Earth Observation assets -> EO4SD CR offerings

- What is Copernicus

- Copernicus Data for EO4SD CR

- Copernicus Services for EO4SD CR

- Additional supported data/products

- Access to data through EO4SD CR platform

What is Copernicus

- Copernicus is the Earth Observation 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

- It is a tool for economic development and a driver for the digital eco

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Copernicus Data for EO4SD CR

Sentinel-1

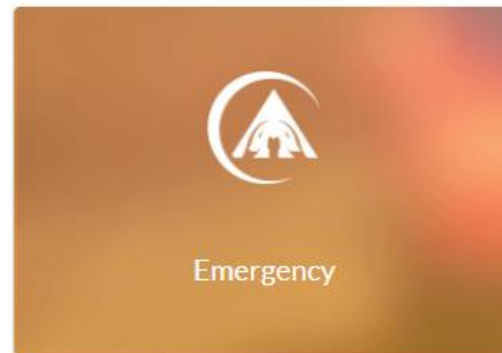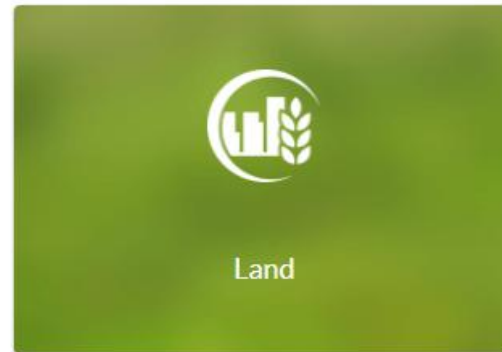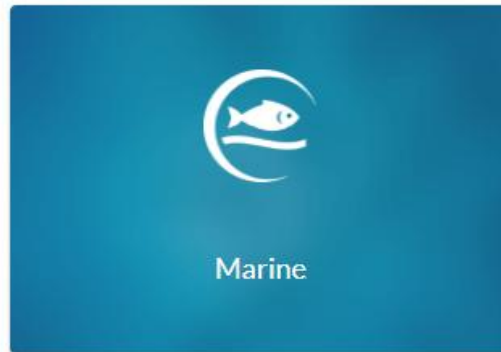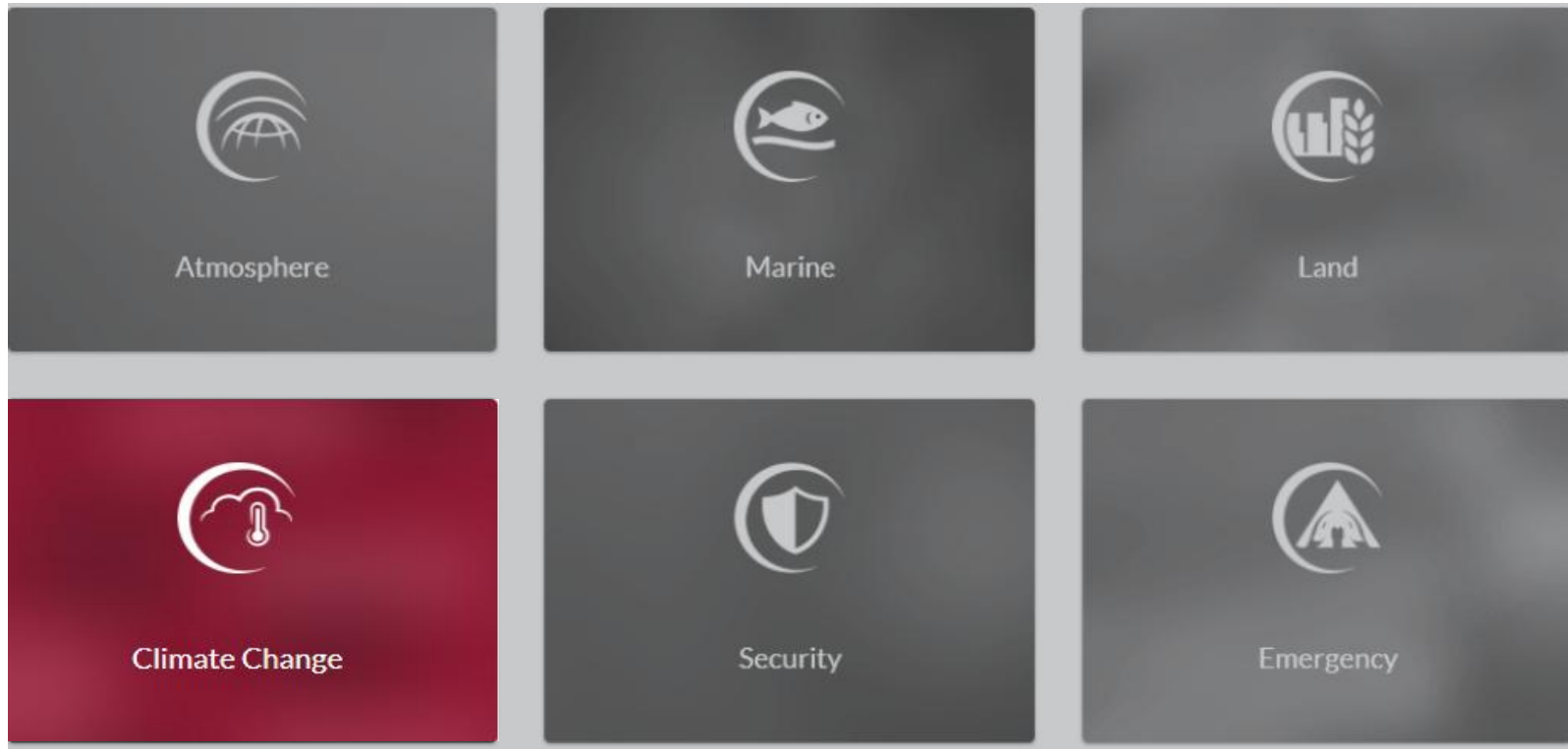|	
Type Imagery:	Synthetic Aperture Radar (SAR) C-band (5.405 GHz)
Applications:	All weather, day/night applications
Orbit:	Polar-orbiting pair - 4/2015 & 4/2016
Revisiting time:	every 6 days (April 2016 & onwards)
Pixel Spacing:	10m to 40 m
Relevance to EO4SD CR products	**Soil**: Historic Soil moisture index Soil moisture anomaly maps; Trends **Flood**: Historic flood extent maps; Time series maps of surface water body extents

Sentinel-2

Type Imagery:	Optical Imagery
Applications:	High-resolution imagery for land services
Orbit:	Sun-synchronous - 6/2015 & 6/2017
Revisiting time:	every 5 days (March 2017 & onwards)
Pixel Spacing:	10m to 60 m
Relevance to EO4SD CR products	**Soil**: Time series vegetation indices (fAPAR, NDVI, LAI), **Flood**: Identification of flooding Potential; Historic flood extent maps; Time series maps of surface water body Extents; Urban (flood) risk maps; Exposure maps of population/assets

Copernicus Data for EO4SD CR

Sentinel-3

Type Imagery:	Multiple (7) sensing instruments
Applications:	Ocean and land
Orbit:	Sun-synchronous - 2/2016 & 4/2018
Revisiting time:	<2days for OLCI & <1 day for SLSTR
Pixel Spacing:	300m resolution
Relevance to EO4SD CR products	Land Surface Temperature & S-3 Contributes to C3S time series of climate data (sea level, sea and land surface temperature)

Copernicus Services for EO4SD CR

Atmosphere

Marine

Land

Climate Change

Security

Emergency

Copernicus Services for EO4SD CR

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Copernicus Services for EO4SD CR

Main objective of the C3S

- To become an authoritative source of climate information for mainly Europe but contribute also at global level
- To build upon national investments and complement national climate service providers
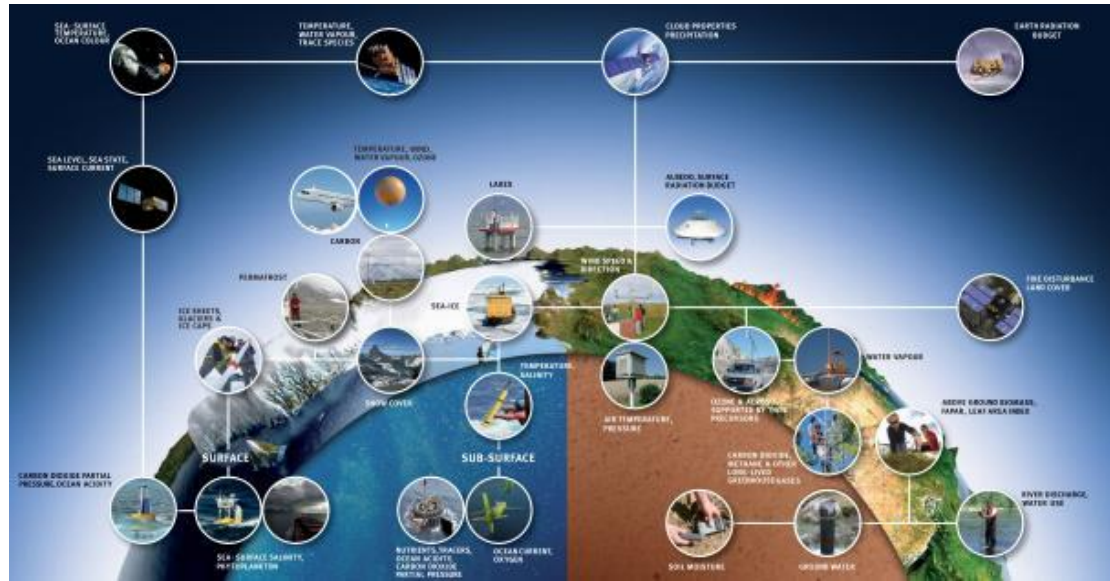- To support the market for climate services in Europe

Climate Data Store (CDS) is a one-stop shop for information about the climate:

- Essential Climate Variables (ECVs) past, present and future
- Observed, re-analysed and simulated
- Derived climate indicators
- Tools to support adaptation and mitigation at global and European level

Temperature difference between 1-20 July 2018 and the 1981-2010 average
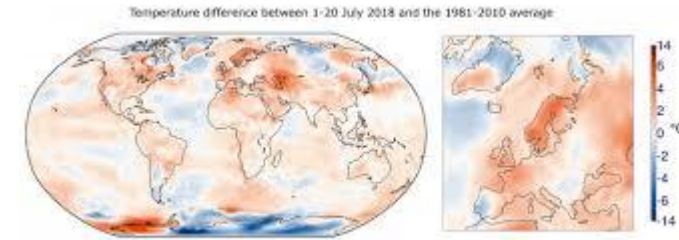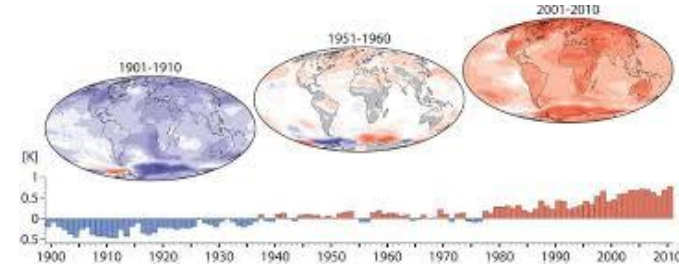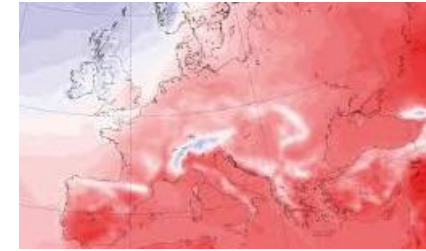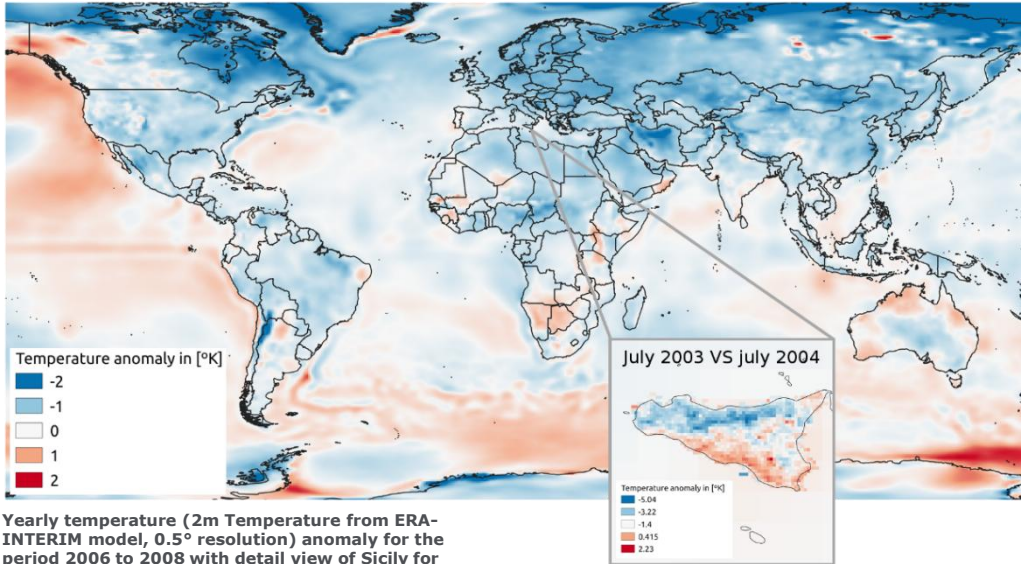
Provision of Essential Climate Variables (ECVs)

- **ECV**: Physical, chemical or biological variable or a group of linked variables that critically contributes to the characterization of Earth's climate, e.g. air temperature or ice sheets.

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Examples for EO derived ECV information

Temperature anomaly in [°K]
- -2
- -1
- 0
- 1
- 2

July 2003 VS july 2004

Temperature anomaly in [°K]
- -5.04
- -3.22
- -1.4
- 0.415
- 2.23

Yearly temperature (2m Temperature from ERA–INTERIM model, 0.5° resolution) anomaly for the period 2006 to 2008 with detail view of Sicily for summers 2003/2004. Plotted by SISTEMA.

Surface elevation changes

Surface Elevation changes, 10.0km gaussian filter (m/yr)

-5   2
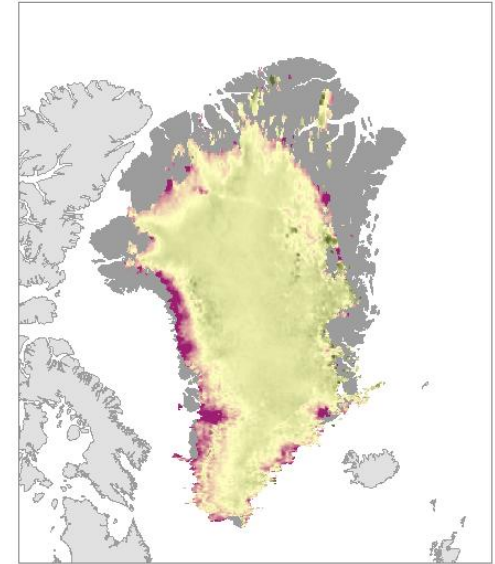
Surface elevation changes of Greenland from 2011-2015 (10km gaussian filter). The change in elevation is indicative of Greenland's melting ice cap. Data from CryoSat 2.

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Relevant global CDS products through EO4SD CR

Service/Product	Time period	Temporal resolution	Spatial resolution
CMIP5 climate projections	1800 – 2100	daily/monthly	0.125^o to 5°
2 m temperature and wind ERA5 reanalysis	1979 - present – 2 months	hourly	0.125^o to 0.25^o
ERA5 reanalysis	1979 - present	hourly	0.125^o to 0.25^o
Precipitation flux mean from CMIP5	1800 - 2100	daily/monthly	0.125^o to 5°
Precipitation flux from CMIP5, bias adjusted	1978 - 2100	daily	0.5^o
Runoff from CMIP5	1800-2100	Monthly	0.125^o to 5°
Sea surface height above geoid from CMIP5	1800-2100	Monthly	0.125^o to 5°
Soil moisture content from CMIP5	1800-2100	Monthly	0.125^o to 5°
Sea surface height above geoid from CMIP5	1800-2100	Monthly	0.125^o to 5°

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Additional supported data/products

Land products

- Albedo
- Land surface temperature
- Soil moisture
- Snow cover
- Vegetation products

Ocean products

- Sea surface temperature
- Sea surface salinity
- Sea level
- Water quality indicators

Atmospheric products

- Greenhouse gases and aerosols
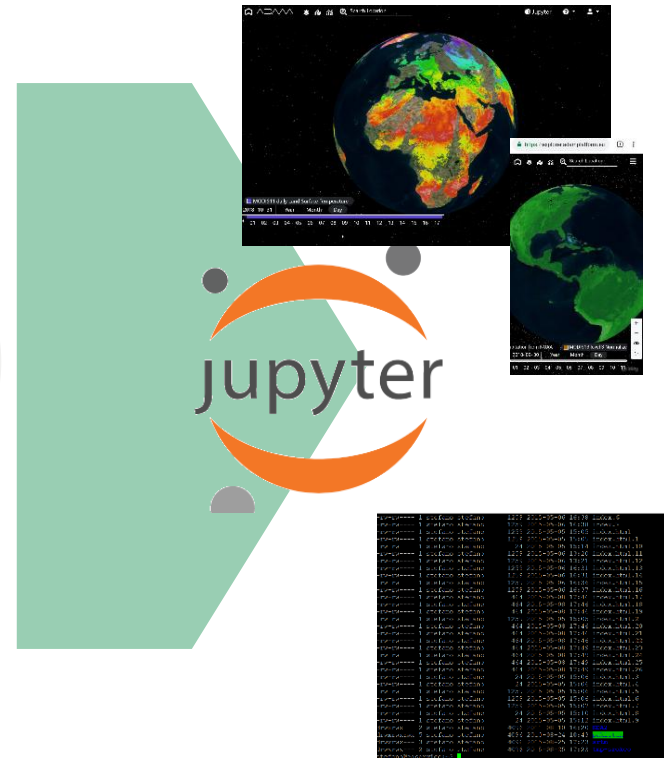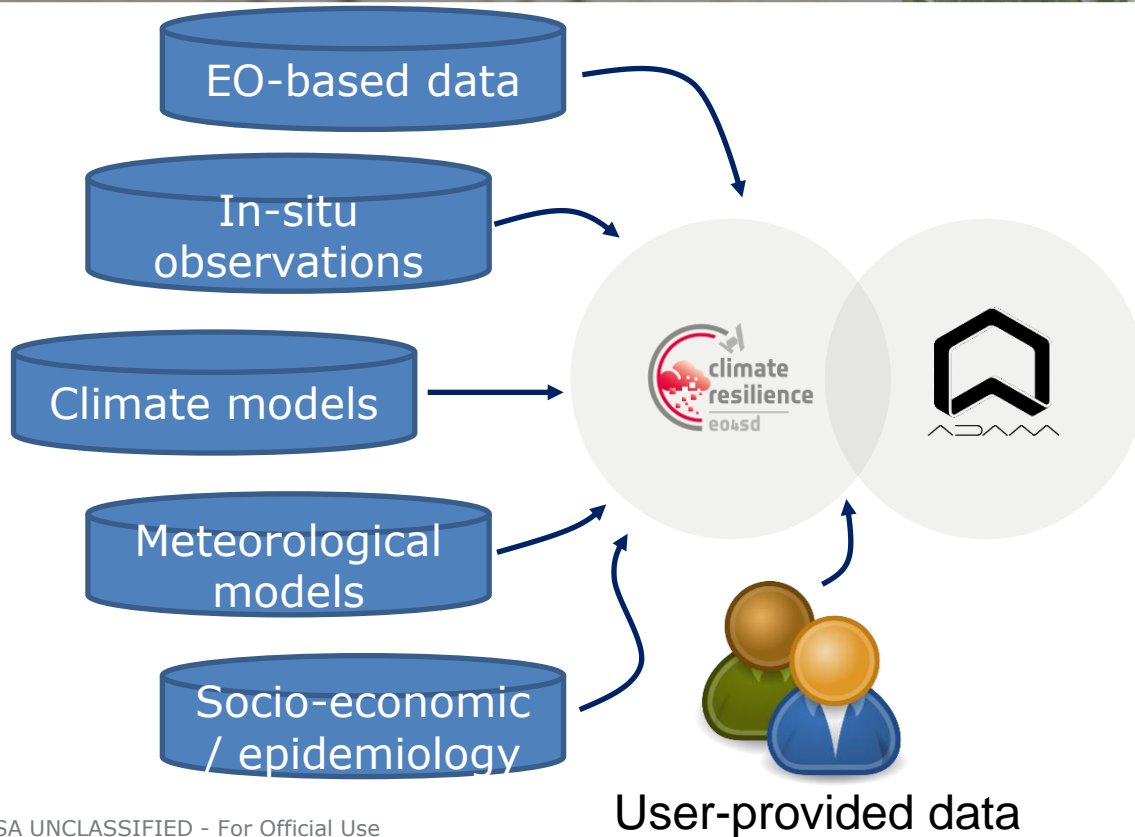- Atmospheric profiles
- Air temperature
- Precipitation

Additional climate datasets

- Seasonal forecasts
- Global climate projections (CMIP5)
- Regional climate projections (CORDEX)
- Copernicus Atmosphere Monitoring service catalogue
- ESA Climate Change Initiative (CCI) datasets*
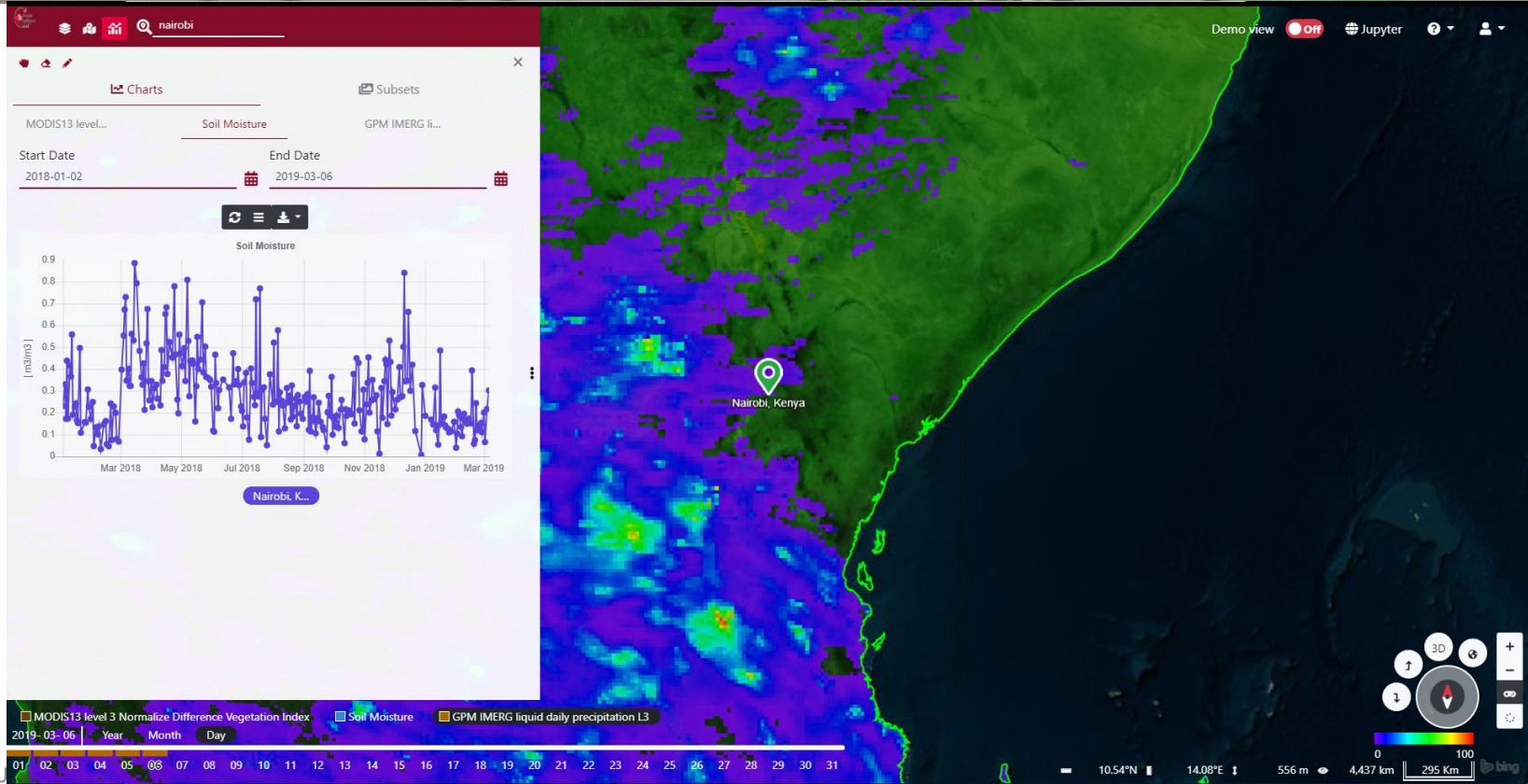- EUMETSAT Satellite Application Facility (SAF) datasets*

Available only upon request

Plus:
Customized climate information solutions & user-provided data

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Access to data through EO4SD CR platform

EO-based data

In-situ observations

Climate models

Meteorological models

Socio-economic / epidemiology

User-provided data

jupyter

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Access to data through EO4SD CR platform

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Thank you for your attention!

For more information, please contact

Project lead: Carlos Domenech | cdomenech@gmv.com

ESA Technical Officer: Anna Burzykowska | Anna.Burzykowska@esa.int

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