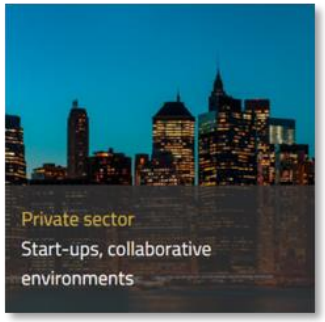
Copernicus WEkEO Service

Copernicus and Sentinel data at your fingertips

WHAT IS WEkEO ?

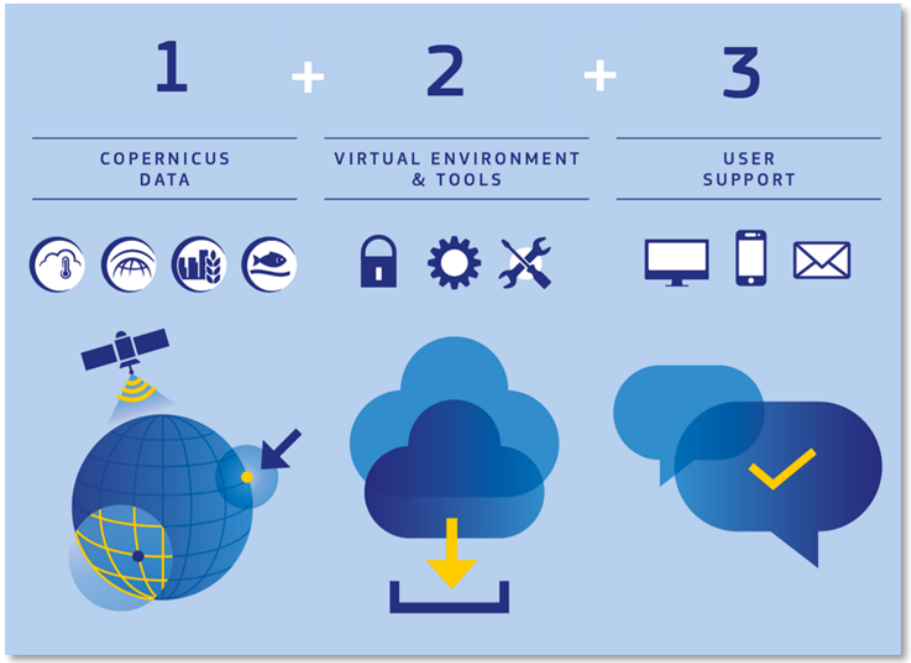
WEkEO is the EU Copernicus DIAS reference service for environmental data, virtual processing environments and skilled user support.

A platform for all audiences.



WEkEO'S OFFER

- Harmonised Data Access
- Cloud Infrastructure
- Expert User Support



JOINT GOVERNANCE BY COPERNICUS ENTITIES

	Copernicus Europe's eyes on Earth initial	Copernicus Europe's eyes on Earth Evolution WEkEO
MERCATOR OCEAN INTERNATIONAL	Marine Monitoring	USER DEVELOPMENT & MANAGEMENT
ECMWF	Climate Change / Atmosphere Monitoring	TOOLS
EUMETSAT	Upstream satellite data	INFRASTRUCTURE
European Environment Agency	Land Monitoring	Joigned WEkEO january 2021

WEkEO Portfolio

Copernicus services

Land Monitoring Service
land.copernicus.eu

Copernicus Marine Service
marine.copernicus.eu

Climate Change Service
climate.copernicus.eu

Atmosphere Monitoring Service
atmosphere.copernicus.eu

Emergency Monitoring Service
emergency.copernicus.eu

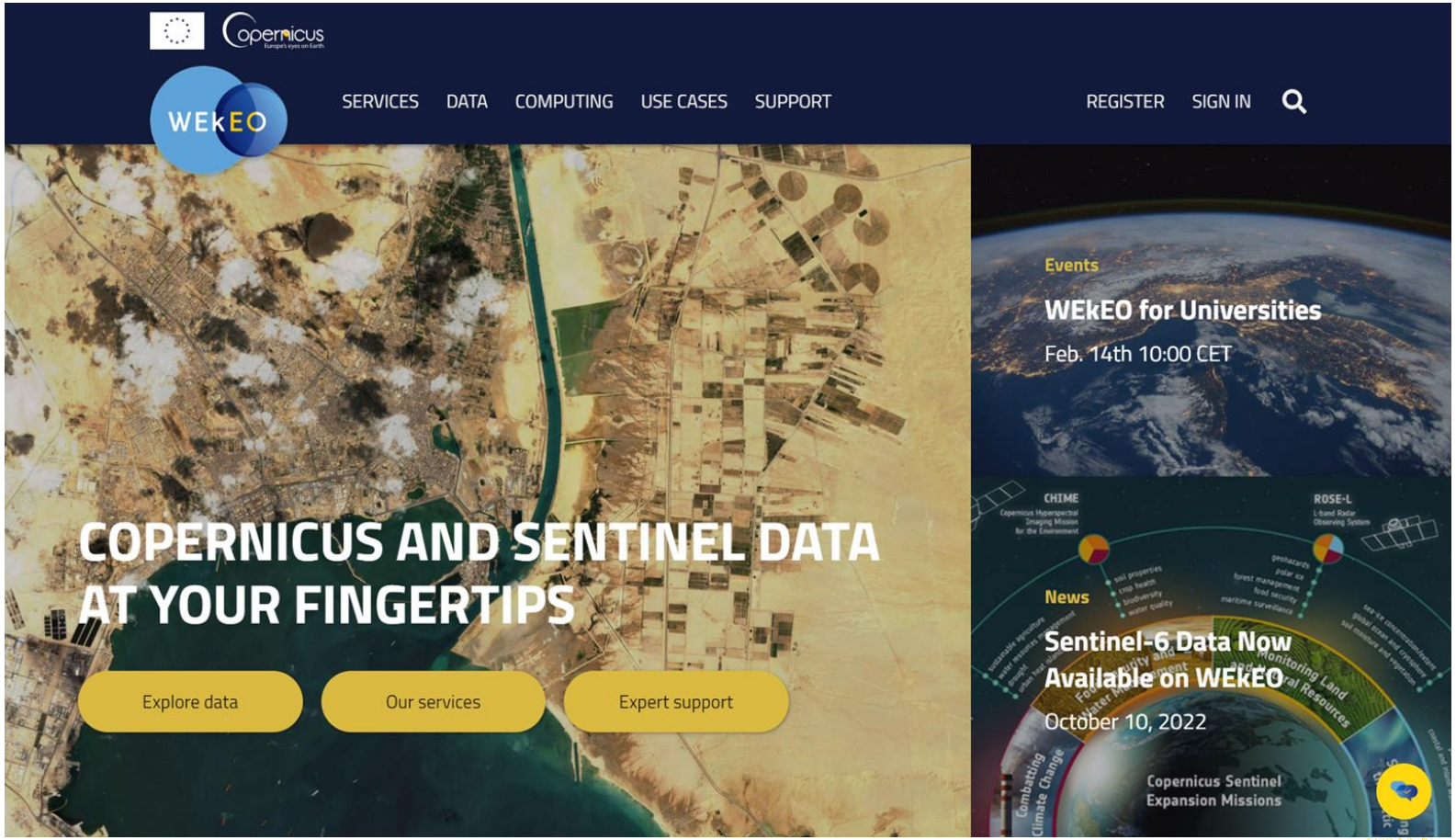
Data (In Situ, satellite*, model), charts, maps...

Sentinel

(& contributing missions)

- sentinel-1
- sentinel-2
- sentinel-3
- sentinel-5p
- sentinel-6

SINGLE ACCESS POINT wekeo.eu



3 MAIN ASSETS FROM WEkEO

Data is not a copy: Access updated and timely Copernicus data directly **from the original sources**: up-to-date data, metadata and documentation

Harmonized Data Access: Use WEkEO's REST-based single protocol to scale and evolve your code, easily integrating all data sources from a virtual station, a Jupyter Notebook or a desktop application of your choice, and using homogeneous subsetting attributes.

Expert User Support delivered by the institutions that produce and manage Copernicus and Sentinel data

THE WEkEO SERVICE

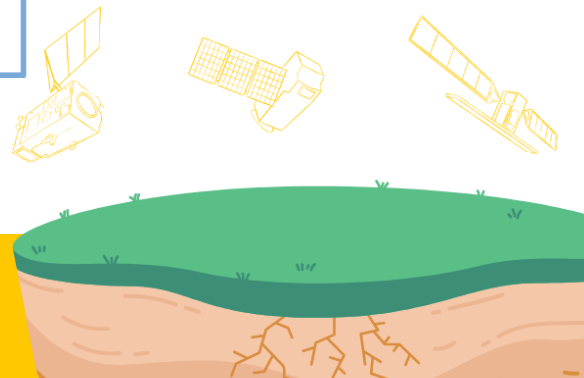
What can you do with WEkEO?

FREE INTERACT WITH USER SUPPORT

USER SUPPORT
Benefit from skilled technical and customer support

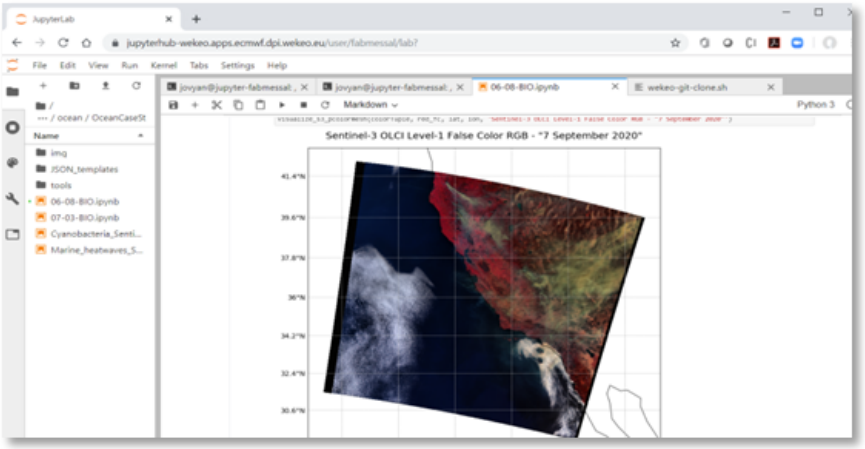
Service Desk's email:
support@wekeo.eu

FREE	FREE	FREE	FREE	FREE	FREE	FREE	€	FREE
WEB PORTAL	VIEWER	SEARCH FOR DATA	REGISTER	DOWNLOAD	TRAINING	COMPUTE	COMPUTE	PROMOTE



WEkEO by COPERNICUS

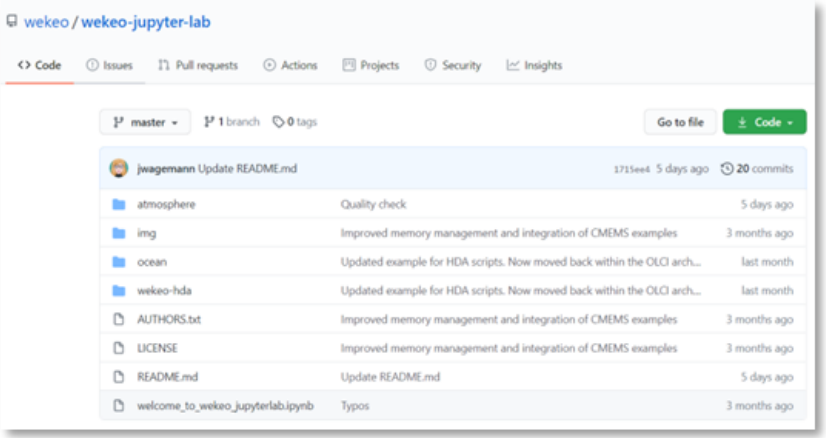
JUPYTERLAB – AN INTRODUCTORY TOOL FOR EXPLORATION AND TRAINING ON WEkEO



jupyter

python

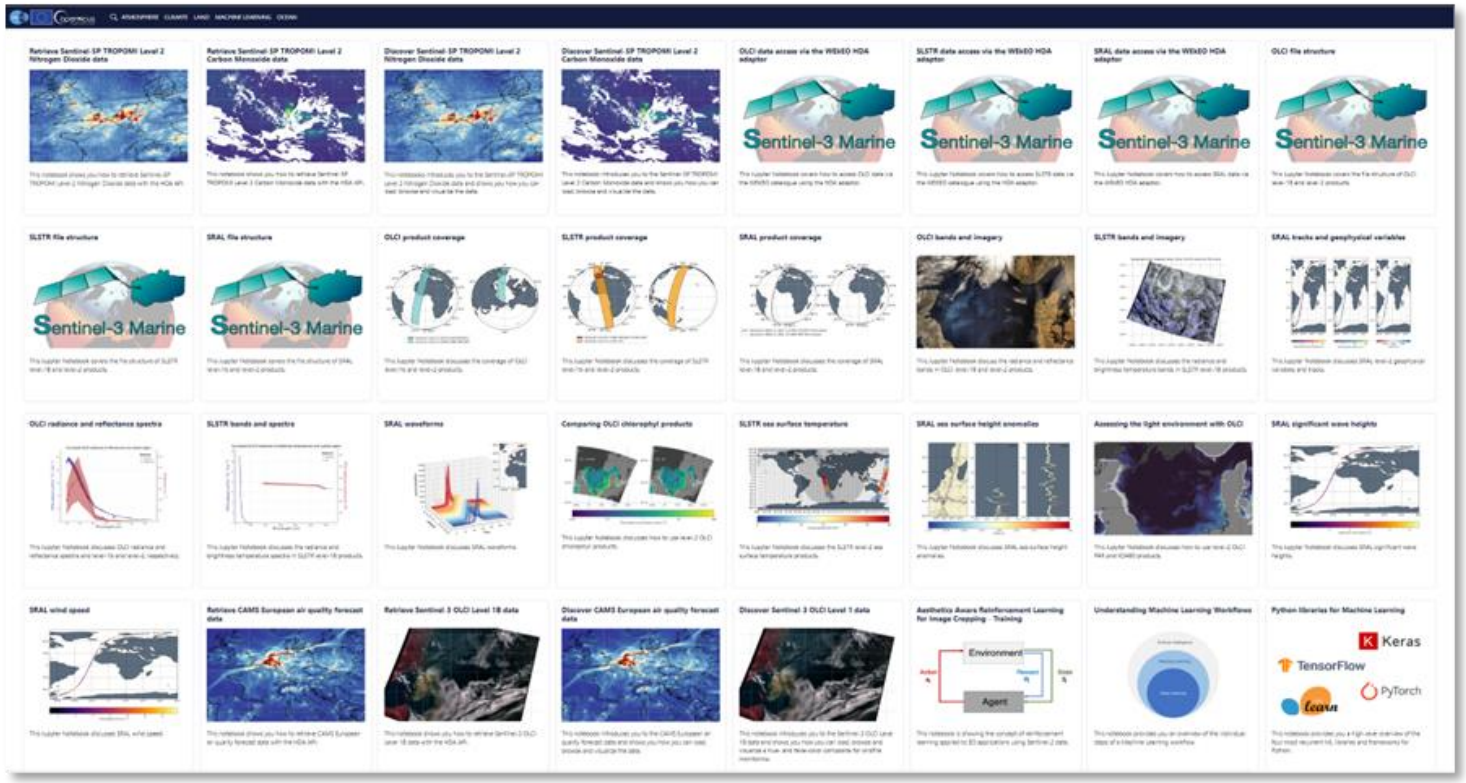
GitHub



- Allow new users to understand how to work with WEkEO HDA.
- Allow users to test simple workflows for free to see how WEkEO can work for them

JUPYTER TRAINING MATERIAL

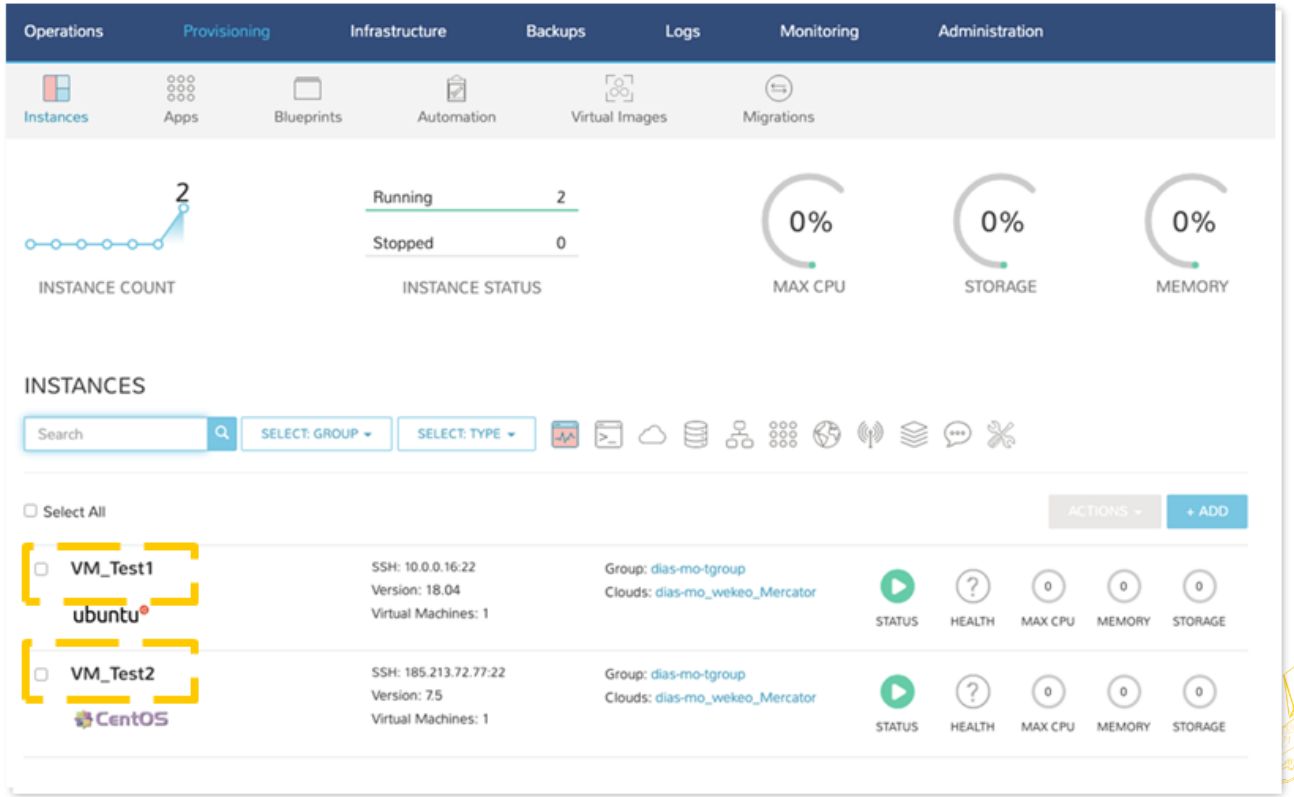
Jupyter Notebook gallery → https://notebooks.apps.mercator.dpi.wekeo.eu/



- **Explore Copernicus and Sentinel data**: Atmosphere, Climate, Land, Ocean and cross-discipline Machine Learning.
- Maintain and updated by WEkEO partners

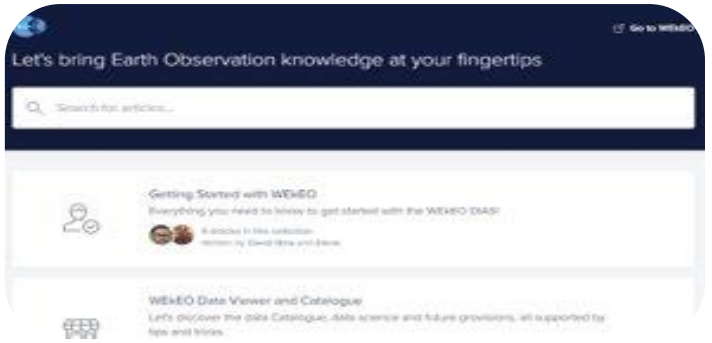
VIRTUAL MACHINES

Virtual Machines can be accessed through the dashboard or by using SSH access



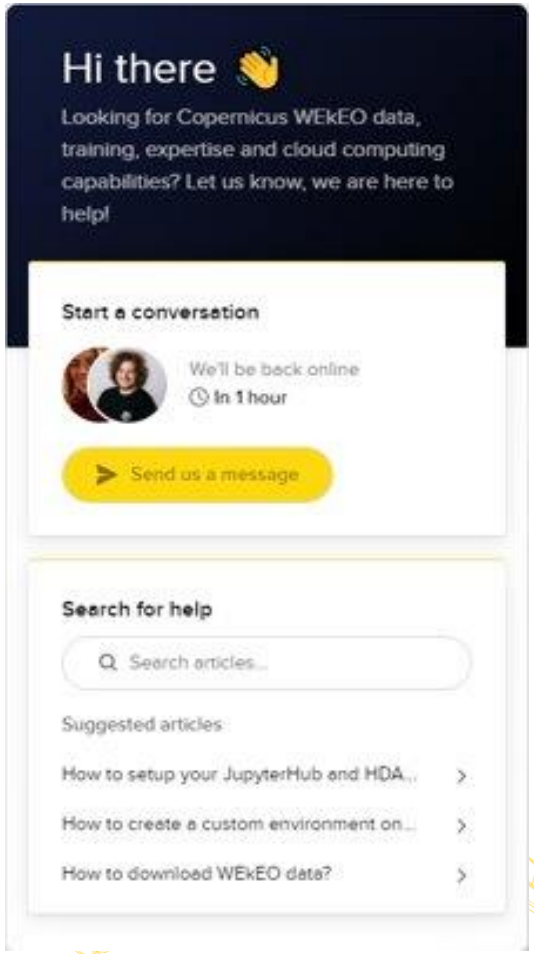
WEkEO User Support

Help Center

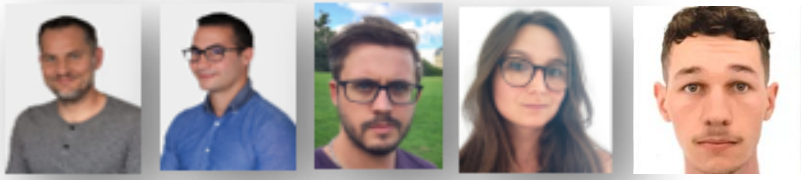


Chat

Contact Us form



Email : support@wekeo.eu



FANTASTIC TEAM AT YOUR SERVICE ☺

PRODUCT OFFER

MERCATOR OCEAN INTERNATIONAL	Marine Monitoring	Copernicus Marine Service
ECMWF	Climate Change, Atmosphere Monitoring, Copernicus EMS	Copernicus Atmosphere Monitoring Service & Climate Change Service & Copernicus Emergency Management Service
European Environment Agency	Land Monitoring Service	Copernicus Land Service
EUMETSAT	Upstream satellite data	Sentinel 1, 2, 3, 6

MERCATOR OCEAN INTERNATIONAL	Marine Monitoring	Copernicus Marine Service
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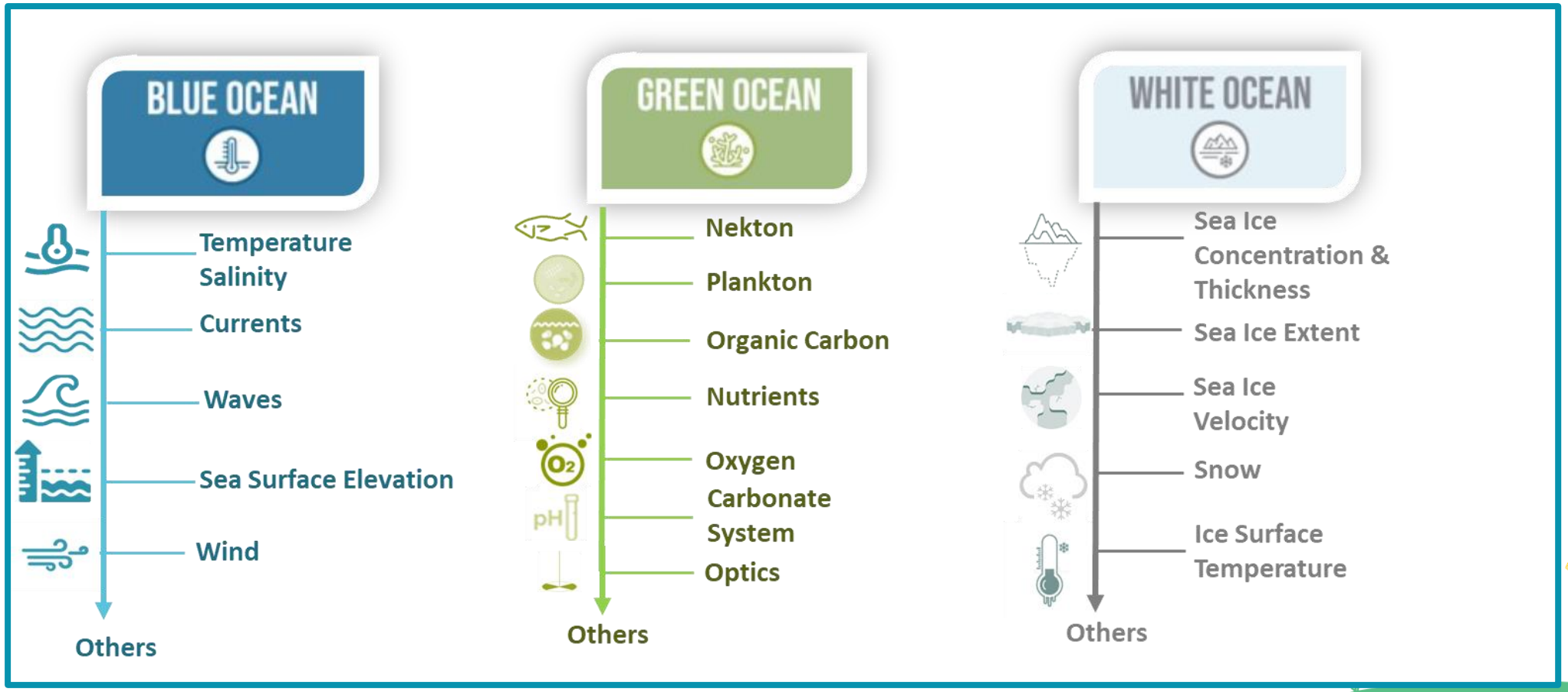
Mercator Ocean International



Mercator Ocean International

Mapping the Oceans using MODEL, SATELLITE, and IN SITU data

MULTI-YEAR 10 to 45 years > **REAL-TIME** Daily, hourly > **FORECAST** 2 to 10 days

ESSENTIAL MARINE VARIABLES

- **BLUE OCEAN** – Physics
- **WHITE OCEAN** – Sea Ice
- **GREEN OCEAN** – Biogeochemistry

OBSERVATIONS In-situ & satellites > **NUMERICAL MODELS** & data assimilation

GEOGRAPHICAL COVERAGE

1. Global
2. Arctic
3. Baltic
4. NWS
5. IBI
6. Med Sea
7. Black Sea

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European Centre for Medium-Range Weather Forecasts

Climate Change Service

climate.copernicus.eu

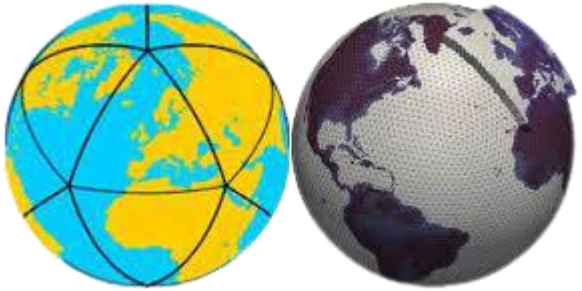
Mapping PAST, PRESENT, and FUTURE climate

In Situ

- Weather stations or balloons
- From 1850 to now
- Variables
  - Glacier elevation and distribution, mass change
  - Gridded temperature and precipitation

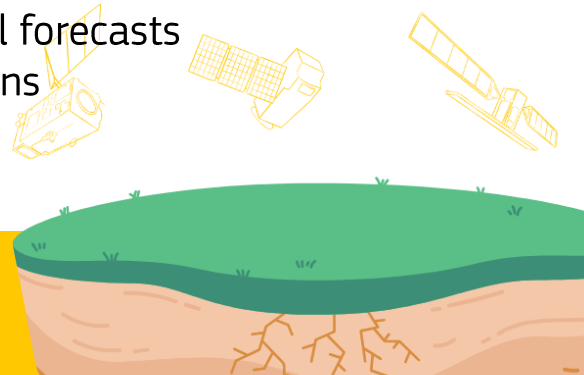
Satellite

- Indirect measurements
- From 1970s to now
- Variables
  - Gases (CO_2, methane)
  - Radiation
  - Sea level, Sea ice
  - Water vapor, humidity



Model

- Weather models can be used for
  - Reanalysis
  - Seasonal forecasts
  - Projections



European Centre for Medium Range Weather Forecasts

MONITORING air quality, solar energy, and the role of atmospheric gases and particles

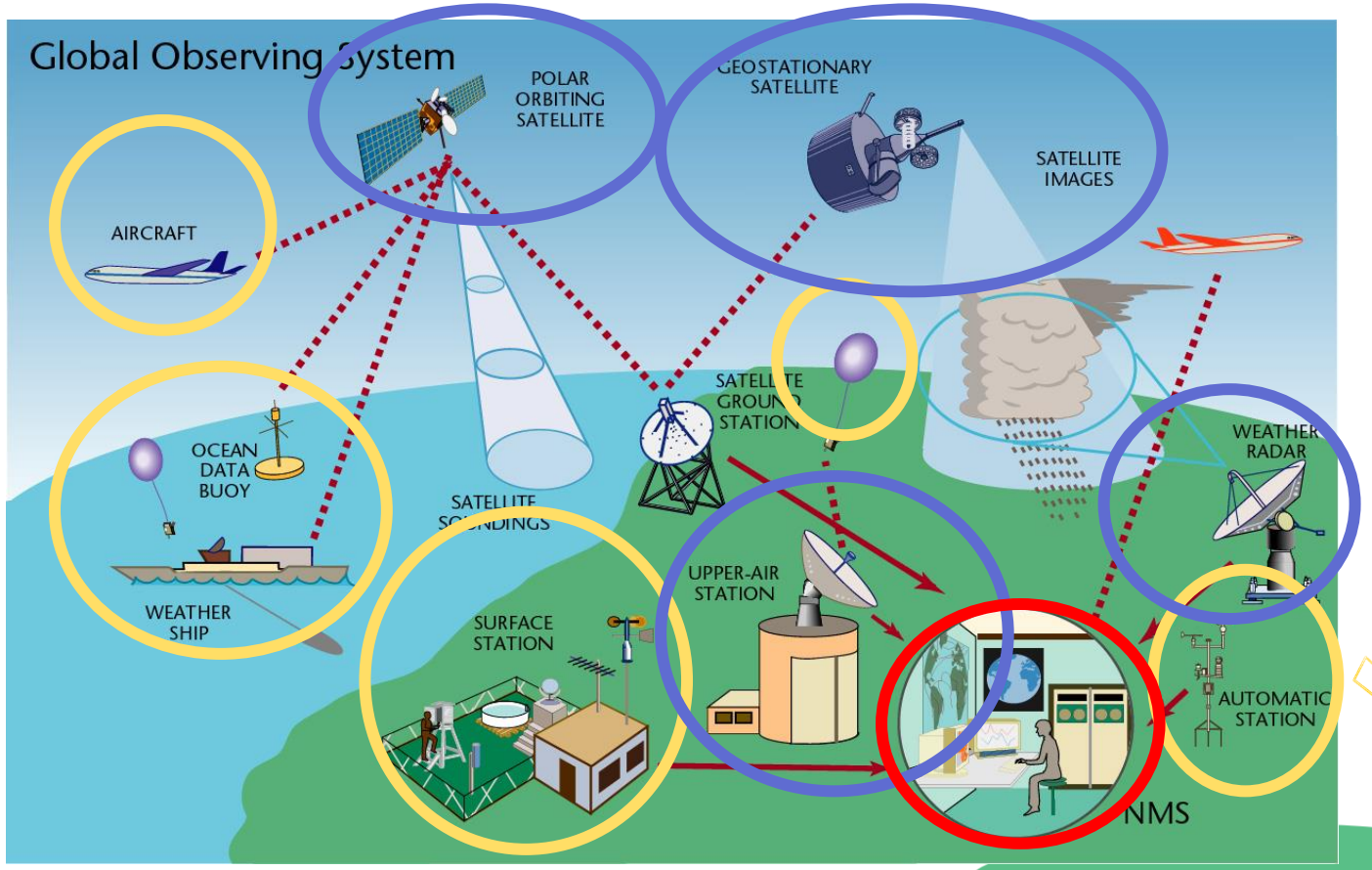
In Situ

- Weather stations (ground based instruments)
- Commercial and research aircrafts
- Balloon sondes

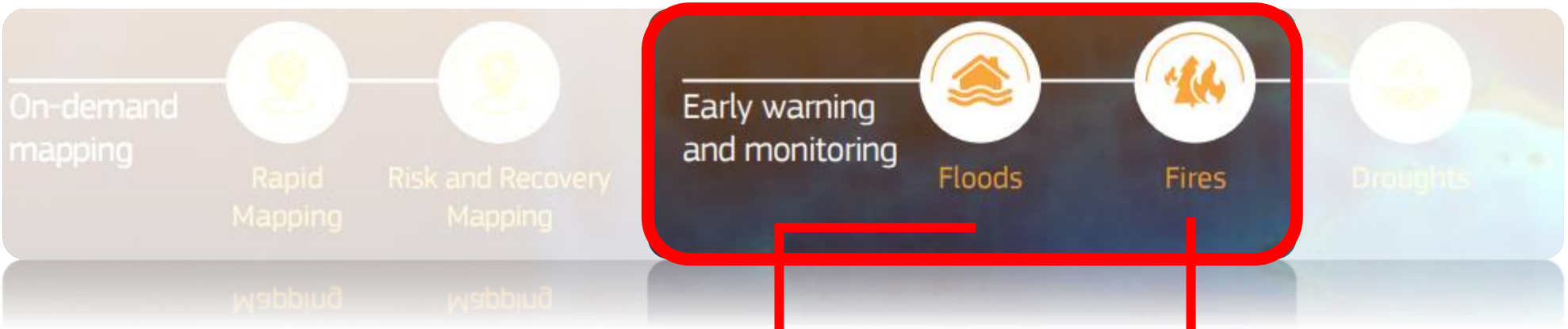
Satellite

- Polar orbiting satellites
- Geostationary satellite
- Satellite images
- Radars

Model



European Centre for Medium Range Weather Forecasts



River discharge

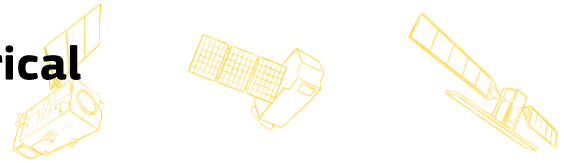
Global **European**

Historical Forecast Seasonal

Fire danger indices

- Burning index
- Danger rating
- Fire danger index
- Fire weather index
- Initial spread index

Global historical data



PRODUCT OFFER

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European Environmental Agency

A SERVICE for monitoring the Earth's land surface

Main Components

Systematic biophysical monitoring

Produces mainly a series of qualified bio geophysical products on the status and evolution of the land surface.

Land Cover and Land Use mapping

Provides information about land cover and land use and its changes at Global and European scale at high resolution.

Thematic hotspot mapping

Focuses on different hotspots, i.e., areas that are prone to specific environmental challenges and problems.

Reference data

Satellite imagery forms the input for the creation of products; and in order to ensure the efficient use of satellite imagery, in situ data is required.

Global

Pan-European

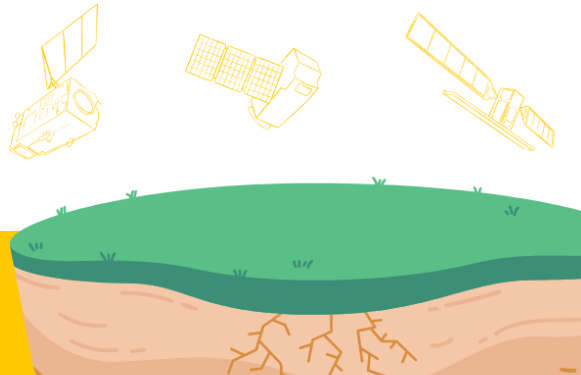
Local

Imagery and reference data

European Environmental Agency

Product Offer

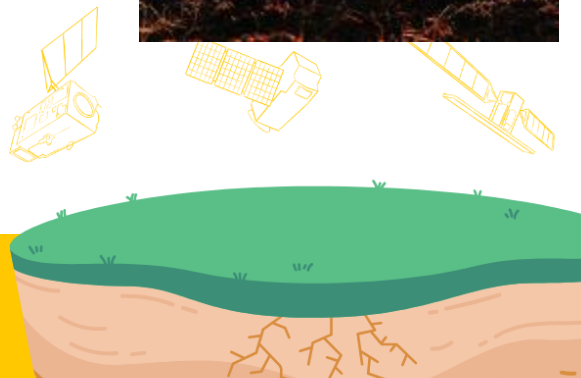
- Vegetation
- Energy
- Water
- Cryosphere
- Hot Spots
- Groundbased



European Environmental Agency

Product Offer

- **Vegetation**
  - Vegetation Properties (LAI, FAPAR, FCover
  - Vegetation Indicies (NDVI, VCI, VPI)
  - Dry matter productivity
  - Burnt Area
- **Energy**
- **Water**
- **Cryosphere**
- **Hot Spots**
- **Groundbased**

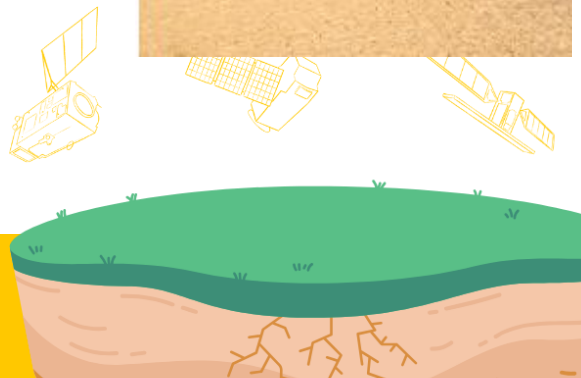


European Environmental Agency

Product Offer

- Vegetation
- Energy
- Water
- Cryosphere
- Hot Spots
- Groundbased

Energy:
- Land surface temperature
- Surface Albedo
- Top Of Canopy Reflectances



European Environmental Agency

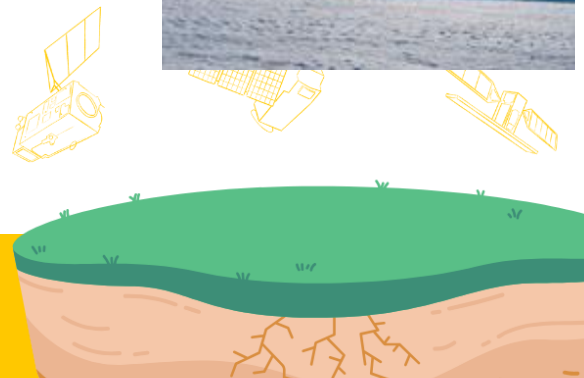
Product Offer

- Vegetation
- Energy
- Water
  - Lake surface water temperature
  - Lake water quality
  - Water bodies
  - Water level
- Cryosphere
- Hot Spots
- Groundbased

European Environmental Agency

Product Offer

- Vegetation
- Energy
- Water
- Cryosphere
  - Lake ice extent
  - Snow cover extent
  - Snow water equivalent
- Hot Spots
- Groundbased



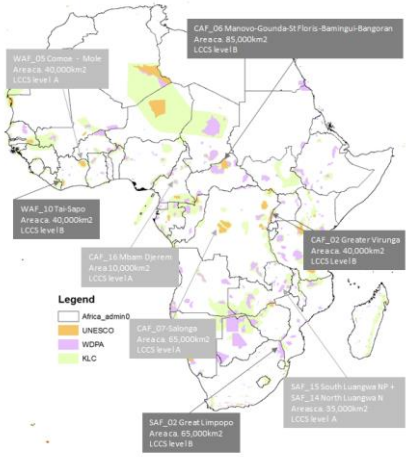
European Environmental Agency

Product Offer

- Vegetation
- Energy
- Water
- Cryosphere
- Hot Spots
- Groundbased

Hot Spots:

- Urban Atlas
- Riparian Zone
- Natura 2000
- Coastal Zones

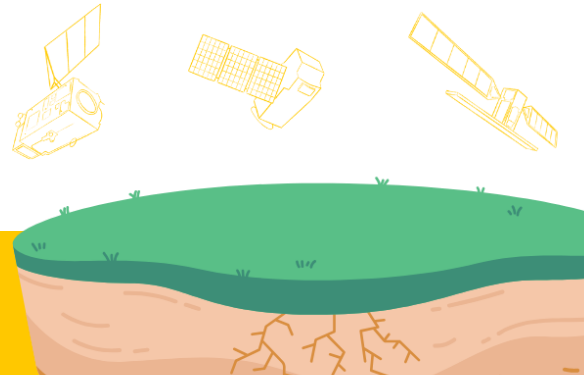


European Environmental Agency

Product Offer

- Vegetation
- Energy
- Water
- Cryosphere
- Hot Spots
- Groundbased

- Global → Provides multiple years of high quality in situ measurements to validate 7 core land products
- Pan European → Produces land cover / land use (LC/LU) information in the CORINE



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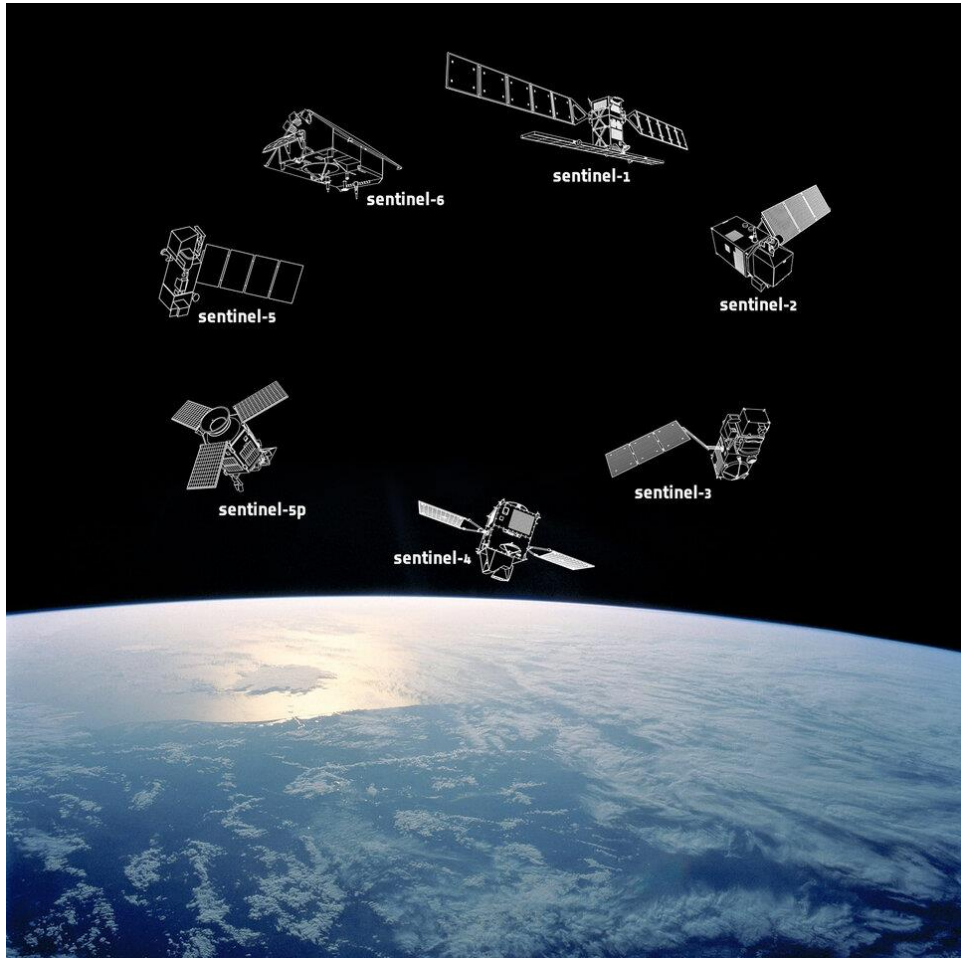
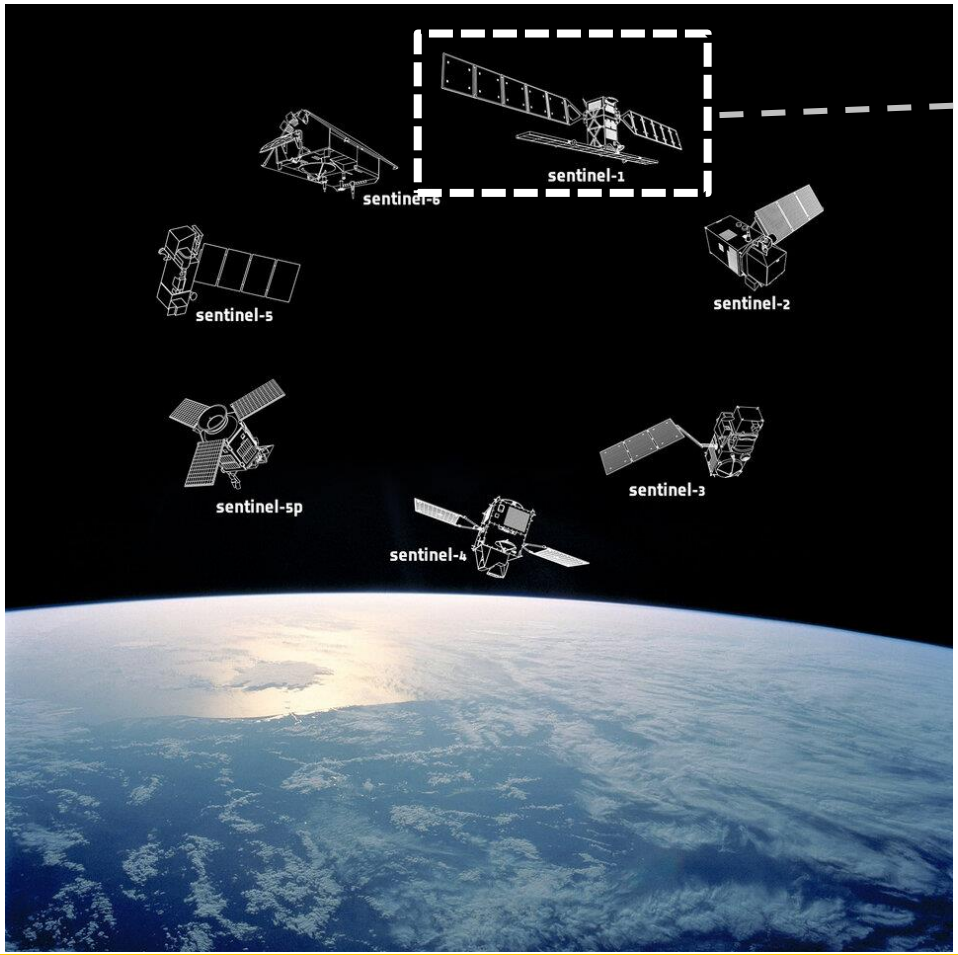
The SENTINEL missions



Sentinel-1

The SENTINEL missions



Sentinel 1

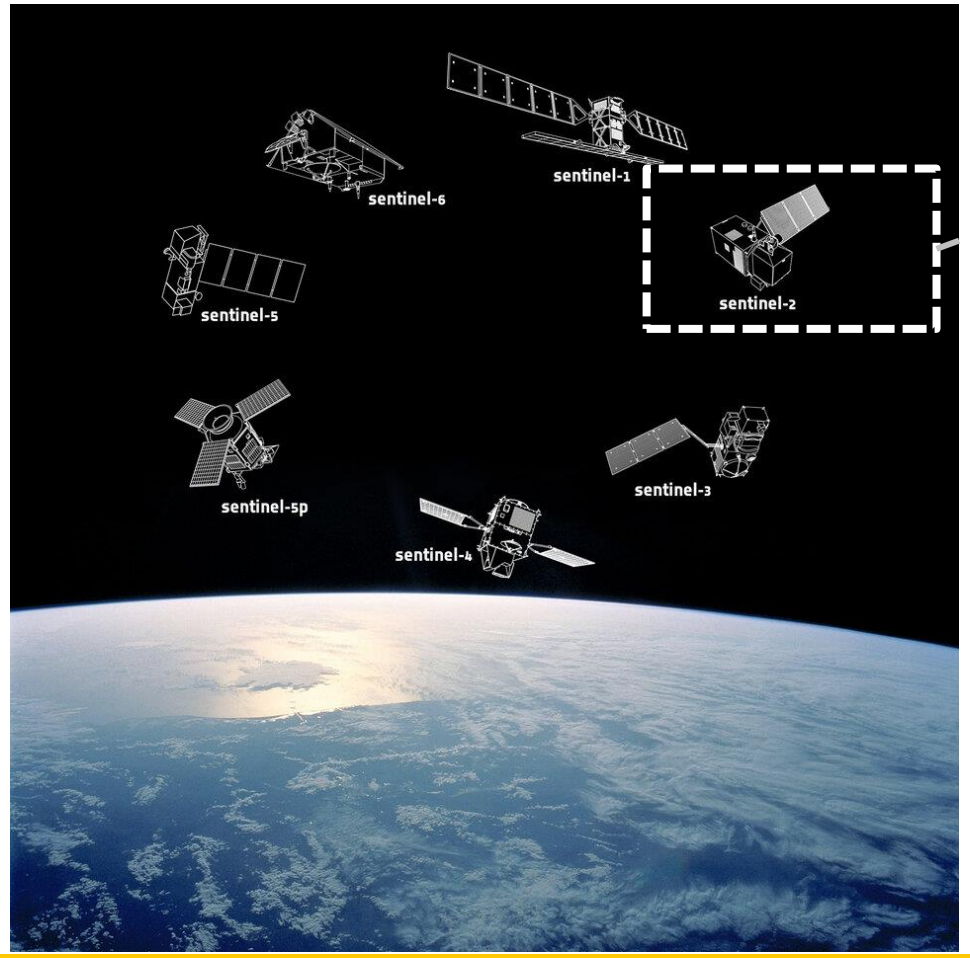
- Synthetic Aperture Radar (SAR
  - Ground Range Detected (GRD)
  - Single Look Complex (SLC)

Applications

- Monitoring sea ice and icebergs
- Monitoring of land ice (glaciers, ice sheets, ice caps)
- River and lake ice monitoring
- Oil spills and ships
- Marine winds waves
- Land use change, agriculture, deforestation
- Land deformation
- Support to emergency management such as floods and earthquakes

Sentinel-2

The SENTINEL missions



Sentinel 2

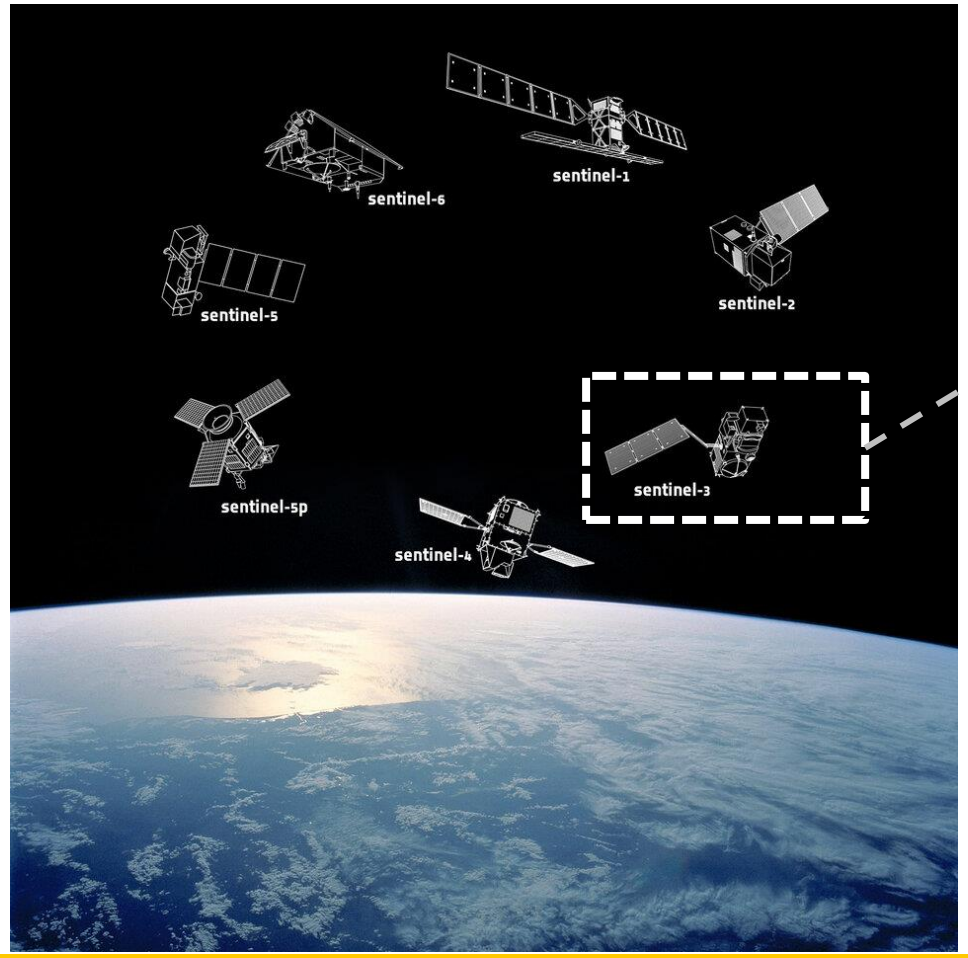
- Level 1C
- Level 2A

Applications

- Agriculture
- Land ecosystems monitoring
- Forests management
- Inland and coastal water quality monitoring
- Disasters mapping
- Civil security

Sentinel-3

The SENTINEL missions

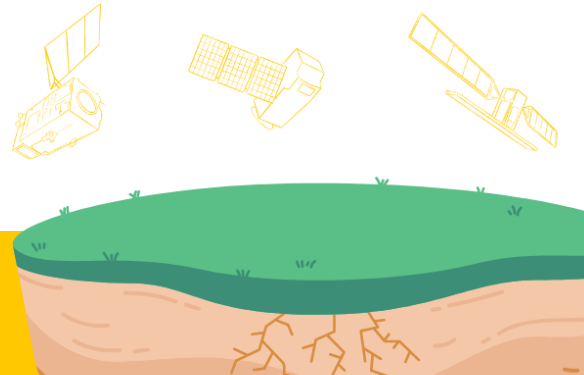


Sentinel 3

- **SRAL**
- **OLCI**
- **SLSTR**

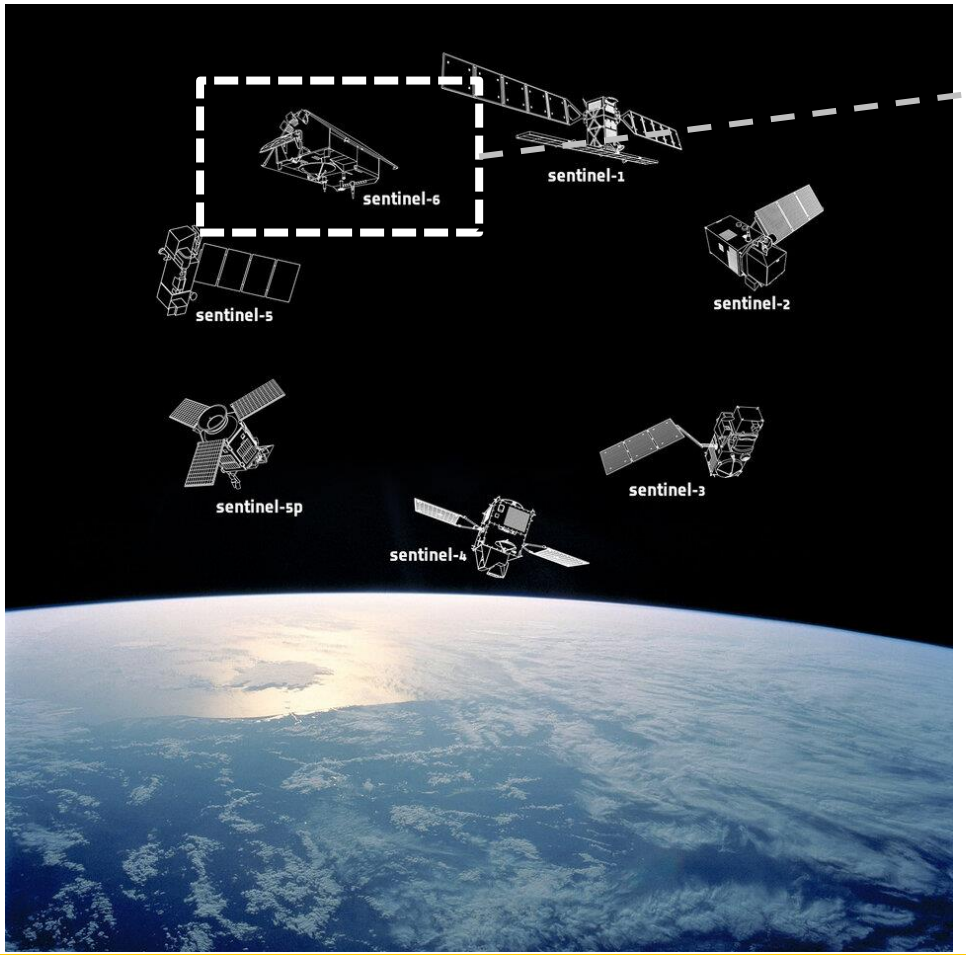
Applications

- Measuring sea and lake surface topography
- Sea and land surface temperature
- Sea ice and land ice elevation
- Ocean and land surface



Sentinel-6

The SENTINEL missions

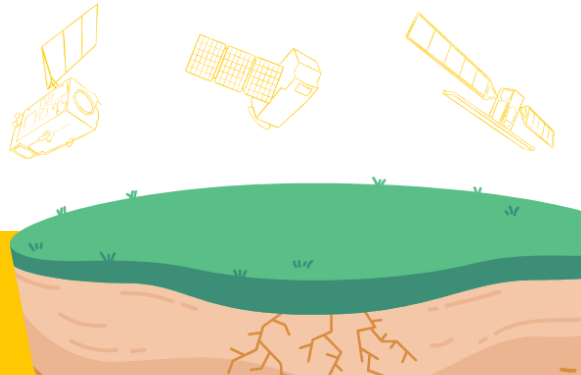


Sentinel 6

- **Poseidon 4**
- **Advanced Microwave Radiometer for Climate (AMR C)**

Applications

- Vital information on
  - ✓ ocean currents
  - ✓ wind speed
  - ✓ wave height



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