ESMValTool setup for NorESM

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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

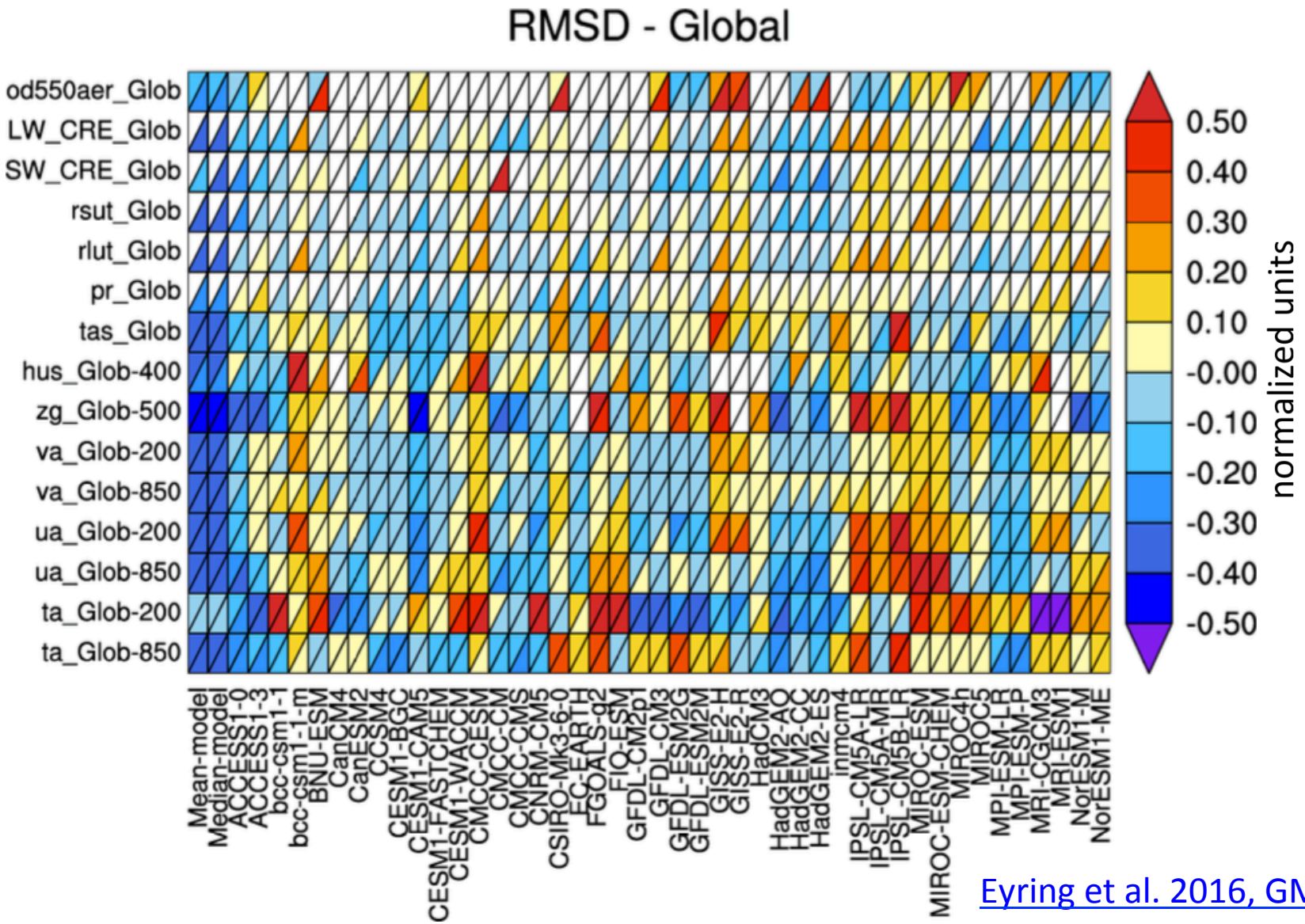
pros

- 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/sampledata/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

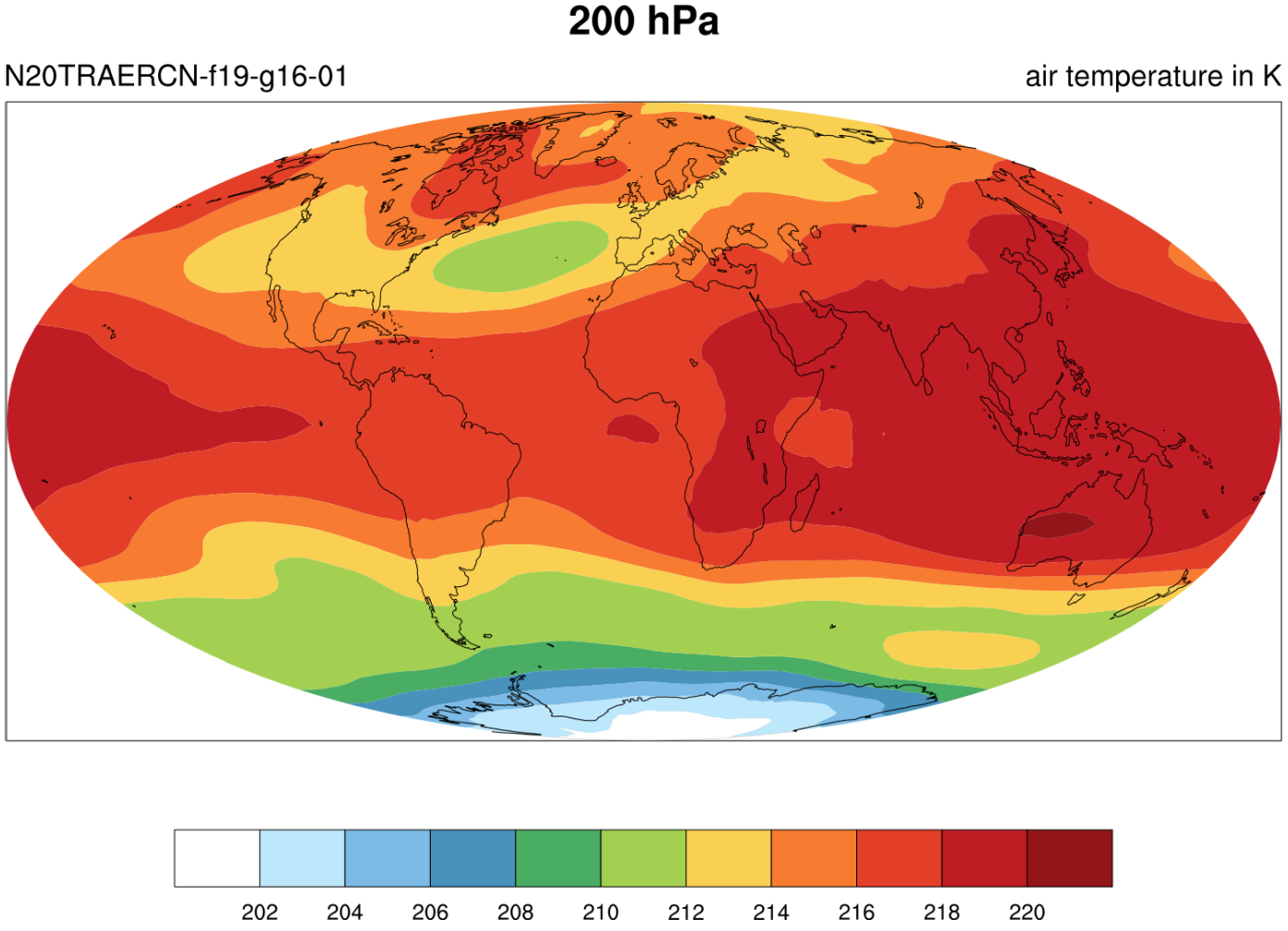
$HOME/NorESMValTool/scripts/esmval $HOME/NorESMValTool/data/cmor N20TRAERCN_f19_g16_01.2000-2000 $HOME/NorESMValTool/mods/namelist/namelist_MyDiag.xml

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



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
- ESMValTool user guide:
  https://www.esmvaltool.org/download/ESMValTool_Users_Guide.pdf
- GMD paper: http://www.geosci-model-dev.net/9/1747/2016