A new interactive and user friendly R laboratory to explore and evaluate large ensembles of climate model simulations

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The climate community has been challenged by the large amount of data produced through various experiments such as the CMIP5 and CORDEX experiments leading to difficulties in analysing and extracting useful information from the large ensemble of climate model simulations.

We will present a new web platform called 'ESD Lab' developed by the Norwegian Meteorological Institute (https://esdlab.met.no) which contains various 'R Shiny' web applications that can be used, for instance, to evaluate and analyse global and regional climate model results in simulating present and future climate. More specifically, we will focus and show a live demo on how to explore and evaluate the full ensemble of the CMIP5 and EURO-CORDEX climate model simulations on a global and regional scale based on basic key performance indicators such as the reproduction of observed seasonal cycle, the effect of the models' internal variability on the ensemble spread, scatter diagrams of changes in precipitation vs temperature, etc. and will demonstrate the usefulness of such tools in facilitating, for instance, the selection of suitable climate models among others.

Additionally, these various shiny-applications are based on an open source R package called 'esd' (https://github.com/metno/esd/wiki) which has recently been developed by the Norwegian Meteorological Institute and has recently been made freely available for use by the climate community. The 'esd' R package was primarily built for statistical downscaling of climate variables and parameters from global climate model results (e.g. CMIP3/5 model results), and has recently been extended to downscale regional climate model results and storm-track statistics. The 'esd' acronym also stands for 'Easy & Simple Data' analyses as it additionally facilitates data I/O (e.g. global climate datasets), statistical analysis, and interactive visualization that opens new ways of exploring large ensembles of climate data in a user friendly way.