

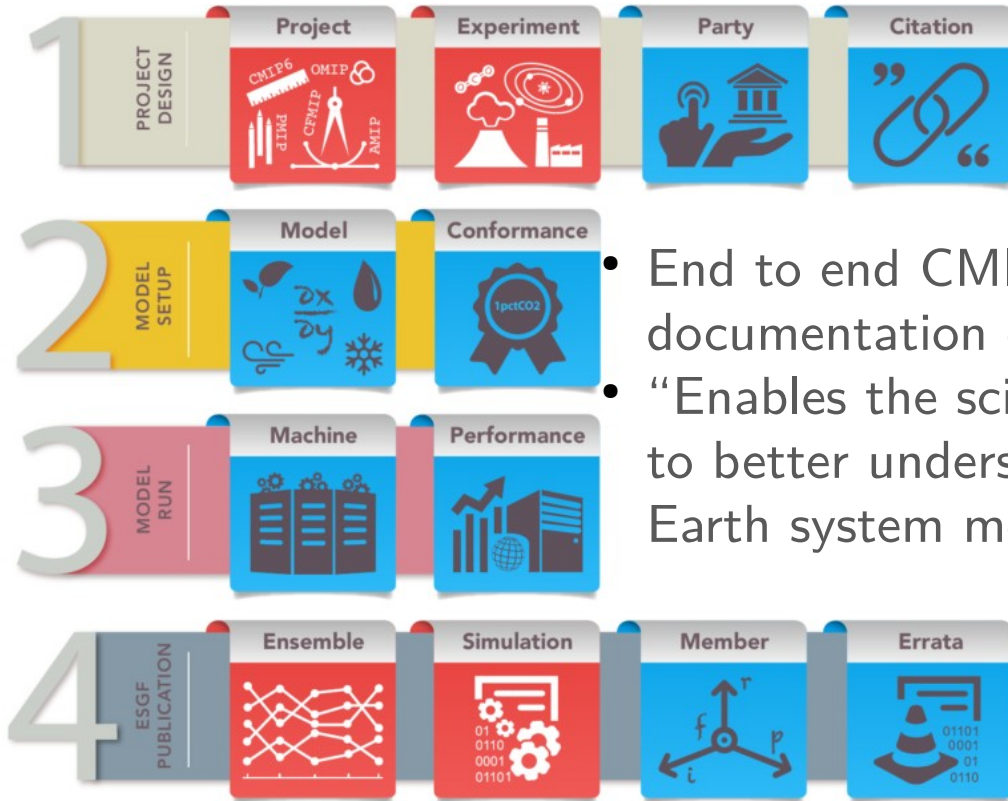
# Introducing the Earth System Documentation (ES-DOC) project for CMIP6

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On behalf of the wider ES-DOC team

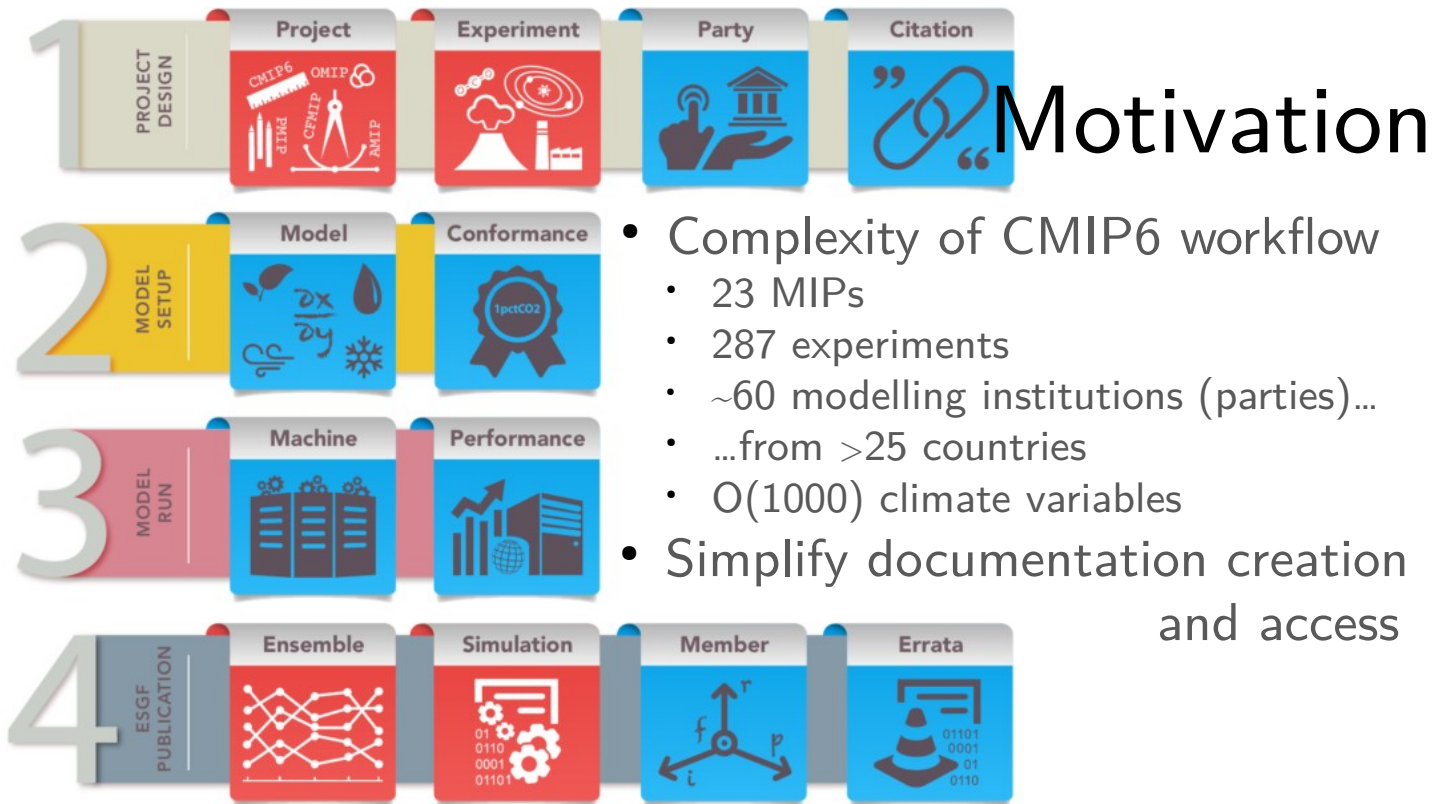
# Overview



- End to end CMIP6 workflow documentation ecosystem
- “Enables the scientific community to better understand and utilise Earth system model data”

Documentation task carried out by: ● Institute ● ES-DOC

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By G. Lelievassier



# Motivation

- Complexity of CMIP6 workflow
  - 23 MIPs
  - 287 experiments
  - ~60 modelling institutions (parties)...
  - ...from >25 countries
  - O(1000) climate variables
- Simplify documentation creation and access

Documentation task carried out by: ● Institute ● ES-DOC

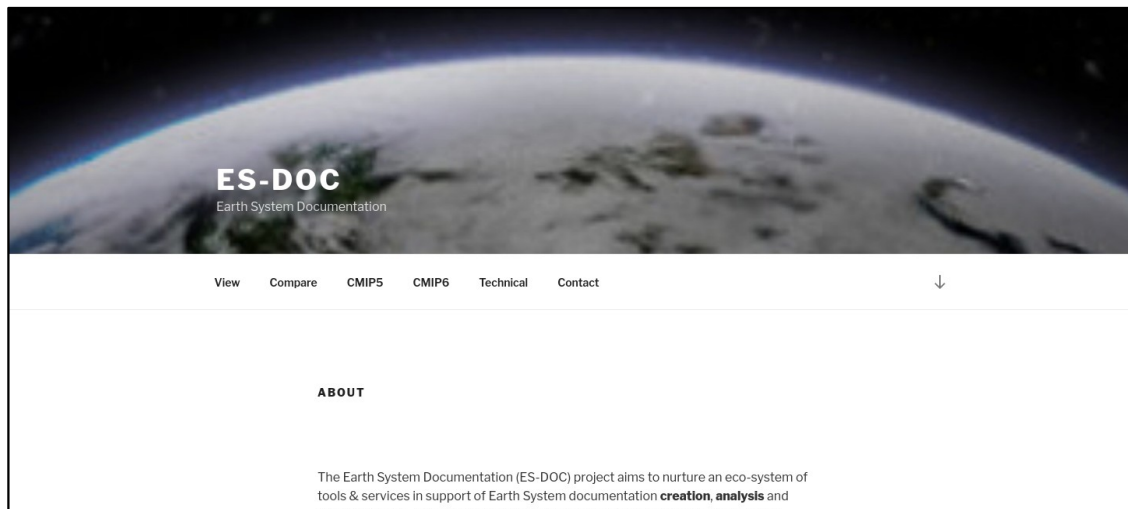
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# Resources and status for CMIP6

- Through a website & Further Info URL concept, ES-DOC provides access points & defined routes to find standardised CMIP6 information systematically
- All published CMIP6 documentation is readily available to view, explore and compare by any interested party
- ES-DOC has been operational for CMIP6 since Dec. 2018
  - published documentation is available, new additions constantly added

# The ES-DOC website

- Via the site, can *search, view, explore* and *compare* CMIP6 documentation, plus *discover errata and citations*
  - project & site root page: [es-doc.org](https://es-doc.org)
  - CMIP6 overview landing page: [es-doc.org/cmip6](https://es-doc.org/cmip6)



# ... search with [search.es-doc.org](https://search.es-doc.org)

**es-doc**  
Earth System Documentation

Documentation Search v1.0.1 [Support](#)

Project / MIP Era:  
CMIP6

Document Type:  
MIP

Document Version:  
Latest

Total Documents = 22. Filtered Documents = 22.

<< < Page 1 of 1 > >> 25 / page

Name	Description	Version
AerChemMIP	Aerosols and Chemistry MIP	1
C4MIP	Coupled Climate Carbon Cycle MIP	1
CDRMIP	The Carbon Dioxide Removal Model Intercomparison Project	1
CFMIP	Cloud Feedback Model Intercomparison Project	1
CMIP	Climate Model Intercomparison Project	1
CMIP6	Climate Model Intercomparison Project Number 6	1
DAMIP	Detection and Attribution Model Intercomparison Project	1
DCPP	Decadal Climate Prediction Project	1
DECK	Diagnosis, Evaluation, and Characterization of Klima (Climate)	1
FAFMIP	Flux-Anomaly-Forced Model Intercomparison Project	1
GeoMIP	The Geoengineering Model Intercomparison Project	1
GMMIP	Global Monsoons Modeling Inter-comparison Project	1
HighResMIP	High Resolution Model Intercomparison Project	1
ISMIP6	Ice Sheet Model Intercomparison Project for CMIP6	1
LS3MIP	Land Surface, Snow and Soil Moisture MIP	1
LUMIP	Land Use Model Intercomparison Project	1

# ... explore with [explore.es-doc.org](http://explore.es-doc.org)

WCRP ES-DOC Explorer v1.1.4 CMIP6 Model: MOHC > HadGEM3-GC31-LL

Institute: MOHC  
Model: HadGEM3-GC31-LL  
Realm > Process  
Top Level  
Radiative Forcings  
Aerosol  
Grid  
Transport  
Emissions  
Concentrations  
Optical Radiative Properties  
Model  
Atmosphere  
Grid  
Dynamical Core  
Radiation  
Turbulence Convection  
Microphysics Precipitation  
Cloud Scheme  
Observation Simulation  
Gravity Waves  
Natural Forcing  
Land Surface

MOHC > HadGEM3-GC31-LL :: Top Level

Top Level Properties

Top Level > Model Name

Description	Name of coupled model
Value	HadGEM3-GC31-LL

Top Level > Model Keywords

Description	Keywords associated with coupled model
Values	UKCA-GLOMAP MetUM JULES NEMO ORCA1 CICE

Top Level > Model Overview

Description	Top level overview of coupled model
Value	Aerosol2: UKCA-GLOMAP-mode, atmos: MetUM-HadGEM3-GA7.1 (N96:192 x 144 longitude/latitude; 85 levels; top level 85km), atmosChem: none, land: JULES-HadGEM3-GL7.1, landIce: none, ocean: NEMO-HadGEM3-GO6.0 (ORCA1 tripolar primarily 1 deg latitude/longitude with meridional refinement down to 1/3 deg in tropics; 400 x 180 longitude/latitude; 75 levels; top grid cell 0-1m), ocnBgchem: none, sealce: CICE-HadGEM3-GSI8 (ORCA1 tripolar primarily 1 deg; 360 x 180 longitude/latitude).

Top Level > Model Type

Description	Model type
Value	GCM

Top Level > Model Long Name

Description	Model long name
Value	HadGEM3-GC3.1-N96ORCA1

Top Level > Model Coupler

... compare at [compare.es-doc.org](https://compare.es-doc.org)

- Currently for CMIP5, coming later in 2021 for CMIP6

The screenshot displays the 'es-doc' (Earth System Documentation) website interface. At the top, the 'es-doc' logo is accompanied by the version number 'v0.13.0.0'. To the right, there are dropdown menus for 'Project' (set to 'CMIP5') and 'Comparator' (set to 'Model Component Properties'), along with 'Open' and 'Support' buttons. Below this is a purple header bar for 'Step 1 : Select Model Component Properties', which includes 'Help', 'Reset', and 'Next' buttons. The main content area is divided into three yellow-highlighted sections: '1. Select Models', '2. Select Components', and '3. Select Properties'. Section 1 lists various climate models (e.g., ACCESS1.0, BCC-CSM1.1, CMCC-CESM) with a 'view' button next to each. Section 2 shows a hierarchical list of components under 'Aerosols' (Emission & Concentration, Model, Transport) and 'Atmosphere' (Convection Cloud Turbulence, Cloud Scheme, Cloud Simulator, Dynamical Core, Advection, Orography & Waves, Ozone Parameterization, Radiation). Section 3 is currently empty.



# Web services

- Errata service\*:
  - found at: [errata.es-doc.org](https://errata.es-doc.org)
  - discover/track known issues & amendments across published datasets
- Citation service†:
  - found (linked within but external to the ES-DOC site) at [cmip6cite.wdc-climate.de](https://cmip6cite.wdc-climate.de) (landing page) and [bit.ly/CMIP6\\_Citation\\_Search](https://bit.ly/CMIP6_Citation_Search) (search application)
- Controlled vocabularies:
  - ‘pyessv’ utility library endpoint at: [pyessv.es-doc.org](https://pyessv.es-doc.org)
- Documentation creation and publication:
  - ‘pyesdoc’ utility library endpoint at: [api.es-doc.org](https://api.es-doc.org)

\* ESGF co-manage the errata service

† the citation service is hosted and managed outside of ES-DOC by DKRZ


# Further Info URL

- A `further_info_url` property is defined in the header of *all* CMIP6 netCDF files! It is a netCDF global attribute.
- With your netCDF manipulation tool of choice you can access it and open it in a browser to see all metadata, e.g:
  - Command line: `$ ncdump <filename>.nc | grep further_info_url`
  - Python via [cf-python](#) (or [cfdm](#)), minimal example with a field from file:

```
>>> import cf
>>> f = cf.read('<filename>.nc')[0]
>>> f.get_property('further_info_url')
```

# Further Info URL

- About the concept, with a working example:  
[es-doc.org/cmip6-ensembles-further-info-url](https://es-doc.org/cmip6-ensembles-further-info-url)



CMIP6 Further Information v1.1.4

SupportHelp

Further Info URL: <https://furtherinfo.es-doc.org/CMIP6.IPSL.IPSL-CM6A-LR.abrupt-4xCO2.none.r1i1p1f1>

ES-DOC Documentation	
MIP Era	<a href="#">CMIP6</a>
Institution	<a href="#">IPSL</a>
Model	<a href="#">IPSL-CM6A-LR</a>
Experiment	<a href="#">abrupt-4xCO2</a>
Ensemble Description	N/A
Machine Performance	N/A

Dataset Documentation	
ESGF Search	<a href="#">View @ PCMDI</a>
Errata	<a href="#">View @ ES-DOC</a>
Citation (Institute)	<a href="#">View @ DKRZ</a>
Citation (Experiment)	<a href="#">View @ DKRZ</a>

Other Documentation	
WCRP CMIP6 Homepage	<a href="https://www.wcrp-climate.org/wgcm-cmip/wgcm-cmip6">https://www.wcrp-climate.org/wgcm-cmip/wgcm-cmip6</a>
ES-DOC CMIP6 Homepage	<a href="https://es-doc.org/cmip6">https://es-doc.org/cmip6</a>

# Summary and quick links

- ES-DOC website:
  - project & site root page: [es-doc.org](https://es-doc.org)
  - CMIP6 overview landing page: [es-doc.org/cmip6](https://es-doc.org/cmip6)
  - search app (discover and view all documentation): [search.es-doc.org](https://search.es-doc.org)
  - explorer (model formulations + further info URL): [explore.es-doc.org](https://explore.es-doc.org)
  - comparator: coming later in 2021 (for CMIP6) at [compare.es-doc.org](https://compare.es-doc.org)
- Further Info URL (get it from your CMIP6 netCDF files!):
  - about the concept, including a working example:  
[es-doc.org/cmip6-ensembles-further-info-url](https://es-doc.org/cmip6-ensembles-further-info-url)