



# From satellites to services: Data access, tools, and user support for the EUMETSAT Copernicus Marine Data Stream

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Tecnologias Marinhas 2019



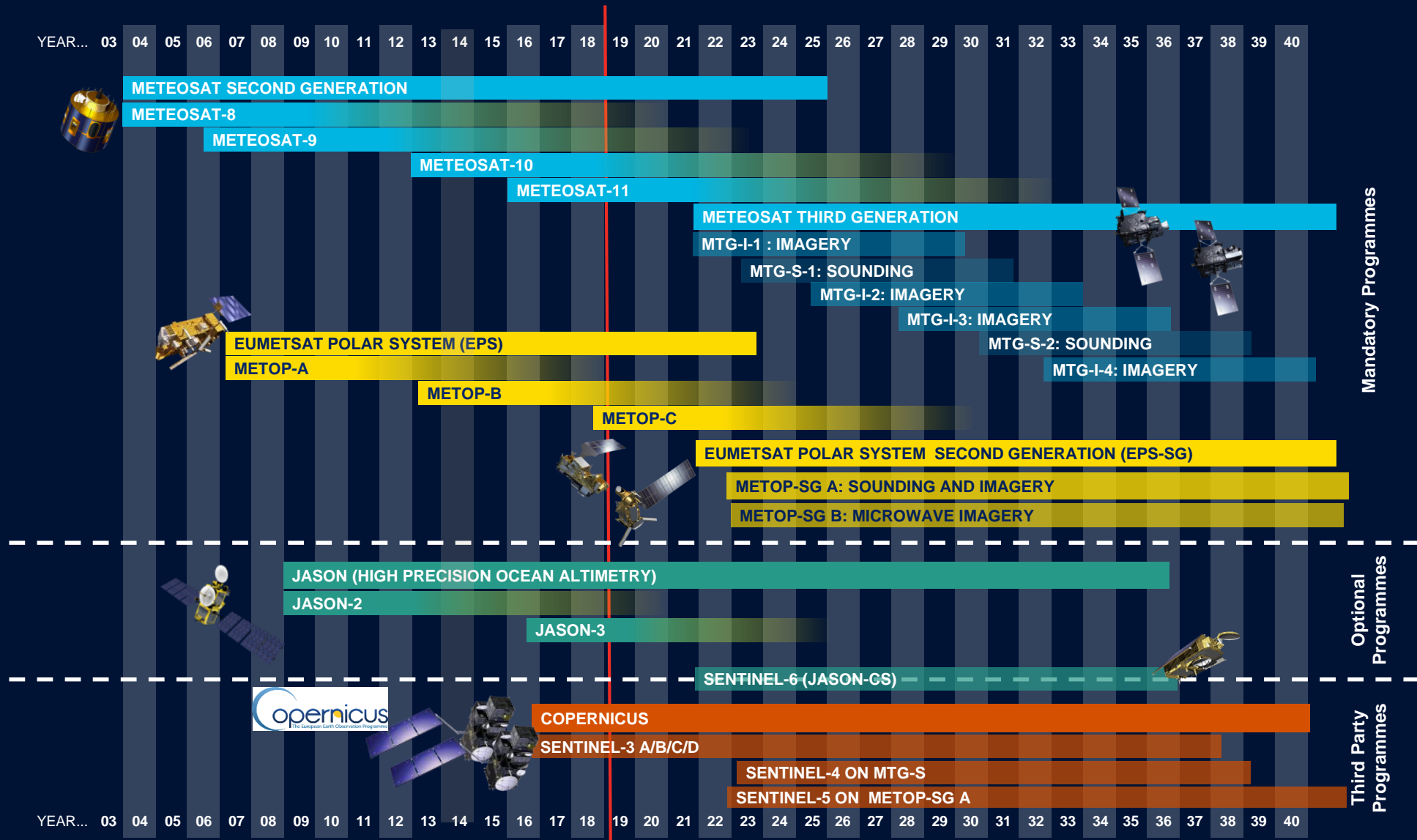
- What is our role? Who are our “users”?
- Data access
- User engagement and support
- Tools and training
- Contacts

# EUMETSAT's Priorities

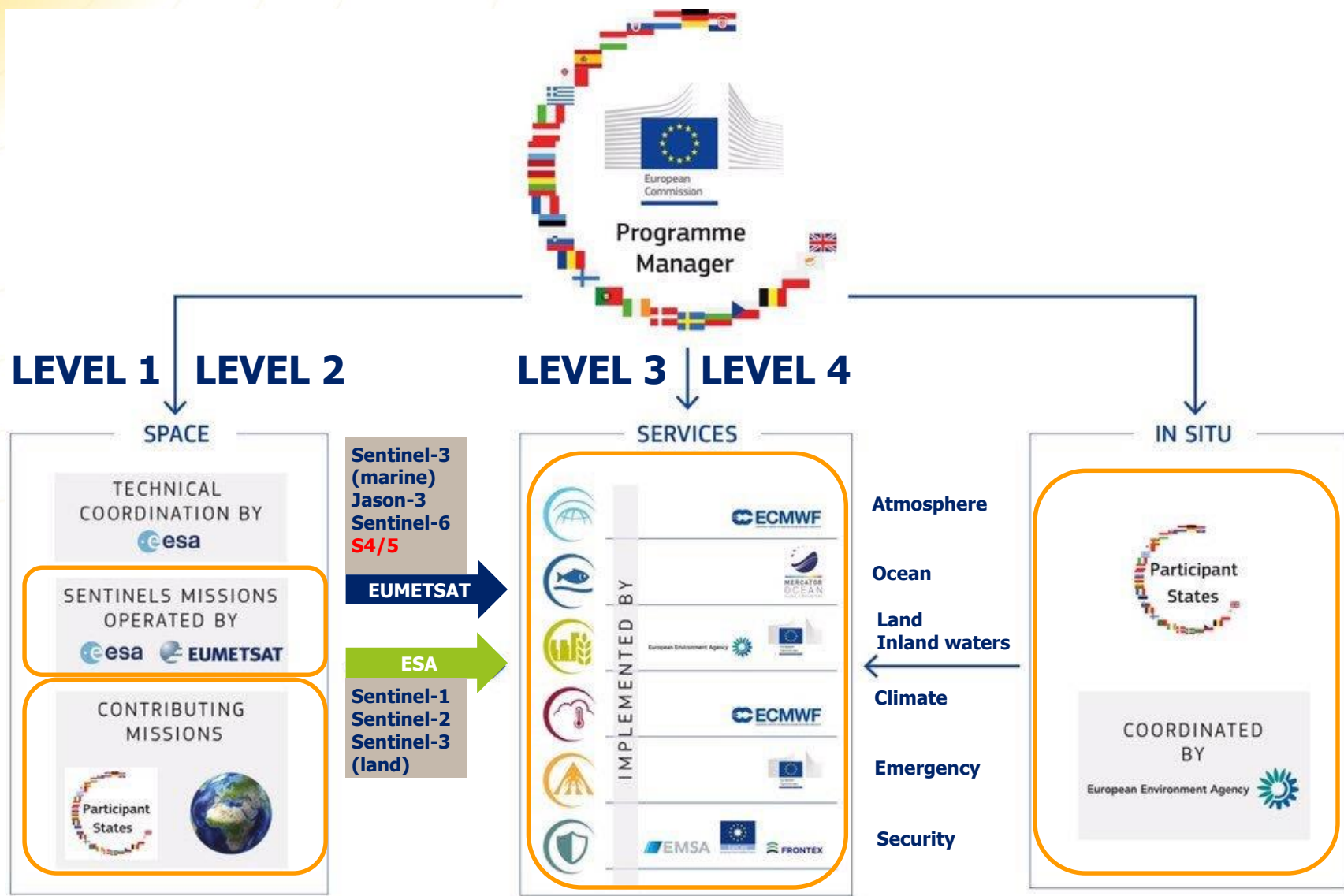
1. "... fulfil [...] through its own satellite programmes the requirements of its Member States for observations and data services for operational weather and Earth system monitoring and forecasting, and for climate services."
2. "... establish additional capabilities in partnerships with the European Union and other satellite operators to achieve synergy with its own satellite missions for the common benefit of its Member States and partners."

**Copernicus**

# EUMETSAT committed to more & better observations until 2040



# Ocean(+) data in Copernicus



**MODELS**



# Who does what in the value chain? Copernicus experience



## EUMETSATs role:

- **Data ID and specification:** Sentinel-3 operations
- **Data processing:** Development and delivery of L1-L2(p, L3) data
- **Product:** Derived geophysical products (SST, Chl, SSH, ice etc etc)
- **Product analysis/tailored service:** infrastructure, training and user support, **connecting experts**.






## Other actors:

- **Data processing/Products:** Development and delivery of L3-4 data
  - Copernicus services
- **Product analysis/tailored service.** Government and businesses, H2020/National funding etc
- **End users:** Marine policy makers, regulating agencies, industry (fishing, aquaculture, shipping, tourism) and **“unknown unknowns”**

# Data Access

## EUMETSAT offers a range of data discovery and delivery mechanisms

**Single sign on registration for online services at <https://eoportal.eumetsat.int>**

	EUMETCast	EUMETCast is a multi-service push dissemination system based on multicast technology. The multicast stream is transported to the user via satellite (EUMETCast Satellite) or terrestrial (EUMETCast Terrestrial) networks.
	Copernicus Online Data Access (CODA)*	CODA offers all Sentinel-3 marine products through a rolling buffer spanning the last 12 months of data. It can be accessed through its API and web-based GUI. <a href="https://coda.eumetsat.int">https://coda.eumetsat.int</a> CODAREP also available for reprocessed data.
	Data Centre Long-Term Archive	An ordering application enables users to browse and select from the long-term archive of products including those from Sentinel-3 marine service. <a href="https://archive.eumetsat.int/">https://archive.eumetsat.int/</a>
	EUMETView	EUMETView is a visualisation service that allows users to view EUMETSAT's data and Copernicus Sentinel-3 marine data in an interactive way using an online map viewer.
	WEkEO	WEkEO is one of the Copernicus Data Information and Access Services (DIAS), and is coordinated by EUMETSAT, ECMWF and Mercator Ocean. It is currently open for beta testing. You can find out more information here: <a href="https://www.wekeo.eu/">https://www.wekeo.eu/</a>

**\*ODA portal for Copernicus services and specific users (e.g. S3VT)**

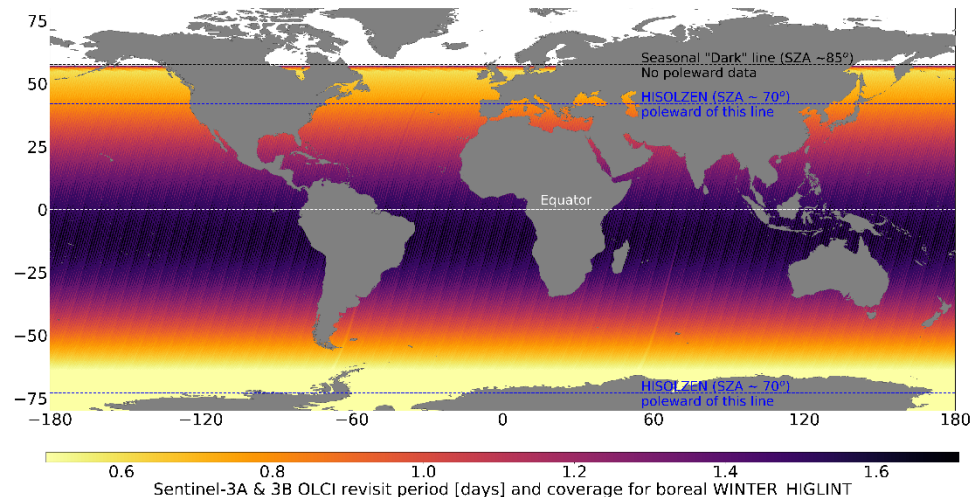
# EUMETSAT user engagement

- **User engagement through**
  - Product User Requirements and Instrument co-design with our main users (e.g. Copernicus services)
  - User support and feedback management
  - Satellite Application Facilities
  - User expert groups on specific issues (Data format, EUMETCast dissemination, S3VT, RAIDEG, GMES&Africa marine, climate etc)
- Product developments and Sentinel-3 reprocessings. Info through S3VT, product release notes, and <https://www.eumetsat.int/website/home/Data/ScienceActivities/ScienceStudies/index.html>
- Regular user surveys – Copernicus, data stream specific, Puma stations (2018)
- Training programme

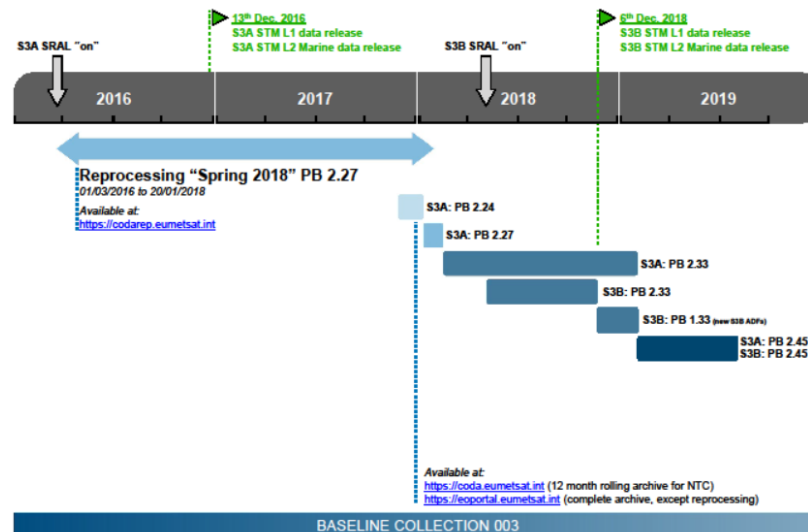


# EUMETSAT user support

- Help Desk (5/7 days, 8/24h) with commitment for response with unique email address [ops@eumetsat.int](mailto:ops@eumetsat.int)
- User Notification Service (maintenance, outage, change)
- Support documentation improvements (e.g. baseline diagrams and (interactive) coverage maps)
- Tools – ‘open’ code repository
  - Downloader script
  - Batch processing workflows
  - Results of product studies...

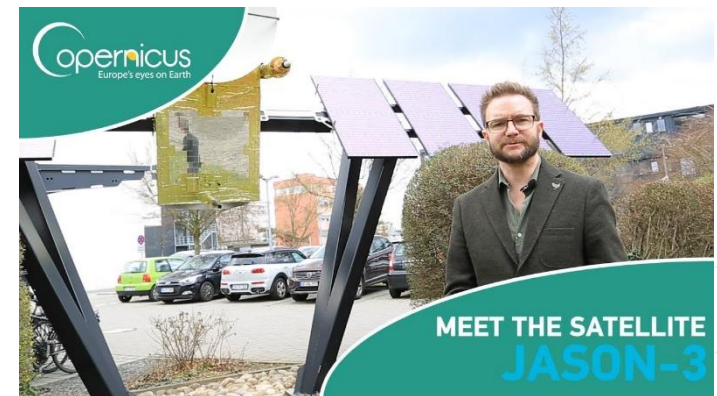


SRAL



# EUMETSAT outreach

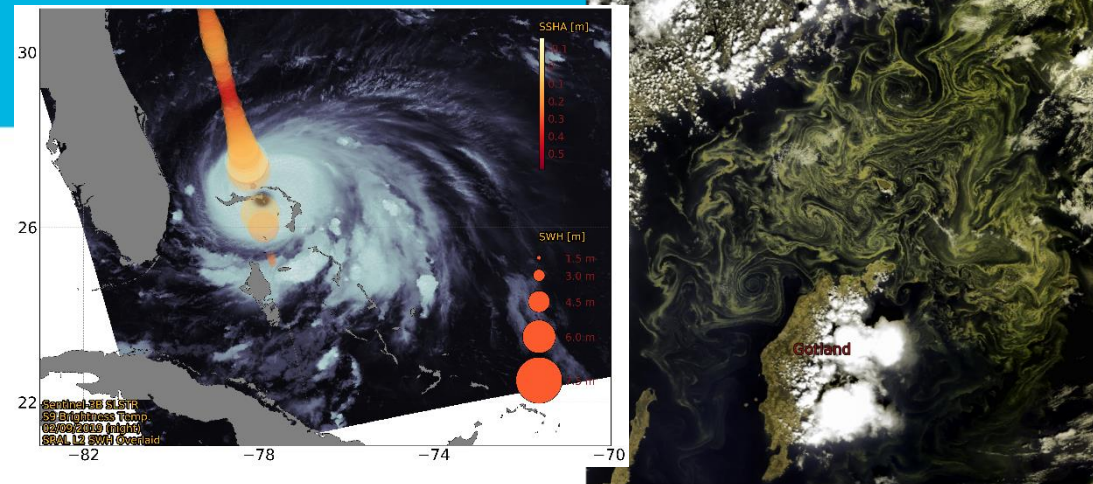
- Copernicus podcast series - first podcast planned for release end of 2019.
- Meet the Satellite and 'year of' videos on YouTube
- Hackathons
  - OceanHack: Baltic sea challenges
- Planning for Copernicus/WEkEO focused MOOC in 2020 with CMEMS/CAMS





# EUMETSAT outreach

- Case studies:
  - Sharing interesting images and story
  - Show potential
  - *New*: provide code for image generation on WEkEO Jupyter Hub
- Spotlight on a user: promoting use cases



**EUMETSAT** MONITORING WEATHER AND CLIMATE FROM SPACE

HOME IMAGES ABOUT US SATELLITES DATA NEWS QUICK LINKS

### SOUTH AFRICAN ALGAL BLOOMS

Detection of harmful algal blooms in the southern Benguela, as seen by OLCI aboard Sentinel-3.

Date & Time	March to June 2017
Satellites	Sentinel-3
Instruments	OLCI
Channels/Products	Level 2 Ocean Colour

By Hayley Evers-King (PML), Marie Smith and Stewart Bernard (CSIR)

The southern Benguela current is a highly productive ecosystem, making it a popular site for fisheries and aquaculture activities.



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### TECHNICAL BULLETINS

#### SPOTLIGHT ON A USER - BLAKE SCHAEFFER


BLAKE SCHAEFFER, OF THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, TALKS ABOUT AN APP THE AGENCY HAS DEVELOPED, WHICH PROVIDES SENTINEL-3 DATA TO WATER QUALITY MANAGERS.

Water, whether in the coastal ocean, or inland lakes and reservoirs, is a vital resource for human activities, and an important ecosystem.

Water resources and habitats can be threatened by poor water quality, as a result of human-induced or naturally occurring phenomena, such as harmful algal blooms.

Cyanobacteria are one type of bloom-forming species that has been linked with significant socio-economic and environmental impacts in aquatic environments.

Of particular concern, is the potential of these blooms to cause respiratory and skin irritation in both humans and animals. Monitoring water quality and providing advisories on these threats, is a challenge for local authorities around the world, in terms of cost and scope of monitoring, and access to suitable supporting data for decision making.



WELCOME  
CLIMATE SERVICE  
DATA CENTRE  
EUMETCAST  
IASI  
GOME-2  
METEOSAT  
METOP  
@EUMETSAT\_USERS

EUMETSAT USERS TWITTER

Tweets by @eumetsat\_users

# Principles of EUMETSAT training

- **Participant-led:**

- They learn what they need to for their application.
- Trainers help to navigate options for data, access, analysis etc.
- Self reflection, confidence, and independent working.

- **Collaborative:**

- Encourage learning from each other and forming networks for post-course support.

- **Open principles**

- Open data, open source software
- Maintainable, shareable

# EUMETSAT training

- Many training interventions across both EUMETSAT and Copernicus product ranges.
- See <http://training.eumetsat.int>
- Includes marine forecasting and Copernicus marine data stream (collaborations – primarily CMEMS, but also ESA and others).
- Primarily English but in French and other languages in regional partnerships.
- Engagement with EO skills alliances (e.g. EO4GEO)
- WEkEO – material prep and upcoming events



# EUMETSAT Copernicus marine training

- Blended courses (online and classroom)
  - Focussed on Sentinel-3
  - 2 per year, 1 in EU, 1 in Africa.
  - Latter now in collaboration with GMES&Africa consortia
  - Participant led, constructivist
- Short courses at conferences/meetings
- Online only course (2020)
- Copernicus Collaborative Exchange
  - Funding for travel and subsistence to facilitate knowledge exchange.



# EUMETSAT Copernicus marine training

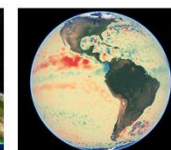
- **Resource development:**
  - Moodle pages:
    - Technical and preparatory information. Interactive elements, surveys etc.
  - YouTube video tutorials and MOOC content ([www.oceansfromspace.org](http://www.oceansfromspace.org))
  - Code repository:
    - Jupyter notebooks, Python code
      - Educational
    - Common workflows:
      - Batch downloading and processing, visualisation, time series analysis
      - New iterations constantly based on requests and collaborations
    - Outcomes of EUMETSAT studies
  - Designed for both stand-alone installation and use on WEkEO
  - Offered with appropriate open source licensing
  - Release in new year on EUMETSAT GitLab (beta version available)



How to access Copernicus sea surf temperature data



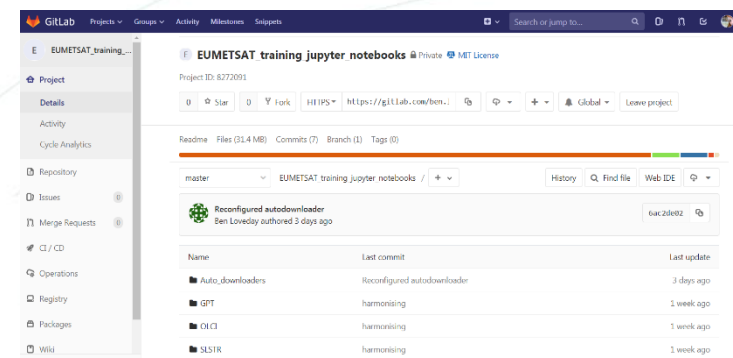
Watch the course videos  
View the course overview and begin watching the course videos



About the course  
Read more about the aims of this course, and who it is supported by



Meet the presenters  
Profiles of our expert course presenters



# What can we do to help this community?

- Support services available to ALL users.
- Feedback is vital to driving product and service improvements.
- Development of our tools – e.g. workflows for averaging etc to be incorporated in to code repositories and training.
- Promoting outcomes through our networks
- Collaboration on training – reuse of material.

## Contacts:

- [ops@eumetsat.int](mailto:ops@eumetsat.int)
- [Copernicus.training@eumetsat.int](mailto:Copernicus.training@eumetsat.int)
- [Hayley.EversKing@eumetsat.int](mailto:Hayley.EversKing@eumetsat.int)