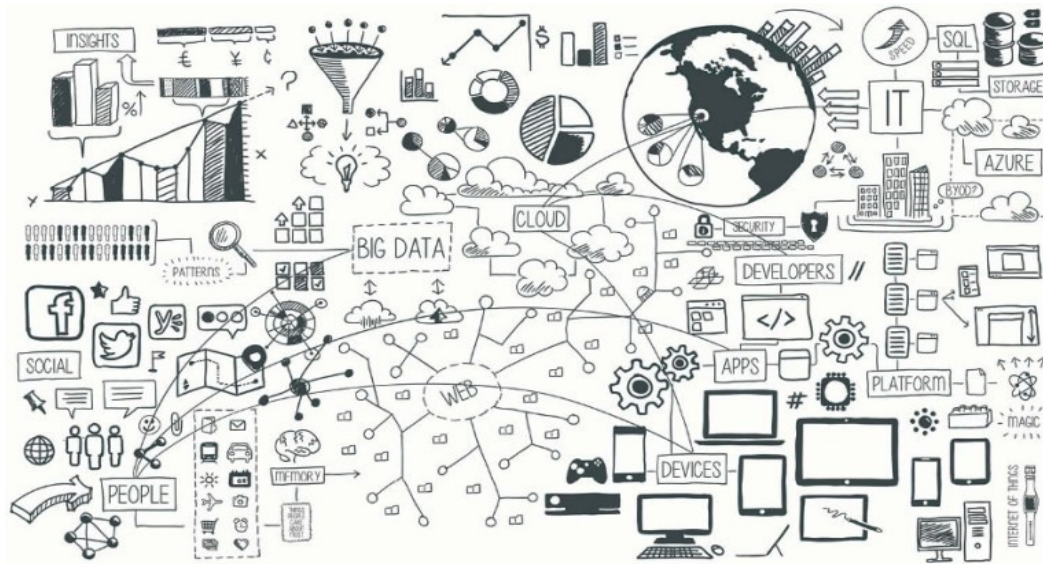


# Downloading Climate Data – ESGF & MARS



# Sixto Herrera García

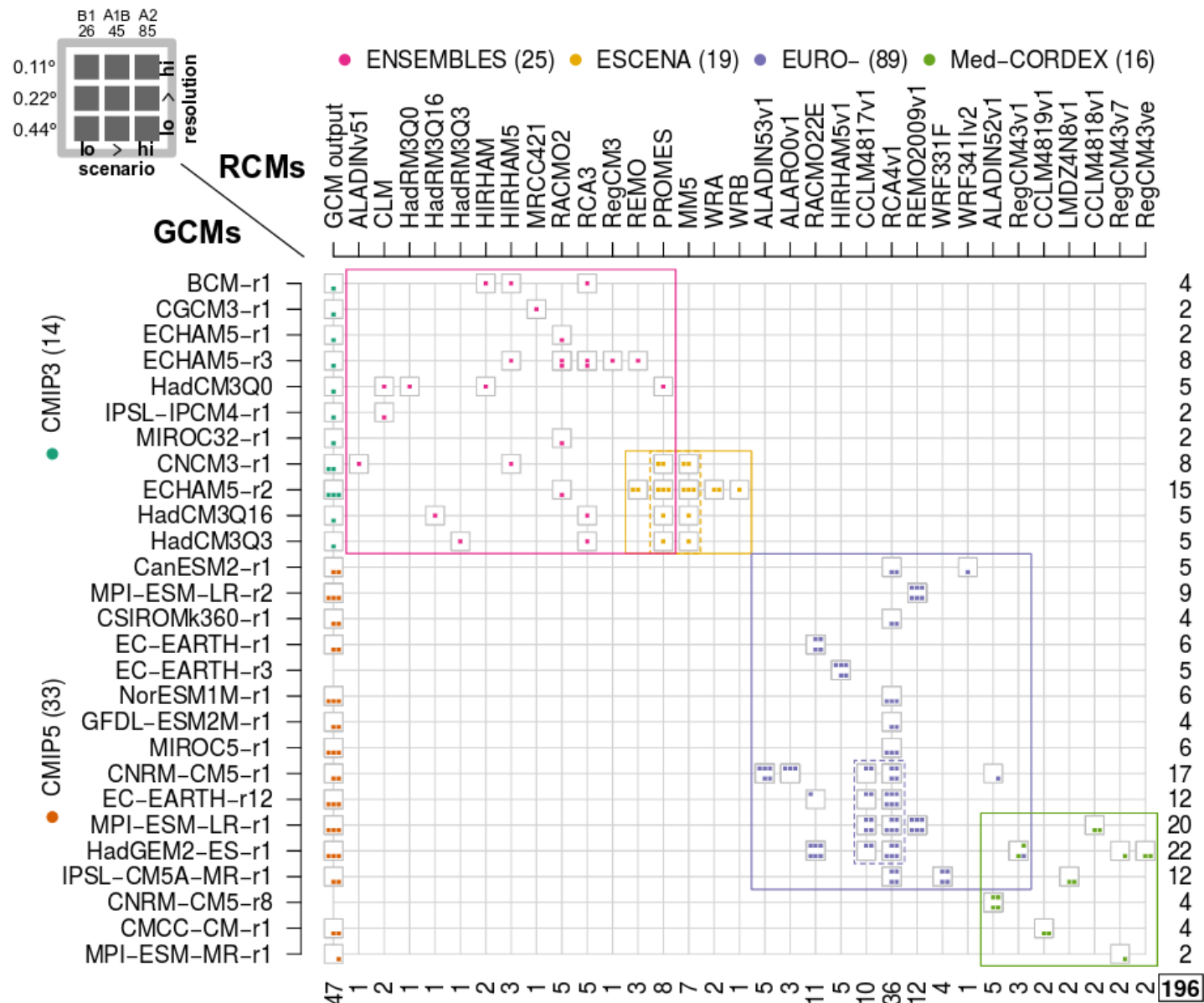
**Grupo de Meteorología**  
**Univ. de Cantabria – CSIC**  
**MACC / IFCA**



## M1980 – Data Laboratory: Environment & Meteorology (18:00-20:00)

04/01	L	Introduction: Clime and Models	T	SH
<b>04/02</b>	<b>M</b>	<b>Data Repositories: ESGF &amp; MARS</b>	<b>TL</b>	<b>SH</b>
<b>04/03</b>	<b>X</b>	<b>Data Repositories: ESGF &amp; MARS</b>	<b>TL</b>	<b>SH</b>
04/04	J	Lab: Climate4R – Example 1	L	JB
04/05	V	Lab: Climate4R – Example 2	L	JB
04/08	L	Downscaling: Data Mining in Clime	T	SH
04/09	M	Lab: downscaleR	L	JB
04/10	X	Evaluation and Validation	T	SH
04/11	J	Lab: Evaluation and Validation	L	JB
04/15	L	Impacts	L	JB & SH
04/16	M	Impacts	L	JB & SH
04/17	X	Impacts	L	JB & SH

**SH** - Sixto Herrera | **JB** - Joaquín Bedia



**Observations**

**Reanalysis**

**Climate Change:**

Global Models (**GCM**)

Regional Models (**RCM**)

Scenarios/Experiments

Runs

Parameterizations

...

**Seasonal Forecast:**

Member

Initialization

...



**Petabytes → Exabytes!!!**

**Source:** Fernández, J. et al. 2018, Consistency of climate change projections from multiple global and regional model intercomparison projects. Climate Dynamics. Doi:10.1007/s00382-018-4181-8

## Observations

- ECA&D: <https://www.ecad.eu//dailydata/index.php>
- WATCH Datasets: [http://www.eu-watch.org/data\\_availability](http://www.eu-watch.org/data_availability)
- EWEMBI:  
<http://dataservices.gfz-potsdam.de/pik/showshort.php?id=escidoc:1809891>
- Spain02: <http://meteo.unican.es/en/datasets/spain02>
- AEMET-OpenData: [http://www.aemet.es/es/datos\\_abiertos/AEMET\\_OpenData](http://www.aemet.es/es/datos_abiertos/AEMET_OpenData)

# Observations

- ECA&D: <https://www.ecad.eu//dailydata/index.php>
- WATCH Datasets: [http://www.eu-watch.org/data\\_availability](http://www.eu-watch.org/data_availability)
- EWEMBI:  
<http://dataservices.gfz-potsdam.de/pik/showshort.php?id=escidoc:1809891>
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- AEMET-OpenData: [http://www.aemet.es/es/datos\\_abiertos/AEMET\\_OpenData](http://www.aemet.es/es/datos_abiertos/AEMET_OpenData)



FAQ RSS



AEMET  
OpenData

¿Qué es?



Obtención  
de API Key

Solicitar



Acceso  
General

Entrar




Acceso  
Desarrolladores

Entrar



# Observations

- ECA&D: <https://www.ecad.eu//dailydata/index.php>
- WATCH Datasets: [http://www.eu-watch.org/data\\_availability](http://www.eu-watch.org/data_availability)
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<http://dataservices.gfz-potsdam.de/pik/showshort.php?id=escidoc:1809891>
- Spain02: <http://meteo.unican.es/en/datasets/spain02>
- AEMET-OpenData: [http://www.aemet.es/es/datos\\_abiertos/AEMET\\_OpenData](http://www.aemet.es/es/datos_abiertos/AEMET_OpenData)



**AEMET OpenData**  
Sistema para la difusión y reutilización de la información de AEMET

Alta en el servicio AEMET OpenData Recibidos x

**opendata\_apikey@aemet.es**  
para mí ▾

Alta en el servicio AEMET OpenData. Su API Key es:  
`eyJhbGciOiJIUzI1NiJ9.eyJzdWIiOiJzaXh0b2hnQGdtYWlsLmNvbSIsImpp0aSI6IjYyYWVlYTRhLTBiZTQtNDgyMi1iO0TU1LCJ1c2VySWQiOiI2MmFIYmE0YS0wYmU0LTQ4MjltYmYwYy01M2M5YjRlZTA3NWYiLCJyb2xlIjoiln0.-TF`

Este correo ha sido generado automáticamente. Por favor, no lo conteste. Para contactar con AEMET dirijase a:  
[http://www.aemet.es/es/lineas\\_de\\_interes/atencion\\_al\\_ciudadano](http://www.aemet.es/es/lineas_de_interes/atencion_al_ciudadano)

**AEMET**  
Agencia Estatal de Meteorología



AEMET  
OpenData

¿Qué es?






Obtención  
de API Key


Solicitar

# Observations

- ECA&D: <https://www.ecad.eu//dailydata/index.php>
- WATCH Datasets: [http://www.eu-watch.org/data\\_availability](http://www.eu-watch.org/data_availability)
- EWEMBI:  
<http://dataservices.gfz-potsdam.de/pik/showshort.php?id=escidoc:1809891>
- Spain02: <http://meteo.unican.es/en/datasets/spain02>
- AEMET-OpenData: [http://www.aemet.es/es/datos\\_abiertos/AEMET\\_OpenData](http://www.aemet.es/es/datos_abiertos/AEMET_OpenData)



Acceso General



001001010101  
10PEN10DATA0  
100100100110  
Agencia Estatal de Meteorología

Introduzca su API Key:

NQOiil2MmFIYmE0YS0wYmU0LTQ4MjltYmYwYy01M2M5YjRlZTA3NWYiLCJyb2xlljoiln0.-TR0UPdt2Czef6XRryp\_FIVU6PvRV97MVNEUwcX4y6M

Mostrar  registros

Buscar:

Acceso General

Entrar

Observación convencional

Mensajes de observación. Último elaborado

Seleccione tipo de parte

Seleccione una estación




Próximamente

Datos de observación. Último elaborado

Cantabria

1111X - Santander

Obtener

Master Universitario Oficial **Data Science**  


con el apoyo del

ESGF & MARS

AEMET-OpenData

# Observations

- ECA&D: <https://www.ecad.eu/dailydata/index.php>
- WATCH Datasets: [http://www.eu-watch.org/data\\_availability](http://www.eu-watch.org/data_availability)
- EWEMBI:  
<http://dataservices.gfz-potsdam.de/pik/showshort.php?id=escidoc:1809891>
- Spain02: <http://meteo.unican.es/en/datasets/spain02>
- AEMET-OpenData: [http://www.aemet.es/es/datos\\_abiertos/AEMET\\_OpenData](http://www.aemet.es/es/datos_abiertos/AEMET_OpenData)

The screenshot displays the AEMET-OpenData website interface. At the top, there is a header with the Spanish flag and the text "GOBIERNO DE ESPAÑA" and "MINISTERIO DE AGRICULTURA Y PESCA, ALIMENTACIÓN Y MEDIO AMBIENTE". Below this, there is a section for API access with the text "Introduzca su API Key:" and a text input field containing "NQiOil2MmFIYmEOYS0wYmUOLT". To the right of the input field, there is a dropdown menu labeled "Mostrar" with the value "100" and the text "registros".

In the center, a Mozilla Firefox browser window is open, displaying a JSON response from the API. The URL in the address bar is "https://opendata.aemet.es/opendata/api/observacion/convi". The JSON response is as follows:

```
{
  "descripcion" : "exito",
  "estado" : 200,
  "datos" : "https://opendata.aemet.es/opendata/sh/95285415",
  "metadatos" : "https://opendata.aemet.es/opendata/sh/55c2971b"
}
```

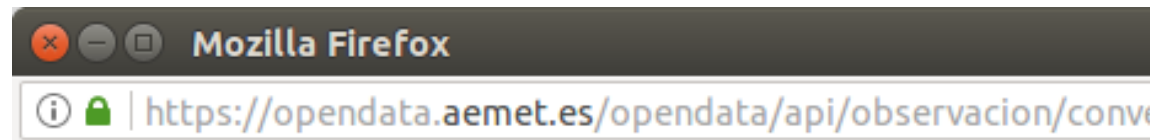
To the right of the browser window, there is a sidebar with a user icon and the text "Acceso General". Below this, there is a blue button labeled "Entrar".

Below the browser window, there is a section titled "Observación convencional". It contains two rows of filters. The first row has a label "Mensajes de observación. Último elaborado", a dropdown menu labeled "Seleccione tipo de parte", and a dropdown menu labeled "Seleccione una estación". The second row has a label "Datos de observación. Último elaborado", a dropdown menu labeled "Cantabria", and a dropdown menu labeled "1111X - Santander". To the right of these filters, there is a yellow button labeled "Próximamente" and a blue button labeled "Obtener".

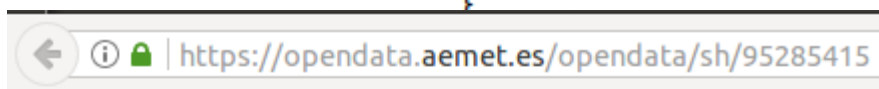


# Observations

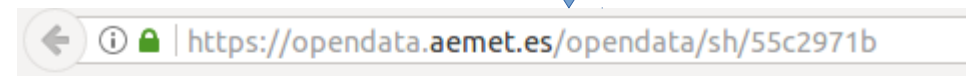
- ECA&D: <https://www.ecad.eu//dailydata/index.php>
- WATCH Datasets: [http://www.eu-watch.org/data\\_availability](http://www.eu-watch.org/data_availability)
- EWEMBI:  
<http://dataservices.gfz-potsdam.de/pik/showshort.php?id=escidoc:1809891>
- Spain02: <http://meteo.unican.es/en/datasets/spain02>
- AEMET-OpenData: [http://www.aemet.es/es/datos\\_abiertos/AEMET\\_OpenData](http://www.aemet.es/es/datos_abiertos/AEMET_OpenData)



```
{
  "descripcion" : "exito",
  "estado" : 200,
  "datos" : "https://opendata.aemet.es/opendata/sh/95285415",
  "metadatos" : "https://opendata.aemet.es/opendata/sh/55c2971b"
}
```



```
[ {
  "idema" : "1111X",
  "lon" : -3.800431,
  "fint" : "2018-04-04T08:00:00",
  "prec" : 0.0,
  "alt" : 52.0,
  "vmax" : 13.3,
  "vv" : 6.3,
  "dv" : 208.0,
  "lat" : 43.491055,
  "dmax" : 205.0,
  "ubi" : "SANTANDER CMT",
```



```
{
  "unidad_generadora": "Servicio de Observación",
  "periodicidad": "continuamente",
  "formato": "application/json",
  "copyright": "© AEMET. Autorizado el uso de la información",
  "notaLegal": "http://www.aemet.es/es/nota_legal",
```

## Observations

- ECA&D: <https://www.ecad.eu//dailydata/index.php>
- WATCH Datasets: [http://www.eu-watch.org/data\\_availability](http://www.eu-watch.org/data_availability)
- EWEMBI:  
<http://dataservices.gfz-potsdam.de/pik/showshort.php?id=escidoc:1809891>
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- AEMET-OpenData: [http://www.aemet.es/es/datos\\_abiertos/AEMET\\_OpenData](http://www.aemet.es/es/datos_abiertos/AEMET_OpenData)

## Reanalysis

- NCEP/NCAR:  
<https://www.ncdc.noaa.gov/data-access>  
<https://www.esrl.noaa.gov/psd/thredds/catalog.html>
- ECMWF:  
<https://www.ecmwf.int/>, <http://apps.ecmwf.int/datasets/>
  - API: <https://software.ecmwf.int/wiki/display/WEBAPI/>

## Observations

- ECA&D: <https://www.ecad.eu/dailydata/index.php>
- WATCH Datasets: [http://www.eu-watch.org/data\\_availability](http://www.eu-watch.org/data_availability)
- EWEMBI:  
<http://dataservices.gfz-potsdam.de/pik/showshort.php?id=escidoc:1809891>
- Spain02: <http://meteo.unican.es/en/datasets/spain02>

- AEMET-OpenData: `#!/usr/bin/env python`

## Reanalysis

- NCEP/NCAR:

<https://www.ncdc.n>

<https://www.esrl.no>

- ECMWF:

<https://www.ecmwf>

- API: <https://so>

```
from ecmwfapi import ECMWFDataServer
```

```
server = ECMWFDataServer()
```

```
server.retrieve({
```

```
'stream' : "oper",
```

```
'levtype' : "sfc",
```

```
'param' : "228.128",
```

```
'dataset' : "interim",
```

```
'step' : "0",
```

```
'grid' : "0.75/0.75",
```

```
'time' : "00/06/12/18",
```

```
'date' : "2004-01-01/to/2017-07-31",
```

```
'type' : "an",
```

```
'class' : "ei",
```

```
'format' : "netcdf",
```

```
'target' : "interim_2004-01-01to2017-07-31_00061218_166.128.nc"
```

```
})
```

## Observations

- ECA&D: <https://www.ecad.eu//dailydata/index.php>
- WATCH Datasets: [http://www.eu-watch.org/data\\_availability](http://www.eu-watch.org/data_availability)
- EWEMBI:  
<http://dataservices.gfz-potsdam.de/pik/showshort.php?id=escidoc:1809891>
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- AEMET-OpenData: [http://www.aemet.es/es/datos\\_abiertos/AEMET\\_OpenData](http://www.aemet.es/es/datos_abiertos/AEMET_OpenData)

## Reanalysis

- NCEP/NCAR:  
<https://www.ncdc.noaa.gov/data-access>  
<https://www.esrl.noaa.gov/psd/thredds/catalog.html>
- ECMWF:  
<https://www.ecmwf.int/>, <http://apps.ecmwf.int/datasets/>
  - API: <https://software.ecmwf.int/wiki/display/WEBAPI/>

`chmod +x script.py` # Execute permission for the user  
`python script.py` # Execute the script



## Observations

- ECA&D: <https://www.ecad.eu//dailydata/index.php>
- WATCH Datasets: [http://www.eu-watch.org/data\\_availability](http://www.eu-watch.org/data_availability)
- EWEMBI:  
<http://dataservices.gfz-potsdam.de/pik/showshort.php?id=escidoc:1809891>
- Spain02: <http://meteo.unican.es/en/datasets/spain02>
- AEMET-OpenData: [http://www.aemet.es/es/datos\\_abiertos/AEMET\\_OpenData](http://www.aemet.es/es/datos_abiertos/AEMET_OpenData)

## Reanalysis

- NCEP/NCAR:  
<https://www.ncdc.noaa.gov/data-access>  
<https://www.esrl.noaa.gov/psd/thredds/catalog.html>
- ECMWF:  
<https://www.ecmwf.int/>, <http://apps.ecmwf.int/datasets/>
  - API: <https://software.ecmwf.int/wiki/display/WEBAPI/>
- JRA-55: [http://jra.kishou.go.jp/JRA-55/index\\_en.html](http://jra.kishou.go.jp/JRA-55/index_en.html)
  - API: [http://jra.kishou.go.jp/comm/application\\_en.html](http://jra.kishou.go.jp/comm/application_en.html)

## Observations

- ECA&D: <https://www.ecad.eu//dailydata/index.php>
- WATCH Datasets: [http://www.eu-watch.org/data\\_availability](http://www.eu-watch.org/data_availability)
- EWEMBI:  
<http://dataservices.gfz-potsdam.de/pik/showshort.php?id=escidoc:1809891>
- Spain02: <http://meteo.unican.es/en/datasets/spain02>
- AEMET-OpenData: [http://www.aemet.es/es/datos\\_abiertos/AEMET\\_OpenData](http://www.aemet.es/es/datos_abiertos/AEMET_OpenData)

## Reanalysis

- NCEP/NCAR:  
<https://www.ncdc.noaa.gov/data-access>  
<https://www.esrl.noaa.gov/psd/thredds/catalog.html>
- ECMWF:  
<https://www.ecmwf.int/>, <http://apps.ecmwf.int/datasets/>
  - API: <https://software.ecmwf.int/wiki/display/WEBAPI/>
- JRA-55: [http://jra.kishou.go.jp/JRA-55/index\\_en.html](http://jra.kishou.go.jp/JRA-55/index_en.html)
  - API: [http://jra.kishou.go.jp/comm/application\\_en.html](http://jra.kishou.go.jp/comm/application_en.html)

## Climatic Change:

- ESGF: <https://esgf.llnl.gov/index.html>



<https://esgf-data.dkrz.de/esgf-idp/openid/M1980>



# ESGF Node at DKRZ

You are at the **ESGF-DATA.DKRZ.DE** node


[Home](#) [About Us](#) [Contact Us](#)

[Technical Support](#)

Last Search |  My Data Cart (0)

- Project** 
- Product** 
- Institute** 
- Model** 
- Experiment** 
- Experiment Family** 
- Time Frequency** 

Enter Text:

 [Search](#) [Reset](#) Display  results per page [\[ More Search Options \]](#)

☐ Show All Replicas ☐ Show All Versions ☐ Search Local Node Only (Including All Replicas)

The search returned 0 results.

<https://esgf-data.dkrz.de/esgf-idp/openid/M1980>

## My Data Cart

**About Data Carts:** You have a Data Cart on every ESGF node you have logged into. This is your Data Cart on the [esgf-data.dkrz.de](#) node. The items in this cart will persist until removed.

**Number of Items (1)** | [Return to Last Search](#)

**Collective Services for All Selected Datasets:** [ [WGET Script](#) ] [ [LAS Visualization](#) ] [ [Globus Download](#) ] [ [Collection PID](#) ]

When 'List Files' is clicked, or when using WGET or Globus, you may use an optional string to sub-select the filenames:

☐ **Select All Datasets**

 [Remove All](#)

**project=CMIP5, model=GFDL-HIRAM-C180, Geophysical Fluid Dynamics Laboratory, experiment=AMIP, time\_frequency=mon, modeling\_realm=atmos, ensemble=r3i1p1, version=20110601**

Description: NOAA GFDL GFDL-HIRAM-C180, AMIP (run 3) experiment output for CMIP5 AR5

Data Node: [esgdata.gfdl.noaa.gov](#)

Version: 20110601

Total Number of Files (for all variables): 342

Full Dataset Services: [ [Show Metadata](#) ] [ [List Files](#) ] [ [THREDDS Catalog](#) ] [ [WGET Script](#) ] [ [LAS Visualization](#) ]



[Remove](#)

<https://esgf-data.dkrz.de/esgf-idp/openid/M1980>

## My Data Cart

**About Data Carts:** You have a Data Cart on every ESGF node you have logged into. This is your Data Cart on the [esgf-data.dkrz.de](#) node. The items in this cart will persist until removed.

Number of Items (1) | [Return to Last Search](#)

Collective Services for All Selected Datasets: [ [WGET Script](#) ] [ [LAS Visualization](#) ] [ [Globus Download](#) ] [ [Collection PID](#) ]

When 'List Files' is clicked, or when using WGET or Globus, you may use an optional string to sub-select the filenames:

Enter Text

Apply

Reset

☐ Select All Datasets

 [Remove All](#)

☐ **project=CMIP5, model=GFDL-HIRAM-C180, Geophysical Fluid Dynamics Laboratory, experiment=AMIP, time\_frequency=mon, modeling\_realm=atmos, ensemble=r3i1p1, version=20110601**  
 Description: NOAA GFDL GFDL-HIRAM-C180, AMIP (run 3) experiment output for CMIP5 AR5  
 Data Node: [esgdata.gfdl.noaa.gov](#)  
 Version: 20110601  
 Total Number of Files (for all variables): 342  
 Full Dataset Services: [ [Show Metadata](#) ] [ [List Files](#) ] [ [THREDDS Catalog](#) ] [ [WGET Script](#) ] [ [LAS Visualization](#) ]

 [Remove](#)

```
chmod +x wget-YYYYMMDDHHMMSS.sh # Execute permission for the user
./wget-YYYYMMDDHHMMSS.sh # Execute the script
# If the script doesn't find the credentials, it requests them to the user
```

<https://esgf-data.dkrz.de/esgf-idp/openid/M1980>



Network Common Data Form (NetCDF)

Unidata Home » NetCDF

NETCDF

[Release Notes](#)

[FAQs](#)

[Documentation](#)

[Download](#)

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[For Developers](#)

[NetCDF Java](#)

[Compatible Software](#)

[NetCDF CDash Tests](#)

[Related Projects](#)

## Network Common Data Form (NetCDF)



NetCDF is a set of software libraries and self-describing, machine-independent data formats that support the creation, access, and sharing of array-oriented scientific data.

[See the netCDF package overview](#) ▶

### NetCDF News & Announcements

[NetCDF 4.6.1](#)

*March 20, 2018*

[NetCDF 4.6.0](#)

*January 26, 2018*

[NetCDF 4.5.0](#)

*October 23, 2017*

[NetCDF news archive](#) ▶

### Citing NetCDF

If you use netCDF and want to provide a DOI/citation, see [How to Acknowledge Unidata](#).

### NetCDF Fact Sheet

A [netCDF fact sheet](#) provides a brief overview of the netCDF package and supported languages and platforms.

[View the netCDF fact sheet](#) ▶

<https://www.unidata.ucar.edu/software/netcdf/>



**Satellite:** ~12 Sentinels in the following 10 years (**ESA, EUMETSAT 6**)

**Local observations (In situ):**

- Sensors in the shore of the rivers
- Ocean buoys
- Meteorological globes
- Non-static radars (ships, airplane, etc.)
- ....

**Local observations are needed to calibrate the data provided by the satellite.**



<https://www.copernicus.eu/en>



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

[Home](#) [Search](#) [Datasets](#) [Applications](#) [Your requests](#) [Toolbox](#) [Help & support](#)

## Welcome to the Climate Data Store

Dive into this wealth of information about the Earth's past, present and future climate.

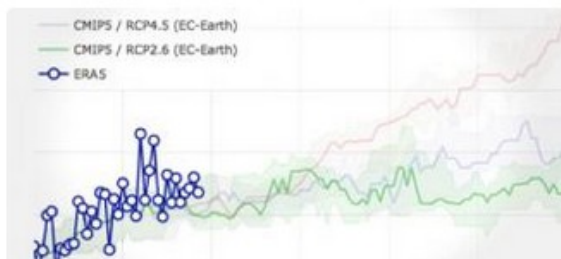
It is freely available and functions as a one-stop shop to explore climate data. [Register for free](#) to obtain access to the [CDS](#) and its [Toolbox](#).

We are constantly improving the services and adding new datasets. For more information, please consult the [catalogue](#) and our [FAQ](#).

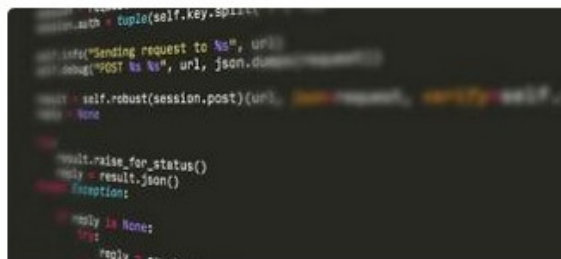
All



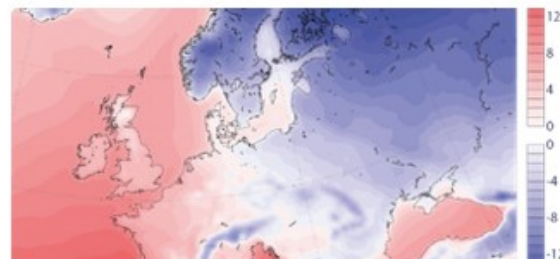
Search



Climate Data Store **Toolbox**



Climate Data Store **API**



Access **climate reanalysis**  
(ERA5)



# Welcome to the Climate Data Store

Dive into this wealth of information about the Earth's past, present and future climate

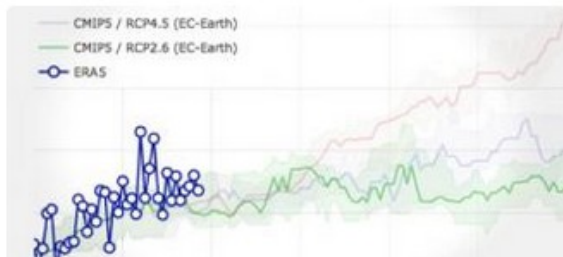
It is freely available and functions as a one-stop shop to explore climate data. [Register for free](#) to obtain access to the full range of data and use the [Toolbox](#).

We are constantly improving the services and adding new datasets. For more information, please consult the [FAQ](#).

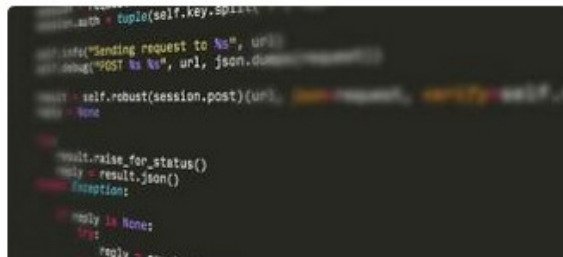
All



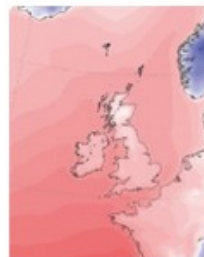
Search



Climate Data Store **Toolbox**



Climate Data Store **API**



Access c

## Product type

- ☐ Climate projections (5)
- ☐ Reanalysis (8)
- ☐ Satellite observations (12)
- ☐ Seasonal forecasts (6)
- ☐ Sectoral climate indices (2)

## Variable domain

- ☐ Atmosphere (composition) (3)
- ☐ Atmosphere (surface) (5)
- ☐ Atmosphere (upper air) (7)
- ☐ Land (biosphere) (1)
- ☐ Land (cryosphere) (2)
- ☐ Land (hydrology) (4)
- ☐ Ocean (physics) (5)

## Spatial coverage

- ☐ Europe (6)
- ☐ Global (23)

## Temporal coverage

- ☐ Future (13)
- ☐ Past (31)
- ☐ Present (4)

## Originating centre

- ☐ ECMWF ☐ UK Met Office ☐ Météo France  
☒ DWD ☐ CMCC

Select all Clear all

## System ?

- ☒ 2 ☐ 3 ☐ 4  
☐ 5 ☐ 6 ☐ 12  
☐ 13

Select all Clear all

## Variable ?

- ☐ 10m u-component of wind ☐ 10m v-component of wind ☐ 10m wind gust since previous post-processing  
☐ 2m dewpoint temperature ☒ 2m temperature ☐ Eastward turbulent surface stress  
☐ Evaporation ☐ Land-sea mask ☐ Maximum 2m temperature in the last 24 hours  
☐ Mean sea level pressure ☐ Minimum 2m temperature in the last 24 hours ☐ Northward turbulent surface stress  
☐ Orography ☐ Runoff ☐ Sea surface temperature  
☐ Sea-ice cover ☐ Snow density ☐ Snow depth  
☐ Snowfall ☐ Soil temperature level 1 ☐ Surface latent heat flux  
☐ Surface net solar radiation ☐ Surface net thermal radiation ☐ Surface sensible heat flux  
☐ Surface thermal radiation downwards ☐ TOA incident solar radiation ☐ Surface solar radiation downwards  
☐ Total cloud cover ☐ Total precipitation ☐ Top net solar radiation  
☐ Top net thermal radiation

### ▼ Product type

- ☐ Climate projections (5)  
☐ Reanalysis (8)  
☐ Satellite observations (12)  
☐ Seasonal forecasts (6)  
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### ▼ Variable domain

- ☐ Atmosphere (composition) (3)  
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### ▼ Spatial coverage

- ☐ Europe (6)  
☐ Global (23)

### ▼ Temporal coverage

- ☐ Future (13)  
☐ Past (31)  
☐ Present (4)



## Originating Year ?

- ☐ ECMWF  
☒ DWD

### ▼ Hindcast years

- |                               |  |                               |
|-------------------------------|--|-------------------------------|
| <input type="checkbox"/> 1993 | <input type="checkbox"/> 1994            | <input type="checkbox"/> 1995 |
| <input type="checkbox"/> 1996 | <input type="checkbox"/> 1997            | <input type="checkbox"/> 1998 |
| <input type="checkbox"/> 1999 | <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 | <input type="checkbox"/> 2009            | <input type="checkbox"/> 2010 |
| <input type="checkbox"/> 2011 | <input type="checkbox"/> 2012            | <input type="checkbox"/> 2013 |
| <input type="checkbox"/> 2014 | <input checked="" type="checkbox"/> 2015 | <input type="checkbox"/> 2016 |

[Select all](#)[Clear all](#)

## System ?

- ☒ 2  
☐ 5  
☐ 13

## Variable ?

### ▼ Forecast years

- |                                   |                               |                               |                               |
|-----------------------------------|-------------------------------|-------------------------------|-------------------------------|
| <input type="checkbox"/> 10m u-co | <input type="checkbox"/> 2017 | <input type="checkbox"/> 2018 | <input type="checkbox"/> 2019 |
|-----------------------------------|-------------------------------|-------------------------------|-------------------------------|

[Select all](#)[Select all](#)[Clear all](#)

- ☐ Orograph  
☐ Sea-ice co  
☐ Snowfall  
☐ Surface n

- ☐ Surface th  
downward  
☐ Total clou

## Month ?

- |                                  |  |                                    |
|----------------------------------|--|------------------------------------|
| <input type="checkbox"/> January | <input type="checkbox"/> February          | <input type="checkbox"/> March     |
| <input type="checkbox"/> April   | <input type="checkbox"/> May               | <input type="checkbox"/> June      |
| <input type="checkbox"/> July    | <input checked="" type="checkbox"/> August | <input type="checkbox"/> September |
| <input type="checkbox"/> October | <input type="checkbox"/> November          | <input type="checkbox"/> December  |

[Select all](#)[Clear all](#)

e	
jections	(5)
	(8)
observations	(12)
forecasts	(6)
imate indices	(2)
main	
re (composition)	(3)
re (surface)	(5)
re (upper air)	(7)
phere)	(1)
osphere)	(2)
rology)	(4)
ysics)	(5)
erage	
	(6)
	(23)
verage	
	(13)
	(31)
	(4)

Originating Year  Day 

- ☐ ECMWF  
☒ DWD

▼ Hindcast years

- ☐ 1993  
☐ 1996  
☐ 1999  
☐ 2002  
☐ 2005  
☐ 2008  
☐ 2011  
☐ 2014


- ☒ 01  
☐ 04  
☐ 07  
☐ 10  
☐ 13  
☐ 16  
☐ 19  
☐ 22  
☐ 25  
☐ 28  
☐ 31

- ☐ 02  
☐ 05  
☐ 08  
☐ 11  
☐ 14  
☐ 17  
☐ 20  
☐ 23  
☐ 26  
☐ 29


- ☐ 03  
☐ 06  
☐ 09  
☐ 12  
☐ 15  
☐ 18  
☐ 21  
☐ 24  
☐ 27  
☐ 30

(5)  
(8)  
(12)  
(6)  
(2)  
—  
(3)  
(5)  
(7)

Select all Clear all

System 

- ☒ 2  
☐ 5  
☐ 13

Variable 

▼ Forecast years

- ☐ 2017

Format

- ☒ GRIB

Leadtime hour

- ☐ 10m u-co  
☐ 2m dewp  
☐ Evaporati  
☐ Mean sea  
☐ Orograph  
☐ Sea-ice co  
☐ Snowfall  
☐ Surface n  
☐ Surface th  
downward  
☐ Total clou

Month 

- ☐ January  
☐ April  
☐ July  
☐ October

- ☐ 0  
☒ 18  
☒ 36  
☒ 54  
☒ 72  
☒ 90  
☒ 108

- ☒ August  
☐ November

- ☒ 6  
☒ 24  
☒ 42  
☒ 60  
☒ 78  
☒ 96  
☒ 114

- ☐ September  
☐ December

- ☒ 12  
☒ 30  
☒ 48  
☒ 66  
☒ 84  
☒ 102  
☒ 120

(1)  
(2)  
(4)  
(5)  
—  
(6)  
(23)  
—  
(13)  
(31)  
(4)

Select all Clear all

Originating Year ? Day ?

Hide API request

Not yet toolbox compatible

Submit Form

- ☐ ECMWF  
☒ DWD

Please go to [the documentation page](#) for information as to how to use the CDS API.

```
import cdsapi

c = cdsapi.Client()

c.retrieve(
    'seasonal-original-single-levels',
    {
        'originating_centre': 'dwd',
        'system': '2',
        'variable': '2m_temperature',
        'year': '2015',
        'month': '08',
        'day': '01',
        'format': 'grib',
        'leadtime_hour': [
            '6', '12', '18',
            '24', '30', '36',
            '42', '48', '54',
            '60', '66', '72',
            '78', '84', '90',
            '96', '102', '108',
            '114', '120', '126',
            '132', '138', '144',
            '150', '156', '162'
        ]
    }
)
```

System ?

- ☒ 2  
☐ 5  
☐ 13

Variable ?

- ☐ 10m u-co  
☐ 2m dewp  
☐ Evaporati  
☐ Mean sea  
☐ Orograph  
☐ Sea-ice co  
☐ Snowfall  
☐ Surface n

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Show API request

Not yet toolbox compatible

Submit Form

Select all Clear all

Originating Year ? Day ?

Hide API request

Not yet toolbox compatible

Submit Form

- ☐ ECMWF  
☒ DWD

Please go to [the documentation page](#) for information as to how to use the CDS API.

```
import cdsapi

c = cdsapi.Client()

c.retrieve(
    'seasonal-original-single-levels',
    {
        'originating_centre': 'dwd',
        'system': '2',
        'product': 'seas-fcst',
        'year': '2017',
        'month': '01',
        'day': '01',
        'time': '14:01:26',
        'lat': '50',
        'lon': '10',
        'height': '1000',
        'level': '1000',
        'variable': 'msl',
        'units': 'hPa',
        'format': 'netcdf'
    })
```

System ?

- ☒ 2  
☐ 5

▶ Seasonal forecast daily data on single levels from 2017 to present	2019-04-01 14:01:26	1:39:44	Queued	<input type="checkbox"/>
▶ Seasonal forecast daily data on single levels from 2017 to present	2019-04-01 14:01:09	1:40:01	Queued	<input type="checkbox"/>
▶ Seasonal forecast daily data on single levels from 2017 to present	2019-04-01 14:00:44	1:40:26	Queued	<input type="checkbox"/>
▶ Seasonal forecast daily data on single levels from 2017 to present	2019-04-01 14:00:25	1:40:46	Queued	<input type="checkbox"/>
▶ Seasonal forecast daily data on single levels from 2017 to present	2019-04-01 14:00:01	1:41:09	In progress	<input type="checkbox"/>

- ☐ Mean sea  
☐ Orograph  
☐ Sea-ice co  
☐ Snowfall  
☐ Surface n

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Show API request

Not yet toolbox compatible

Submit Form

Select all

Create all

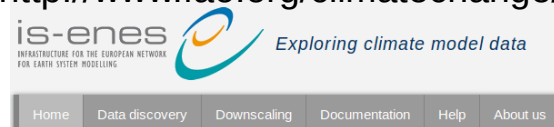
# Research



## Statistical Downscaling Portal



<http://www.fao.org/climatechange/mosaicc>

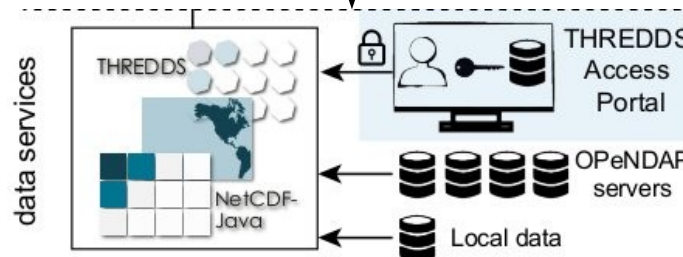


Welcome to IS-ENES Climate4Impact

<https://climate4impact.eu>



## User Data Gateway



## ESGF Node



ECLISEA



VALUE



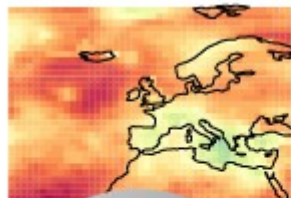
Master Universitario Oficial **Data Science**



ESGF & MARS

Santander Climate Data Service





THREDDS

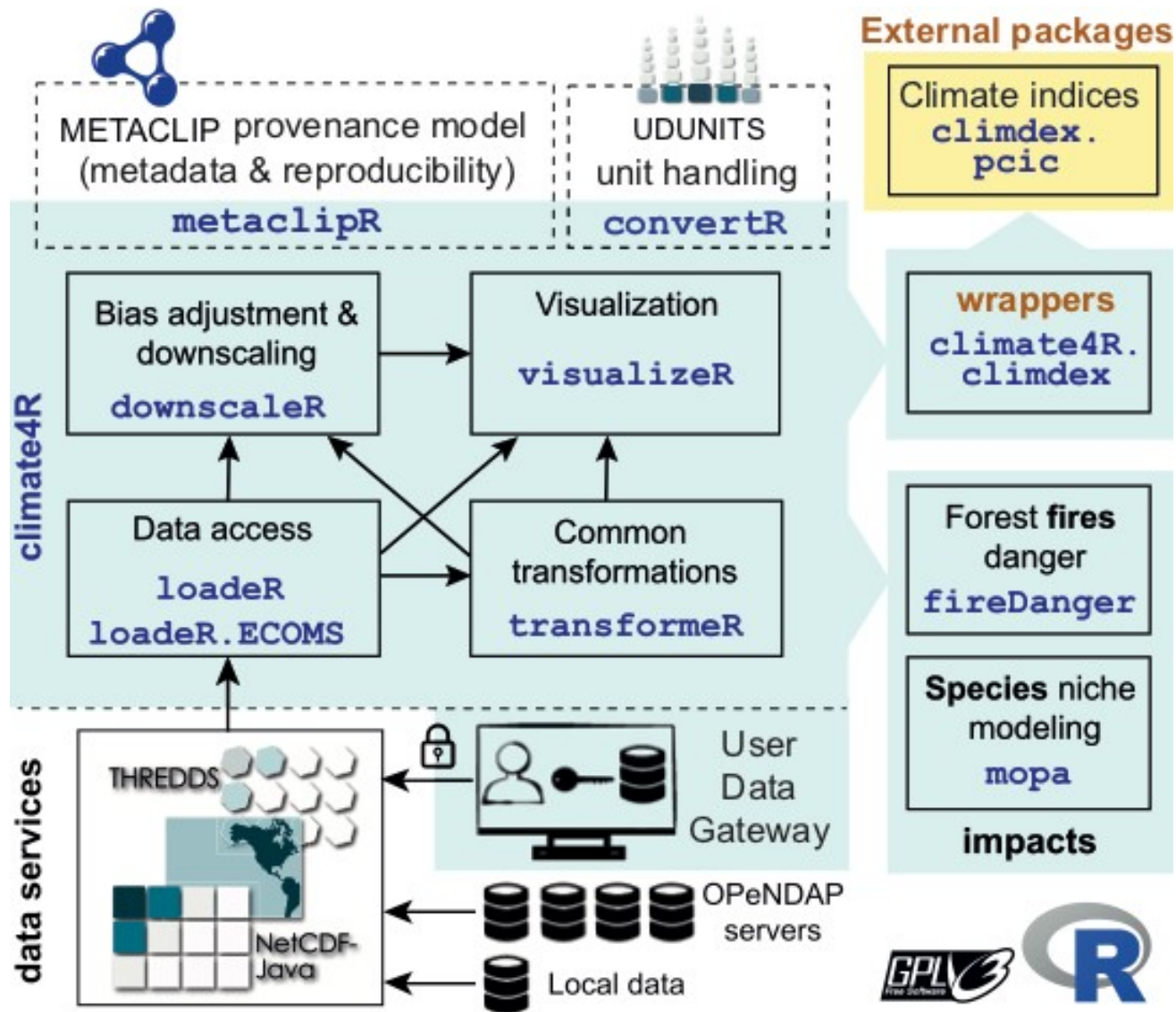


NetCDF-  
Java

UDG: <http://meteo.unican.es/udg-tap/home>

UDG-Public Data:

<http://www.meteo.unican.es/tds5/catalogs/public.html>

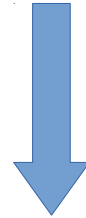




**UDG:** <http://meteo.unican.es/udg-tap/home>

**UDG-Public Data:**

<http://www.meteo.unican.es/tds5/catalogs/public.html>



**Task: Follow the instructions and complete the registration on the User Data Gateway. All the details are included in the Santander MetGroup Trac:**

**<https://meteo.unican.es/trac/wiki/udg>**