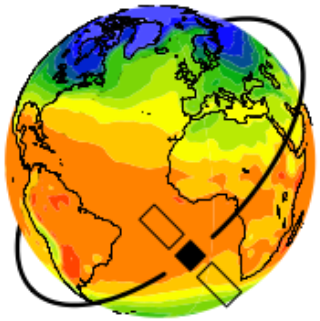

ESMValTool

Earth System Model Evaluation Tool

The Future of NCL

Current Situation

- Since November 2020, NCL is not actively developed anymore, but in maintenance mode (details: https://geocat.ucar.edu/blog/2020/11/11/November-2020-update)
- We currently install NCL via conda-forge
- Over the years, people (incl. many ESMValTool developers) tried to keep the NCL conda-forge package alive
- Old dependencies make NCL incompatible with more and more packages, e.g., Python 3.13, Numpy 2, …

Usage of NCL in ESMValTool (slide by Tina)

In total: 127 NCL diagnostics in 18 folders + 20 shared NCL diags

- 9 diag folders only used for 1 recipe (folder)
  - austral_jet -> wenzel16jclim, bock20jgr, example, eyring06jgr, eyring13jgr, mder -> wenzel16jclim, russel18jgr, tebaldi21esd, xco2_analysis -> gier2020bg
- 3 diag folders used for 1 recipe + ipcc
  - carbon_cycle -> anav13jclim, ar5ch9
  - regional_downscaling -> ar5ch9, weigel21gmd
  - seaice -> seaice, ar5ch9
- 2 diag folders for IPCC
  - ipcc_ar5, ipcc_ar6
- 4 diag folders used for several recipes:
  - carbon_ec (wenzel16nat, wenzel14jgr)
  - clouds (clouds_bias, ar5ch9, clouds_ipcc, bock20jgr, lauer13jclim, lauer22jclim)
  - emergent_constraints (ecs_scatter, schlund20esd, ecs_constraints, snowalbedo, ar5ch9)
  - perfmetrics (2 smpi, 3 perfmetrics, bock20jgr, anav13jclim, ar6ch3)
- Honorable mention: 6 ts_line diagnostics (2 of which are tsline_collect)
- 25 NCL cmorizer

Possible Solutions

- Remove NCL from our environment and let the user take care of its installation (e.g., module load ncl works on Levante)
- Transform some (!) of the important NCL diagnostics to Python (example: https://github.com/ESMValGroup/ESMValTool/pull/3551)
- Remove other NCL diagnostics and corresponding recipes from main repository and only mention them in documentation (incl. last version they ran)