



Climate Change

Climate Change Service

Implications for climate research and for
the development of useful services

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Climate Change

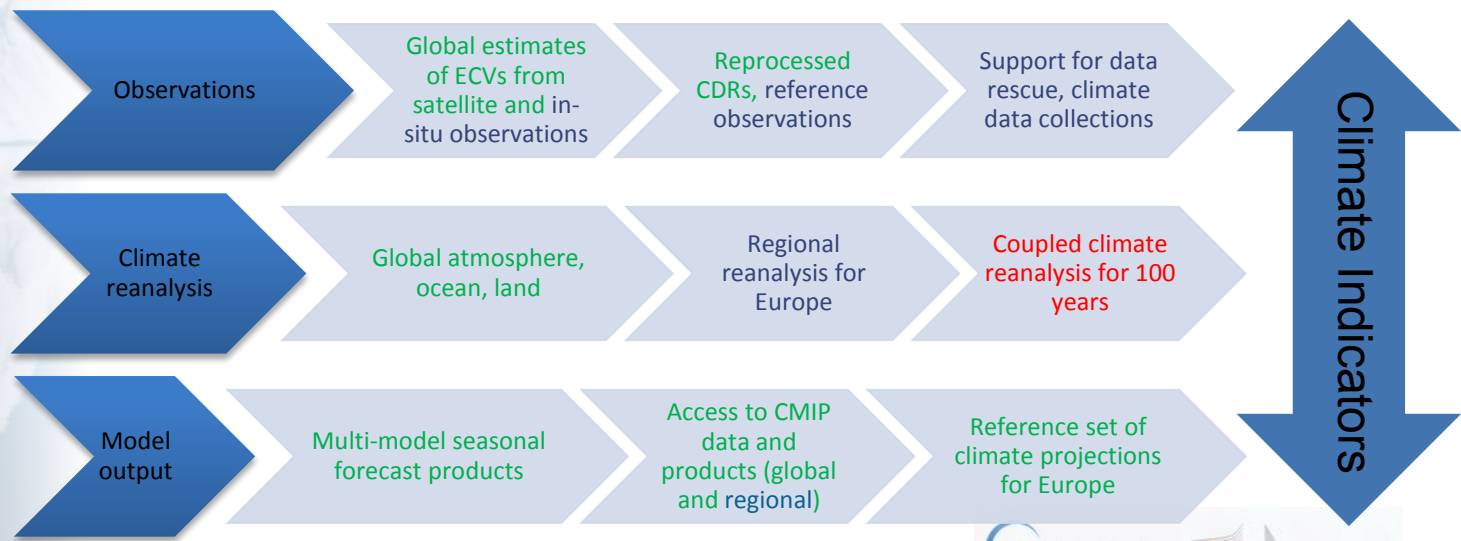
Climate Data Store content



Scientific basis:

- Essential Climate Variables as defined by GCOS
- GCOS Status Report and Implementation Plan
- IPCC, CMIP

- Action engaged
- In preparation (PIN or ITT out)
- Not started





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Climate Data Store: Reanalyses

ERA5 global reanalysis:

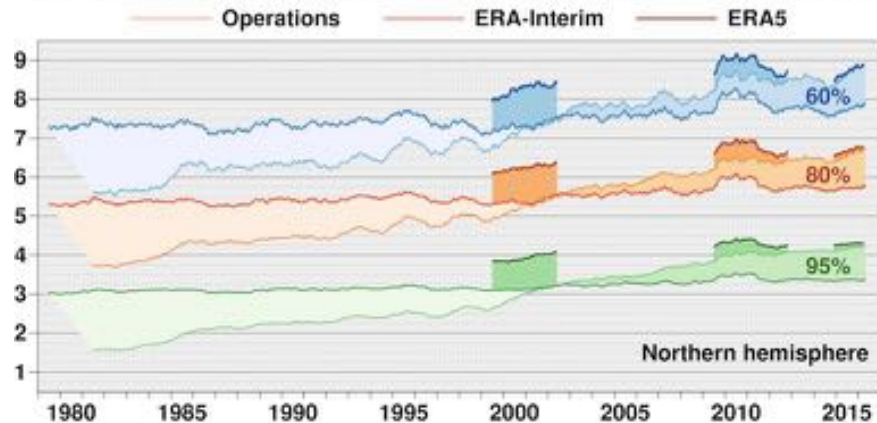
- Atmosphere/land/wave parameters
- 31 km global resolution, 137 levels
- Hourly output from 1979 onward
- Based on IFS Cy41r2 (March 2016)
- Using improved input observations
- Ensemble data assimilation
- Providing uncertainty estimates

Regional reanalysis:

- European + Arctic domains
- Higher spatial resolution
- Workshop organised 2016 Q2
- Competitive call issued 2016 Q4, bids under evaluation

EUMETSAT
reprocessing
activity

Range (days) when 365-day mean 500hPa height AC (%) falls below threshold





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Seasonal forecasts - content

Variables:

- sea-level pressure
- geopotential height
- precipitation
- air temperature

Type of plots:

- maps:
 - global
 - pre-defined regions
- time series

Publication schedule:

- monthly updates
- published on each 15th

The screenshot displays the Copernicus Climate Change Service website. The main heading is "C3S seasonal charts". On the left, there is a filter panel with the following sections:

- Filters:** A search box.
- Parameters:** Radio buttons for WSP (4), SST (3), Tm (4), T850 (4), geopotential height 500hPa (4), and precipitation (4).
- Plot type:** Radio buttons for Maps (24) and Time series (8).
- Centres:** Radio buttons for C3S Multi-system (1), ECMWF (1), Met Office (1), and Meteo-France (1).

The main content area shows a grid of 20 matching items, each with a small thumbnail image representing a forecast chart. The items are organized by system and parameter, such as "C3S Multi-system WSP", "ECMWF WSP", "Met Office WSP", etc.



CDS infrastructure and tool box

CDS infrastructure (Telespazio UK):
alpha version Jan 2017, beta version
summer 2017

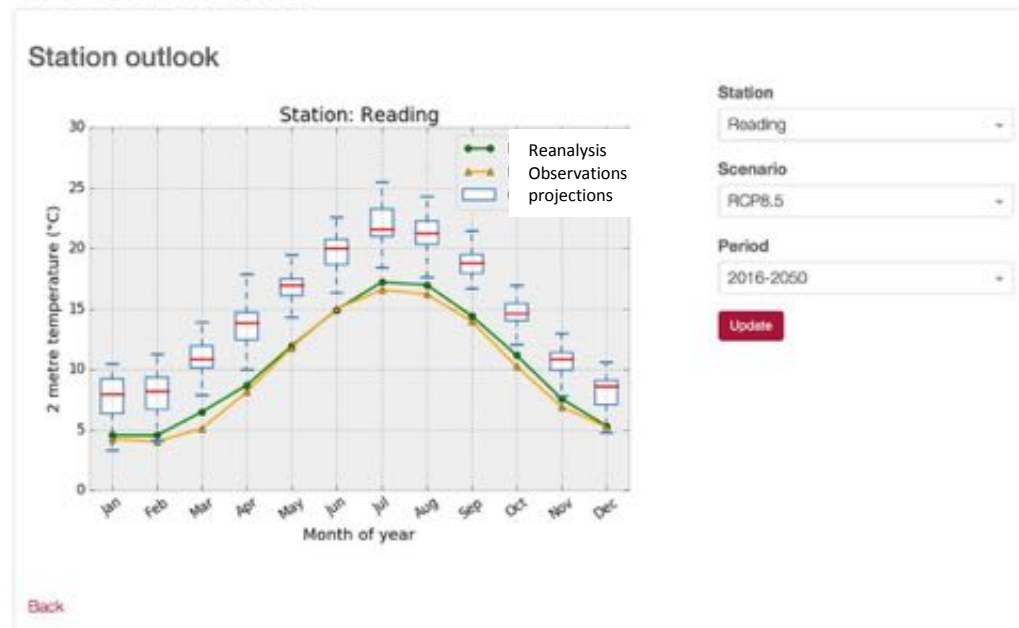
CDS toolbox (B-open, IT): incremental
until 2019

Technical challenges:

- Diversity of users
- Diversity of data sets
- Very large data volumes
- Data residing at different locations
- Interoperability, efficiency
- User-defined workflows
- Variety of presentation methods
- Need for interactivity
- Access via API
- User management
- Performance monitoring



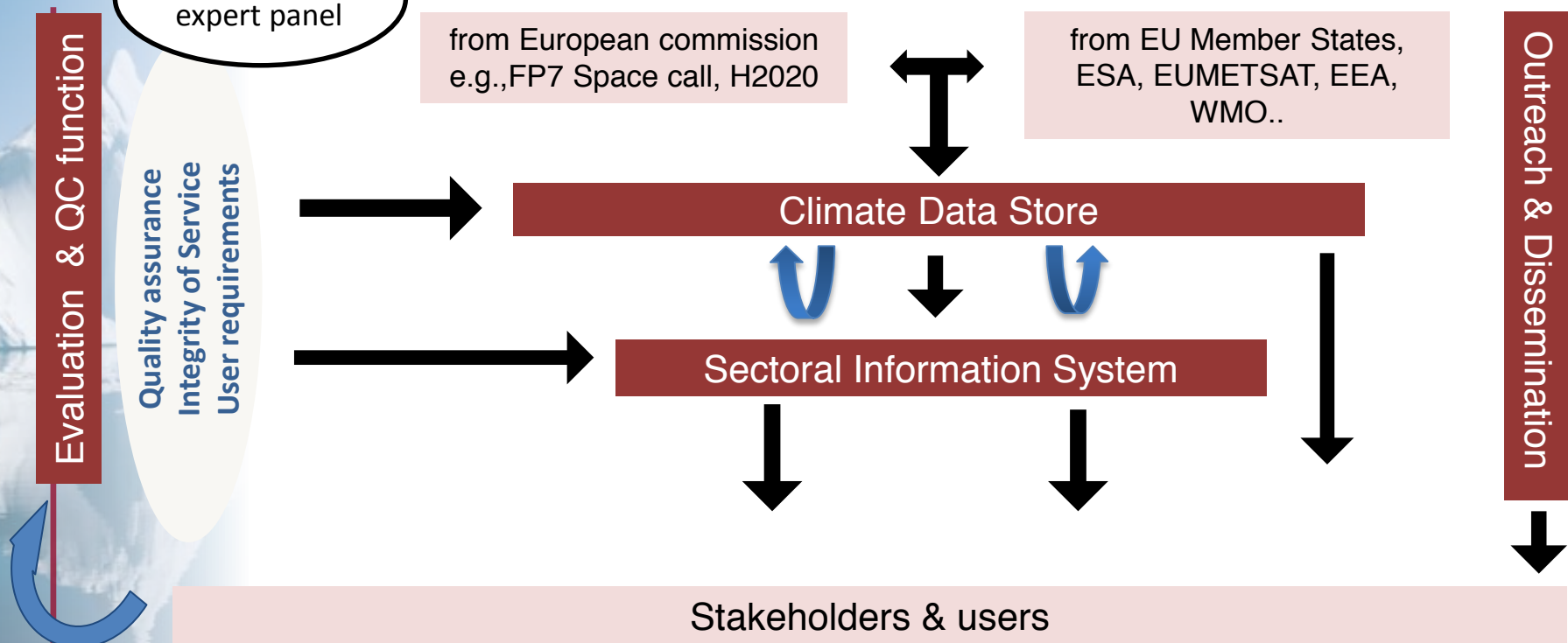
CDS Toolbox demo.





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C3S in a nutshell





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Sectoral Information System

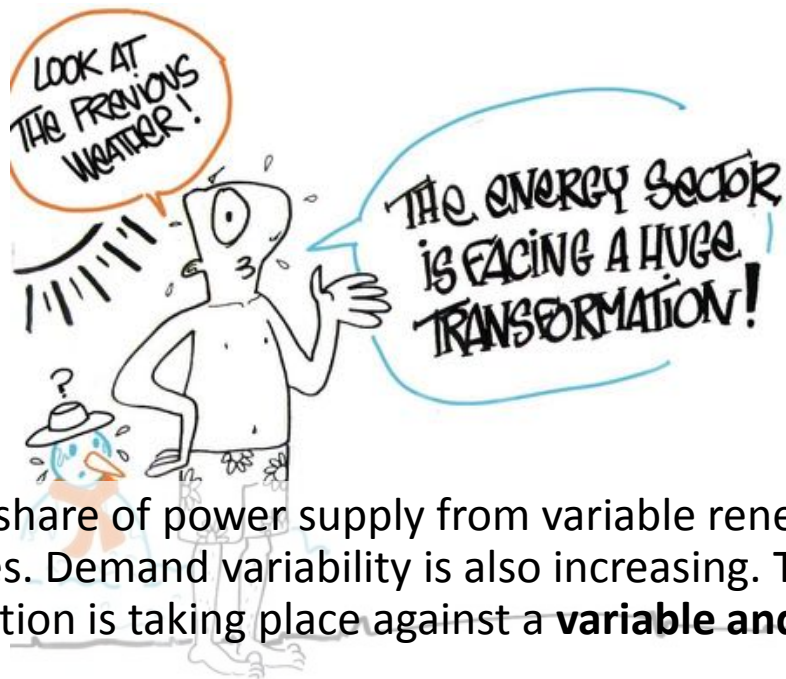
WHAT WILL THE INFORMATION BE USED FOR?

The wealth of climate information will be the basis for generating a wide variety of climate indicators aimed at supporting adaptation and mitigation policies in Europe in a number of sectors. These include, but are not limited to, the following:



C3S WILL DELIVER SUBSTANTIAL 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



- Increasing share of power supply from variable renewable energy (RE) sources. Demand variability is also increasing. The transformation is taking place against a **variable and changing climate**.

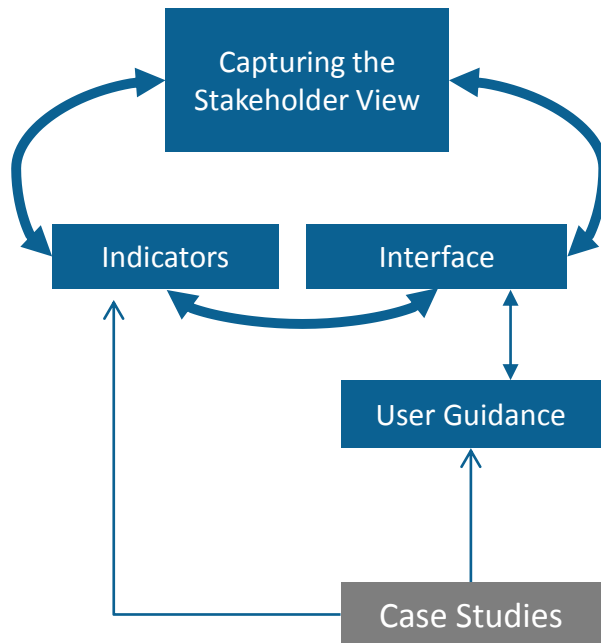


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Focus Groups

Stakeholder
Engagement

Evidence Gathering



Deliverables

SC Impact Indicators
User friendly interface
User guidance
Technical reports
Case Study fact sheets
Model output



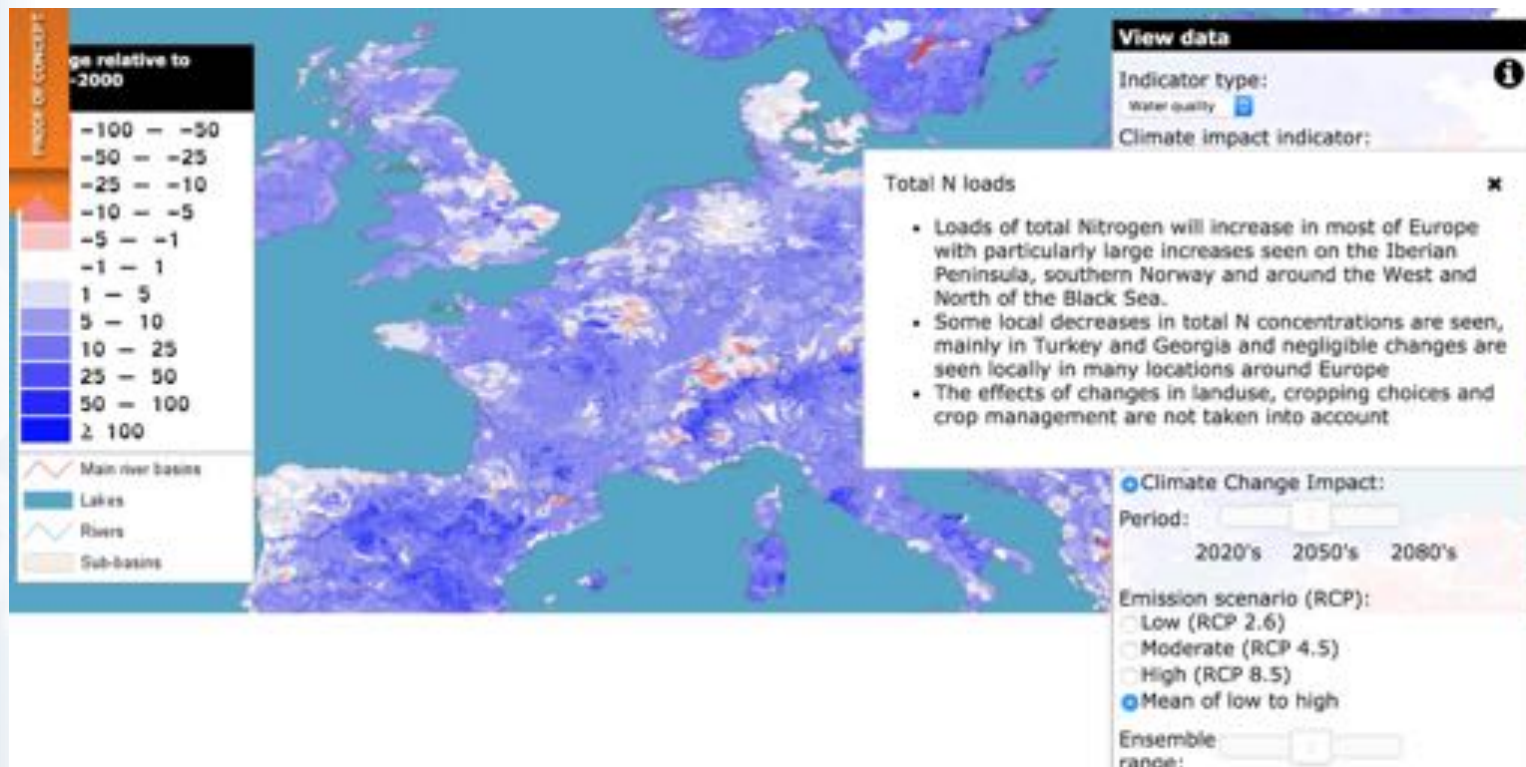
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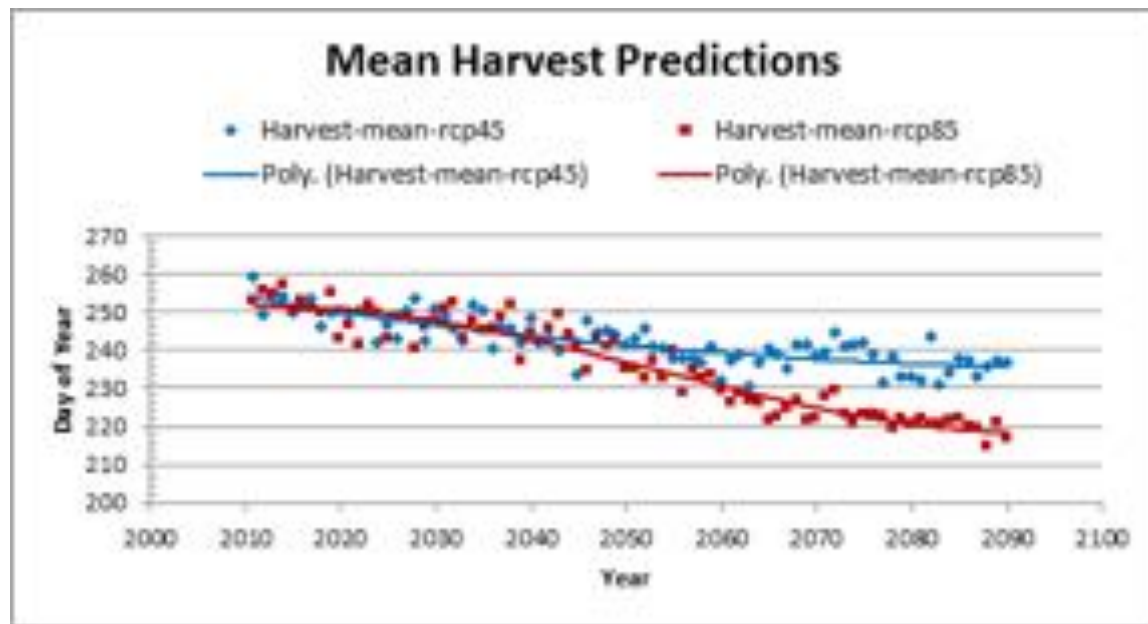
User relevant parameter for water





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Preliminary results: vines



Predicted harvest date advances by 18 days (RCP4.5) and 32 days (RCP8.5)



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Useful services

- If we don't want to become a solution in search of a problem we should not pre-empt the discussion with the users.
- This means:
 - Skill/quality is (also) in the eye of the beholder
 - The art of discovering the unknown knowns (e.g. Mark Payne and fish quotas) is time consuming
- Can the often cited user-fatigue be simply a results of sub-optimal (if not totally irrelevant) products and services?



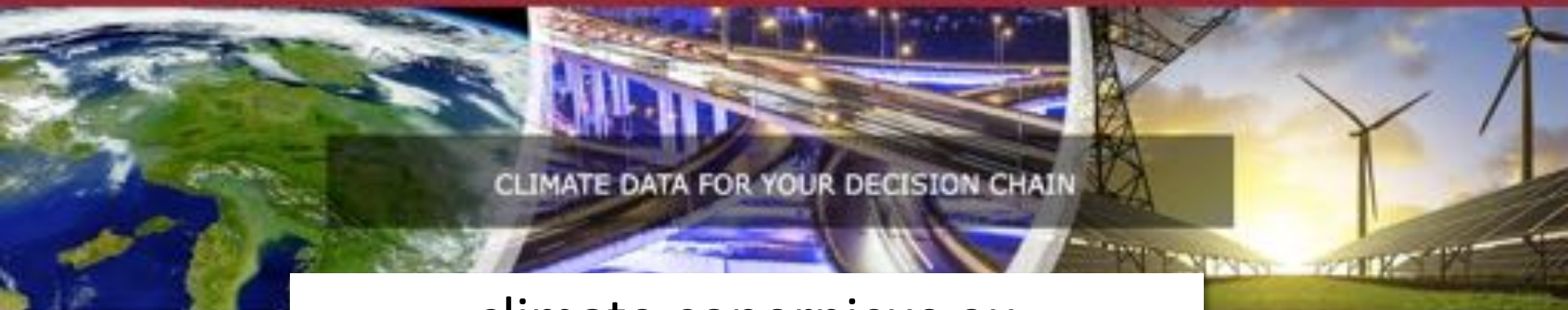
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Climate research for services

- Not all research needs to serve the needs of the services!
- For the service relevant science: we need to first understand the needs of the users and then translate them, whenever appropriate, in fundamental research and technology challenges (e.g. SwissRe).

Some possible challenges:

- Development of meaningful high-resolution field
- Skill/quality based on users' next best alternative
- Definition of “present-day climate” in a non-stationary climate



CLIMATE DATA FOR YOUR DECISION CHAIN

climate.copernicus.eu

IN FOCUS



#OpenDataHack @ECMWF - explore creative uses of open data

13 Dec 2016

MONTHLY MAPS



Average surface air temperatures for November 2016

November 2016

NEWS



13 Dec 2016
#OpenDataHack @ECMWF - explore creative uses of open data



06 Dec 2016
Report Assesses Variations in Global Warming



28 Nov 2016
Copernicus at Wismar