What is the Copernicus Climate Change Service?

Copernicus for Climate Change Adaptation and Mitigation

Copernicus
Europe's eyes on Earth

Space

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www.copernicus.eu

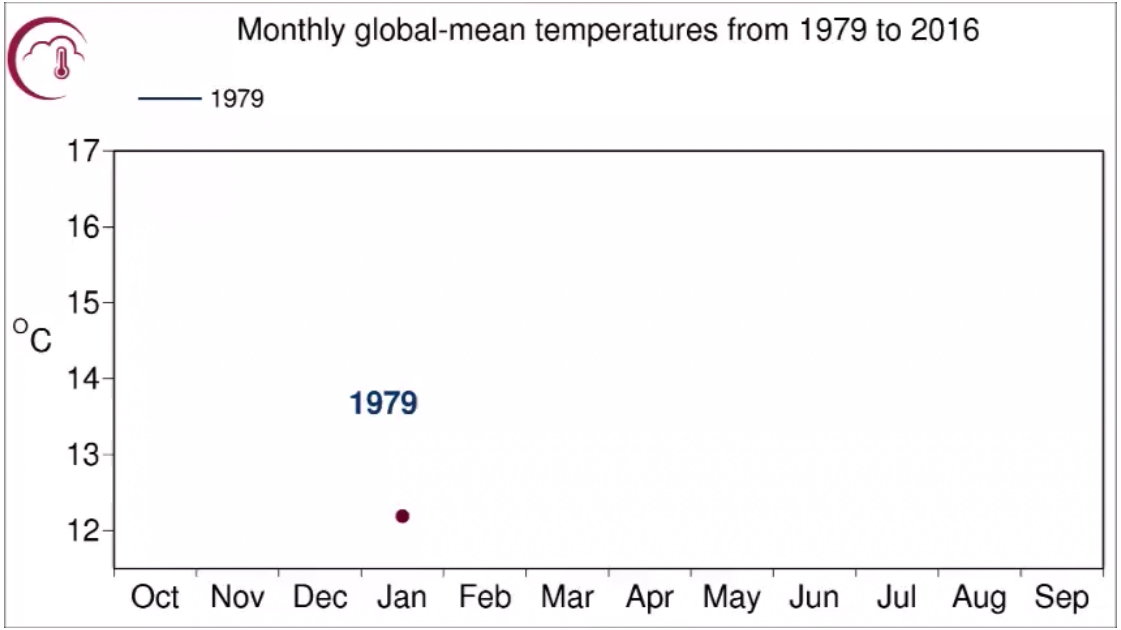
Climate Change

WHAT IS CLIMATE CHANGE?

Climate change is “a change in the state of the climate that can be identified by changes in the mean and/or variability of its properties, and that persists for an extended period, whether due to natural variability or human activity” ~ *IPCC*

- Evidence for climate change includes:
  - Changes in global mean temperature
  - Sea-level rise
  - Changes in the intensity or frequency of extreme events

CLIMATE CHANGE MONITORING



Data from the Copernicus Climate Change Service

https://climate.copernicus.eu/resources/data-analysis/average-surface-air-temperature-analysis

Climate Change

WHY IS CLIMATE INFORMATION NEEDED?

Climate Change

- Rising global temperatures
- Changing climate patterns
- Rising sea levels
- Extreme weather events
- Changing atmospheric circulation
- Changing ocean circulation
- Hydrological cycle intensification
- Droughts
- Flooding

Climate Change

WATER MANAGEMENT

WATER MANAGEMENT

- Climate and the water cycle are closely linked

Changing ocean & atmospheric circulation	Hydrological cycle intensification	Changing precipitation patterns	Changing severity & frequency of flooding/ droughts

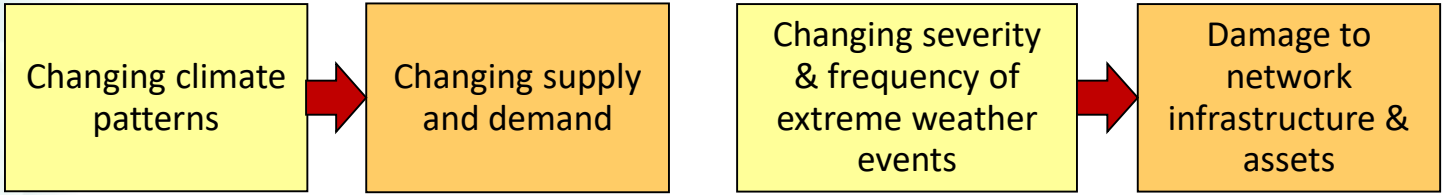
- Over the last century Northern Europe has become 10 - 40 % wetter, whilst Southern Europe has become up to 20% drier ~ *EEA, www.eea.europa.eu*
- All have the potential to alter availability & seasonality of water resources
- Risk assessment is essential for water sector companies to grow and adapt
- Changes in the water sector can have consequences for other sectors, particularly: **agriculture, forestry, energy & health**
- ECMWF's **C3S** aims to help understand the impacts of climate change on the water sector and to provide relevant data and knowledge

Climate Change

ENERGY

ENERGY

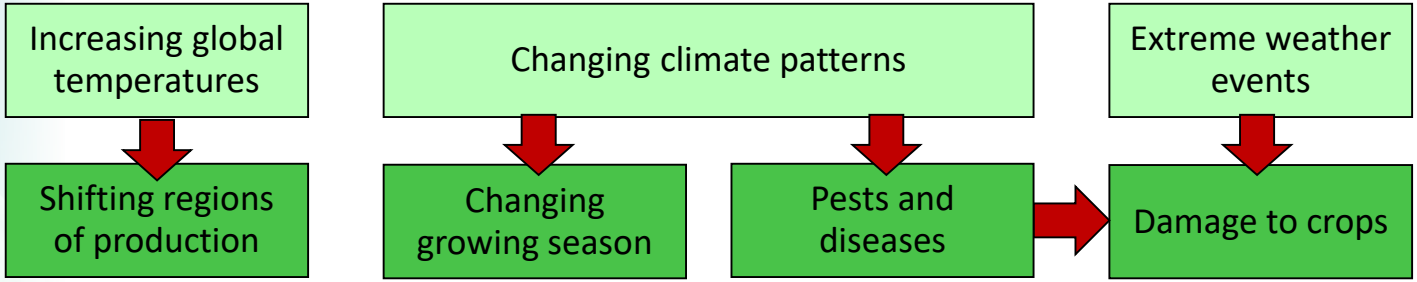
- Energy is at the core of economic and social activity in Europe
- The complex interaction between energy assets and climate is made more complex by climate change



- Renewable energy sources – **Wind, Solar & Hydroelectricity** – have close ties to climate, making the balance of supply and demand challenging
- Extreme weather events, can cause damage to energy infrastructure, and affect electricity distribution
- ECMWF's **C3S** aims to help understand the impacts of climate change on the energy sector and to provide relevant data and knowledge

AGRICULTURE & FORESTRY

- Climate change poses a direct challenge to agriculture in Europe

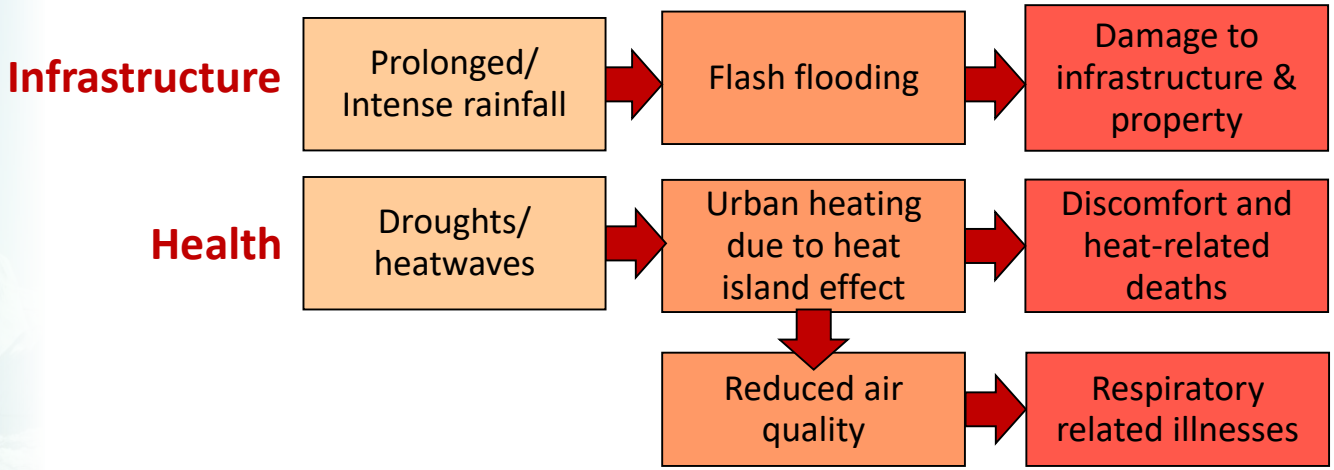


- Projected climate changes will affect the crop growing seasons, crop yields, livestock management, and ultimately food security in Europe
- Increasing global temperatures can gradually shift the geography of crop production, e.g. vine growing conditions from southern to northern Europe
- Risk assessment is essential for the agricultural sector to grow and adapt
- ECMWF's **C3S** aims to help understand the impacts of climate change on this sector and to provide relevant data and knowledge

Climate Change

INFRASTRUCTURE & HEALTH

- European cities are already experiencing effects of climate change



INFRASTRUCTURE

HEALTH

- **Urban Heat Island** – an urban area that is significantly warmer than its surrounding rural areas, due to urban construction materials, increased energy usage and reduced ventilation
- ECMWF's **C3S** aims to generate regional-specific climate indicators to help understand and mitigate the impacts of climate change on Europe's Cities

Climate Change

WHAT IS C3S?

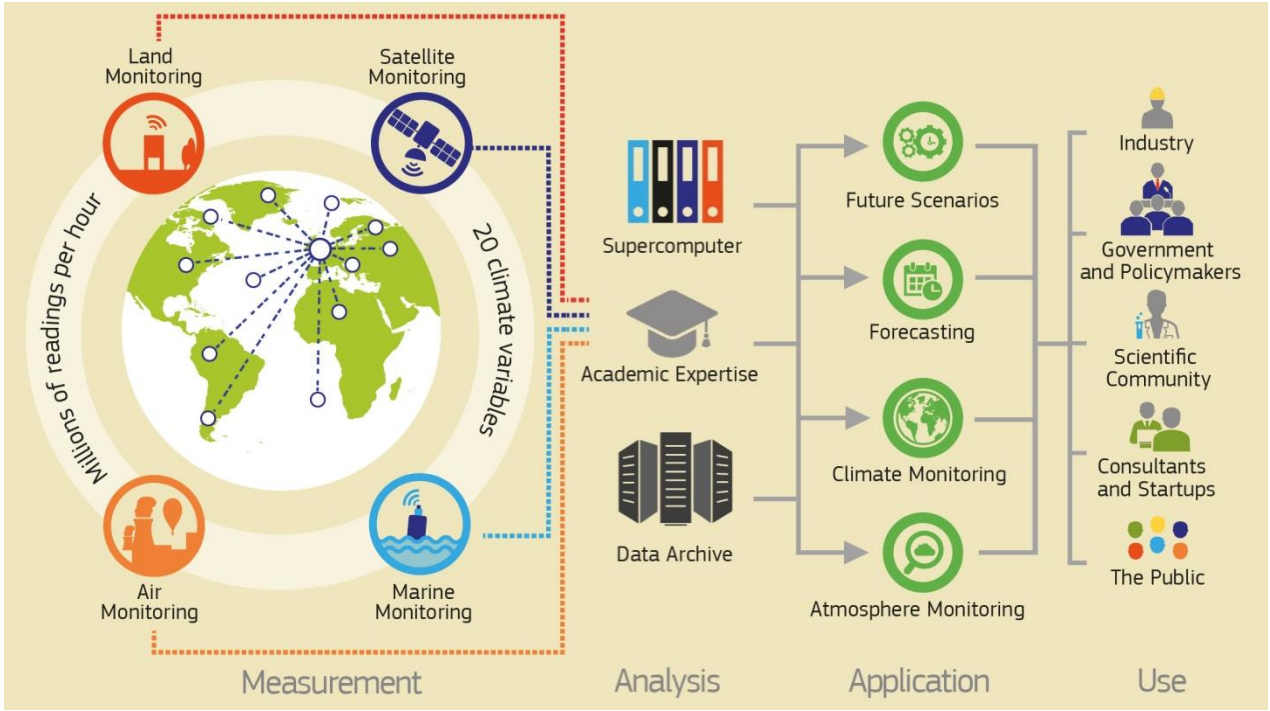
The Copernicus Climate Change Service (C3S) "responds to environmental and societal challenges associated with human-induced climate change" ~ *Copernicus*

- A value-added Copernicus Service operated by ECMWF on behalf of the EC
- Will combine observations with latest science to develop quality-assured information about past, current and future climate change.
- Will build upon and complement existing and future climate change research initiatives
- Will become a major contribution from the EU to the World Meteorological Organisation (WMO) Global Framework for Climate Services (GFCS)

Climate Change

WHAT IS C3S?

- It aims to provide the data and tools to help policy makers, businesses, and academics to understand and adapt to the challenges of climate change



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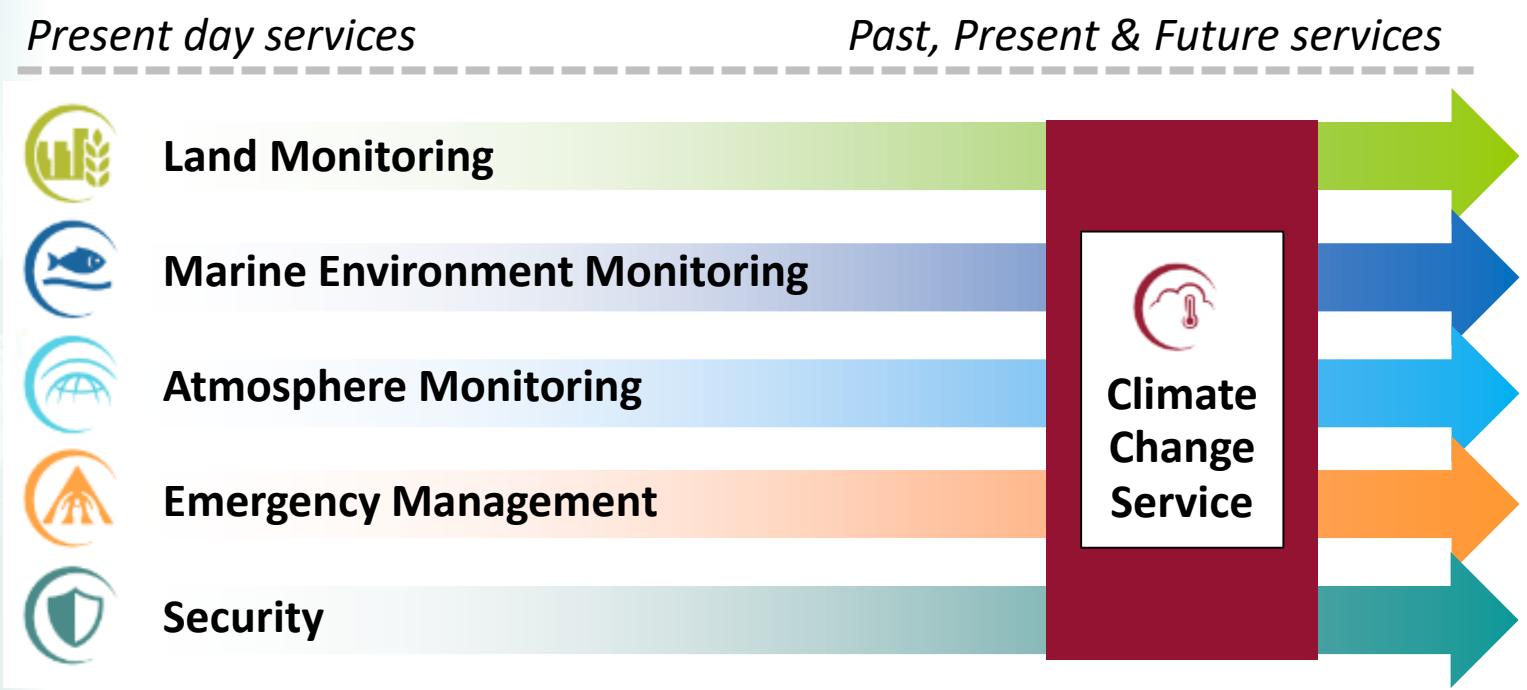
WHAT IS C3S?

- **C3S** cuts across the existing Copernicus services and provides long-term projections of how climate change will impact each sector in the future



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SERVICE AIMS

- To combine expertise from across Europe
- To provide key indicators on climate change drivers and impacts
- To support European climate change policy
- To deliver economic value to Europe by:

1

informing

policy development to protect citizens from climate-related hazards such as high-impact weather events

2

improving

planning of mitigation and adaptation practices for key human and societal activities

3

promoting

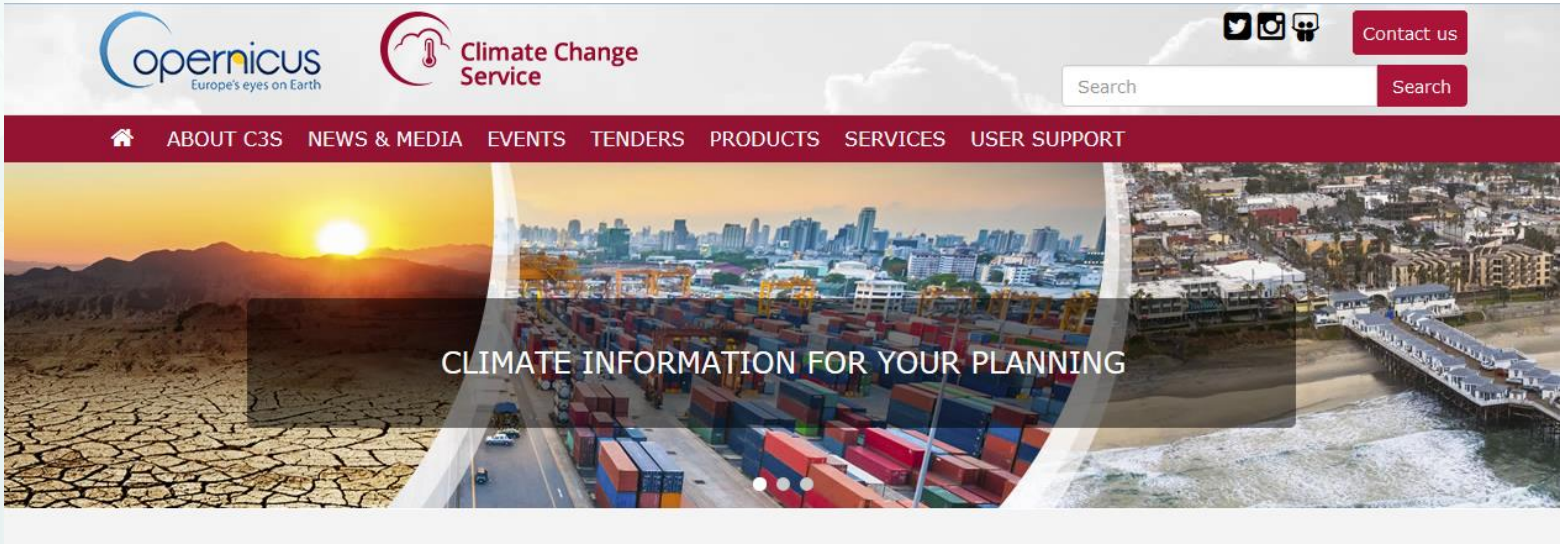
the development of new services for the benefit of society

Climate Change

WHAT WILL C3S PROVIDE?

- The C3S website has been developed, providing access to climate datasets, project information and news: **http://climate.copernicus.eu**

- **To be updated as new material becomes available**



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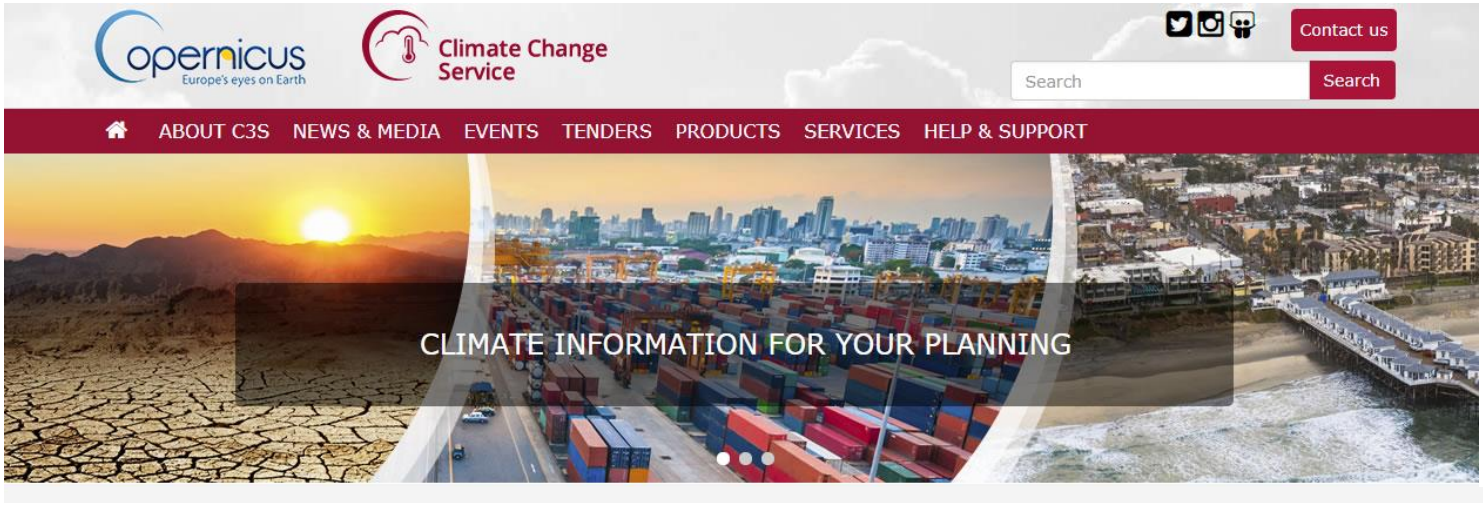
HOME PAGE



EVENTS

13 Nov 2017
5th International Conference on Reanalysis

06 Mar 2017
C3S General Assembly

22 Feb 2017
Copernicus Symposium on Climate Services for the Energy Sector

MORE EVENTS

TENDERS

C3S_330 Operational Production of Seasonal Forecasts
Deadline 10 Oct 2017

C3S_312b Essential Climate Variable products derived from observations
Deadline 28 Sep 2017

C3S_521 SIS EQC Framework - Prior information notice

C3S_311c Satellite Data Rescue - Prior information notice

ARCHIVE

PROJECTS

SWICCA - Service for Water Indicators in Change Adaptation

EDgE - End-to-end Demonstrator for improved decision making in the water sector in Europe

ECEM - European Climatic Energy Mixes

CLIM4ENERGY - A service providing climate change indicators tailored for the energy sector

UrbanSIS - Climate Information for EU Cities

AgriCLASS - Agricultural Climate Advisory Services

WISC: Wind Storm Climate Service

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PRODUCTS

Copernicus Europe's eyes on Earth

Climate Change Service

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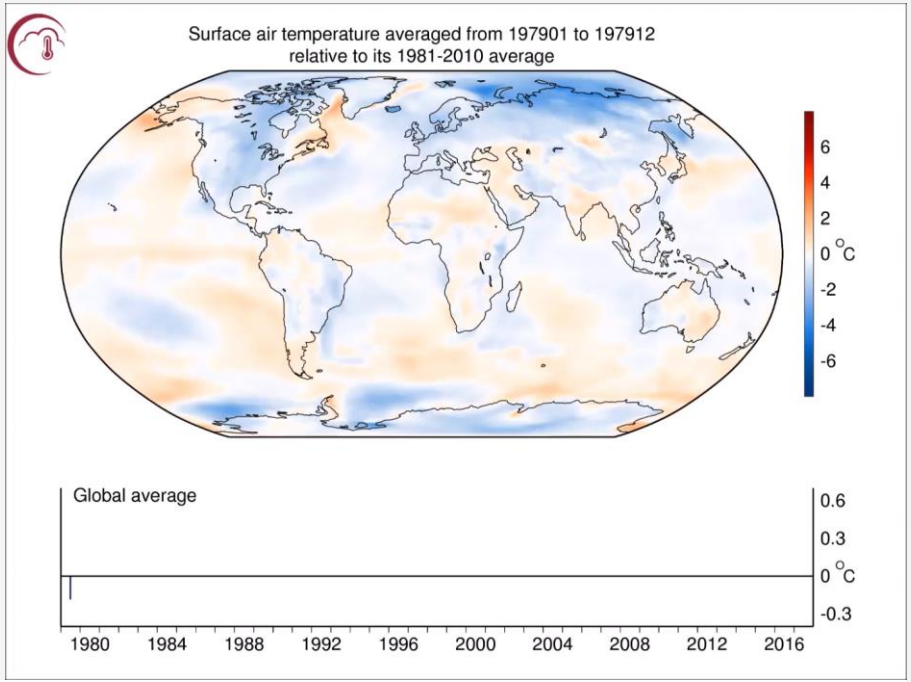
Average surface air temperature monthly maps



- AVERAGE SURFACE AIR TEMPERATURE MONTHLY MAPS
- MONTHLY SEA-ICE MAPS
- HYDROLOGICAL CLIMATE VARIABLES
- CLIMATE REANALYSIS
- SEASONAL FORECASTS

NEWS

16 Jul 2017
C3S releases powerful new climate change "encyclopaedia" for public use

03 Mar 2017
#OpenDataHack @ECMWF - explore creative uses of open data

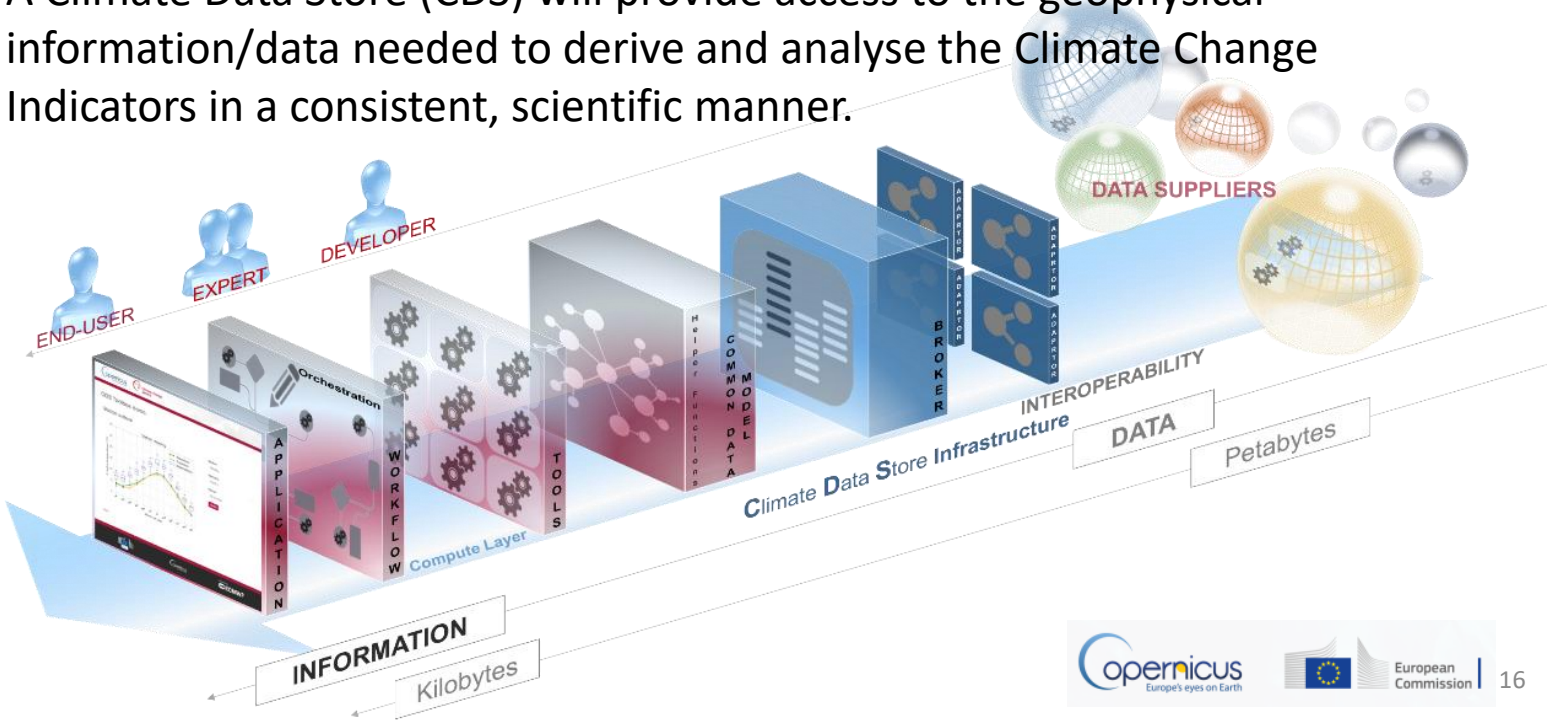
03 Mar 2017
C3S holds its inaugural General Assembly

26 Jan 2017
Copernicus at the 4th International Conference on Energy & Meteorology (ICEM)

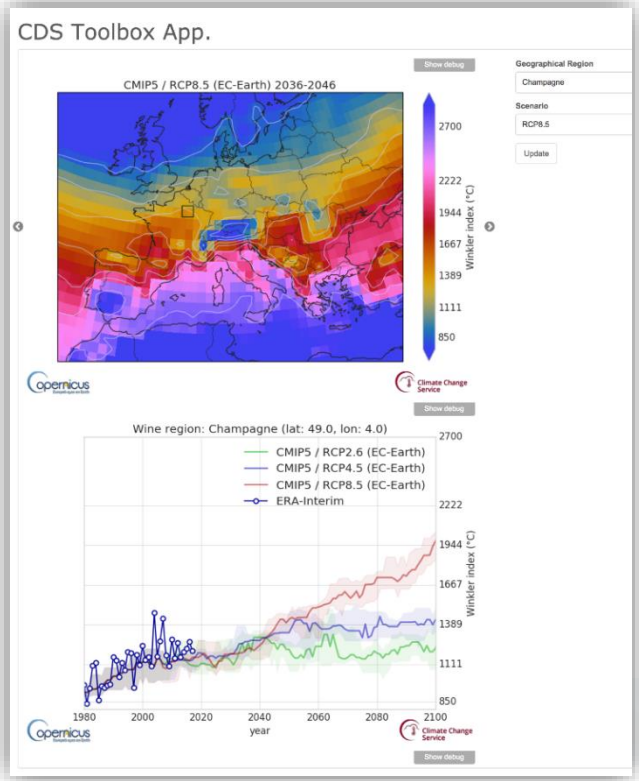
06 Dec 2016
Report Reassesses Variations in Global Warming

More News

- A Climate Data Store (CDS) will provide access to the geophysical information/data needed to derive and analyse the Climate Change Indicators in a consistent, scientific manner.



- The CDS will provide access to:
  - Estimates of Essential Climate Variables (ECVs) and climate indicators
  - Near-real time climate monitoring facility
  - Multi-model seasonal forecasts
  - Climate projections at global and regional scales
  - Data processing and visualisation tools



- 7 Sectoral Information System (SIS) “proof of concept” projects have already been initiated for a number of sectors

- These are intended to demonstrate potential C3S products and services

Climate Change

- Currently, C3S can be reached via:
  - Web portal (http://climate.copernicus.eu)
  - Twitter (@CopernicusECMWF)
  - Instagram (www.instagram.com/copernicusecmwf)
  - Slideshare (www.slideshare.net/CopernicusECMWF)