

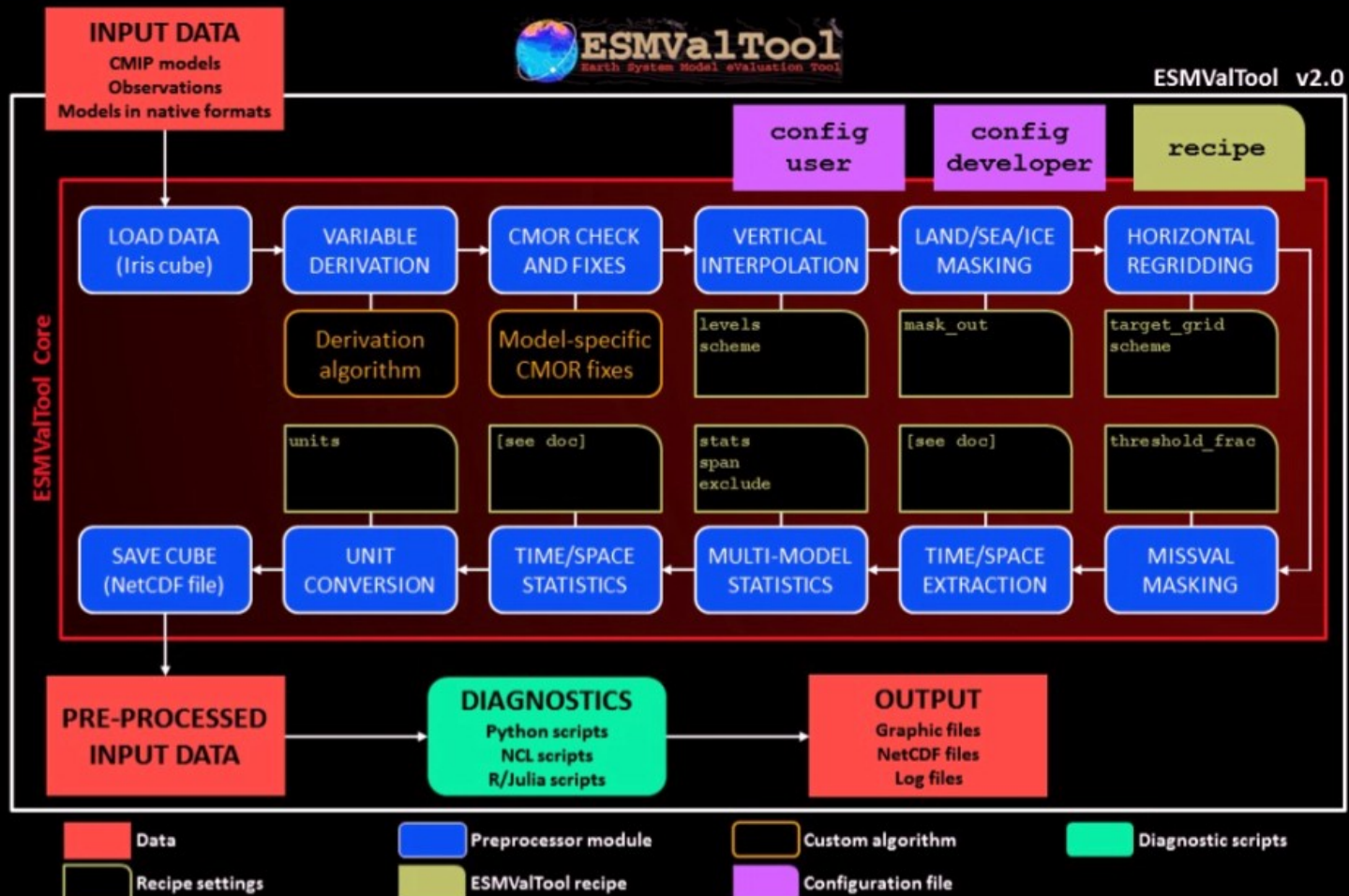
**ESMValTool**  
Earth System Model Evaluation

# ESMValTool v2.0

## A very brief overview

# Preprocessor schematic (esmvalcore)

Group of steps executing standardized functions in either standard or custom order





## USR: CODEBASE and INSTALLATION

Package location:

<https://github.com/ESMValGroup/ESMValTool.git>

The most recent version of ESMValTool source code is hosted on GitHub and is constantly updated when new features are merged and with every new release. GitHub offers a flexible platform for continuous integration via developers' pull requests (PR), issue tracking and resolution and installation, unit and functional testing (via CircleCI in this case):

<https://github.com/ESMValGroup/ESMValTool/>

ESMValTool is a Python 3 package with cross-language dependencies meant to support diagnostics in various programming languages (Python, NCL, R etc.); it is comprised of the preprocessing core (esmvalcore, pure Python package) and of the diagnostics library (cross-language package; this uses esmval-core as a dependency). Installed versions are available directly on compute clusters like CEDA-Jasmin or DKRZ or the user can install it via `conda install`

Run command:

```
[user@machine]$ conda install -c esmvalgroup -c conda-forge esmvaltool
```

## DEV: ENVIRONMENT SETUP and INSTALLATION

Environment file: `environment.yml`

For diagnostic (and core) developers it will be easier if they create the esmvaltool software environment and install the tool for development, testing and contributions to the code base via git.

A Python 3.x anaconda3 or miniconda3 installation is required *a-priori*, since the esmvaltool environment is a conda-based one.

The software package dependencies needed by esmvaltool are specified in the `environment.yml` file and this one is used to create the software environment.

After the environment has been created and activated, the tool is installed in the usual manner for a Python package.

Run command:

```
[user@machine]$ git clone https://github.com/ESMValGroup/ESMValTool.git
[user@machine]$ conda env create -n esmvaltool -f environment.yml
[user@machine]$ source activate esmvaltool
(esmvaltool) [user@machine]$ pip install -e ".[development]"
```



## USER INPUTS

User config file: `config-user.yml` Recipe: `recipe.yml`

User-defined parameters for the run e.g.: path to root directory for output; desired output graphical file formats (pdf, eps, png etc.); root paths for data and types of DRS.

A single configuration file can be used for a large number of diagnostic runs. It is also optimized for a minimum number of inputs.

Parameters needed by the core preprocessor(s) and diagnostic(s): three groups: **dataset(s) parameters**, **preprocessor(s) settings** and **diagnostic(s) settings**.

Each diagnostic may use any number of datasets, any number of preprocessors and any combination of variables (standard or derived variables). A single recipe file can be used for a large number of preprocessors and diagnostics.

Run command:

```
(esmvaltool) [user@machine]$ esmvaltool -c config-user.yml recipe.yml
```

diagnostics:

- an landsurf surfрад: ← Name (multiple diagnostics supported)
- description: Autoassess test diag for Land-Surface Surfrad.
- variables: ← Variables (derivation or non-CMOR standard supported)
- rsms: # Surf SW net all sky
- field: T2Ms
- derive: true
- force derivation: false
- fx\_files: [sftlf]
- rlms: # Surf LW net all sky
- field: T2Ms
- derive: true
- force derivation: false
- fx\_files: [sftlf]
- additional datasets: ← Additional datasets (CMIP, OBS, obs4mips...)
- dataset: CERES-EBAF, project: obs4mips, level: L3B, version: Ed2-7, start\_year: 2001, end\_year: 2012, tier: 1
- scripts: ← Diagnostic specific parameters
- autoassess landsurf surfрад: Autoassess landsurf surfрад settings
- script: autoassess/autoassess area base.py
- title: "Autoassess Land-Surface Diagnostic Surfrad Metric"
- area: land\_surface\_surfrad
- control\_model: MPI-ESM-LR
- exp\_model: MPI-ESM-MR
- obs\_models: [CERES-EBAF]
- obs\_type: obs4mips
- fx: [sftlf]
- start: 1997/12/01
- end: 2002/12/01

