



Programa Copernicus y aplicaciones

Lidia Quental
LNEG



Copernicus EU



Copernicus EU

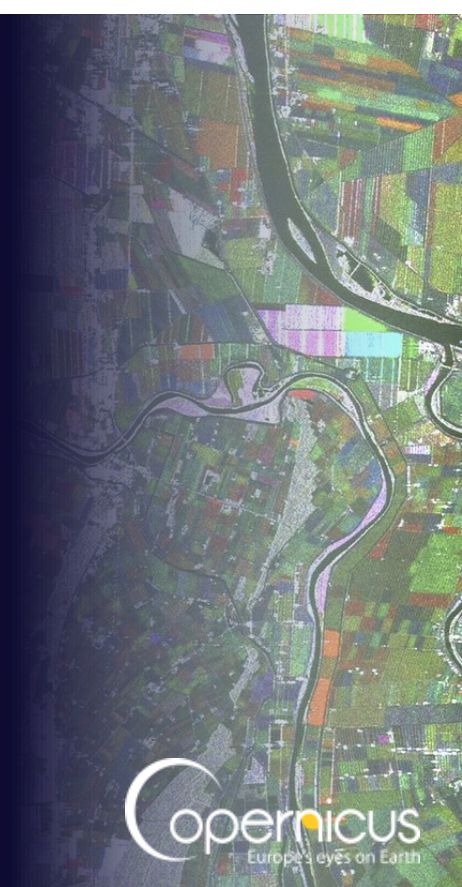


@CopernicusEU



www.copernicus.eu

esta presentación está parcialmente en español e inglés
19/12/2021





Copernicus

Visión general

INTRODUCCIÓN

programa Copernicus

mecanismos de apropiación de datos

APLICACIONES COPERNICUS

fuentes de datos, productos, flujos de trabajo dentro de temáticas y proyectos de geociencias

COMENTARIOS

oportunidades y desafíos



Copernicus

Programa Copernicus

Copernicus

es el programa de la Unión Europea de observación y monitorización de la Tierra, que analiza el planeta y su medio ambiente en beneficio de los ciudadanos

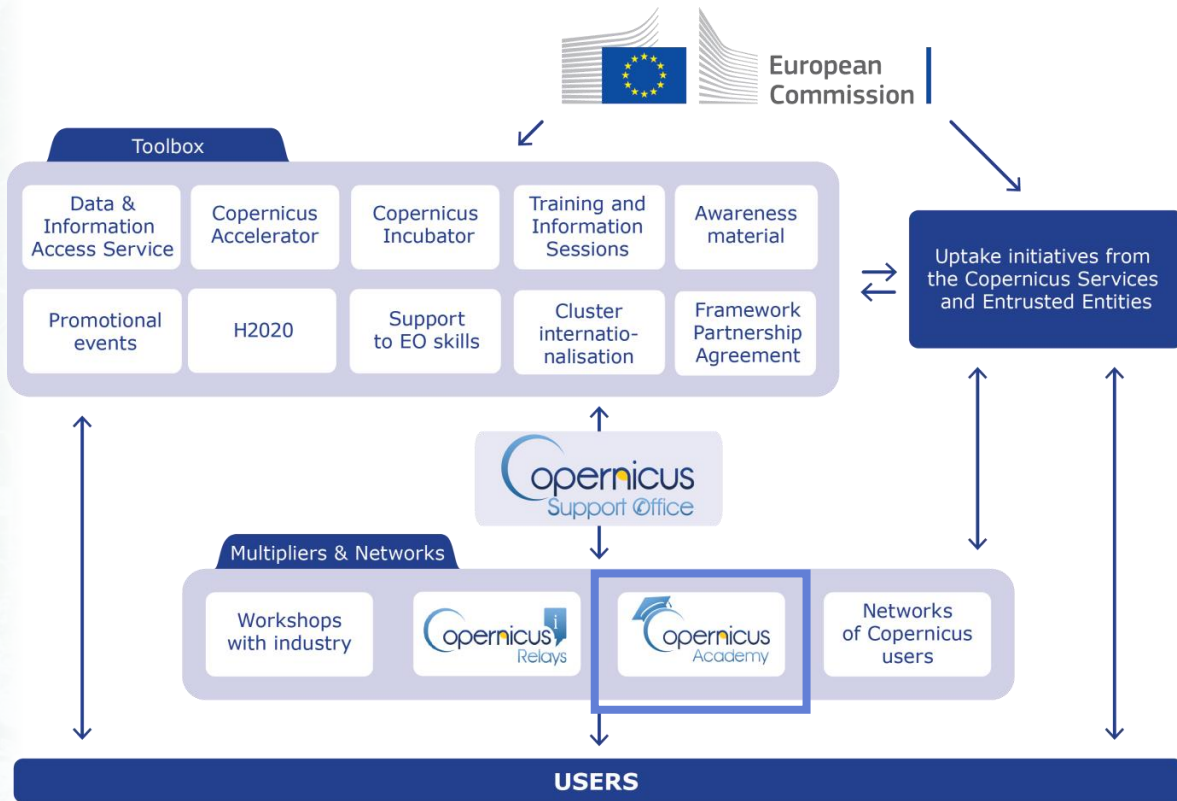
creado para responder a los desafíos sociales europeos y mundiales

Proporciona datos de manera operacional y servicios de información de forma gratuita sobre diversas áreas de aplicación que incluyen una gran variedad de tecnologías, desde los satélites en el espacio a los sistemas de medición en tierra, mar y aire



Copernicus

COPERNICUS ES IMPULSADO POR LOS USUARIOS

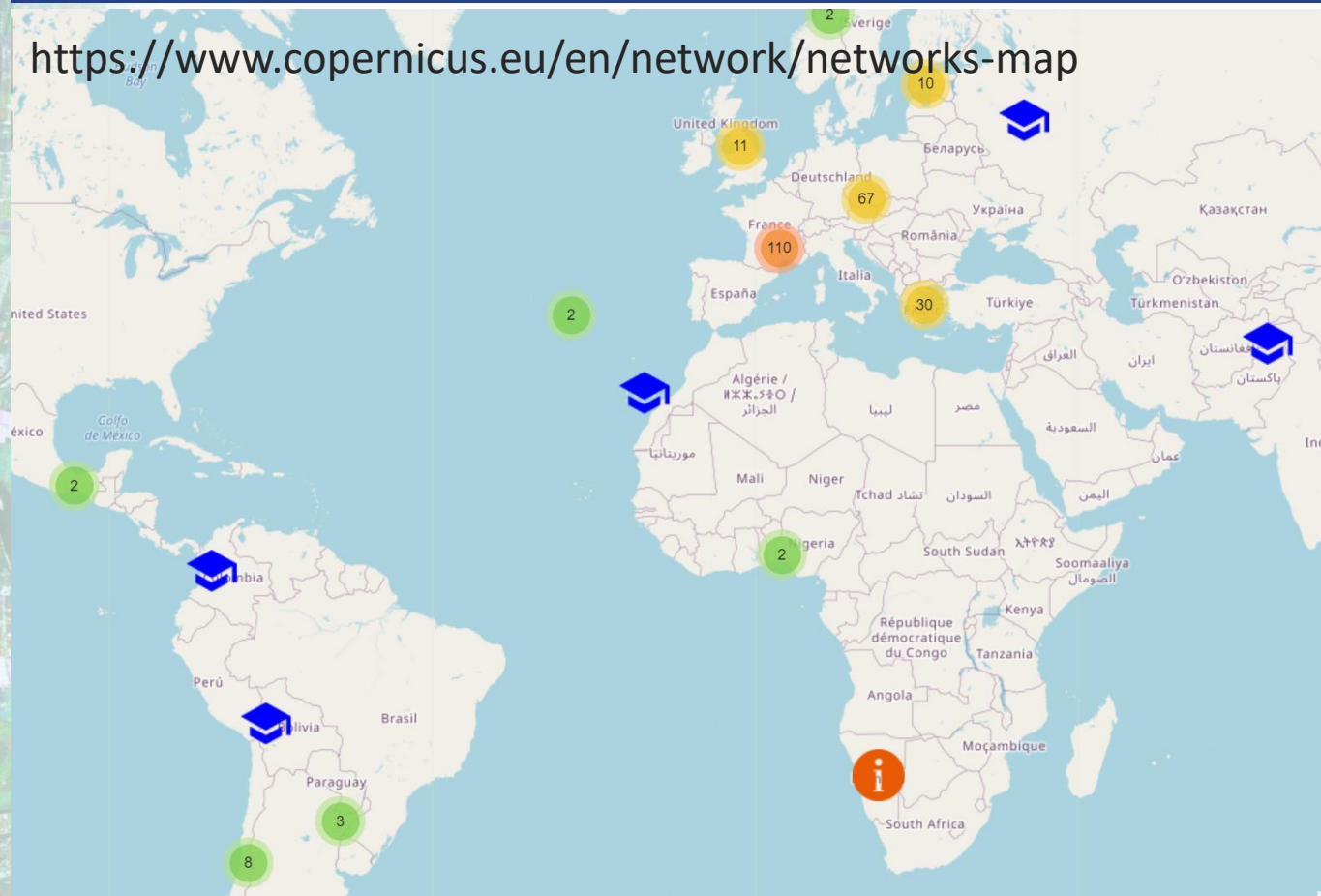




Copernicus

ACADEMIA COPERNICUS

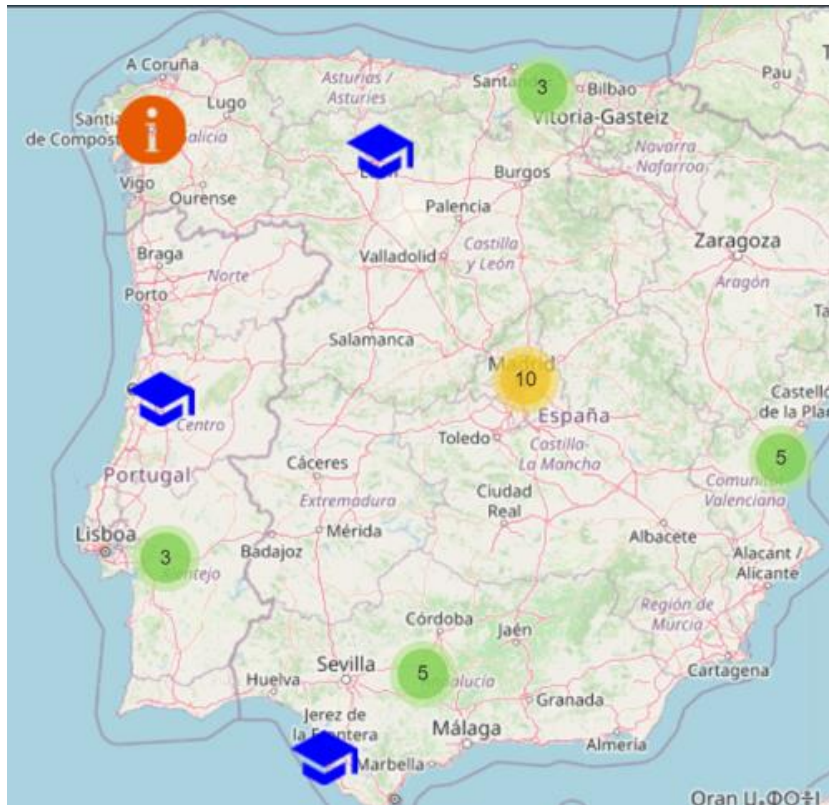
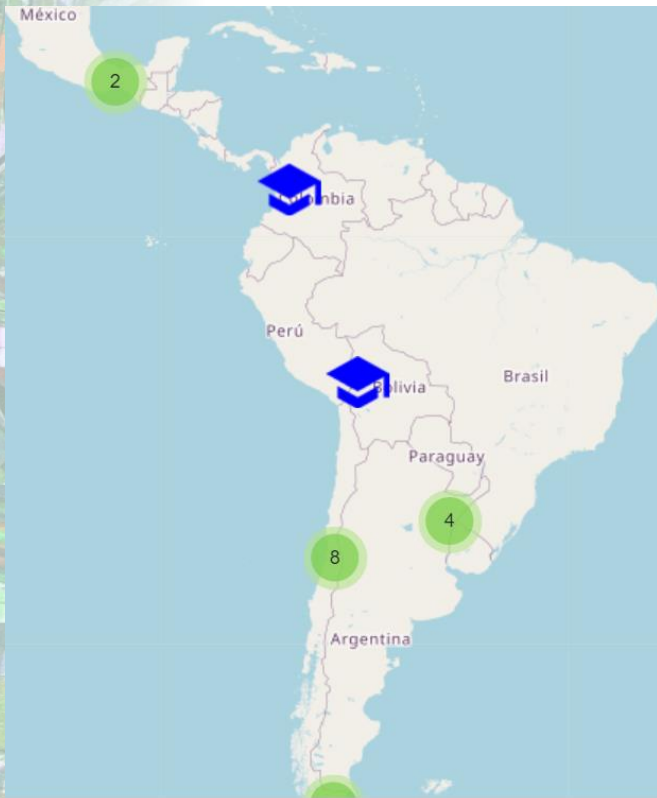
<https://www.copernicus.eu/en/network/networks-map>





Copernicus

ACADEMIA COPERNICUS





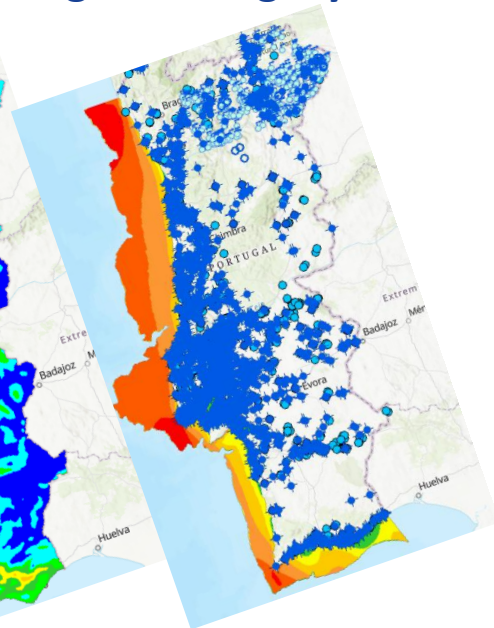
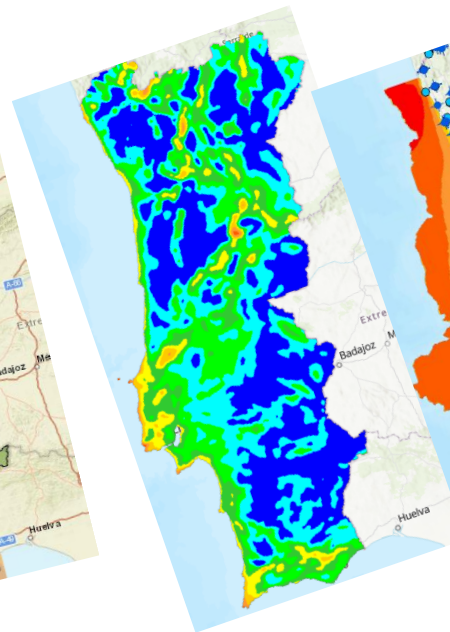
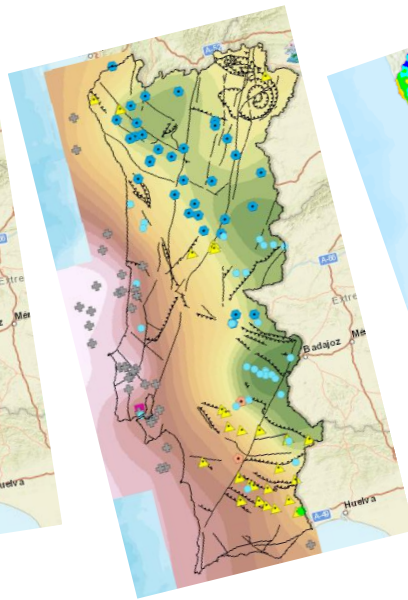
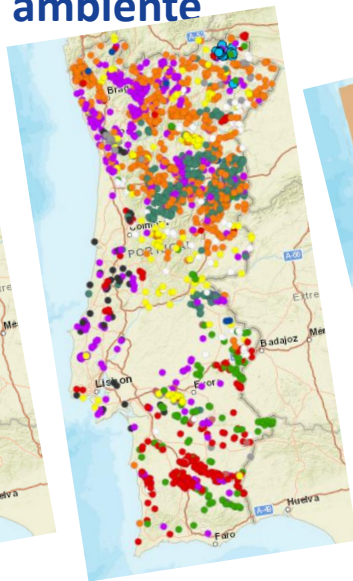
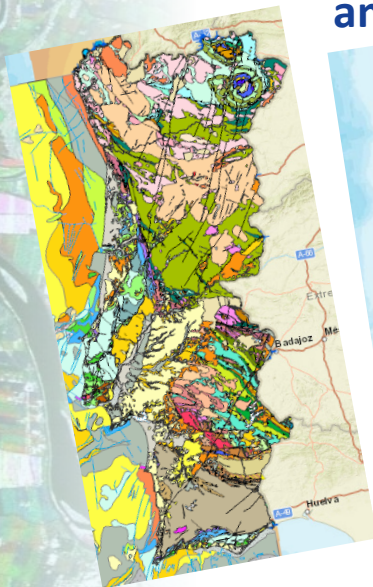
Copernicus

ACADEMIA COPERNICUS

Motivación

LNEG

Investigación y desarrollo de datos y servicios Copernicus integrados en competencias institucionales **geología, recursos geológicos, peligrosidad geológica, energía y medio ambiente**



<https://geoportal.lneg.pt/mapa/#>



Copernicus

FUENTES DE DATOS Y PRODUCTOS



Espacio
(ESA)

Misiones
Sentinels
S1-S2-S3-
S5P...

+

misiones
contributivas



In situ

para producir, enriquecer
y validar los servicios,
mejorando su precisión y
confiabilidad

[https://insitu.copernicus.eu/ob
servations](https://insitu.copernicus.eu/observations)



Land
Monitoring



Marine
Environment
Monitoring



Atmosphere
Monitoring



Emergency
Management



Security



Climate
Change



LNEG
Laboratório Nacional de Energia e Geologia, I. P.












Copernicus

FUENTES DE DATOS Y PRODUCTOS

Sentinel Mission and Status

	SENTINEL-1: 4-40m resolution, 3 day revisit at equator	S1A and 1B <i>in orbit</i>
	SENTINEL-2: 10-60m resolution, 5 days revisit time	S2A and 2B <i>in orbit</i>
	SENTINEL-3: 300-1200m resolution, <2 days revisit	S3A in orbit S3B in orbit
	SENTINEL-4: 8km resolution, 60 min revisit time	<i>1st Launch</i> <i>2020</i>
	SENTINEL-5p: 7-68km resolution, 1 day revisit	S5P in orbit
	SENTINEL-5: 7.5-50km resolution, 1 day revisit	<i>1st Launch</i> <i>2021</i>
	SENTINEL-6: 10 day revisit time	S5P in orbit

Key Features

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

Polar-orbiting, multispectral optical, high-resolution imaging

Optical and altimeter mission monitoring sea and land parameters

Payload for atmosphere chemistry monitoring on MTG-S

Mission to reduce data gaps between Envisat, and Sentinel 5

Payload for atmosphere chemistry monitoring on MetOp 2ndGen

Radar altimeter to measure sea-surface height globally

Cada uno de los Sentinels desarrollado para el programa y dedicado a diferentes áreas temáticas



Laboratório Nacional de Energia e Geologia, I.P.

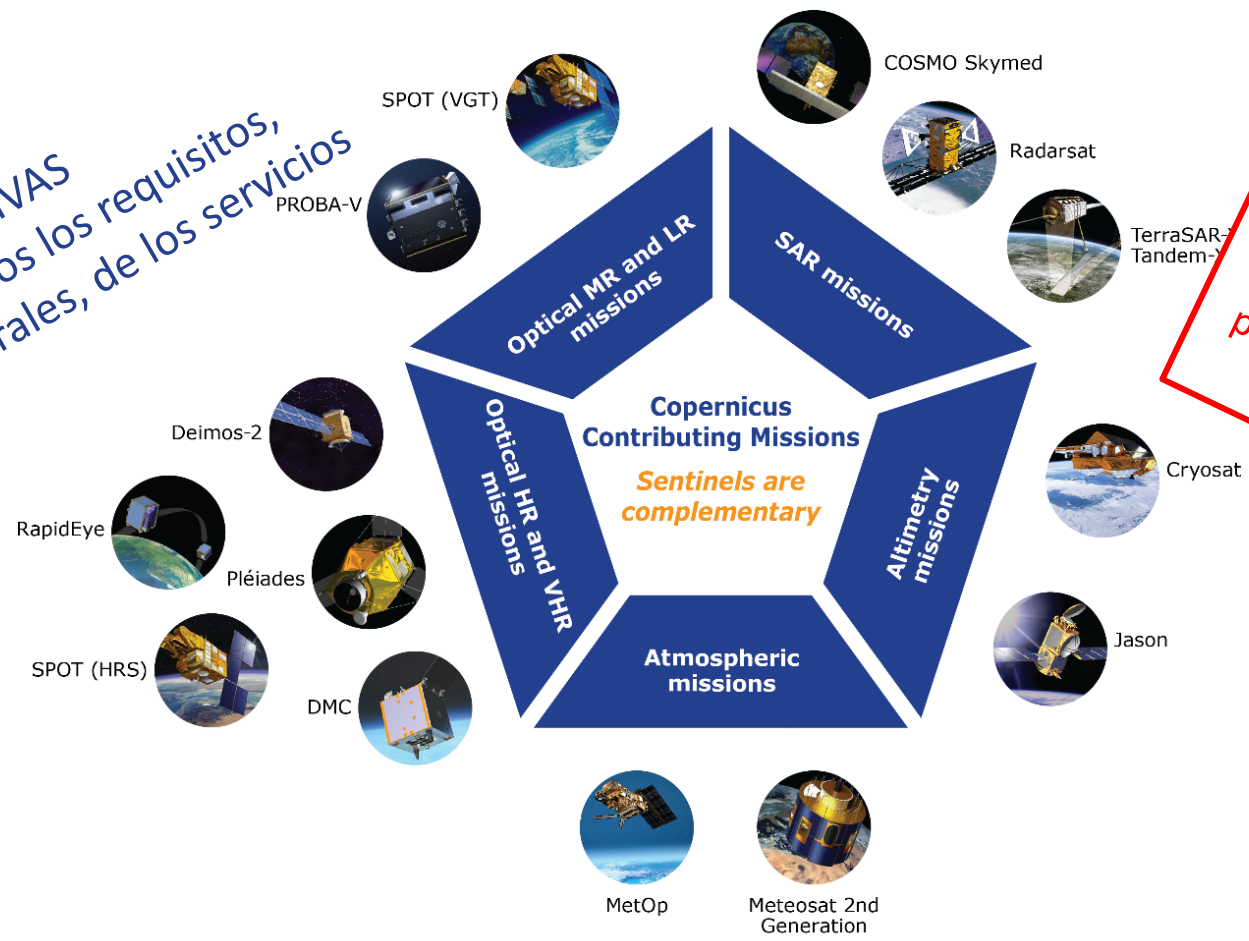




Copernicus

FUENTES DE DATOS Y PRODUCTOS

MISIONES CONTRIBUTIVAS
para cumplir con todos los requisitos,
espaciales y espectrales, de los servicios



sujetos a la política de propietarios de datos





Copernicus

FUENTES DE DATOS Y PRODUCTOS

ACCESO A DATOS DE COPERNICUS: ENLACES CLAVE

Access to Satellite data

COMPLETO, LIBRE Y ABIERTO *




sentinel data hub

Scientific and Other Access


<https://scihub.copernicus.eu/>




Copernicus Space Component Data Access Portal*
CSC-DA

<http://spacedata.copernicus.eu/>

COMPLETO, LIBRE Y ABIERTO *



- Copernicus Online Data Access (CODA)
- EUMETCast:
www.eumetcast.com
Needs to get a station and pay a yearly fee

* Not for Security Services And Data purchased from third parties



Copernicus

FUENTES DE DATOS Y PRODUCTOS

Monitoring the State of the Earth System Environment ...



... Six cross-cutting Thematic Services

**COMPLETO,
LIBRE Y
ABIERTO**

Access to Copernicus Services Data

- Land-related data: <http://land.copernicus.eu>
- Atmosphere-related data: <http://atmosphere.copernicus.eu>
- Marine-related data: <http://marine.copernicus.eu>
- Emergency-related data: <http://emergency.copernicus.eu>
- Climate change-related data: <http://climate.copernicus.eu> (Beta version)



Copernicus

FUENTES DE DATOS Y PRODUCTOS

Portfolios

<https://services-portfolios.copernicus.eu/>

User Guide



Products Search Engine

Feedback

User Guide

Subscribe

Mobile

Copernicus offers you 1109 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

Search



Laboratório Nacional de Energia e Geologia, I. P.





Copernicus

FUENTES DE DATOS Y PRODUCTOS

<https://services-portfolios.copernicus.eu/>

☰ Search Copernicus information products by Alphabetical index

C 30 products

CAMS global reanalysis of aerosol concentrations - **Atmosphere**

CAMS global reanalysis of chemical species - **Atmosphere**

CAMS global reanalysis of total aerosol optical depth at multiple wavelengths - **Atmosphere**

Civil Protection Exercise: RESTART 2013 (2013-06-21) - **Emergency**

Clear-sky surface solar irradiation - **Atmosphere**

Coastal flood risk analysis for population and assets, Portugal (2017-04-21) - **Emergency**

Cold spell in Huaphan (2016-02-01) - **Emergency**

Conflict in Bangui, Central African Republic (2014-02-18) - **Emergency**

Corine Land Cover 1990 – 2000 changes (raster 100m) – version 18, Mar. 2016 - **Land**

Corine Land Cover 1990 – 2000 changes (raster 250m) – version 18, Mar. 2016 - **Land**

Corine Land Cover 1990 – 2000 changes (vector) – version 18, Mar. 2016 - **Land**

Corine Land Cover 1990 (raster 100m) – version 18, Mar. 2016 - **Land**

Corine Land Cover 1990 (raster 250m) – version 18, Mar. 2016 - **Land**

Corine Land Cover 1990 European (vector) – version 18, Mar. 2016 - **Land**

Corine Land Cover 2000 – 2006 changes (raster 100m) – version 18, Mar. 2016 - **Land**

Floods in Norway (2018-05-10) - **Emergency**

Floods in Peru (2017-03-22) - **Emergency**

Floods in Philippines (2012-08-14) - **Emergency**

Floods in Romania (2014-04-23) - **Emergency**

Floods in Romania (2016-10-12) - **Emergency**

Floods in Roscommon (2016-02-05) - **Emergency**

Floods in Roscommon II (2016-03-08) - **Emergency**

Floods in Rudaki District, Tajikistan (2016-05-16) - **Emergency**

Floods in Sabaragamuwa/West, Sri Lanka (2017-05-31) - **Emergency**

Floods in Serbia (2014-04-25) - **Emergency**

Floods in Serbia (2014-05-16) - **Emergency**

Floods in Slovenia (2012-11-06) - **Emergency**

Floods in Slovenia (2014-02-11) - **Emergency**

Floods in Slovenia (2014-09-14) - **Emergency**

Floods in South Eastern Australia (2016-09-26) - **Emergency**

Floods in South-West Romania (2014-05-04) - **Emergency**

Floods in Southern England (2014-02-10) - **Emergency**

Floods in Southern France (2013-06-18) - **Emergency**

Floods in Southern France (2016-10-13) - **Emergency**

Floods in Sweden (2012-07-09) - **Emergency**

Floods in Uttarakhand state – India (2013-06-27) - **Emergency**

User Guide





Copernicus

FUENTES DE DATOS Y PRODUCTOS

<https://services-portfolios.copernicus.eu/>

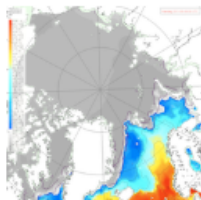
User Guide

Copernicus Information Products Search Results for: sea surface height

sea surface height

Search

Results found: 24
[Download/Print PDF](#)



Arctic Ocean Physics Analysis and Forecast - Marine

Last updated on: February 18, 2019

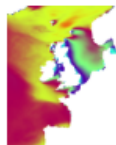
'Short description:'

The operational TOPAZ4 Arctic Ocean system uses the HYCOM model and a 100-member EnKF assimilation scheme. It is run daily to provide 10 days of forecast (average of 10 members) of the 3D physical ocean, including sea ice; data assimilation is performed weekly to provide 7 days of analysis (ensemble average).

'Detailed description:'

Operational Ocean General Circulation Models describe routinely the 4D evolution of the physical ocean and sea ice variables, such as temperature, salinity, currents, sea level height, sea ice thickness and concentration. The TOPAZ system has provided analyses and forecasts for the Atlantic and Arctic Basins since 2002, assimilating available satellite and in situ observations. TOPAZ has provided the Arctic physics analysis and forecast component of the product

[Read more](#)



Atlantic – European North West Shelf – Ocean Wave Analysis and Forecast - Marine

Last updated on: February 18, 2019

'Short description:'

Products from the North-West European Shelf Wave Analysis and Forecast system are generated using a WAVEWATCH III version 4.19.1.7 km Atlantic Margin Model (transfer denoted as WAMM3L AMM7) which became operational within CMEMS in April 2017



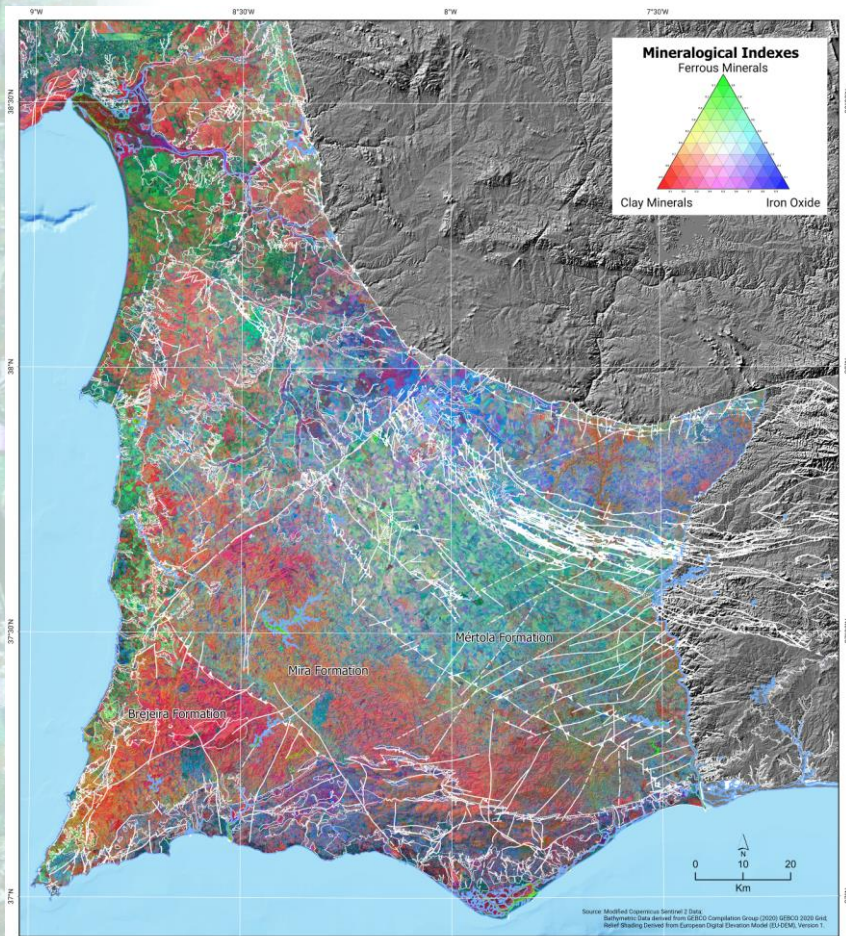
Academy

Laboratório Nacional de Energia e Geologia, I.P.



Copernicus

FUENTES DE DATOS Y PRODUCTOS



Utilizar productos ya disponibles o buscar una experiencia más práctica procesando datos adaptados a nuestro caso

Mayor conocimiento sobre minerales asociados a diferentes capas y unidades geológicas y relación con los recursos geológicos

Patrones espaciales de información espectral

Fuente: datos de Sentinel 2 modificados superpuestos en relieve sombreado de EU DEM

Quental, L. et.al. 2020 - Multispectral and hyperspectral remote sensing as a source of knowledge in the Portuguese sector of the Iberian Pyrite Belt. In: *Comunicações Geológicas*, 2020, Vol. 107, Especial III, p. 21-39



LNEG
Laboratório Nacional de Energia e Geologia, I. P.

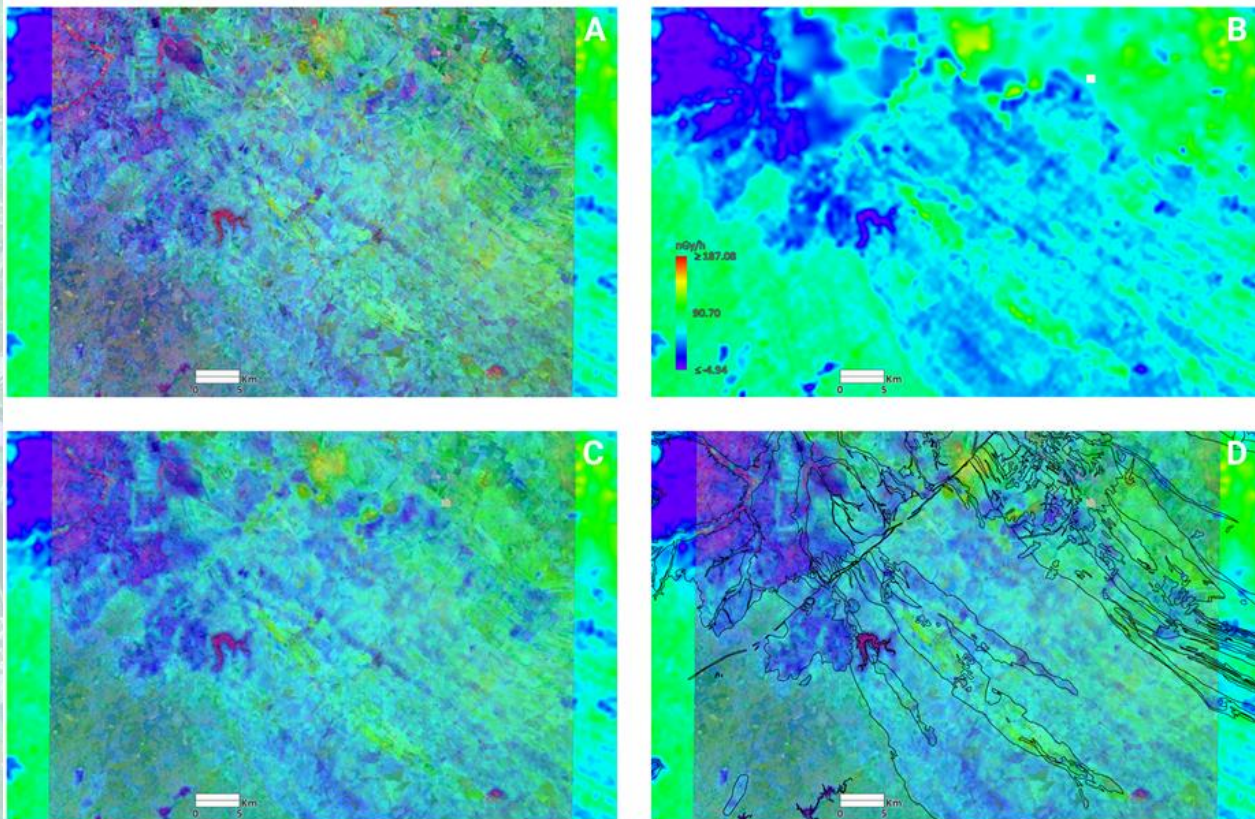
Copernicus
Academy



Copernicus



FUENTES DE DATOS Y PRODUCTOS



Independent Component Analysis (ICA) processed on Sentinel 2 mosaic and relationship with radiometry map (Batista et al., 2013)

Added value for interpretation of radiometric data and relationship with mineralisations

Quental, L. et.al. 2020 - Multispectral and hyperspectral remote sensing as a source of knowledge in the Portuguese sector of the Iberian Pyrite Belt. In: *Comunicações Geológicas*, 2020, Vol. 107, Especial III, p. 21-39



Copernicus

FUENTES DE DATOS Y PRODUCTOS

Copernicus Emergency Management Service (EMS) <https://emergency.copernicus.eu/>

**Disaster
Emergency
Situations**

**Humanitarian
Crises**



Risk & Recovery Mapping:

- Reference Maps
- Pre-disaster Situation Maps
- Post-disaster Situation Maps

Rapid Mapping:

- Reference Maps
- Delineation Maps
- Grading Maps

Early Warning:

- Floods: EFAS
- Forest Fires: EFFIS

*EFAS = European Flood Awareness System;
EFFIS=European Forest Fire Information System*



Copernicus

LATEST NEWS · 2021-01-16 | [EMSR494] La Soufriere Volcano eruption in St. Vincent and the Grenadines

EMS - MAPPING

- Service Overview
- Who can use the service
- How to use the service
- Portfolio: Rapid Mapping
- Portfolio: Risk and Recovery
- Quality control
- User Guide

RAPID MAPPING

- List of Activations
- Map of Activations
- GeoRSS Feed
- Online Manual

RISK AND RECOVERY

- List of Activations
- Map of Activations
- GeoRSS Feed

OTHER

EMSR289: Fuego Volcano Eruption in Guatemala

Event Time (UTC): 2018-06-04 06:00

Event Time (LOC): 2018-06-04 00:00

Event Type: Volcanic activity (Ash fall)

Activation Time (UTC): 2018-06-04 11:22

Activation Status: Closed

Affected Countries/Territories:

- █ Republic of Guatemala

Service Output: 18 maps

Delineation: 4 maps

Grading: 14 maps

Authorised User:

EC Services|DG ECHO

Activation Reason:

On 3 June, Volcan de Fuego, located in Southern Guatemala, experienced a strong eruption, provoking floods of lava and mud along with ash and ballistic (small rocks) emissions. The ash fall and lahars affected different areas of Chimaltenango, Sacatepéquez and Escuintla. As of 4 June, 25 people died, 3 100 people were evacuated and over 1.7 million people were affected

Relevant news:

- [The Copernicus EMS Monitors a Catastrophic Volcanic Eruption in Guatemala](#)



Tweet

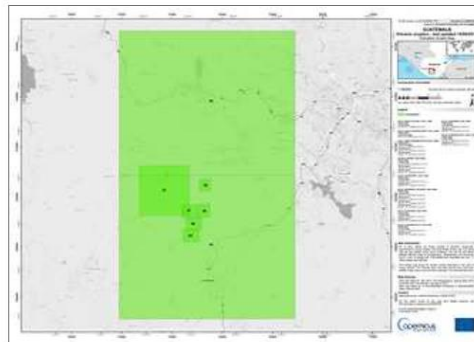
Coverage map:



GeoRSS:



GOACS



EMSR289 - Activation Extent Map ?

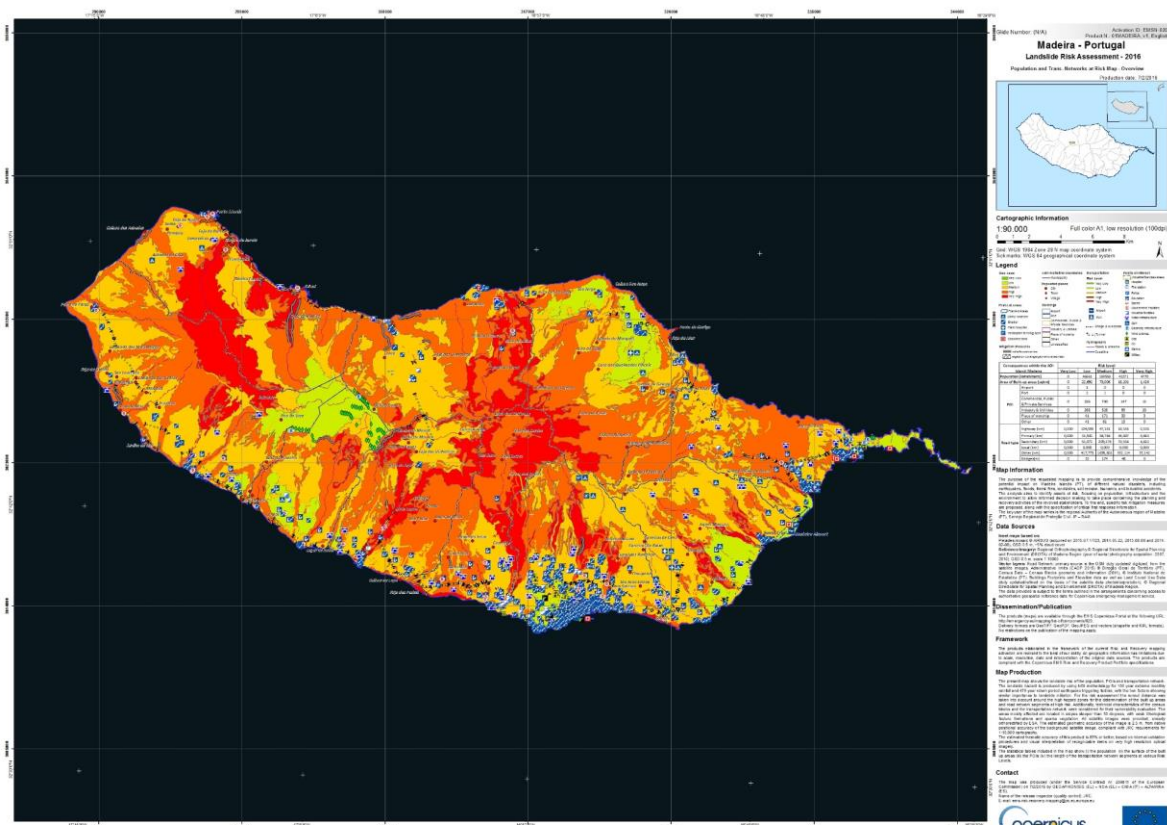


Copernicus

FUENTES DE DATOS Y PRODUCTOS

Copernicus Emergency Management Service (EMS)

<https://emergency.copernicus.eu/mapping/list-of-components/EMSN020>



Map of EMSN020 of Landslide Risk Assessment for Madeira Island from very low (green) to very high (red).





Copernicus

FUENTES DE DATOS Y PRODUCTOS

ESA Monitoring Coastal Erosion from Space: Ireland Online Conference are now available to watch on-demand on the Geological Survey Ireland YouTube channel available here: <https://bit.ly/3mNwc8a>





Copernicus

FUENTES DE DATOS Y PRODUCTOS

COPERNICUS DATA ACCESS OVERVIEW



NO MORE LARGE FILES DOWNLOADS
NO MORE STORAGE ISSUES

THE DIAS & WHERE TO REACH THEM

WWW.CREODIAS.EU

WWW.MUNDIWEBSERVICES.COM

WWW.ONDA-DIAS.COM

WWW.SOBL00.EU

WWW.WEKEO.EU

CREODIAS

mundi
WEB SERVICES

ONDA

sobloo

WEKEO
by COPERNICUS

DÍAS:
Servicios de
acceso a
datos e
información
Copernicus

cinco plataformas basadas en la nube para facilitar y estandarizar el acceso centralizado a los datos y la información, así como a las herramientas de procesamiento.

descubrir, manipular, procesar y descargar datos e información de Copernicus



Copernicus

COMENTARIOS

Copernicus está en continua evolución refinando más conjuntos de datos, nuevas explotaciones y oportunidades



Servicio de movimiento de tierra europeo

Desarrollo del servicio paneuropeo



Overall planning

Henrik St



<https://www.copernicus.eu/en/events/events/online-european-ground-motion-service-copernicus>



Copernicus

COMENTARIOS

Importancia en el campo de los datos espaciales como GESIG

Capacidad para monitorear peligros geológicos

Desarrollo de estudios de series temporales

Desarrollo de modelos predictivos



Muchas gracias

[Homepage](#) > [Geología e Recursos Geológicos](#) > [Geo-Informação](#) > [Detecção Remota](#)