



Climate Change

The Copernicus Climate Data Store

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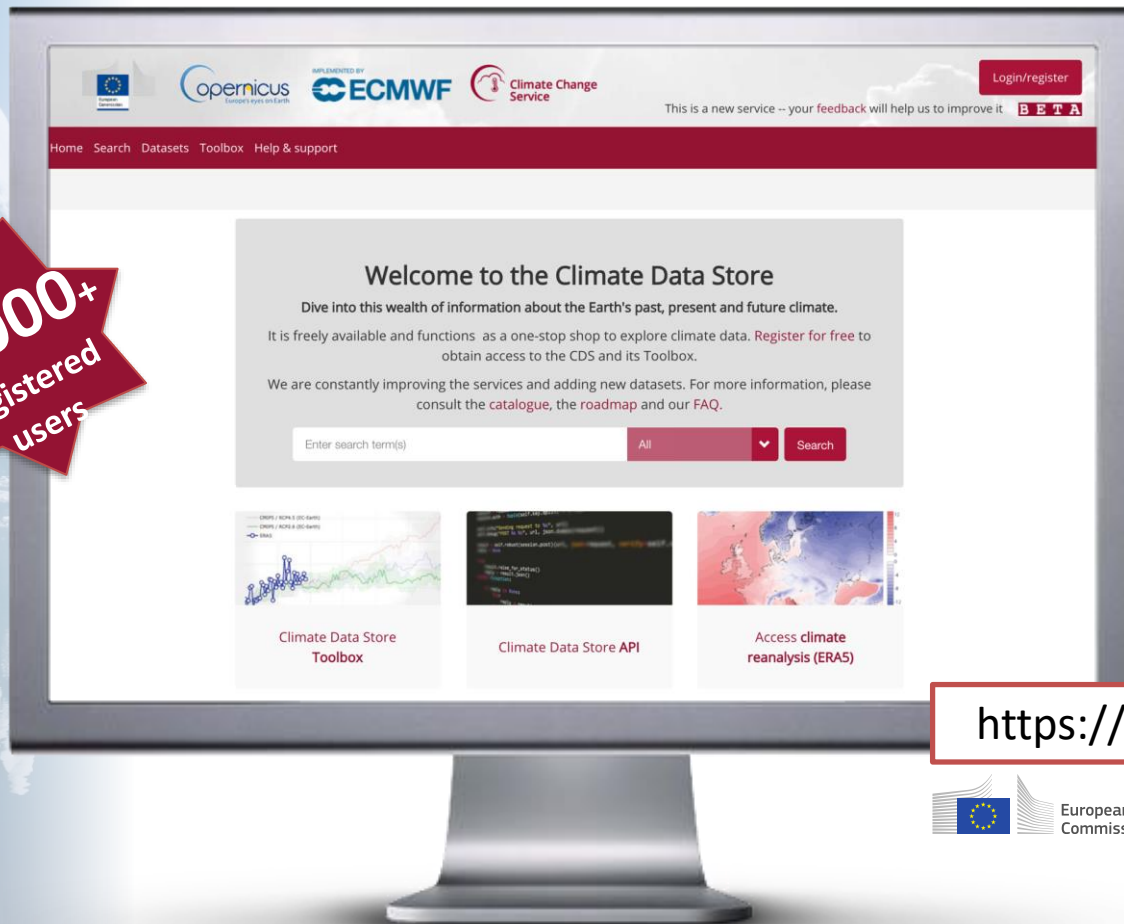




Climate
Change

What is the Climate Data Store (CDS)?

16000+
registered
users



The **Climate Data Store (CDS)**, is an online **open and free service**.

It allows users to browse and access the wide range of climate datasets via a searchable catalogue...

... It allows users to build their own applications, maps and graphs

<https://cds.climate.copernicus.eu>

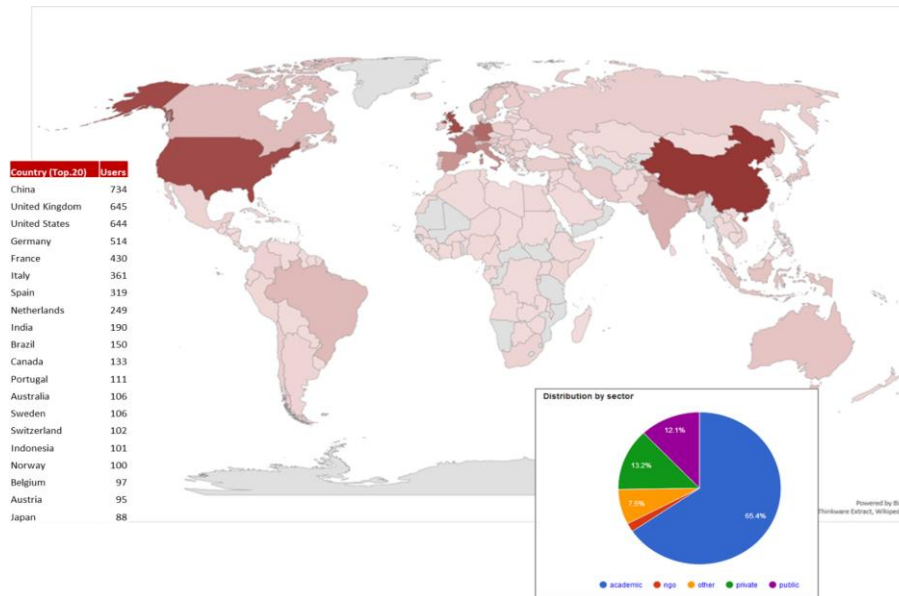
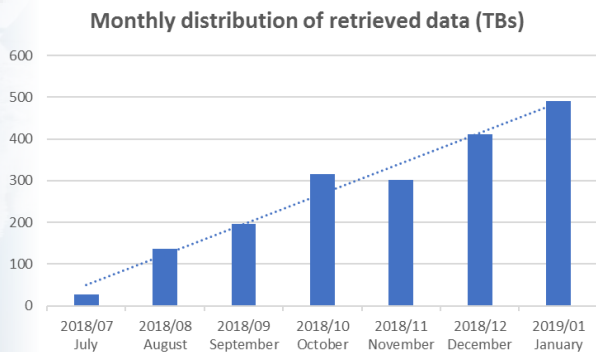
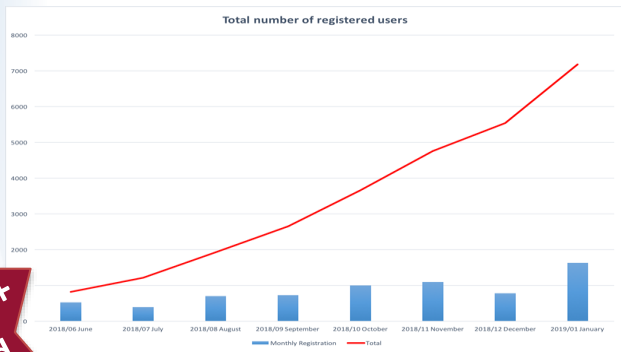




Climate Change

Global usage

16000+
registered users





Climate
Change

What is the CDS vision?

- Make data discovery, access easy and relevant for users
- Provide scalable data access
- Provide online capabilities to process the data to users
- Provide easy-to-use online applications for users
- Enable reproducible research

► Spend less time handling the data



Europe's eyes on Earth





Climate Change

Finding datasets before the CDS...

ESGF Portal at CEDA

ESGF logo, NERC logo, Science & Technology logo, ES-ENES logo

Welcome, Guest | Login | Create CEDA Account

Home About Us Contact Us

Project: MRS-meranalysis (1), ORE-meranalysis (3), Regional Meranalysis (10), Size-adjusted-out (309), Isomodes (2), climate-projection (862), observational (15), forcing-dataset (308), historical (25), input (191), input-secondary (1), meta (104), observations (892), output (809650), output4 (43816), output5 (2771), reanalysis (1103), season-forecast (8), unclassified (1215)

Dataset Metadata: corcos.output.AFR-44.DMI.ECMWF-ERAMT-evaluation.v1r11r20.042

ERA Interim/LAND

Select a month

Year	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Jan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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Dec	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Select parameter

View the MARS request | Retrieve GRIB | Retrieve NetCDF



OSISAF logo

Home / List of products

List of products

Domain: Sea Ice

Thumbnail	Title	Identifier	Status	Satellite Input	Level	Frequency	Timeliness	Spatial coverage	Spatial sampling
	Global Sea Ice Concentration (SSM/I)	OSI-401-b	Operational	DMSV/SSM/I	L3	1 per day	5 h	Global	10 km
	Global Sea Ice Edge	OSI-402-c	Operational	DMSV/SSM/I and Meteo/ASCAT	L3	1 per day	5 h	global	10 km
	Global Sea Ice Type	OSI-403-c	Operational	DMSV/SSM/I, Meteo/ASCAT and CCOM-WA/MSK-2	L3	1 per day	5 h	global	10 km
	Global Sea Ice Emissivity	OSI-404	Operational	DMSV/SSM/I	L3	1 per day	5 h	global	10 km
	Global Low Resolution Sea Ice Drift	OSI-405-c	Operational	Meteo/ASCAT and CCOM-WA/MSK-2	L3	1 per day	6 h	Global	62.5 km
	Medium Resolution Sea Ice Drift	OSI-407	Operational	Meto/AVHRR	L3	2 per day	6 h	Northern Hemisphere	20 km

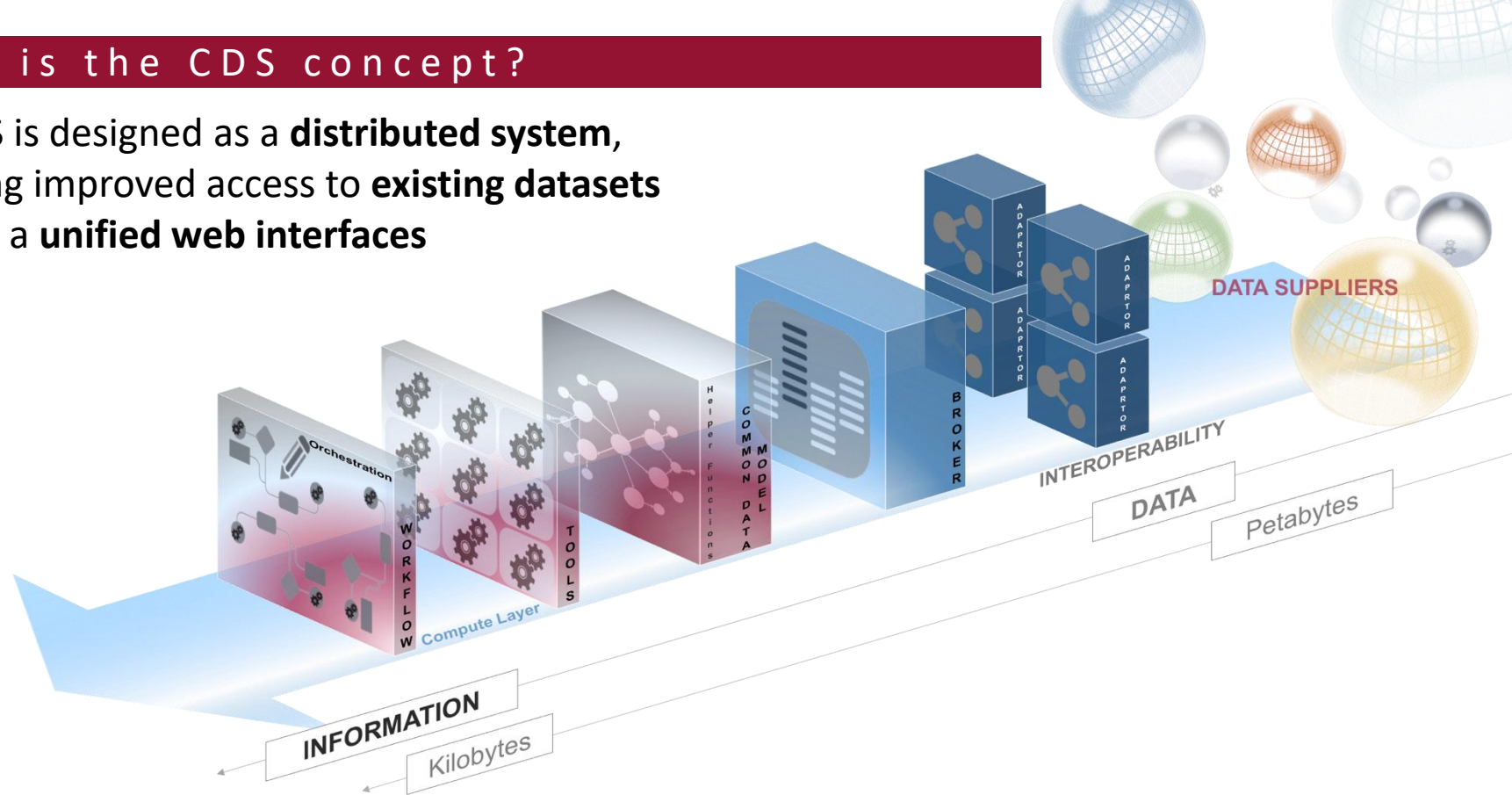
Product: Near real time product

ssh cds@cds-test.climate.copernicus.eu -- 117 x 34

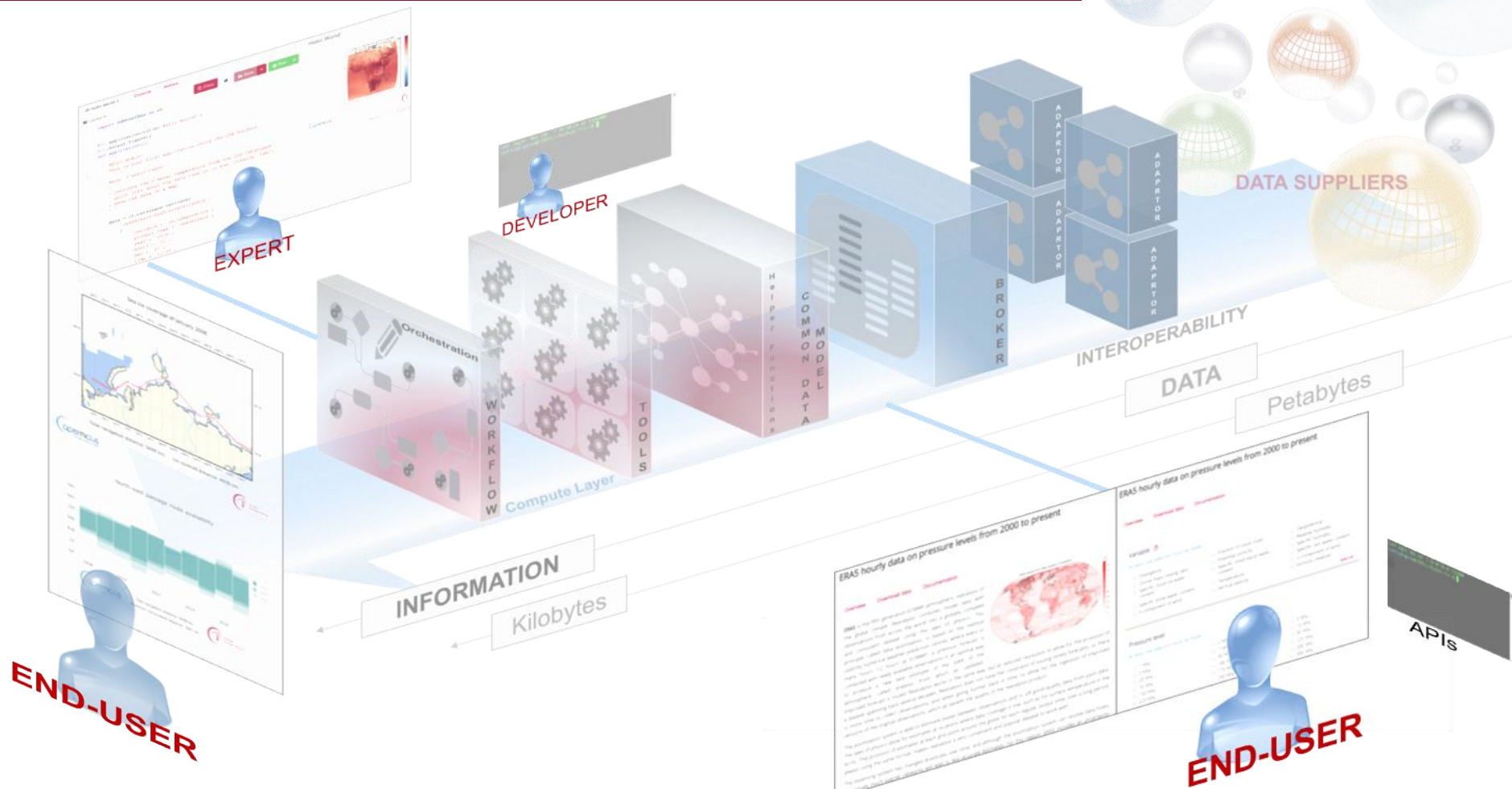
```
ssh cds@cds-test.climate.copernicus.eu
4688 of 6 13:23 dt_med_twosvt_phy_14_20051202.nc.gz
186 of 6 13:23 dt_med_twosvt_phy_14_20051203.nc.gz
689 of 6 13:23 dt_med_twosvt_phy_14_20051204.nc.gz
897 of 6 13:23 dt_med_twosvt_phy_14_20051205.nc.gz
375 of 6 13:23 dt_med_twosvt_phy_14_20051206.nc.gz
26 of 6 13:23 dt_med_twosvt_phy_14_20051207.nc.gz
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627 of 6 13:23 dt_med_twosvt_phy_14_20051216.nc.gz
768 of 6 13:23 dt_med_twosvt_phy_14_20051217.nc.gz
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587 of 6 13:23 dt_med_twosvt_phy_14_20051229.nc.gz
766 of 6 13:23 dt_med_twosvt_phy_14_20051230.nc.gz
227 x 61-c3s/Products/SEALEVEL/regional-med/terranon/dt-grids/two-ssr-merged/phy/2005 is the current directory
```

What is the CDS concept?

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



What is the CDS concept?





Climate
Change

Finding datasets

The screenshot shows the Copernicus Climate Change Service website interface. At the top, there are logos for the European Union, Copernicus, ECMWF, and the Climate Change Service. A 'Login/register' button is in the top right. Below the navigation bar, the 'Search results' section is active. A search bar contains the text 'Search dataset'. The results are filtered by 'All' and 'Datasets'. The search criteria are 'Reanalysis' and 'Satellite observations'. The results list several datasets, including 'Climate data for the European energy sector from 1979 to 2016 derived from ERA-Interim', 'ERA5 hourly data on single levels from 2000 to present', 'ERA5 hourly data on pressure levels from 2000 to present', and 'Ozone monthly gridded data from 1970 to present'. On the left side of the search results, there are filters for 'Product type' and 'Variable domain'.

Search dataset

Showing 1-15 of 15 results for **Reanalysis** x **Satellite observations** x

Sort by **Relevancy**

Title

▼ Product type

- Climate projections (5)
- Reanalysis (3)
- Satellite observations (12)
- Seasonal forecasts (6)
- Sectoral climate indices (2)

▼ Variable domain

- Atmosphere (composition) (3)
- Land (biosphere) (1)
- Land (cryosphere) (2)
- Land (hydrology) (1)
- Ocean (physics) (5)

▼ Spatial coverage

- Global (11)

Climate data for the European energy sector from 1979 to 2016 derived from ERA-Interim

The dataset contains wind speed, precipitation, relative humidity, global horizontal irradiance, sea level pressure, air temperature, snow depth and dewpoint depression near-surface data relevant to e...

ERA5 hourly data on single levels from 2000 to present

ERA5 is the fifth generation ECMWF atmospheric reanalysis of the global climate. Reanalysis combines model data with observations from across the world into a globally complete and consistent dataset...

ERA5 hourly data on pressure levels from 2000 to present

ERA5 is the fifth generation ECMWF atmospheric reanalysis of the global climate. Reanalysis combines model data with observations from across the world into a globally complete and consistent dataset...

Ozone monthly gridded data from 1970 to present

This dataset provides estimates of the monthly mean values of the ozone concentration, mixing ratio and content over the globe from a large set of satellite sensors. Most of the ozone data products in...

Metadata ISO 19115





Climate Change

Accessing datasets: Global reanalysis data

Simplicity and consistency are key

Quality Evaluation will come soon (2019)

Home Search Datasets Applications Your requests Toolbox Help & support

Search results

Search dataset All Datasets

Sort by

Relevancy

Title

- Product type
 - Climate projections (4)
 - Reanalysis (2)
 - Satellite observations (11)
 - Seasonal forecasts
 - Sectoral climate indices (2)
- Spatial coverage
 - Global (2)
- Temporal coverage
 - Past (2)

ERA5 hourly data on pressure levels from 2000 to present

Overview Download data Documentation

ERA5 is the fifth generation ECMWF atmospheric reanalysis of the global climate. Reanalysis combines model data with observations from across the world into a globally complete and consistent dataset using the laws of physics. This principle, called data assimilation, is based on the method used by numerical weather prediction centres, where every so many hours (12 hours at ECMWF) a previous forecast is combined with newly available observations in an optimal way to produce a new best estimate of the state of the atmosphere, called analysis, from which an updated, improved forecast is issued. Reanalysis works in the same way, but at reduced resolution to allow for the provision of a dataset spanning back several decades. Reanalysis does not have the constraint of issuing timely forecasts, so it is more time to collect observations, and when going further back in time, to allow for the ingestion of improvements of the original observations, which all benefit the quality of the reanalysis product.

The assimilation system is able to estimate biases between observations and to sift good-quality data from poor. The laws of physics allow for estimates at locations where data coverage is low, such as for surface temperature Arctic. The provision of estimates at each grid point around the globe for each regular output time, over a long period always using the same format, makes reanalysis a very convenient and popular dataset to work with.

The observing system has changed drastically over time, and although the assimilation system can resolve data from the initially much sparser networks will lead to less accurate estimates. For this reason, ERA5 includes an uncertainty

ERA5 hourly data on pressure levels from 2000 to present

ERA5 is the fifth generation ECMWF atmospheric reanalysis of the global climate. Reanalysis combines model data with observations from across the world into a globally complete and consistent dataset...

ERA5 hourly data on single levels from 2000 to present

ERA5 is the fifth generation ECMWF atmospheric reanalysis of the global climate. Reanalysis combines model data with observations from across the world into a globally complete and consistent dataset...

ERA5 hourly data on pressure levels from 2000 to present

Overview Download data Documentation

Variable

At least one selection must be made

<input type="checkbox"/> Divergence	<input type="checkbox"/> Fraction of cloud cover	<input type="checkbox"/> Geopotential
<input type="checkbox"/> Ozone mass mixing ratio	<input type="checkbox"/> Potential vorticity	<input type="checkbox"/> Relative humidity
<input type="checkbox"/> Specific cloud ice water content	<input type="checkbox"/> Specific cloud liquid water content	<input type="checkbox"/> Specific humidity
<input type="checkbox"/> Specific snow water content	<input type="checkbox"/> Temperature	<input type="checkbox"/> Specific rain water content
<input type="checkbox"/> V-component of wind	<input type="checkbox"/> Vertical velocity	<input type="checkbox"/> U-component of wind
		<input type="checkbox"/> Vorticity (relative)

Select all

Pressure level

At least one selection must be made

<input type="checkbox"/> 1 hPa	<input type="checkbox"/> 2 hPa	<input type="checkbox"/> 3 hPa
<input type="checkbox"/> 5 hPa	<input type="checkbox"/> 7 hPa	<input type="checkbox"/> 10 hPa
<input type="checkbox"/> 20 hPa	<input type="checkbox"/> 30 hPa	<input type="checkbox"/> 50 hPa
<input type="checkbox"/> 70 hPa	<input type="checkbox"/> 100 hPa	<input type="checkbox"/> 125 hPa
<input type="checkbox"/> 150 hPa	<input type="checkbox"/> 175 hPa	<input type="checkbox"/> 200 hPa
<input type="checkbox"/> 225 hPa	<input type="checkbox"/> 250 hPa	<input type="checkbox"/> 300 hPa
<input type="checkbox"/> 350 hPa	<input type="checkbox"/> 400 hPa	<input type="checkbox"/> 450 hPa
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<input type="checkbox"/> 650 hPa	<input type="checkbox"/> 700 hPa	<input type="checkbox"/> 750 hPa
<input type="checkbox"/> 775 hPa	<input type="checkbox"/> 800 hPa	<input type="checkbox"/> 825 hPa
<input type="checkbox"/> 850 hPa	<input type="checkbox"/> 875 hPa	<input type="checkbox"/> 900 hPa
<input type="checkbox"/> 925 hPa	<input type="checkbox"/> 950 hPa	<input type="checkbox"/> 975 hPa

Select all

Product type

Reanalysis Ensemble members Ensemble mean

Ensemble spread

Select all Clear all

Year

At least one selection must be made

<input type="checkbox"/> 2000	<input type="checkbox"/> 2001	<input type="checkbox"/> 2002
<input type="checkbox"/> 2003	<input type="checkbox"/> 2004	<input type="checkbox"/> 2005
<input type="checkbox"/> 2006	<input type="checkbox"/> 2007	<input type="checkbox"/> 2008





Climate Change

Accessing datasets: Multi-system seasonal forecasts

Simplicity and consistency are key

Home Search Datasets Applications Your requests Toolbox Help & support

Search results

Search dataset All Datasets

Sort by

Relevancy

Title

Product type

- Climate projections (4)
- Reanalysis (2)
- Satellite observations (11)
- Seasonal forecasts (6)
- Sectoral climate indices (2)

Spatial coverage

- Global (6)

Temporal coverage

- Future (6)
- Past (6)

Seasonal forecast monthly statistics on single levels from 2017 to present

Overview Download data Documentation

Seasonal forecasts provide a long-range outlook of changes in the Earth system over periods of a few weeks or months, as a result of predictable changes in some of the slow-varying components of the system. For example, ocean temperatures typically vary slowly, on timescales of weeks or months; as the ocean has an impact on the overlying atmosphere, the variability of its properties (e.g. temperature) can modify both local and remote atmospheric conditions. Such modifications of the 'usual' atmospheric conditions are the essence of all long-range (e.g. seasonal) forecasts. This is different from a weather forecast, which gives a lot more precise detail - both in time and space - of the evolution of the state of the atmosphere over a few days into the future. Beyond the chaotic nature of the atmosphere limits the possibility to predict precise changes at local scales. This is why long-range forecasts of atmospheric conditions have large uncertainties. To quantify such uncertain range forecasts use ensembles, and meaningful forecast products reflect a distributions of outcomes.



Given the complex, non-linear interactions between the individual components of the Earth system, the best long-range forecasting are climate models which include as many of the key components of the system and typically, such models include representations of the atmosphere, ocean and land surface. These models are with data describing the state of the system at the starting point of the forecast, and used to predict the evolution of this state in time. While uncertainties coming from imperfect knowledge of the initial conditions of the Earth system can be described with the use of ensembles, uncertainty arising from approximations in the models are very much dependent on the choice of model. A convenient way to quantify the effect of approximations is to combine outputs from several models, independently developed, initialised and operated.

To this effect, the C3S provides a multi-system seasonal forecast service, where data produced by state-of-the-art seasonal forecast systems developed, implemented and operated at forecast centres in several European countries are collected, processed and combined to enable user-relevant applications. The composition of the C3S seasonal forecast service is shown in the diagram below.

Seasonal forecast monthly statistics on pressure levels from 2017 to present

Seasonal forecasts provide a long-range outlook of changes in the Earth system over periods of a few weeks or months, as a result of predictable changes in some of the slow-varying components of the s...

Seasonal forecast daily data on pressure levels from 2017 to present

Seasonal forecasts provide a long-range outlook of changes in the Earth system over periods of a few weeks or months, as a result of predictable changes in some of the slow-varying components of the s...

Seasonal forecast daily data on single levels from 2017 to present

Seasonal forecasts provide a long-range outlook of changes in the Earth system over periods of a few weeks or months, as a result of predictable changes in some of the slow-varying components of the s...

Seasonal forecast monthly statistics on single levels from 2017 to present

Overview Download data Documentation

Originating centre

At least one selection must be made

- ECMWF
- UK Met Office
- Météo France

Select all

Variable

At least one selection must be made

- 10m u-component of wind
- 10m wind speed
- East-west surface stress rate of accumulation
- Mean sea level pressure
- Runoff
- Snow density
- Soil temperature level 1
- Surface solar radiation
- Top solar radiation
- Total precipitation
- 10m v-component of wind
- 2m dewpoint temperature
- Evaporation
- Minimum 2m temperature in the last 24 hours
- Sea surface temperature
- Snow depth
- Surface latent heat flux
- Surface solar radiation downwards
- Top thermal radiation
- 10m wind gust since previous post-processing
- 2m temperature
- Maximum 2m temperature in the last 24 hours
- North-south surface stress rate of accumulation
- Sea-ice cover
- Snowfall
- Surface sensible heat flux
- Surface thermal radiation downwards
- Total cloud cover

Select all

Product type

At least one selection must be made

- Ensemble





Climate Change

Accessing datasets: Climate model output via ESGF

Simplicity and consistency are key

Home Search Datasets Applications Your requests Toolbox Help & support

Search results

Showing 1-4 of 4 results for **Climate projections** x

Search dataset

Sort by **Relevancy**

Title

- Product type
 - Climate projections (4)
 - Reanalysis (2)
 - Satellite observations (11)
 - Seasonal forecasts (6)
 - Sectoral climate indices (2)
- Variable domain
 - Atmosphere (surface) (4)
 - Atmosphere (upper air) (4)
- Spatial coverage
 - Global (4)
- Temporal coverage
 - Future (4)
 - Past (4)
 - Present (4)

CMIP5 daily data on pressure levels

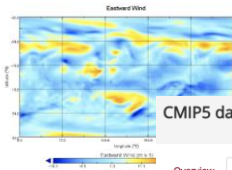
Overview Download data Documentation

This catalogue entry provides daily climate projections on pressure levels from a large number of models, members and time periods computed in the framework of fifth phase of the Coupled Model Intercomparison Project (CMIP5) for the Historical experiment. Information on how to access the complete CMIP5 dataset can be found in the Documentation section.

The term "pressure levels" is used to express that the variables were computed at multiple vertical levels, which may differ in number and location among the different models. The term "experiments" refers to the four main categories of CMIP5 simulations:

- Pre-industrial control experiments (PI-control) with prescribed, non-evolving concentrations of water and aerosols as they are supposed to be before the industrial period;
- Historical experiments which cover the period where climate observations do exist;
- Ensemble of experiments from the Atmospheric Model Intercomparison Project (AMIP), which oceanic variables for all models and during the all period of the experiment. This configuration complexity of ocean-atmosphere feedbacks in the climate system;
- Ensemble of climatic projection experiments following the Representative Concentration Path 6.0 and 8.5.

Typically, the same experiment was done using different models. In addition, for each model, it was repeatedly done using slightly different conditions producing in that way an ensemble of related. Each member of that ensemble is named after a triad of integers associated to the letters



CMIP5 daily data on pressure levels

Overview Download data Documentation

Variable

At least one selection must be made

- Temperature U-component of wind Geopotential height

Model

At least one selection must be made

- | | | |
|---|---|--|
| <input type="checkbox"/> Inmcm4 (INM, Russia) | <input type="checkbox"/> ACCESS1-0 (BOM-CSIRO, Australia) | <input type="checkbox"/> bcc-csm1-1 (BCC, China) |
| <input type="checkbox"/> CMCC-CM (CMCC, Italy) | <input type="checkbox"/> CMCC-CMS (CMCC, Italy) | <input type="checkbox"/> CNRM-CM5 (CNRM-CERFACS, France) |
| <input type="checkbox"/> GFDL-CM3 (NOAA, USA) | <input type="checkbox"/> GFDL-ESM2G (NOAA, USA) | <input type="checkbox"/> GFDL-ESM2M (NOAA, USA) |
| <input type="checkbox"/> HadGEM2-CC (UK Met Office, UK) | <input type="checkbox"/> HadGEM2-ES (UK Met Office, UK) | <input type="checkbox"/> IPSL-CM5A-LR (IPSL, France) |
| <input type="checkbox"/> IPSL-CM5B-LR (IPSL, France) | <input type="checkbox"/> MPI-ESM-LR (MPI, Germany) | <input type="checkbox"/> MPI-ESM-MR (MPI, Germany) |
| <input type="checkbox"/> NorESM1-M (NCC, Norway) | <input type="button" value="Select all"/> | |

Ensemble member

- r1i1p1 r2i1p1 r3i1p1
- r4i1p1 r5i1p1 r6i1p1

Period

At least one selection must be made

- 18600101-18641231 18610101-18651231 18650101-18691231





Climate
Change

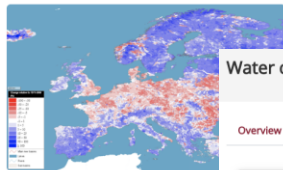
Simplicity and
consistency are key

Accessing datasets: Sectoral impact indicators

Water quality indicators for European rivers

Overview Download data Documentation

This dataset contains modelled data for phosphorous and nitrogen concentrations and loads. The data comes from the Swedish Meteorological and Hydrological Institute E-HYPE model at catchment level for Europe. These water quality indicators were computed as a part of a proof of concept contract designed to speed up the workflow in impact assessments and to simplify climate change adaptation of water management practices across Europe.



These indicators are provided as averages over 30 year periods, either for each calendar month or for the whole period. For the reference period (1971-2000) the absolute values are given, whereas for the future periods the relative changes are provided. In addition to total organic and inorganic parts are provided for nitrogen. For phosphorous, in addition to the total amount and soluble parts are provided. Values of the temperature of the water is provided for the same periods.

More details about the product are given in the Documentation section.

DATA DESCRIPTION

Horizontal coverage	Pan European domain.
Horizontal resolution	Irregular catchment polygons, median catchmentsize 215 km ² .

Water quality indicators for European rivers

Overview Download data Documentation

Variable

At least one selection must be made

- Inorganic nitrogen concentrations
- Soluble phosphorous concentrations
- Inorganic nitrogen loads
- Soluble phosphorous loads
- Water temperature
- Organic nitrogen concentrations
- Total nitrogen concentrations
- Organic nitrogen loads
- Total nitrogen loads
- Particulate phosphorous concentrations
- Total phosphorous concentrations
- Particulate phosphorous loads
- Total phosphorous loads

Select all

Emissions scenario

At least one selection must be made

- RCP 2.6
- RCP 4.5
- RCP 8.5

Select all

Time aggregation

At least one selection must be made

- 30-year average
- Month average

Select all

Period

At least one selection must be made

- 1971-2000 (reference)
- 2011-2040
- 2041-2100



This is a new service...

Home Search Datasets Applications Your requests Toolbox Help & support

Search results

Search dataset All Datasets

Sort by

Relevancy

Title

Showing 1-2 of 2 results for Sectoral climate indices

Product type

- Climate projections (4)
- Reanalysis (2)
- Satellite observations (11)
- Seasonal forecasts (6)
- Sectoral climate indices (2)

Variable domain

- Land (hydrology) (2)

Spatial coverage

- Europe (2)

Temporal coverage

- Future (2)

Water quality indicators for European rivers

This dataset contains modelled data for phosphorous and nitrogen concentrations and loads. The data comes from the Swedish Meteorological and Hydrological Institute E-HYPE model at catchment level F...

Water quantity indicators for Europe

This dataset contains modelled data for water runoff and wetness, river flow, snow water equivalent, soil water content and other water related quantities for the European region. These variables wer...





Climate Change

Using the data online: The CDS Toolbox Editor



Toolbox Editor

Applications Data Documentation Wine Regions Conscis Run

- demo
 - Wine Regions
 - Station Outlook
 - Seasonal Outlook
 - Infrastructure Planning
 - Forecast Evaluation
 - Download
- examples
 - 01 Retrieve Download
 - 02 Plot 2D
 - 03 Plot 1D
 - 04 Plot Location
 - 05 Retrieve and Plot
 - 05a Retrieve ERA5 Daily
 - 05b Retrieve ERA5 Modis
 - 05c Retrieve CDR
 - 05d Retrieve ICJR
 - 11 Mean Standard Deviation
 - 12 Climatology
 - 21 Anomaly
 - 22 Anomaly Time Reference
 - 23 Anomaly Climatology Reference
 - 31 Trends
 - 41 Regrid
 - 51 Indices GDD
 - 52 Indices CGU

```

214   gdd_proj_mean[s] = attrs.update(gdd_proj_extended[s], attrs)
215   gdd_proj_high[s] = ct.select(gdd_proj_rolling.reduce(
216     rp.percentile, q=95).dropna('time'), **region_sel, method='nearest')
217   gdd_proj_low[s] = ct.select(gdd_proj_rolling.reduce(
218     rp.percentile, q=5).dropna('time'), **region_sel, method='nearest')
219
220   #
221   # Building maps
222   #
223   gdd_past_maps = ct.select(gdd_past_raw_mean, time=[1986, None, 10])
224   gdd_proj_maps = ct.select(gdd_proj_mean_map[scenario], time=[2024, None, 10])
225   gdd_past_titles = ['Winkler regions for ERA-Interim %s'
226     % (max(1979, t.year - 10), t.year)
227     for t in gdd_past_maps.time.indexes['time']]
228   gdd_proj_titles = ['Winkler regions for CMIP5 / %s (EC-Earth) %s-%s'
229     % (scenario, t.year - 10, t.year)
230     for t in gdd_proj_maps.time.indexes['time']]
231
232   winkler_regions = plot_winkler_regions(
233     gdd_past_maps, gdd_past_titles,
234     gdd_proj_maps, gdd_proj_titles,
235     region_sel
236   )
237
238   #
239   # Building chart
240   #
241   figure_projections = plot_projections(
242     gdd_past,
243     gdd_proj_low,
244     gdd_proj_mean,
245     gdd_proj_high,
246     region, scenario
247   )
248
249   return winkler_regions, figure_projections
  
```

Wine Regions (build: 4d2037c8143c359197823054a30f025ab3c74)



European Commission

Europe's eyes on Earth



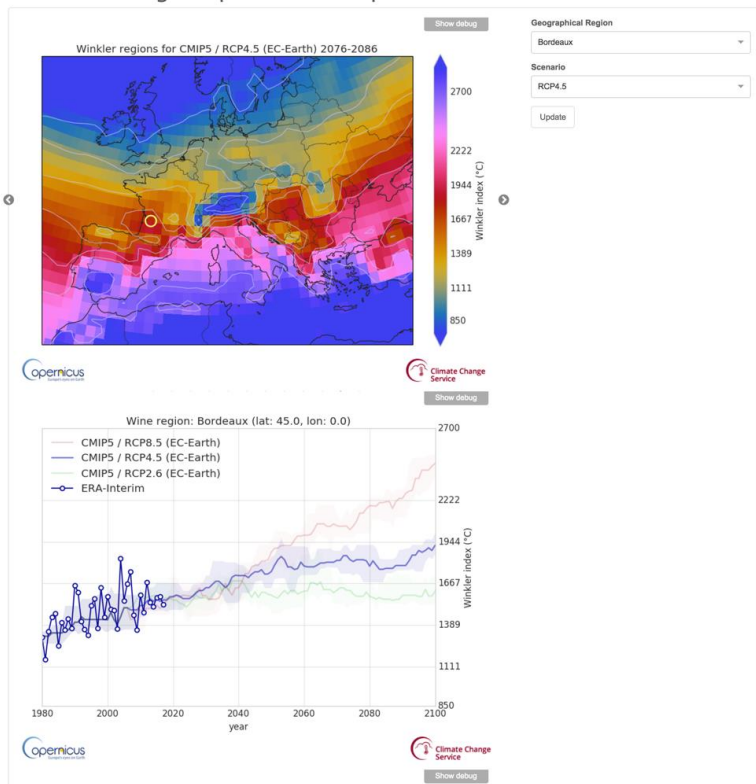


Climate
Change

Using the data online: Building Online Applications



Climate change impact on wine production



- Web page/components with possible parameterization from users
- Perform specific tasks
- Provide one or more of:
 - Data
 - Processed results
 - Plots / Maps





Climate Change

CDS: Under the bonnet

Carbon dioxide data from 2002 to present derived from satellite sensors

Warning: the structure of this dataset was slightly modified. Please, review your old API scripts if you were using them to download the data.

Overview Download data Documentation

Carbon dioxide (CO₂) is a naturally occurring Greenhouse gas, but one whose abundance has been increased substantially above its pre-industrial value of some 280 ppm by human activities, primarily because of emissions from combustion of fossil fuels, deforestation and other land-use change. These took values to about 340 ppm in the early 1980s. Growth has continued since then with values exceeding 400 ppm now recorded early in the year over the extratropical northern hemisphere. Somewhat lower values over the southern hemisphere are a consequence of emissions that are larger in the northern hemisphere. The annual cycle in the northern hemisphere is primarily due to natural biological variations, with CO₂ taken up by photosynthesis in the growing season but released throughout the year by respiration. CO₂ release by wildfires varies seasonally.

This dataset is a time extension of products generated in the framework of the European Space Agency anthropogenic greenhouse gases Climate Change Initiative (ESA GHG-CCI) using data from the Scanning Imaging Absorption Spectrometer for Atmospheric Cartography sensor (SCIAMACHY) and the subunit Fourier Transform Spectrometer of the Thermal And Near-infrared Sensor for carbon Observation sensor (TANSO/FTS).

The column average carbon dioxide values are computed from the SCIAMACHY original data using two different algorithms: the Bremen optimal Estimation Doas (BESD) algorithm and the Weighting Function Modified Doas (WFMD) algorithm. For the TANSO/FTS sensor, the two algorithms that were applied are: the University of Leicester Full Physics Retrieval Algorithm (OCFPA) based on the original Orbiting Carbon Observatory (OCO) Full Physics Retrieval Algorithm and the SRO/NVIT RemoteTC Full Physics Retrieval Algorithm (SRFP).

Typically different methods have different strength and weaknesses and therefore which product to use for a given application typically depends on the application.

More details about the product are given in the Documentation section.

DATA DESCRIPTION	
Horizontal coverage	Between 70° N and 70° S
Horizontal resolution	SCIAMACHY: 30x60 km ² TANSO/FTS: 10 km ²
Temporal coverage	SCIAMACHY-WFMD: October 2002 until April 2012 SCIAMACHY-BESD: August 2003 until March 2012 TANSO/FTS-OCFPA: April 2009 until December 2017 TANSO/FTS-SRFP: April 2009 until December 2017
Temporal resolution	SCIAMACHY: 1s. However, since the products are derived from Nadir (downlooking) mode observations, which are carried out only 50% of the time, the resolution has gaps along each orbit.

Name	Size	Modified
README.md	262 bytes	4 Jun
abstract.md	2.0 kB	4 Jun
abstract.yaml	1.1 kB	4 Jun
adaptor.yaml	5.7 kB	4 Jun
cdm.yaml	99 bytes	4 Jun
constraints.json	112.9 kB	4 Jun
dataset.yaml	518 bytes	4 Jun
documentation.yaml	1.3 kB	4 Jun
form.json	8.5 kB	4 Jun
generate.yaml	1.6 kB	4 Jun
mapping.json	917 bytes	4 Jun
metadata.yaml	1.0 kB	4 Jun
overview.png	169.4 kB	4 Jun
product-user-guide-annex-a-v1.3.pdf		
"adaptor.yaml" selected (5.7 kB)		

```

description:
  data-type: Grid
  file-format: NetCDF
  horizontal-coverage: "Between 70\u00B0 N and 70\u00B0 S"
  horizontal-resolution: '

  SCIAMACHY: 30x60 km^2

  TANSO/FTS: 10 km^2
  temporal-coverage: '

  SCIAMACHY-WFMD: October 2002 until April 2012

  SCIAMACHY-BESD: August 2003 until March 2012

  TANSO/FTS-OCFPA: April 2009 until December 2017

  TANSO/FTS-SRFP: April 2009 until December 2017
  temporal-resolution: '

  SCIAMACHY: 1s. However, since the products are derived from Nadir (downlooking)
  mode observations, which are carried out only 50% of the time, the resolution
  has gaps along each orbit.

  TANSO/FTS: 4s. However, there are gaps of about 20s (about 200 km) between the
  10 km footprints.

  This means that, for both sensors, the temporal sampling is inherently sparse.
  Furthermore, nearly cloud free conditions are required for a good retrieval'
keywords:
  - 'Variable domain: Atmosphere (composition)'
  - 'Product type: Satellite observations'
  - 'Temporal coverage: Past'
  - 'Spatial coverage: Global'
  
```

- Use metadata to populate a series of template yaml files.
- Apply a generalised executable to convert into a format the CDS website uses.



EU
CO



Climate Change

CDS: Under the bonnet - Discovery

The same generate executable transposes the metadata into:

- Geonetwork/CSW webservice which allows portals such as GEOSS and Google-Discovery to harvest the metadata in a range of formats, including OGC and INSPIRE
- Portfolio page which contains an "Id.json" in the page header for the Google dataset search engine

By maintaining our generic naming system, it is easy to update our scripts to match future advances in the requirements of INSPIRE or other

The screenshot displays the CDS Catalogue interface with search results for 'Carbon dioxide data from 2002 to present derived from satellite sensors'. The interface includes a search bar, navigation tabs, and a detailed view of the dataset. The dataset description includes a paragraph about CO2 levels and a table of metadata.

Carbon dioxide data from 2002 to present derived from satellite sensors

Carbon dioxide (CO₂) is a naturally occurring Greenhouse gas, but one whose abundance has been increased substantially above its pre-industrial value of some 280 ppm by human activities, primarily because of emissions from combustion of fossil fuels, deforestation and other land-use change. These took values to about 340 ppm in the early 1980s. Growth has continued since then with values exceeding 400 ppm now recorded early in the year over the extratropical northern hemisphere. Slightly lower values over the southern hemisphere are a consequence of emissions that are larger in the northern hemisphere. The annual cycle in the northern hemisphere is primarily due to natural biological variations, with CO₂ taken up by photosynthesis in the growing season but released throughout the year by respiration. CO₂ release by wildfires varies seasonally.

This dataset is a time series of products generated in the framework of the European Space Agency anthropogenic greenhouse gases Climate Change Initiative (ESA-GHG-CCI) using data from the Scanning Imaging Absorption Spectrometer for Atmospheric Cartography sensor (SCIAMACHY) and the Thermal And Near-infrared Sensor for carbon Observation Sensor (TANSO-FTS).

The column average carbon dioxide values are computed from the SCIAMACHY original data using two different algorithms: the Best Estimation of Gas (BESD) algorithm and the Modified Doas (WFMDOAS) algorithm. For the BESD method, the Physical Retrieval Algorithm (OC2-PA) and the Carbon Retrieval Algorithm (OC2-CA) were used. For the WFMDOAS method, the Physical Retrieval Algorithm (OC2-PA) and the Carbon Retrieval Algorithm (OC2-CA) were used. Typically different methods have different strengths and weaknesses and therefore which product to use for a given application typically depends on the application.

Product family	Satellite observations
Geographical area	Global
Horizontal coverage	Between 70° N and 70° S
Vertical coverage	SCIAMACHY: 0.001 km to 300 km TANSO-FTS: 0.001 km to 300 km
Spatial resolution	SCIAMACHY: 100 km TANSO-FTS: 100 km
Temporal coverage	SCIAMACHY WFMDOAS: October 2002 until April 2012 SCIAMACHY BESD: August 2002 until March 2012 TANSO-FTS OC2-PA: April 2009 until December 2007 TANSO-FTS OC2-CA: April 2009 until December 2007 TANSO-FTS SPP: April 2009 until December 2007 SCIAMACHY is, however, since the products are derived





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Thank you

<https://cds.climate.copernicus.eu>

<https://climate.copernicus.eu>

