Barcelona Supercomputing Center
Centro Nacional de Supercomputación

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New ESMValTool features

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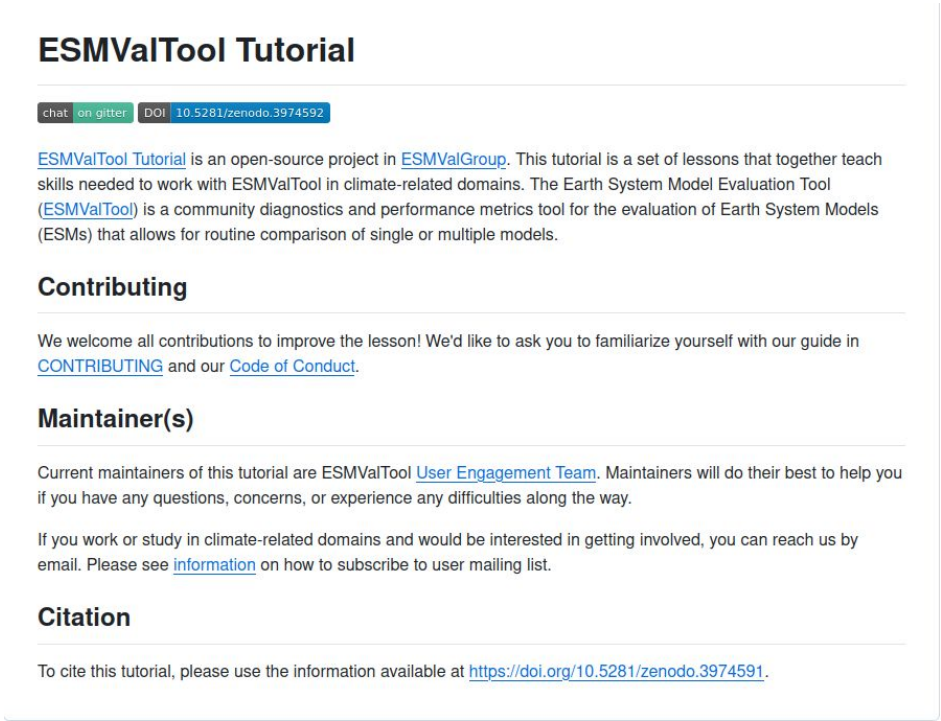
ESMValTool Workshop

1. Background

- The tutorial has not been updated in a while with the latest ESMValTool features



ESMValTool Tutorial

chat on gitter DOI 10.5281/zenodo.3974592

ESMValTool Tutorial is an open-source project in ESMValGroup. This tutorial is a set of lessons that together teach skills needed to work with ESMValTool in climate-related domains. The Earth System Model Evaluation Tool (ESMValTool) is a community diagnostics and performance metrics tool for the evaluation of Earth System Models (ESMs) that allows for routine comparison of single or multiple models.

Contributing

We welcome all contributions to improve the lesson! We'd like to ask you to familiarize yourself with our guide in CONTRIBUTING and our Code of Conduct.

Maintainer(s)

Current maintainers of this tutorial are ESMValTool User Engagement Team. Maintainers will do their best to help you if you have any questions, concerns, or experience any difficulties along the way.

If you work or study in climate-related domains and would be interested in getting involved, you can reach us by email. Please see information on how to subscribe to user mailing list.

Citation

To cite this tutorial, please use the information available at https://doi.org/10.5281/zenodo.3974591.

1. Background

- Last documented features include :
  - The ability to use wildcards in the recipe
  - The ability to download data from multiple ESGF nodes

Features from version 2.8

1. Background

Version 2.9

Version 2.10

Version 2.11

Since then, three more versions have been released

2. New features in version 2.9

- Implementation to use the dask distributed scheduler via the configuration file dask.yml

```
cluster:
  type: distributed.LocalCluster
  n_workers: 8
  threads_per_worker: 4
  memory_limit: 4 GiB
```

2. New features in version 2.9

- Implementation to use the dask distributed scheduler via the configuration file dask.yml

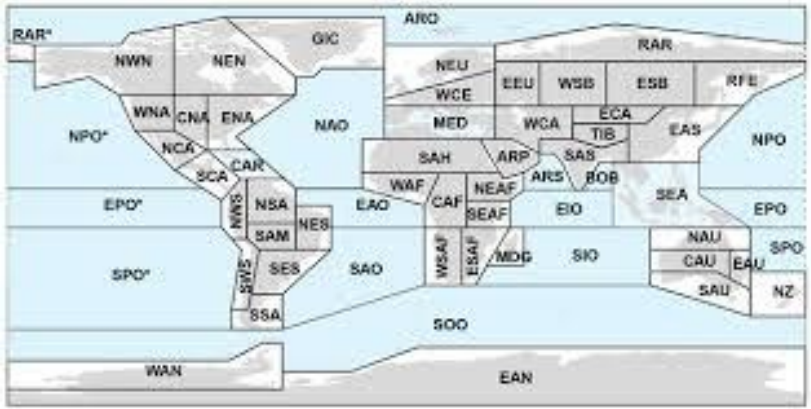
```
cluster:
  type: dask_jobqueue.SLURMCluster
  queue: bsc_es
  account: bsc32
  cores: 16
  memory: 4GiB
  local_directory: "$TMPDIR"
  n_workers: 8
  processes: 4
  job_extra_directives: ["--exclusive"]
  job_directives_skip: ['--mem', '-p']
  walltime: '08:00:00'
  interface: "ib0"
```

2. New features in version 2.9

- Computational improvements → Lazy pre-processors
  - `extract_levels`
  - `multi_model_statistics`
  - `ensemble_statistics`
  - `concatenate`

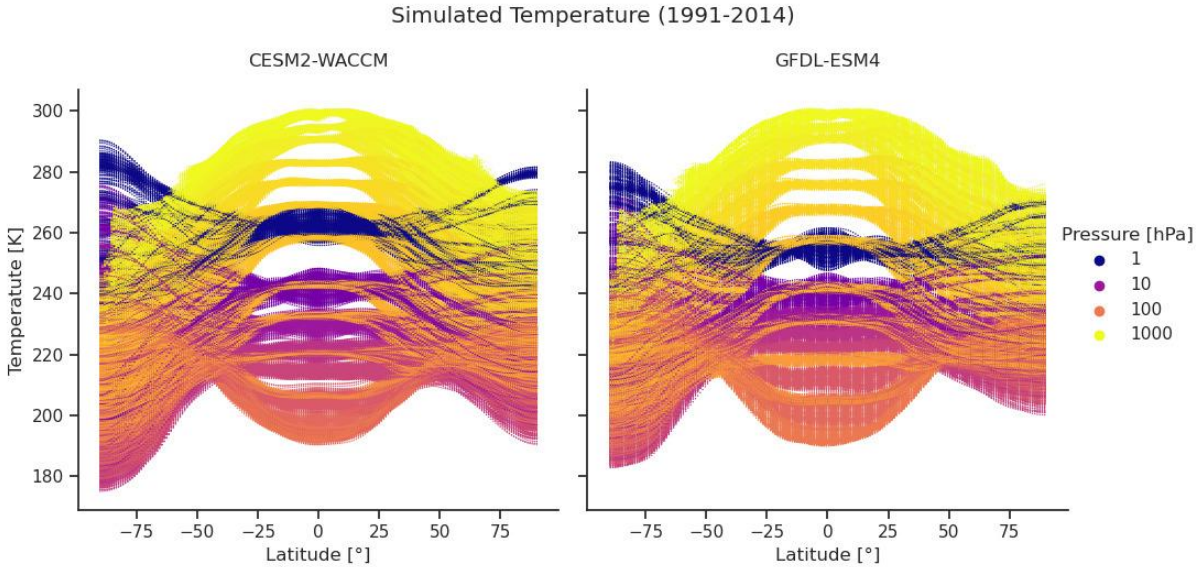
2. New features in version 2.9

- Preprocessors
  - Support ‘hourly’ period in `climate_statistics` and `anomalies`
  - Support IPCC AR6 regions in `extract_shape`



2. New features in version 2.9

- New diagnostics
  - `recipe_seaborn.yml`
  - `recipe_galytska23jgr.yml`



2. New features in version 2.9

- New observational and reanalysis datasets
  - GPCP-SG
  - Extended NASA MERRA2

3. New features in version 2.10

- Computational improvements →Lazy preprocessors
  - `mask_above_threshold`
  - `mask_below_threshold`
  - `mask_inside_range`
  - `mask_outside_range`

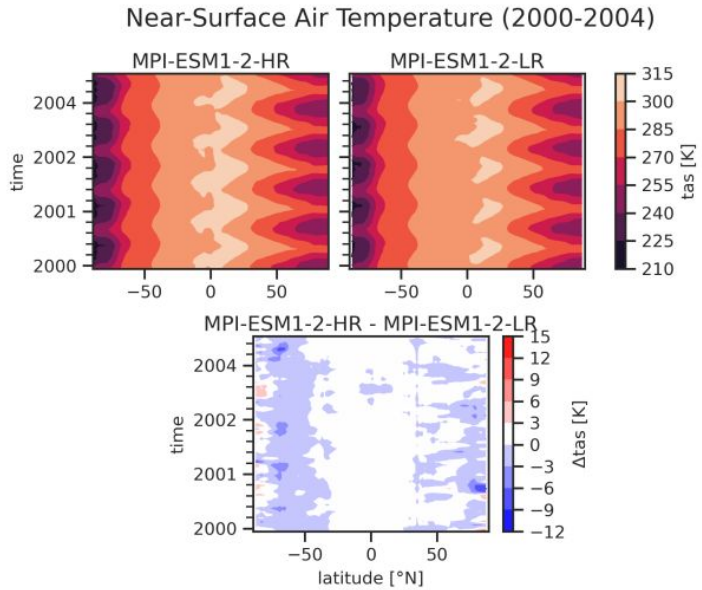
3. New features in version 2.10

- Preprocessors
  - New supported statistical operators

operator	Corresponding `Aggregator`	Weighted? [1]
`gmean`	`iris.analysis.GMEAN`	no
`hmean`	`iris.analysis.HMEAN`	no
`max`	`iris.analysis.MAX`	no
`mean`	`iris.analysis.MEAN`	yes
`median`	`iris.analysis.MEDIAN` [2]	no
`min`	`iris.analysis.MIN`	no
`peak`	`iris.analysis.PEAK`	no
`percentile`	`iris.analysis.PERCENTILE`	no
`rms`	`iris.analysis.RMS`	yes
`std_dev`	`iris.analysis.STD_DEV`	no
`sum`	`iris.analysis.SUM`	yes
`variance`	`iris.analysis.VARIANCE`	no
`wpercentile`	`iris.analysis.WPERCENTILE`	yes

3. New features in version 2.10

- New diagnostics
  - `recipe_easy_ipcc.yml`
  - Extended plots in `recipe_monitor_with_refs.yml`
  - `recipe_iht_toa.yml`



3. New features in version 2.10

- New observational and reanalysis datasets
  - NOAA-CIRES-20CR v3
  - NASA MERRA
  - NOAA-MBL-CH4

4. New features in version 2.11

- Performance improvements → Lazy preprocessors
  - `mask_landsea`
  - `mask_landseaice`
  - `mask_glaciated`
  - `extract_levels`

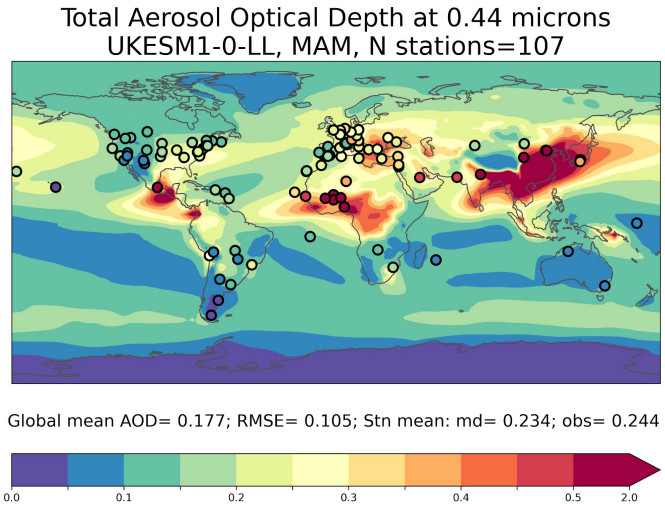
4. New features in version 2.11

- New preprocessors
  - `local_solar_time`
  - `distance_metrics`
  - `histogram`
- Normalize statistics in statistical preprocessors
- Accept cubes as input in bias preprocessor
- Set a common calendar for decadal, yearly and monthly data in `regrid_time`
- Add an unstructured linear regridding scheme

```
area_statistics:
  operator: mean
  normalize: subtract
```

4. New features in version 2.11

- New diagnostics
  - `recipe_aod_aeronet_asses`
  - `recipe_climate_patterns`



4. New features in version 2.11

- New observational and re-analysis datasets
  - AERONET
  - ANU Climate 2.0
  - AGCD
  - NOAA-ERSST
  - NSIDC-G02202-sh

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Thank you

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