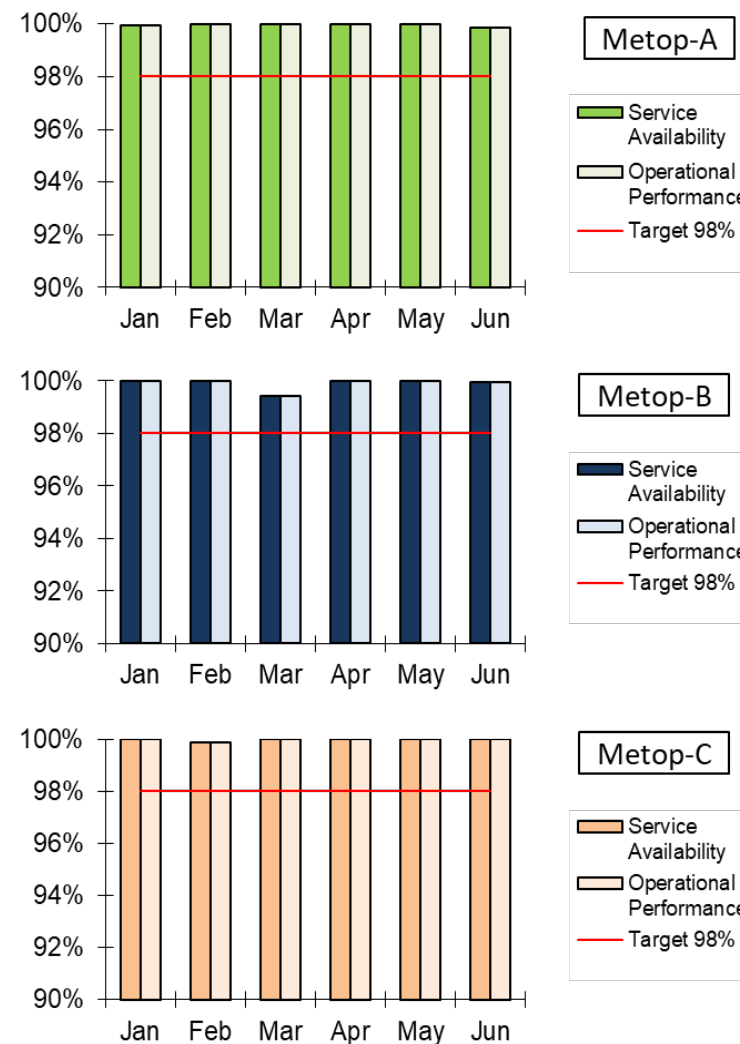
## Metop, Suomi-NPP & NOAA GDS → SEM Level 0 Data

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



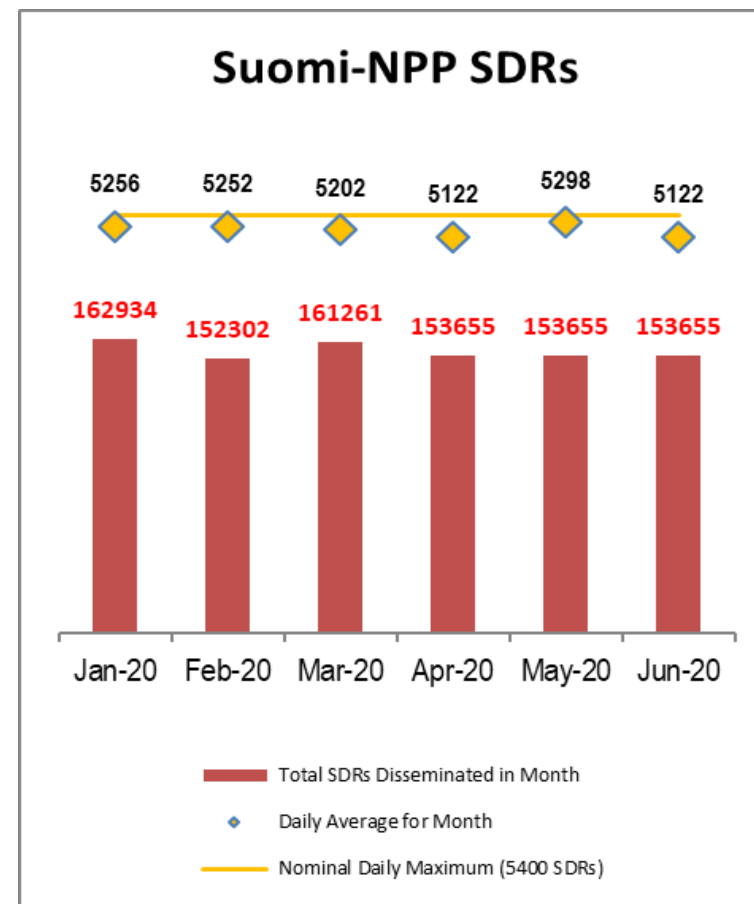
# EUMETSAT Central Operations Report for January - June 2020

## 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.

# EUMETSAT Central Operations Report for January - June 2020

## Regional Data Services → EARS-ASCAT

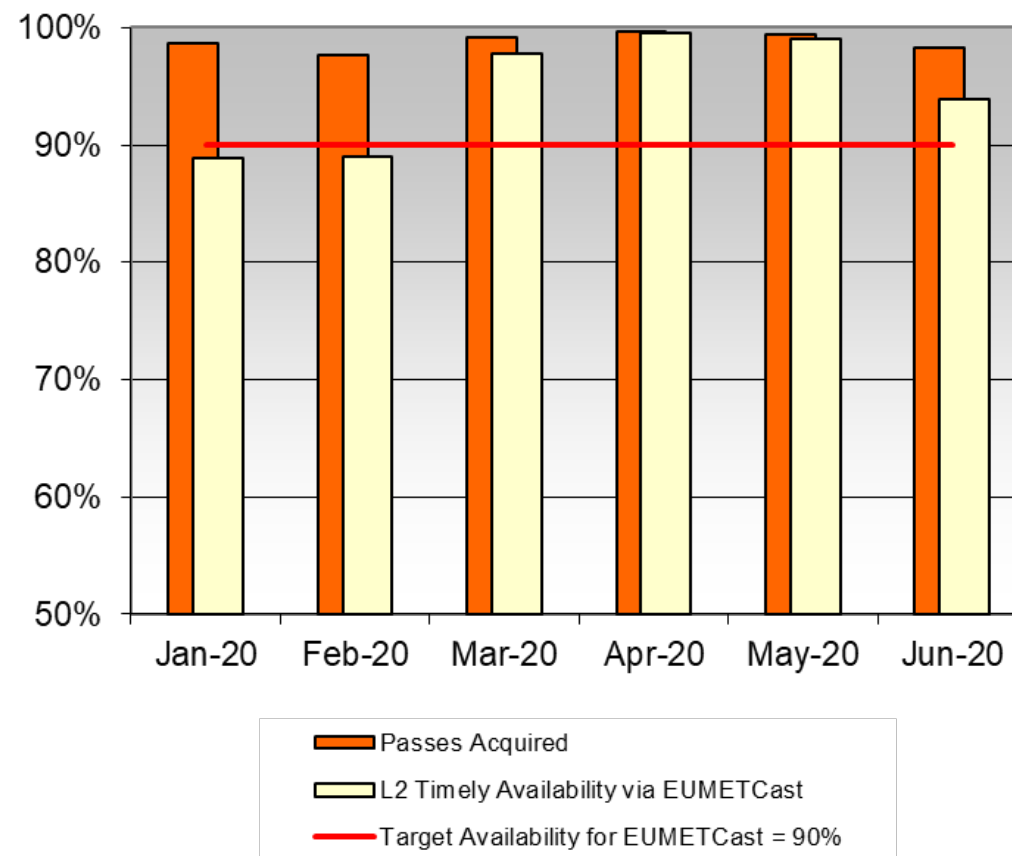
This service provides products derived from the data produced by the ASCAT instruments onboard the Metop satellites.

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:

20-Oct. 2019 – 6-Mar. 2020:

Moscow reception station hardware problem  
(faulty L-band downconverter).



# EUMETSAT Central Operations Report for January - June 2020

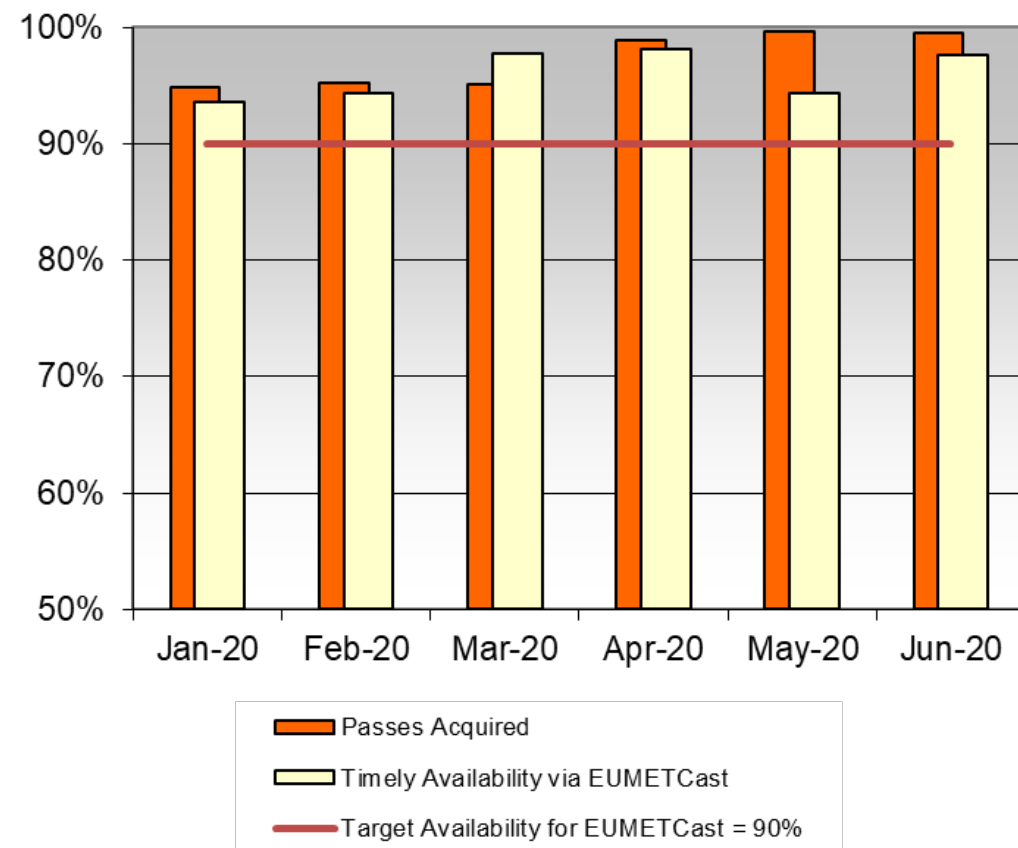
## Regional Data Services → EARS-ATMS

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



# EUMETSAT Central Operations Report for January - June 2020

## 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, NOAA-19, Metop-C, NOAA-18, Metop-A. 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.

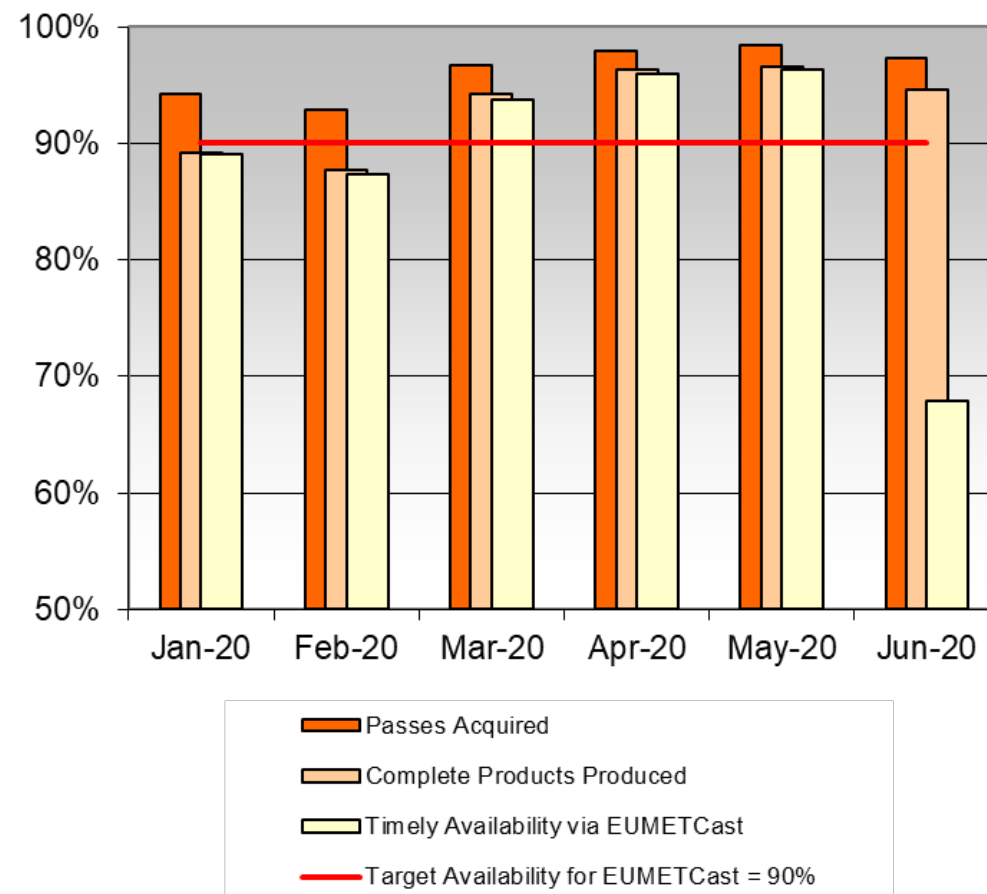
Note the less-stringent timeliness target of 45 minutes for data from the Edmonton and Gander stations.

### Events which impacted availability:

**20-Oct. 2019 – 6-Mar. 2020:**

Moscow reception station hardware problem  
(faulty L-band downconverter).

**27-May:** Distribution of ATOVS L2 products was stopped –  
HIRS data unuseable (see [slide 8](#)).



# EUMETSAT Central Operations Report for January - June 2020

## Regional Data Services → EARS-AVHRR

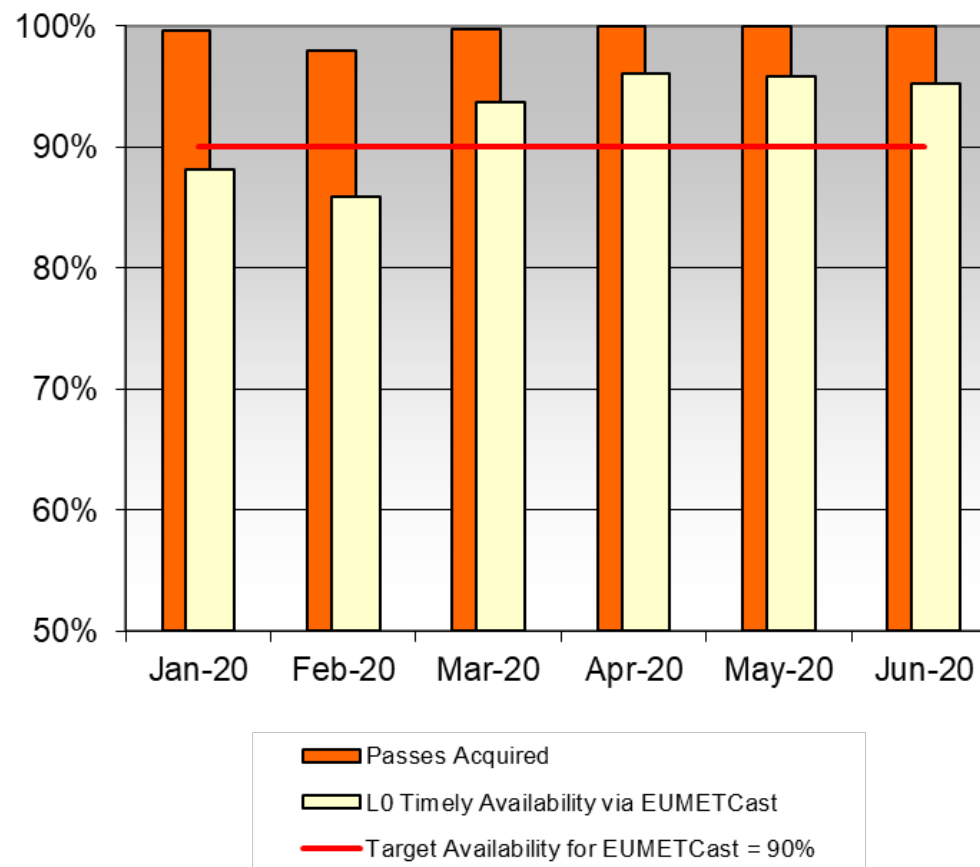
This service provides data from the AVHRR instruments onboard NOAA-19 and the Metop satellites. AHRPT partial coverage data and data from the Fast Dump Extract System (FDES) are used from the Metops.

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:

20-Oct. 2019 – 6-Mar. 2020:

Moscow reception station hardware problem  
(faulty L-band downconverter).



# EUMETSAT Central Operations Report for January - June 2020

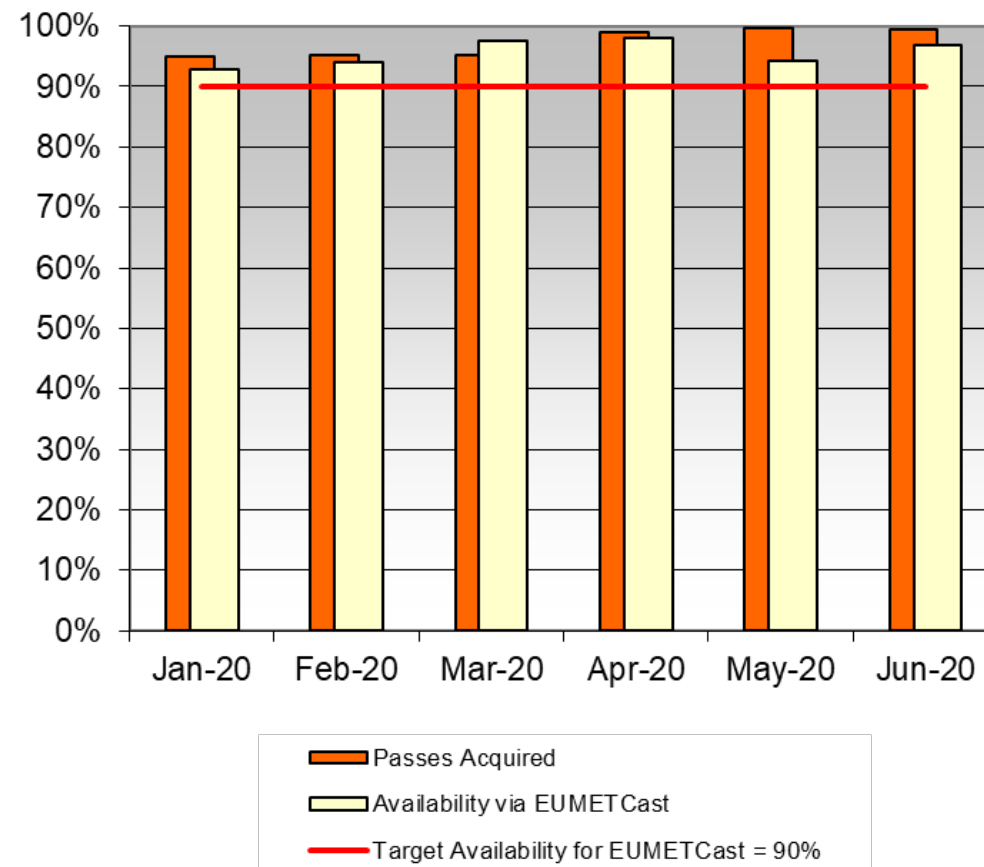
## Regional Data Services → EARS-CrIS

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

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

### Events which impacted availability:

None significant.



# EUMETSAT Central Operations Report for January - June 2020

## Regional Data Services → EARS-IASI

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

Availability shown on the chart is that of the L1C and 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.

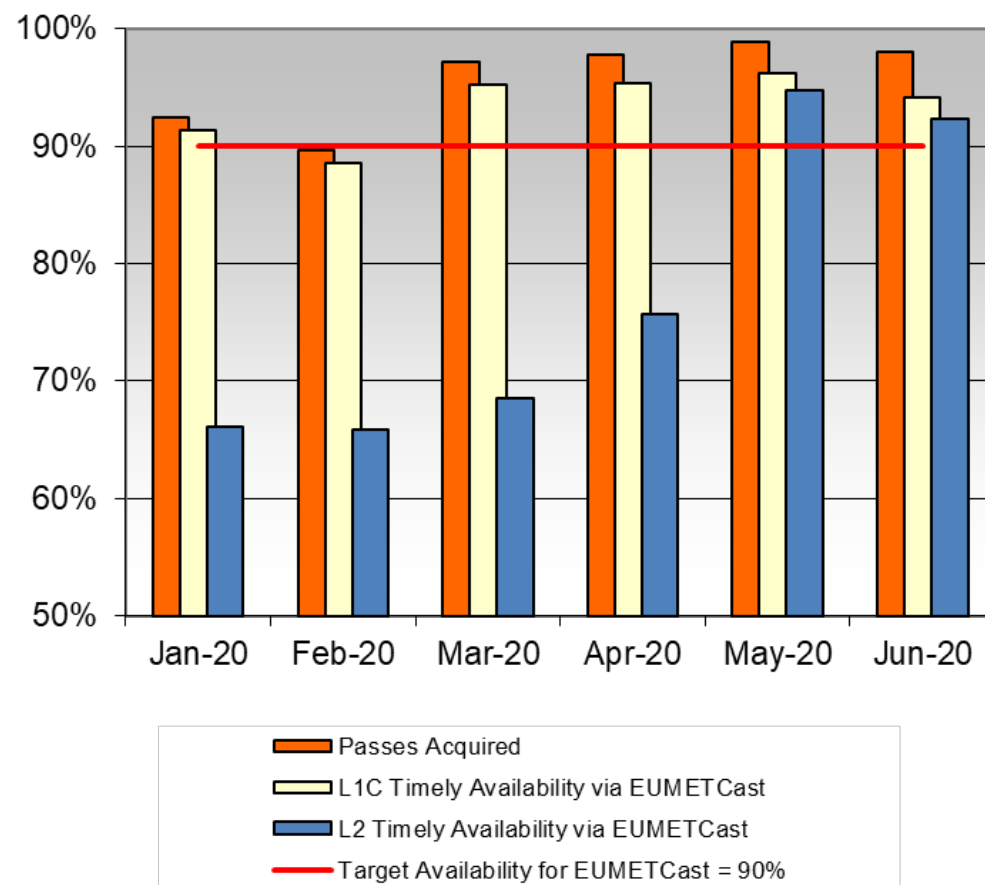
### Events which impacted availability:

**20-Oct. 2019 – 6-Mar. 2020:**

Moscow reception station hardware problem (faulty L-band downconverter).

**Jan – April:** IASI L2 processing impacted by degraded quality MHS L1B data from Metop-A (channel 2 in particular). Processor modified in April to be more resilient to such data.

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



# EUMETSAT Central Operations Report for January - June 2020

## 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.

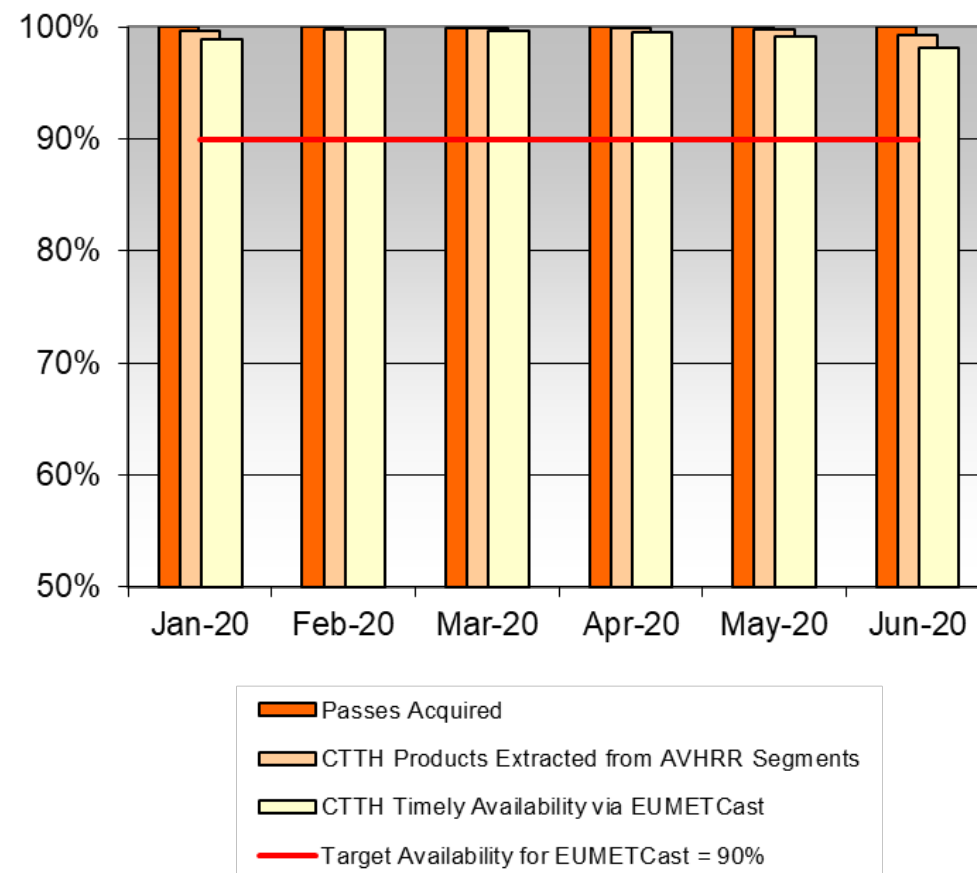
Three types of product are delivered:

- 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.



# EUMETSAT Central Operations Report for January - June 2020

## Regional Data Services → EARS-VASS

The EARS Vertical Atmospheric Sounding Service (VASS) delivers data processed to L1B from the MWHS (Microwave Humidity Sounder) and MHTS (Microwave Temperature Sounder) instruments onboard the FY-3D satellite of the China Meteorological Administration (CMA).

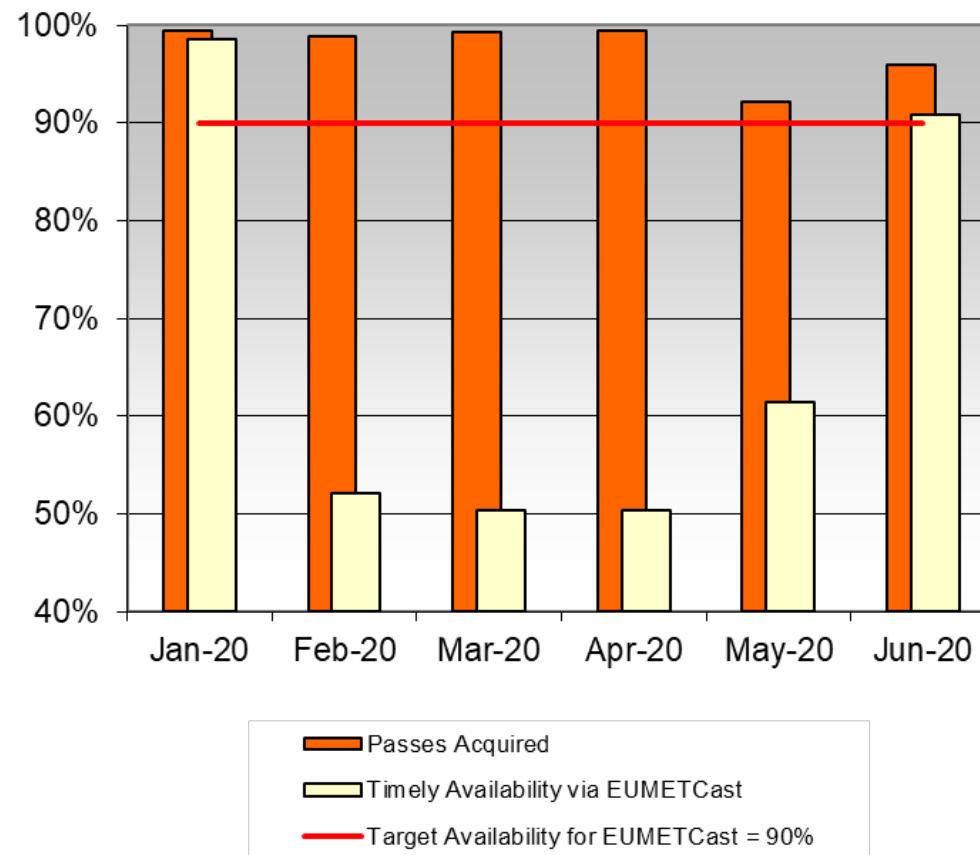
Availability shown on the chart is that of the BUFR-formatted L1B data relayed via EUMETCast.

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

### Events which impacted availability:

**4-February:** FY-3C IRAS and MWRI data becomes unavailable.

**26-May:** CMA informed that the DPT and HRPT data transmission services of FY-3C would no longer be provided outside China - FY-3C IRAS and MWRI data excluded from the statistics.



# EUMETSAT Central Operations Report for January - June 2020

## Regional Data Services → EARS-VIIRS

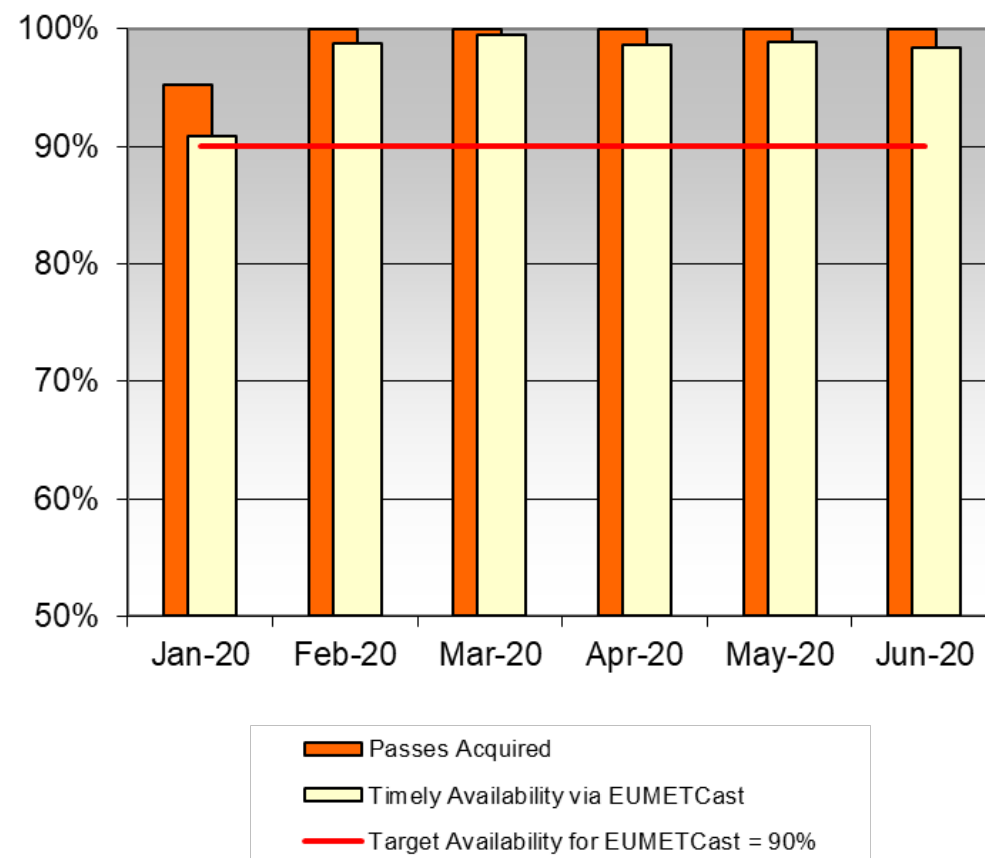
This service delivers products based on M-Band data from the Visible Infrared Imaging Radiometer Suite (VIIRS) instrument onboard NASA-NOAA's Suomi-NPP satellite.

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:

**16 - 17 Jan.:** VIIRS SDR reflective solar bands (RSB) calibration anomaly, due to an unexpected change in the solar vector, which impacted the SDR products.



## 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](http://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-A and Metop-B have provided full-time SAR support during the reporting period, with no outages.

## Jason-3 OGDR Service

This service delivers the ‘Operation Geophysical Data Record’ (OGDR) products, derived from the altimetry data acquired from the Jason-3 satellite.

The Jason-3 mission is a cooperative undertaking between EUMETSAT, NOAA, CNES and NASA, and 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 satellite in near real-time, and disseminate and archive the products. The chart on the next slide shows the availability of the products over EUMETCast within the timeliness constraint of 3 hours from the time of sensing.

**Special note:** The Jason-2 mission ended on 1 October 2019, after more than 11 years in orbit and well beyond the foreseen 3-5 year mission baseline, due to ageing-related issues onboard the spacecraft.

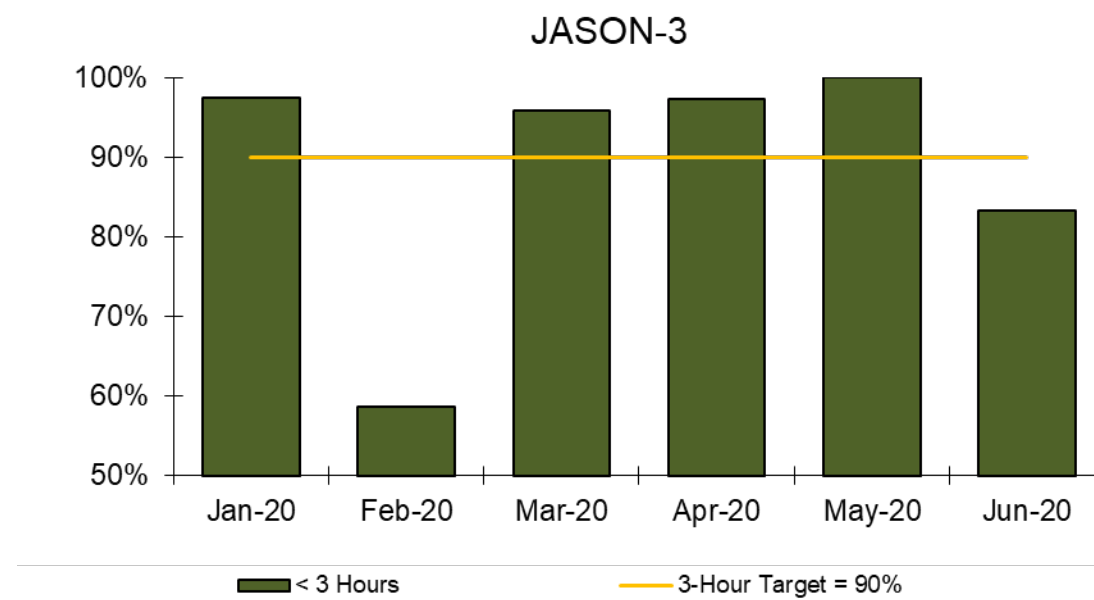
## Jason-3 OGDR Service

The chart shows the availability of the Jason-3 Operational Geophysical Data Record (OGDR) products disseminated via EUMETCast.

### Events which impacted availability:

- 31 Jan – 13 Feb:** Two consecutive Safe-Hold Modes, the first triggered by an anomaly on Gyro 3, suspected due to an SEU, followed by a second one on 5-Feb, the day on which the recovery from the first one had been completed only hours earlier.
- 15 – 19 June:** A further Safe-Hold Mode, this time triggered by an SEU affecting Gyro 2.

**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 GOES-17 ('GOES-West') at 137.2°W
- JMA's Himawari-8 at 140.7°E
- CMA's FY-2G at 105°E, and FY-2H at 79°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 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.**

# EUMETSAT Central Operations Report for January - June 2020

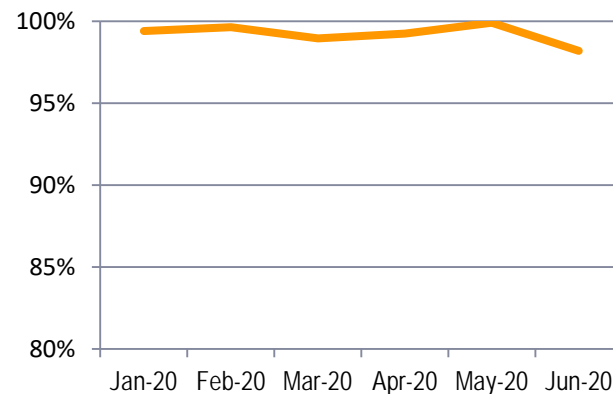
## Third-Party Data Services → Geostationary Satellite Data & Products (1 of 2)

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.

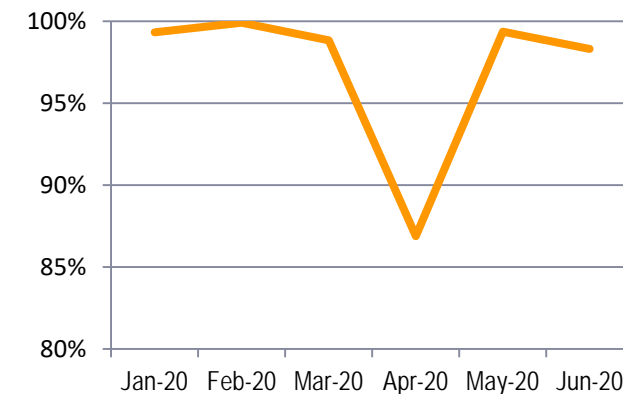
### Events which impacted availability:

**April:** GOES-West: dataflow disrupted by link problems and 2 planned remedial maintenance activities.

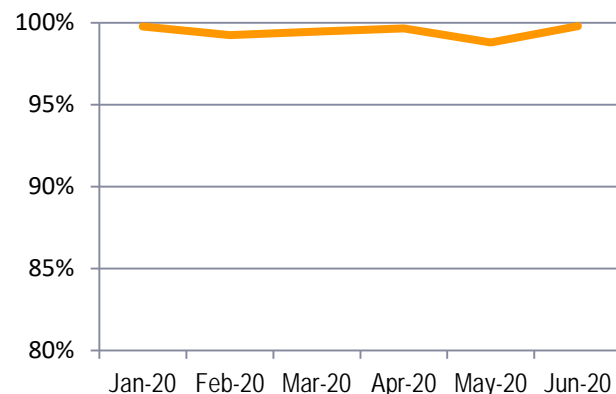
**GOES-East (75°W)**



**GOES-West (137.2°W)**



**Himawari-8 (140.7°E)**



# EUMETSAT Central Operations Report for January - June 2020

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

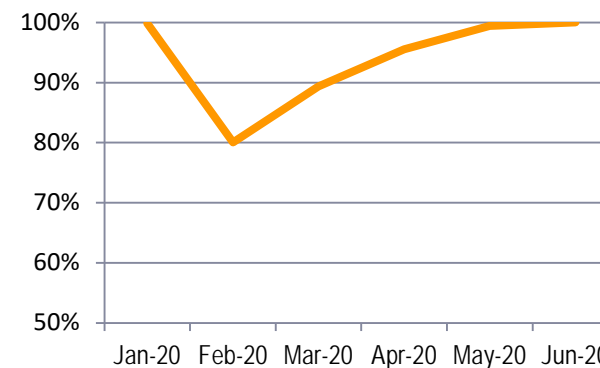
The charts here show the timely availability (as percentage of expected) of selected meteorological products generated from the data acquired by the Fengyun geostationary satellites operated by the China Meteorological Agency (CMA), as disseminated via EUMETCast.

### Events which impacted availability:

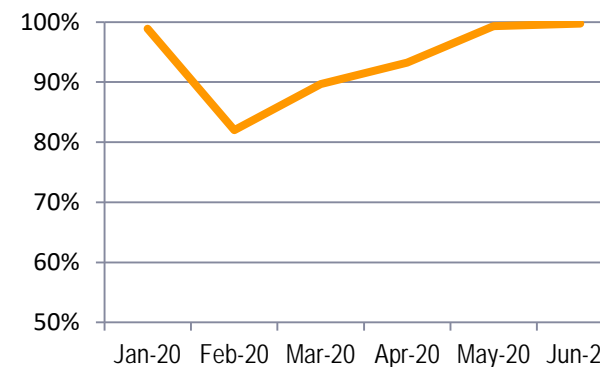
**7-11 Feb:** FY-2G and FY-2H: Data unavailable from CMA.

**Feb-April:** Eclipse season impacted some products.

**FY-2G (99.5°E)**



**FY-2H (79°E)**



# EUMETSAT Central Operations Report for January - June 2020

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

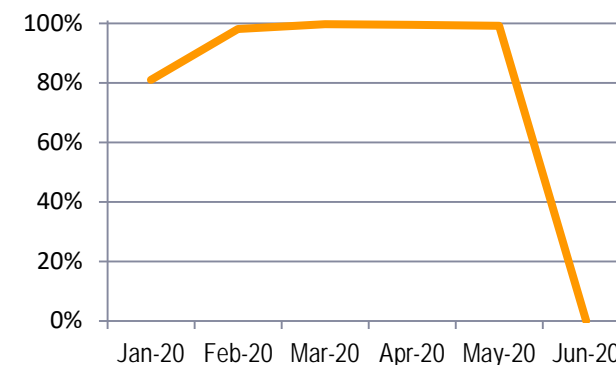
This section presents charts which show the availability of data and products for LEO satellites operated by partner organisations, as disseminated via EUMETCast.

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

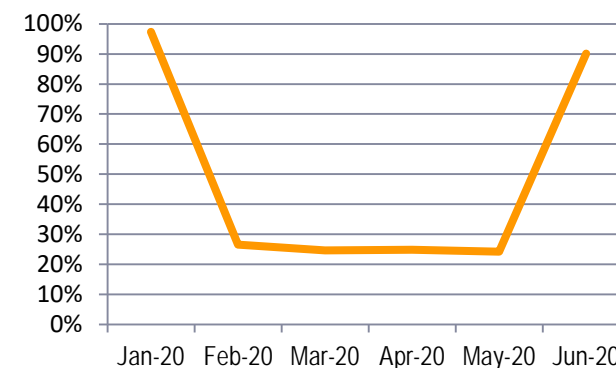
### Events Which Impacted Availability:

- 1 June:** FY-3B service terminated.
- 4-February:** FY-3C IRAS and MWRI data becomes unavailable.
- 26-May:** CMA informed that the DPT and HRPT data transmission services of FY-3C would no longer be provided outside China - FY-3C IRAS and MWRI data excluded from the statistics as of 26-May.

**FY-3B Level 1 Data**



**FY-3C Level 1 Data**



# EUMETSAT Central Operations Report for January - June 2020

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

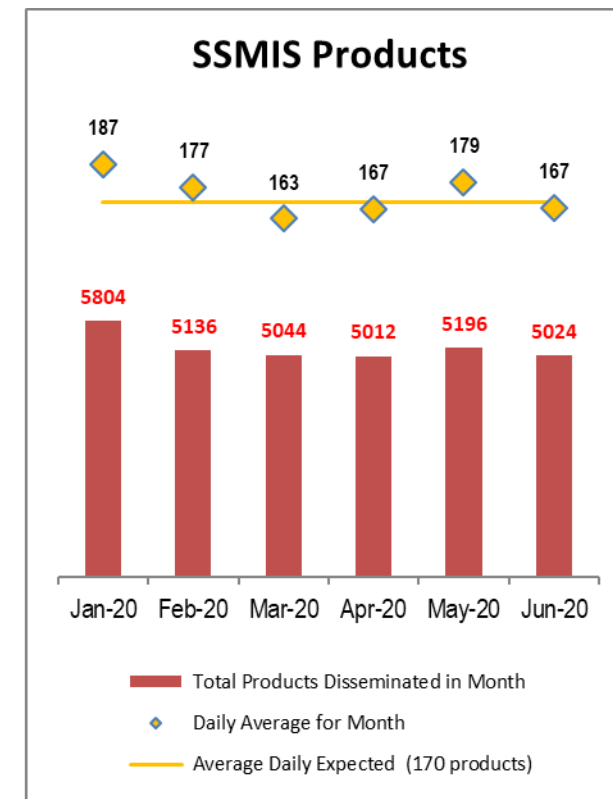
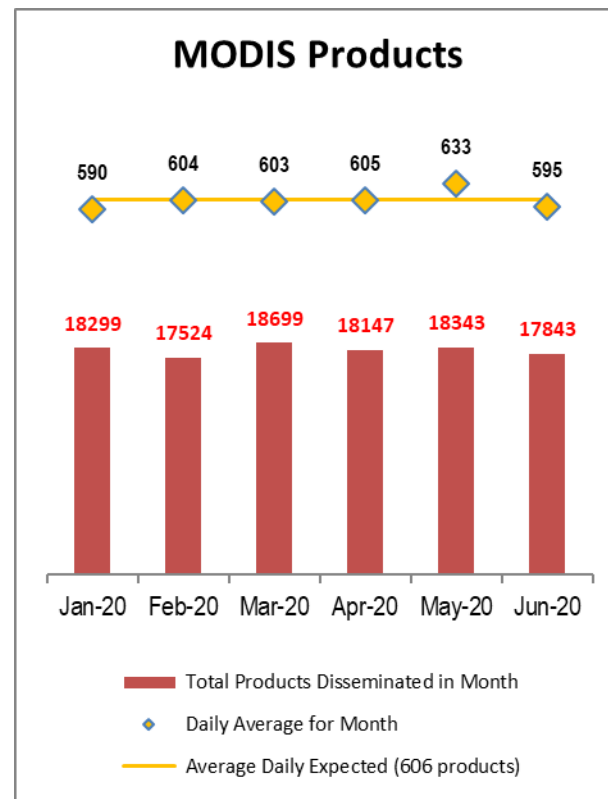
This slide presents further charts showing the availability of certain LEO satellite products from partner organisations, as disseminated via EUMETCast. Availability shown in terms of total products disseminated /month and equivalent daily average/month.

**MODIS Products:** Various regional products derived from the 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.

### Note:

The dissemination of MODIS L2 products was discontinued at the end of November 2020. The 'Average Daily Expected' products has been reduced accordingly.



# EUMETSAT Central Operations Report for January - June 2020

## 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.

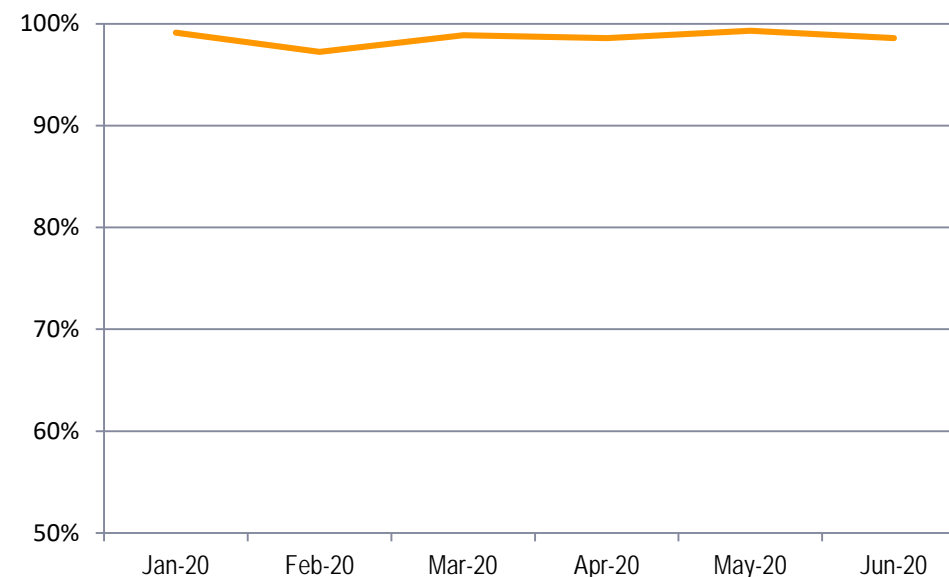
Each OGDR corresponds to one orbit of data, and their availability is shown as a percentage of the scheduled passes.

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.

**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.

Both EUMETCast Europe and EUMETCast Africa services utilize DVB-S2 technology, the former supported by a Ku-Band transponder on EUTELSAT-10A, and the latter by a C-Band transponder on EUTELSAT-8.

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 2020

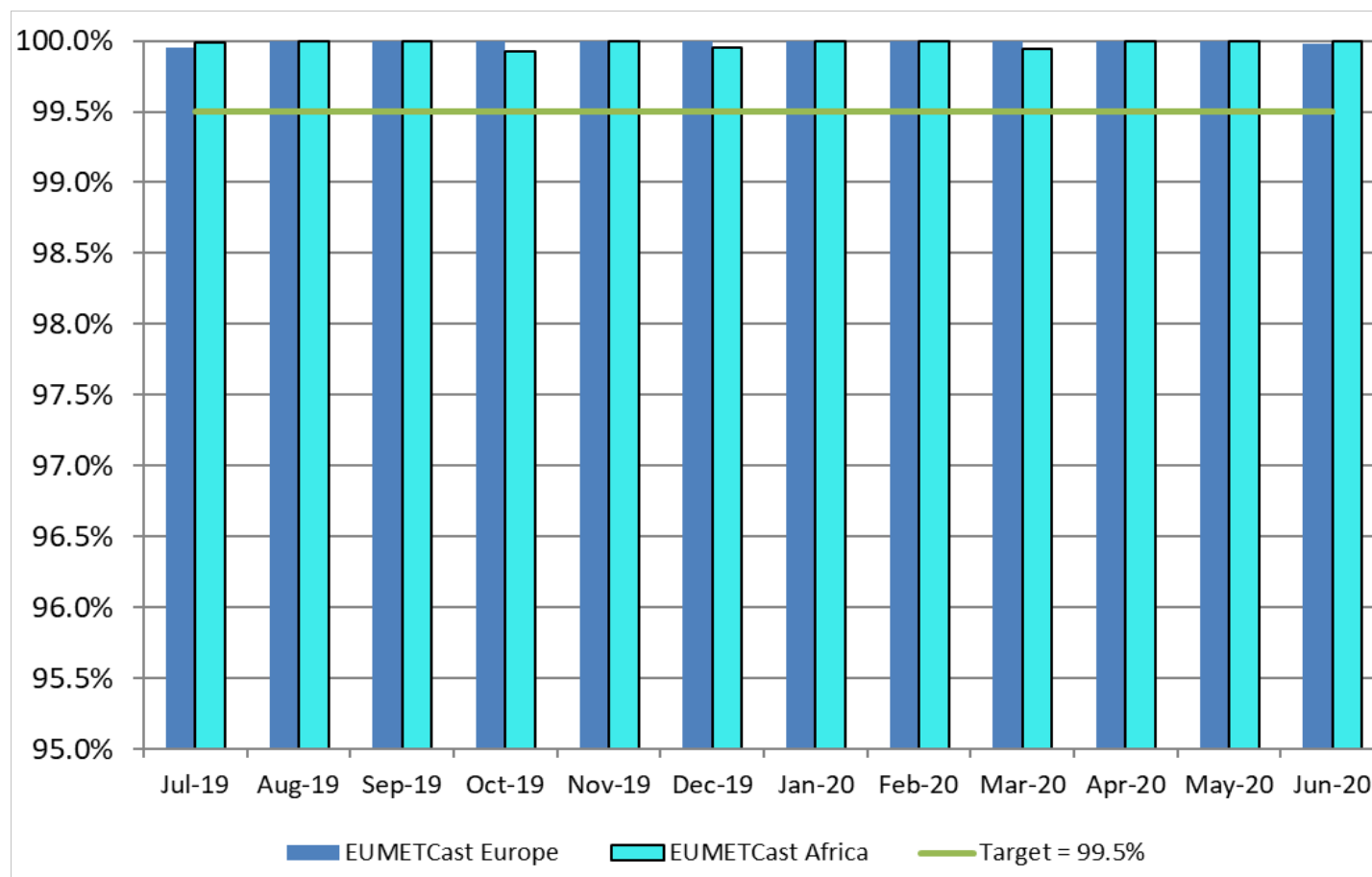
## EUMETCast → System Availability for the Year-To-Date

The chart here shows the monthly system availability for the 2 EUMETCast services covering Europe and Africa respectively.

Both services are based on DVB-S2 technology, with EUMETCast Europe being disseminated via Ku-band and EUMETCast Africa via C-band.

Events which impacted availability:

None significant.

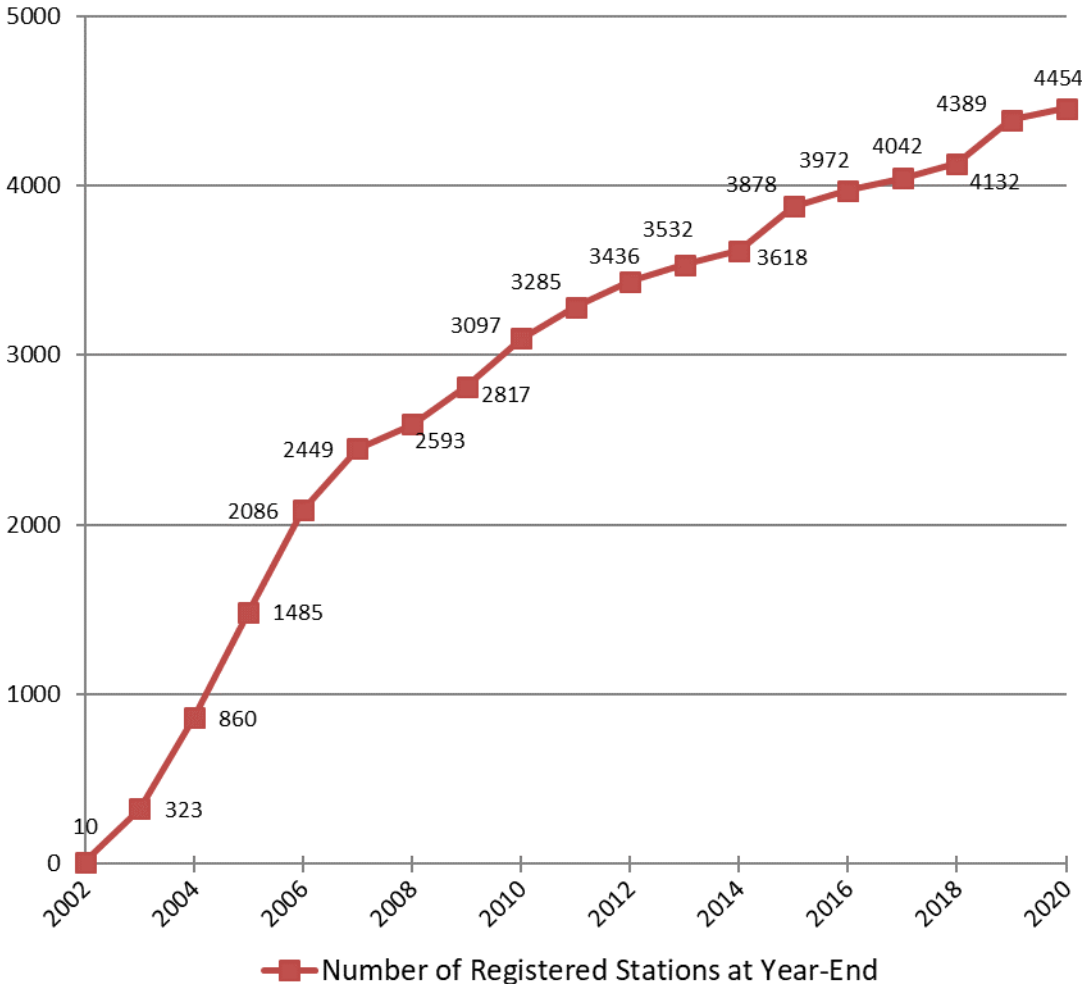


# EUMETSAT Central Operations Report for January - June 2020

## EUMETCast → Registered User Stations

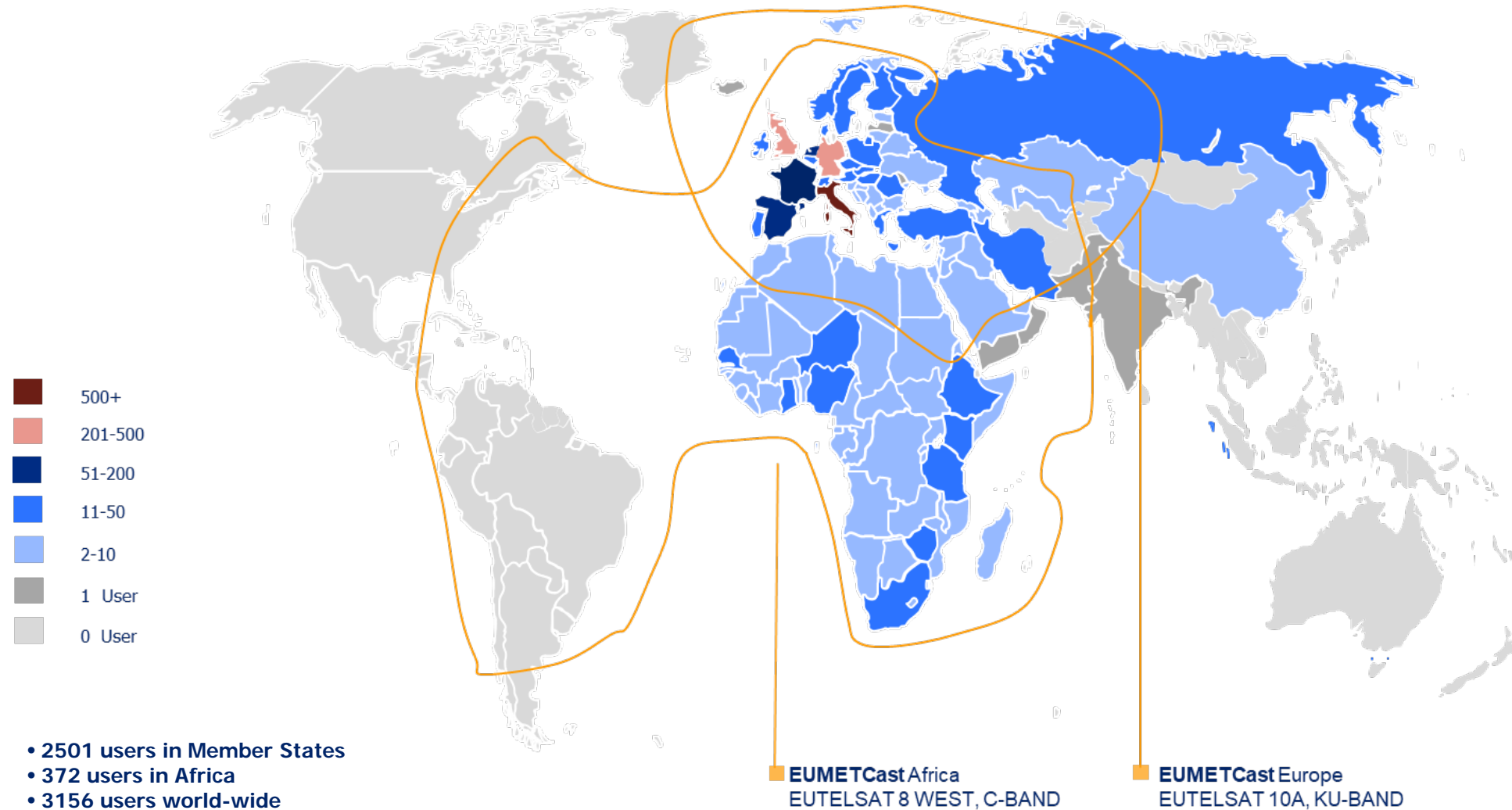
The chart shows the trend of registrations of EUMETCast user stations since the establishment of the system in 2002, up until the end of the reporting period.

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 2020

## EUMETCast → Users Worldwide as of 30 June 2020



## 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

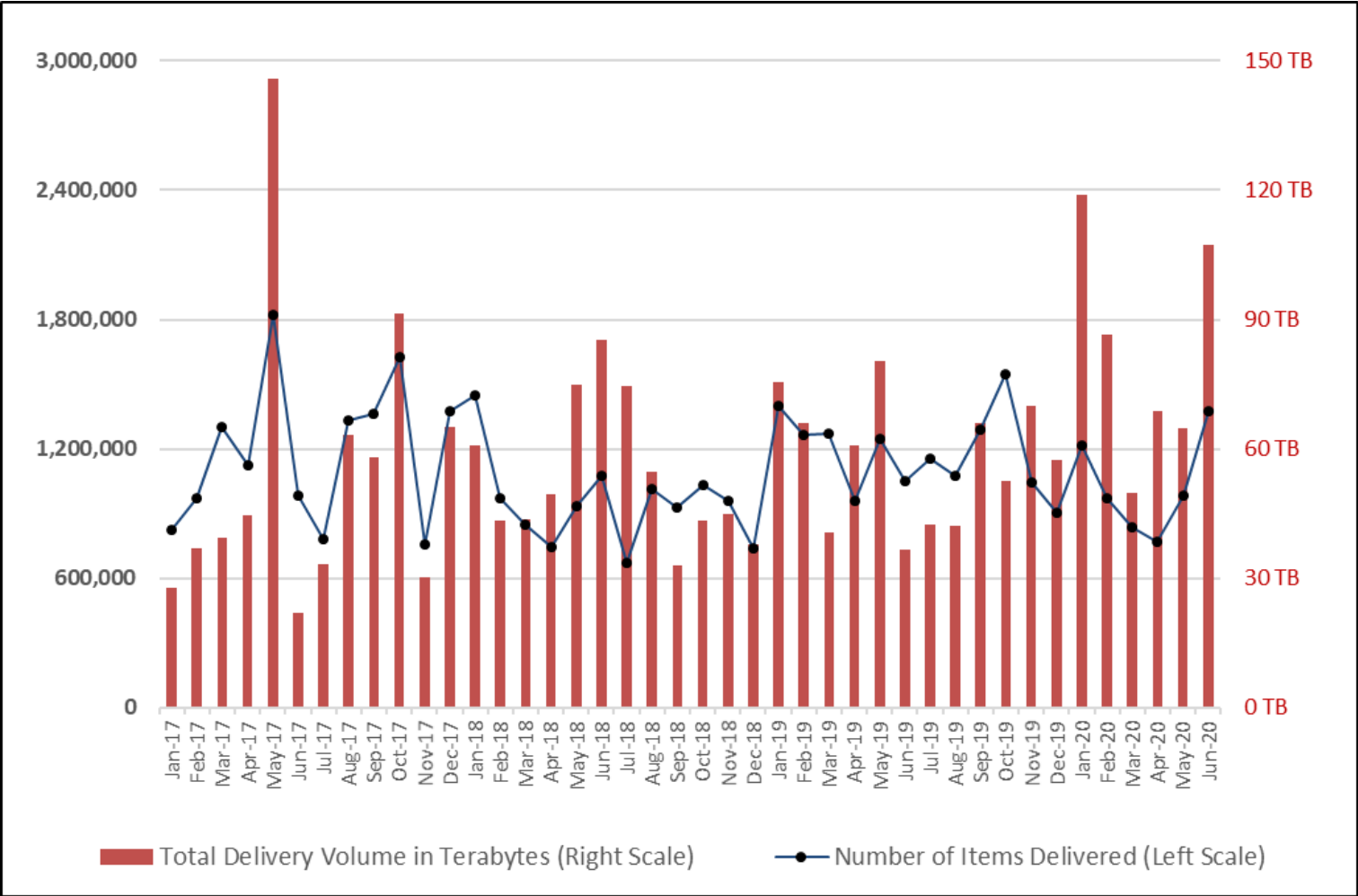
Note that the charts do not include orders and deliveries of Climate Data Records (CDRs). Although the volumes of CDR deliveries are large (typically many TBs), they are not logged in the automated statistics provided by EUMETSAT's Data Centre.

# EUMETSAT Central Operations Report for January - June 2020

## 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 the end of the current reporting period.

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



# EUMETSAT Central Operations Report for January - June 2020

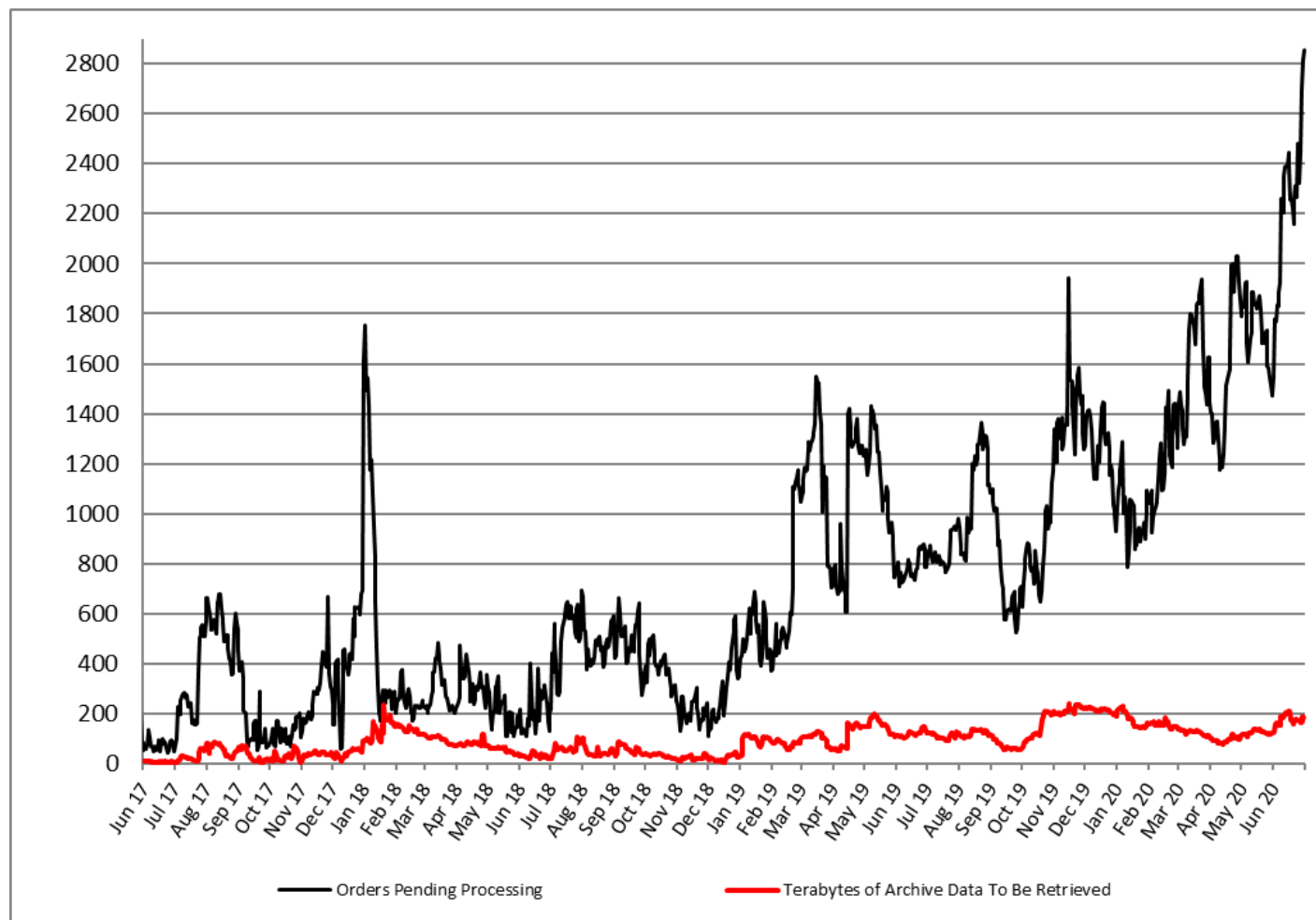
## The EUMETSAT Data Centre → Archive Orders versus Data To Be Retrieved

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.

The day-by-day profile of archive orders awaiting processing has been showing a steady increase since December 2018 while the volume of Archive data (to be) retrieved remains stable.

These somewhat counter-intuitive facts are attributable to significant increases in the numbers of small and medium orders, while the numbers of large orders have decreased.



# EUMETSAT Central Operations Report for January - June 2020

## 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).

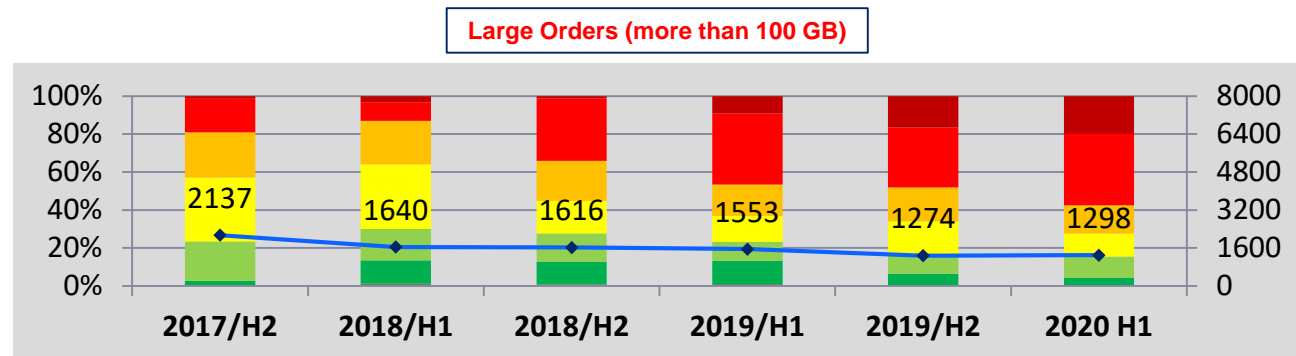
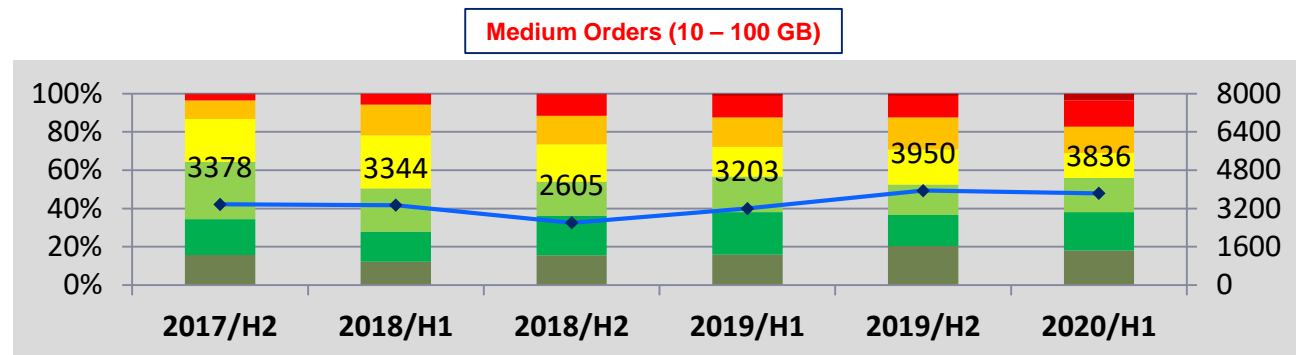
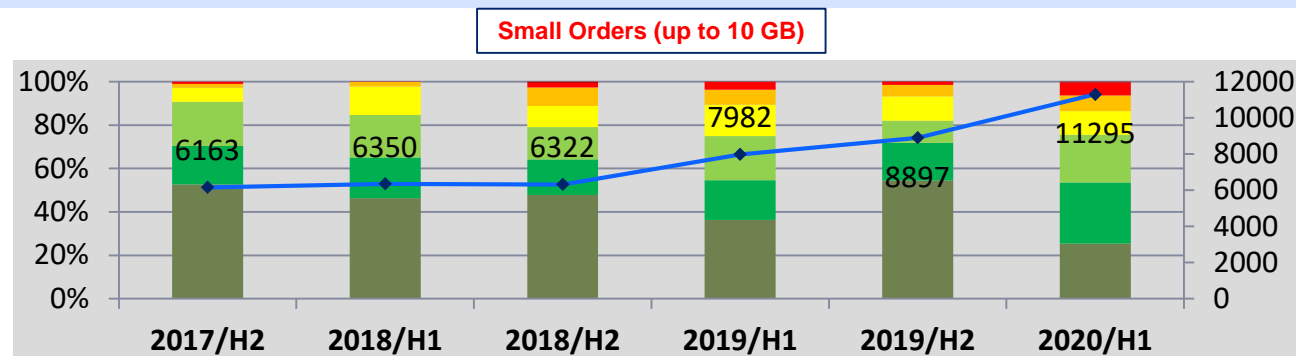
The colour-coding for the delivery-time bands on each of vertical bars on each chart is as follows:



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

Delivery times for medium and large orders have increased over the last year as a consequence of the increasing number of orders overall, as shown on the previous slide. Worth noting is the planned release of the new EUMETSAT Data Store later this year, which will enable direct download of data via the Internet – this is expected to lead to a change in demand for the existing user-ordering method.

For more information, please see [‘New Pilot Data Services’](#) on the EUMETSAT website.



## 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 2020

## EUMETSAT's Support to Climate Services → Climate Data Record (CDR) Generation

### Published in 2020/H1:

- Metop-A IASI level 1c FCDR
- Metop-A/B GRAS bending-angle profiles FCDR (up to 2018)
- Metop A/B AVHRR Global and Polar AMV TCDRs

### Previously produced, pending publication:

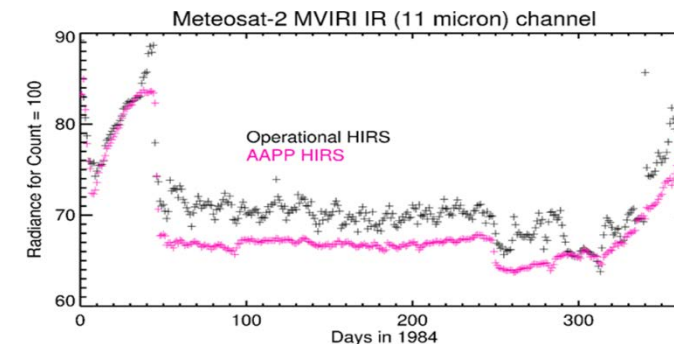
- Meteosat FCDR (recalibrated IR M2-9 and VIS M2-7)
- Meteosat 2-10 surface albedo TCDR
- Meteosat 2-10 ASR/CSR and AMV TCDR
- Metop A/B MHS, S-NPP ATMS, FY-3A/B MWHS-1, FY-3C MWHS-2, DMSP SSM/T-2 FCDRs
- Metop IASI Temperature and Humidity Profiles L2 Release 1
- Nimbus-6, NOAA, Metop HIRS FDR
- NOAA AVHRR GAC Polar AMV TCDR extension

### To be produced in 2020/H2:

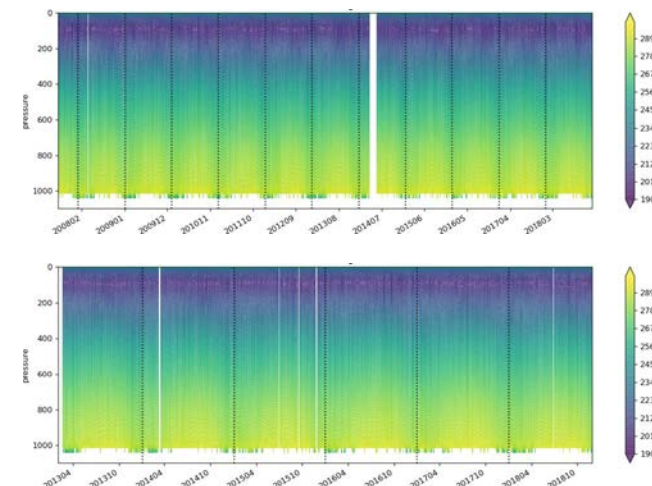
- Metop-A/B GRAS bending-angle profiles FCDR Release 3 (up to 2019)
- NOAA AVHRR GAC AMV Release 2
- GOME-2 L1B FCDR (up to 2019/20)
- ICDR demonstration for Meteosat AMV and NOAA ATMS

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

- Metop A/B IASI L2 TCDR for trace gases
- PMAP Aerosol TCDR (2020/21)
- MVIRI full image reprocessing: Release 2 FCDR, 2021
- Optimal Cloud Analysis (OCA) L2 Release 1, 2021



Potential improvements to early Meteosat calibration using HIRS from the improved AAPP FCDR processor.



IASI A (top) and B (bottom) global daily atmospheric temperature profiles (in K)

## 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.

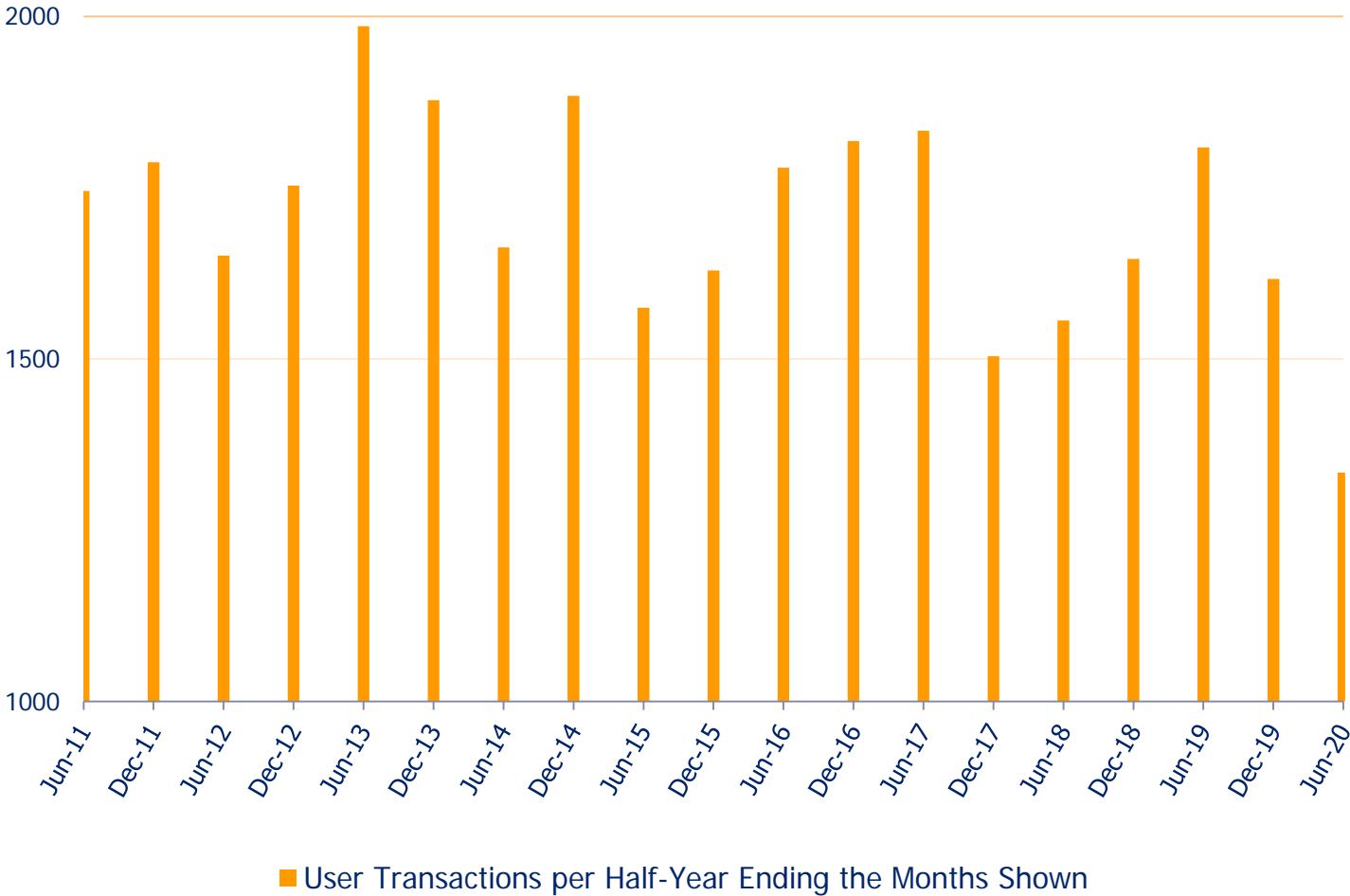
This section includes charts on the following subjects:

- 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 2020

## Helpdesk Service → User Interaction History

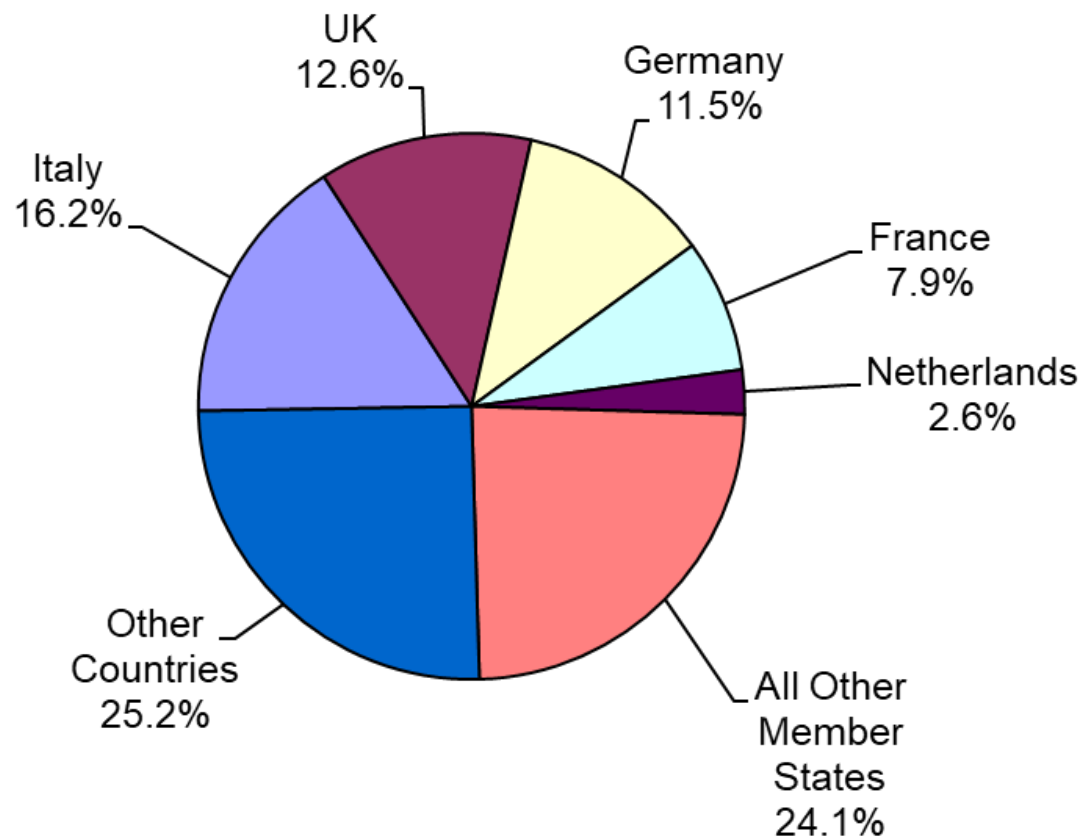
The chart shows the number of user interactions handled by EUMETSAT's User Helpdesk in each half-year of the last 10 years. The next two slides focus on the user interactions for the current reporting period, in which a total of 1334 interactions were handled.



The chart shows the interactions in the first half of 2020 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 2020

## Helpdesk Service → User Interactions 2020/H1 by Category

The chart shows the numbers of user interactions in the first half of 2020 for:

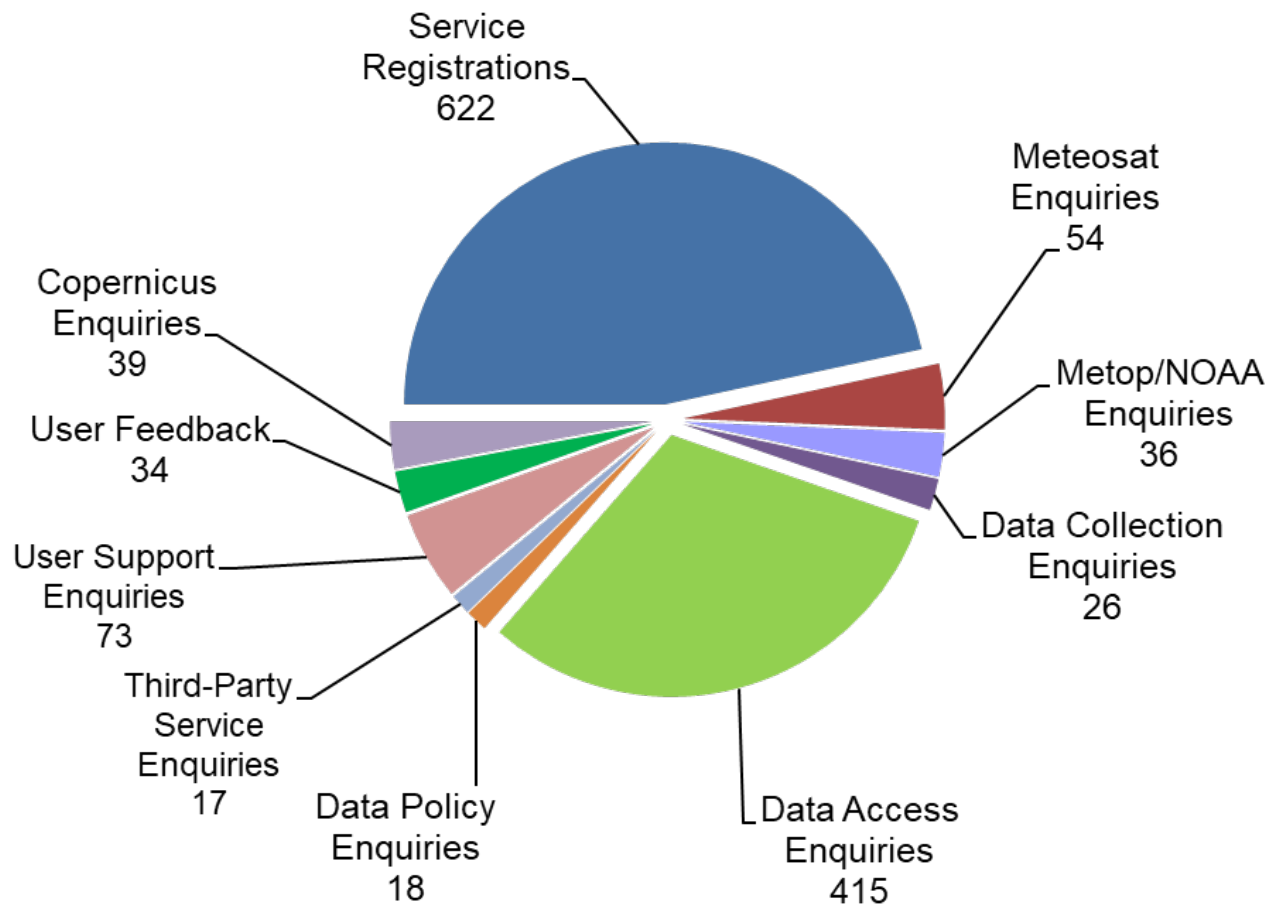
- Service Enquiries (8 categories)
- Service Registrations
- User Feedback

Total interactions for the half-year came to 1334.

### 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](http://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 2020

## 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 ( <a href="http://www.cma.gov.cn/en2014/">http://www.cma.gov.cn/en2014/</a> )
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 2020

## 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 ( <a href="http://www.jma.go.jp/jma/indexe.html">http://www.jma.go.jp/jma/indexe.html</a> )

# EUMETSAT Central Operations Report for January - June 2020

## 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 2020

## 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 ( <a href="http://www.noaa.gov/">http://www.noaa.gov/</a> )
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 2020

## 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