

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



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Overview

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



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COPERNICUS CLIMATE CHANGE SERVICE (C3S)



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/>





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COPERNICUS CLIMATE DATA STORE (CDS) AND TOOLBOX



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Climate Data Store (CDS) – free data access

cds.climate.copernicus.eu

The screenshot shows the homepage of the Climate Data Store. At the top, there are logos for the European Union, Copernicus, ECMWF, and the Climate Change Service. A 'Login/register' button is visible in the top right. Below the logos, a navigation bar includes 'Home', 'Search', 'Datasets', 'Toolbox', and 'Help & support'. The main content area features a large heading 'Welcome to the Climate Data Store' followed by a sub-heading 'Dive into this wealth of information about the Earth's past, present and future climate.' Below this, there is a paragraph explaining that the service is freely available and functions as a one-stop shop for exploring climate data, with a link to 'Register for free'. A search bar with the placeholder text 'Enter search terms()' and a 'Search' button is present. At the bottom, there are three featured sections: 'Climate Data Store Toolbox' with a line graph, 'Climate Data Store API' with a code snippet, and 'Access climate reanalysis (ERA5)' with a map of Europe.

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**.



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Content of the Climate Data Store



Scientific basis:

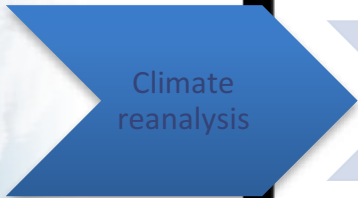
- Essential Climate Variables as defined by GCOS
- GCOS Status Report (GCOS-195)
- IPCC, CMIP, CORDEX



Global estimates of ECVs from satellite and in-situ observations

Reprocessed CDRs, reference observations

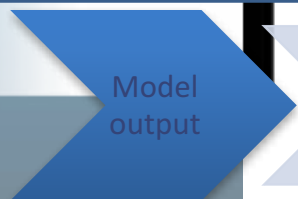
Support for data rescue, climate data collections



Global atmosphere, ocean, land

Regional reanalysis for Europe

Coupled climate reanalysis for 100 years



Multi-model seasonal forecast products

Access to CMIP data and products

Reference set of climate projections for Europe





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CORDEX DATASETS PUBLISHED IN THE CDS



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Search results

CORDEX



All

Datasets

Sort by

Relevancy

Title

Type

Product type

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



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

The screenshot displays the Copernicus Data Store (CDS) interface for the CORDEX dataset. The main navigation tabs are 'Overview', 'Download data', and 'Documentation'. The 'Download data' and 'Documentation' tabs are circled in red. The 'Overview' tab is selected, showing a list of variables and filters for Experiment, Regional Climate Model, Global Climate Model, and Ensemble member. A red line points from the 'Overview' tab to a text box on the left.

Overview Download

This dataset provides single levels from a number of experiments in the framework of the CORDEX. The term 'CORDEX' is used to refer to the data computed at one vertical level or a dedicated pressure level excluded from this category.

High-resolution RCMs at local scales in relative to the Global Climate Model.

Variable

At least one selection must be made

- Near surface relative humidity
- Surface solar radiation downwards
- Mean precipitation flux
- Mean sea level pressure

Experiment

At least one selection must be made

- Evaluation
- RCP 2.6
- RCP 8.5

Regional Climate Model

At least one selection must be made

- CCLM4-8-17 (CLM-Community, EU)
- RACMO22E (KNM, Netherlands)

Global Climate Model

At least one selection must be made

- CNRM-CM5 (CNRM-CERFACS, France)
- IPSL-CM5A-MR (IPSL, France)
- NorESM1-M (NCC, Norway)

Ensemble member

At least one selection must be made

- r12i1p1
- r1i1p1

Documentation

- **EURO-CORDEX essential information (.net)**

The link above provides simple and direct information on EURO-CORDEX. It also works as an entry point for more in-depth documentation on EURO-CORDEX data and experiments.

Contact

copernicus-support@ecmwf.int

License

CORDEX licence

Publication Date



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CDS.CLIMATE.COPERNICUS.EU

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

67

Number of completed requests

2,136

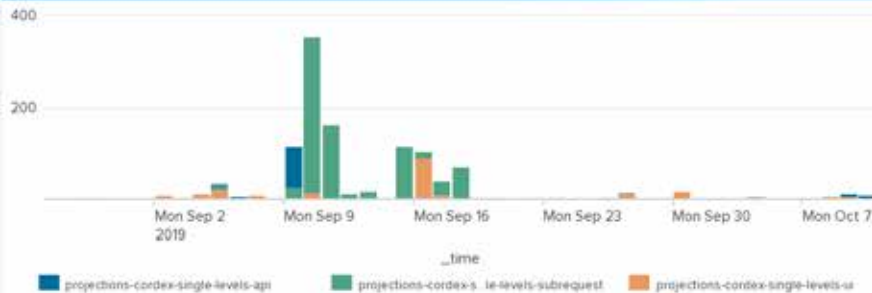
Number of failed requests

154

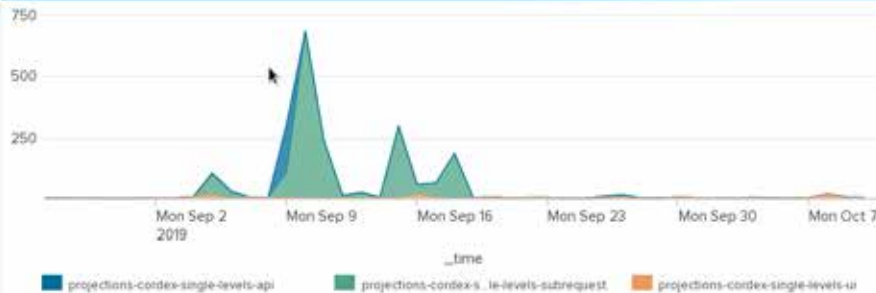
Retrieved volume in GB

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	14.87
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



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C O R D E X I N T H E C D S : I N F R A S T R U C T U R E

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**





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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-MIROCS			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



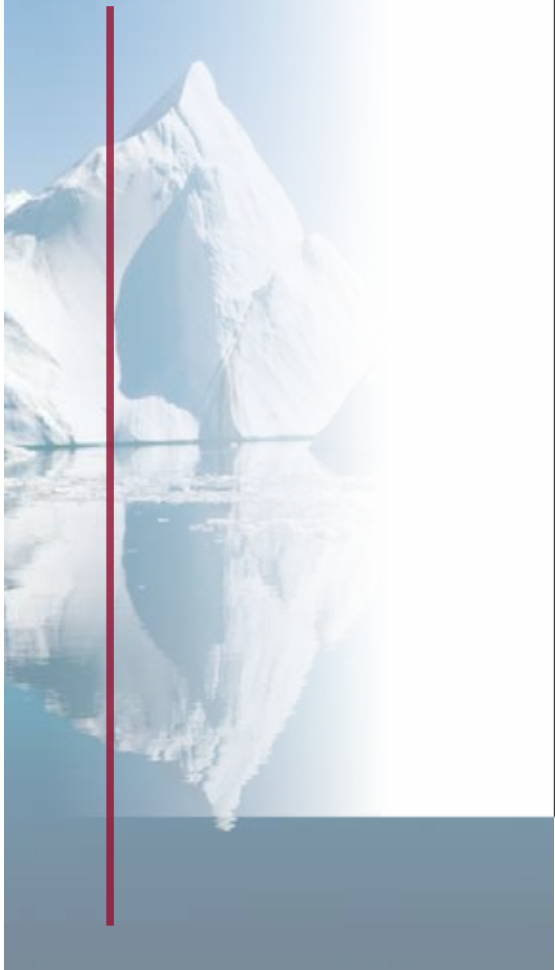
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CORDEX IN THE CDS: WHY TO USE THEM?

- **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**



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FUTURE PLANS



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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**