Meteosat Data Collection Service
CGMS WGI DCS Task Group

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April 2023

Agenda

- Meteosat Data Collection Service (DCS) overview
- CGMS WGI Task Group on Data Collection Services
- Enhances DCP and way forward

EUMETSAT DCS

- **Nicholas Coyne** – Additional Data Services Manager, EUMETSAT
- Lead for the NOAA – EUMETSAT Operations Working Group (OWG)
- Lead for the CGMS Working Group 1 Data collection service Task group
- Operations lead for the EUMETSAT Meteosat Data Collection System
- Team - Karolina Nikalova, Wil Doran and Carlos Vicente. Many others in support.

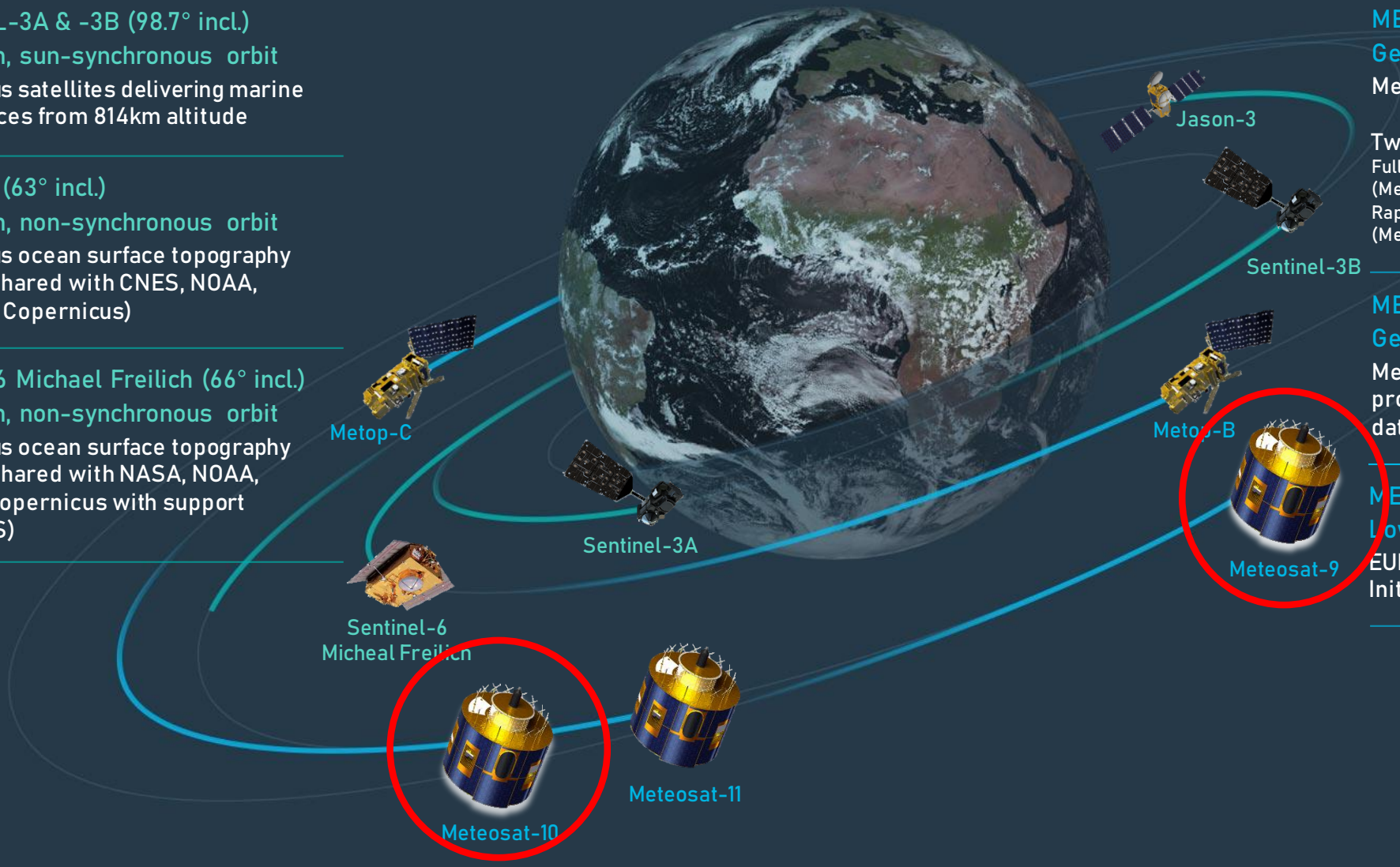
EUMETSAT Operational DCS satellites

www.eumetsat.int

SENTINEL-3A & -3B (98.7° incl.)
Low Earth, sun-synchronous orbit
Copernicus satellites delivering marine data services from 814km altitude

JASON-3 (63° incl.)
Low Earth, non-synchronous orbit
Copernicus ocean surface topography mission (shared with CNES, NOAA, NASA and Copernicus)

Sentinel-6 Michael Freilich (66° incl.)
Low Earth, non-synchronous orbit
Copernicus ocean surface topography mission (shared with NASA, NOAA, ESA and Copernicus with support from CNES)



METEOSAT-10, -11
Geostationary orbit
Meteosat Second Generation

Two-satellite system
Full disc imagery mission (15 mins)
(Meteosat-10 (0°))
Rapid scan service over Europe (5 mins)
(Meteosat-11 (9.5° E))

METEOSAT-9 (45.5° E)
Geostationary orbit
Meteosat Second Generation providing Indian Ocean data coverage

METOP-B & -C (98.7° incl.)
Low Earth, sun-synchronous orbit
EUMETSAT Polar System (EPS)/ Initial Joint Polar System

Next-generation satellites 2022-2026 with DCS capacity

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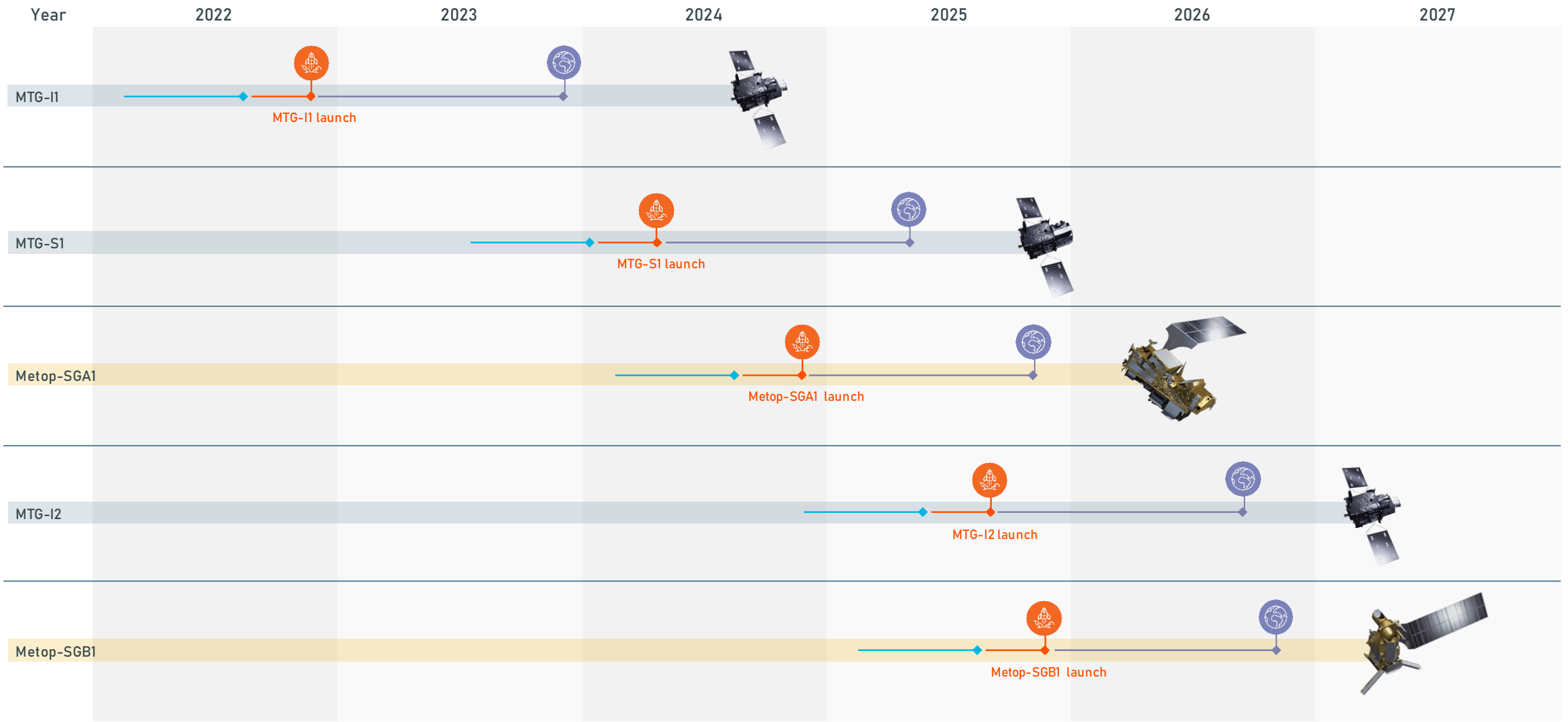
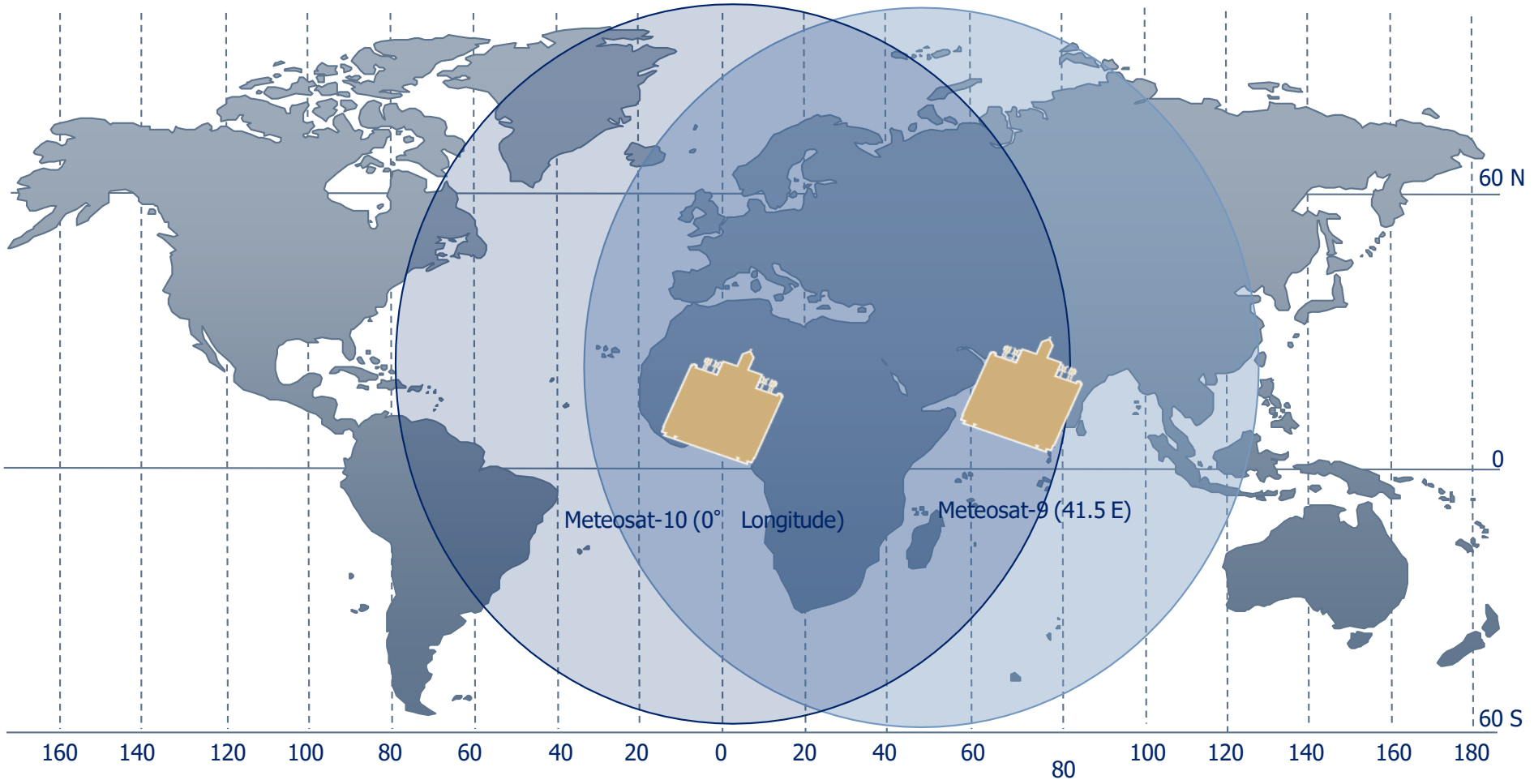
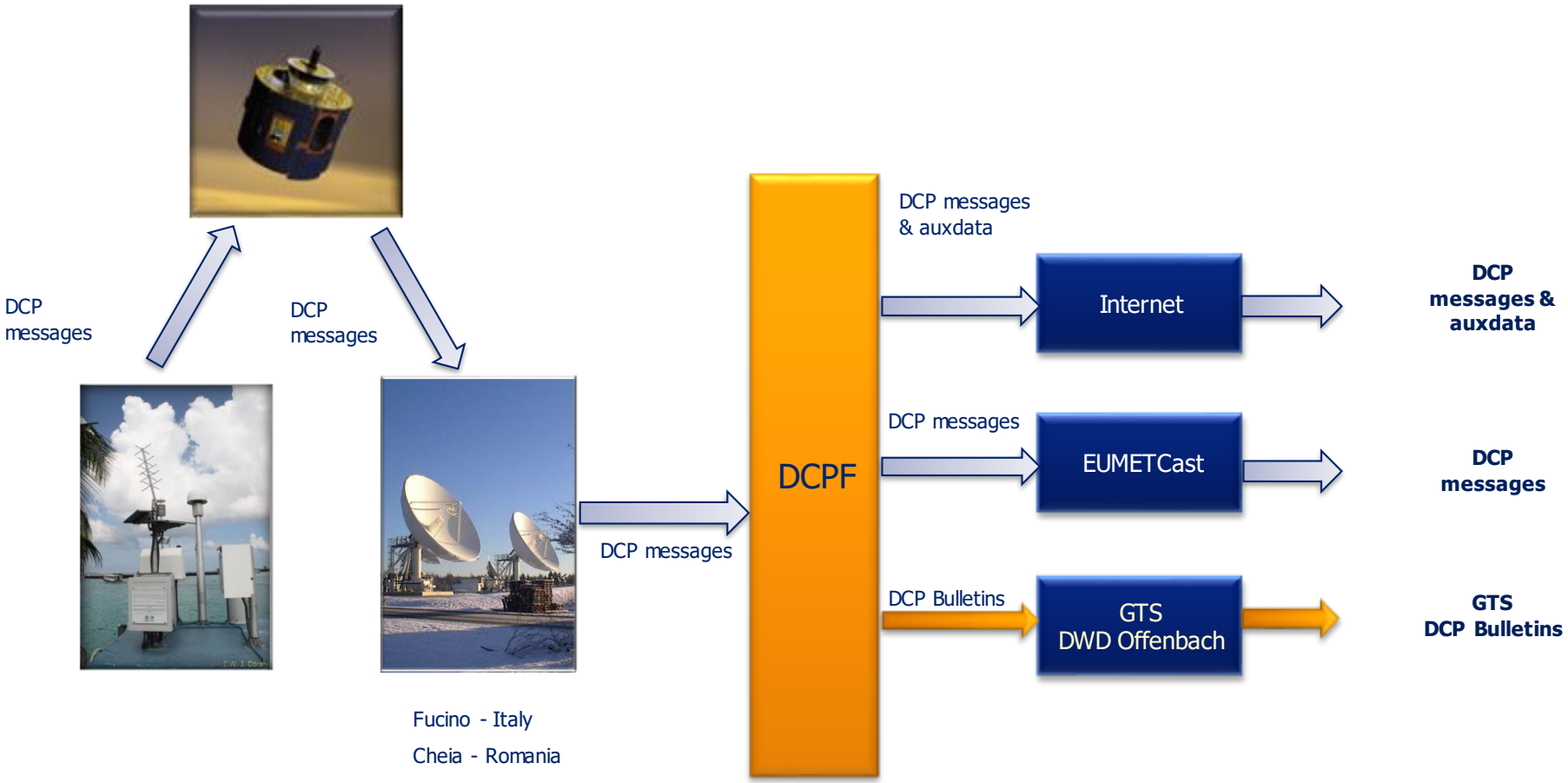


System Integration, Verification and Validation Launch Campaign Commissioning

Current Coverage

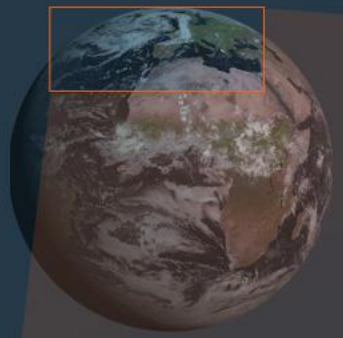


DCS System Overview – DCP Data Flow



Meteosat ground systems across Europe

www.eumetsat.int



MTG Mission Data Acquisition Stations

Leuk, Switzerland

Lario, Italy

MSG/MTG Telemetry, Tracking and Control Station

Cheia, Romania

EUMETSAT headquarters

Darmstadt, Germany

Mission Control Centre

Data processing

Product processing

Data centre archive

Data dissemination

Online data access

User helpdesk and support

MSG/MTG Mission Data Acquisition Station and Backup Control Centre

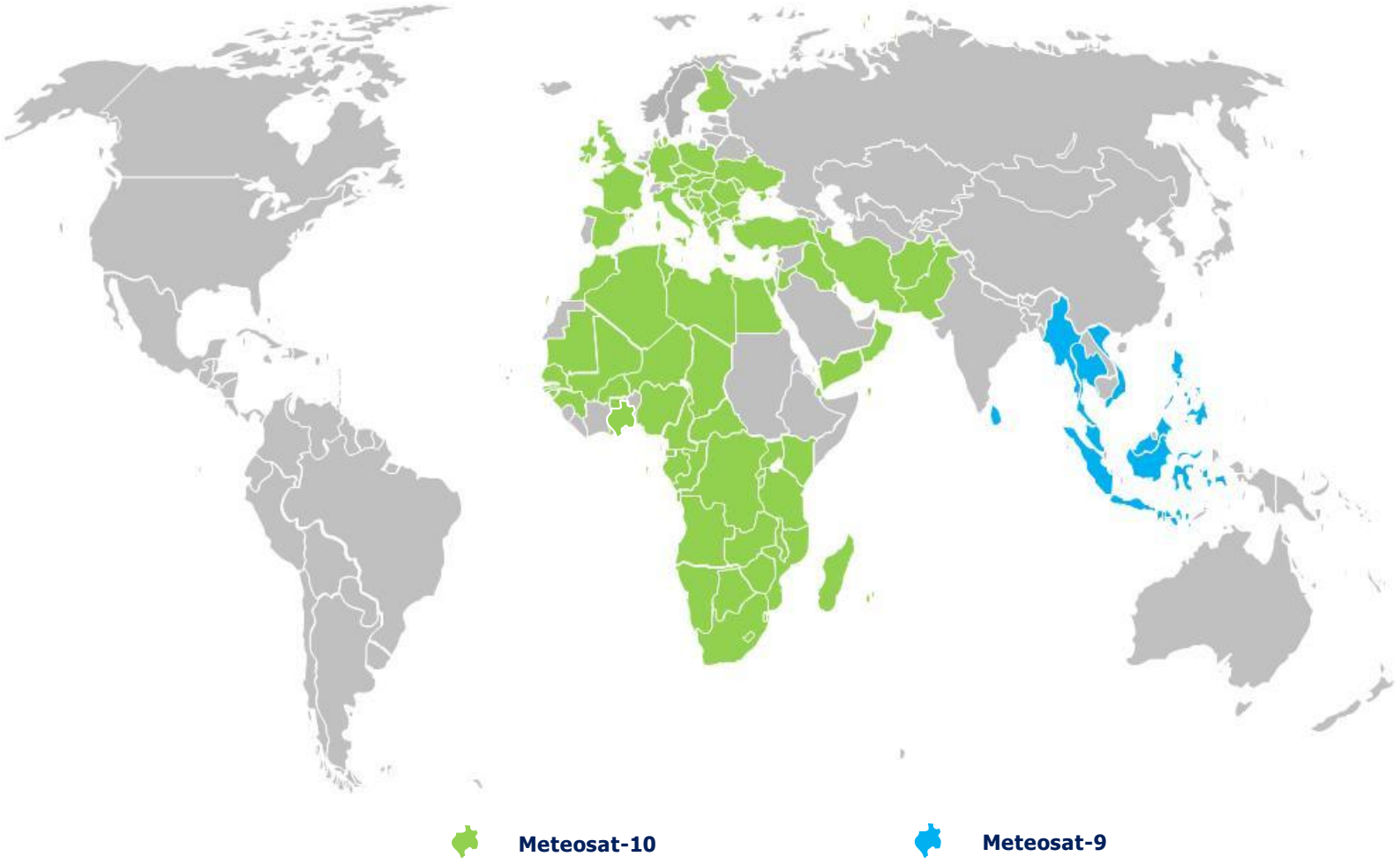
Fucino, Italy

EUMETSAT mission control

DCS – Users (approximately)

- Number of Operators – 142
- Number of Countries – 77 (Europe, Africa, Asia)
- Number of allocated Regional DCPs – 1546
- Number of DCPs transmitting – around 500

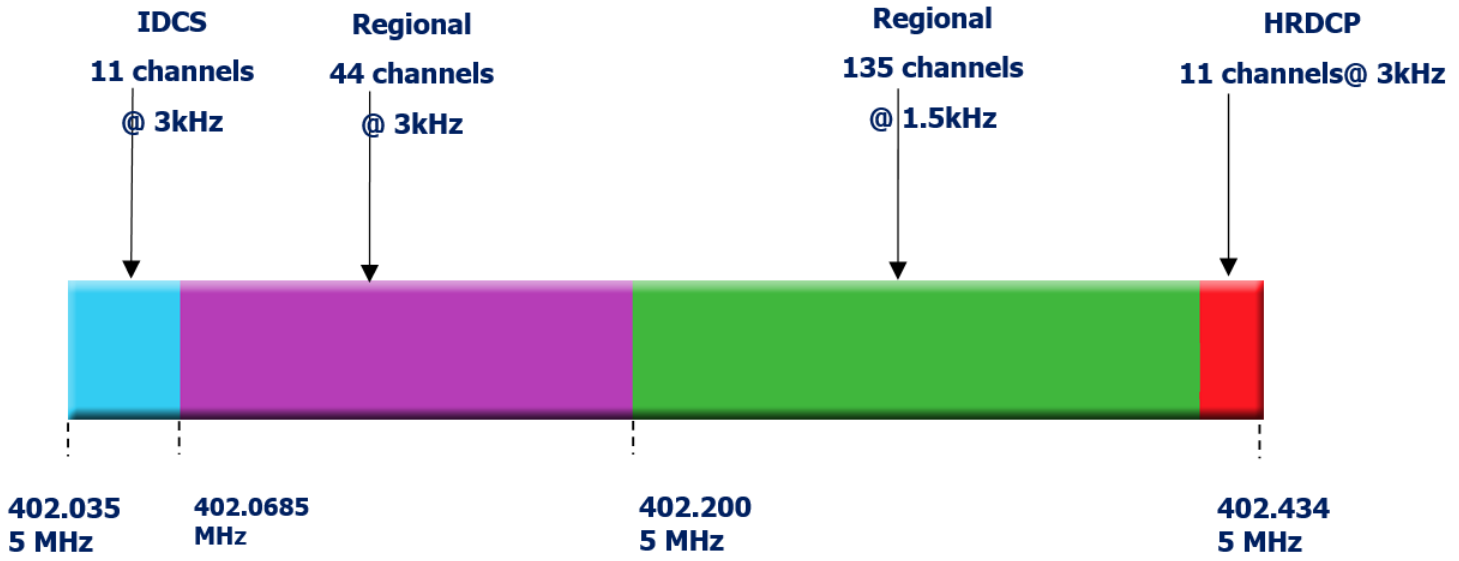
DCP Users by Country



DCP Frequencies

The allocation of regional DCP channels is shown in below. This figure also shows the 11 international (IDCS) channels (with centre frequencies spaced 3 kHz apart), from 402.0355 - 402.0655 MHz. Originally there were 33 International Channels, but they were redistributed following the agreement at CGMS-36, i.e.:

- **I01 – I11 (402.0025 – 402.0325 MHz) were allocated to NOAA for regional use;**
- **I12 – I22 (402.0355 – 402.0655 MHz) remain as International channels.**
- **I23 – I33 (402.0685 - 402.0985 MHz) allocated to EUMETSAT for regional use.**



DCP Frequencies

https://cgms-info.org/

https://cgms-info.org/satellites/data-collection-systems-dcs/

Working group I (WG I): Satellite systems and operations

The CGMS Working Group I on Telecommunications was originally set off, together with the Working Group on Meteorological products, as part of the decisions taken in the CGMS-18 plenary meeting in Geneva (CH) in 1989. The rational of the decision was based on the need to provide an adequate forum for the different CGMS experts to focus the discussions on technical topics, as well as allowing the plenary meeting to reduce the increasing number of agenda items to cover during the plenary meetings.
WG I Co-chairs: Dohyeong Kim, KMA, (and Sean Burns, EUMETSAT, acting)
WG I Rapporteur: Karolina Nikolova, EUMETSAT

The DCS Task Group sits within WG I

The main purpose of the group is to make continued effective progress with DCS activities and issues in the context of CGMS. The first task of the group has been to address the need for and make proposals for a new IDCS DCP standard, the development of DCS best practices for common DCS data access mechanisms and DCP certification, as well as the inclusion of CGMS DCS webpage. Best practices, SWOT analysis, RFI.

Here is a link to the CGMS WGI Task Group on Data collection Services Report for CGMS 51
https://www.cgms-info.org/Agendas/GetWpFile.ashx?wid=0559dddd-2cca-4c3a-87c1-b3c72aed75d0&aid=b807b14c-e99b-4bad-a936-d2aba0cc34b3

CGMS Task Group Members

As part of WGI, all CGMS members are encouraged to participate in the Task Group on DCS. The core members of this group are the DCS Managers from each of the following agencies:

EUMETSAT	Nicholas Coyne – Co-ordinator
EUMETSAT	Karolina Nikolova
EUMETSAT	Wil Doran
NOAA	William Dronen
NOAA	Letecia Reeves
JMA	Kotaro Bessho
JMA	Yasutaka Hokase
Also the following frequency managers:	
NOAA	Beau Backus
EUMETSAT	Markus Dreis

A mailing list server for the WGI Task Group on DCS has been setup – WGI_DCS@LISTSERV.EUMETSAT.INT
The following people are included on the list in addition to those listed above.

Anne Taube
Beau Backus - NOAA Affiliate
Dave Kunkee - Aerospace Corp
Juha-Pekka Luntama – ESA
Mark W. Turner - NOAA
Markus Dreis - EUMETSAT
Melanie Heil - ESA
Nancy Ritchey - NOAA
Olga Ryzhkova - Roshydromet
Sean Dominic Burns - EUMETSAT
Thomas Feroli - NOAA
Yu Deng – NOAA
Hassan Haddouch - WMO
The co-ordinator should be informed of any CGMS members wishing to be included on the list.

Future evolutions - Enhanced DCP (EDCP)

- There is an ongoing study for a new common DCP standard co-ordinated through CGMS (The Coordination Group for Meteorological Satellites) https://cgms-info.org/.
- This is a joint initiative between NOAA, JMA and EUMETSAT
- The main objective of CGMS is to coordinate long-term, sustainable satellite systems relevant to weather and climate, to which both operational and research and development space agencies contribute, while responding as far as possible to the requirements and related programmes of the World Meteorological Organisation
- The need for new standard is driven the following factors.
  - Robustness against interference
  - Utilisation on moving platforms
  - International use – a DCP transmitter certification from one agency allows use on other agency systems
  - Inter-agency use cross platform use

DCS Workshop 2022 October Paris

The was held in Paris on the 12th October 2022. The main aim was to sit down and talk about the Enhanced DCP standard.

In conclusion the DCS workshop was a great success and proved to be the very catalyst needed to start the Enhanced DCP ball really rolling.

Enhanced DCP (EDCP) Standard

With our CGMS hats on we have been working towards the definition of an new DCP standard. This would be a standard the allows

1. Compatible for use by all agengies – Min CMA, NOAA, EUMETSAT
2. More robust against use on moving platforms
3. Allow a true international DCP capability

We have had a lot of help and input from Microcom and OTT/Sutron

EDCP Details

- The main points to note are that we have defined something that will only require firmware updates to the existing transmitters. The receivers would eventually also need to be modified as well and this would also be expected to be realised with firmware updates. It would take 1500Hz of bandwidth. It can operate at 400 or 800 baud dependant on the modulation type. It can optionally use different code block sizes. There is a new header defined that would allow the GPS co-ordinates, battery voltage etc. to be included in each transmission. There are some of these aspects that we need to refine and agree upon. Some of them would be of benefit to the operatoprs and manufacturers and some would be of benefit to the users. There is naturally a trade of between the size of the header and using this capacity for the message package. We believe this could be made configurable. The 400-baud setting would provide a platform which would be more robust to movement and interference at the cost of speed. The 800 would provide the speed at the cost of robustness. The best mode could be chosen for the environmental conditions. This operational mode would be automatically detected on the receiver side making it very flexible.
- More info in the report https://www.cgms-info.org/Agendas/GetWpFile.ashx?wid=0559dddd-2cca-4c3a-87c1-b3c72aed75d0&aid=b807b14c-e99b-4bad-a936-d2aba0cc34b3

EDCP Schedule

After this draft is endorsed, we would could imagine the following schedule:

2024

- Finalise the EDCP standard with the agreement of all agencies and CGMS.
- Relocate current DCPs away from the international identified channels.
- Define how the project would be funded.

2025

- Produce and test a prototype transmitter.
- Modify on of the receive sites to enable the reception of the EDCP.
- Test the system and verify the performance of the prototype and ensure it covers the different modes.

2026

- Certify the EDCP transmitters from the manufacturers.
- Modify the reception systems of all agencies.
- Test the reception for all agencies and satellites.

2027

- Declare EDCP operational.
- This would give us the common standard which would once again allow international use of DCPs.

References

- CGMS Data Collection Services Handbook

  https://cgms-info.org/wp-content/uploads/2021/10/DCS_Handbook_1Mar2020.pdf

- TD 16 – Meteosat Data Collection and Distribution Service

  https://www.eumetsat.int/media/45152

Thank you!

Questions are welcome.