



Access to Copernicus Data

Overview and Introduction



Copernicus

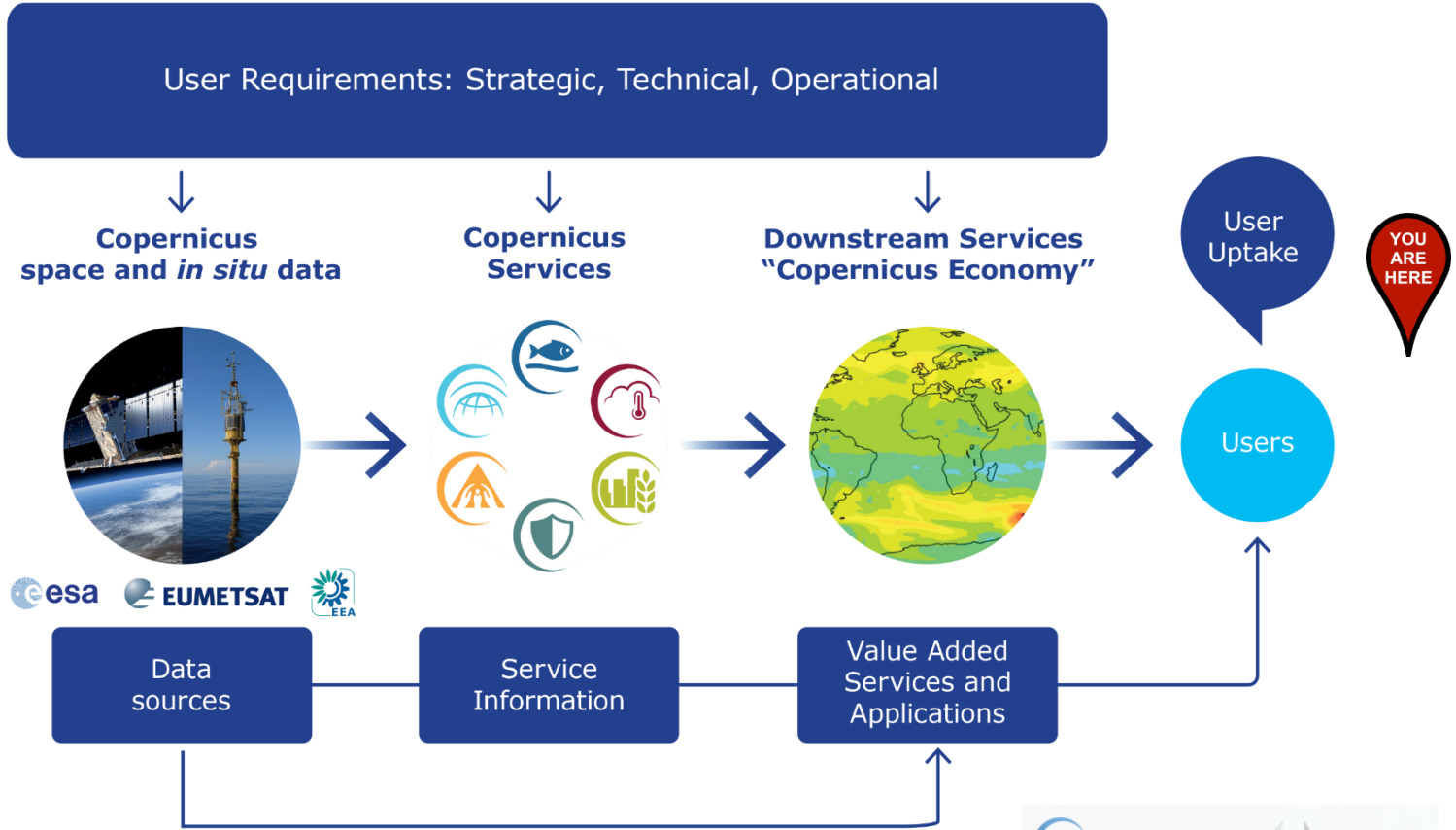
C O P E R N I C U S I N B R I E F

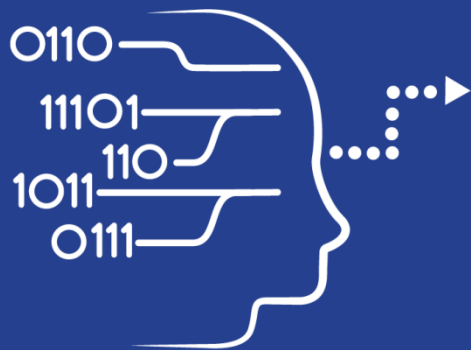
- **Copernicus, a flagship programme** of the European Union:
 - Monitors **the Earth**, its environment and ecosystems
 - Prepares for **crises, security risks** and **natural or man-made disasters**
 - Contributes to the **EU's role as a global soft power**
- Adopts a **full, free and open data policy**
- Is a tool for **economic development** and a driver for the **digital economy**



Copernicus

COPERNICUS IS DRIVEN BY THE USERS





User Uptake

Copernicus Data Access

- 10 European Access points
- Several national and private initiatives



Copernicus Data Access Overview

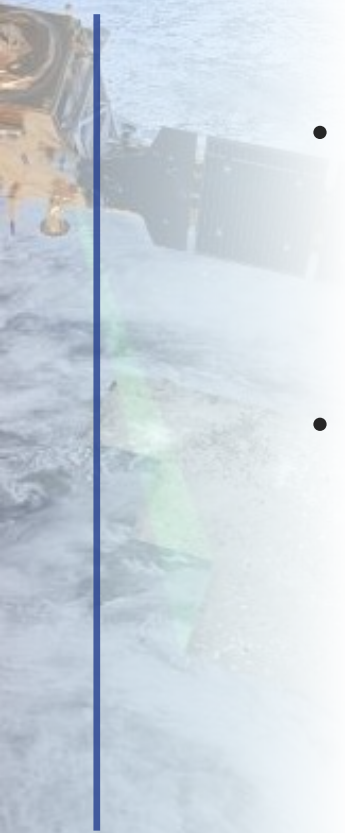
Data
Access

- 10 European Data Access points:
 - 4 for Satellite Data
 - 6 for Services Data and Information
- Satellite data =
 - Access to images in NRT
 - Access to archives
- Services Data and Information=
 - Added value products, indicators
 - Models
 - Archives, Near Real Time and Forecasts products





Space Component



Access to Satellite Data

- 4 data access points:
- 2 managed by ESA:
 - Scientific Data Hub (SCI Hub)
 - Copernicus Space Component Data Access (CSCDA)
- 2 managed by EUMETSAT
 - EUMETCast
 - Copernicus Online Data Access (CODA)





Space Component

SENTINEL SCIENTIFIC DATA ACCESS



FULL, FREE AND OPEN

Search & Browse



- Sentinel data
- Graphical user interface

Discover & Visualise



- Visualise/analyse data
- Access info

Register



- Order
- Customise
- Helpdesk

Download



- Select and download
- One-off or by scripts

Compute




- Use data
- Integrate
- Merge

Join Up



- Get trained
- Get inspired
- Meet partners

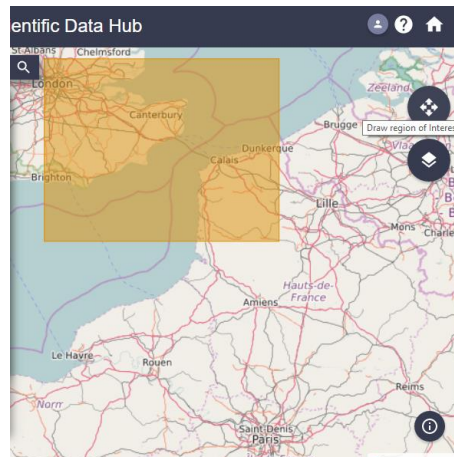
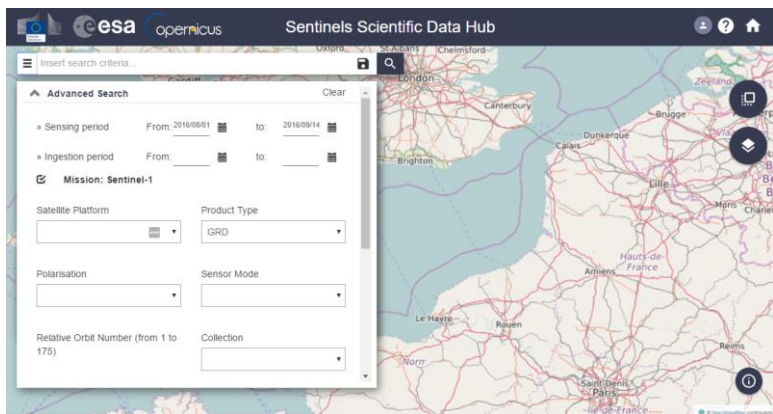
Where	How	Key Figures						
<p>https://scihub.copernicus.eu</p>  <p>Scientific and Other Access</p>	<p>Two kinds of user interfaces:</p> <ul style="list-style-type: none"> • Graphic User Interface • Application Programming Interfaces (API) <p>Two API Options:</p> <ul style="list-style-type: none"> • Open Data Protocol • Open Search 	<table border="1"> <tr> <td> <p>15,243</p> <p>users successfully registered in 2015</p> </td> <td> <p>355,939</p> <p>products published</p> </td> <td> <p>502 Tbytes</p> <p>published</p> </td> </tr> <tr> <td> <p>1,050</p> <p>average number of products published per day</p> </td> <td> <p>6,900</p> <p>average number of products downloaded per day</p> </td> <td> <p>Each user</p> <p>2 concurrent downloads max and 500 Mbit/s</p> </td> </tr> </table>	<p>15,243</p> <p>users successfully registered in 2015</p>	<p>355,939</p> <p>products published</p>	<p>502 Tbytes</p> <p>published</p>	<p>1,050</p> <p>average number of products published per day</p>	<p>6,900</p> <p>average number of products downloaded per day</p>	<p>Each user</p> <p>2 concurrent downloads max and 500 Mbit/s</p>
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SCI-HUB IN PRACTICE (EXAMPLE)

On <https://scihub.copernicus.eu/dhus/#/home>:

- Draw region of interest
- Click on the Menu button to the left. A popup opens where you can fill out your search parameters, and select the mission you need.
- Click the Search icon.





Space Component

SPACE COMPONENT DATA ACCESS (CSCDA)



RESTRICTED

Search & Browse



- HR/VHR images from 3rd Parties
- Global SAR coverage

Discover & Visualise



- Visualise/analyse data
- Access info

Register



- Order
- Customise
- Helpdesk

Download



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- One-off or by scripts

Compute




- Use data
- Integrate
- Merge

Join Up



- Get trained
- Get inspired
- Meet partners

Where	How	Key Figures
<p>Registration with eosupport@Copernicus.esa.int</p>  <p>Access for Collaborative Ground Segment</p>	<ul style="list-style-type: none"> • Access restrictions: EU Public authorities and institutions, EU Research projects, Copernicus Services • https://spacedata.copernicus.eu/web/cscda/copernicus-users/access-rights • Order quota (for R&D and Copernicus services only) 	<div data-bbox="1362 616 1555 769"> <p>Worldwide SAR coverage</p> <p>in High Resolution (20m)</p> </div> <div data-bbox="1574 616 1748 769"> <p>24/7 satellite availability</p> <p>for emergencies</p> </div> <div data-bbox="1362 791 1555 955"> <p>High Resolution (10-20m)</p> <p>of 39 European States</p> </div> <div data-bbox="1574 791 1748 955"> <p>Very High Resolution (1-4m)</p> <p>of 39 European States</p> </div>



Space
Com

FULL, FREE AND OPEN
But you must
get the station
and pay a
yearly fee

EUMETCast



Discover & Visualise



- EUMETCast satellite service, EUMETCast Terrestrial
- Operational NRT data covering: Atmosphere, ocean, weather, land, climate
- More than 380 products

Get the Station



- One-stop-shop access service
- Standard PC
- DVB/DVB-S2 reception device
- EUMETCast client S/W and Key Unit (EKU)

Register



- View and edit profile
- Subscribe to services
- Register for notifications

Use Data



- Enhance operational environmental monitoring
- Sound decision making in several critical areas

Join Up



- 4500 stations globally
- Get trained inspired
- Meet partners

Where	How	Other info
<ul style="list-style-type: none"> • All data listed on the EUMETSAT Product Navigator. • Register on EUMETSAT EO Portal (EOP) 	<ul style="list-style-type: none"> • Get the station , configure and receive stream of data • Client S/W and EKU installed on your PC decrypt/decode incoming data stream 	<ul style="list-style-type: none"> • Open data policy depending on the data. • Frequent user trainings organised by EUMETSAT









FULL, FREE AND OPEN

- Brand new Copernicus Access Point
- No need for satellite dishes
- All Sentinel-3 marine and atmosphere products through a rolling buffer which at its maximum will span up to 12 months worth of data.
- 2 access modes:
 - The ftp provides access to a fixed set of global and regional marine and atmosphere data.
 - The user interface allows users to select their own area of interest from the global products.
- **Work in Progress (URL to come next month)**

Access to Services Data and Information

Data
Access

- 6 Thematic Copernicus Services:
- 5 are under Full, free and open access:
 - Land (CLMS) 
 - Marine (CMEMS) 
 - Atmosphere (CAMS) 
 - Climate (C3S) 
 - Emergency (EMS) 
- 1 has restricted access
 - Security 



COPERNICUS SERVICES



Data
Access

*Monitoring the State of the
Earth System Environment ...*

The collage displays six Copernicus Thematic Services covers, each with a distinct color and iconography:

- Land Monitoring:** Green cover with a bar chart and wheat stalks icon. Partner: ESA.
- Marine Environment Monitoring:** Blue cover with a fish icon. Partner: Copernicus.
- Atmosphere Monitoring:** Light blue cover with a globe icon. Partner: ECMWF.
- Emergency Management:** Orange cover with a fire tower icon. Partner: JRC (European Commission).
- Security:** Teal cover with a shield icon. Partners: FRONTEX and EMSA.
- Climate Change:** Red cover with a thermometer icon. Partner: ECMWF.

*... Six cross-cutting
Thematic Services*

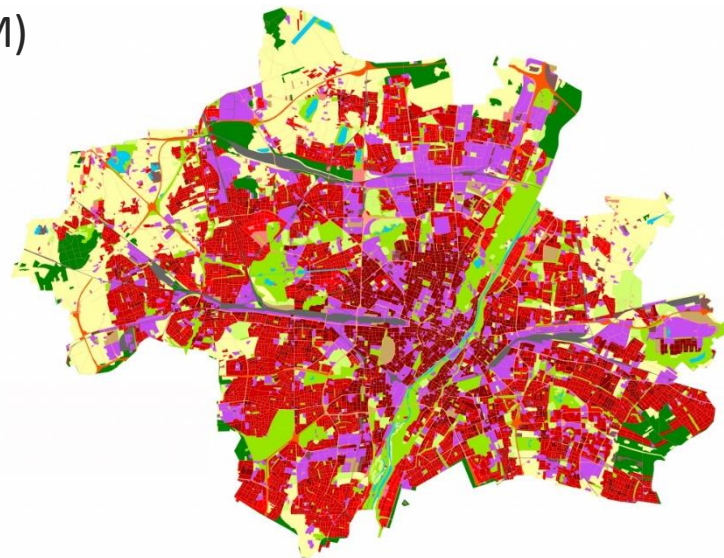


Land
Monitoring

FULL, FREE AND
OPEN

ACCESS TO CLMS

- What type of product is available ?
 - Land Use / Land Cover (CORINE)
 - Hydrology
 - Digital Elevation Model (DEM)
 - Urban Atlas
 - Natura 2000,
 - etc...





Land
Monitoring

ACCESS TO CLMS

FULL, FREE AND
OPEN

BIO-GEOPHYSICAL PRODUCTS:
VEGETATION, WATER, ENERGY

LU/LC & LU/LC CHANGE, FORESTS,
GRASSLANDS, WETLANDS, WATER BODIES

URBAN ATLAS, NATURA 2000

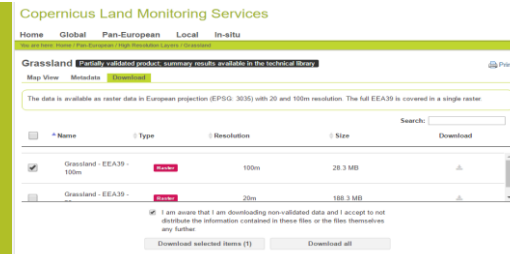
Global <http://land.copernicus.vgt.vito.be/PDF/portal/Application.html#Home>

- Register or log in
- Select portal with desired parameters
- Indicate time frame and area of interest
- Download the selected result



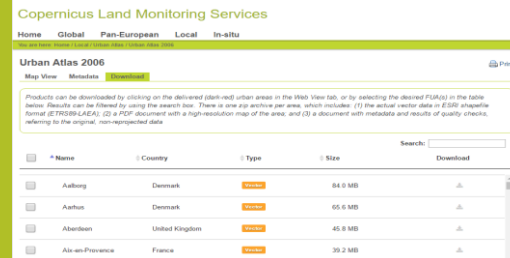
Pan-European <http://land.copernicus.eu/pan-european>

- Select the desired portal
- Switch to Download tab
- Select the desired dataset
- Agree and download the selected result



Local <http://land.copernicus.eu/local>

- Select the desired portal
- Switch to Download tab
- Select the desired dataset
- Agree and download the selected result





Marine
Monitoring

ACCESS TO CMEMS

FULL, FREE AND OPEN

- What type of product is available ?
 - 140 products
 - Key physical and biogeochemical ocean parameters (currents, temperature, chlorophyll ...)
 - Global ocean and 6 European regional seas
 - Analysis, forecast and long time series
 - Models and observations (Satellite or in situ)

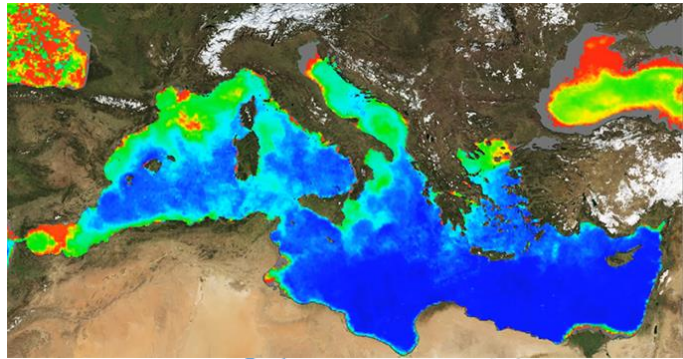
CMEMS products support **Marine Safety**, any safe activities at sea

CMEMS products support **Marine Resources**, protection and the sustainable management of living

CMEMS products support **Coastal areas**, water quality monitoring and pollution

CMEMS products support the **EU and national Meteo services**, as physical parameters of the ocean's surface are used in atmospheric models, and changes in sea ice extent, concentration and volume are signals to detect global warming for instance

... will be added





FULL, FREE AND OPEN

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

- Register or log in
- Select a sea or ocean



- Select additional parameters
- Press “Add to Cart” under the desired dataset



View or Download the dataset





FULL, FREE AND
OPEN

- CAMS provide information on air quality and on the atmosphere composition.
- CAMS answers the following questions:
 - What will the air we breathe be like tomorrow?
 - Where are the best places for my solar farm? What is the yield I can expect?

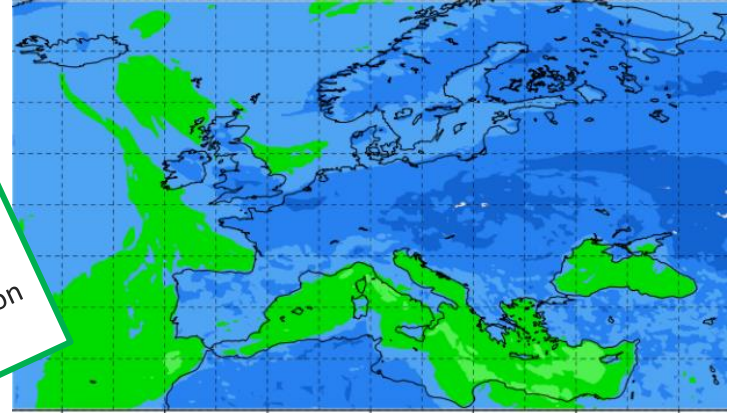
CAMS products support the **Air Quality**, a comprehensive global

CAMS products **monitor the global**

CAMS products maintain and update the **stratospheric forecasts of stratospheric** up to 5 days ahead forecasts of clouds, and

CAMS products provide **Global and direct irradiances** for Europe, Africa, the Middle East and Asia providing the solar energy industry, the electricity sector, and renewable energy institutions accurate irradiation

CAMS products **compiles emission inventories**, estimates net fluxes of CO₂, N₂O and CH₄ at the Earth's surface, estimates emissions of aerosols, chemical species, and greenhouse gases from wild fires on a daily basis





ACCESS TO CAMS

Atmosphere
Monitoring

FULL, FREE AND
OPEN

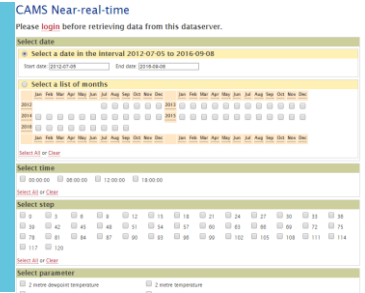
<http://atmosphere.copernicus.eu/>
Catalogue → Enter



Select parameters.
Click Data Download.



Log in to ECMWF server.
Select parameters and time frame.
Download result.



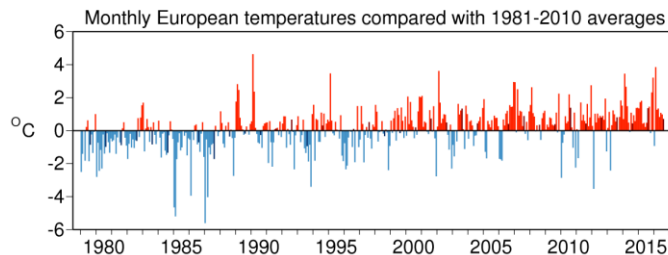
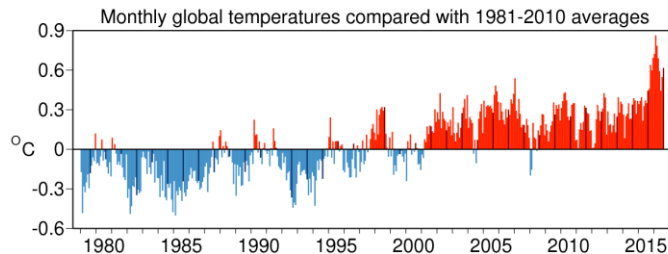


Climate
Change

FULL, FREE AND
OPEN

ACCESS TO C3S

- C3S= Copernicus Climate Change Service
- Under construction with Sectoral Information System (Insurance, Water, Energy, etc.) and specific portals and indicators
- Some datasets already available.



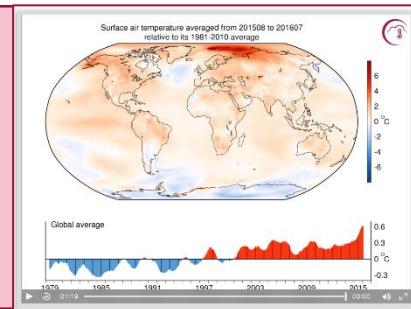


Climate
Change

FULL, FREE AND
OPEN

ACCESS TO C3S

- Visit <https://climate.copernicus.eu> and select data of interest
- Can access data via C3S or on ECMWF website at <http://apps.ecmwf.int/datasets/data/interim-full-daily/>



- To access the **ECMWF public datasets** . You will need to have an account on ECMWF web site
- If you **don't have an account**, please self register at <https://apps.ecmwf.int/registration/>
- Very **simple**: the user writes a request, submits it and retrieves a file

ECMWF Space

Pages | ECMWF Web-APP Home

Access ECMWF Public Datasets

Created by Clément Chelariu, last modified on 22/06/2016

Introduction

This service will allow you to access the **ECMWF public datasets**. You will need to have an account on ECMWF web site. If you **don't have an account**, please self register at <https://apps.ecmwf.int/registration/>.

The datasets are available for use via a request, submit it and retrieve the file or retrieve forecast holding to the requested data.

It is mandatory to use a request to **ACCESS** datasets with Public.

Stop by step guide

This method allows users to download ECMWF public datasets in a programmed way:

1. Install ECMWF key
2. Install client libraries
 - a. Python
 - b. Client libraries
3. Check data availability
4. Check dataset
5. Build examples
6. Register system
7. Run it online

Available ECMWF Public Datasets

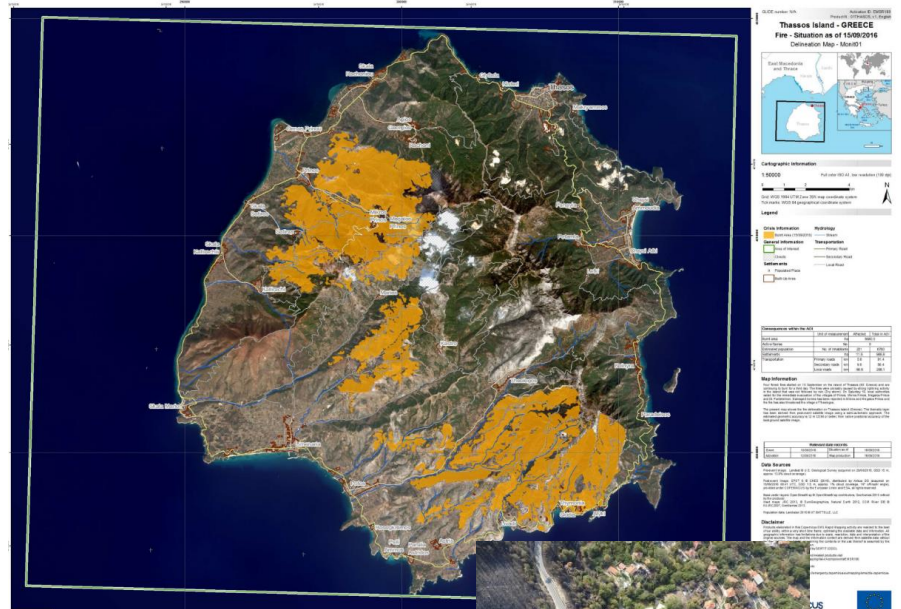
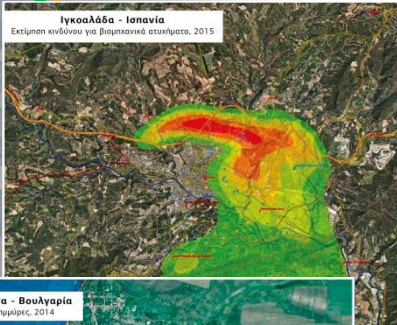
- Sample datasets jobs
- Real time jobs
- Python ERA-20C examples
- Python ERA-10 examples
- Python ERA-5 examples
- Python ERA-5 reanalysis
- Python GFS reanalysis examples
- Python M20C time series examples



Emergency Management

FREE AND OPEN

- EMS answers to :
 - floods,
 - tsunami,
 - earthquake,
 - landslides,
 - fires,
 - severe storms,
 - humanitarian crisis,
 - volcanic eruptions,
 - technological disaster



Only authorized users can trigger the service
But everybody can assess maps!





EMS Registration process

- Emergency Management Service: <http://emergency.copernicus.eu/>
- Implemented by EC
- Data Policy: Depend on profile
- **Authorised Users** may trigger the service: National Focal Points (NFPs) in EU Member States and in countries participating in the European Civil Protection Mechanism as well as EC Services (DGs) and the Situation Room of the EEAS.
- **Associated Users** must coordinate with and go through the Authorised Users in order to trigger the service. Associated Users include local, regional and other public entities; International Governmental Organisations (e.g. UN agencies, World Bank), and National & International Non-Governmental Organisations; entities and institutions within the EEAS sphere such as EU Delegations, the INTCEN, the EU Satellite Centre.
- **General Public Users** are not authorised to trigger the service, but can be informed of an activation request through the web portal. Activations, for which sensitivity restrictions apply, are excluded.
-





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

Emergency Management

FREE AND OPEN

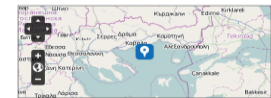
- Under Rapid Mapping, click on List of Activations
- Search by Activation Status, Event Type, Date or Country
- Click on the event of interest.
- Download the available maps.

- Under Risk and Recovery, click on List of Activations
- Search by Activation Status, Event Type, Date or Country
- Click on the event of interest
- Download the available maps

The screenshot shows the Copernicus Emergency Management Service interface. The main heading is 'List of EMS Rapid Mapping Activations'. Below this, there are search filters for Title, Event Type, Event Date (UTC), Start date, End date, and Affected Countries. A table lists various activation events with columns for Act. Code, Title, Event Date, Type, Country, and Feed. The table includes entries for fires on Thassos Island, earthquakes in Italy and the US, and floods in various regions.

EMSR180: Fires on Thassos Island

Event Time (UTC): 2016-09-10 07:00
Event Time (LOC): 2016-09-10 10:00
Event Type: Forest fire, wild fire
Activation Time (UTC): 2016-09-12 14:36
Reference maps produced: 0
Delineation maps produced: 3
Gridding maps produced: 0
Activation Status: Open



Affected Countries:
 Hellenic Republic
Area Descriptor: Island of Thassos, Greece
Authorized User:
 Greece (General secretariat for Civil protection - Directorate for Emergency Planning and Response)

Activation Reason:
 On Saturday 10-09-2016 morning, four fires that started on the island of Thassos (NE Greece) and continue to burn for a third day. The fires were probably caused by strong lightning activity in the island that was not followed by rain (Dry storm). Villages have been evacuated.
Requested Product: Delineation and monitoring



EMSR180 - Activation Extent Map
 Release: 023 - Version: V2 - Delivered: 2016-09-14 09:06
 View as: EMSR180-AEH-3PG - EMSR180-AEH-KMZ - EMSR180-AEH

Filter by map type: ALL - DELINEATION



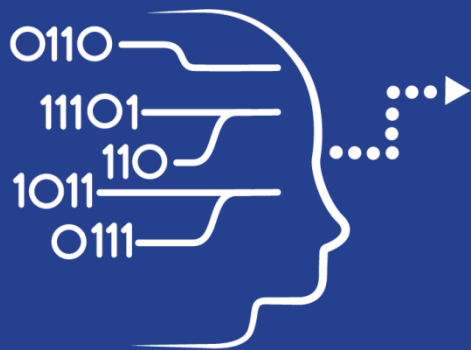
Security

Access to Security Service

The Copernicus service for Security applications aims to support European Union policies by providing information in response to Europe's security challenges. It improves crisis prevention, preparedness and response in three key areas:

- Border surveillance;
- Maritime surveillance;
- Support to EU External Action.

Its access is strictly restricted to authorised users



User Uptake

Copernicus Access to Data

National and private Initiatives





Data
Access

OTHER DATA ACCESS PUBLIC INITIATIVES

National Initiatives- Collaborative Ground Segment

Initiative Name	Initiative Leader	Website and Target User Group
THEIA Land Data Centre	CEA, Cerema, IRSTEA, IRD, CNRS, INRA, IGN, Meteo France, CIRAD, ONERA	<ul style="list-style-type: none">• URL: theia-land.fr• Scientific communities and public authorities
NOA Hellenic National Sentinel Data Mirror Site	NOA, IAASARS	<ul style="list-style-type: none">• URL: sentinels.space.noa.gr• Scientific communities, public authorities, private industry players
CATAPULT Satellite Applications and CEDA	UK Space Agency	<ul style="list-style-type: none">• URL: sa.catapult.org.uk• Scientific communities, public authorities, private industry players
ESA Thematic Exploitation Platforms	ESA	<ul style="list-style-type: none">• URL: tep.eo.esa.int• All user types
Platform for Exploiting Products from Sentinels (PEPS1)	CNES	<ul style="list-style-type: none">• URL: peps.cnes.fr• Scientific communities and public authorities



Data
Access

Private Initiatives

Initiative Name	Initiative Leader	Website and Target User Group
CLOUDEO	CloudEO	<ul style="list-style-type: none"> • URL: cloudeo-ag.com • Users and developers of geo services, providers of geo data, services, applications and tools
Earth Observation Data Centre (EODC) for water resources monitoring	Vienna University of Technology Department of Geodesy and Geo-info	<ul style="list-style-type: none"> • URL: eodc.eu • Regional public authorities and private users
GEOPEdia platform	Sinergise	<ul style="list-style-type: none"> • URL: geopedia.world • National, regional public authorities and private users
GEOSTORM platform	CS-SI	<ul style="list-style-type: none"> • URL: geostorm.eu • Regional authorities and private users
Sentinel-2 on AWS	Amazon	<ul style="list-style-type: none"> • URL: sentinel-pds.s3-website.eu-central-1.amazonaws.com • Developers, private/public downstream players
Google Earth Engine	Google	<ul style="list-style-type: none"> • URL: earthengine.google.com • Regional authorities and private users



Data
Access

Perspectives

- Imminent launch of a **Data Access and Information Service**
- Intention to procure parallel services from three suppliers:
 - **3 platforms** to provide equal access to the basic data and services
 - **Run by 2 entrusted entities:** EUMETSAT (1 platform) and ESA (2 platforms)
- Overall **ensuring that Copernicus data is easily accessible and used!**

