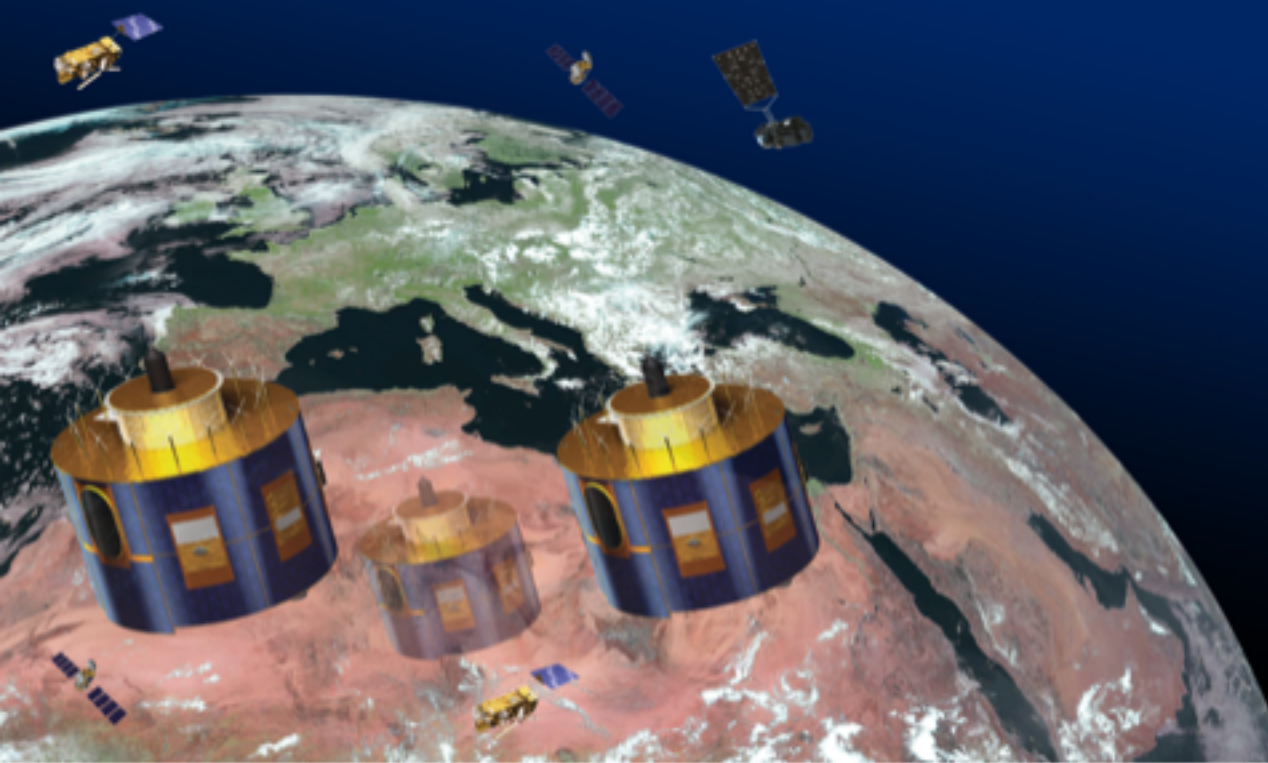


Overview of EUMETSAT

Dr. Dieter Klaes

EUMETSAT



EUMETSAT is an intergovernmental organisation

30 Member States

Member States



AUSTRIA



BELGIUM



BULGARIA



CROATIA

SERBIA



CZECH REPUBLIC



DENMARK



ESTONIA



FINLAND



FRANCE



GERMANY



GREECE



HUNGARY



ICELAND



IRELAND



ITALY



LATVIA



LITHUANIA



LUXEMBOURG



THE NETHERLANDS



NORWAY



POLAND



PORTUGAL



ROMANIA



SLOVAK
REPUBLIC



SLOVENIA



SPAIN



SWEDEN



SWITZERLAND



TURKEY



UNITED KINGDOM



EUMETSAT mission and vision

Primary objective:

Establish, maintain and **exploit** European systems of **operational** meteorological satellites.

Further objective:

Contribute to the **operational monitoring** of the **climate** and the detection of **global climatic changes**.

Vision:

Be the leading **user-driven operational** agency in Europe for Earth observation satellite programmes that fulfil the objectives of its Convention, and a trusted **global partner** for those outside Europe who share these objectives.

EUMETSAT Missions – Current and planned

Geostationary Programmes

Meteosat-10
2013

MSG-4 / Meteosat-11
destroyed 2018
2016

MTG-I
Imagery
2021

MTG-S
Sounding
2023

Mandatory Programmes

Meteosat-9
2006

Meteosat-8
2004

Low Earth Orbit Programmes

Metop-A
2007

Metop-B
2013

Metop-C
2019

Metop-SG A
Sounding & Imagery
2023

Metop-SG B
Microwave Imagery
2023

Optional and Third Party Programmes (incl. Copernicus)

JASON-2
2009

Sentinel-3A
2016

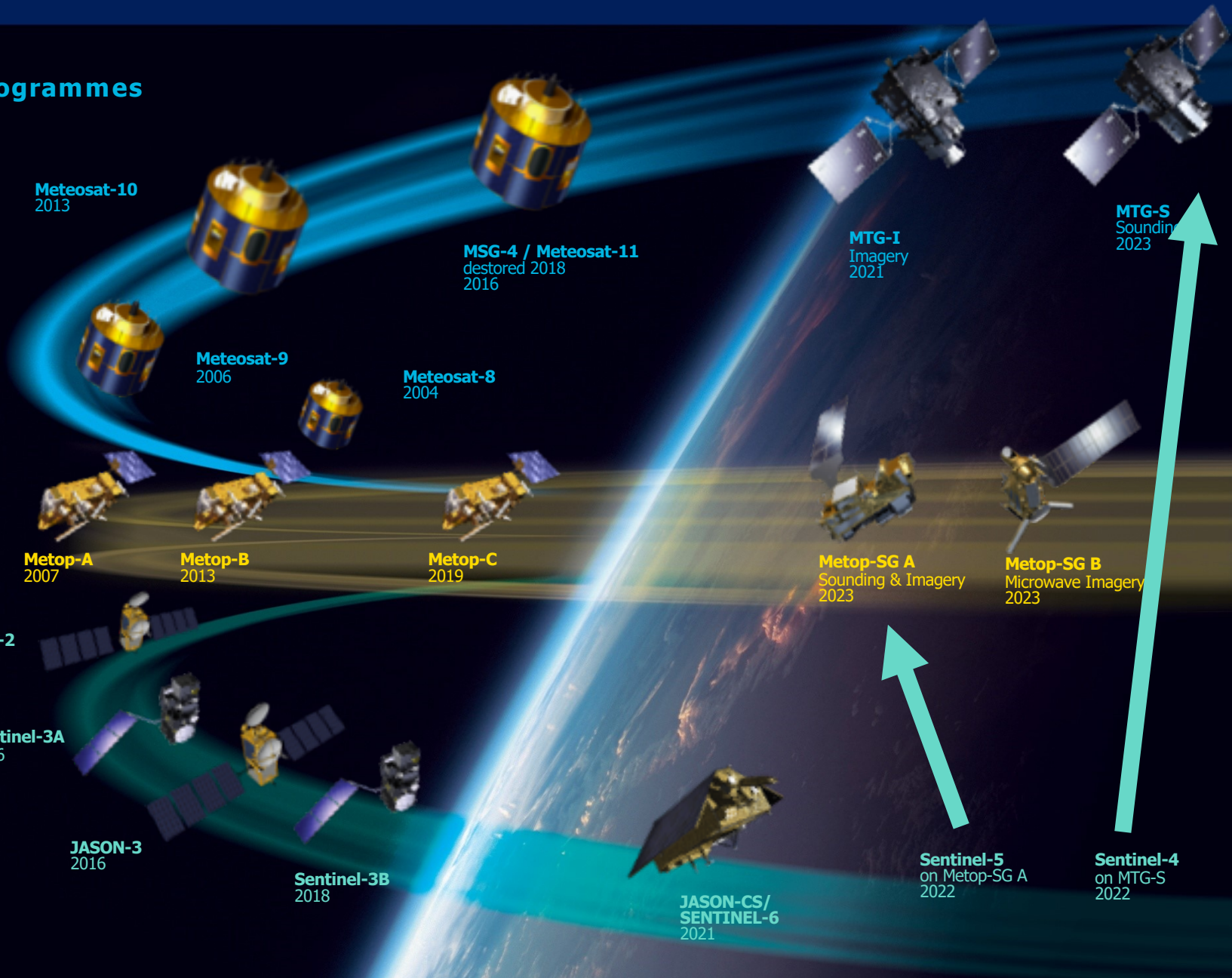
JASON-3
2016

Sentinel-3B
2018

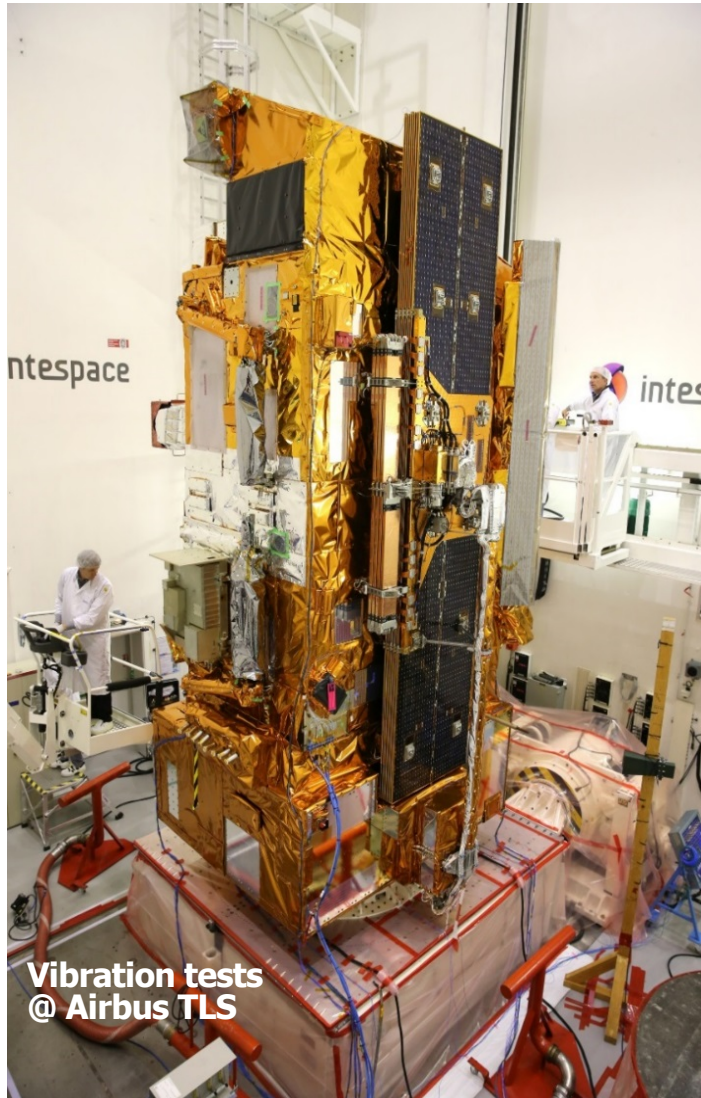
JASON-CS/
SENTINEL-6
2021

Sentinel-5
on Metop-SG A
2022

Sentinel-4
on MTG-S
2022



EPS: Metop-C being prepared for launch (1)



- System V&V : SIVVR *passed successfully*, close-out achieved at LORR-2
- LEOP : OVRR *passed successfully*
- Launcher : FMAR *passed successfully*
- System : LORR-1/LORR-2 including SIOV preparation *passed successfully*, SC took place earlier today
- Satellite : FAR-3, Part 2 *passed successfully*
- Launch Campaign : Consent to Ship *recommendation given*

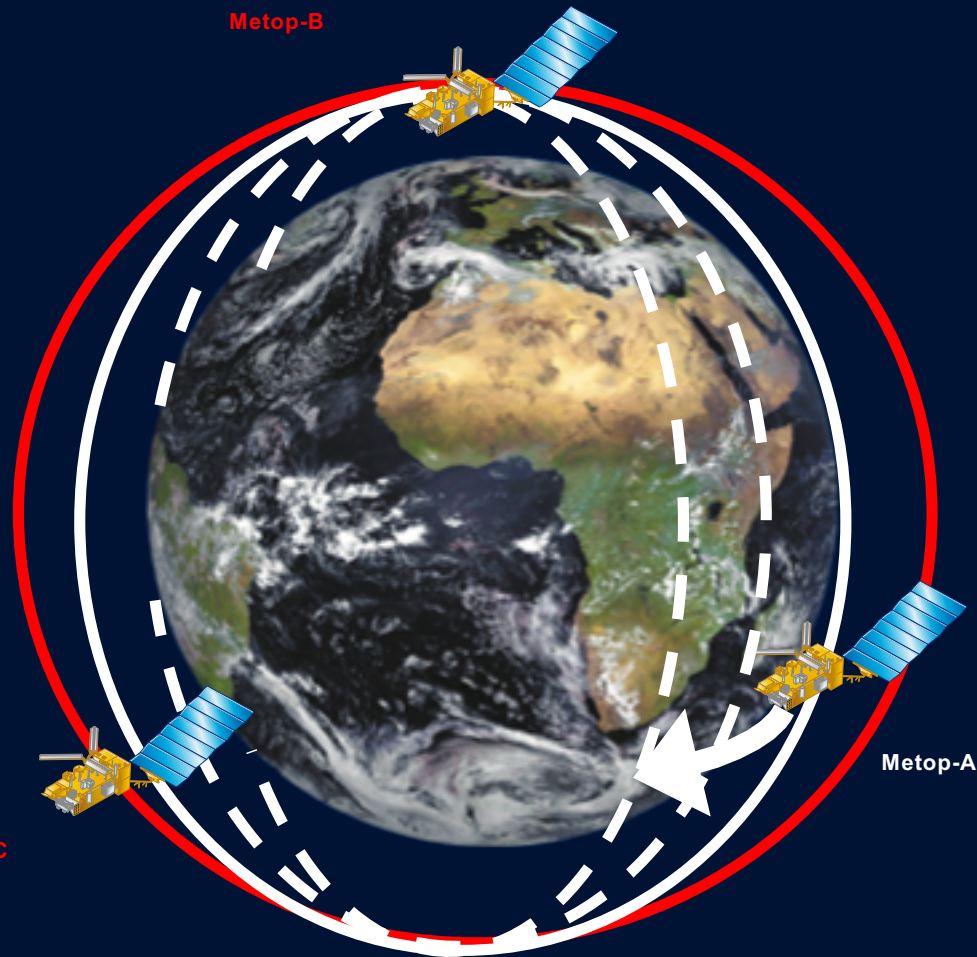
EPS Metop-C being prepared for launch (2)

Activities following the successful FAR/LORR-2:

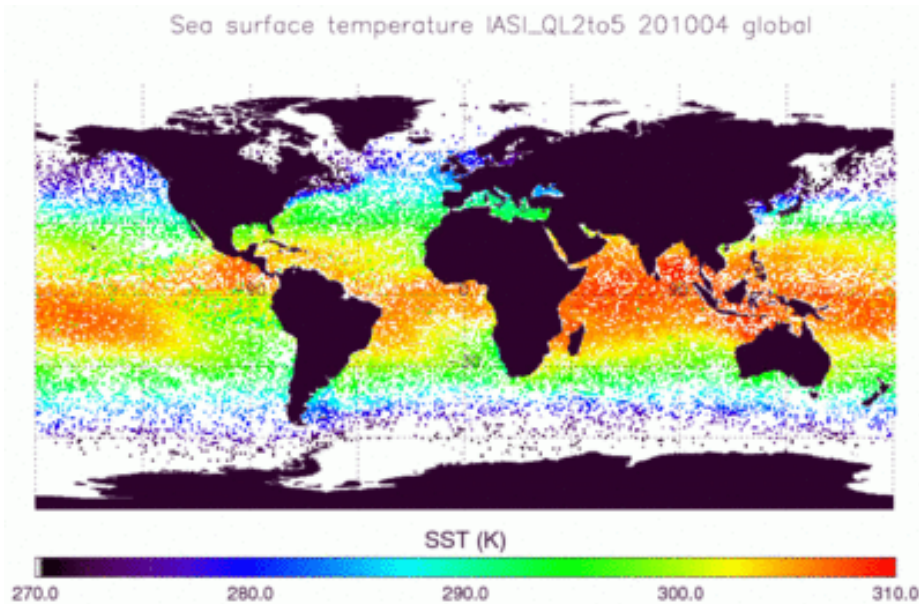
- ✓ **Consent to Ship**, start of Launch Campaign;
- **21/09/2018 (UTC) : Launch (target date)**;
- L → L+3 days : LEOP, followed by SHR;
- L+3 days → L+6 weeks (approx.) : SIOV, followed by SIOVR;
- L+6 weeks → L+4 months (approx.) : Commissioning Phase 1, followed by AR/CHR;
- TBD after AR/CHR : Commissioning Phase 2;
- TBD after AR/CHR : Metop-C declared operational as prime Metop;

There will be three Metop satellites in orbit 2018 - 2021

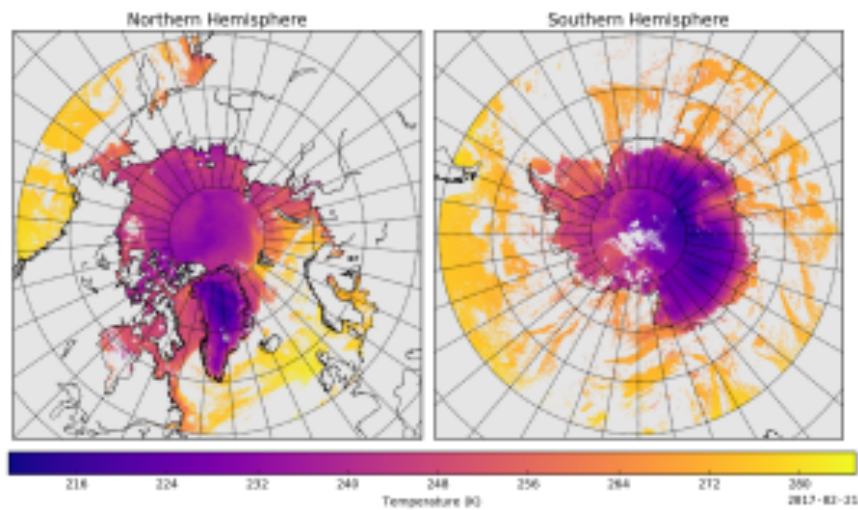
- Metop-A in drifting orbit; last OOP manoeuvre in August 2016 (EOL end 2021/early 2022)
- Metop-B prime satellite
LTDN 9:30 LST
- Metop-C launch
planned for 19/09/2018
LTDN 09:30 LST



SST and IST products from Metop



➤ IASI SST L2PCore product



➤ OSI SAF Metop-A NH Ice Surface Temperature

MTG development in cooperation with ESA – continuity beyond 2040



- Preliminary Acceptance Review (PAR) for MDAF closed in December 2017
- PAR of TT&C stations ongoing
- Launch: 2021 for MTG-I1, 2023 for MTG-S1



Operational configuration of the full MTG mission

- Imagery mission implemented by two MTG-I satellites
- Full disc imagery every 10 minutes in 16 bands
- Fast imagery of Europe every 2.5 minutes
- New Lightning Imager (LI)
- Start of operations in 2021
- Operational exploitation: 2021-2042
- Hyperspectral infrared sounding mission
- 3D weather cube: temperature, water vapour, O₃, every 30 minutes over Europe
- Air quality monitoring and atmospheric chemistry in synergy with Copernicus Sentinel-4 instrument
- Start of operations in 2023
- Operational exploitation: 2023-2042

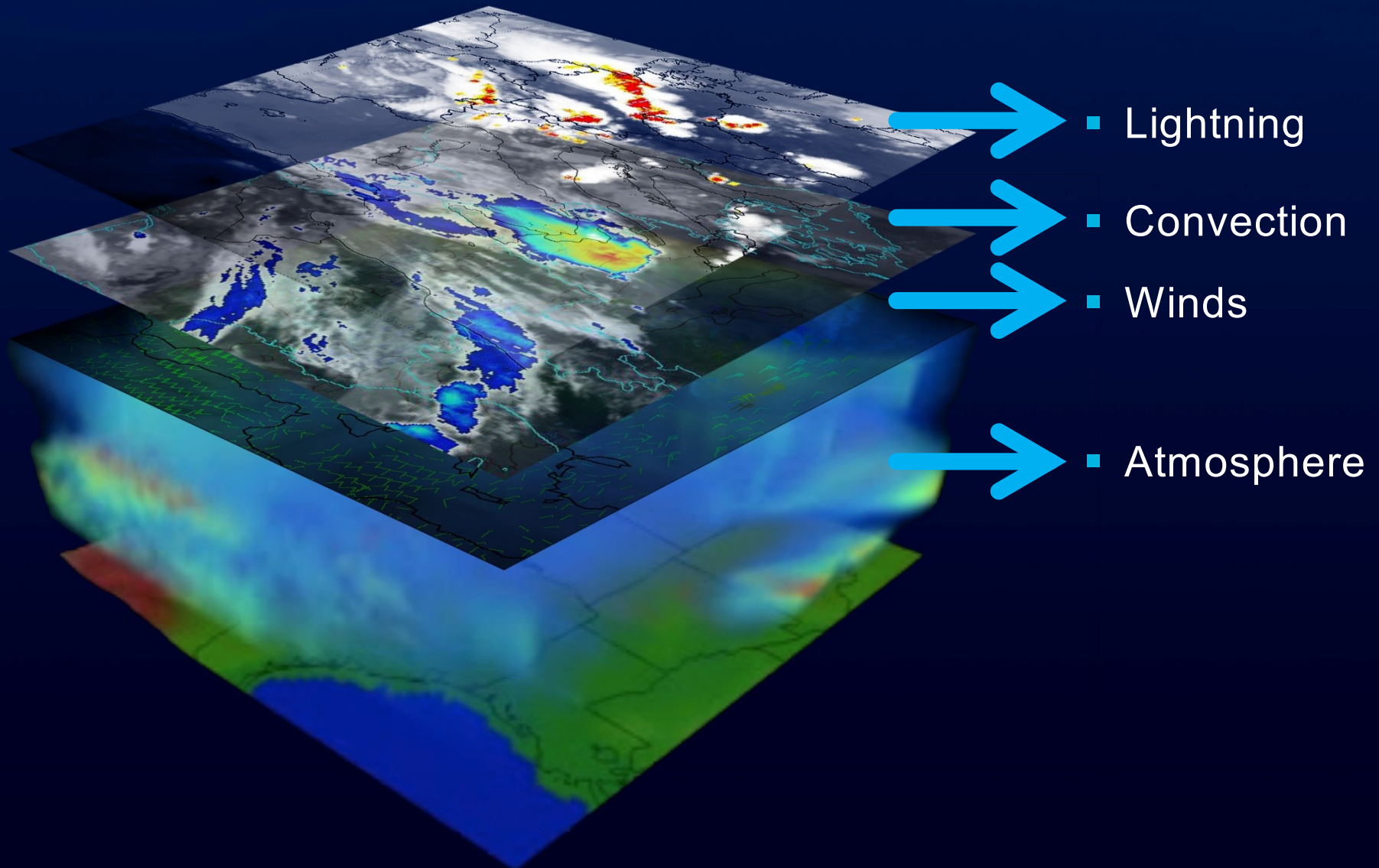


MTG-I
Rapid Scan Service

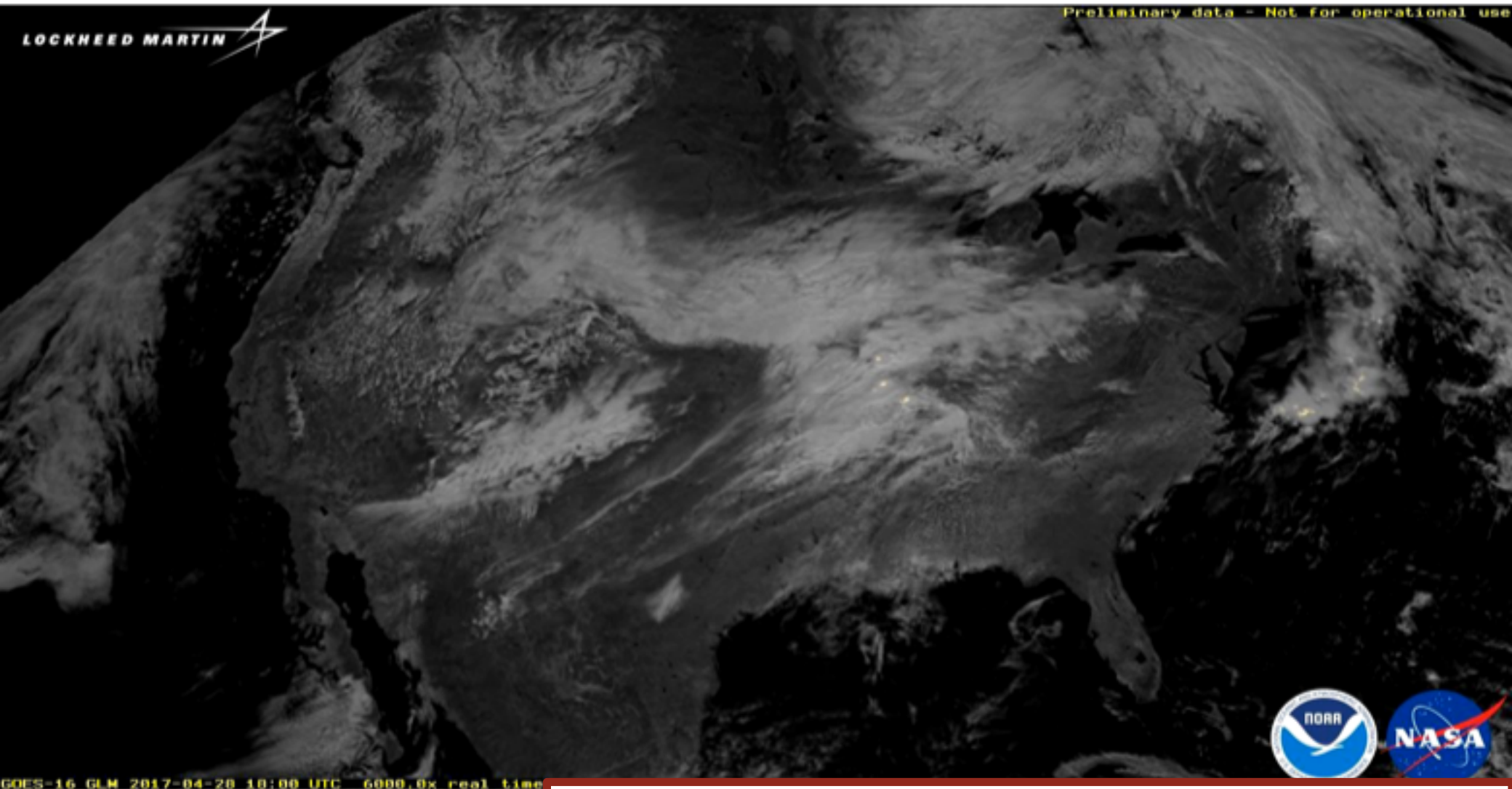
MTG-S
Sounding Service

MTG-I
Full Scan Service

4D weather cube with MTG-I and MTG-S



Lightning monitoring for very short range forecasting: example of GOES-16 (R)



April 28-30, 2017

GOES-16 GLM lightning superimposed on GLM background

EPS Second Generation - continuity beyond 2040

- Primary mission: further improvement of observational inputs to Numerical Weather Prediction models
- Significant improvements of other applications
 - Nowcasting at high latitudes
 - Marine meteorology and operational oceanography
 - Operational hydrology
 - Air quality monitoring
 - Climate monitoring



EPS-SG-A: Sounding and imaging



- 1. IASI-NG**
Infrared Atmospheric Sounding
- 2. MWS**
Microwave Sounding
- 3. METImage**
Visible-Infrared Imaging
- 4. RO**
Radio Occultation
- 5. 3MI**
Multi-viewing, -channel, -polarisation
Imaging
- 6. Copernicus Sentinel-5**
UN/VIS/NIR/SWIR Sounding

Operational exploitation 2023

EPS-SG-B: Microwave imaging and scatterometry

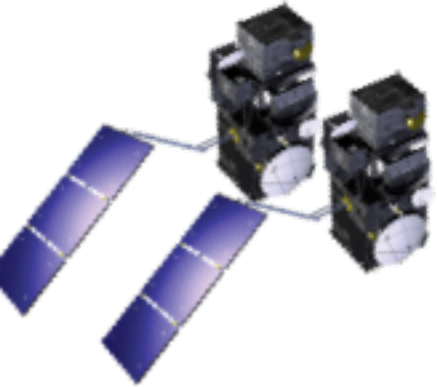


- 1. SCA**
Scatterometer
- 2. RO**
Radio Occultation
- 3. MWI**
Microwave Imaging for Precipitation
- 4. ICI**
Ice Cloud Imager
- 5. ARGOS-4**
Advanced Data Collection System

Operational exploitation 2023

Contributions to Copernicus

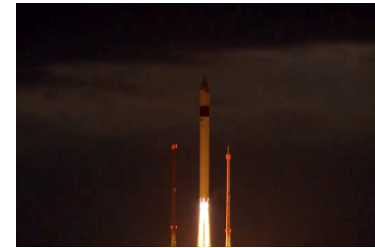
- Sentinel-3 Marine mission



Sentinel-3A: routine operations since 16 October



Sentinel-3B: launched 25/05/2018



- Jason-3 and Sentinel-6/Jason-CS cooperative missions

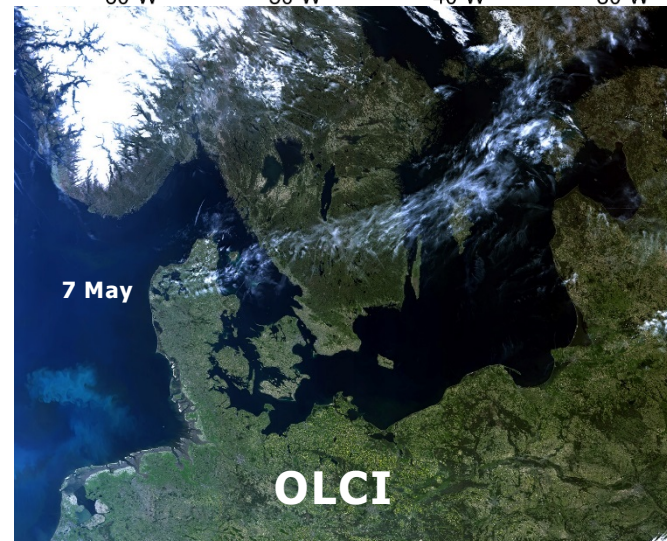
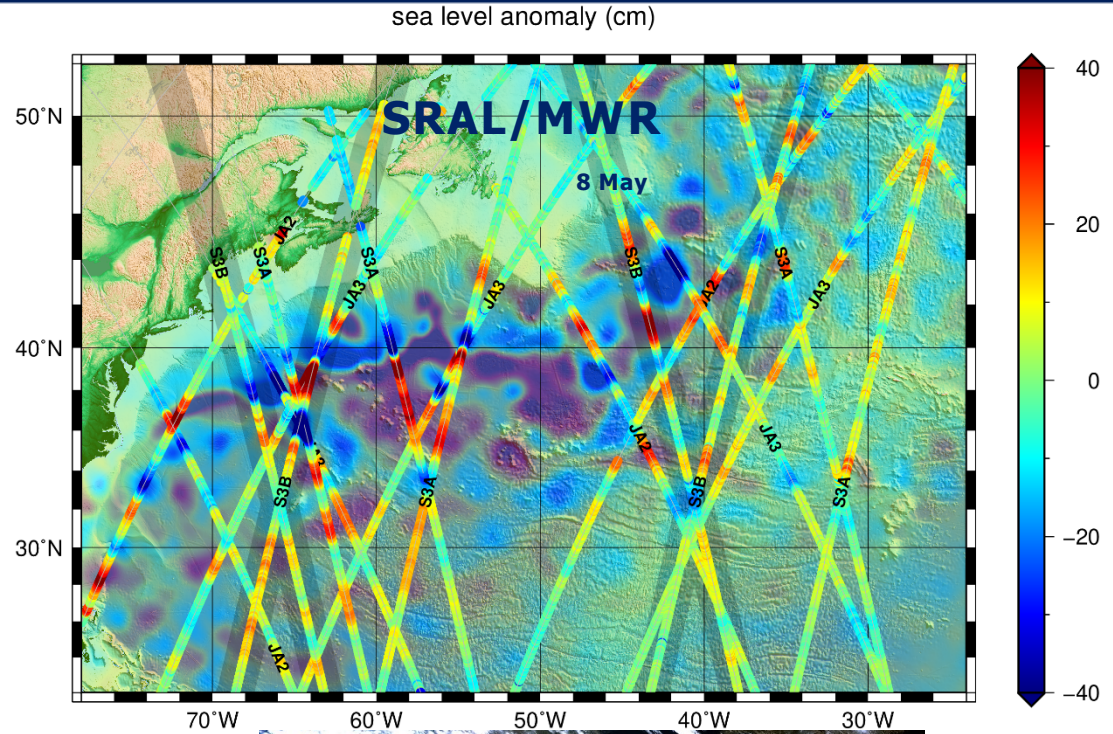


- Sentinel-4 as part of MTG(-S) system
- Sentinel-5 as part of EPS-SG system
- Data access



Deployment of recurrent satellites: Sentinel-3B

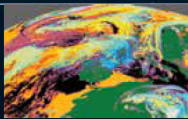
First data/images



SAF Network in Europe

NWC SAF

Support to Nowcasting and Very Short Range Forecasting
Led by Agencia Estatal de Meteorología, Spain



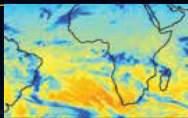
OSI SAF

Ocean and Sea Ice
Led by Météo France



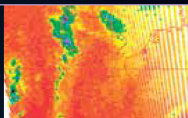
CM SAF

Climate Monitoring
Led by Deutscher Wetterdienst, Germany



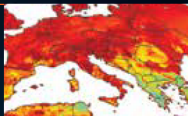
NWP SAF

Numerical Weather Prediction
Led by Met Office (UK)



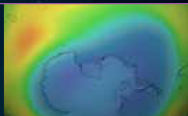
LSA SAF

Land Surface Analysis
Led by Portuguese Meteorological Institute



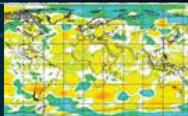
O3M SAF

Ozone and Atmospheric Chemistry Monitoring
Led by Finnish Meteorological Institute



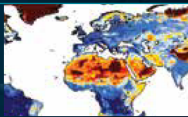
ROM SAF

Radio Occultation Meteorology
Led by Danish Meteorological Institute



H SAF

Support to Operational Hydrology and Water Management
Led by Italian Meteorological Institute



H SAF

Support to Operational Hydrology and Water Management
Led by Italian Meteorological Institute

ROM SAF

Radio Occultation Meteorology
Led by Danish Meteorological Institute

O3M SAF

Ozone and Atmospheric Chemistry Monitoring
Led by Finnish Meteorological Institute

LSA SAF

Land Surface Analysis
Led by Portuguese Meteorological Institute

NWC SAF

Support to Nowcasting and Very Short Range Forecasting
Led by Agencia Estatal de Meteorología, Spain

OSI SAF

Ocean and Sea Ice
Led by Météo France

CM SAF

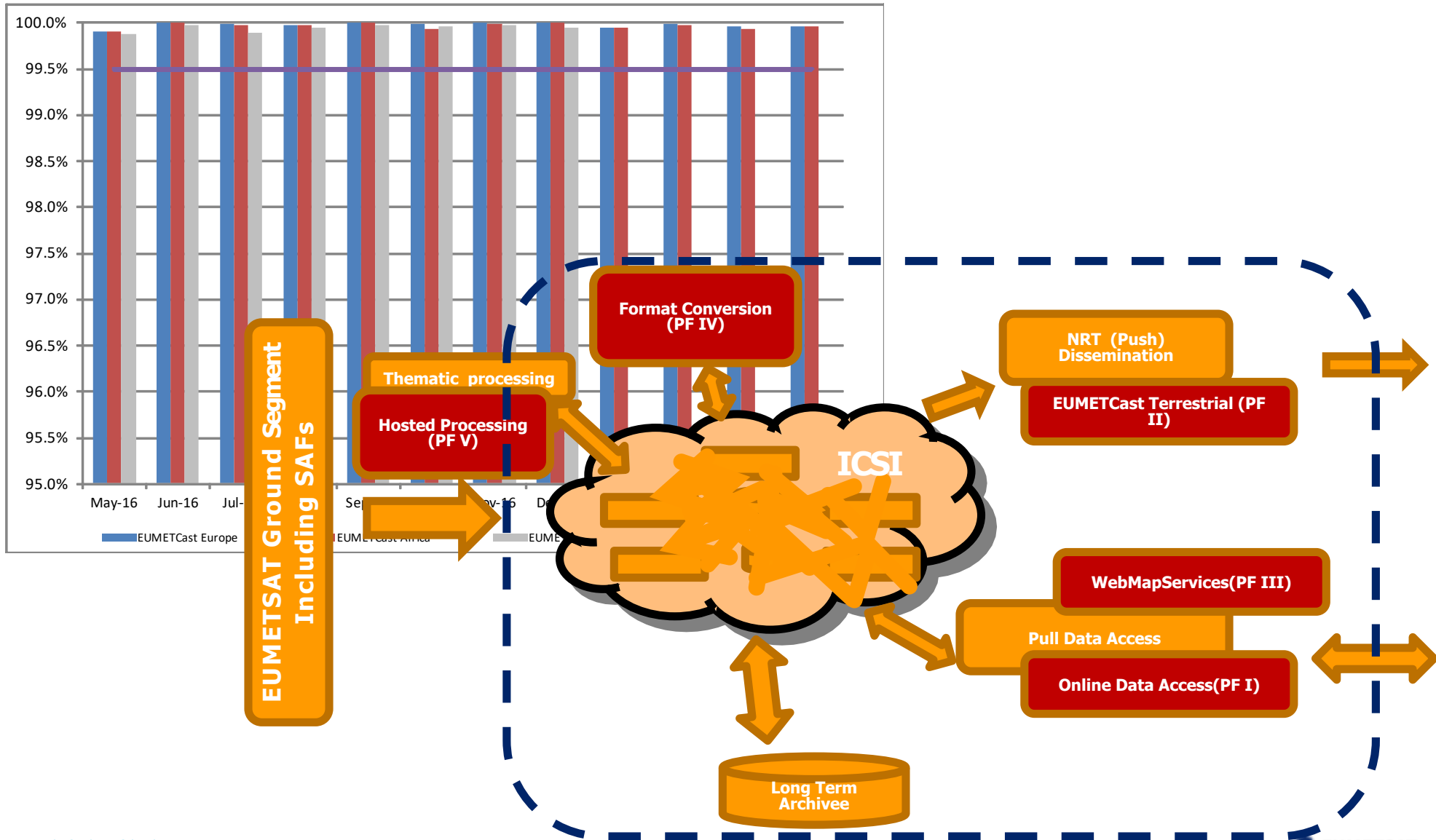
Climate Monitoring
Led by Deutscher Wetterdienst, Germany

NWP SAF

Numerical Weather Prediction
Led by Met Office (UK)



Data access: EUMETCast & “big data” Pathfinder projects



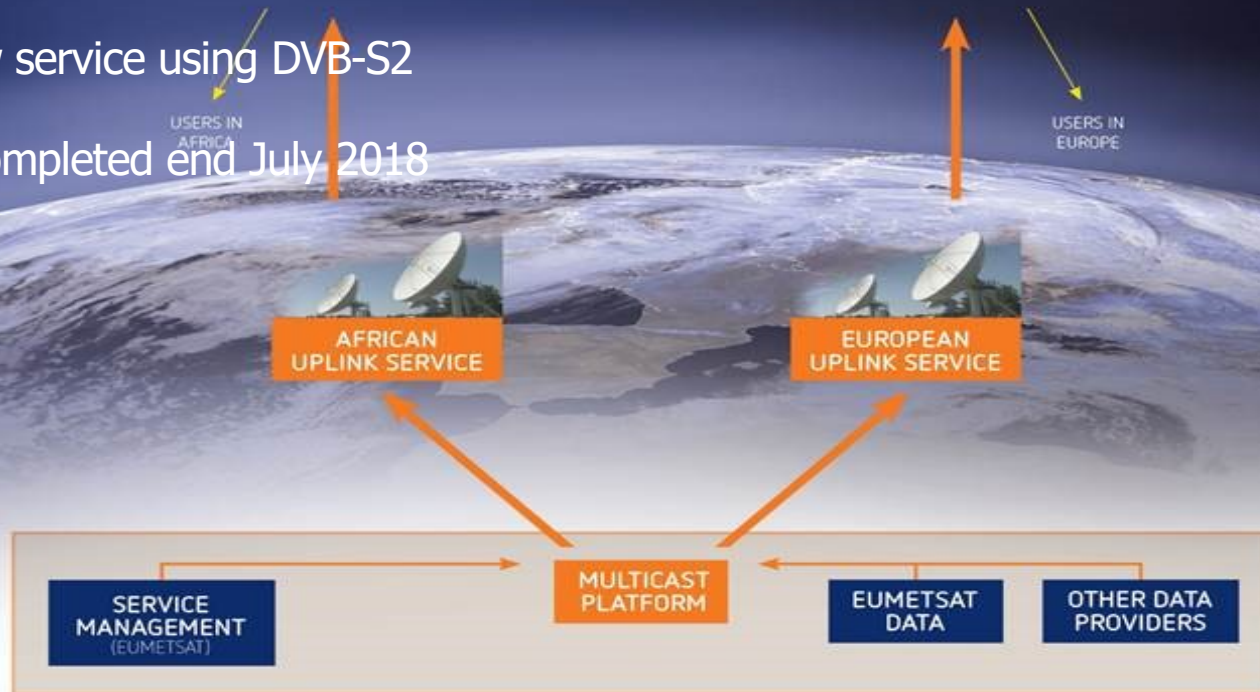
New EUMETCast Africa Service

EUMETCAST SYSTEM OVERVIEW

- Went live 1 May
- 380 registered users (entities)
- 770 stations (some sharing same antenna)



- Migration to new service using DVB-S2 Standard
- Planned to be completed end July 2018

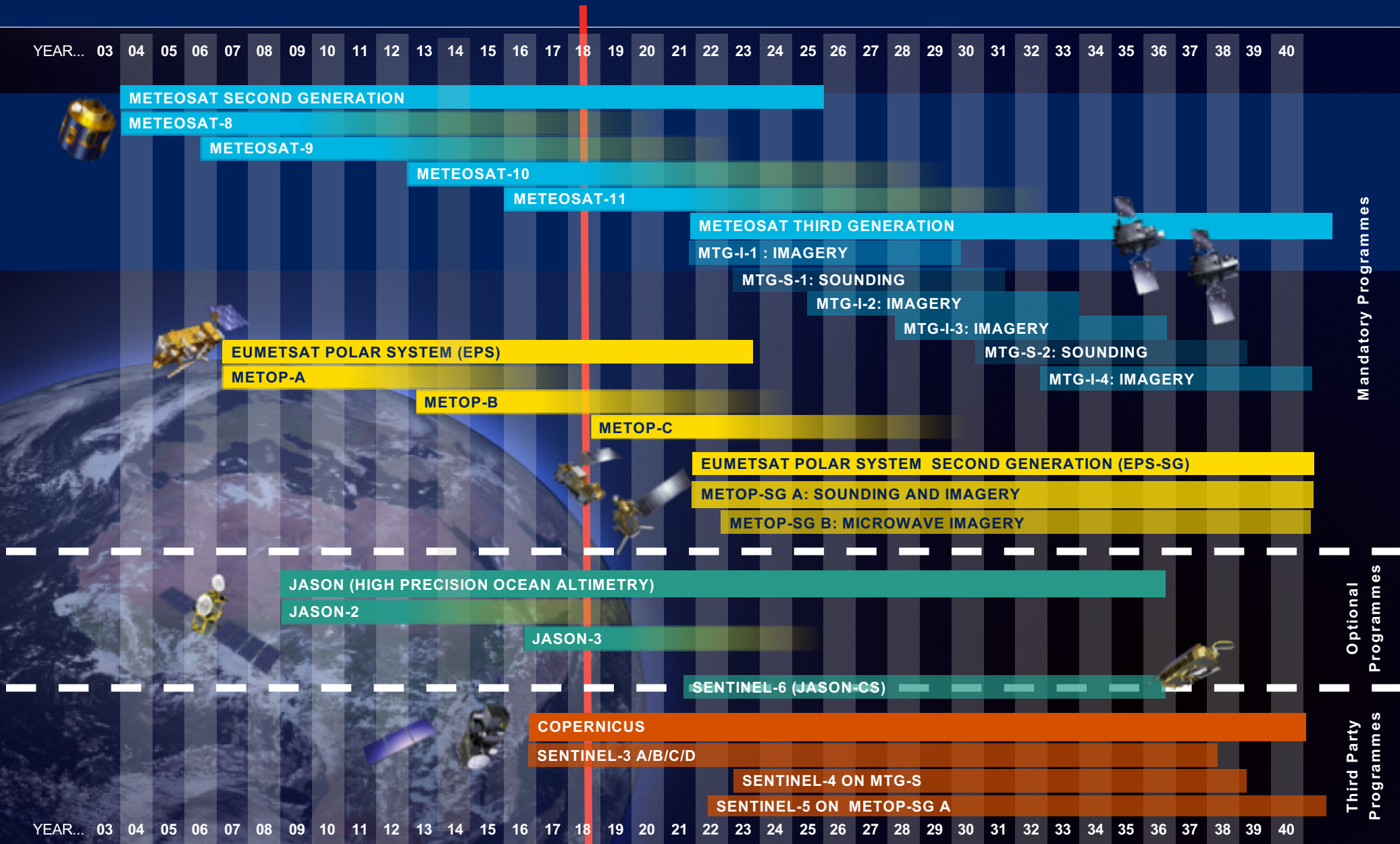


International cooperation with partner agencies

Country	Agency
Canada:	ECCE
China:	CMA, CNSA, NSOAS
India:	ISRO, IMD
Japan:	JAXA, JMA
Russian Federation:	Roshydromet
South Korea:	KMA
United States:	NASA, NOAA



EUMETSAT mission planning



Conclusion

- Eumetsat assures mission continuity of mandatory programmes beyond 2040 – assured today by the programmes under development;
- In the frame of optional missions and Copernicus the continuity of operational altimetry and operational oceanography missions is assured beyond 2026;
- Data distribution services in near real time and for non time critical products are available, as well as the long term archiving of mission data;
- International cooperation assures the availability of Third Party data for Member States;