

Copernicus EO data and information in support of the SDGs and International Conventions

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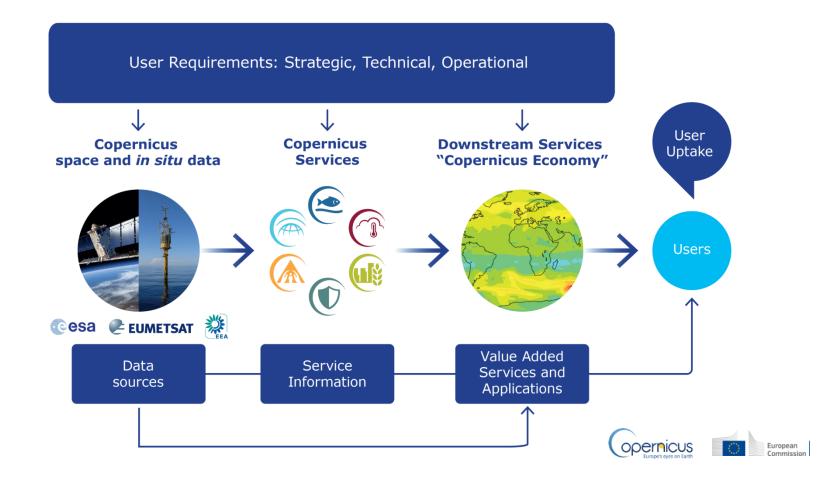
What is unique about Copernicus as a Programme to address the SDGs and International Conventions?







COPERNICUS IS DRIVEN BY USERS & POLICY



Copernicus

THESENTINELS

Key Features

SEELE		
	SENTINEL-1:	
	4-40m resolution, 3 day revisit at equator	
William III		

Sentinel Mission and Status

2 Sats in orbit

Polar-orbiting, all-weather, day-and-night radar imaging



SENTINEL-2: 10-60m resolution, 5 days revisit time 2 Sats in Orbit

Polar-orbiting, multispectral optical, high-res imaging



SENTINEL-3:

300-1200m resolution, <2 days revisit

2 Sat in Orbit

Optical and altimeter mission monitoring sea and land parameters



SENTINEL-4:

8km resolution, 60 min revisit time

1st Launch in 2020

Payload for atmosphere chemistry monitoring on MTG-S



SENTINEL-5p:

7-68km resolution, 1 day revisit

1 Sat in Orbit

Mission to reduce data gaps between Envisat, and S-5



SENTINEL-5:

7.5-50km resolution, 1 day revisit

1st Launch in 2021

Payload for atmosphere chemistry monitoring on MetOp 2ndGen



SENTINEL-6: 10 day revisit time 1st Launch in 2020

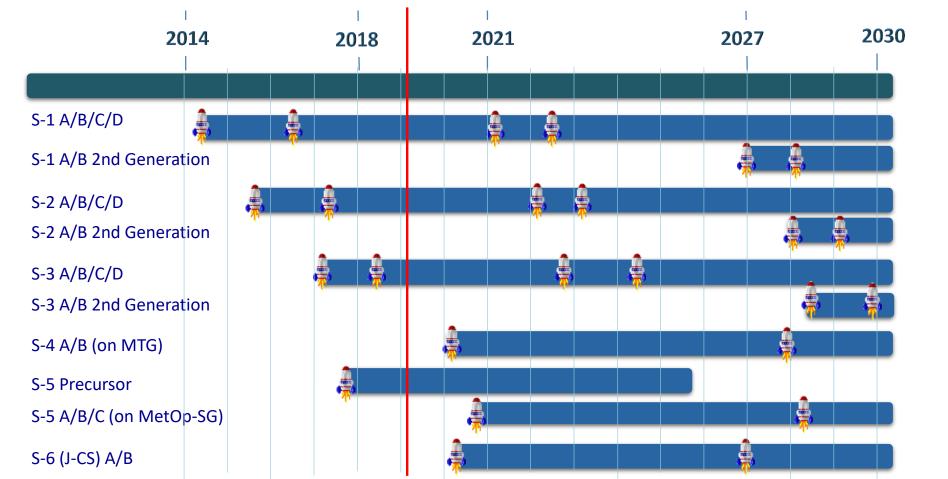
Radar altimeter to measure seasurface height globally





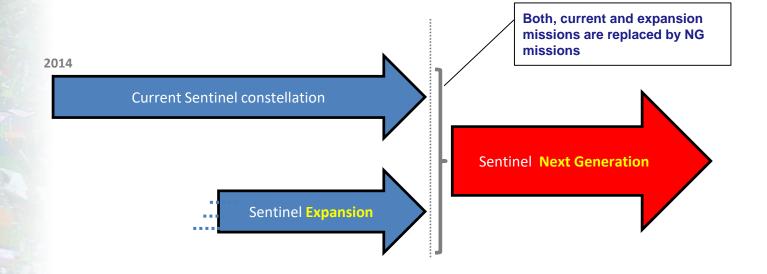
The European Copernicus Programme







COPERNICUS SPACE COMPONENT EVOLUTION









COPERNICUS EVOLUTION: SPACE STRATEGY FOR EUROPE

Stability of the programme and long term committment

- (Enhanced) continuity of current data and services
- Continuity of full, open and free data policy

Copernicus will continue to be a public service, driven by the needs of policy and public administrations and fostering economic development in Europe

- Support Public core Users at European, national, and sub-national level
- Help Europe to maintain a prominent role in the international context
- Strengthen Intermediate Users, downstream companies, value added service providers







POLICY NEEDS AND PRIORITIES

- Additional services will be considered to meet emerging needs (Enhanced)
 - Climate change and sustainable development
 - Monitoring CO2 and other greenhouse gas emissions
 - Changes in the Arctic
 - Land use and forestry
 - Security and Defence: improving the EU's capacity (border controls and maritime surveillance)







Data Policy

FULL, FREE AND OPEN

Copernicus Data and Information Policy

- Sentinel data and service information are disseminated under a free, full and open data policy
- Free access is provided under pre-defined technical conditions through Copernicus dissemination platforms

Legal basis

 COMMISSION DELEGATED REGULATION (EU) of 12.7.2013 supplementing Regulation (EU) No 911/2010 of the European Parliament and of the Council on the European Earth monitoring programme (GMES)

Data and information

- Sentinel Data and Copernicus Service Information
- Satellite Data from Contributing Missions (national, commercial, ...) and In situ data
- Data available under specific license conditions set by, or negotiated with, the data providers

Rights of use

 The users are granted the rights to use, copy, modify, distribute, communicate to the public these data and information or the results of their processing

Attribution

- When redistributing, the user must indicate the source of the data or information.
- Redistribution of modified data or information must be correctly labelled.







COPERNICUS SIX SERVICES



User Driven Service Enabled Programme







Broad Product Portfolio



♠ Products Search Engine

edback Buser Guide



Copernicus offers you 1092 information products

Faithful to its mission to provide strategic, social, economic and environmental benefits to European public authorities and to the civil society, the European Commission has designed a downstream service tailored to the specific needs of Copernicus users, making easier the access to data and information.

The interface displays a comprehensive list of information products and other functionalities such as data extraction, data manipulation and queries in a secure and user-friendly approach, no matter the user profile.

Copernicus Information products are available through three different search methods: displayed below:

(i) Search by name ore keyword (ii) Search by Alphabetical index (iii) Search by theme/services. Also, Copernicus data can be directly accessed from Copernicus website dedicated page.

Search Copernicus information products by name or keyword

Enter a name or keyword ...

Search

■ Search Copernicus information products by Alphabetical index

Search Copernicus information products by theme / services



The tool is a dynamic interface between the Copernicus website and Copernicus Domains websites, automatically updated on a daily basis. It provides opportunities to be informed, to communicate, to provide feedback and remarks, and to go further in terms of research and experience.

Copernicus data can also be accessed from Copernicus website dedicated page.



eedback Suser Guide





Copernicus Information Products Search Results for: ecosystem

ecosystem

Sparch

Results found: 21

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Arctic Remote Sensing Reflectances, Attenuation Coefficient at 490nm, and inherent optical properties from Satellite observations - Marine

Last updated on: January 23, 2019

'Short description:'

This RRS product is defined as the ratio of upwelling radiance and downwelling irradiance at 412, 443, 490, 510, 555 and 670 nm wavebands (corresponding to SeaWiFS), and can also be expressed as the ratio of normalized water leaving Radiance (nw) and the extra-terrestrial solar irradiance (FO). The ESA Climate Change Initiative is a 2-part programme aiming to produce "climate quality" merged data records from multiple sensors. The Ocean Colour project within this programme has a primary focus on chlorophyll in open oceans, using the highest quality Rrs merging process to date. This uses a combination of bandshifting to a reference sensor and temporally-weighted bias correction to align

Read more



Corine Land Cover 2006 (vector) - version 18, Sep. 2016 - Land

Last updated on: January 23, 2019

CORINE Land Cover (CLC) was specified to standardize data collection on land in Europe to support environmental policy development. The reference year of first CLC inventory was 1990 (CLC1990), and the first update created in 2000. Later the update cycle has become 6 years. The number of participating countries has increased over time – currently includes 33 European Environment Agency (EEA) member countries and six cooperating countries (EEA39) with a total area of over 5.8 Mkm.2 Ortho-corrected high spatial resolution satellite images provide the geometrical and thematic basis for mapping. In-situ data (topographic maps, ortho-photos and ground survey data) are essential ancillary information. The project is coordinated by the EEA in







International Dimension

- 1. Already the original Copernicus Regulation (377/2014)
- 2. Highlighted as 1 of 4 Pillar of the Space Strategy (2016)
- 3. Reinforced in the Proposed Regulation for a Union Space Programme (draft 2018)

(60) In the international domain, Copernicus should provide accurate and reliable information for cooperation with third countries and international organisations, and in support of the Union's external and development cooperation policies. Copernicus should be considered as a European contribution to the Global Earth Observation System of Systems (GEOSS), the Committee on Earth Observation Satellites (CEOS), the Conference of the Parties (COP) to the 1992 United Nations Framework Convention on Climate Change (UNFCCC) and the Sendai Framework for Disaster Risk Reduction. It should establish or maintain appropriate cooperation with relevant sectoral UN bodies and [agencies] World Meteorological Organisation.

EN





Euro GEOSS coordinate, combine, cooperate



- The European component to the Global Earth observation System of Systems (GEOSS) under the Group on Earth Observations (GEO) with Copernicus as major component
- Launched by the European GEO Caucus in Oct 2017
- Focus on Sustainable Development Goals, GEO Societal Benefit Areas and GEO priorities in a European context
- Application oriented, based on existing elements (umbrella)
- From "data-centric approach" to "user-driven GEOSS"
- Integrate scattered efforts: Horizon 2020, Copernicus, ESA, national initiatives,...
- Improving user uptake of the GEOSS assets
- Leverage and make **European EO assets visible** internationally







Dedicated EuroGEOSS Action (1st year)



- Horizon 2020 call 'Strengthening the benefits for Europe of the Global Earth Observation System of Systems (GEOSS) - establishing 'EuroGEOSS' is in the final stages of evaluation – big push for EuroGEOSS initiative
- Since September 2018 scheme for open innovation partnerships: 9 Action Groups out of almost 50 responses!
 - Topical (Agriculture/Food, Land use/land coverage, Urban, Disaster Resilience, Biodiversity & Ecosystems, Marine, Climate, Atmosphere and Energy)
 - Lifespan of max 3 year
 - For upscaling existing applications
 - Voluntary and bottom-up
 - Private and public engagement
- Showcases in preparation for GEO Ministerial November 2019
 Marjan van Meerloo European Commission/ RTD





"The integration of statistics, geospatial information, Earth observations, and other sources of Big Data, combined with new emerging technologies, analytics and processes, are becoming a fundamental requirement for countries to measure and monitor local to global sustainable development policies and programs"

UN-GGIM co-chairs







Copernicus and SDGs

Base support for addressing Sustainable Development Goals



























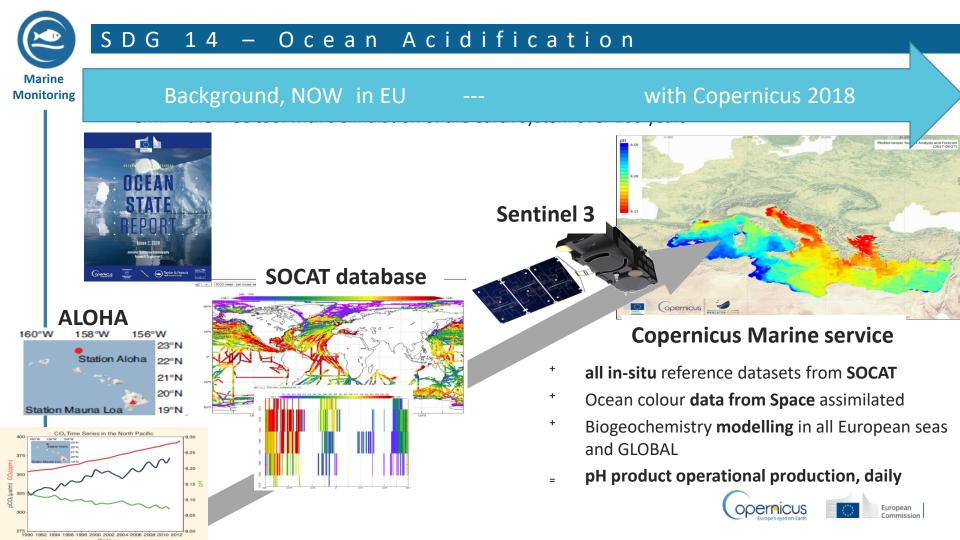






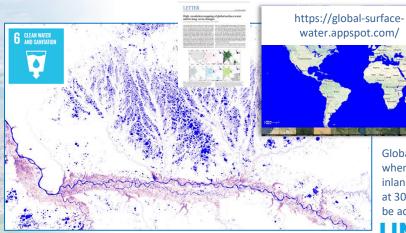








GLOBAL LAND COMPONENT and SDGs



Global mapping of when and where of inland coastal waters at 30m, 32 years, to be adapted to S2





Land productivity Dynamics, 1km, 15 years (moving to 300m, 18 yrs) https://wad.jrc.ec.europa.eu/



Copernicus for support to **GEOGLAM**



Global Human Settlement Layer 20m - 1km

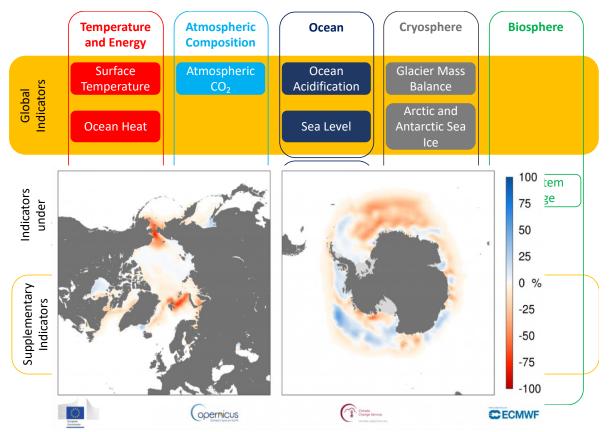
https://ghsl.jrc.ec.e uropa.eu/index.php







GCOS Climate Indicators





Sea-ice cover anomaly for December 2017 relative to the December average for the period 1981-2010. Source: ERA-Interim. (Credit: ECMWF Copernicus Climate Change Service)







C3S and CCI: Research to Operations

Climate Change





Wetlands inventory, assessment and monitoring (Example Uganda)





Target 6.6 "By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes"

Indicator 6.6.1 Change in the extent of water-related ecosystems over time

Custodians: UN Environment and Ramsar

Table 1 Water-related Ecosystem Categories and their Applicable Extent Components

		Water-related Ecosystem Categories				
		Lakes	Rivers and Estuaries	Vegetated Wetlands	Aquifers	Artificial Waterbodies
Extent	Spatial Extent				N/A	
	Quality					
	Quantity	N/A		N/A		N/A

N/A = No requirement to monitor for Indicator 6.6.1

Ramsar Convention on Wetlands

- Intergovernmental Treaty that embodies the commitments of its Member
 Countries to maintain the ecological character of their wetlands of international importance and the "conservation and wise use" of all wetlands
- 170 Contracting Parties, 2,336 Ramsar Sites, 2.51 Million km2
- Affiliated with the UN system of MEAs (biodiversity-related cluster with CBD)

Ramsar 4th strategic plan (2016-2024)

Strategic Goal 3:

Ensure the wise use of all wetlands

Target 8: National wetland inventories have been initiated, completed or updated and disseminated



2017/18 Wetlands Inventory, Uganda, based on Sentinel 1 and Sentinel 2

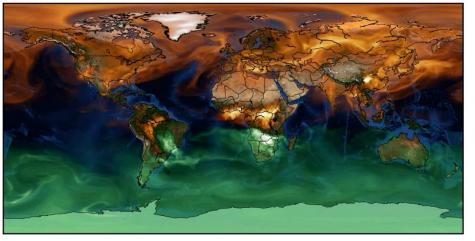


Preparing for a Copernicus CO2 emission Monitoring Capacity

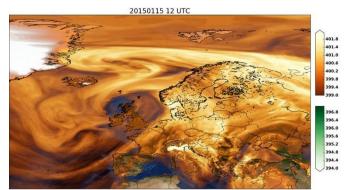
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Summary

What makes Copernicus <u>unique</u> as a Programme to address the SDGs and International Conventions?

- 1. User and Policy Driven
- 2. Long-term sustained commitment
- 3. Full free and open data Policy
- 4. Strong international dimension
- 5. Operational data production and Service delivery
- 6. Broad cross-domain product portfolio
- 7. Open to new needs and requirements
- 8. Responsive to new technologies and research







Mission	Objective	Technical Concept
CO2 Mission	Paris agreement, anthropogenic CO ₂ "MRV" support	VNIS/SWIR Spectrometer and multi-angle polarimeter, 4km2, 2-3 days revisit via a constellation
Thermal Mission	Addressing policies related to water and food security – EU Water Framework EU Directive, Common Agriculture Policy, UN SDGs, UNFCCC, UNCCD	30-50 m, daily (goal) via a constellation, 3-5 TIR bands & minimum VNIR/SWIR
Polar Ice and Snow Topographic Mission	Monitoring of critical climate signals: ice sheet (sea ice and land ice elevation and thickness), ice cap melting and sea level; Support applications related to coastal and inland waters; contribute to the observation of ocean topography.	Ku-band and Ka-band interferometric radar altimeter, a laser retro-reflector array, a GNSS receiver
Passive Microwave Imaging Mission	Integrated EU Arctic Policy, sustainable development in and around the Arctic	Multifrequency microwave radiometer (CMIR) which sustains AMSR2 type capability and SMAP/SMOS capability
Hyperspectral Mission	management of natural resources. Supports services for food security, agriculture and raw materials.	400-2500nm; 10nm;<30m, 10d via a constellation;
L-Band SAR Mission	vegetation cover, biomass and surface soil moisture. Enhanced monitoring polar regions (sea and land ice) and ground movement and deformation due to hazards.	L-band imaging SAR, full-pol, 5-30m, revisit TBD