

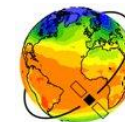
ESMValTool

Earth System Model Evaluation Tool

<https://www.esmvaltool.org/>

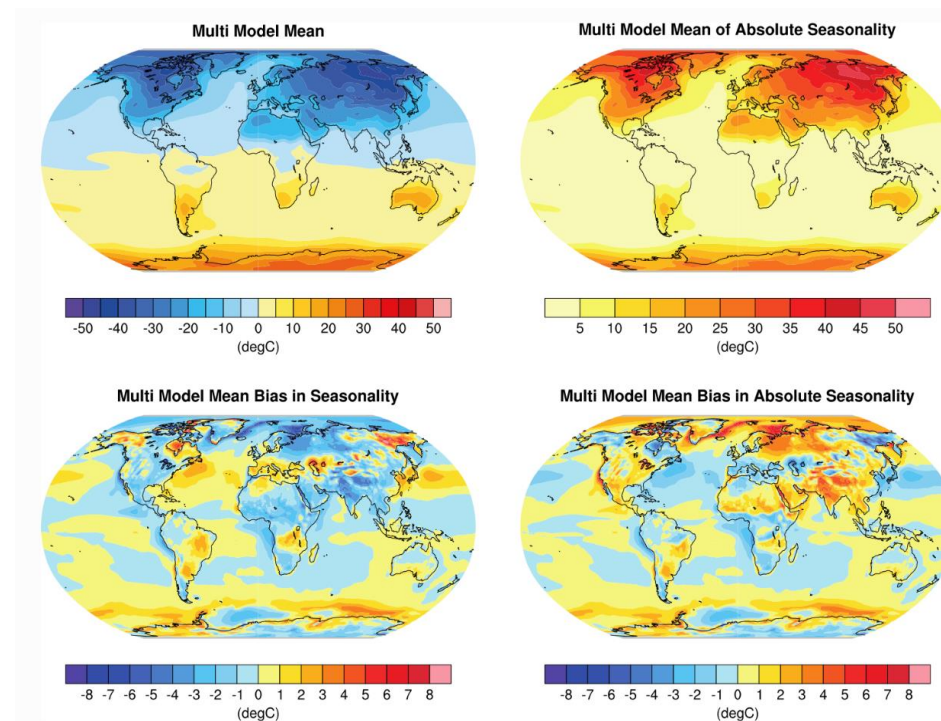
Earth System Model Evaluation with
ESMValTool in a Jupyter notebook

25 May, EGU 2022



What is ESMValTool?









It facilitates the analysis of Earth system model's data.



[IPCC AR5 Chapter 9](#)

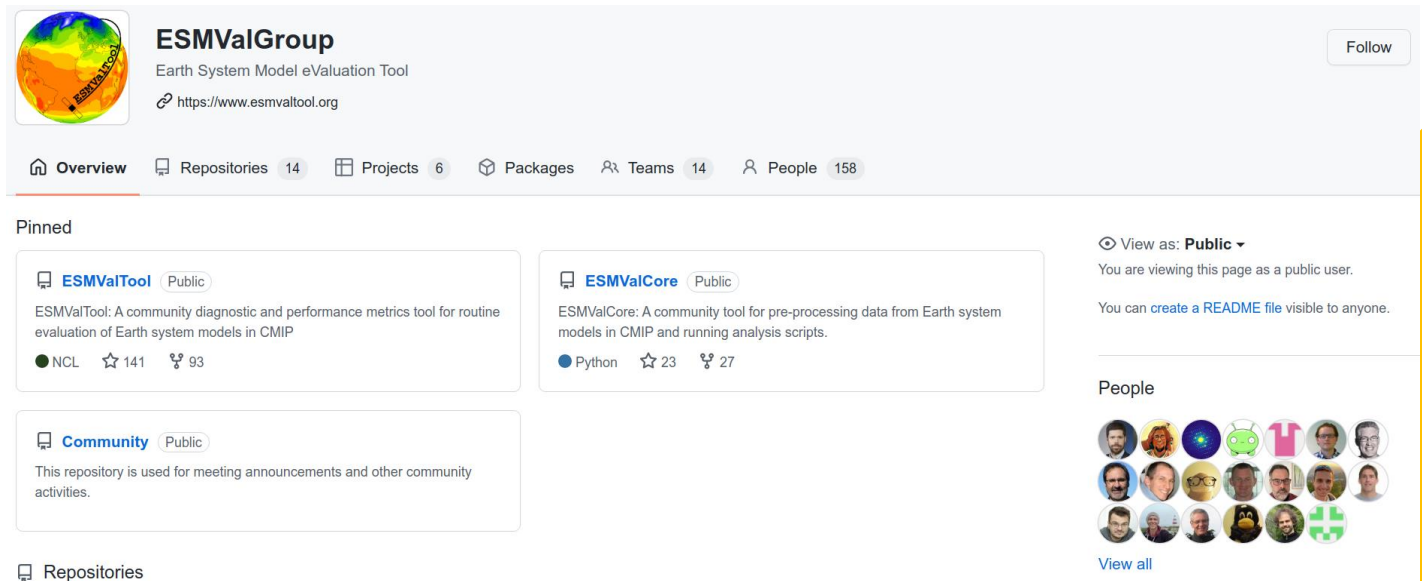
What is ESMValTool?

By an international community of scientists and software engineers

14 teams in the ESMValGroup organization		Visibility ▾	Members ▾
ESMValTool-CoreTeam Team members can read, clone, and push to this repository.		17 members	2 teams ▾
ESMValTool-DevelopmentTeam Team members can create new feature branches.		148 members	0 teams
IPCC developer Secret ESMValTool AR6 contributions		39 members	0 teams
ESMValTool-recipe-maintainers		14 members	0 teams
UserEngagementTeam User Engagement Team		11 members	0 teams
tech-reviewers Technical review team		12 members	0 teams
science-reviewers Scientific review team		11 members	4 teams ▾
IPCC-maintainers Maintainers of the AR6 repositories		3 members	0 teams

What is ESMValTool?

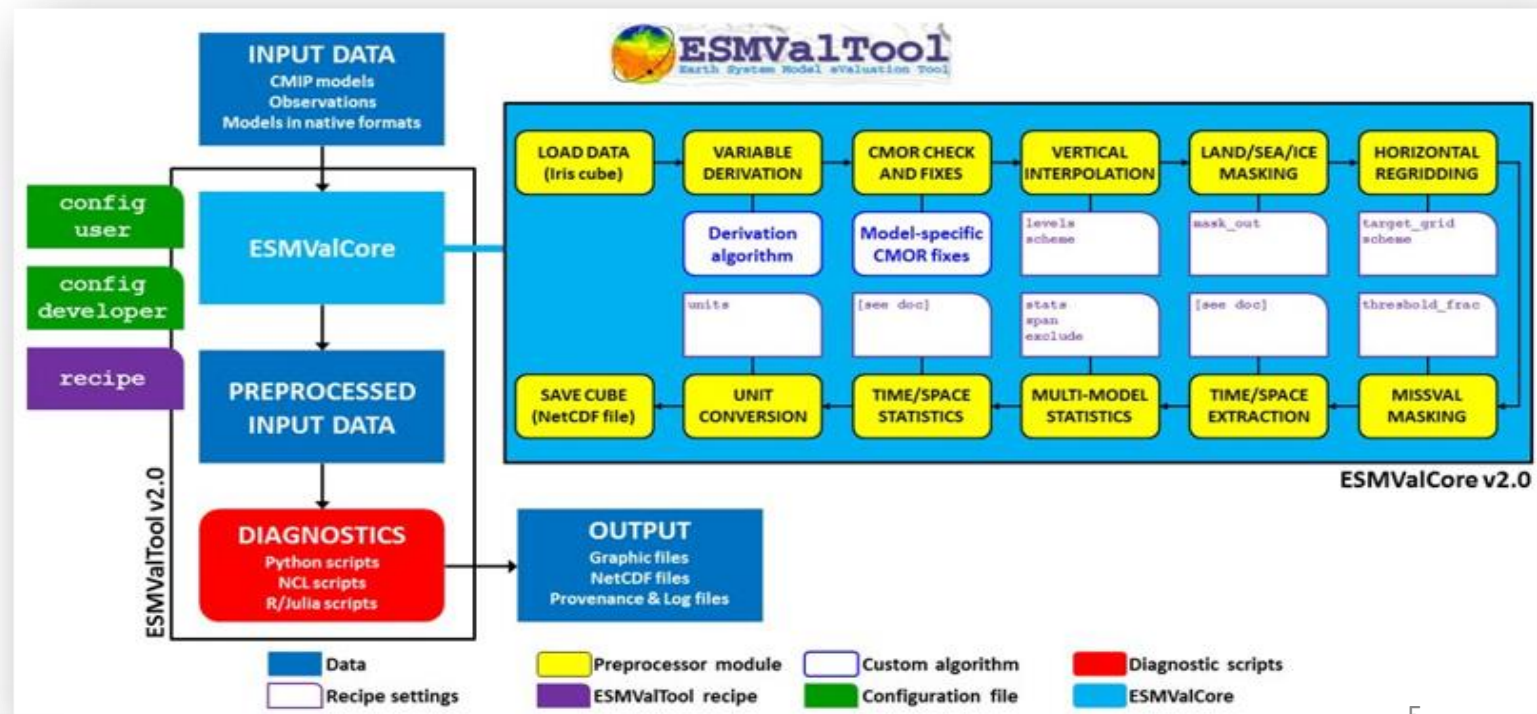
Developments, maintenance, discussions, and collaborations in **public** <https://github.com/esmvalgroup>



The screenshot shows the GitHub profile for ESMValGroup. The profile header includes the ESMValTool logo, the name "ESMValGroup", the description "Earth System Model eValuation Tool", and the website "https://www.esmvaltool.org". A "Follow" button is in the top right. Below the header is a navigation bar with tabs: Overview (selected), Repositories (14), Projects (6), Packages, Teams (14), and People (158). The "Pinned" section contains three repositories:
1. **ESMValTool** (Public): "ESMValTool: A community diagnostic and performance metrics tool for routine evaluation of Earth system models in CMIP". It has 141 stars and 93 forks.
2. **ESMValCore** (Public): "ESMValCore: A community tool for pre-processing data from Earth system models in CMIP and running analysis scripts." It has 23 stars and 27 forks.
3. **Community** (Public): "This repository is used for meeting announcements and other community activities."
On the right side, there is a "View as: Public" dropdown, a note "You are viewing this page as a public user.", a link to "create a README file", and a "People" section showing a grid of 16 user avatars with a "View all" link below.

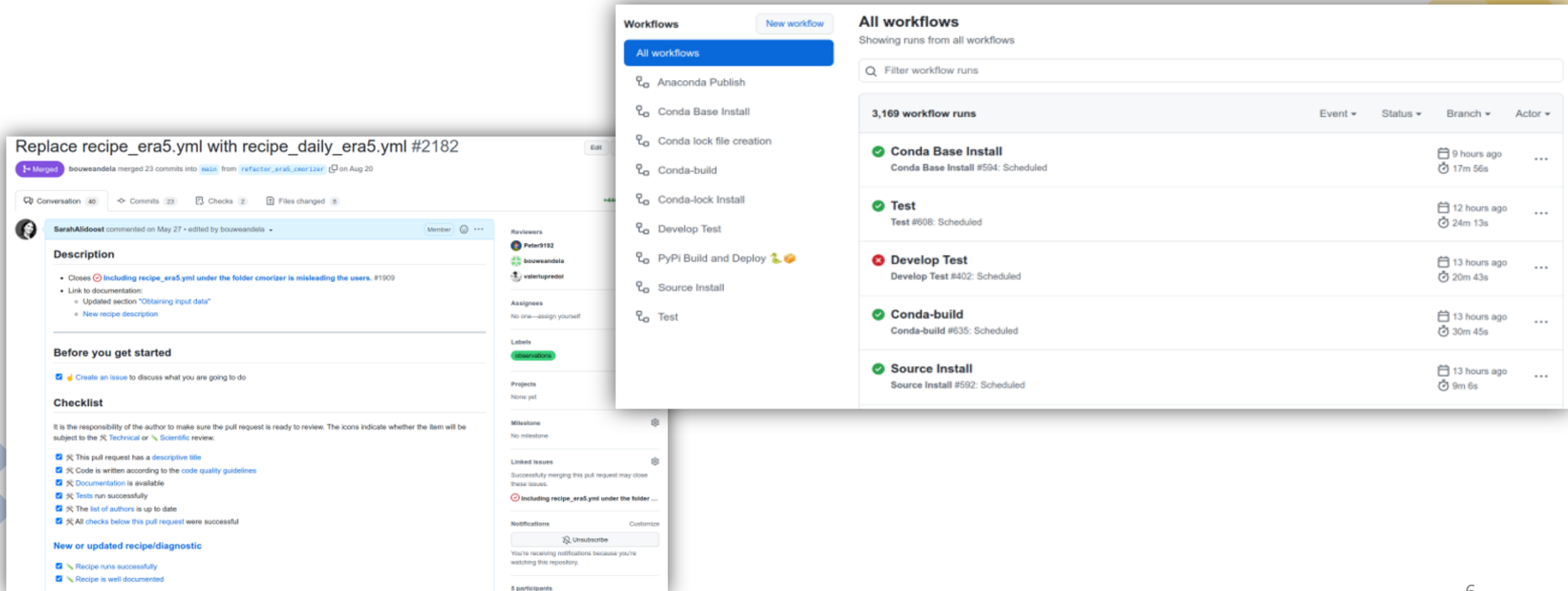
What can ESMValTool do for you?

- Helps to analyze climate data
- Provides provenance and citation information.
- Supports several programming languages and operating systems.
- Helps efficient data processing.



What can ESMValTool do for you?

- Provides automated testing and review processes.



The image displays three screenshots illustrating the ESMValTool workflow and its integration with GitHub.

Left Screenshot: GitHub Pull Request

Replace recipe_era5.yml with recipe_daily_era5.yml #2182

Conversation (40) Commits (23) Checks (2) Files changed (8)

SarahAlidoost commented on May 27 • edited by bouweandela

Description

- Closes [including recipe_era5.yml under the folder cmorizer is misleading the users](#). #1909
- Link to documentation:
 - Updated section "Obtaining input data"
 - New recipe description

Before you get started

- ☒ Create an issue to discuss what you are going to do

Checklist

It is the responsibility of the author to make sure the pull request is ready to review. The icons indicate whether the item will be subject to the [Technical](#) or [Scientific](#) review.

- ☒ This pull request has a descriptive title
- ☒ Code is written according to the [code quality guidelines](#)
- ☒ Documentation is available
- ☒ Tests run successfully
- ☒ The list of authors is up to date
- ☒ All checks below this pull request were successful

New or updated recipe/diagnostic

- ☒ Recipe runs successfully
- ☒ Recipe is well documented

Right Screenshot: GitHub Workflows

Workflows [New workflow](#)

All workflows

Filter workflow runs

3,169 workflow runs

Event	Status	Branch	Actor
Conda Base Install	Conda Base Install #594: Scheduled	9 hours ago	17m 56s
Test	Test #608: Scheduled	12 hours ago	24m 13s
Develop Test	Develop Test #402: Scheduled	13 hours ago	20m 43s
Conda-build	Conda-build #635: Scheduled	13 hours ago	30m 45s
Source Install	Source Install #592: Scheduled	13 hours ago	9m 6s

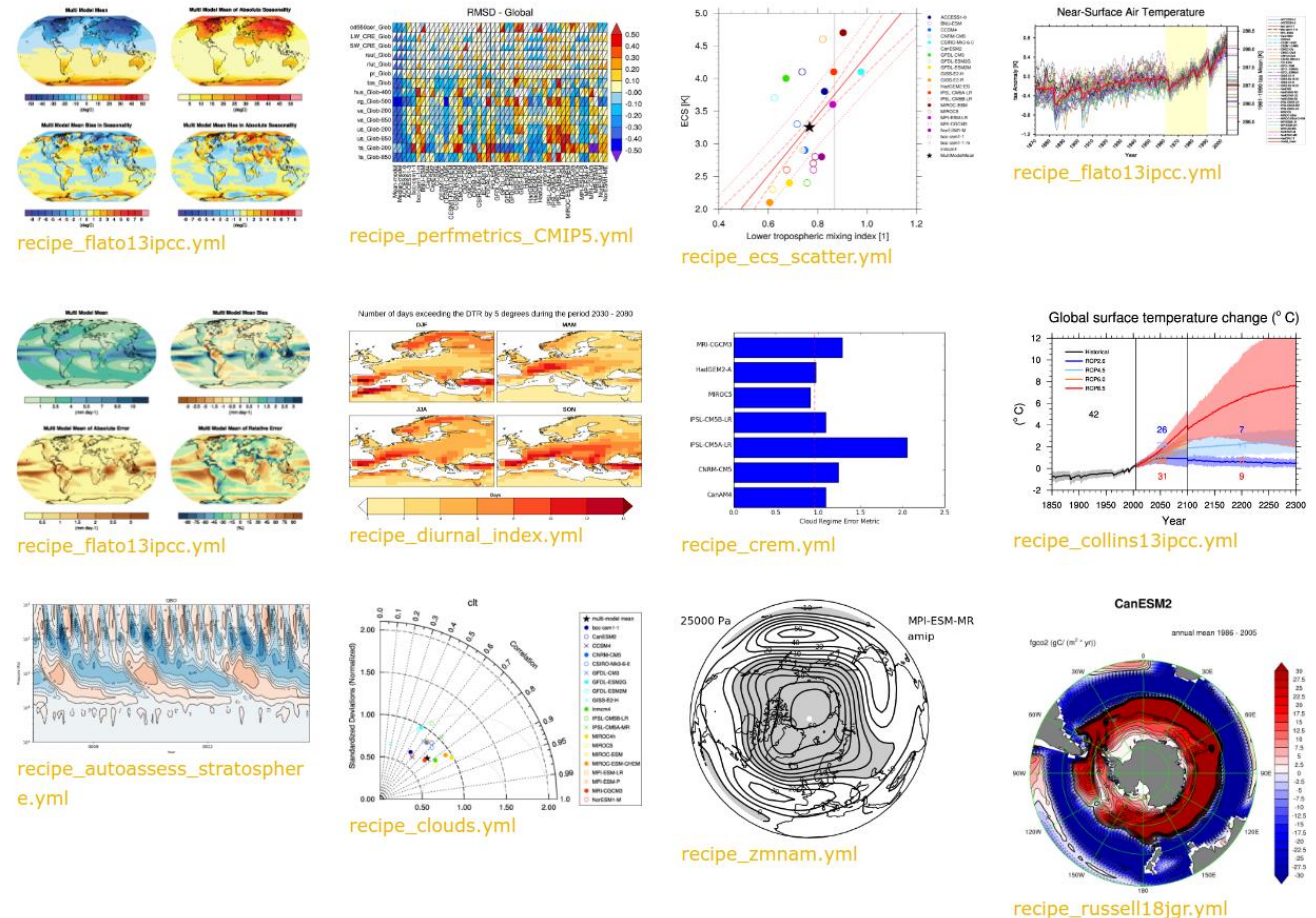
What can ESMValTool do for you?

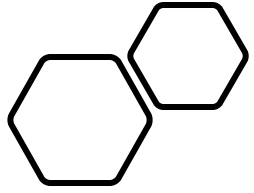
- A collection of scripts with extensive documentation.

<https://docs.esmvaltool.org/>

- An online tutorial

https://esmvalgroup.github.io/ESMValTool_Tutorial/

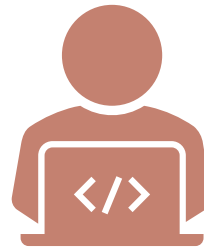




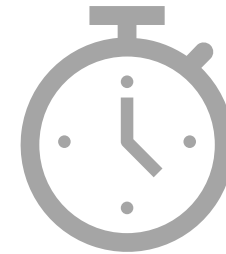
using ESMValTool:



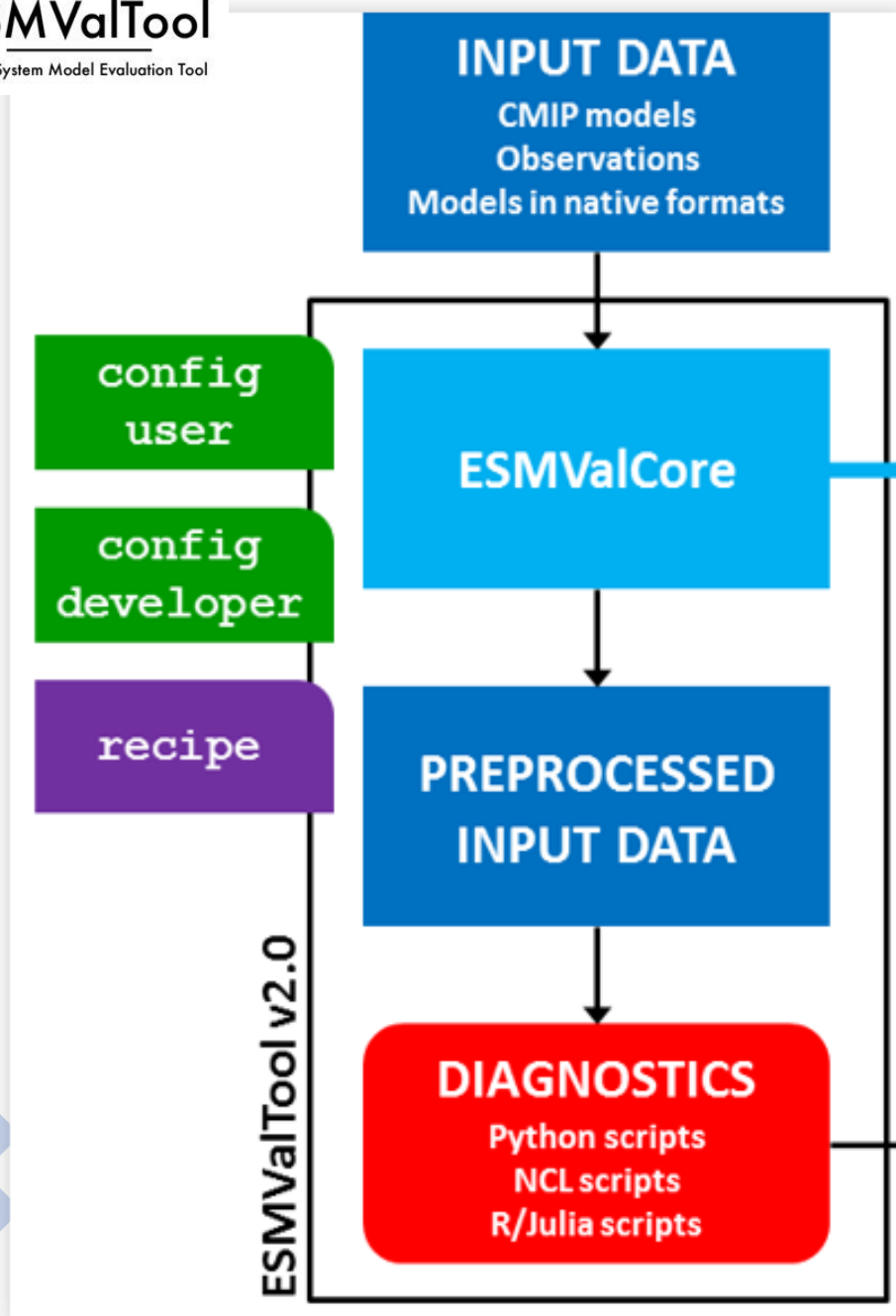
others can understand our
analyses



we can re-use code
instead of re-implementing it



we spend less time on
developing code



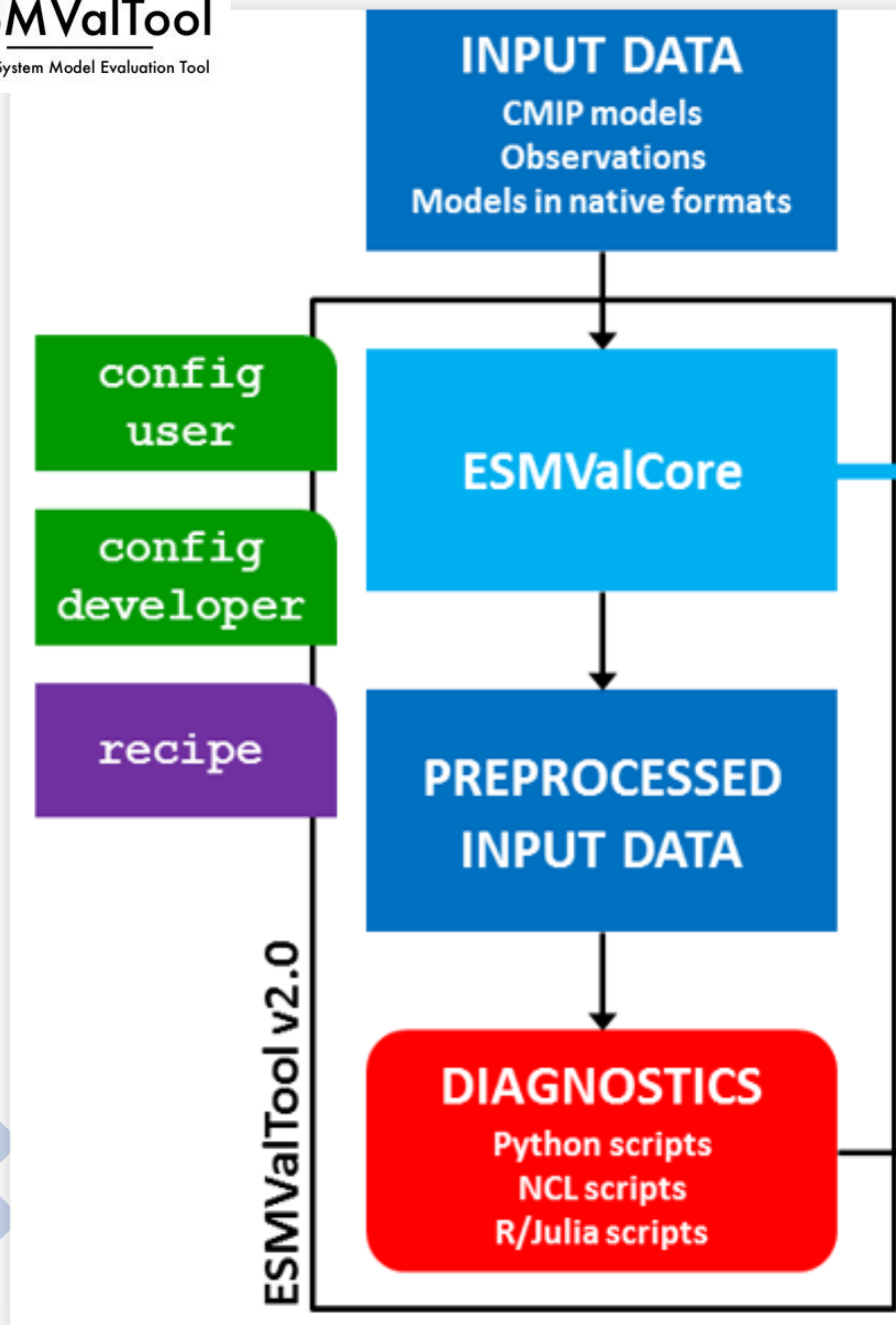
Earth System Model Evaluation with ESMValTool

Access to CMIP and observational data and a suitable compute cluster

Use a computing cluster with an Earth System Grid Federation (ESGF) node:

- German Climate Computing Center (DKRZ), Germany
- Center for Environmental Data Analysis (CEDA), UK
- Institut Pierre-Simon Laplace (IPSL), France
- Swiss Federal Institute of Technology Zurich (ETHZ), Switzerland
- National Supercomputer Centre (NSC), Sweden
- Barcelona Supercomputing Center (BSC), Spain





Recipe:

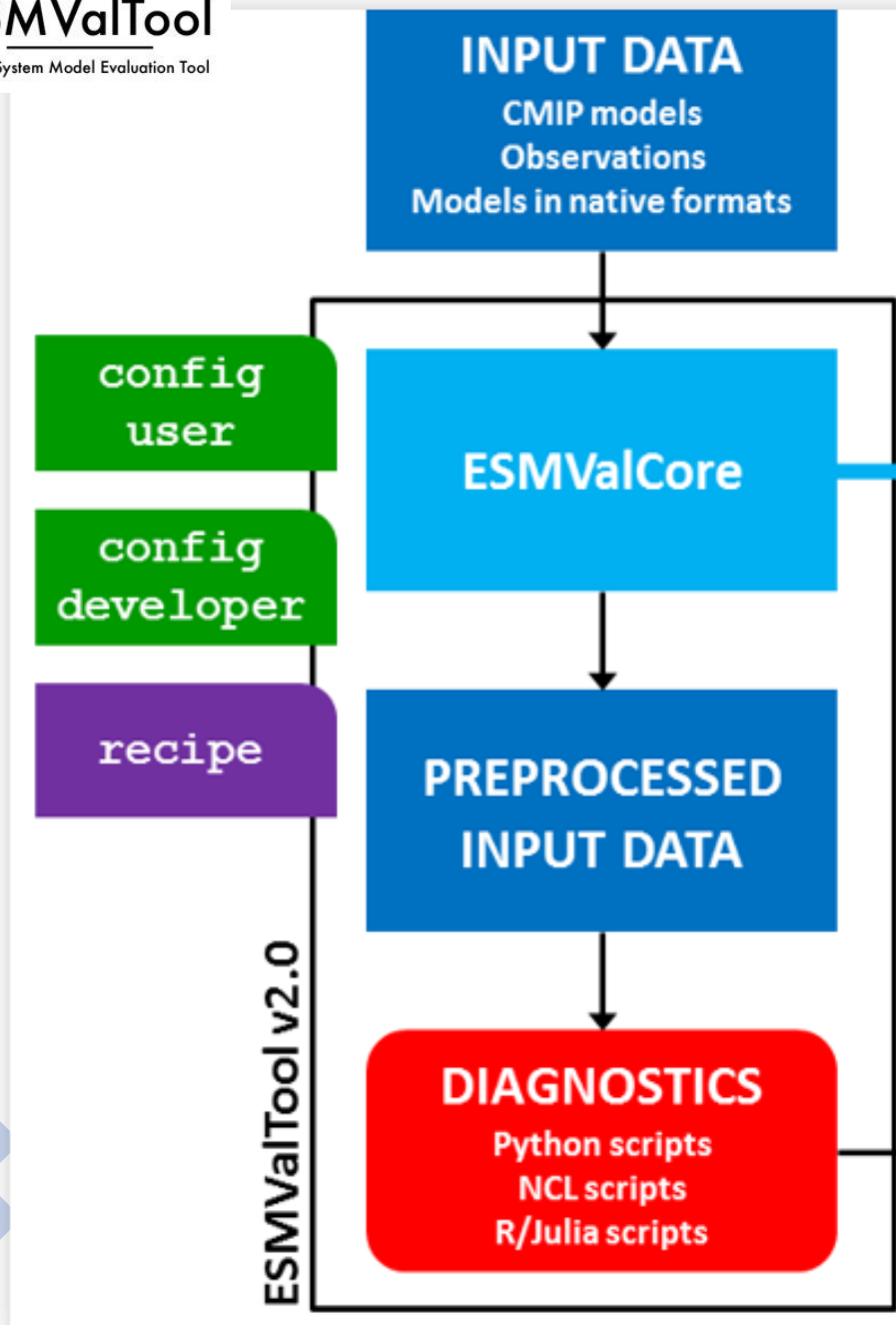
Instructions are given to esmvaltool using a YAML script called a recipe.

Instructions like:

- the **datasets** which need to be analyzed,
- the **preprocessors** that need to be applied,
- the specific analysis called **diagnostic** script.

Available recipes:

<https://docs.esmvaltool.org/en/latest/recipes/index.html>



How to run a recipe:

- ESMValTool as a command-line tool:

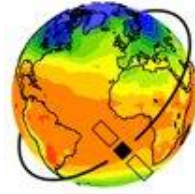
```
esmvaltool run examples/recipe_python.yml
```

- Using ESMValTool Python API:
We learn it during the course.



Related projects:

- IS-ENES3 has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824084
- EUCP has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 776613



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