**CMIP5 Essential Information**

23 November 2011

***CMIP5 Experiment Design Overview:***

The primary reference for experiment design is:

Taylor, K.E., R.J. Stouffer, G.A. Meehl: An Overview of CMIP5 and the experiment design.” *Bull. Amer. Meteor. Soc*., [doi:10.1175/BAMS-D-11-00094.1](http://dx.doi.org/doi:10.1175/BAMS-D-11-00094.1), 2011.

An overview of various aspects of CMIP5 is provided by:

WCRP Coupled Model Intercomparison Project – Phase 5: Special Issue of the [CLIVAR Exchanges Newsletter, No. 56](http://www.clivar.org/publications/exchanges/Exchanges_56.pdf), Vol. 15, No. 2

A fuller description (“lots of details”) of the experiments can be found in:

[A Summary of the CMIP5 Experiment Design](http://cmip-pcmdi.llnl.gov/cmip5/docs/Taylor_CMIP5_design.pdf)

The objectives and strategy for the CMIP5 decadal predictions simulations is summarized in:

Meehl, Gerald A., and Coauthors: Decadal Prediction. *Bull. Amer. Meteor. Soc.*, **90**, 1467–1485, [doi:10.1175/2009BAMS2778.1](http://dx.doi.org/doi:10.1175/2009BAMS2778.1), 2009.

For further background and information, consult the following web page:

[Experiment Design](http://cmip-pcmdi.llnl.gov/cmip5/experiment_design.html)

***“Official” Experiment Names.*** [cmip5\_data\_reference\_Appendix1-1.doc](http://cmip-pcmdi.llnl.gov/cmip5/docs/cmip5_data_reference_Appendix1-1.doc) ***,***[pdf](http://cmip-pcmdi.llnl.gov/cmip5/docs/cmip5_data_reference_Appendix1-1.pdf)

***CMIP5 Forcing Information:***

For simulations of the future, the primary references for the forcing (emissions/concentrations/land-use change can be found in a Special Issue of Climatic Change, which is described at:

Representative Concentration Pathways (RCP’s) [RCP\_special\_journal](http://cmip-pcmdi.llnl.gov/cmip5/docs/RCP_journal_special.docx) , [pdf](http://cmip-pcmdi.llnl.gov/cmip5/docs/RCP_journal_special.pdf)

For simulations of the historical period, references for the forcing (emissions/concentrations/land-use change) can be found in the citation section of the IIASA website:

[http://www.iiasa.ac.at/web-apps/tnt/RcpDb/dsd?Action=htmlpage&page=about - citation](http://www.iiasa.ac.at/web-apps/tnt/RcpDb/dsd?Action=htmlpage&page=about#citation)

Additional datasets and references used in CMIP5 are described on the CMIP5 website at:

<http://cmip-pcmdi.llnl.gov/cmip5/forcing.html>

For some CMIP5 simulations, modeling groups could elect to include only a subset of the forcing contributions. A list of “forcings” that are active in each run is stored in each output file (in a global attributed called “forcing”) and the key to the abbreviations used in that list is available here:

List of abbreviations used to describe forcing [Appendix 1.2 of DRS document](http://cmip-pcmdi.llnl.gov/cmip5/docs/cmip5_data_reference_Appendix1-2.doc), ([pdf form](http://cmip-pcmdi.llnl.gov/cmip5/docs/cmip5_data_reference_Appendix1-2.pdf))

Additional information relevant to the development of the forcing datasets, as well as their interpretation, can be found at:

[IPCC's DDC](http://www.ipcc-data.org/index.html)

***CMIP5 Model Output:***

The list of variables requested as part of CMIP5 is available in 3 formats:

[standard\_output.pdf](http://cmip-pcmdi.llnl.gov/cmip5/docs/standard_output.pdf)

[standard\_output.xls](http://cmip-pcmdi.llnl.gov/cmip5/docs/standard_output.xls)

[standard\_output.xlsx](http://cmip-pcmdi.llnl.gov/cmip5/docs/standard_output.xlsx)

The output is stored in netCDF files and includes extensive metadata allowing automated processing. The metadata requirements of CMIP5 are described in:

[cmip5\_data\_reference\_syntax.pdf](http://cmip-pcmdi.llnl.gov/cmip5/docs/cmip5_data_reference_syntax.pdf)

A key to some of the controlled vocabulary applied to CMIP5 model output, which enables one to decipher the information contained in filenames and in some of the metadata is described in:

[cmip5\_data\_reference\_syntax.pdf](http://cmip-pcmdi.llnl.gov/cmip5/docs/cmip5_data_reference_syntax.pdf)

All users of CMIP5 model output should be sure to properly cite and acknowledge the data:

[Citation/Acknowledgment](http://cmip-pcmdi.llnl.gov/cmip5/citation.html)

***“Official” Names of CMIP5 Models and Modeling Groups*** [CMIP5\_modeling\_groups](http://cmip-pcmdi.llnl.gov/cmip5/docs/CMIP5_modeling_groups.docx) ([pdf format](http://cmip-pcmdi.llnl.gov/cmip5/docs/CMIP5_modeling_groups.pdf)).

***CMIP5 Model Output Archive:***

The process for registering and downloading CMIP5 model output is summarized in the

[Getting Started Document](http://cmip-pcmdi.llnl.gov/cmip5/data_getting_started.html)

An overview of currently available model output can be found at:

[Current Availability of Output](http://cmip-pcmdi.llnl.gov/cmip5/availability.html)

The CMIP5 model output is served by the following ESG Data Portals:

PCMDI:<http://pcmdi3.llnl.gov/esgcet/home.htm>

BADC: <http://cmip-gw.badc.rl.ac.uk/home.htm>

DKRZ: <http://ipcc-ar5.dkrz.de/home.htm>

***Observational Datasets of Special Interest to CMIP5:***

Special efforts are being made by a few research groups to provide observationally-based data in a structure and format that facilitates immediate comparison with CMIP5 model output. Observational datasets that are written in netCDF format and follow the CMIP5 output requirements (modified slightly to apply to observations) are referred to as “Obs4MIPs”. The Obs4MIPs data is accessible through the same data portals as CMIP5 model output. For more information and guidance on preparing observational data conforming to the Obs4MIPs specifications see:

[Obs4MIPs Guidance and Standards](https://oodt.jpl.nasa.gov/wiki/display/CLIMATE/TEMPLATES+AND+STANDARDS)

There are, of course, many additional datasets of interest to CMIP5 researchers. Some of these are described and can be access via the following website:

<http://wcrp.ipsl.jussieu.fr/SF_RCD_CORDEX.html>

***Downscaled Data Based on CMIP5:***

The CORDEX project is a WCRP-coordinated exercise to regionally downscale climate model projection data. The initial focus of this project is to downscale CMIP5 model output from the following CMIP5 simulations: historical, RCP4.5, RCP8.5, AMIP, and decadal prediction runs. Further information is available at:

<http://wcrp.ipsl.jussieu.fr/SF_RCD_CORDEX.html>

***Links to Projects and Sites with Close Ties to CMIP5:***

[CFMIP](http://cfmip.metoffice.com/)

[CORDEX](http://wcrp.ipsl.jussieu.fr/SF_RCD_CORDEX.html)

[GeoMIP](http://climate.envsci.rutgers.edu/GeoMIP/)

[PMIP](http://pmip3.lsce.ipsl.fr/)

[TAMIP](http://www.metoffice.gov.uk/hadobs/tamip/)

[TGICA & IPCC's DDC](http://www.ipcc-data.org/ddc_about.html)