

Wikiprint Book

Title: Regional-Continental domain selections

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In this example we will load data for Europe for the variable surface (2m) minimum temperature (`var = tasmin`), for the first two members (`members = 1:2`) of the CFSv2 hindcast (`dataset = CFSv2_seasonal_16`), considering the wintertime (DJF, `season = c(12,1,2)`) for the 10-year period 2001-2010 (`years = 2001:2010`), according to the forecast of previous September (`leadMonth = 3`). The original variable is stored as 6-hourly data for this particular dataset. We will retrieve the daily mean values, by setting the argument `time = "DD"`, that internally computes the daily minimum from the 6-hourly instantaneous values (see the NOTE below when executing the command):

```
> ex2 <- loadECOMS(dataset = "CFSv2_seasonal_16", var = "tasmin", members = 1:2, lonLim = c(-15,35), latLim = c(32, 75), s
[2014-09-02 16:45:58] Defining homogeneization parameters for variable "tasmin"
NOTE: daily minimum will be calculated from the 6-h model output
[2014-09-02 16:45:58] Defining geo-location parameters
[2014-09-02 16:45:58] Defining initialization time parameters
[2014-09-02 16:46:03] Retrieving data subset ...
[2014-09-02 16:52:57] Done
> print(object.size(ex2), units = "Mb")
35 Mb
```

In this case, the data are stored in a 4D-array, with the dimensions indicated by the `dimensions` attribute, always following the canonical ordering of dimensions:

```
> str(ex2$Data)
num [1:2, 1:902, 1:47, 1:54] 17.4 17.2 16.4 18.7 17.4 ...
- attr(*, "dimensions")= chr [1:4] "member" "time" "lat" "lon"
```

Members can be plotted individually by setting `multimember = TRUE` in the `plotMeanField` function of the `downscaleR` package:

```
plotMeanField(ex2, multi.member = TRUE)
```



We load now the reference observations for the spatio-temporal domain previously chosen:

```
> ex2.obs <- loadECOMS(dataset = "WFDEI", var = "tasmin", lonLim = c(-15,35), latLim = c(32, 75), season = c(12,1,2), year
[2014-09-02 17:07:43] Defining homogeneization parameters for variable "tasmin"
[2014-09-02 17:07:44] Defining geo-location parameters
[2014-09-02 17:07:44] Defining time selection parameters
[2014-09-02 17:07:44] Retrieving data subset ...
[2014-09-02 17:07:58] Done
> print(object.size(ex2.obs), units = "Mb")
60.6 Mb
```

This is the map of the observed mean minimum surface temperature observed for DJF 2001-2010:

```
> plotMeanField(ex2.obs)
```



Note that WFDEI provides data for land areas only, and its spatial resolution is finer than CFS (1° vs 0.5°). In order to compare both datasets, it is first necessary to put them in the same grid (i.e., to interpolate). We use bilinear interpolation to this aim, using the `downscaleR` function `interpGridData` in combination with the `getGrid` method, useful to recover the parameters defining the grid of a dataset to pass them to the interpolator:

```
> obs.regridded <- interpGridData(gridData = ex2.obs, new.grid = getGrid(ex2), method = "bilinear")
> plotMeanField(obs.regridded)
```