



# Tutorial session on the use of the ESGF portal to screen and download data of the Pre-EERIE simulations

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Pablo Ortega – 28/09/2023 – EERIE Science Hour

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**UK Research  
and Innovation**

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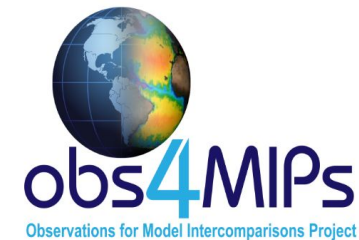
Schweizerische Eidgenossenschaft  
Confédération suisse  
Confederazione Svizzera  
Confederaziun svizra

# A brief introduction to the **ESGF** portal



The **Earth System Grid Federation (ESGF)** is a collaboration that develops, deploys and maintains software infrastructure for the management, dissemination, and analysis of model output and observational data

## Hosted Projects



# A brief introduction to the **ESGF** portal



## The **ESGF** mission is to:

- Support current CMIP activities, and prepare for future assessments
- Develop data and metadata facilities for inclusion of observations and reanalysis products for CMIP use
- Enhance and improve current climate research infrastructure capabilities through involvement of the software development community and through adherence to sound software principles
- Foster collaboration across agency and political boundaries
- Integrate and interoperate with other software designed to meet the objectives of ESGF: e.g., software developed by NASA, NOAA, ESIP, and the European **IS-ENES**
- Create software infrastructure and tools that facilitate scientific advancements

# A brief introduction to the **ESGF** portal



## **ESGF** partners and sponsors:



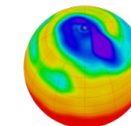
**MAX-PLANCK-INSTITUT  
FÜR METEOROLOGIE**



**Barcelona  
Supercomputing  
Center**  
*Centro Nacional de Supercomputación*



**DKRZ**  
DEUTSCHES  
KLIMARECHENZENTRUM



**Centre for Environmental  
Data Analysis**  
SCIENCE AND TECHNOLOGY FACILITIES COUNCIL  
NATURAL ENVIRONMENT RESEARCH COUNCIL



# Table of Pre-EERIE simulations



Model	Experiments available	Cmorization	Availability
<b>EC-Earth-3P-VHR</b> (10 km ocean / 20 km atmos)	1 x control-1950 1 x hist-1950/highres-future	Ocean cmorised Atmos in progress	<a href="#">Soon to be uploaded to ESGF</a> Possibility to share via thredds
<b>HadGEM3-GC31-HH (MH)</b> (10 km ocean / 50(100) km atmos)	1 x control-1950 3(1) x hist-1950 / highres-future	1 member cmorized (non cmorized)	<a href="#">1 member uploaded to ESGF</a> (some data could be shared)
<b>MPI-ESM-XR</b> (10 km ocean / 100 km atmos)	1 x control-1950 3 x hist-1950 / highres-future	Non-cmorized (but in netcdf format)	Available in <a href="#">DKRZ archive</a>
<b>CESM1-CAM5-SE-HR</b> (10 km ocean / 25 km atmos)	1 x control-1950 / picontrol 1 x hist-1950 / highres-future 3 x hist (since 1920) / RCP85	cmorized	<a href="#">Uploaded to ESGF</a> Available in iHESP <a href="#">data archive</a>
<b>FGOALS-f3-H</b> (10 km ocean / 25 km atmos)	1 x control-1950 1 x hist-1950/highres-future	cmorized	<a href="#">Uploaded to ESGF</a>

# Two engines to explore CMIP6 data



## Classic CMIP6 Search Interface:

<https://esgf-node.llnl.gov/search/cmip6/>



Welcome, Guest. | Login | Create Account

You are at the [ESGF@DOE/LLNL node](#)

Home Contact Us Data Nodes Status **Technical Support**

MIP Era +  
Activity +  
Product +

Source ID +  
Institution ID +  
Source Type +  
Nominal Resolution +

Experiment ID +  
Sub-Experiment +  
Variant Label +  
Grid Label +

Table ID +  
Frequency +  
Realm +  
Variable +  
CF Standard Name +  
Data Node +

WARNING: Not all models include a variant "r1i1p1f1", and across models, identical values of variant\_label do not imply identical variants! To learn which forcing datasets were used in each variant, please check modeling group publications and documentation provided through ES-DOC.

CMIP6 project data downloads are unrestricted. Downloads should be performed with the -s option to a wget script without the need to login. When using this method for download, ensure you are not using additional options, eg. -s and -H should never be combined.

Globus Transfers for LLNL-hosted data must now use the Metagrid site: <https://aims2.llnl.gov/>

For more information about CMIP6 data please consult this guide: <https://pcmdi.llnl.gov/CMIP6/Guide/dataUsers.html>

Please try our updated ESGF web application (named "Metagrid"), now undergoing beta testing. For this test release we are reaching out for help from users in the community to report any issues they encounter with the application. The beta-test web application can be found at the following site: <https://aims2.llnl.gov/>  
Please see the following page for more information including a FAQ: <https://esgf.github.io/esgf-user-support/metagrid.html>

Enter Text:    Display 10 results per page [More Search Options](#)

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

The search returned 0 results.

## Metagrid beta Search Interface:

<https://aims2.llnl.gov/search/?project=CMIP6>

ESGF Federated Nodes

CMIP6 Search for a keyword

Search Cart Saved Searches Node Status News

Select a Project

CMIP6

CMIP6 Website

Filter By Transfer Options

Any Only Globus Transferrable

Filter with Facets

Expand All

General

Identifiers

Resolutions

Labels

Classifications

Additional Properties

Version Type: Latest

Result Type: Originals and Replicas

Version Date Range: Start d... End d...

Filename

Home

12,945,231 results found for CMIP6

Add Selected to Cart Save Search Copy Search

Query String: latest = true

Cart	Dataset Title	Files	Total Size	Version	Download Options	Globus Ready
<input type="checkbox"/>	CMIP6.ScenarioMIP.CCCma.CanESM5.ssp126.r12i1p2f1.Amon.wap.gn	1	572.6 MB	20190429	wget	<input type="checkbox"/>
<input type="checkbox"/>	CMIP6.ScenarioMIP.CCCma.CanESM5.ssp126.r12i1p2f1.day.clt.gn	1	587.77 MB	20190429	wget	<input type="checkbox"/>
<input type="checkbox"/>	CMIP6.ScenarioMIP.CCCma.CanESM5.ssp126.r12i1p2f1.day.hfhs.gn	1	911.31 MB	20190429	wget	<input type="checkbox"/>
<input type="checkbox"/>	CMIP6.ScenarioMIP.CCCma.CanESM5.ssp126.r12i1p2f1.day.hfss.gn	1	907.15 MB	20190429	wget	<input type="checkbox"/>
<input type="checkbox"/>	CMIP6.ScenarioMIP.CCCma.CanESM5.ssp126.r12i1p2f1.day.hursmax.gn	1	764.63 MB	20190429	wget	<input type="checkbox"/>
<input type="checkbox"/>	CMIP6.ScenarioMIP.CCCma.CanESM5.ssp126.r12i1p2f1.day.hursmin.gn	1	840.16 MB	20190429	wget	<input type="checkbox"/>
<input type="checkbox"/>	CMIP6.ScenarioMIP.CCCma.CanESM5.ssp126.r12i1p2f1.day.mrsos.gn	1	290.76 MB	20190429	wget	<input type="checkbox"/>
<input type="checkbox"/>	CMIP6.ScenarioMIP.CCCma.CanESM5.ssp126.r12i1p2f1.day.prc.gn	1	363.26 MB	20190429	wget	<input type="checkbox"/>
<input type="checkbox"/>	CMIP6.ScenarioMIP.CCCma.CanESM5.ssp126.r12i1p2f1.Lmon.fVegLitte r.gn	1	9.6 MB	20190429	wget	<input type="checkbox"/>
<input type="checkbox"/>	CMIP6.ScenarioMIP.CCCma.CanESM5.ssp126.r12i1p2f1.Lmon.grassFrac .gn	1	9.47 MB	20190429	wget	<input type="checkbox"/>

1 2 3 4 5 ... 1294524 10 / page

Open as JSON

# Two engines to explore CMIP6 data



## Classic CMIP6 Search Interface:

<https://esgf-node.llnl.gov/search/cmip6/>

### Advantages

- More consolidated
- Older users are more familiarized with it

## Metagrid *beta* Search Interface:

<https://aims2.llnl.gov/search/?project=CMIP6>

### Advantages

- Updates data availability on the fly
- Faster and more intuitive to use
- Downloading tends to work better



# Two engines to explore CMIP6 data



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<https://esgf-node.llnl.gov/search/cmip6/>

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## Advantages

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- Faster and more intuitive to use
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**RECOMMENDED**

# Getting to know the **key search filters**



**Activity ID:** HighResMIP

**Data Node:** esgf.ceda.ac.uk

**Source ID:** CESM1-CAM5-SE-HR,  
FGOALS-f3-H, EC-Earth-3P-VHR,  
HadGEM3-GC31-HH

**Experiment ID:** control-1950, hist-1950,  
highres-future

**Nominal Resolution:** 10 km\*

**Variant label:** r1i1p1f1...

**Grid label:** gn, gr

**Table ID:** 3h, 6hLev, day, Omon, Oday,  
Slday, SImon,...

**Frequency:** 3hr, 6hr, day, mon, fx

**Realm:** atmos, ocean, sealce

**Variable ID:** zg, psl, pr, tas, tos, thetao,...

**CF Standard Name:** geopotential height...

*\* Caution: it sometimes refers to the ocean and sometimes to the atmosphere*

# Checking **metadata** and additional info



**Classic** CMIP6 Search Interface:  
<https://esgf-node.llnl.gov/search/cmip6/>

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Please see the following page for more information including a FAQ: <https://esgf.github.io/esgf-user-support/metagrid.html>

Enter Text:  Search Reset Display 10 results per page [\[ More Search Options \]](#)

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

Search Constraints: ✖ [highres-future](#) | ✖ [10 km](#)

Total Number of Results: 94

[-1-](#) [2](#) [3](#) [4](#) [5](#) [6](#) [Next >>](#)

Please login to add search results to your Data Cart

Expert Users: you may display the search URL and return results as XML or return results as JSON

1. **CMIP6.HighResMIP.CAS.FGOALS-f3-H.highres-future.r1i1p1f1.Emon.zossq.gn**  
Data Node: esg.lasg.ac.cn is reported as unavailable. Any existing replica data sets can be seen by selecting 'Show All Replicas'.  
Version: 20201224  
Total Number of Files (for all variables): 36  
Full Dataset Services: [Show Metadata](#) | [List Files](#) | [WGET Script](#) | [Show Citation](#) | [PID](#) | [Further Info](#)

**Metagrid** *beta* Search Interface:  
<https://aims2.llnl.gov/search/?project=CMIP6>

Home

21,118 results found for CMIP6 Add Selected to Cart Save Search Copy Search

Query String: latest = true AND (experiment\_id = esm-hist) AND (data\_node = aims3.llnl.gov OR esgf-data1.llnl.gov OR esgf-data2.llnl.gov)

esm-hist x aims3.llnl.gov x esgf-data1.llnl.gov x esgf-data2.llnl.gov x Filename Search: esm4 x Clear All

<input type="checkbox"/>	<input type="checkbox"/>	Cart	Dataset Title	Files	Total Size	Version	Download Options	Globus Ready
<input checked="" type="radio"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	CMIP6.CMIP.NOAA-GFDL.GFDL-ESM4.esm-hist.r1i1p1f1.Emon.co2s.gr1	2	194.01 MB	20180701	wget <input type="button" value="v"/>	<input checked="" type="checkbox"/>

Home

21,118 results found for CMIP6 Add Selected to Cart Save Search Copy Search

Query String: latest = true AND (experiment\_id = esm-hist) AND (data\_node = aims3.llnl.gov OR esgf-data1.llnl.gov OR esgf-data2.llnl.gov)

esm-hist x aims3.llnl.gov x esgf-data1.llnl.gov x esgf-data2.llnl.gov x Filename Search: esm4 x Clear All

<input type="checkbox"/>	<input type="checkbox"/>	Cart	Dataset Title	Files	Total Size	Version	Download Options	Globus Ready
<input checked="" type="radio"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	CMIP6.CMIP.NOAA-GFDL.GFDL-ESM4.esm-hist.r1i1p1f1.Emon.co2s.gr1	2	194.01 MB	20180701	wget <input type="button" value="v"/>	<input checked="" type="checkbox"/>

[Files](#) **[Metadata](#)** [Citation](#) [Additional](#)

File Title	Size	Download / Copy URL	Checksum
<input checked="" type="radio"/> co2s_Emon_GFDL-ESM4_esm-hist_r1i1p1f1_gr1_185001-194912.nc	116.67 MB	<input checked="" type="button" value="v"/> <input checked="" type="button" value="u"/>	dd19bc1ab6dd456d9d6ec6a2b5297fcc312c32037283277c87c3e6c82597c6f7
<input checked="" type="radio"/> co2s_Emon_GFDL-ESM4_esm-hist_r1i1p1f1_gr1_195001-201412.nc	77.33 MB	<input checked="" type="button" value="v"/> <input checked="" type="button" value="u"/>	4503f6bbcbf0c305ddbc3a26c7f87de915b826b28d70c791f87a7225275d3b51

< [1](#) > 10 / page

# Options for **data downloading**



- **Globus:**

- Faster transfers
- Not all data available through it
- Requires your institution to be subscribed to the service

- **wget script:**

- Allows the transfer of multiple files at once on your local or institutional machine
- Needs to be used in a terminal (Mac, Linux)
- Also possible in windows but requires installing a specific [program](#)
- Requires ESGF registration and some manual installation to set it up

- **via http:**

- Allows direct download from your favourite browser
- Doesn't work well in classic search interface, and is a bit hidden in the metagrid one
- Not optimal for multiple downloads

## Some **other useful information**



- User guide on how to download data from ESGF (both via browser and wget):

[https://esgf.github.io/esgf-user-support/user\\_guide.html](https://esgf.github.io/esgf-user-support/user_guide.html)

- CMIP6 Overview and Contributors:

<https://pcmdi.llnl.gov/CMIP6/>

- Archive statistics on models & datasets available per CMIP6 initiative:

[https://pcmdi.llnl.gov/CMIP6/ArchiveStatistics/esgf\\_data\\_holdings/](https://pcmdi.llnl.gov/CMIP6/ArchiveStatistics/esgf_data_holdings/)