Practical approaches to EUMETSAT marine data access

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EUMETSAT EUMDAC Series – Session 5
30 April 2024, 13:00 UTC (14:00 CET)

Agenda

- Welcome & introduction (10 mins)
- EUMETSAT marine data records (20 mins)

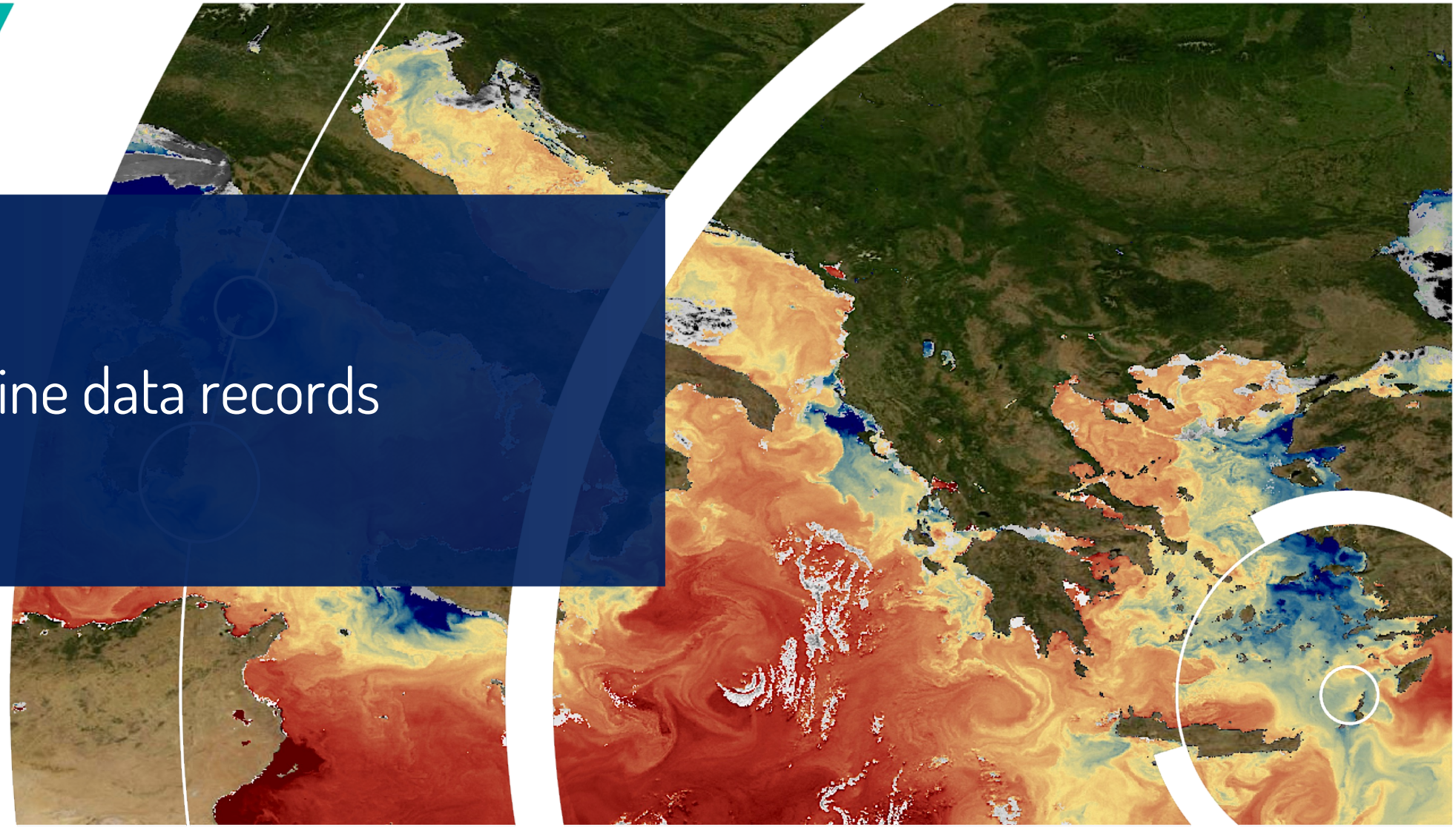
- **Use case 1:** selecting altimetry data (20 min)
- **Use case 2:** cruise tracking (20 min)
- **Use case 3:** automated downloading of marine products (20 min)
- **Use case 4:** creating pan-collection data cubes (20 min)

- Q&A (10 min+)

Q&A info

- We have an **open Q&A** throughout the meeting
- This is hosted on Slido: https://www.slido.com/ event code; **#EUMDAC5**
- Or you can use this QR code >>>>>>>>>>>>>>>>>>>>>>
- We will answer questions after each session and at the end of the event
- Reminders of the login details will be given in chat
- At the end we will have a short **feedback questionnaire**, also on Slido (please take 2 minutes to give us your thoughts)
- Session **recorded**, presentations available through **Moodle**.

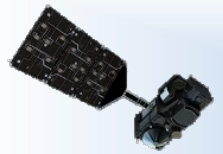
EUMETSAT marine data records



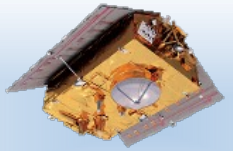
EUMETSAT marine data streams

copernicus.eumetsat.int

Copernicus
Europe's eyes on Earth



Sentinel-3



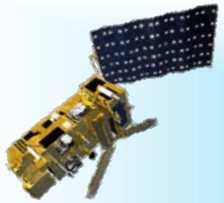
Sentinel-6
Micheal Freilich

Jason-3

The European Organisation for the Exploitation of Meteorological Satellites.

- Providing observations and data services for operational weather and Earth system monitoring and forecasting, and for climate services.
- Also provides operational marine data through our commitments to the Copernicus programme and via our mandatory missions through our Ocean and Sea Ice Satellite Application Facility (OSI SAF)

EUMETSAT
OSI SAF
OCEAN AND SEA ICE



MetOp

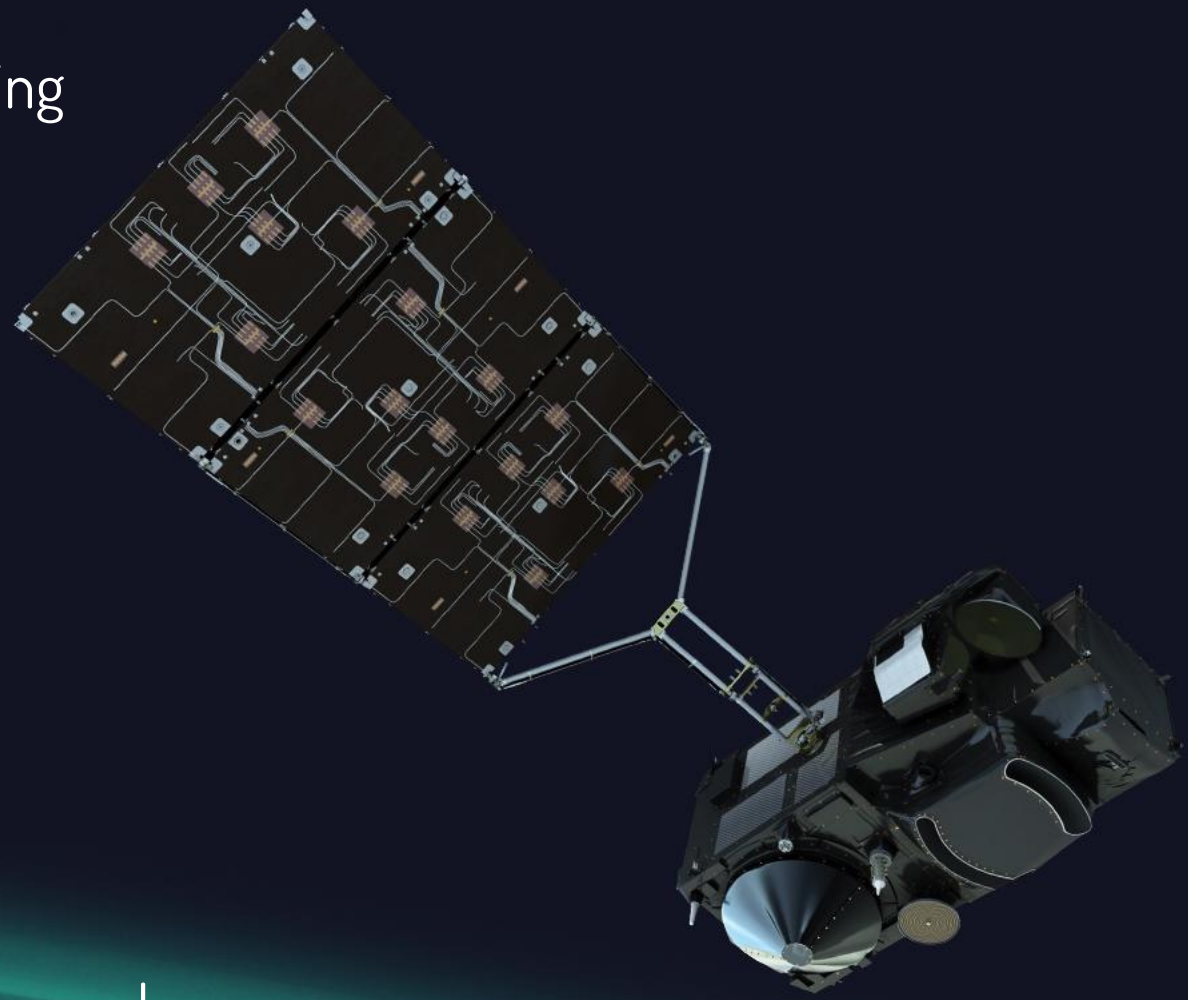
MSG

MTG

Upcoming developments

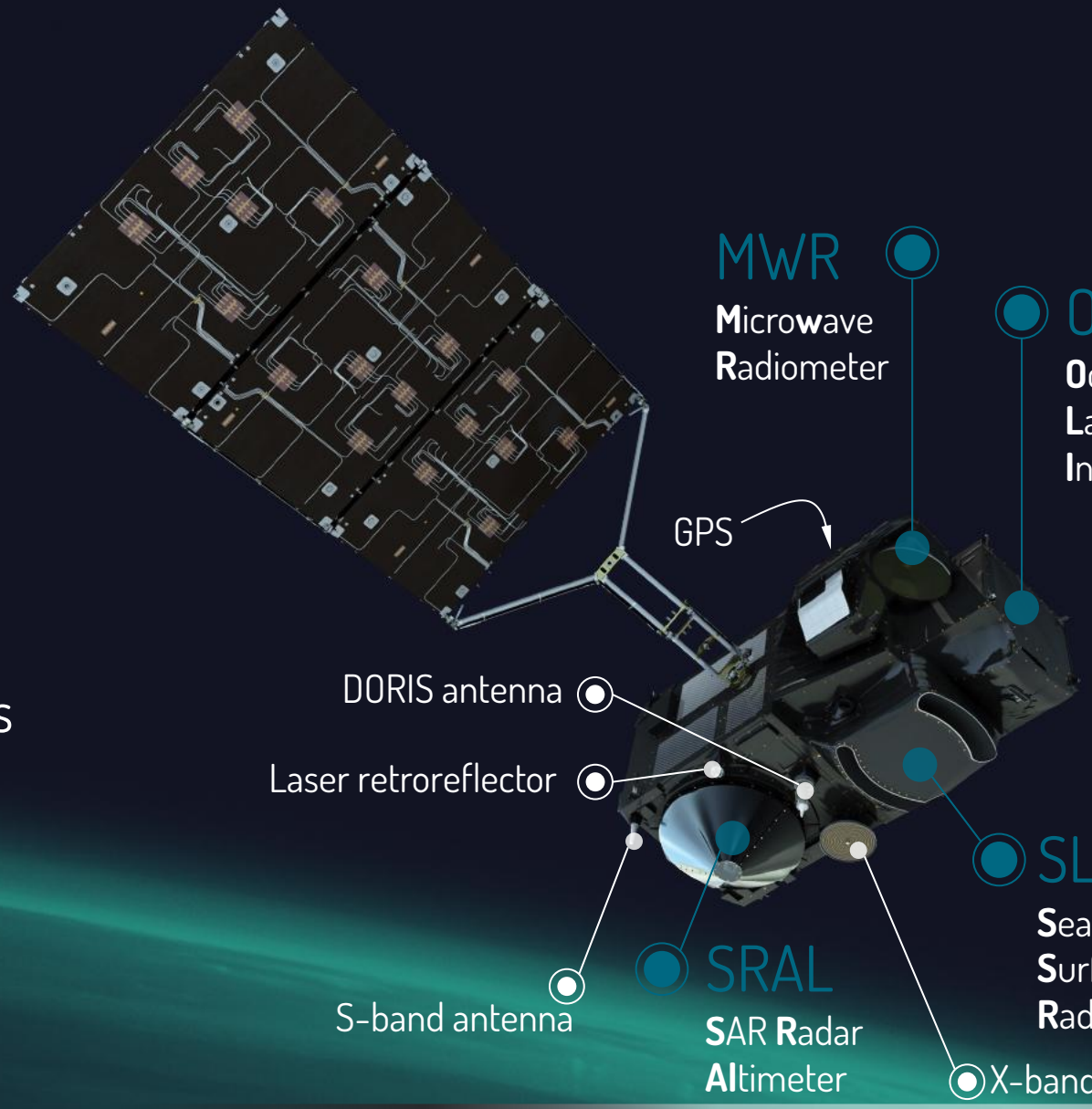
Marine missions: Sentinel-3 mission and configuration

- The “blue” sentinel; suite of ocean observing instruments.
- Main objectives: acquire sea-surface topography, sea surface temperature and ocean colour data.
- Constellation of two platforms:
  - Sentinel-3A launched February 2016
  - Sentinel-3B launched April 2018
  - Sentinel-3C planned mid-2026
- Sun-synchronous 98.65° polar orbit, 27 day cycle.
- Near global coverage; <2 day revisit (optical) & <1 day (thermal)



Marine missions: Sentinel-3 instruments and variables

- OLCI >> visible radiometry
  - **ocean colour**: radiances & reflectances
  - chlorophyll, suspended sediment (TSM), CDOM, IOPs
  - PAR / kd490
- SLSTR >> thermal radiometry
  - radiances & brightness temperatures
  - Sea and sea-ice surface temperatures
- SRAL / MWR / POD (DORIS/GNSS/LRR) >> surface topography mission
  - Sea surface height
  - Significant wave height
  - Wind speed



Marine missions: Sentinel-3 operations and data distribution

- EUMETSAT operates the satellite & provides the marine data stream at level-1 and level-2
- Supports the generation of level-3 and level-4 products by the Copernicus Marine Service (primary user)
- Operational and reprocessed data made directly available to users via the EUMETSAT Data Store
- Redistributed (and used) by NOAA
- Atmospheric products also available through EUMETSAT
- Land products available through ESA

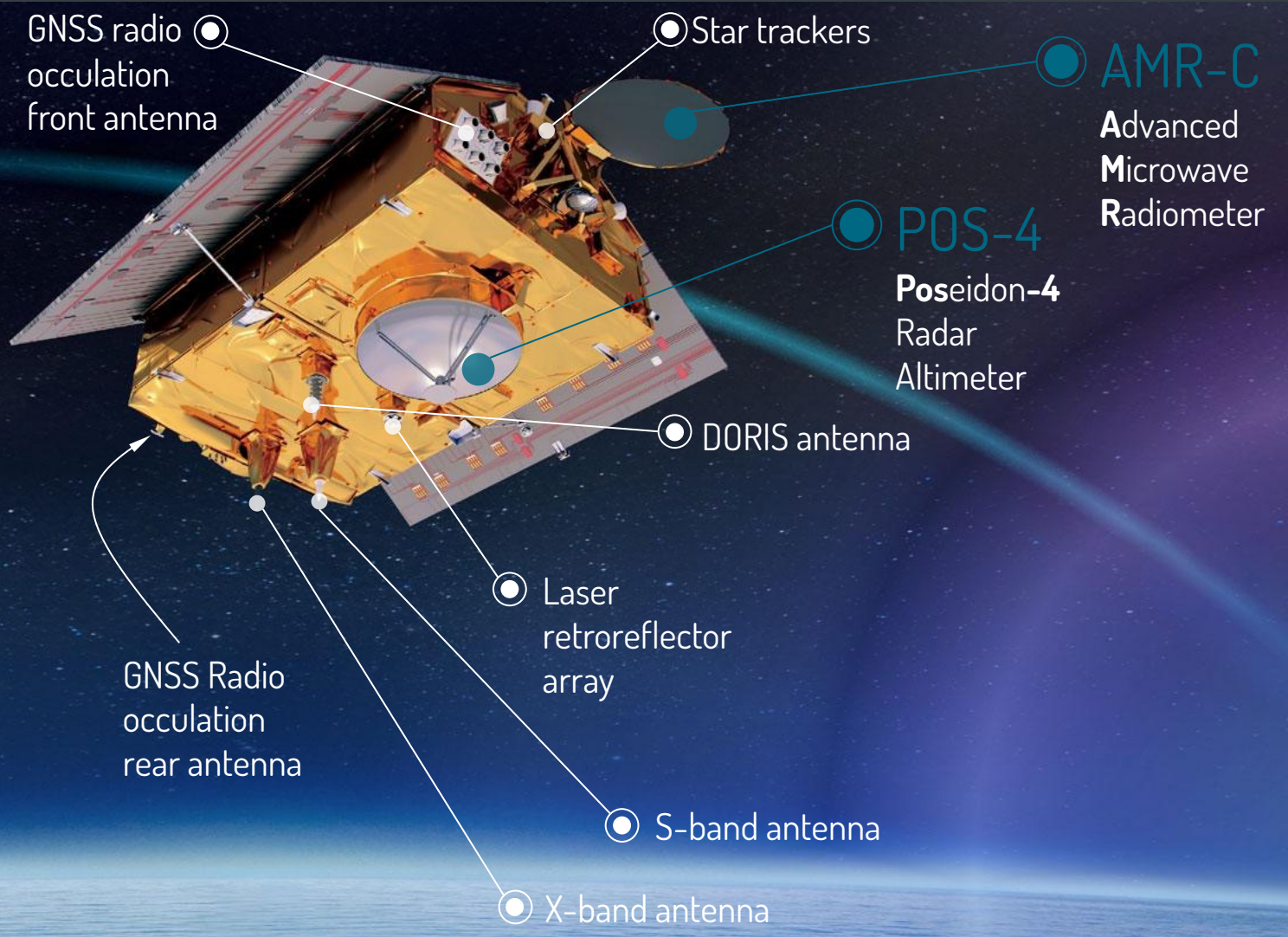
Marine missions: Sentinel-6 mission and configuration

- The current **altimetry reference mission**
- Main objectives: high precision **sea-surface topography**measurements
- Will continue the altimetry record into the next decade(s)
- Constellation of two platforms:
  - Sentinel-6A launched Nov. 2020
  - Sentinel-6B launch plan 2025/2026
- Non-sun sychronous 66° polar orbit, 10-day cycle.

Marine missions: Sentinel-6 instruments and variables

- Poseidon-4 / AMR-C / POD (DORIS/GNSS/LRR) >> surface topography mission
  - Sea surface height
  - Significant wave height
  - Wind speed

- Poseidon-4 ;
  - Back compatible for climate continuity
  - State-of-the-art
    - Open burst transmission
    - Low noise
    - Improved resolution

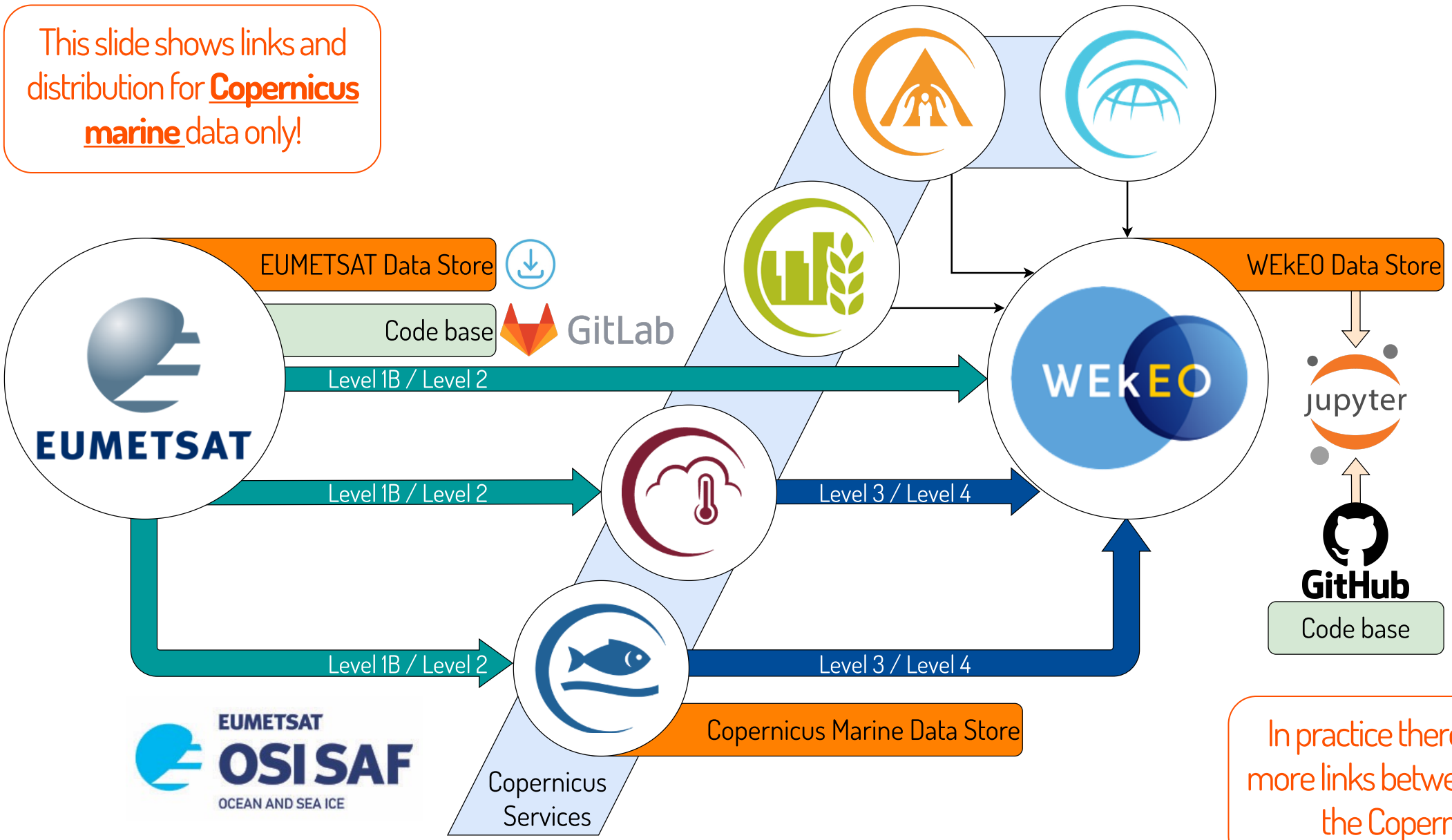


Marine missions: Sentinel-6 operations and data distribution

- Collaborative mission: EUMETSAT / ESA / NASA / NOAA
- EUMETSAT operates the satellite & provides the marine data stream at level-1 and level-2
- Level-2p and level-3 provided by CNES for EUMETSAT
- Operational and reprocessed data made directly available to users via the EUMETSAT Data Store
- Data also available via PO.DAAC

EUMETSAT marine data distribution

This slide shows links and distribution for **Copernicus marine** data only!



In practice there are many, many more links between EUMETSAT and the Copernicus Services

EUMETSAT Copernicus Marine Data Access

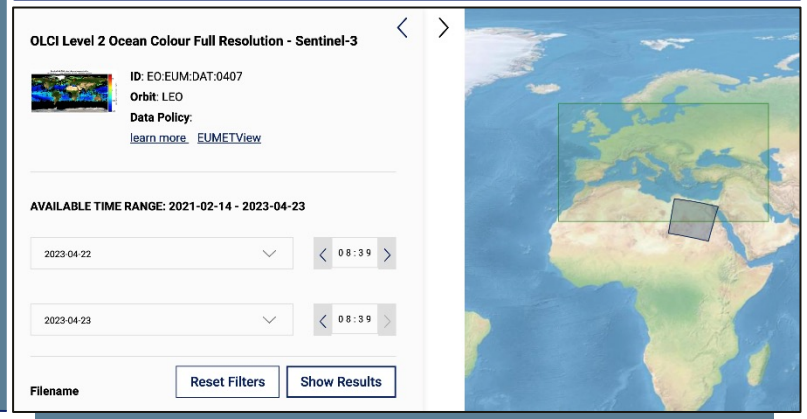
The **EUMETSAT Data Store** provides single point of access to a growing catalogue of EUMETSATs meteorological, climate and ocean data.

Data collections

- Near real-time products
- Historic & reprocessed products
- Climate data records

Data Store Interfaces

Online web user interface



1. Browse API
2. OpenSearch API
3. Download API
4. Subscription API

EUMDAC (EUMETSAT Data Access Client)

Python library and command line interface

Service available at:
https://data.eumetsat.int

Operational and reprocessed data streams

Operational products

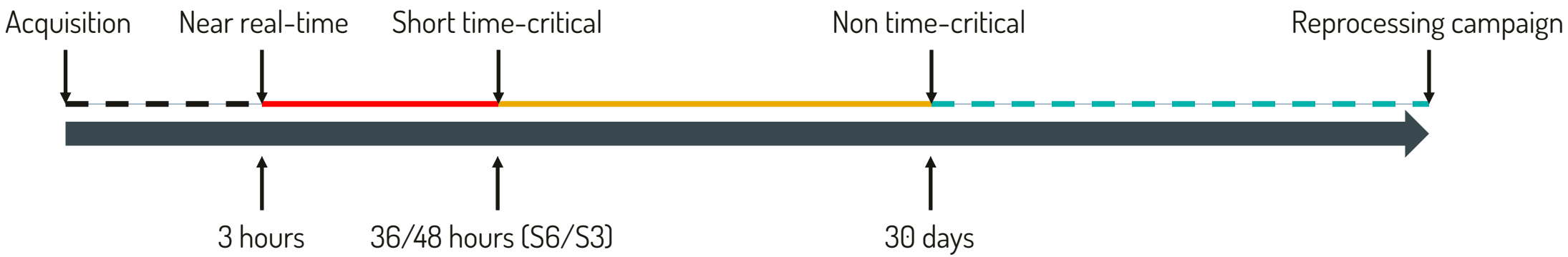
Constantly updated and available in three "timeliness":

- Near real-time
- Short time-critical
- Non time-critical

Reprocessed products

Periodically updated through reprocessing campaigns:

- Typically whole mission
- Highest quality data
- Performed with latest processing baseline
- Supercede previous reprocessing(s)
- Not really to be mixed with NRT data



Data store products: ocean colour and sea surface temperature

Copernicus

Collection	Description	Date start
EO:EUM:DAT:0407	OLCI Level 2 Ocean Colour Full Res (OPE)	2021-01-01
EO:EUM:DAT:0556	OLCI Level 2 Ocean Colour Full Res (REP:BC003)	2016-04-25
EO:EUM:DAT:0408	OLCI Level 2 Ocean Colour Reduced Res (OPE)	2021-01-01
EO:EUM:DAT:0557	OLCI Level 2 Ocean Colour Reduced Res (REP:BC003)	2016-04-25
EO:EUM:DAT:0409	OLCI Level 1B Full Res (OPE)	2021-01-01
EO:EUM:DAT:0577	OLCI Level 1B Full Res (REP:BC002)	2016-04-25
EO:EUM:DAT:0410	OLCI Level 1B Reduced Res (OPE)	2021-01-01
EO:EUM:DAT:0578	OLCI Level 1B Reduced Res (REP:BC002)	2016-04-25
EO:EUM:DAT:0412	SLSTR Level 2 Sea Surface Temperature (OPE)	2021-01-01
EO:EUM:DAT:0582	SLSTR Level 2 Sea Surface Temperature (REP:BC003)	2016-09-14
EO:EUM:DAT:0411	SLSTR Level 1B Radiances & BTs (OPE)	2021-01-01
EO:EUM:DAT:0581	SLSTR Level 1B Radiances & BTs (REP:BC003)	2016-09-14
EO:EUM:DAT:0615	SLSTR Level 1B Radiances & BTs (REP:BC004)	2018-05-01

Mandatory Missions

Collection	Description	Date start
EO:EUM:DAT:METOP:GLB-SST-NC	Global L3C AVHRR Sea Surface Temperature (GHRSST) - Metop	2017-07-11

Data store products: altimetry

Copernicus

Collection	Description	Date start
EO:EUM:DAT:0415	SRAL Level 2 Altimetry Global (OPE)	2021-01-08
EO:EUM:DAT:0834	SRAL Level 2 Altimetry Global (REP:BC005)	2016-03-01
EO:EUM:DAT:0406	SRAL Level 1B (OPE)	2021-01-08
EO:EUM:DAT:0833	SRAL Level 1B (REP:BC005)	2016-03-01
EO:EUM:DAT:0414	SRAL Level 1B Stack Echoes (OPE)	2021-01-08
EO:EUM:DAT:0835	SRAL Level 1B Stack Echoes (REP:BC005)	2016-03-01
EO:EUM:DAT:0413	SRAL Level 1A Complex Echoes (OPE)	2021-01-08
EO:EUM:DAT:0836	SRAL Level 1A Complex Echoes (REP:BC005)	2016-03-01
EO:EUM:DAT:0859 / 0601	Poseidon-4 Level 3 HR / LR (OPE)	2022-04-06
EO:EUM:DAT:0143	Poseidon-4 Level 3 Wind/Wave Products LR (OPE)	2022-04-06
EO:EUM:DAT:0857 / 0858	Poseidon-4 Level 2P LR / HR (OPE)	2022-12-06
EO:EUM:DAT:0142	Poseidon-4 Level 2P Wind/Wave Products LR (OPE)	2022-04-06
EO:EUM:DAT:0854 / 0855	Poseidon-4 Level 2 LR / HR (OPE)	2023-02-09
EO:EUM:DAT:0841 / 0842	Poseidon-4 Level 2 HR / LR (REP: F08)	2020-12-17
EO:EUM:DAT:0851 / 0852	Poseidon-4 Level 1B HR / LR (OPE)	2023-02-09
EO:EUM:DAT:0839 / 0840	Poseidon-4 Level 1B HR / LR (REP: F08)	2020-12-17
EO:EUM:DAT:0850	Poseidon-4 Level 1A HR (OPE)	2023-02-09
EO:EUM:DAT:0838	Poseidon-4 Level 1A HR (REP: F08)	2020-12-17

Questions?

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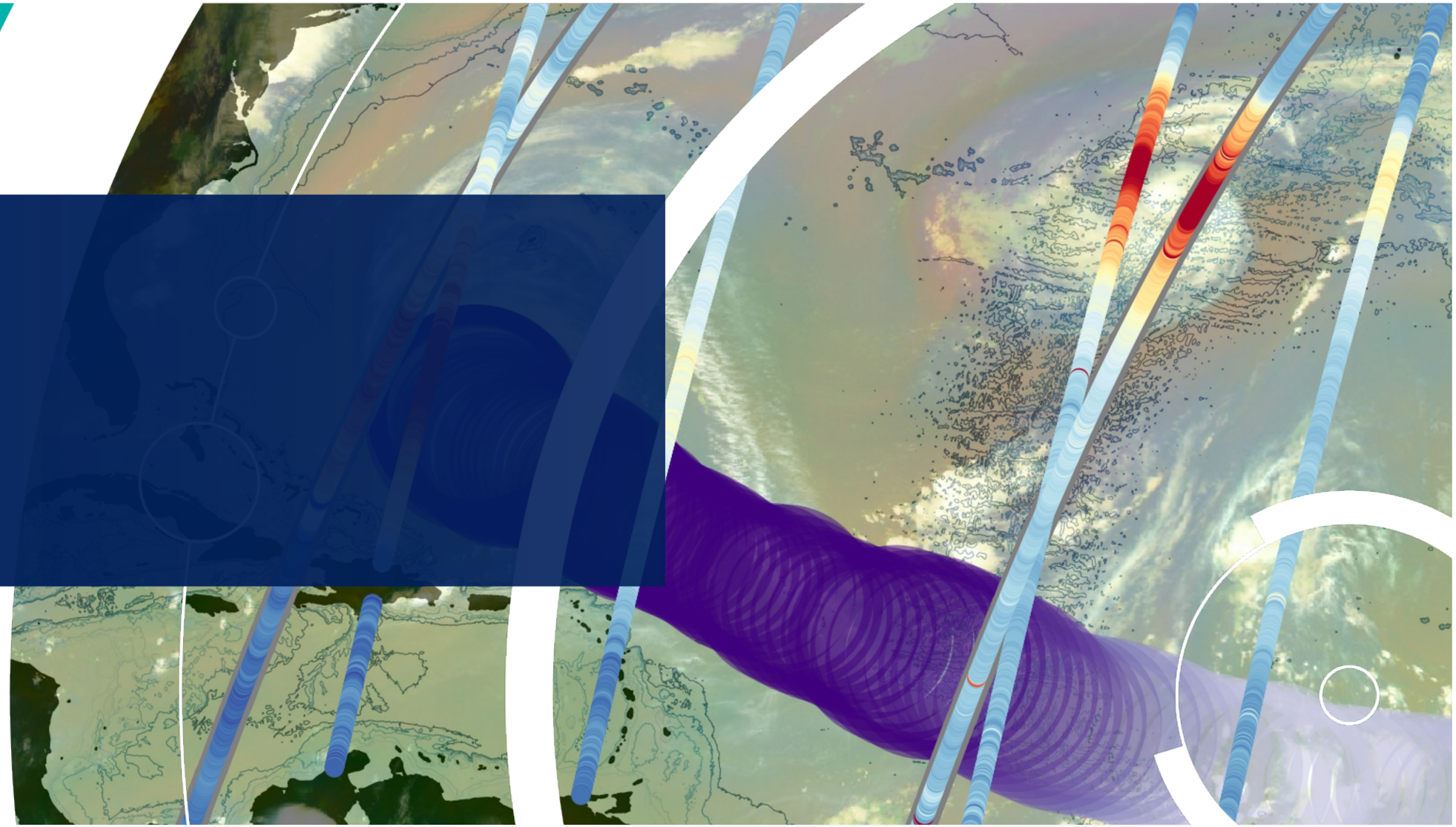
Next: Lets learn how to access this data to support some common marine workflows!

Use cases



Four use cases to consider

- **Use case 1:** selecting altimetry data (20 mins)
- **Use case 2:** cruise tracking (20 mins)
- **Use case 3:** automated downloading of marine products (20 mins)
- **Use case 4:** creating pan-collection data cubes (20 mins)

Each has an accompanying Jupyter Notebook, available at: https://gitlab.eumetsat.int/eumetlab/oceans/ocean-training/applications/ocean-case-studies

Round-up

- Slido: https://www.slido.com/ event code; **#EUMDAC5**
- Short **feedback questionnaire**, also on Slido (please take 2 minutes to give us your thoughts)

- Questions about our data: ops@eumetsat.int
- Questions about our training: training@eumetsat.int
- Next marine courses: Liege Colloquium, Ocean Optics, more short courses on EUMETSAT marine data
- more info via: https://trainingevents.eumetsat.int/