Extpar

Status and future plans

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Status Extpar v5.7.4 (January 2022)

Scientific updates

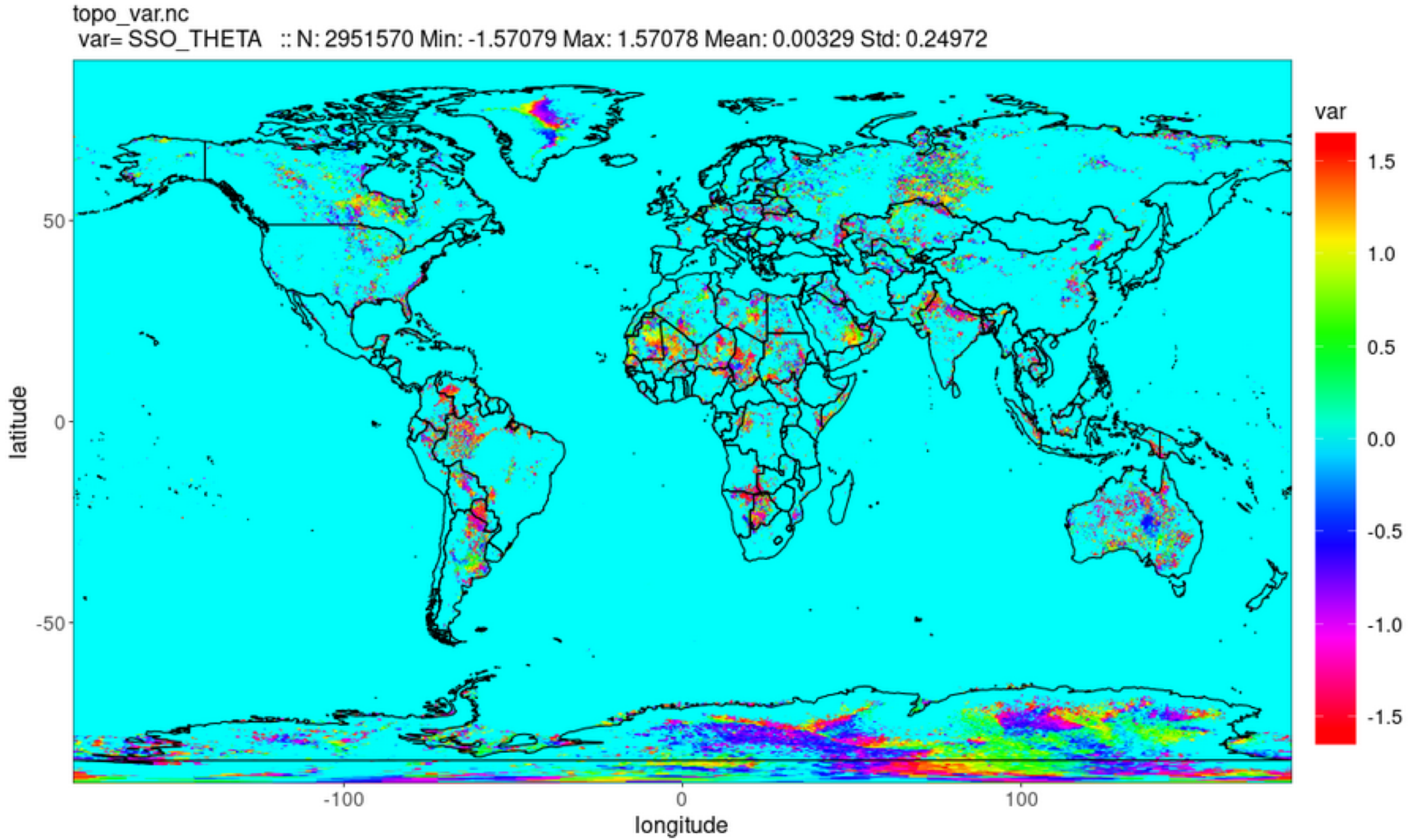
- Revised SSO threshold for ICON by DWD (lowering from 10m to 1m)

Technical improvements

- Ongoing effort to reduce Fortran code base (7/8 executables transfered so far)
- Refactoring code of lsubstract_mean_slope=.TRUE. for ICON to reduce memory footprint of large grids
- Automatic detection if CDO contains thread-safe HDF5 library

Documentation

- Complete revision of the GitHub documentation
- Quick-Start for all supported machines (Daint, Tsa and Mistral)


topo_var.nc
var= SSO_THETA :: N: 2951570 Min: -1.57079 Max: 1.57078 Mean: 0.00329 Std: 0.24972
var
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.5
50
0
-50
latitude
-100
0
100
longitude

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Python rewrite revisited

Reason

- Performance issues for large input grids
- Known and unresolved deficiencies of the bilinear interpolation algorithm in Fortran
- Large code base to maintain

Implementation

- Python code does the logic, CDO does the work (remapping,data processing, etc.)
- Seamless transition from Fortran to Python
- Minor changes in results due to different interpolation methods

Downsides

- Fortran, Python and CDO as dependencies of Extpar
- Memory issue with CDO interpolation algorithm for global grids

Python rewrite revisited

Reason

- Performance issues for large input grids
- Known and unresolved deficiencies of the bilinear interpolation algorithm in Fortran
- Large code base to maintain

Implementation

- Not a domain specific language or anything fancy
- Seamless transition from Fortran to Python
- Minor changes in results due to different interpolation methods

Downsides

- Fortran, Python and CDO as dependencies of Extpar
- Memory issue with CDO interpolation algorithm for global grids

Future developments

New datasets

- Incorporate new parameters for Urban
- JSBACH 4 Extpar

Code refactoring

- Replace extpar_flake_to_buffer with a Python-CDO script

Testsuite

- Replace redundant namelist settings, currently about 80% of all settings identical

Webinterface

- Replacement of WebPep planned for Q1 of 2022

More infos

GitHub

- https://github.com/C2SM-RCM/extpar/blob/master/ReleaseNotes.md
- https://github.com/C2SM-RCM/extpar/wiki
- https://github.com/C2SM-RCM/extpar/blob/master/doc/user_and_implementation_manual.pdf

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Discussion