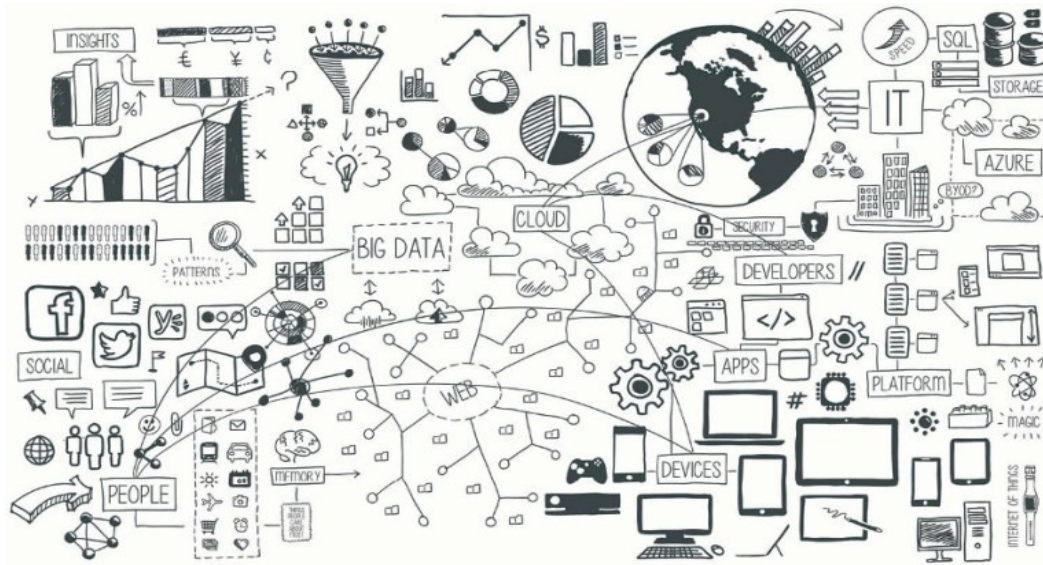


DataLab: Environment and Meteorology

Downloading Climate Data – ESGF & MARS



Analytics
Engineer
Senior Research Science
Principal
Sr
Data Scientist
Analyst
Business
Learning
Intelligence
Development
Platform
MAGIC
Internet of Things
Devices
Apps
Developers
Security
Cloud
Storage
IT
Azure
Byod
Marketing
Mining
Modeling
Machine
Big Developer
Advanced
Director
Manager
Principal
Sr
Business
Learning
Intelligence
Development
Platform
MAGIC
Internet of Things
Devices
Apps
Developers
Security
Cloud
Storage
IT
Azure
Byod
Marketing
Mining
Modeling
Machine

Sixto Herrera García

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

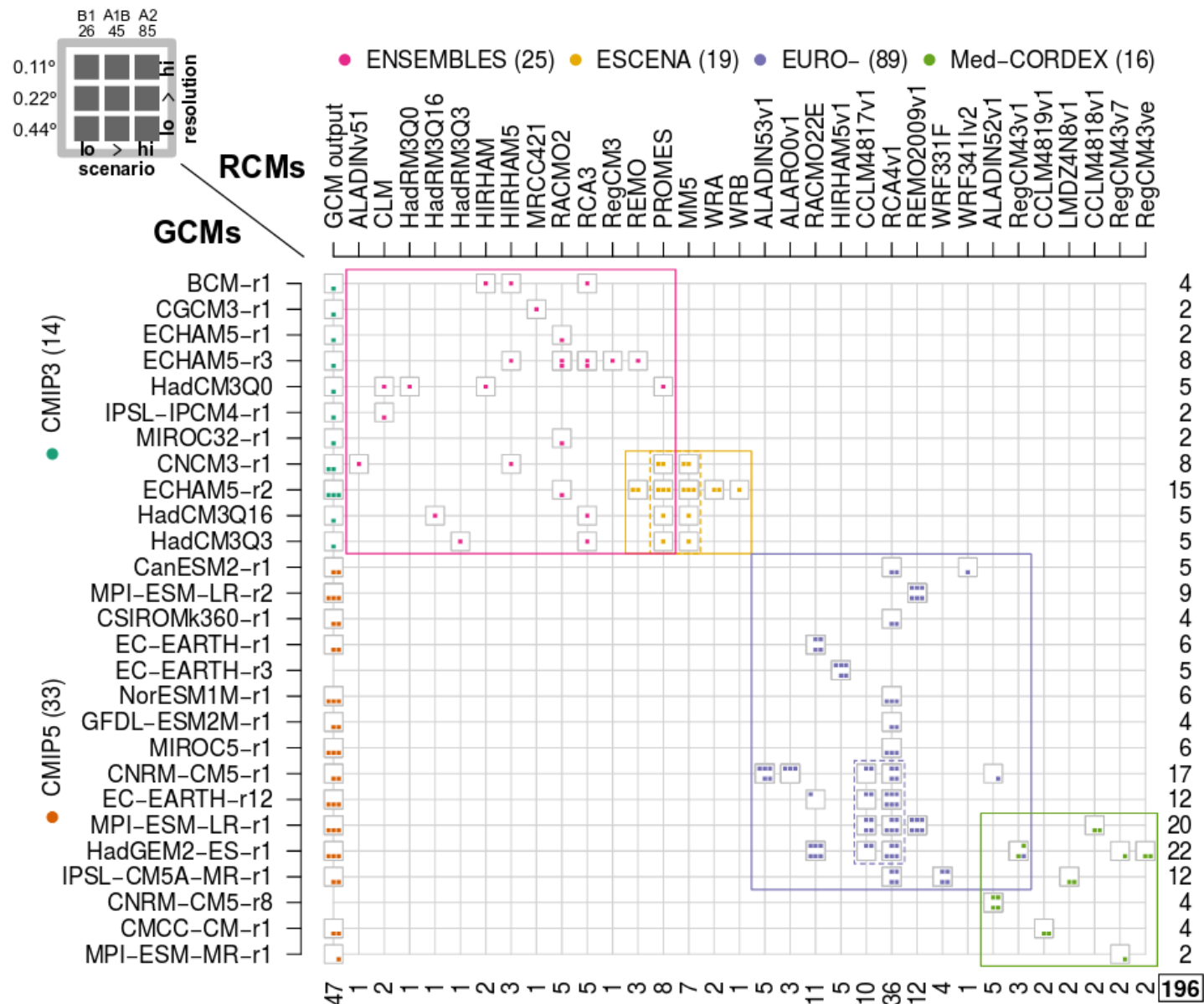


M1980 – Data Laboratory: Environment & Meteorology (16:00-18:00)

Virtual classroom: <https://meet.jit.si/M1980>

03/25	X	Introduction and Climate4R package	TL	JB
03/26	J	Climatic System & Models (DM & ML in Climate Science)	T	SH
03/27	V	Data Repositories: ESGF & MARS	TL	SH
03/30	L	Data Repositories: ESGF & MARS	TL	SH
03/31	M	Lab: Climate4R – Example 1	L	JB
04/01	X	Lab: Climate4R – Example 2	L	JB
04/02	J	Downscaling: Data Mining in Clime	T	SH
04/03	V	Lab: downscaleR	L	JB
04/06	L	Evaluation and Validation	T	SH
04/07	M	Lab: Evaluation and Validation	L	JB
04/08	X	Impacts	L	JB
04/13	L	Impacts	L	JB

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



Observations
Reanalysis
Seasonal Forecast:
 Member
 Initialization
 ...
Climate Change:
 Global Models (GCM)
 Regional Models (RCM)
 Scenarios/Experiments
 Runs
 Parameterizations
 ...

↓

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

- Worldwide: <ftp://ftp.ncdc.noaa.gov/pub/data/>
<https://www.ncdc.noaa.gov/data-access>
- ECA&D: <https://www.ecad.eu//dailydata/index.php>
- AEMET-OpenData: http://www.aemet.es/es/datos_abiertos/AEMET_OpenData





Observations

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<https://www.ncdc.noaa.gov/data-access>
- ECA&D: <https://www.ecad.eu//dailydata/index.php>
- AEMET-OpenData: http://www.aemet.es/es/datos_abiertos/AEMET_OpenData



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

FAQ RSS

 AEMET OpenData ¿Qué es?	 Obtención de API Key Solicitar	 Acceso General Entrar	 Acceso Desarrolladores Entrar
-----------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------

Observations

- Worldwide: <ftp://ftp.ncdc.noaa.gov/pub/data/>
<https://www.ncdc.noaa.gov/data-access>
- ECA&D: <https://www.ecad.eu//dailydata/index.php>
- 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.eyJzdWIiOiJzaXh0b2hnQGdtYWlsLmNvbSIsImpp0aSI6IjYyYVYyYTRhLTBiZTQtNDgyMi1iO0TU1LCJ1c2VzSWQiOiI2MmFIYmE0YS0wYmU0LTQ4MjltYmYyYy01M2M5YjRlZTA3NWYiLCJyb2xlIjoiaW0.-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

AEMET
Agencia Estatal de Meteorología



AEMET OpenData

¿Qué es?






Obtención de API Key


Solicitar

Observations

- Worldwide: <ftp://ftp.ncdc.noaa.gov/pub/data/>
<https://www.ncdc.noaa.gov/data-access>
- ECA&D: <https://www.ecad.eu//dailydata/index.php>
- AEMET-OpenData: http://www.aemet.es/es/datos_abiertos/AEMET_OpenData



Acceso General




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

Observations

- Worldwide: <ftp://ftp.ncdc.noaa.gov/pub/data/>
<https://www.ncdc.noaa.gov/data-access>
- ECA&D: <https://www.ecad.eu//dailydata/index.php>
- AEMET-OpenData: http://www.aemet.es/es/datos_abiertos/AEMET_OpenData

GOBIERNO DE ESPAÑA MINISTRO DE AGRICULTURA Y PESCA, ALIMENTACIÓN Y MEDIO AMBIENTE

Introduzca su API Key:

NQIOil2MmFIYmE0YS0wYmU0LT...

Mostrar 100 registros

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

Observación convencional

Mensajes de observación. Último elaborado

Seleccione tipo de parte

Seleccione una estación

Próximamente

Datos de observación. Último elaborado

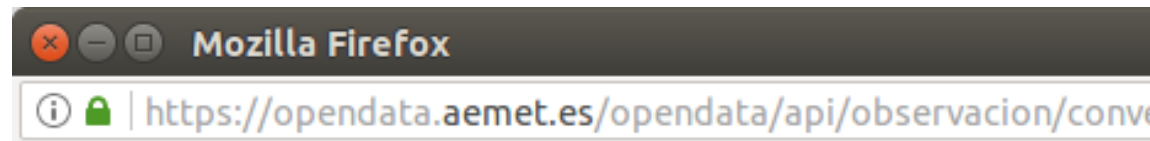
Cantabria

1111X - Santander

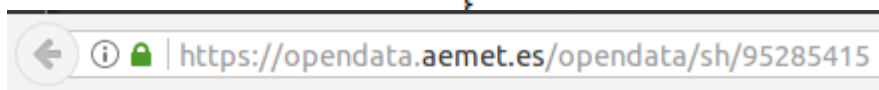
Obtener

Observations

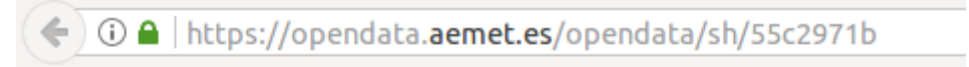
- Worldwide: <ftp://ftp.ncdc.noaa.gov/pub/data/>
<https://www.ncdc.noaa.gov/data-access>
- ECA&D: <https://www.ecad.eu//dailydata/index.php>
- AEMET-OpenData: http://www.aemet.es/es/datos_abiertos/AEMET_OpenData



```
{
  "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

- Worldwide: <ftp://ftp.ncdc.noaa.gov/pub/data/>
<https://www.ncdc.noaa.gov/data-access>
- ECA&D: <https://www.ecad.eu//dailydata/index.php>
- AEMET-OpenData: http://www.aemet.es/es/datos_abiertos/AEMET_OpenData



BOLETÍN OFICIAL DEL ESTADO



Núm. 4

Martes 5 de enero de 2016

Sec. III. Pág. 659

ANEXO IV

Impresos de solicitud

IMPRESO DE SOLICITUD DE PRESTACIONES METEOROLÓGICAS PARA SOLICITUDES GENERALES (IMPRESO L1)

1. DATOS DEL SOLICITANTE

CIF//NIF:	Empresa (Nombre) // Particular (Nombre y Apellidos):		
Su referencia:	Sector de actividad (*):		
<input type="checkbox"/> Empresa Privada	<input type="checkbox"/> Empresa Pública	<input type="checkbox"/> Administración Pública	<input type="checkbox"/> Particular
Domicilio Fiscal		Código Postal:	Apdo. Correos:
Localidad:		Provincia:	País:
Teléfono:	Fax:	E-mail:	

(*) En caso de administración pública o enseñanza universitaria, rellenar el apartado 5 y cumplimentar (1) para obtener el descuento aplicable en el precio de la información y presentar documento original.

2. DATOS DE LA PERSONA DE CONTACTO (rellenar únicamente en caso de ser distintos que los del solicitante)

Persona de contacto (nombre y apellidos):

Teléfono:

Fax:

E-mail:

Dirección de contacto:

Observations

- Worldwide: <ftp://ftp.ncdc.noaa.gov/pub/data/>
<https://www.ncdc.noaa.gov/data-access>
- ECA&D: <https://www.ecad.eu//dailydata/index.php>
- AEMET-OpenData: http://www.aemet.es/es/datos_abiertos/AEMET_OpenData



BOLETÍN OFICIAL DEL ESTADO



Núm. 4

Martes 5 de enero de 2016

Sec. III. Pág. 659

ANEXO IV

Campos incluidos:

Indicativo: Indicativo climatológico

NOMBRE: Nombre estación

ALTITUD: Altitud de la estación (metros)

C_X: Coordenada X (Huso 30)

C_Y: Coordenada Y (Huso 30)

NOM PROV: Provincia

LONGITUD: Longitud geográfica

(La última cifra indica la orientación: 1 para longitud E y 2 para W)

LATITUD: Latitud geográfica

P1: Precipitación día 1

P31: Precipitación día 31

Unidades y valores especiales:

Horas UTC (Tiempo Universal Coordinado)

Precipitación en décimas de milímetro, medida de 07 a 07 (desde la 07 del día de la fecha hasta las 07 del día siguiente)

Valores especiales de precipitación:

-4: Precipitación acumulada

-3: Precipitación inapreciable (inferior a 1 décima de mm)

icitud

TEOROLÓGICAS PARA SOLICITUDES
ISO L1)

ore y Apellidos):

Administración Pública

☐ Particular

Código Postal:

Apdo. Correos:

Observations

- Worldwide: <ftp://ftp.ncdc.noaa.gov/pub/data/>
<https://www.ncdc.noaa.gov/data-access>
- ECA&D: <https://www.ecad.eu//dailydata/index.php>
- AEMET-OpenData: http://www.aemet.es/es/datos_abiertos/AEMET_OpenData

Any of the previous datasets includes all the ECVs?

Observations

- Worldwide: <ftp://ftp.ncdc.noaa.gov/pub/data/>
<https://www.ncdc.noaa.gov/data-access>
- ECA&D: <https://www.ecad.eu//dailydata/index.php>
- AEMET-OpenData: http://www.aemet.es/es/datos_abiertos/AEMET_OpenData

Gridded datasets:

- Climate Research Unit (CRU): <http://www.cru.uea.ac.uk/data/> → SPEI Dataset
- E-OBS: <https://www.ecad.eu//download/ensembles/ensembles.php>
https://surfobs.climate.copernicus.eu/dataaccess/access_eobs.php
- Iberian01: <http://hdl.handle.net/10261/183071>
- Spain02: <http://meteo.unican.es/en/datasets/spain02>
- MOPREDAS and MOTEDAS (Universidad de Zaragoza) - Monthly

Observations

- Worldwide: <ftp://ftp.ncdc.noaa.gov/pub/data/>
<https://www.ncdc.noaa.gov/data-access>
- ECA&D: <https://www.ecad.eu//dailydata/index.php>
- AEMET-OpenData: http://www.aemet.es/es/datos_abiertos/AEMET_OpenData

Gridded datasets:

- Climate Research Unit (CRU): <http://www.cru.uea.ac.uk/data/> → SPEI Dataset
- E-OBS: <https://www.ecad.eu//download/ensembles/ensembles.php>
https://surfobs.climate.copernicus.eu/dataaccess/access_eobs.php
- Iberian01: <http://hdl.handle.net/10261/183071>
- Spain02: <http://meteo.unican.es/en/datasets/spain02>
- MOPREDAS and MOTEDAS (Universidad de Zaragoza) - Monthly

Any of the previous datasets includes all the ECVs?



Network Common Data Form (NetCDF)

Unidata Home » NetCDF

NETCDF

Release Notes

FAQs

Documentation

Download

Support

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/>

Data Software Downloads Support Community Projects News Events About Us

NetCDF (4.6) Tools

System Modes Debug Help

Viewer Writer NCDump losp CoordSys FeatureTypes THREDDS Fmrc GeoTiff Units NcML URLdump

dataset: <https://www.esrl.noaa.gov/psd/thredds/dodsC/Datasets/ncep.reanalysis2/surface/hgt.sfc.nc>

	dataType	description	dimensions	group	name	shape	units
lat	float	Latitude	lat		lat	73	degrees_north
lon	float	Longitude	lon		lon	144	degrees_east
time	double	Time	time		time	1	hours since 1...
hgt	short	Geopotential Height ...	time,lat,lon		hgt	1,73,144	m

Related Projects

[NetCDF news archive](#)

[View the netCDF fact sheet](#)

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

NetCDF (4.6) Tools

System Modes Debug Help

Viewer Writer NCDump losp CoordSys FeatureTypes THREDDS Fmrc GeoTiff Units NcML URLdump

dataset: <https://www.esrl.noaa.gov/psd/thredds/dodsC/Datasets/ncep.reanalysis2/surface/hgt.sfc.nc>

	dataType	description	dimensions	group	name	shape	units
lat	float	Latitude	lat		lat	73	degrees_north

NetCDF (4.6) Tools

System Modes Debug Help

Viewer Writer NCDump losp CoordSys FeatureTypes THREDDS Fmrc GeoTiff Units NcML URLdump

command: <https://www.esrl.noaa.gov/psd/thredds/dodsC/Datasets/ncep.reanalysis2/surface/hgt.sfc.nc>

```
netcdf dods://www.esrl.noaa.gov/psd/thredds/dodsC/Datasets/ncep.reanalysis2/surface/hgt.sfc.nc {
  dimensions:
    lat = 73;
    lon = 144;
    time = UNLIMITED;  // (1 currently)
  variables:
    float lat(lat=73);
      :units = "degrees_north";
      :actual_range = 90.0f, -90.0f; // float
      :long_name = "Latitude";
      :standard_name = "latitude";
      :axis = "Y";
      :coordinate_defines = "point";

    float lon(lon=144);
      :units = "degrees_east";
      :long_name = "Longitude";
      :actual_range = 0.0f, 357.5f; // float
      :standard_name = "longitude";
      :axis = "X";
      :coordinate_defines = "point";

    double time(time=1);
      :units = "hours since 1800-1-1 00:00:0.0";
      :long_name = "Time";
      :actual_range = 1569072.0, 1569072.0; // double
      :delta_t = "0000-00-00 06:00:00";
      :standard_name = "time";
      :axis = "T";
      :coordinate_defines = "point";

    short hgt(time=1, lat=73, lon=144);
```

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

NetCDF (4.6) Tools

System Modes Debug Help

Viewer Writer NCDump losp CoordSys FeatureTypes THREDDS Fmrc GeoTiff Units NcML URLdump

dataset: <https://www.esrl.noaa.gov/psd/thredds/dodsC/Datasets/ncep.reanalysis2/surface/hgt.sfc.nc>

	dataType	description	dimensions	group	name	shape	units
lat	float	Latitude	lat		lat	73	degrees_north
lon	float	Longitude	lon		lon	144	degrees_east
time	double	Time	time		time	1	hours since 1...
lat	short	Geopotential Height ...	time,lat,lon		hgt	1,73,144	m

NetCDF (4.6) Tools

System Modes Debug Help

Viewer Writer NCDump losp CoordSys FeatureTypes THREDDS Fmrc GeoTiff Units NcML URLdump

NcmlEditor Aggregation

dataset: <https://www.esrl.noaa.gov/psd/thredds/dodsC/Datasets/ncep.reanalysis2/surface/hgt.sfc.nc>

```

1 <?xml version="1.0" encoding="UTF-8"?>
2 <ncml:netcdf xmlns:ncml="http://www.unidata.ucar.edu/namespaces/netcdf/ncml-2.2" location="dods://www.esrl.noaa.gov/psd/thredds/dodsC/Datasets/ncep.reanalysis2/surface/hgt.sfc.nc" >
3   <ncml:dimension name="lat" length="73" />
4   <ncml:dimension name="lon" length="144" />
5   <ncml:dimension name="time" length="1" isUnlimited="true" />
6   <ncml:attribute name="Conventions" value="CF-1.0" />
7   <ncml:attribute name="title" value="4x Daily NCEP/DOE Reanalysis 2" />
8   <ncml:attribute name="history" value="created 2002/03 by Hoop (netCDF2.3)" />
9   <ncml:attribute name="comments" value="Data is from &#xA;NCEP/DOE AMIP-II Reanalysis (Reanalysis-2)&#xA;(4x/day). Data interpolated from model (sigma) su" />
10  <ncml:attribute name="platform" value="Model" />
11  <ncml:attribute name="source" value="NCEP/DOE AMIP-II Reanalysis (Reanalysis-2) Model" />
12  <ncml:attribute name="institution" value="National Centers for Environmental Prediction" />
13  <ncml:attribute name="dataset_title" value="NCEP-DOE AMIP-II Reanalysis" />
14  <ncml:attribute name="References" value="https://www.esrl.noaa.gov/psd/data/gridded/data.ncep.reanalysis2.html" />
15  <ncml:attribute name="source_url" value="http://www.cpc.ncep.noaa.gov/products/wesley/reanalysis2/" />
16  <ncml:variable name="lat" shape="lat" type="float">
17    <ncml:attribute name="units" value="degrees_north" />
18    <ncml:attribute name="actual_range" type="float" value="90.0 -90.0" />
19    <ncml:attribute name="long_name" value="Latitude" />
20    <ncml:attribute name="standard_name" value="latitude" />
21    <ncml:attribute name="axis" value="Y" />
22    <ncml:attribute name="coordinate_defines" value="point" />
23  </ncml:variable>
24  <ncml:variable name="lon" shape="lon" type="float">
25    <ncml:attribute name="units" value="degrees_east" />
26    <ncml:attribute name="long_name" value="Longitude" />
27    <ncml:attribute name="actual_range" type="float" value="0.0 357.5" />
28    <ncml:attribute name="standard_name" value="longitude" />
29    <ncml:attribute name="axis" value="X" />
30    <ncml:attribute name="coordinate_defines" value="point" />
31  </ncml:variable>
32  <ncml:variable name="time" shape="time" type="double">
33    <ncml:attribute name="units" value="hours since 1800-1-1 00:00:0.0" />
34    <ncml:attribute name="long_name" value="Time" />

```

Related Projects

Data Software Downloads Support Community Projects News Events About Us

NetCDF (4.6) Tools

System Modes Debug Help

Viewer Writer NCDump losp CoordSys FeatureTypes THREDDS Fmrc GeoTiff Units NcML URLdump

dataset: <https://www.esrl.noaa.gov/psd/thredds/dodsC/Datasets/ncep.reanalysis2/surface/hgt.sfc.nc>

	dataType	description	dimensions	group	name	shape	units
lat	float	Latitude	lat		lat	73	degrees_north
lon	float	Longitude	lon		lon	144	degrees_east
time	double	Time	time		time	1	hours since 1...
hgt	short	Geopotential Height ...	time,lat,lon		hgt	1,73,144	m

NetCDF (4.6) Tools

System Modes Debug Help

Viewer Writer NCDump losp CoordSys FeatureTypes THREDDS Fmrc GeoTiff Units NcML URLdump

NcmlEditor Aggregation

dataset: <https://www.esrl.noaa.gov/psd/thredds/dodsC/Datasets/ncep.reanalysis2/surface/hgt.sfc.nc>

```

1 <?xml version="1.0" encoding="UTF-8"?>
2 <ncml:netcdf xmlns:ncml="http://www.unidata.ucar.edu/namespaces/netcdf/ncml-2.2" location="dods://www.esrl.noaa.gov/psd/thredds/dodsC/Datasets/ncep.reanalysis2/surface/hgt.sfc.nc">
3   <ncml:dimension name="lat" length="73" />
4   <ncml:dimension name="lon" length="144" />
5   <ncml:dimension name="time" length="1" isUnlimited="true" />
6   <ncml:attribute name="Conventions" value="CF-1.0" />

```

<https://www.unidata.ucar.edu/software/thredds/current/tds/tutorial/NcMLExamples.html>

<https://www.unidata.ucar.edu/software/thredds/current/tds/tutorial/NcMLAggExamples.html>

<https://www.unidata.ucar.edu/software/thredds/current/netcdf-java/ncml/Tutorial.html>

Related Projects

```

15 <ncml:attribute name="source_url" value="http://www.cpc.ncep.noaa.gov/products/wesley/reanalysis2/" />
16 <ncml:variable name="lat" shape="lat" type="float">
17   <ncml:attribute name="units" value="degrees_north" />
18   <ncml:attribute name="actual_range" type="float" value="90.0 -90.0" />
19   <ncml:attribute name="long_name" value="Latitude" />
20   <ncml:attribute name="standard_name" value="latitude" />
21   <ncml:attribute name="axis" value="Y" />
22   <ncml:attribute name="coordinate_defines" value="point" />
23 </ncml:variable>
24 <ncml:variable name="lon" shape="lon" type="float">
25   <ncml:attribute name="units" value="degrees_east" />
26   <ncml:attribute name="long_name" value="Longitude" />
27   <ncml:attribute name="actual_range" type="float" value="0.0 357.5" />
28   <ncml:attribute name="standard_name" value="longitude" />
29   <ncml:attribute name="axis" value="X" />
30   <ncml:attribute name="coordinate_defines" value="point" />
31 </ncml:variable>
32 <ncml:variable name="time" shape="time" type="double">
33   <ncml:attribute name="units" value="hours since 1800-1-1 00:00:0.0" />
34   <ncml:attribute name="long_name" value="Time" />

```

Master Universitario Oficial

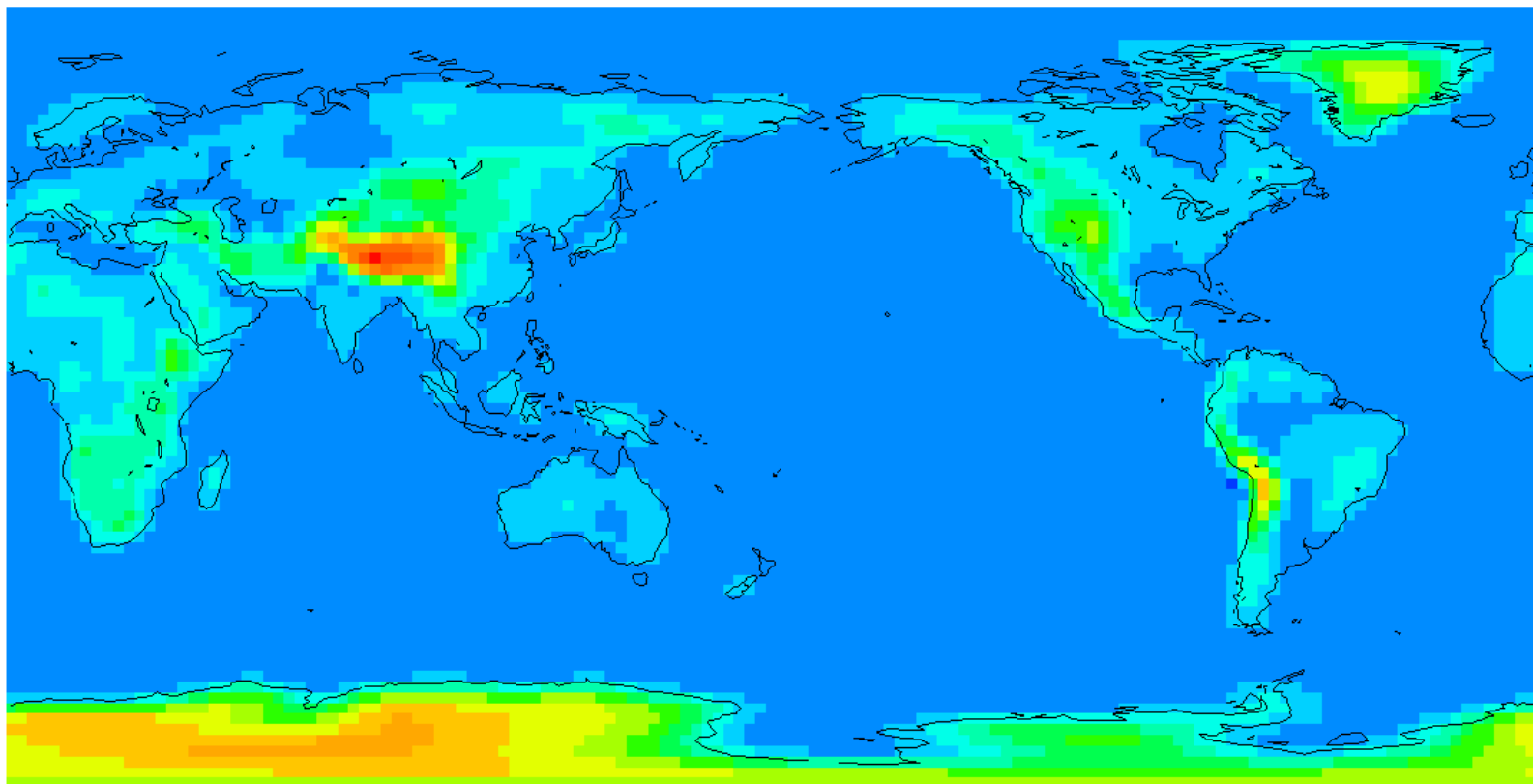
UC UNIVERSIDAD DE CANTABRIA

UIMP Universidad Internacional Menéndez Pelayo

Dataset: dods://www.esrl.noaa.gov/psd/thredds/dodsC/Datasets/ncep.reanalysis2/surface/hgt.sfc.nc

Dataset Configure Controls hgt == Geopotential Height at the Surface 1979-01-01 00:00:00Z 1

horiz



27.280N 41.178W

.0 m @ 27.5N 40.0W

```

26 <ncml:attribute name="long_name" value="Longitude" />
27 <ncml:attribute name="actual_range" type="float" value="0.0 357.5" />
28 <ncml:attribute name="standard_name" value="longitude" />
29 <ncml:attribute name="axis" value="X" />
30 <ncml:attribute name="coordinate_defines" value="point" />
31 </ncml:variable>
32 <ncml:variable name="time" shape="time" type="double">
33 <ncml:attribute name="units" value="hours since 1800-1-1 00:00:0.0" />
34 <ncml:attribute name="long_name" value="Time" />
    
```

Observations

- Worldwide: <ftp://ftp.ncdc.noaa.gov/pub/data/>
<https://www.ncdc.noaa.gov/data-access>
- ECA&D: <https://www.ecad.eu//dailydata/index.php>
- AEMET-OpenData: http://www.aemet.es/es/datos_abiertos/AEMET_OpenData

Gridded datasets:

- Climate Research Unit (CRU): <http://www.cru.uea.ac.uk/data/> → SPEI Dataset
- E-OBS: <https://www.ecad.eu//download/ensembles/ensembles.php>
https://surfobs.climate.copernicus.eu/dataaccess/access_eobs.php
- Iberian01: <http://hdl.handle.net/10261/183071>
- Spain02: <http://meteo.unican.es/en/datasets/spain02>
- MOPREDAS and MOTEDAS (Universidad de Zaragoza) - Monthly

Gridded datasets (reanalysis calibration):

- WATCH Datasets: http://www.eu-watch.org/data_availability
- EWEMBI:
<http://dataservices.gfz-potsdam.de/pik/showshort.php?id=escidoc:1809891>
- WFDE5: <https://cds.climate.copernicus.eu/cdsapp#!/search>
- SAFRAN (Spain): <http://meteo.unican.es/en/node/73339>
- AEMET 5 km: <http://www.aemet.es/es/serviciosclimaticos>
- Regional Reanalysis: UERRA Project (<http://www.uerra.eu/>)

Observations

- Worldwide: <ftp://ftp.ncdc.noaa.gov/pub/data/>
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- ECA&D: <https://www.ecad.eu//dailydata/index.php>
- AEMET-OpenData: http://www.aemet.es/es/datos_abiertos/AEMET_OpenData

Any of the following datasets includes all the ECVs?

Gridded datasets (reanalysis calibration):

- WATCH Datasets: http://www.eu-watch.org/data_availability
- EWEMBI:
<http://dataservices.gfz-potsdam.de/pik/showshort.php?id=escidoc:1809891>
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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/>

Reanalysis

- NCEP/NCAR:

<https://www.ncdc.noaa.gov/data-access>

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<https://www.ecmwf.int/>, <http://apps.ecmwf.int/datasets/>

- API: <https://software.ecmwf.int/wiki/display/WEBAPI/>

```
#!/usr/bin/env python
```

```
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"
```

```
})
```

Reanalysis

- NCEP/NCAR:

<https://www.ncdc.noaa.gov/data-access>

<https://www.esrl.noaa.gov/psd/thredds/catalog.html>

- ECMWF:

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```

```
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```

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```

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

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

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

```
})
```

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

Reanalysis

- NCEP/NCAR:

<https://www.ncdc.noaa.gov/data-access>

<https://www.esrl.noaa.gov/psd/thredds/catalog.html>

- ECMWF:

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- API: <https://software.ecmwf.int/wiki/display/WEBAPI/>

- Copernicus CDS: <https://cds.climate.copernicus.eu/cdsapp#!/home>

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/>

- Copernicus CDS: <https://cds.climate.copernicus.eu/cdsapp#!/home>

If possible, explore the CDS App and define the request to download the surface ECVs for the ERA5 Reanalysis considering any month, year, etc...

Reanalysis

- NCEP/NCAR:

<https://www.ncdc.noaa.gov/data-access>

<https://www.esrl.noaa.gov/psd/thredds/catalog.html>

- ECMWF:

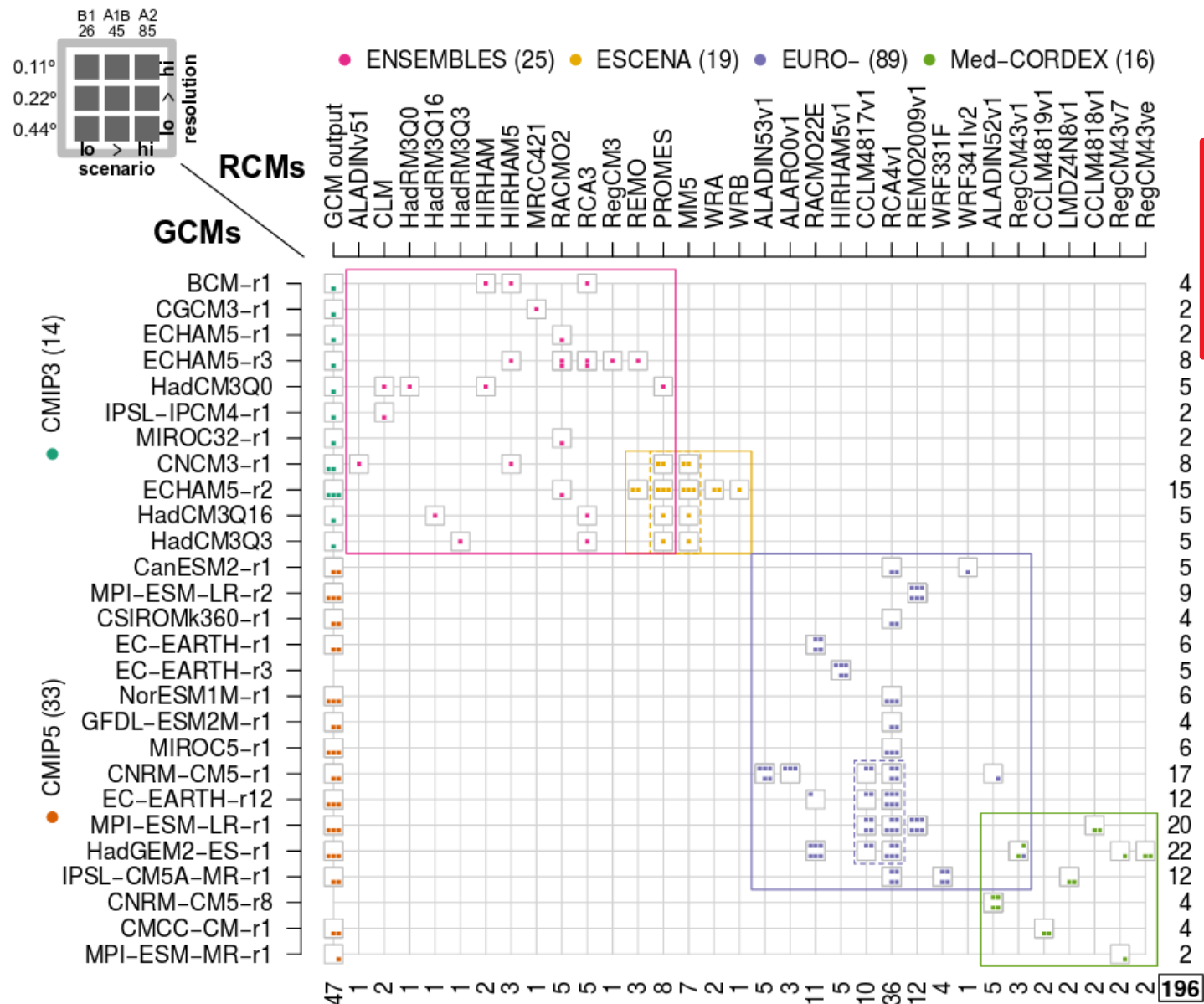
<https://www.ecmwf.int/>, <http://apps.ecmwf.int/datasets/>

- API: <https://software.ecmwf.int/wiki/display/WEBAPI/>

- Copernicus CDS: <https://cds.climate.copernicus.eu/cdsapp#!/home>

- JRA-55: http://jra.kishou.go.jp/JRA-55/index_en.html

- API: http://jra.kishou.go.jp/comm/application_en.html



Observations
Reanalysis

Seasonal Forecast:

Member
Initialization
...

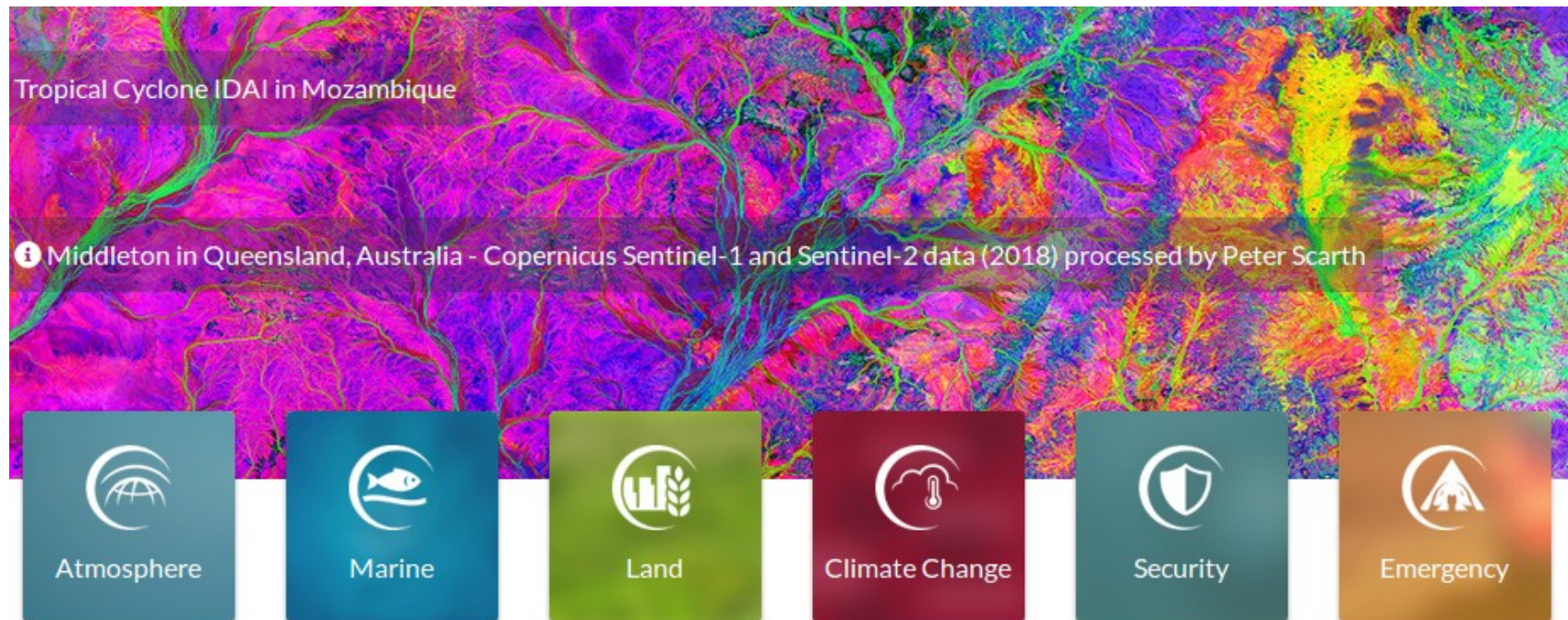
Source: Fernández, J. et al. 2018, Consistency of climate change projections from multiple global and regional model intercomparison projects. Climate Dynamics. Doi:10.1007/s00382-018-4181-8

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

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.

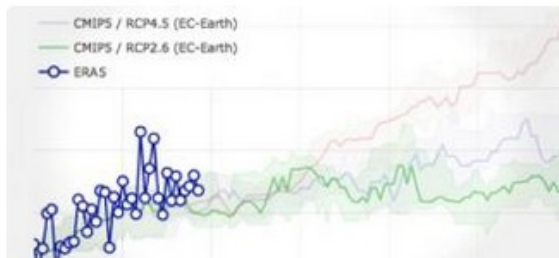
It is freely available and functions as a one-stop shop to explore climate data. [Register for free](#) to obtain access to the [CDS](#) and its [Toolbox](#).

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

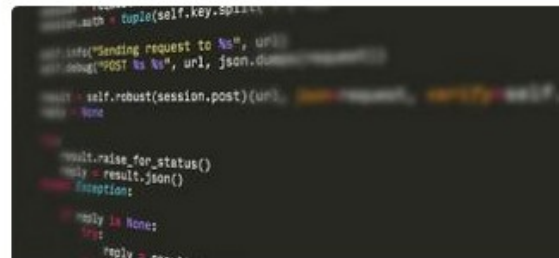
All



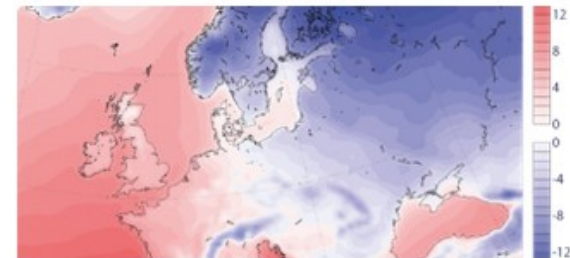
Search



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

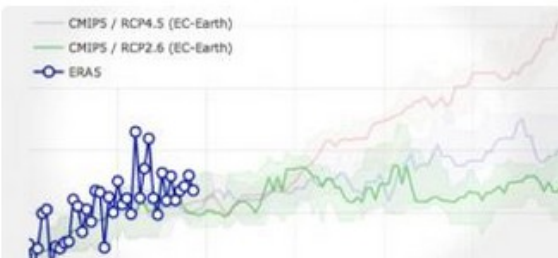
It is freely available and functions as a one-stop shop to explore climate data. [Register for free](#) to obtain access to the full range of data and use the [Toolbox](#).

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

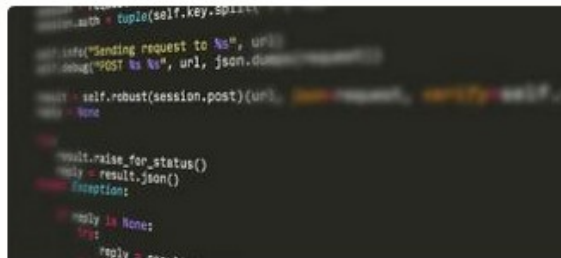
All



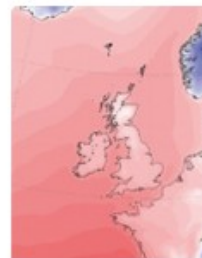
Search



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)
☐ 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 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-cor | <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)
orecasts	(6)
imate indices	(2)
main	
re (composition)	(3)
re (surface)	(5)
re (upper air)	(7)
phere)	(1)
sphere)	(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

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

Month 

- ☐ January
☐ April
☐ July
☐ October

Leadtime hour

- ☐ 0
☒ 18
☒ 36
☒ 54
☒ 72
☒ 90
☒ 108

- ☒ 6
☒ 24
☒ 42
☒ 60
☒ 78
☒ 96
☒ 114

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

- ☒ August
☐ November

- ☐ September
☐ December

(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-cor
☐ 2m dewpo
☐ Evaporati
☐ Mean sea
☐ Orograph
☐ Sea-ice co
☐ Snowfall
☐ Surface n

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Show API request

Not yet toolbox compatible

Submit Form

- ☐ Surface th
downward
☐ Total clou

Originating Year ? Day ?

Hide API request

Not yet toolbox compatible

Submit Form

- ☐ ECMWF
☒ DWD

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```
import cdsapi

c = cdsapi.Client()

c.retrieve(
    'seasonal-original-single-levels',
    {
        'originating_centre': 'dwd',
        'system': '2',
        'time': '1970-01-01 to 2019-04-01'
```

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 Clear all

Observations

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- EWEMBI:
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<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
 - API: http://jra.kishou.go.jp/comm/application_en.html

Climatic Change:

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

User Information	
User Name	M1980 <small>[5 to 30 characters, letters, digits and @/./-/_ only. Please note that the username is used to build a unique OpenID that you will use to login. If your chosen username is not available, you will be automatically assigned a similar one.]</small>
First Name	Meteo
Last Name	DataLab
Email	sixtohg@gmail.com
Password	<div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> </div> <small>[At least 8 characters, including one lower case letter, one upper case letter, one number, and one special symbol. All characters are allowed EXCEPT for () " .]</small> <div> <div></div> <div></div> </div> Password score: strong. Estimated time to crack password: 4 years
Confirm Password	<div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> </div> <small>[Must match the password above.]</small>
Institution	University of Cantabria
Department	Applied Mathematics and Computer Science
City	Santander
State	
Country	SPAIN
Interest Keywords	downscaling, climate change <small>[A short list of science fields you are involved with (60 characters maximum). Example: Software Engineering, Grid Computing, Climate Change.]</small>
Interest Statement	Regional climate change scenarios. <small>[A short paragraph describing your professional interests (1000 characters maximum).]</small>
Subscribe to COG Email List?	<input type="checkbox"/> <small>['cog_info', low traffic list]</small>

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

ESGF Node at DKRZ

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


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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:

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](#)

<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

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[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>

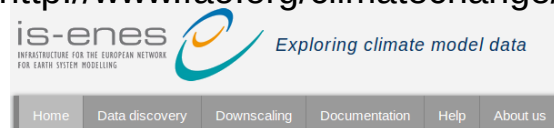
Research



Statistical Downscaling Portal



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

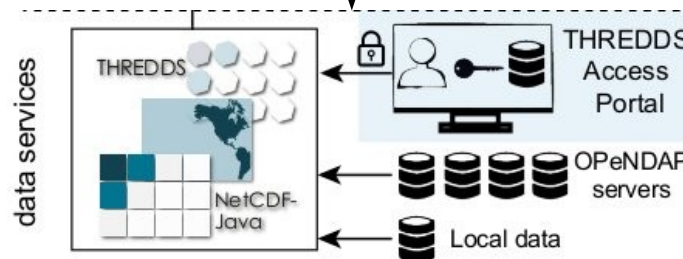


Welcome to IS-ENES Climate4Impact

<https://climate4impact.eu>



User Data Gateway



ESGF Node



ECLISEA



VALUE

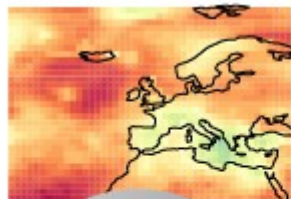


Master Universitario Oficial **Data Science**



ESGF & MARS

Santander Climate Data Service



THREDDS

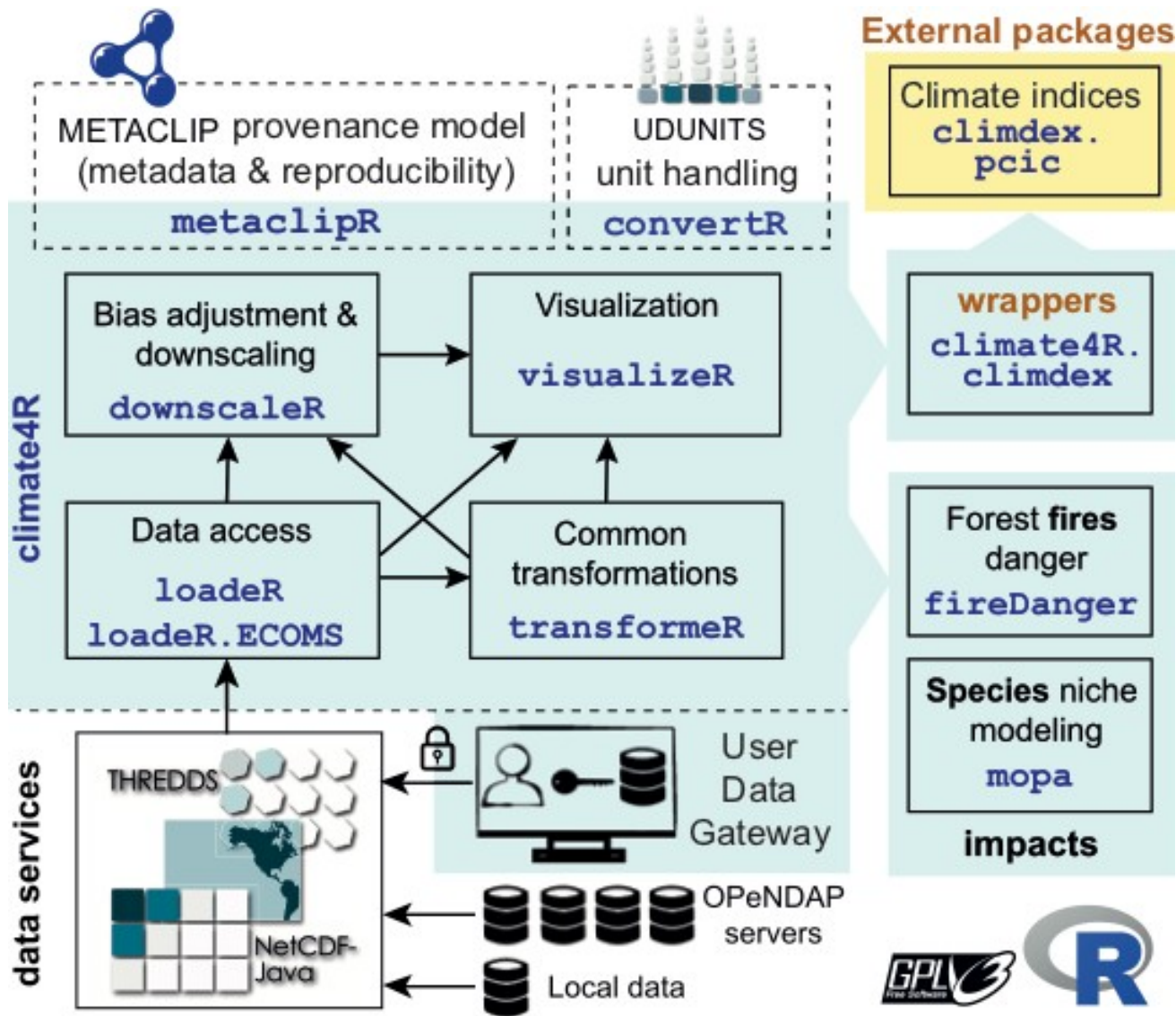


NetCDF-
Java

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

UDG-Public Data:

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

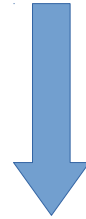




UDG: <http://meteo.unican.es/udg-tap/home>

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>