Update on EUMETSAT ocean colour services

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EUMETSAT –space data provider for operational oceanography

- Operational data provider for services and end users: weather, climate, oceanography, atmospheric composition (research and operational use)
- User requirements drive the definition of satellite programmes (with ESA, CNES, NASA/NOAA) and data services

Ocean colour in EUMETSAT operational services

- Sentinel-3 system developed by ESA with EUMETSAT support
- EUMETSAT – future operator of Sentinel-3 under EC/ESA Copernicus programme
- Integration of ocean colour data services into the fully mature operational infrastructure with real time capabilities at EUMETSAT
- Use of EUMETSAT expertise, infrastructure, and global partnerships to provide meteo, climate and environmental data services to users

EUMETSAT new infrastructure building
Assembly of Sentinel-3 Marine Centre

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Ocean colour applications and users

- Operational ocean colour data services for diverse and evolving applications
- Copernicus MyOcean Marine service – delivers marine products and information services, developing an Ocean Monitoring and Forecasting system
- MyOcean – user of EUMETSAT satellite data services, future user of Sentinel-3 and Jason-3 data

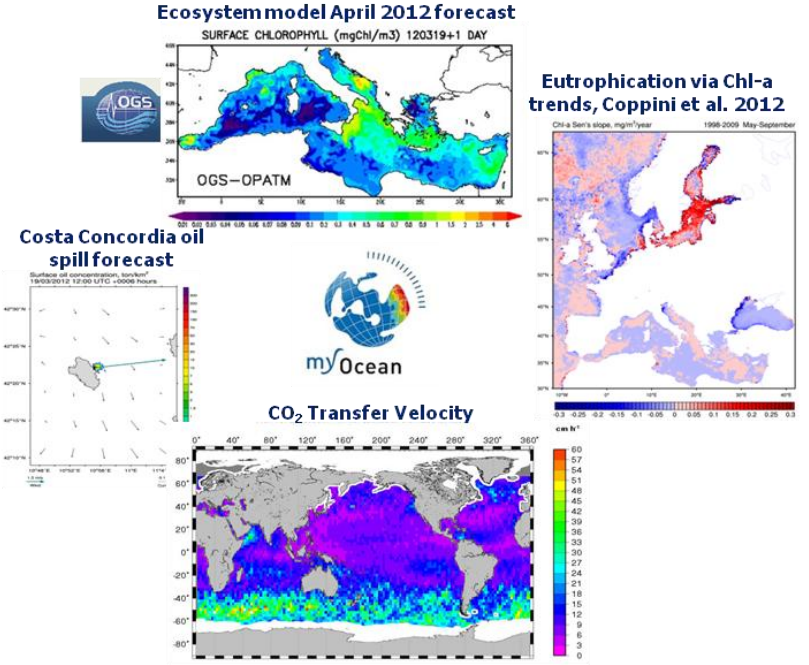
Coupled ocean-atmosphere and coupled physical-biogeochemical modelling and NWP link
air-sea heat fluxes – phytoplankton absorption, optical turbidity
air-sea CO_2 exchange – carbon flux, CO_2 sources, sinks and transport
ecosystem modelling

Climate

Science

Marine environment monitoring
detection and early warning of harmful algal blooms
impacts of natural disasters and human activities
sediment load and transport, water transparency
monitoring of oil spills
eutrophication

Marine resource management
fisheries management and research
sustainable aquaculture
tourism
water resource forecasting
water quality



EUMETSAT end-to-end approach towards meeting user needs

User requirements for operational services

Sustained long-term and uninterrupted provision of satellite data through a set of reliable services

Highest quality of data to serve the diverse applications

Highest accuracy and long-term stability of observations

Multi-mission data availability

Data consistency with other sensors and missions

NRT, delayed mode and reprocessed data distribution

Understanding and support to evolving user needs

Close collaboration with users, MyOcean

Ocean colour community support (IOCS meeting)

Satellite instrument calibration (calibration task force)

State of the art science, algorithms and products (IOCCG ECV task force)

Product cal/val (Sentinel-3 Validation Team, with ESA)

Data formats and distribution, including Third Party data

International training and outreach

User consultation for future Copernicus missions (for EC: GMES PURE)

GMES PURE

Sentinel-3 Cal/Val activities

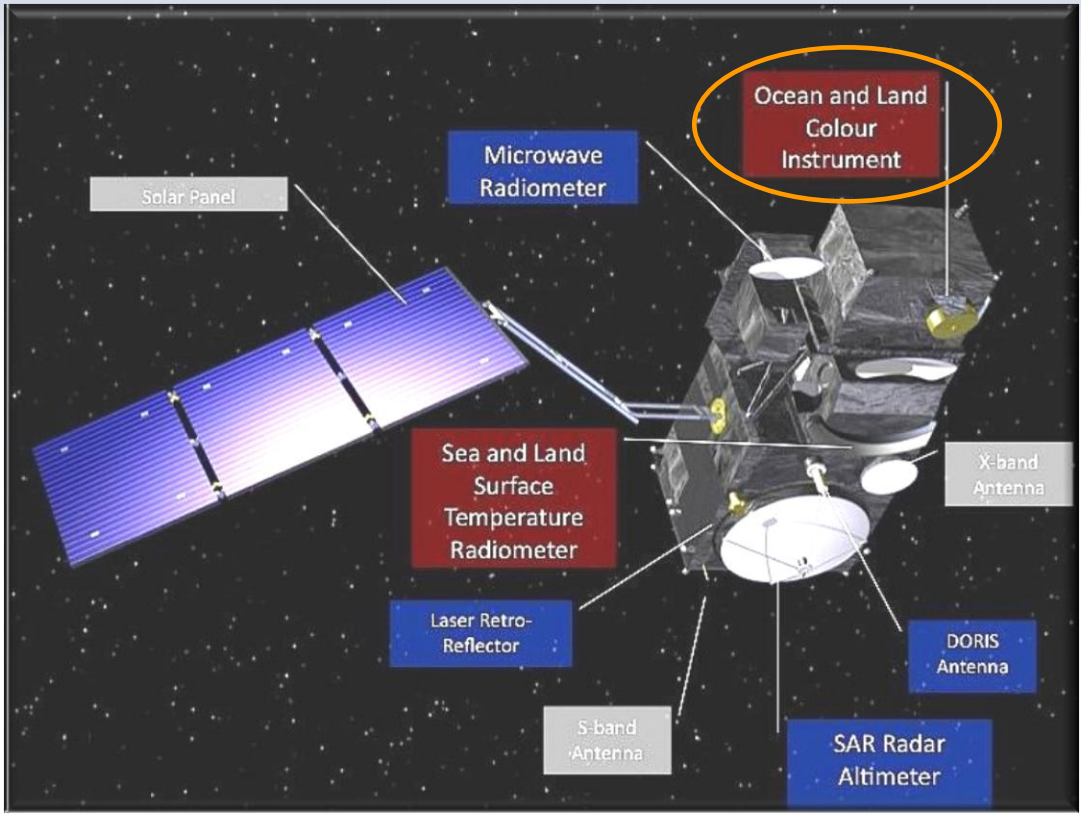
ESA-EUMETSAT planning and preparation for the mission (launch in Nov. 2014)

ESA-EUMETSAT joint Cal/Val Plan

- benefits from community recommendations
- Cal/Val plan version 1 ready and reviewed

ESA-EUMETSAT joint Call for Sentinel-3 Validation Team (S3VT)

- rolling call
- 80 total submissions
- 40 ocean colour submissions
- first workshop 26-29 November 2013
- S3VT subgroups
  - Ocean Colour
  - Altimetry
  - Sea Ice and Sea Surface Temperature
  - Land parameters



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EUMETSAT Sentinel-3 Marine Centre

ESA leads in the development of Sentinel-3 Space and Ground Segment; EUMETSAT supports the development

EUMETSAT operations for Sentinel-3

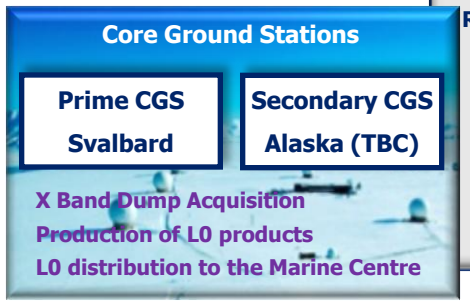
- monitoring and control of Sentinel-3 platform and payloads
- acquisition, processing, maintenance and distribution of instrument data and marine products
- support to the marine user community

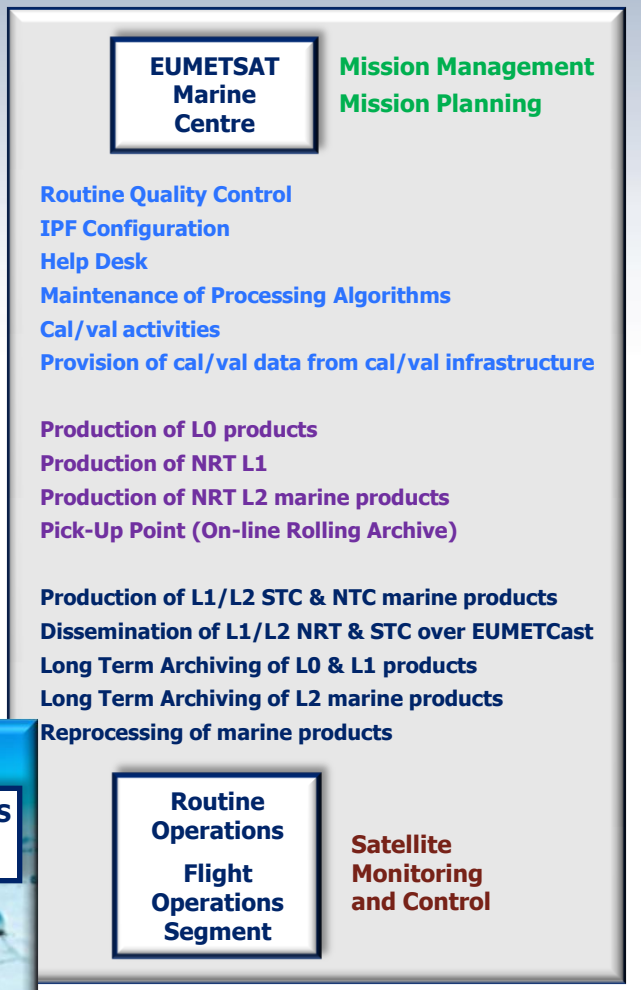
Operations of Payload Data Ground Segment (PDGS)

- ESA – land services
- EUMETSAT – marine services

EUMETSAT Marine Centre

- Sentinel-3 ground segment under integration at EUMETSAT HQ (with ESA and Industry)





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Sentinel-3 OLCI product summary

OLCI Products Summary for Sentinel-3A and Sentinel-3B (Auxiliary Data excluded)			
Product Type	Level	Description	PDGS Product Category
OL_0_EFR___	0	Full Resolution ISPs	Internal
OL_0_CR0___	0	Calibration with no spectral relaxation	Internal
OL_1_SPC___	1	Wavelength characterization from spectral calibration	Internal
OL_1_RAC___	1	Dark offset and gain coefficients from radiometric calibration	Internal
OL_1_EFR___	**1**	**Full Resolution calibrated top of atmosphere radiances (L1B)**	**User**
OL_2_WFR___	**2**	**Full Resolution Marine products and Atmospheric by-products**	**User**
OL_2_LFR___	2	Full Resolution Land and Atmospheric parameters	User
OL_1_ERR___	**1**	**Reduced Resolution calibrated top of atmosphere radiances (L1B)**	**User**
OL_2_WRR___	**2**	**Reduced Resolution Marine products and Atmospheric by-products**	**User**
OL_2_LRR___	2	Reduced Resolution Land and Atmospheric parameters	User

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Sentinel-3 Level-2 core optical products

Sentinel-3 core optical products	application domain	spatial resolution	measurement source
Normalised Water Leaving Reflectances		**300 m, 1.2 km**	**OLCI**
Chlorophyll Concentration for open ocean waters		**300 m, 1.2 km**	**OLCI**
Chlorophyll Concentration for coastal waters		**300 m, 1.2 km**	**OLCI**
Total suspended matter concentration		**300 m, 1.2 km**	**OLCI**
Diffuse attenuation coefficient		**300 m, 1.2 km**	**OLCI**
Coloured Detrital and Dissolved Material absorption		**300 m, 1.2 km**	**OLCI**
Photosynthetically active radiation		**300 m, 1.2 km**	**OLCI**
Aerosol Optical Depth over water		**300 m, 1.2 km**	**OLCI**
Aerosol Angstrom exponent over water		**300 m, 1.2 km**	**OLCI**
Integrated Water Vapour Column		**300 m, 1.2 km**	**OLCI**
Sea Surface Temperature		**1 km**	**SLSTR**
Land Surface Temperature		1 km	SLSTR
Fraction of Absorbed PAR		300 m, 1.2 km	OLCI
Terrestrial Chlorophyll Index		300 m, 1.2 km	OLCI
Surface Reflectances over Land		300 m	OLCI+SLSTR
Aerosol Optical Depth over Land		300 m	OLCI+SLSTR
Aerosol Angstrom exponent over Land		300 m	OLCI+SLSTR
Vegetation-like Surface Reflectances 1 day Synthesis		1 km	OLCI+SLSTR
Vegetation-like Surface Reflectances 10 day Synthesis		1 km	OLCI+SLSTR
Vegetation Normalised Difference of Vegetation Index		1 km	OLCI+SLSTR

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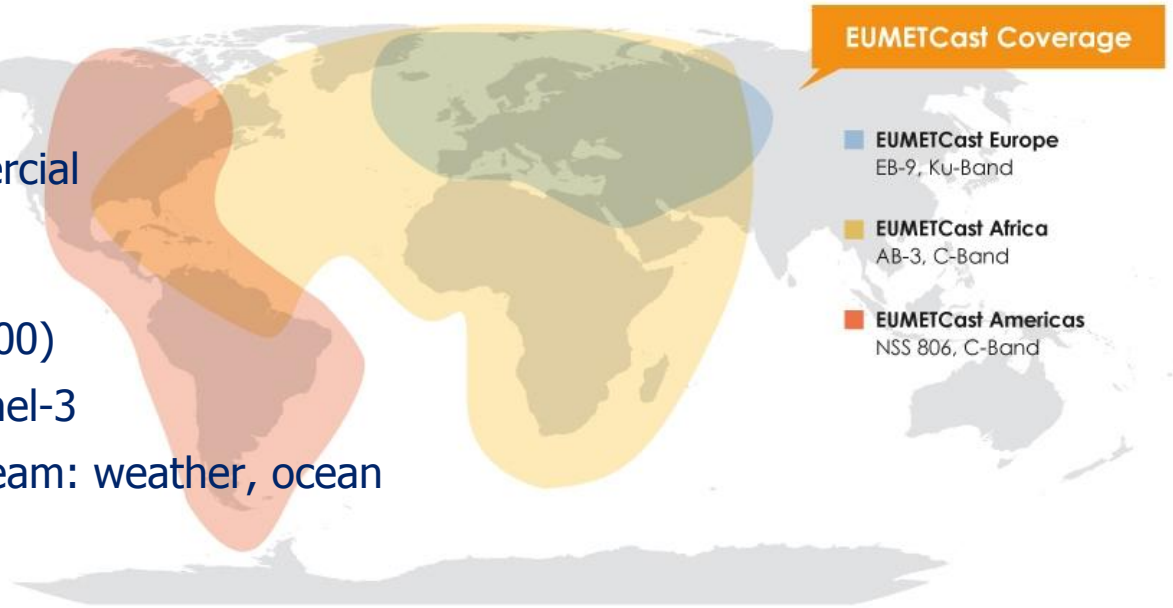
EUMETSAT Sentinel-3 data dissemination: baseline

Near Real Time: EUMETCast

- Digital Video Broadcast using commercial telecommunication satellite services
- low cost, standard VSAT (Very Small Aperture Terminal, > 4000)
- 3 hour near-real timeliness for Sentinel-3
- access to integrated marine data stream: weather, ocean



Long-term archive

- U-MARF (Unified Meteorological Archive and Retrieval Facility)
- two last baselines of all products

On-line data access (ODA)

- rolling archive: last 1 month of data

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EUMETSAT Product Navigator

- Central service for all EUMETSAT data and products

  http://www.eumetsat.int/Home/Main/DataProducts/ProductNavigator/

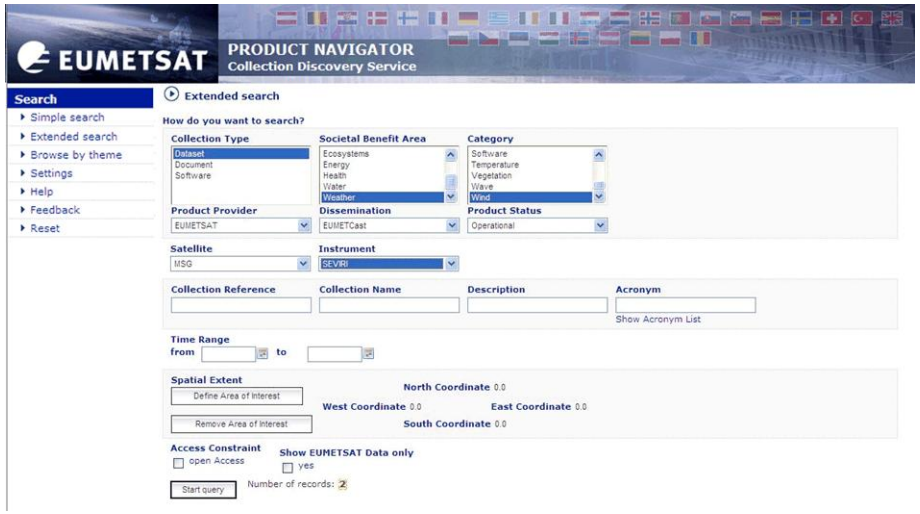
- Data search and data ordering

  Product Dissemination Units over regions of interest

  product subsets containing user-selected parameters

- Distribution from the long term archive
- Subscription to EUMETCast dissemination services

OLCI total volume uncompressed	GB/day	TB/year
Level-1 FR and RR	440.40	160.75
Level-1 RR	33.23	12.13
Level-2 marine FR and RR	438.29	159.98
Level-2 marine RR	33.80	12.34



EO Portal

helpdesk

ops@eumetsat.int

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Summary

- EUMETSAT: user-driven agency/programmes
- Involvement in ocean colour through Copernicus Sentinel-3 development and operations; in cooperation with ESA and the EC
- Operations and data services in support of Copernicus and worldwide user community
  - operations/exploitation of Sentinel-3 marine mission
  - delivery of ocean colour data services: Sentinel-3 and Third Party missions (e.g. VIIRS Suomi NPP with NOAA/NASA)
  - easy real time access through low cost VSAT: EUMETCast – integrated real time data stream
  - emphasis on quality of data and service; importance of user requirements and community recommendations

Looking forward to serving ocean colour users and the community!

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