Copernicus Climate Change Service – C3S

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C3S vision

- To be an authoritative source of climate information for Europe
- To build upon national investments and complement national climate service providers
- To support the market for climate services in Europe
The basic questions:

How is the climate changing?
- Earth observations
- Reanalyses

How will climate change in future?
- Predictions
- Projections

How will it impact society?
- Climate indicators
- Sectoral information
C3S components

**Climate Data Store**
- ECVs past, present and future
- Observed, reanalysed and simulated
- Derived climate indicators
- Tools to support adaptation and mitigation at global and European level

**Sectoral Information System**

**Evaluation and Quality Control**
- Monitors quality of C3S products and services
- Ensures C3S delivers state-of-the-art climate information to end-users
- Identifies gaps in service provision
- Bridges Copernicus with the research agenda in Europe (e.g. H2020, national research projects)

**Outreach and Dissemination**
- Web content
- Public outreach
- Coordination with national outreach
- Liaison with public authorities
- Conferences, seminars
- Training and education
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
Development of CDS software infrastructure

2016 Q1: Start of contract

2016 Q3: Initial release of working prototype for limited testing

2017 Q1: First functional release exposed to a large user group, then quarterly releases with added functionality

2018 Q1: Final release

Development of CDS toolbox

2016 Q2: Start of contract
Scientific basis:
- Essential Climate Variables as defined by GCOS
- GCOS Status Report (GCOS-195)
- IPCC, CMIP

Observations
- Global estimates of ECVs from satellite and in-situ observations
- Reprocessed CDRs, reference observations
- Support for data rescue, climate data collections

Climate reanalysis
- Global atmosphere, ocean, land
- Regional reanalysis for Europe
- Coupled climate reanalysis for 100 years

Model output
- Multi-model seasonal forecast products
- Access to CMIP data and products
- Reference set of climate projections for Europe
## Climate Data Store

### Work in progress

1 Feb 2016

- **Services in development**
  - Data access via ECMWF/providers

### ECV roadmap for C3S

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Global reanalysis:

ERA5 is now in production
- 32km global resolution
- Uncertainty estimates
- Improved use of observations
- Newly reprocessed satellite data
- Hourly data from 1979-NRT
- Access to all input observations

Regional reanalysis:

- European domain
- Higher spatial resolution
- Workshop planned for 2016 Q2
- Competitive call by 2016 Q4
Sectoral Information System

Proof of concept development for sectoral applications

Copernicus Climate Change Service

Coastal Areas

Infrastructure

Health

Energy

Water Management

Transport

Tourism

Agriculture & Forestry

Disaster Risk Reduction

Insurance
The SIS concept

1. Water Manager has climate issue
2. Water Manager consults Purveyor
3. Purveyor understands issue and goes to C3S
4. Purveyor consults Data provider/CDS

5. Data provider search and extracts data to Purveyor
6. Purveyor tailors, downscales, merges, repurposes datasets
7. Purveyor extracts, explains, visualises relevant information to water manager

8. Water manager makes decision and business improves!

9. Purveyor reports on needed climate indicators to data provider
10. Data Provider produces new pan-EU climate indicators
11. New climate indicators are readily available in C3S and CDS
12. Purveyor can extend business with more clients!

Water manager
Purveyor
Data Provider (C3S)
The Copernicus Climate Change Service (C3S) will combine observations of the climate system with the latest science to develop authoritative, quality-assured information about the past, current and future states of the climate in Europe and worldwide.

IN FOCUS

C3S Climate Data Store presentation at the AMS 96th Annual Meeting in New Orleans
13 Jan 2016

MONTHLY MAPS

Average surface air temperatures for December 2015
December 2015

NEWS

13 Jan 2016
C3S Climate Data Store presentation at the AMS 96th Annual Meeting in New Orleans

08 Jan 2016
Copernicus documents record warmth of 2015

09 Dec 2015
Copernicus predicts 2015 to be an all-time record year