



Climate Change

Copernicus Climate Change Service

Stijn Vermoote, ECMWF
Tervuren, 13 November 2019



A Union that strives for more

- **Within 100 days – introduction of the European Green Deal, which will include:**
 - European Climate Law
 - Extension of Emission Trading System
 - European Climate Pact for education and motivation purposes
 - The Sustainable Europe Investment Plan supporting €1 trillion of investment
- **By 2050 – Europe should be the first climate-neutral continent in the world**





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Copernicus Climate Change Service: our mission

To support European adaptation and mitigation policies by:

- Providing consistent and authoritative information about climate (past, present, future)
- Building on existing capabilities and infrastructures (nationally, in Europe and worldwide)
- Stimulating the market for climate services in Europe





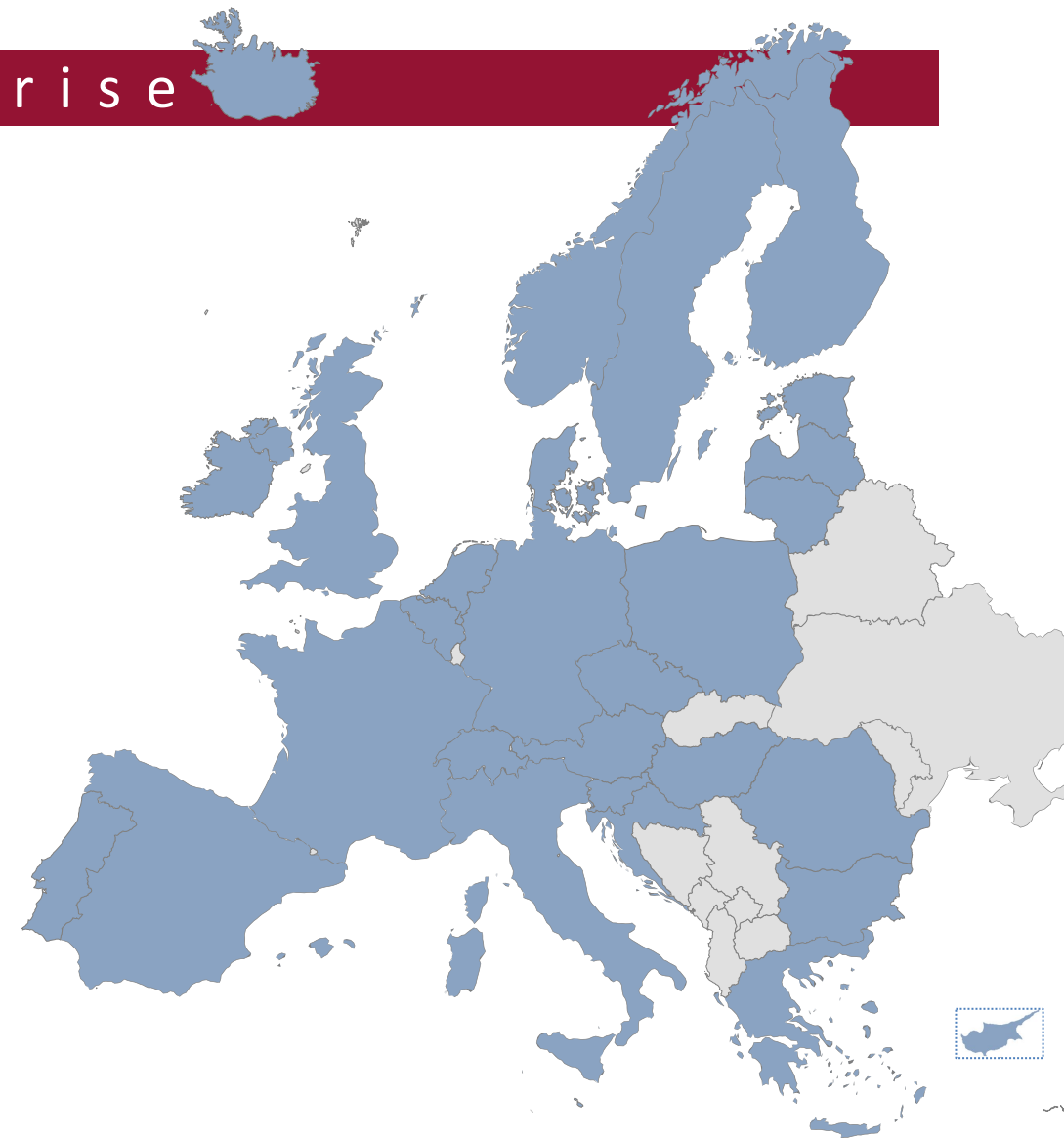
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the C3S European enterprise

C3S builds upon a strong European capacity

*295 different entities from
29 EU and ECMWF Member States,
International Organisations and third countries*

Total budget: 215 Meuros over 7 years



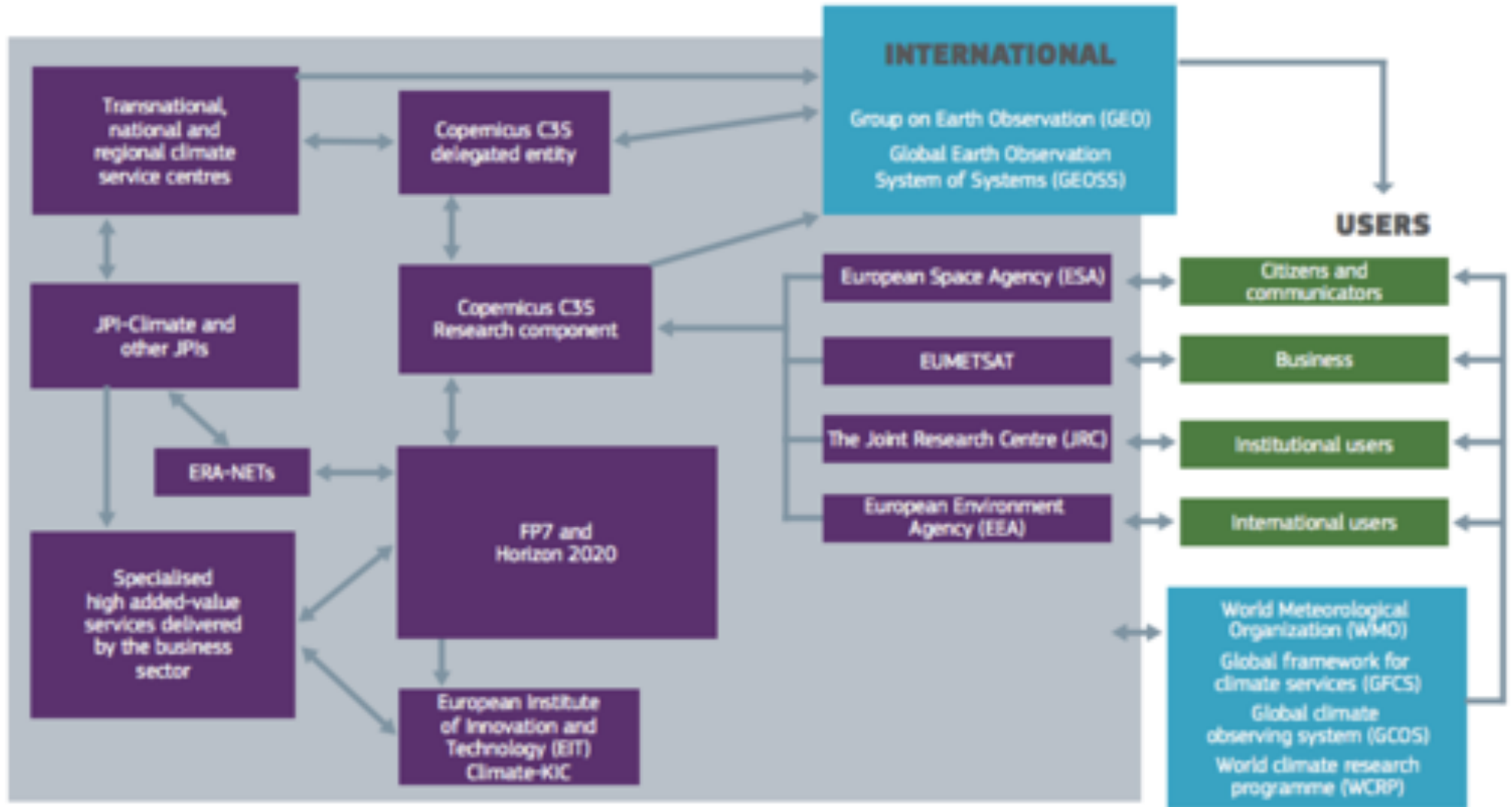
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C3S ... part of a bigger picture



Credit: European Commission



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What the Climate Change Service has to offer

- Open and free access to climate data
- Tools needed to use the data
- Information on sectoral impacts
- Quality assurance
- User support and training
- Climate change assessments
- Outreach and communication

A one-stop Climate Data Store

climate.copernicus.eu

Implemented by ECMWF as part of The Copernicus Programme

Climate Change Service

News Events Press Tenders Help & Support

ABOUT US WHAT WE DO DATA SEARCH

European Commission Copernicus ECMWF

What we do

Our core objective is to provide reliable access to high-quality climate data. We do this through our Climate Data Store (CDS). We also offer tools and expert guidance that make it possible to transform the data into more visual products, such as maps and charts.

Climate datasets

The CDS provides a single point of access to a variety of climate datasets, including observations, reanalyses of past observations, seasonal forecasts and climate model projections.

[Read more](#)

[Browse the CDS data catalogue](#)

Tools for using climate data

The CDS features a powerful toolbox for processing and visualising data in the cloud, so that users can develop climate information suited to their needs.

[Read more](#)

[Browse the CDS toolbox](#)

Sectoral impacts

We provide real applications of CDS data and tools that demonstrate how businesses, governments and citizens can make informed decisions on how to mitigate the effects of climate change.

[Read more](#)

Quality assurance

We provide quality assurance for all CDS data, tools and applications. We continuously engage with users and independent experts to evaluate our services and ensure that they are fit for purpose.

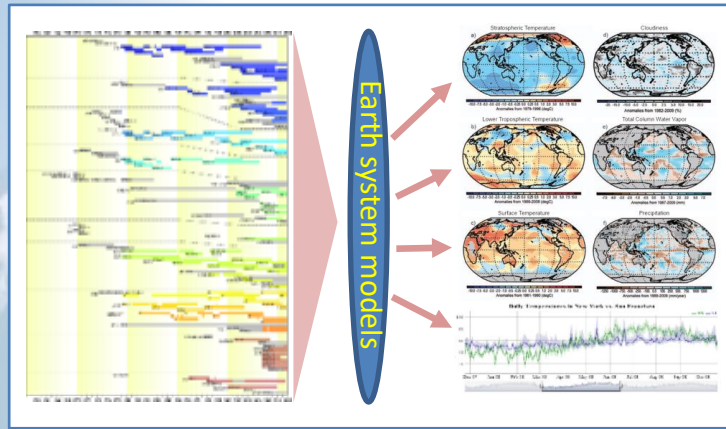
[Read more](#)

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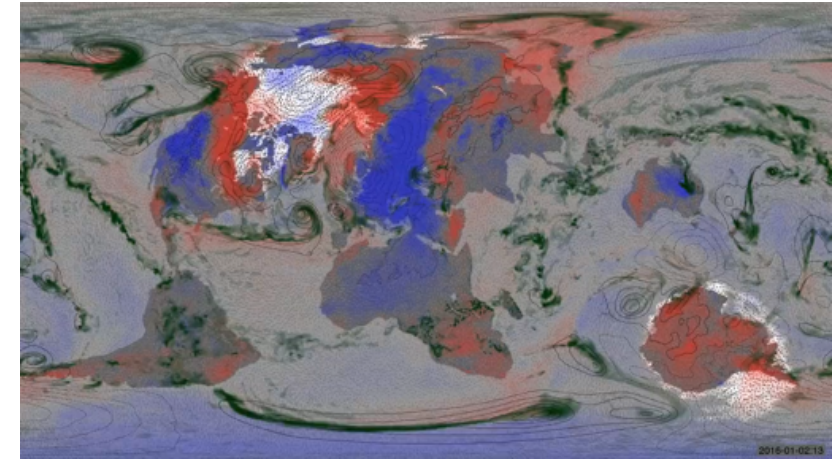
C3S portfolio: past, present and future climate data and information



Observations, climate data
records, ECVs and climate
reanalyses

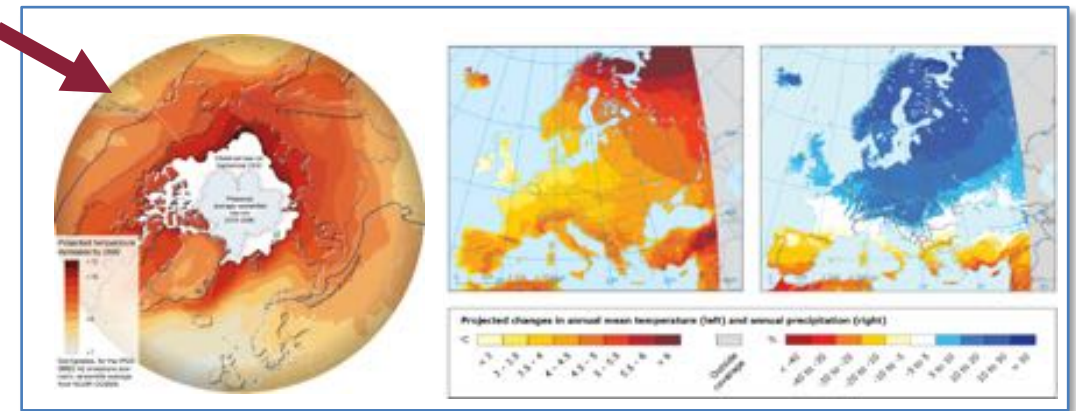
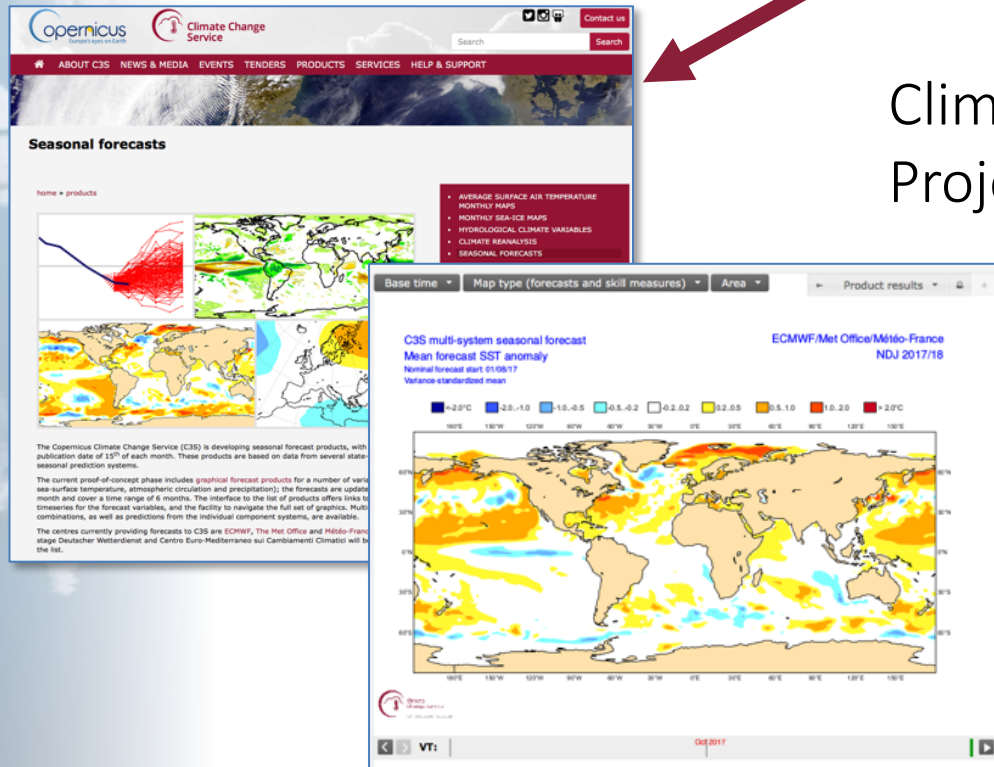
Seasonal forecast data
and products

Climate
Projections



Courtesy: Philip Brohan

Sectoral climate impact indicators



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Copernicus
Europe's eyes on Earth

ECMWF



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Catalogue of climate datasets: uniform look and feel

Home Search Datasets Toolbox Help & support

Search results

Search dataset

Sort by

Relevancy

Product type

- Climate projections (14)
- Reanalysis (2)
- Satellite observations (7)
- Seasonal forecasts (1)
- Sectoral climate indices (2)

Variable domain

- Atmosphere (composition) (1)
- Atmosphere (surface) (1)
- Atmosphere (upper air) (1)
- Land (biosphere) (1)
- Land (cryosphere) (2)
- Land (hydrology) (2)
- Ocean (physics) (2)

Spatial coverage

Temporal coverage

Glaciers elevation and mass change data from 1894 to 2014 from the Fluctuation of Glaciers Database

Glaciers extent data from 1995 to 2015 from the Randolph Glacier Inventory

Methane data from 2002 to present derived from satellite sensors

Sea surface temperature daily gridded data from 1991 to 2010 produced by ESA-CCI

Water quality indicators for European rivers

Water quantity indicators for Europe

CMIP5 daily data on pressure levels

CMIP5 daily data on single levels

CMIP5 monthly data on pressure levels

Seasonal forecast monthly statistics on single levels from 2017 to present

Seasonal forecast monthly statistics on pressure levels from 2017 to present

Seasonal forecast daily data on pressure levels from 2017 to present

ERA5 hourly data on pressure levels from 2000 to present

Seasonal forecast daily data on single levels from 2017 to present



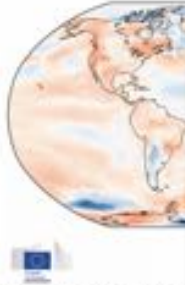
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Transforming data into useful information products

Surface air temperature anomaly for July 2018 relative to 1981-2010



Our mandate

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WMO confirms 2017 among the three warmest years on record

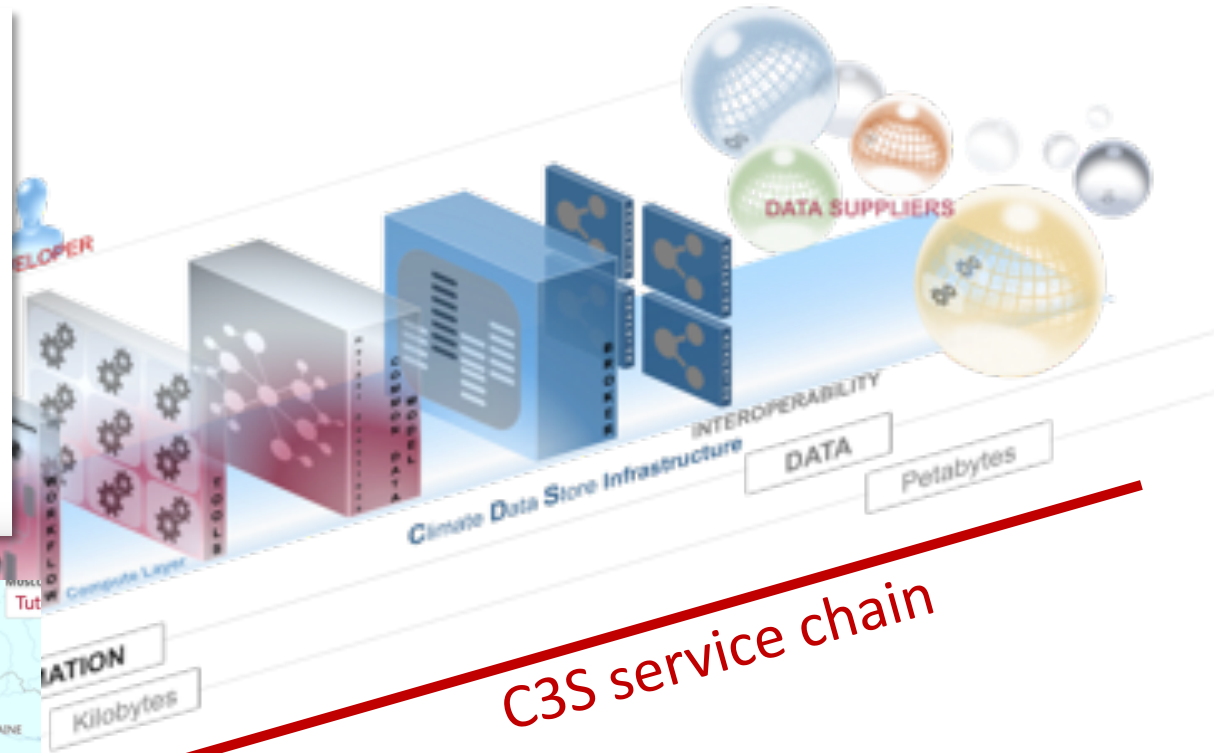
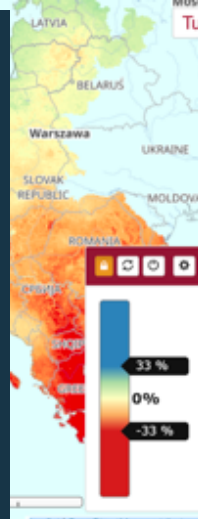
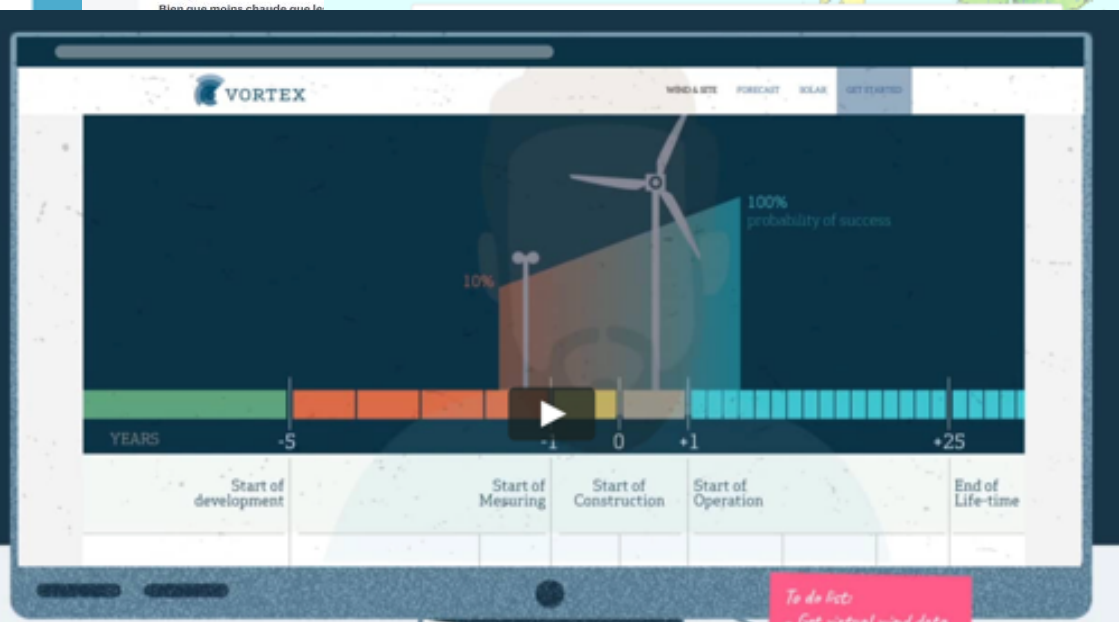
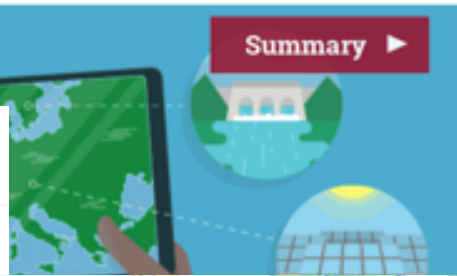


Le Monde

PLANETE - CLIMAT

2018 fut la quatrième année la plus chaude depuis 1850

Bien sûr, mais chaude aussi la



C3S service chain

Quality assured information and tools for scientists, consultants, decision makers.



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Data and information ≠ the endpoint

We are part of a value chain which we need to foster and enable to create value to users

... this does not only happen at the level of data or information but at **knowledge and wisdom**



https://en.wikipedia.org/wiki/DIKW_pyramid

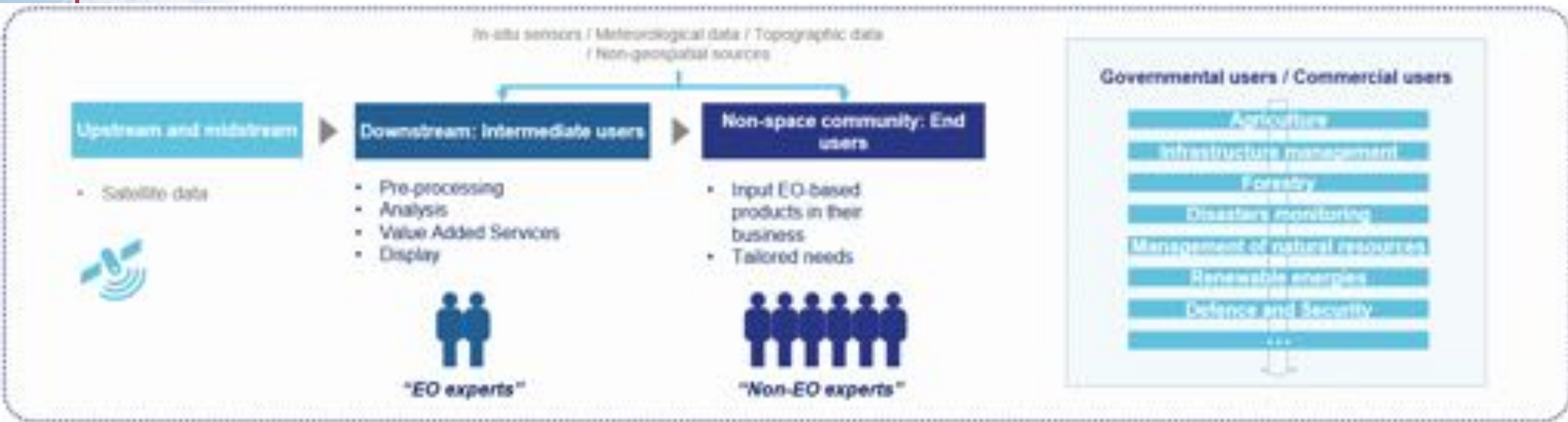


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The value chain from a user perspective

C3S acts as an enabler:

we are part of a solution which in many occasions also requires input from the downstream sector



PwC, Copernicus Market Report, 2019



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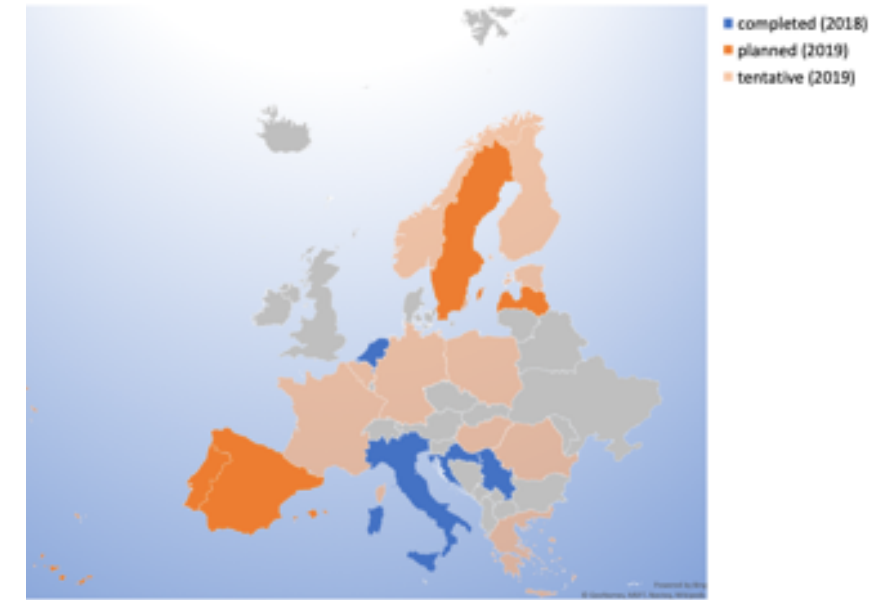
USER LEARNING SERVICES

Focus on the use of the Climate Data Store to address climate change adaptation challenges

Key elements:

- Blended training
- Online training resources freely available anywhere and anytime
- Personalized learning
- 3 main target audiences
- In-country training events in local language in more than 30 EU countries
- Train the trainers to widen the reach of the training and increase the impact

Past, current and future training events



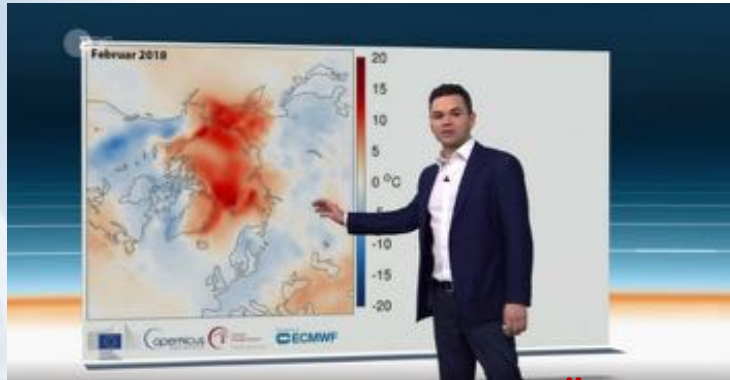
In the pipeline: **the first C3S MOOC**



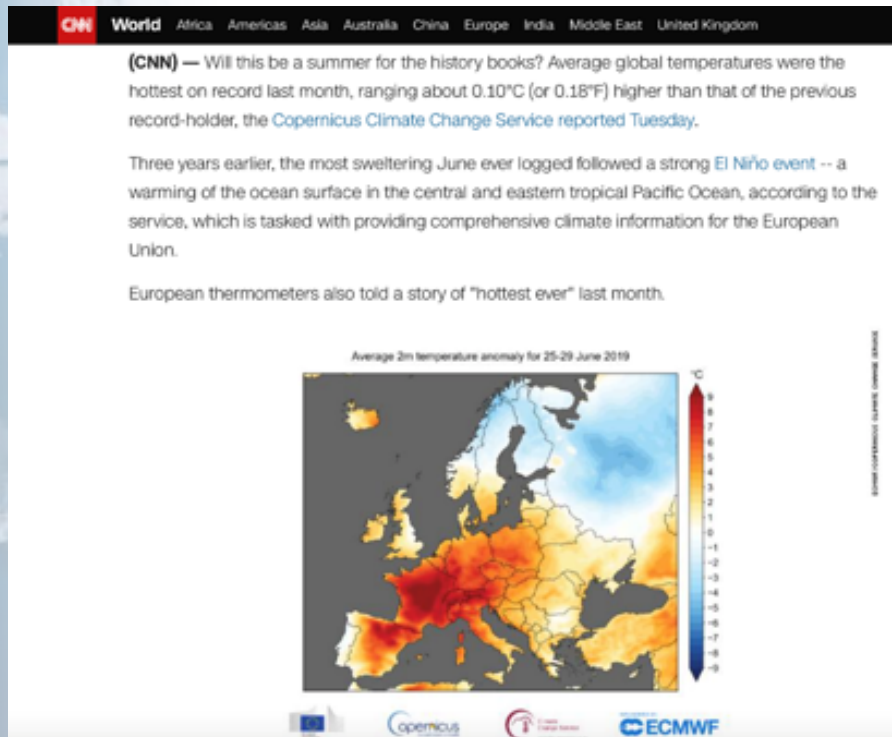


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Examples of user uptake by the media



Credit: ZDF – German State TV, Özden Terli, C3S



CNN, July 2019



BBC, July 2018



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CONCLUSION

C3S: an operational service since summer 2018

C3S benefits from European underpinning research and provides an infrastructure for downstream applications

C3S delivers > 60 Tbytes /day to ~ 25 000 CDS users (total number of users is much higher)

C3S is now a mainstream resource in the media

Huge effort has been made on the infrastructure (CDS), traceability and quality assurance, as well as on training and outreach

C3S acts as an enabler for the climate services market, active User Engagement is part of the future service delivery



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