# Climate data analysis with ESMValTool

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# What is CMIP and what is ESGF?

## Coupled Model Intercomparison Project (CMIP)

CMIP Coupled Model Intercomparison Project — A WCRP project — WCRP World Climate Research Programme

An important goal of CMIP is to make climate model output publicly available in a standardized format.

https://wcrp-cmip.org

## Earth System Grid Federation (ESGF)

ESGF Earth System Grid Federation

An open-source effort providing a distributed data and computation platform, enabling worldwide access to climate model and observational data.

https://esgf.llnl.gov

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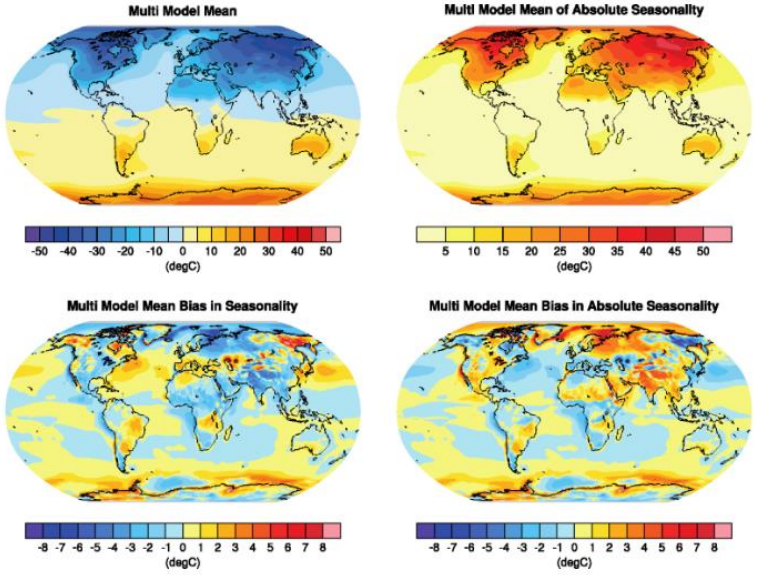
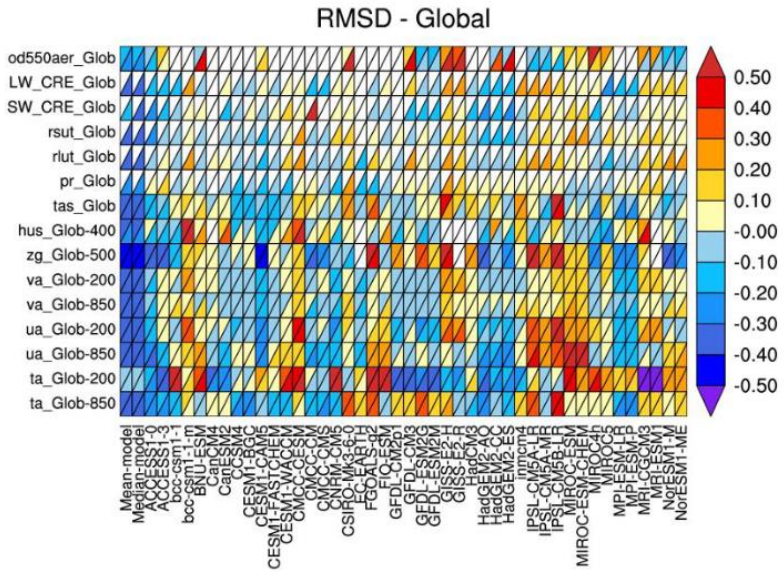
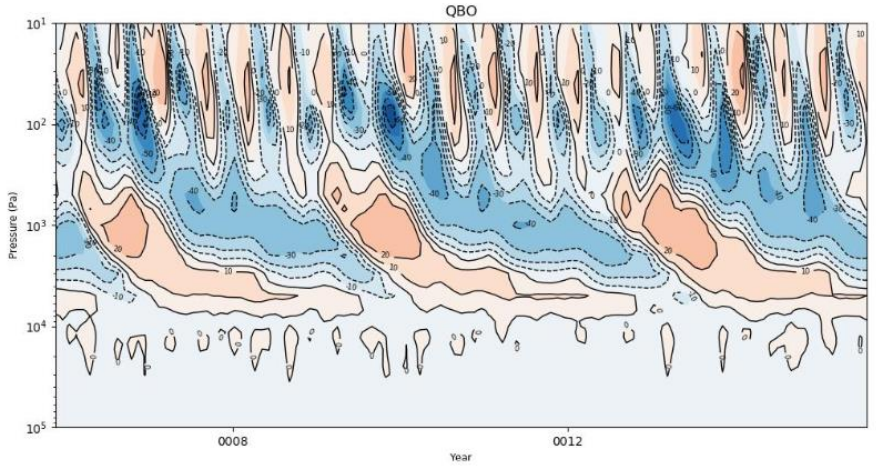
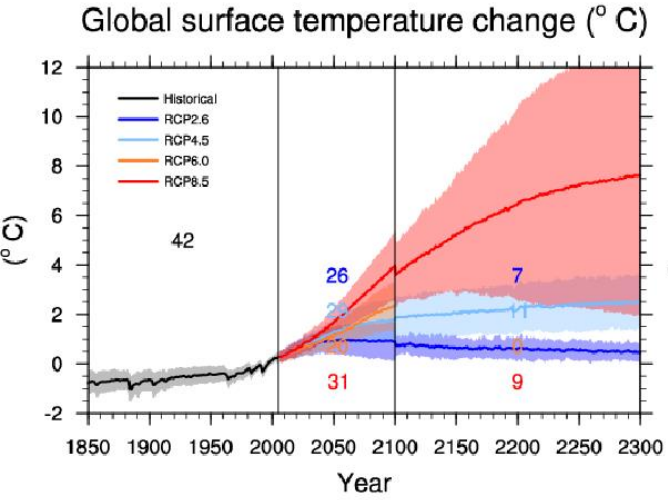
# ESMValTool gallery

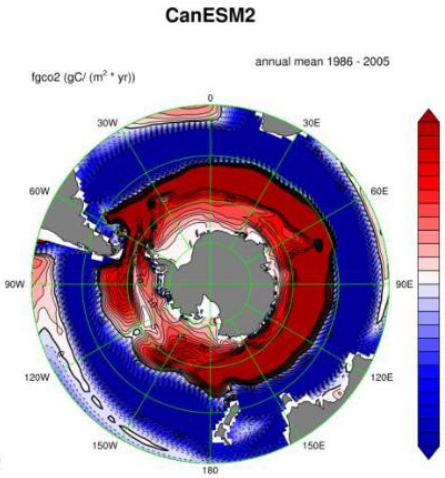
https://docs.esmvaltool.org

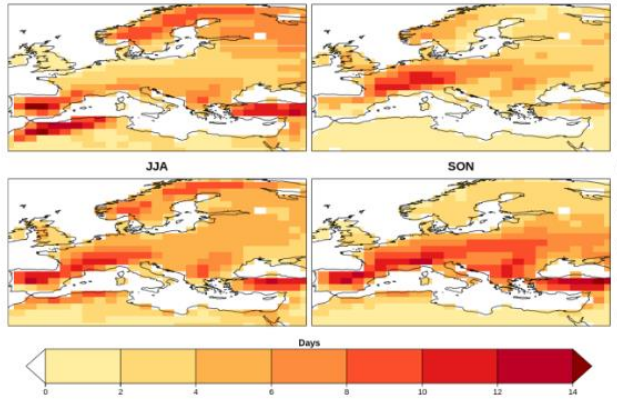


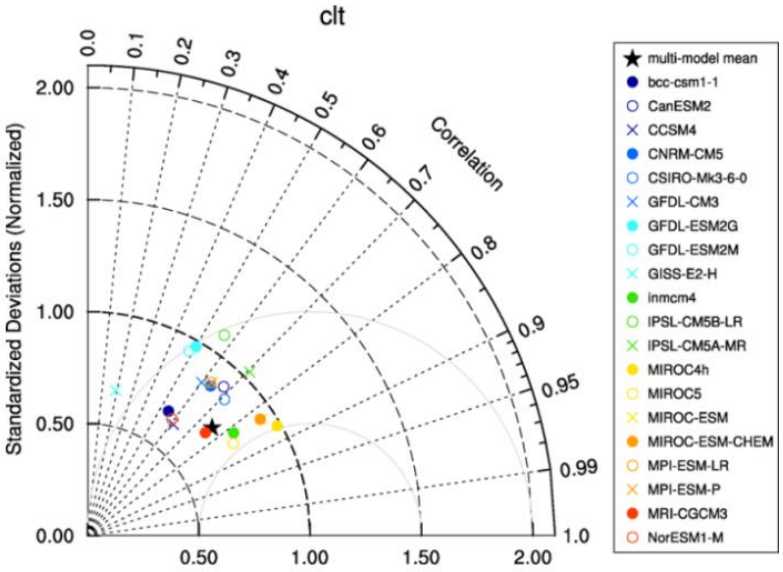



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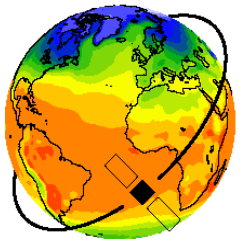
# What is ESMValTool?



ESMValTool
Earth System Model Evaluation Tool

**Earth System Model Evaluation Tool** (ESMValTool) is a collection of "recipes" for climate data analysis.

- **International community effort**: developed by and for researchers working with climate data, with the support of several Research Software Engineers (RSEs)
- **Wide scope**: includes many analyses, ranging from IPCC report figures to hydrological model forcings
- **Flexible**: new diagnostics and support for new datasets can be easily added
- **Multi-language support**: Python, NCL, R, Julia
- **Reproducible** recipes, with provenance tracking
- **Well-documented** source code and analyses

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# What is ESMValCore?

The Python package that runs ESMValTool "recipes".

- Supports many climate datasets: CMIP, ERA5, obs4MIPs, ESA-CCI, etc.
- Find and optionally download data from ESGF
- Make data analysis ready
- Preprocess the data, e.g. regrid, statistics
- Run the diagnostic scripts
- Built on top of Iris for reliability
- Uses Dask for efficient parallel computations


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# Resources

Webpage: https://esmvaltool.org

Tutorial: https://esmvalgroup.github.io/ESMValTool_Tutorial
Documentation: https://docs.esmvaltool.org
Open-source development: https://github.com/ESMValGroup

Join our community at https://github.com/ESMValGroup/Community:

- Monthly community meetings
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