ESMValTool setup for NorESM

Ingo Bethke, 2017.05.10 EVA meeting
NCAR diagnostic package vs ESMValTool

NCAR/NorESM diagnostic package
• designed for CESM system
• compares one simulation vs another simulation or observation
• uses raw model output as input
• ncl based

ESMValTool (www.esmvaltool.org)
• designed for generic ESM output
• compares one or more simulations vs CMIP5 model suite and observ.
• uses cmor-ized model output
• python+ncl based (some code adapted from NCAR package)
ESMValTool – pros and cons

pros
• complementary to NCAR package as it allows to evaluate against models outside the CESM family
• versatile – provides a well documented framework to integrated your own analyses
• project commitments (CRESCENDO, APPLICATE) to contribute to its development

cons
• necessary to CMOR-ize data (takes time, cpu-resources, disk space)
• requires large amounts of input data; obtaining and installing it is not automated and can be labour intensive
• some ESMValTool analyses are very memory intensive (>10 GB) and generally slow (several hours)
ESMValTool example – portrait diagram

Eyring et al. 2016, GMD
What makes NorESMValTool?

NorESMValTool

• NorESM cmorization tools
• ESMValTool
• observational data & CMIP5 model data
• customized namelists for Norstore/NorESM
• wrapper scripts for easy use

available at

norstore.uio.no:/projects/NS2345K/NorESMValTool
https://github.com/NorwegianClimateCentre/NorESMValTool.git
Installation of NorESMValTool

On Norstore, execute

/projects/NS2345K/NorESMValTool/install.sh

This will create your personal setup in

$HOME/NorESMValTool
How is NorESMValTool organised?

$HOME/NorESMValTool/

- data/  input and derived data (sym.link to project area)
- mods/ source mods for ESMValTool
- plots/ plots will be stored here
- scripts/ wrapper scripts for cmor, ESMValTool
- tools/ noresm2cmor, ESMValTool
How is NorESMValTool organised?

$HOME/NorESMValTool/

data/
  clim/ - climatologies derived from original input data
  cmor/ - cmor output of new experiments
  model/ - CMIP5
  obs/ - obs. data installed with ESMValTool scripts
  rawobs/ - obs. data as downloaded from internet
  regrid/ - data regridded by ESMValTool
  work/ - work directory of ESMValTool
How is NorESMValTool organised?

$HOME/NorESMValTool/
  mods/
    namelists/ - customised namelists for Norstore/NorESM
  scripts/
    cmorize - cmor wrapper script for NorESM output
    esmval - ESMValTool wrapper script
  tools/
    noresm2cmor/ - cmorization tools
    ESMValTool/ - original ESMValTool installation
Cmor-ization

Syntax
$HOME/NorESMValTool/scripts/cmorize <case folder> <start year> <end year>

Example
$HOME/NorESMValTool/scripts/cmorize /projects/NS2345K/www/cmor/sampleddata/N20TRAERCN_f19_g16_01 2000 2000

Output configuration
$HOME/NorESMValTool/tools/noresm2cmor/namelists/noresm2cmor_NorESM_GENERIC_template.nml

Output location
$HOME/NorESMValTool/data/cmor/<case name>.<start year>-<end year>
e.g. $HOME/NorESMValTool/data/cmor/N20TRAERCN_f19_g16_01.2000-2000

Tip: use processing node cruncher.norstore.uio.no
Running ESMValTool

Syntax

$HOME/NorESMValTool/scripts/esmval  <cmor folder> <ESMValTool namelist>

Example

$HOME/NorESMValTool/scripts/esmval $HOME/NorESMValTool/data/cmor N20TRAERCN_f19_g16_01.2000-2000 $HOME/NorESMValTool/mods/namelist/namelist_MyDiag.xml

How it works

esmval script replaces MODELTAG in customised ESMValTool namelist with path to cmorized output and then calls ESMValTool main script main.py with updated namelist as argument.

Tip: use processing node cruncher.norstore.uio.no
Running ESMValTool

200 hPa

Location: $HOME/NorESMValTool/plots/MyDiag/MyDiag_MyVar.ps
How is ESMValTool organised?

$HOME/NorESMValTool/tools/ESMValTool

- *main.py* - ESMValTool main script that takes path to namelist file as argument
- *config_private.xml* - path configurations
- *diag_scripts/* - 88 diagnostic script templates
- *plot_scripts/* - 16 plotting scripts
- *reformat_scripts/* - 63 conversion scripts of obs data
- ... - utilities etc etc
Resources

- norstore.uio.no:/projects/NS2345K/NorESMValTool/README
- norstore.uio.no:/projects/NS2345K/noresm2cmor/README
- ESMValTool home page: [www.esmvaltool.org](http://www.esmvaltool.org)
- ESMValTool user guide: