CORDEX data in the Climate Data Store (CDS) of the Copernicus Climate Change Service (C3S): current status and plans

András Horányi

(Andras.Horanyi@ecmwf.int)

Anca Brookshaw, Cedric Bergeron, Carlo Buontempo

Climate Change

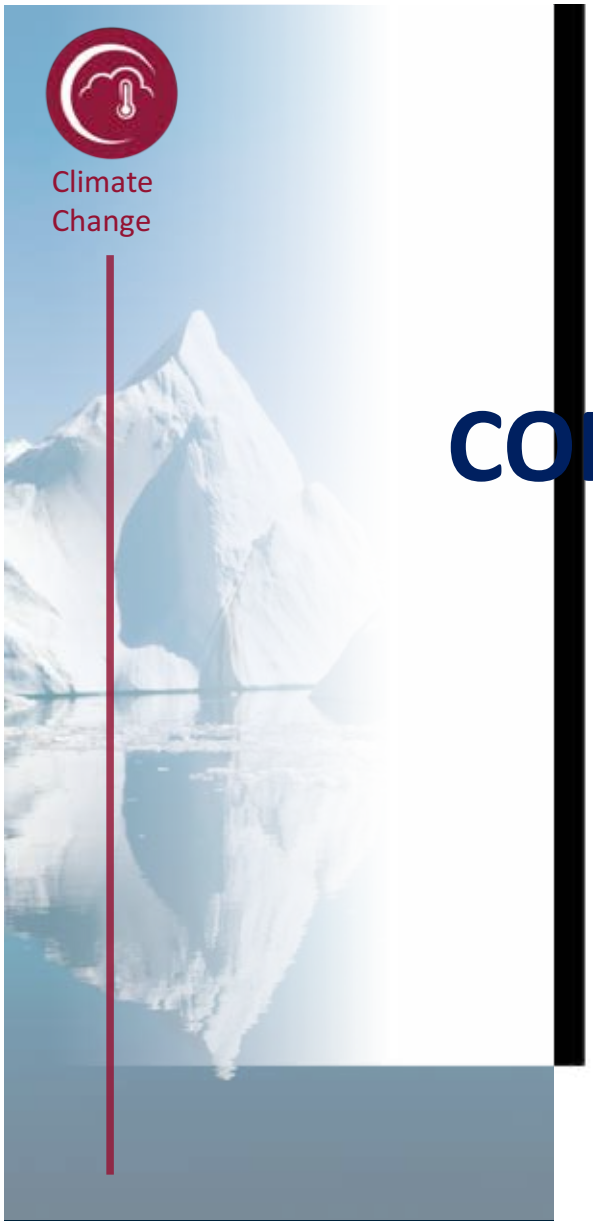
European Centre for Medium-Range Weather Forecasts (ECMWF)

Climate Change

Overview

- Copernicus Climate Change Service (C3S)
- Climate Data Store (CDS) and Toolbox
- CORDEX datasets published in the CDS
- Future plans, next steps

ECMWF Copernicus Europe's eyes on Earth European Commission



COPERNICUS CLIMATE CHANGE SERVICE (C3S)

ECMWF Copernicus Europe's eyes on Earth European Commission

Copernicus Climate Change Service (C3S)

Aim: to be an authoritative source of climate information for Europe
(building on national investments and complement national climate service providers

Financed by the European Union

Past: how the climate is changing?

Observations & Reanalysis

What are the societal impacts?

Climate indicators & Sectoral information

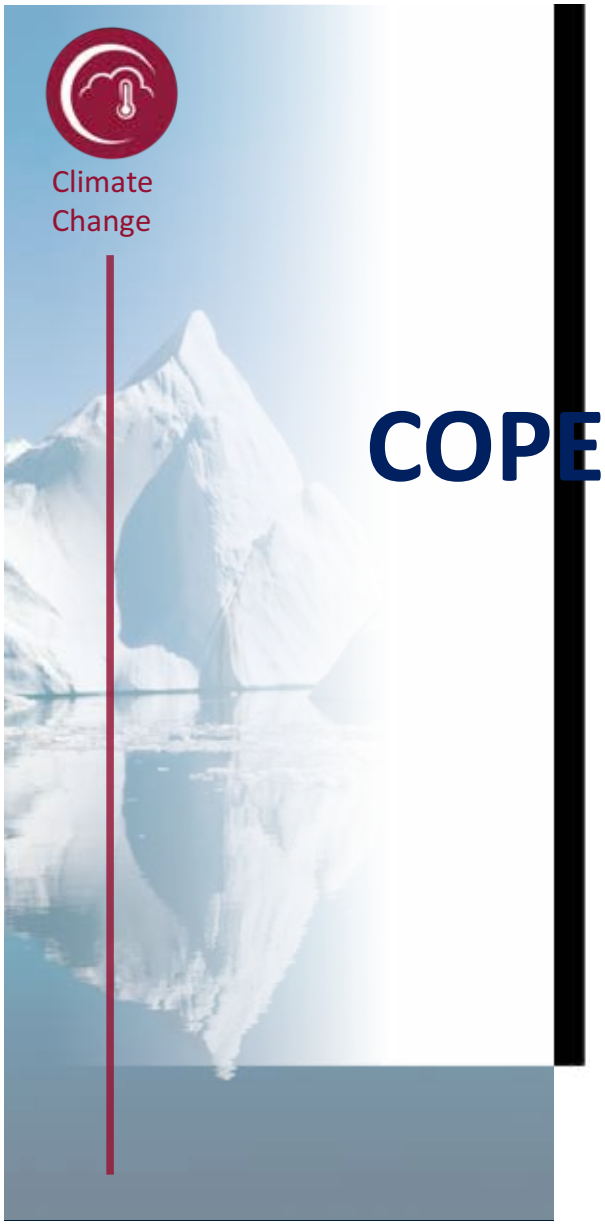
Future: How the climate change will evolve in the future?

Forecasts & Projections

Free and open access to climate data and tools based on the best available science

http://climate.copernicus.eu/

ECMWF Copernicus Europe's eyes on Earth European Commission



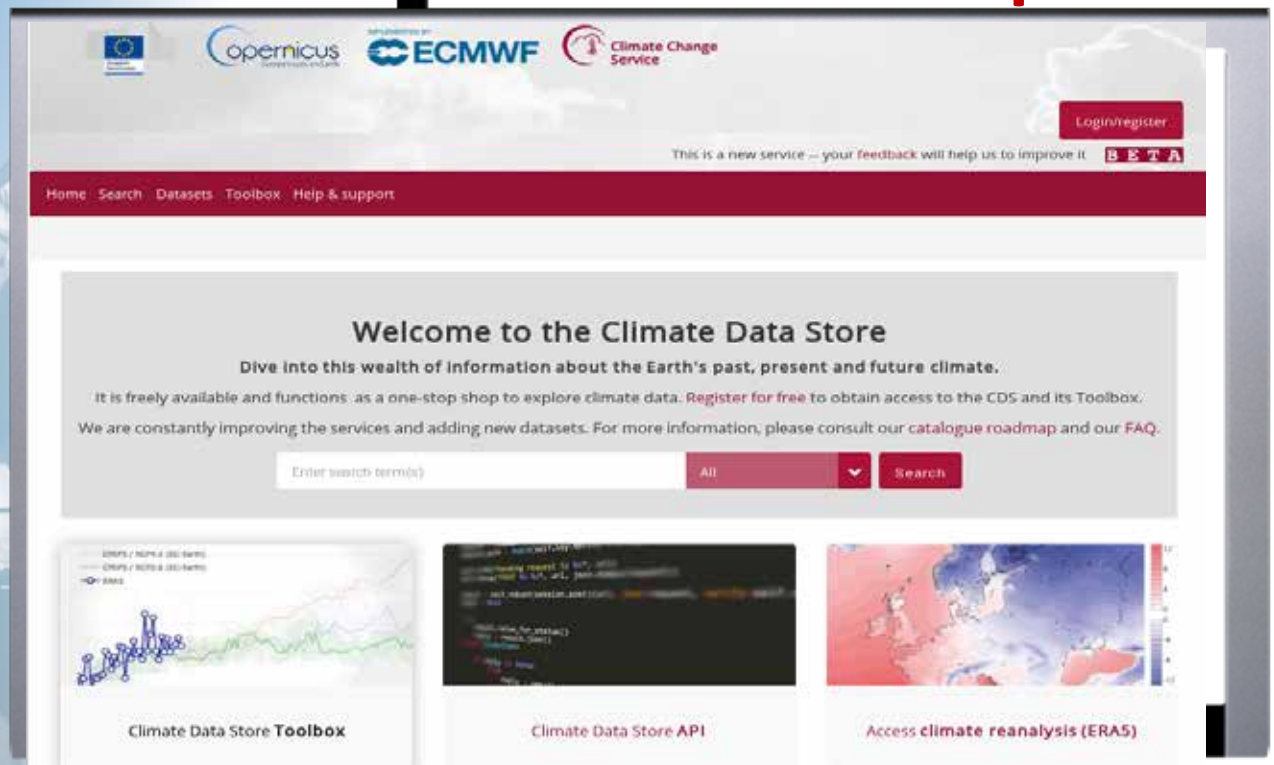
COPERNICUS CLIMATE DATA STORE (CDS) AND TOOLBOX

ECMWF Copernicus Europe's eyes on Earth European Commission

Climate Change

Climate Data Store (CDS) – free data access

cds.climate.copernicus.eu



The CDS contains **observations**, global and regional **climate reanalyses**, global and regional **climate projections** and **seasonal forecasts.** It also contains generic and **sectoral climate indicators.**

The CDS is designed as a **distributed system**, providing improved access to **existing datasets** through a **unified web interface.**

ECMWF Copernicus Europe's eyes on Earth European Commission

Content of the Climate Data Store

Climate Change

Scientific basis:

- Essential Climate Variables as defined by GCOS
- GCOS Status Report (GCOS-195)
- **IPCC, CMIP, CORDEX**

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 Indicators

ECMWF Copernicus Europe's eyes on Earth

European Commission

CORDEX DATASETS PUBLISHED IN THE CDS

ECMWF Copernicus Europe's eyes on Earth European Commission

Climate Change

C D S . C L I M A T E . C O P E R N I C U S . E U

Search results

CORDEX

Sort by

Relevancy

Title

Type

Product type

All | Datasets

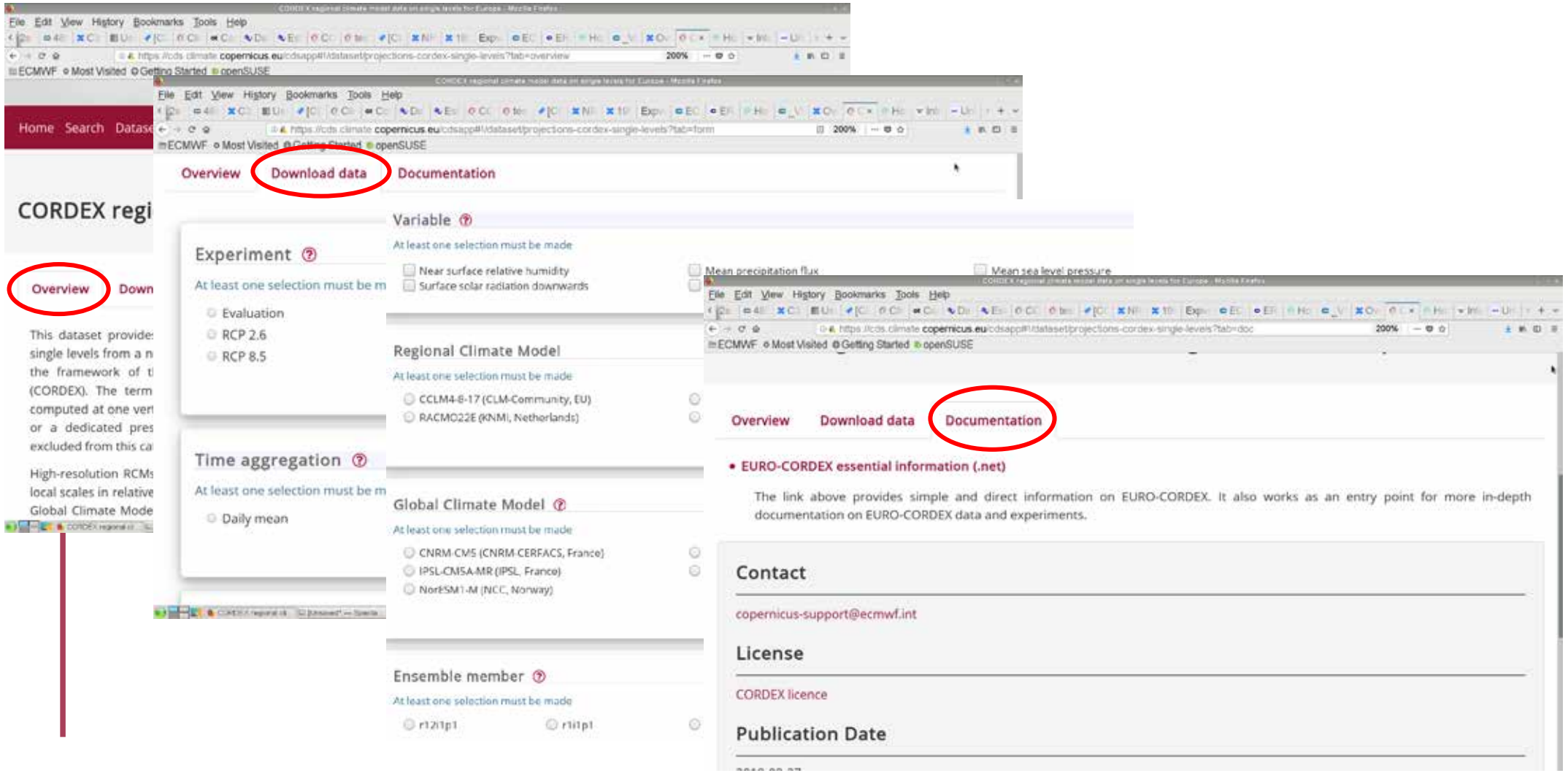
Showing 1-1 of 1 results for **CORDEX** x

CORDEX regional climate model data on single levels for Europe

CORDEX regional climate model data on single levels for Europe

ECMWF Copernicus Europe's eyes on Earth European Commission

CORDEX DATA IN THE CDS (ONLY FOR EUROPE FOR THE TIME BEING)



Note:

- There is also an option to use API (Application Program Interface) requests
- There is a related CDS Toolbox to compute basic diagnostics on the data

CORDEX DOWNLOAD STATISTICS

Active users	Number of completed requests	Number of failed requests	Retrieved volume in GB
67	2,136	154	1,145.19 GB

Retrieved volumes (GB) by product

Number of requests by product

Geographical distribution of Active users

Top users (Volume in GB)

User	Requests	Volume
18309 - Unknown - Spain - private	2076	888.33
21655 - IEA - United Kingdom - private	42	123.46
19239 - Cerema - France - public	16	21.53
4958 - Aistech Space SL - Spain - private	9	15.19
24349 - Ansee Consulting - Poland - private	1	14.07
22942 - Fédération des Réserves Naturelles Catalanes - France - other	1	11.62
642 - Unknown - Luxembourg - public	2	8.78
14952 - Unknown - Luxembourg - academic	1	7.17
23181 - Slovenian Environment Agency - Slovenia - public	33	5.58
24726 - Mr - Ireland - academic	1	3.93

Climate Change

CORDEX IN THE CDS: INFRASTRUCTURE

The CORDEX datasets in the CDS are available from dedicated ESGF (Earth System Grid Federation) nodes through the CDS portal (cds.climate.copernicus.eu)

- Behind the portal the data are replicated into 3 ESGF nodes (IPSL-France, STFC-United Kingdom, DKRZ – Germany)

- A load balance is ensured among the 3 sites to get an optimal quick and reliable access for the users

ECMWF Copernicus Europe's eyes on Earth European Commission

Climate Change

CORDEX IN THE CDS: ADDITIONAL EXPERIMENTS

Additional experiments are being funded by C3S to extend the CORDEX information in terms of addressing uncertainties (RCP/GCM/RCM ma

RCP8.5	RCA4	CcrCLM	REMO 09,15	RACMO22E	HIRHAM5	WRF381P	ALADIN63	RegCM4.6.1	HadGEM3-RA	Total now
MOHC-HadGEM2-ES	1		1	1	1*	#	#	*	*	6
ICHEC-EC-EARTH	1##		1	2#	1##				#	6
CNRM-CERFACS-CNRM-CM5	1		1	1*	#		*			4
NCC-NorESM1-M	1*	*	*	#	1	#				3
MPI-M-MPI-ESM-LR	1	1##	2#					#		3
IPSL-IPSL-CM5A-MR	1					1*				2
CCCma-CanESM2			1							1
MIROC-MIROC5			1							1
Current status	6	2	8	4	3	1	1	1	1	27
Remaining	4	7	2	4	5	5	3	4	4	37
RCP4.5	RCA4	CcrCLM	REMO 09,15	RACMO22E	HIRHAM5	WRF381P	ALADIN63	RegCM4.6.1	HadGEM3-RA	Total now
MOHC-HadGEM2-ES	1			1						2
ICHEC-EC-EARTH	1			2	1					4
CNRM-CERFACS-CNRM-CM5	1									1
NCC-NorESM1-M					1					1
MPI-M-MPI-ESM-LR	1		2							3
IPSL-IPSL-CM5A-MR	1									1
Current status	4	0	2	3	2	0	0	0	0	12
Remaining	0	0	3	0	1	0	1	0	0	5
RCP2.6	RCA4	CcrCLM	REMO 09,15	RACMO22E	HIRHAM5	WRF381P	ALADIN63	RegCM4.6.1	HadGEM3-RA	Total now
MOHC-HadGEM2-ES	1		1	1				#		3
ICHEC-EC-EARTH	1		1	1	1					4
CNRM-CERFACS-CNRM-CM5							#			0
NCC-NorESM1-M	#									0
MPI-M-MPI-ESM-LR	1		2							3
IPSL-IPSL-CM5A-MR										0
Current status	3	0	4	2	1	0	0	0	0	10
Remaining	2	0	2	2	2	0	1	2	2	15
Total outside PRINCIPLES	13	1	13	8	5	0	0	0	0	40
Remaining all RCPs	6	7	7	6	8	5	5	5	6	55
SC1 already counted	1	1	1	1	1	1	1	1	1	9
SC2 commitment	3	2	2	2	3	2	2	2	1	19
PRINCIPLES total	7	8	8	7	9	6	6	7	7	65
Maximum commitment	10	10	10	10	10	7	7	7	8	
Grand total	20	9	21	15	14	6	6	7	7	105

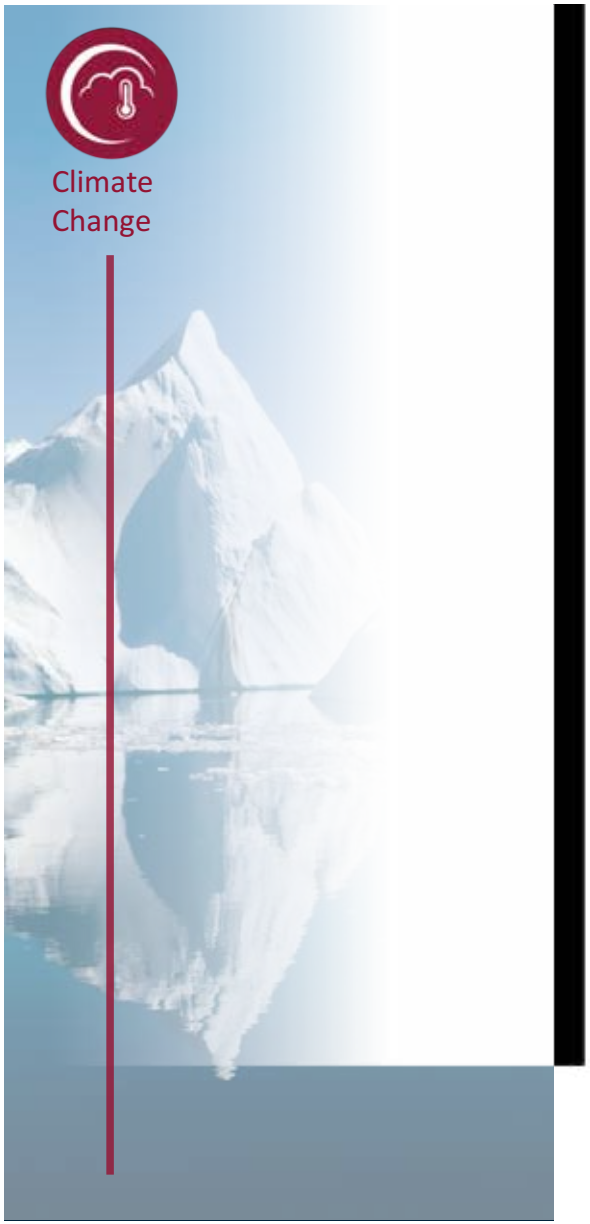
European Commission

Climate Change

CORDEX IN THE CDS: WHY TO USE THEM?

- It is true that the data are available elsewhere, BUT in the CDS
  - New RCM experiments are available by additional C3S funding
  - CORDEX data traceability had been improved (persistent identifiers)
  - Available together with other climate service datasets
  - CDS Toolbox is also available for simple data manipulations
  - Free User Support is available in case of questions

ECMWF opernicus Europe's eyes on Earth European Commission



FUTURE PLANS

ECMWF Copernicus Europe's eyes on Earth European Commission

Climate Change

NEXT STEPS

- More data to be published, particularly the additional ones produced by C3S (contracts)
  - Seasonal means, 6-hourly or 3-hourly data
- MED-CORDEX domain in the near future (next year)
- Some additional tools like interpolation and boundary condition extraction from GCMs is planned to be provided too
- Addition of non-European CORDEX domains until the end of 2020

ECMWF Copernicus Europe's eyes on Earth European Commission