PROGRAMME OF THE EUROPEAN UNION

Copernicus
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EUMETSAT

esa

SENTINEL-3 OVERALL MISSION STATUS

Anja STRØMME **Hilary WILSON**

Sentinel-3 Mission Managers

ESA **EUMETSAT**

S3VT#7, Frascati 18-20 October 2022

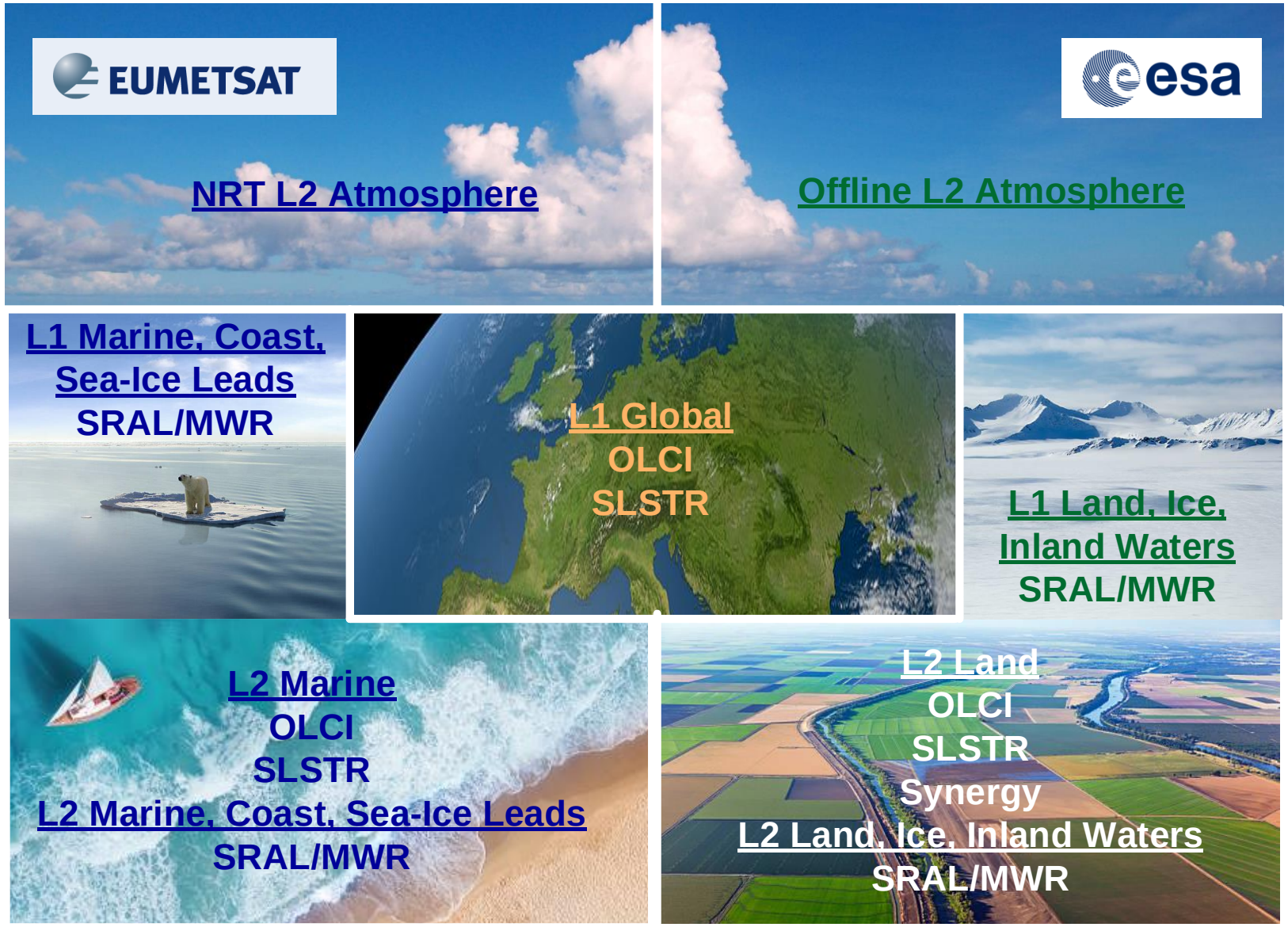
SENTINEL-3 **OVERALL MISSION STATUS** 1

- The **Sentinel-3A** and **Sentinel-3B** missions are operating well with no significant issues to report
  - Satellite availability remains high with a lifetime beyond that expected by the design
  - Both ESA and EUMETSAT Ground Segments are operating well and delivering products to users within the expected targets (outside of planned maintenance activities or ground/space segment anomalies)
- The **3rd Mission Constellation Review** (covering operations during 2021) held on 12th January confirmed the mission continues to meet the applicable requirements within the known and documented limitations, noting that improvements/mitigations are planned in the future
- The 4th Mission Constellation Review (for 2022) is planned for 28 March 2023
- More information on how you can access Sentinel-3 data can be found here:
  - ESA: https://sentinel.esa.int/web/sentinel/missions/sentinel-3
  - EUMETSAT: https://www.eumetsat.int/sentinel-3

SENTINEL-3 **OVERALL MISSION STATUS** 2

- The **Sentinel-3C** and **Sentinel-3D** satellites have successfully completed their final reviews and have been placed in storage
- Sentinel Framework launcher contract being negotiated by the Commission with support from ESA, launch window expected earliest from Q4 2024 to latest Q2 2025
- For Sentinel-3D the launch is expected not before end 2027
- Activities are ongoing to define the requirements for the tandem phase during commissioning
- Concepts for a potential in-orbit “standby” are also being assessed with the support of industry

SENTINEL-3 **MISSION DATA PRODUCT** RESPONSIBILITIES



UPDATES FROM ESA SENTINEL-3 LAND & NTC ATMOSPHERE

Anja STRØMME
Sentinel-3 Mission Manager

ESA

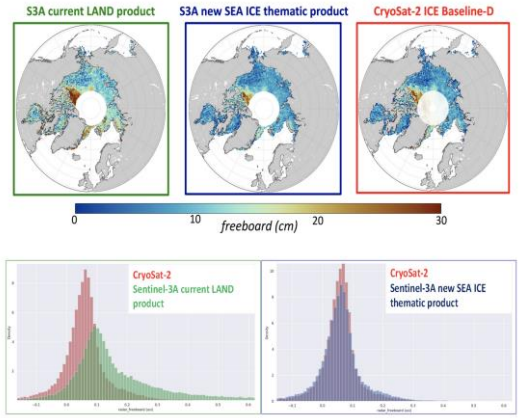
Sentinel-3

Space Component

New Sentinel-3 LAND Altimetry Thematic Pilot Products

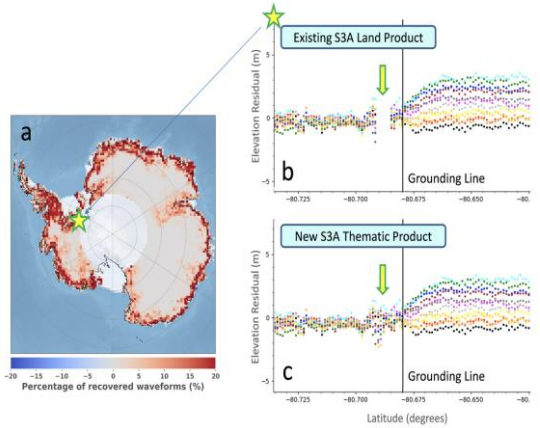
- Operational release of the "STM Land Thematic" Pilot products on **4 August 2022**
- Dedicated and tailored processing per surface type
- Targeting end user needs
- Available from Copernicus Open Access Hub operated by ESA
- Will be switched to nominal processing baseline after Full Mission Reprocessing (FMR)

L2 Sea Ice



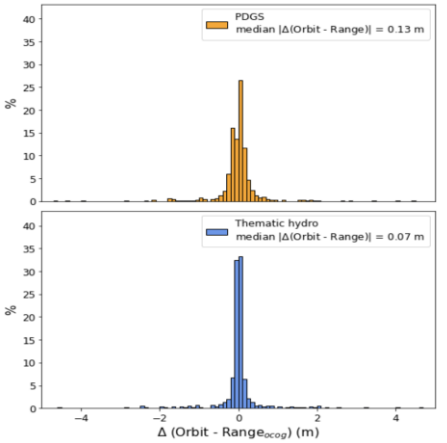
- ❖ Very good agreement between S3 NEW Sea Ice Thematic products and CryoSat
- ❖ Similar processing to CryoSat
- ❖ Both SAR processing endowed with zero-padding and Hamming

L2 Land Ice



- ❖ Clear improvement in coverage at the ice shelf coastal margins thanks to the NEW extended window processing,
- ❖ Glaciologically very important region!

L2 Inland Water



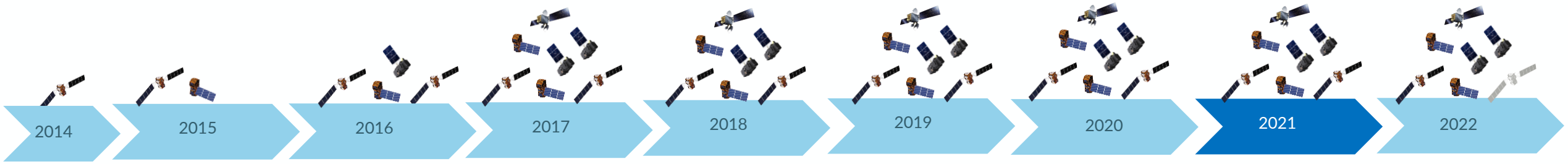
- ❖ Noise reduction of the Inland Water products thanks to the NEW implementation of the zero-padding processing,
- ❖ Improved range resolution of the measurements

Copernicus Europe's eyes on Earth

European Commission

ESA Ground segment transformation: Context

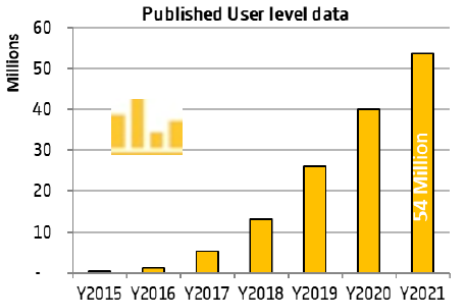
Putting the CSC Operations and the GS operations transformation in context



In 8 years of operations:

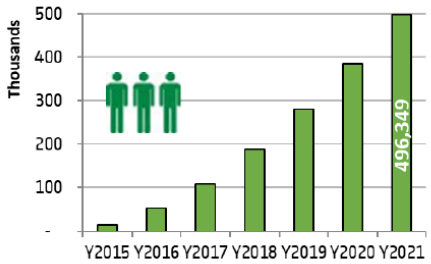
>54,000,000

Total Published User Level Data



>600,000

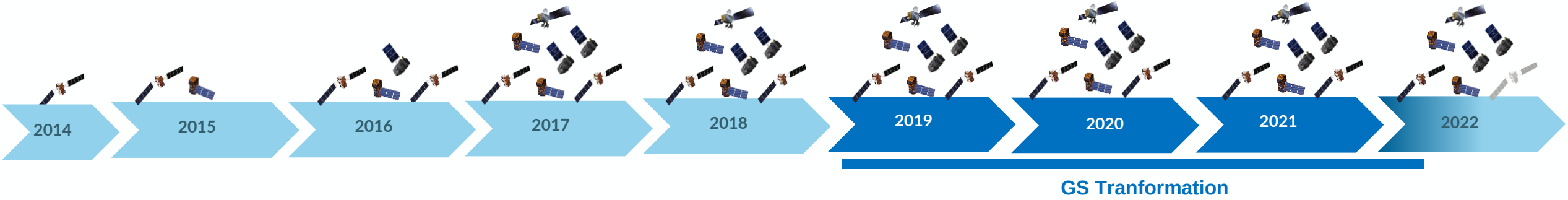
Total Registered Users



In 2021 during the final transformation steps

- **> 50,000 satellite downlink acquisitions**
- **> 13 million data published**
- **> 185 million downloads**
- **~ 80 PiB data downloaded**

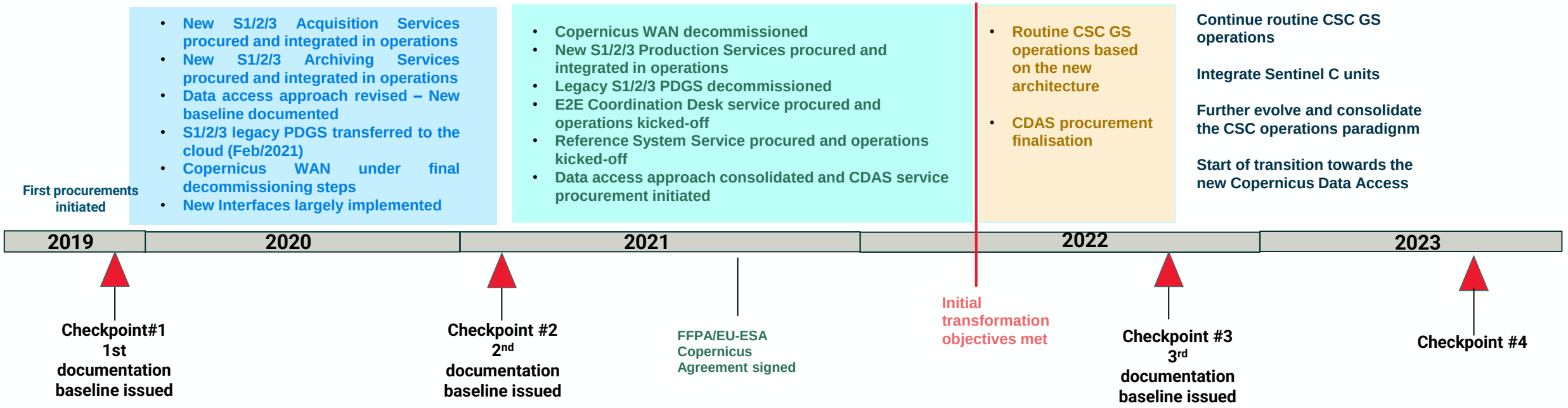
GS Transformation context



- Dedicated deployment infrastructure
- Dedicated one-off software solutions
- Long deployment & integration time
- High risk of technical and industrial lock-in
- Lack of flexibility to cope with new programme and user needs
- High risk of operations not being affordable in the medium-long term

- Relying on existing European infrustructure
- Service based operations
- Shorten integration times and increased flexibility
- Increased operations resilience
- Strong industrial competition
- Increased capability to adapt to evolving programme and user needs
- Capability to transparently manage operations capacity and performance according to available resources

- **2020 has been a turning point in the CSC ground segment operations transformation, with a major step forward towards the target scenario.**
- **Mid-2022, with the entry into operations of the new Production Services, the initial transformation objectives have been met**



UPDATS FROM EUMETSAT SENTINEL-3 MARINE & NRT ATMOSPHERE

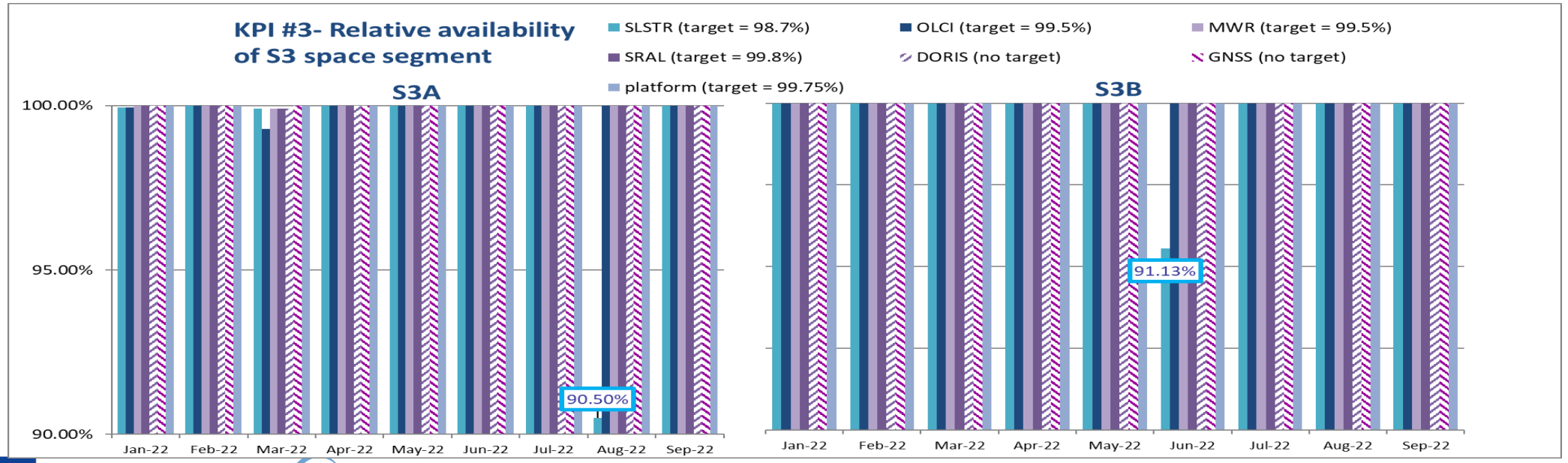
Hilary WILSON

Sentinel-3 Mission Manager

EUMETSAT

SATELLITE OPERATIONS

- Satellite operations continue smoothly with availability generally above targets with the exception of the anomalies on SLSTR-A in August and SLSTR-B in June
- The series of 10 monthly OLCI lunar calibrations with S3A and S3B on alternating months and with different cameras has now been completed with the data under analysis and results looking promising
- These activities will continue, on alternating months only for camera #4, until end 2023
- At the next MCR in March the final results of this analysis will be presented and the way forward to continue beyond 2023 proposed for agreement by the JSG

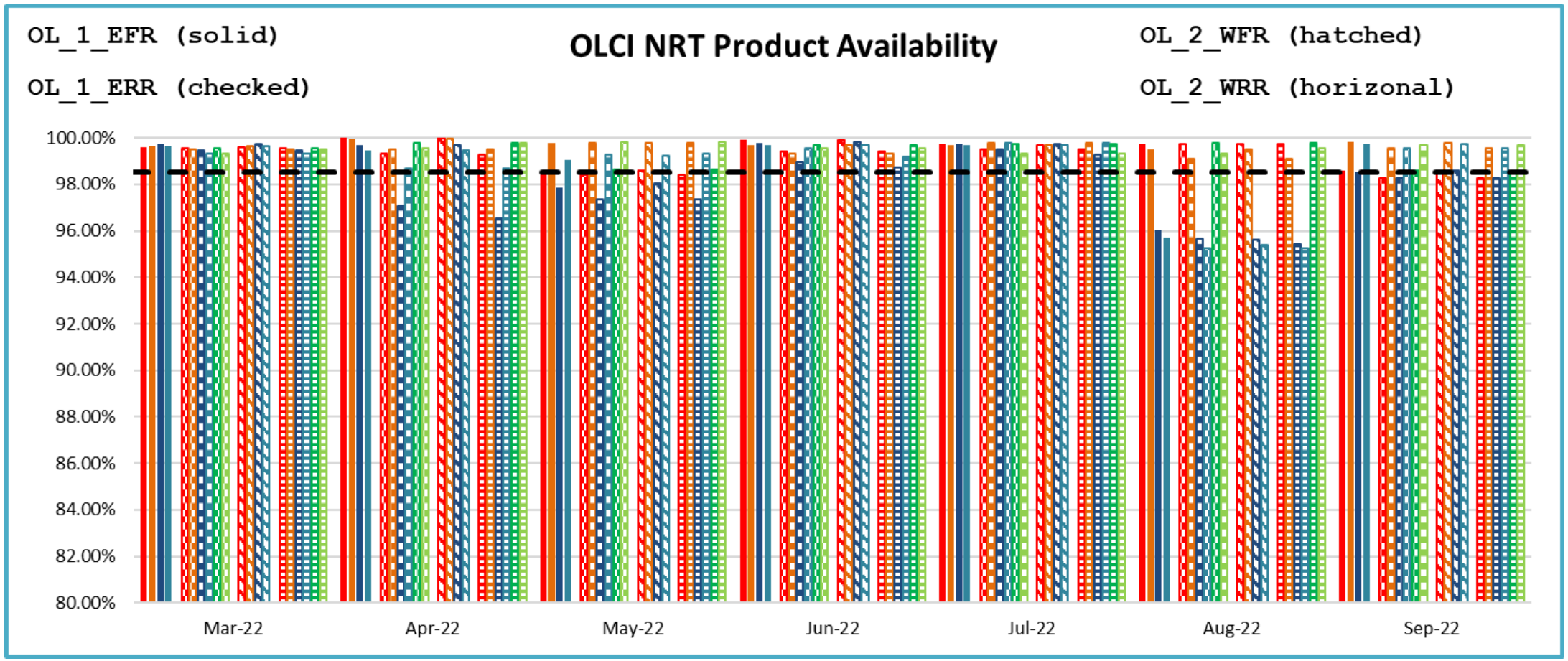


DATA PROCESSING AND DISSEMINATION OPERATIONS

- **Data Processing and dissemination** is also generally nominal in 2022 except as shown on the next slides
- **Migration of users from CODA** to the new EUMETSAT Data Store has been completed and CODA is being decommissioned (see Hayley Evers-King's presentation for more details of how to access live and reprocessed Sentinel-3 data from the new Data Store)

- The activities for the S3 ground segment (GS) re-engineering and upgrade for Sentinel-3C are progressing broadly as expected
  - the entry into operations of the re-engineered ground segment including both the updated Flight Operations Segment (FOS) and the new Payload Data Processing system (PDP) is expected in Q3 2023, this will also include the **migration of users from ODA to the new Data Store**
  - The readiness of the GS to support Sentinel-3C operations is planned to be confirmed at the Sentinel-3C Ground Segment Acceptance Review Planned for Q4 2024.

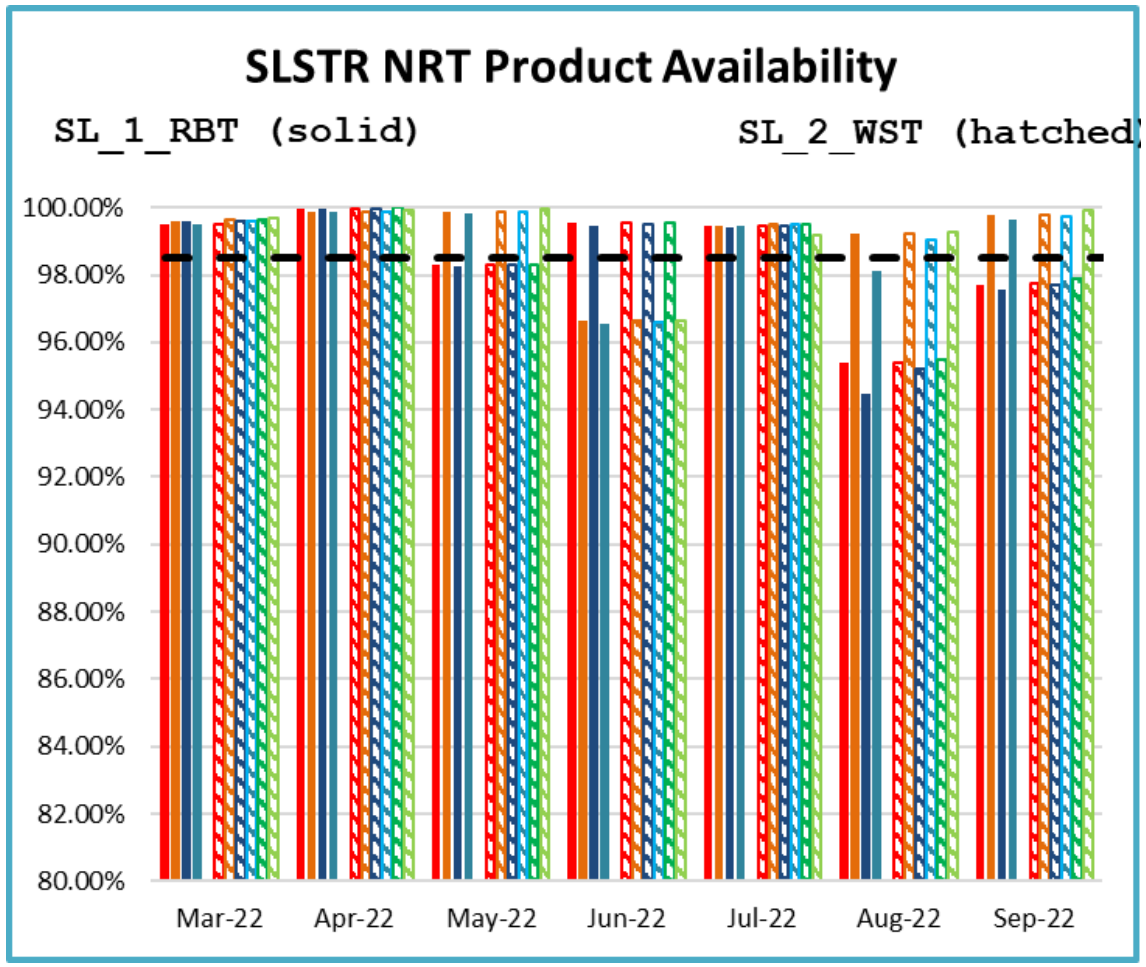
SENTINEL-3 E2E MARINE PRODUCT AVAILABILITY (OLCI)

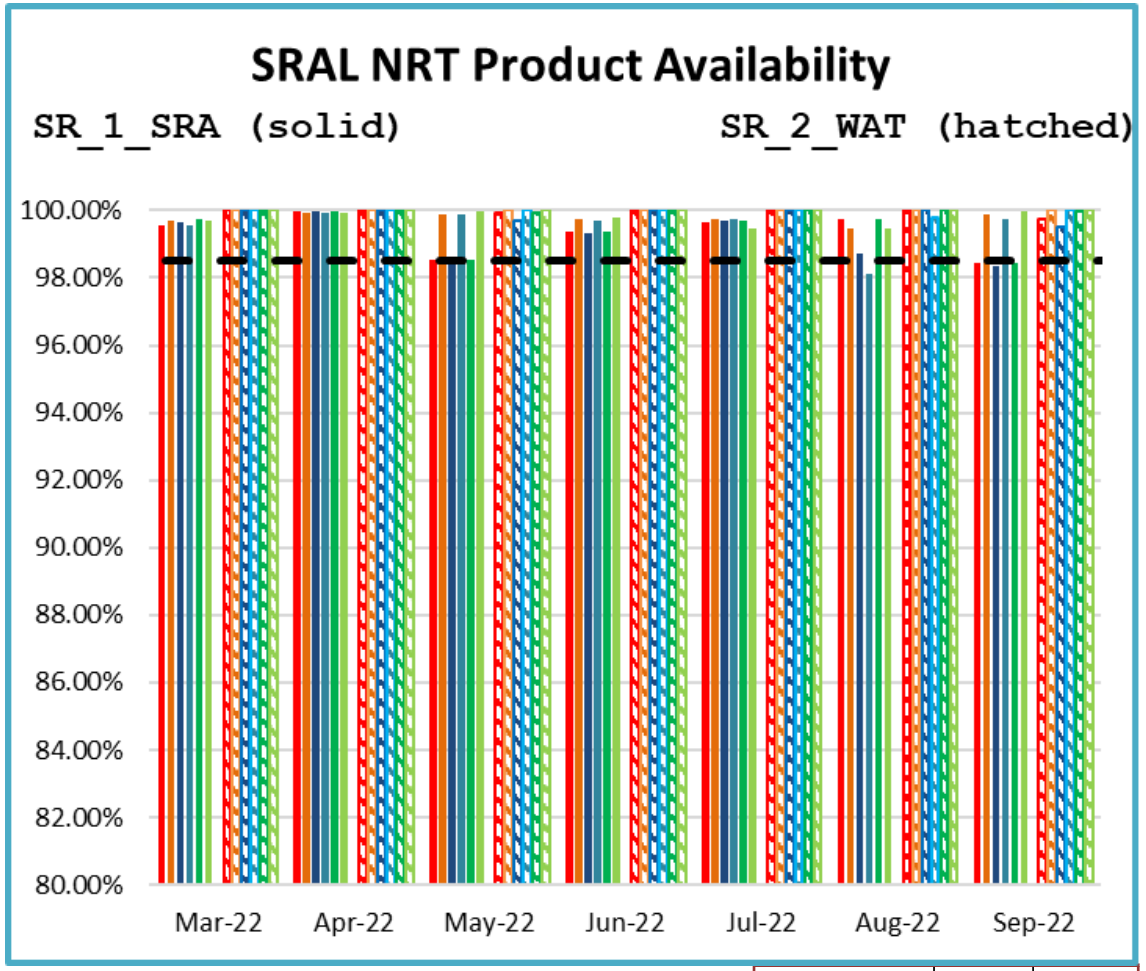


- **Issues with data reception from ESA in April/May/September**
- **OLCI seasonal effect in April/May (compensated in June)**
- **Issue with CODA in August**

Key	S3A	S3B
ODA		
CODA		
EUMETCast		

SENTINEL-3 E2E MARINE PRODUCT AVAILABILITY (SLSTR & SRAL)



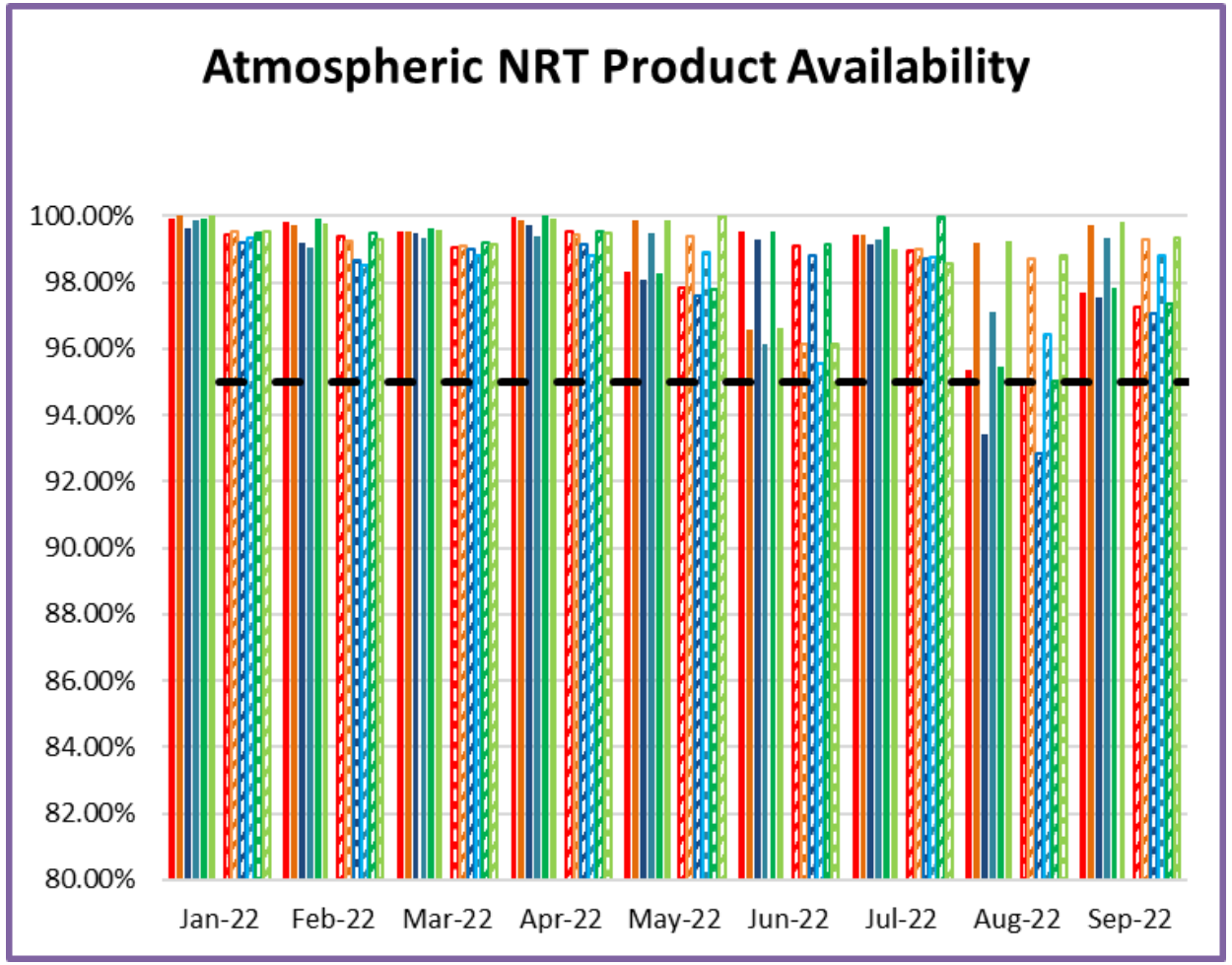


Key	S3A	S3B
ODA		
CODA		
EUMETCast		

- **SLSTR-B anomaly in June**
- **SLSTR-A anomaly in August**

- **Issues with data reception from ESA in April/May/September**
- **Issue with CODA in August**

SENTINEL-3 E2E ALTMOSPHERIC PRODUCT AVAILABILITY



Key	S3A	S3B
ODA		
CODA		
EUMETCast		

- **SLSTR-B anomaly in June**
- **SLSTR-A anomaly in August**

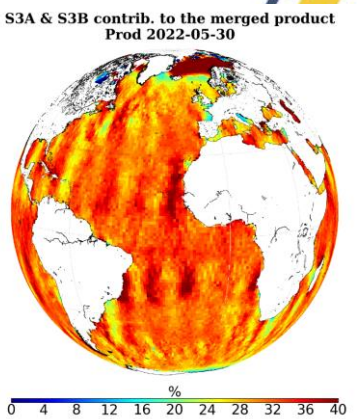
- **Issues with data reception from ESA in April/May/September**
- **Issue with CODA in August**

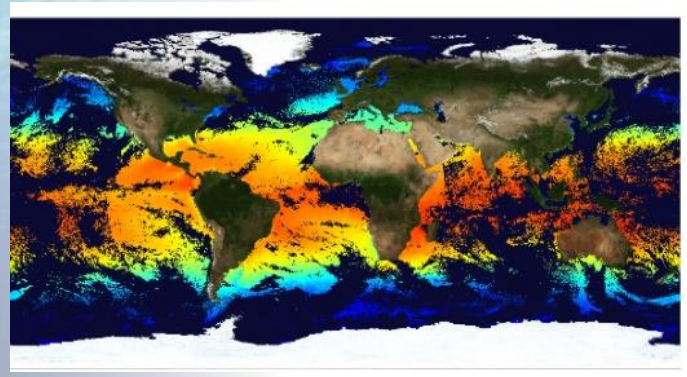
HIGHLIGHTS FROM COPERNICUS MARINE SERVICE

Copernicus Marine Service

Major impact of Sentinel-3A&B and S6 (new Reference Mission) +J3, on Copernicus Marine SL capacity to retrieve ocean mesoscale eddies:

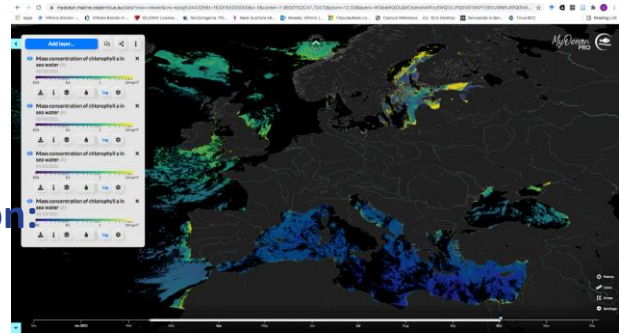
- Strongly improve mesoscale retrieval thanks 2 tandems and excellent availability, latency and quality.
- Full reprocessing planned in 2023: will benefit from reprocessed L2P.





The integration of SLSTR-3A/3B into all SST TAC products has been successfully completed in July 2020.

- **Overall, the integration improved the quality of SST products.**
- **Dual-view SST from SLSTR-3A is used as reference sensor in the MED and BS NRT SST products.**



Sentinels-3 A/B fully integrated in OC-TAC;

- **Since January 2021 OLCI (S3A+B) NRT products are delivered at 300m resolution**
  - **Regional Seas; Global (Coastal = 200km.**

- **Regionalisation of processing chains takes into account the bio-optical characteristics of each regional sea.**

S-3 Impact on Model Forecasts:

- **There is a clear evidence that data provided by Sentinel-3 constellation have improved the quality of Copernicus Marine Forecasts, and are actively used for validation.**

Thank you!