

## Single point selections

The following call to `loadECOMS` will load a time series of summer 2001 (JJA, `season = 6:8`, `years = 2001`) surface (2m) daily mean temperature (`var = "tas"`, as defined in the [?vocabulary](#)) for the coordinate -3.7E 40.4N, (`lonLim = -3.7`, `latLim = 40.4`) corresponding to the city of Madrid (Spain), as forecasted the previous March (`leadMonth = 2`) by the CFSv2 hindcast (`dataset = "CFSv2_seasonal_16"`). We will select the first 10 members (`members = 1:10`). Note that the original variable is stored in the CFSv2 database as 6-hourly. Hence, we indicate to the function to compute the daily mean from the 6-hourly data using the argument `time = "DD"`.

First of all, the library is called and we log-in into the ECOMS-UDG:

```
library(ecomsUDG.Raccess)
loginECOMS_UDG("user", "password")
```

Now we are ready for accessing the ECOMS-UDG:

```
point.cfs <- loadECOMS(dataset = "CFSv2_seasonal_16",
                      var = "tas",
                      members = 1:10,
                      lonLim = -3.7,
                      latLim = 40.4,
                      season = 6:8,
                      years = 2001,
                      leadMonth = 2,
                      time = "DD")
```

Note that a number of informative messages will appear on-screen:

```
[2014-09-02 15:28:42] Defining homogeneization parameters for variable "tas"
NOTE: daily mean will be calculated from the 6-h model output
[2014-09-02 15:28:42] Defining geo-location parameters
[2014-09-02 15:28:42] Defining initialization time parameters
[2014-09-02 15:28:46] Retrieving data subset ...
[2014-09-02 15:31:25] Done
```

This is the size of the loaded object:

```
print(object.size(point.cfs)) # 22456 bytes
```

The returned object contains all the necessary information for data representation (geo-location, time ...). In the next lines we plot the loaded time series for each member. The element `Data` contains the data itself. In this case, it is a 2D array with the dimensions `member` (10 members selected) and `time` (92 days for June, July and August), as indicated by the `dimensions` attribute.

```
str(point.cfs$Data)
```

which returns information on the `Data` array structure:

```
num [1:10, 1:92] 16.3 17.1 12.9 10.4 15.3 ...
- attr(*, "dimensions")= chr [1:2] "member" "time"
```

Note that, by convention, the dimensions of the `Data` array will be always ordered in the canonical form `member > time > lat > lon`. Several vertical levels are never loaded at the same time, so the dimension `level` will never appear. This will be indicated in the `Variables` element of the returned output if existing. In this case it is `NULL`, because the variable loaded is a surface variable:

```
str(point.cfs$Variable)
```

returns the structure of the `Variable` element of the output:

```
List of 3
 $ varName : chr "tas"
```

```
$ isStandard: logi TRUE  
$ level      : NULL
```

In the following example we plot the time series with the multi-member mean and its dispersion (interquartilic range 25-75):

```
quartiles <- apply(point.cfs$Data, MARGIN = 2, FUN = quantile, probs = c(.25,.75))  
ens.mean <- colMeans(point.cfs$Data)  
dates <- as.POSIXlt(point.cfs$Dates$start, tz="GMT")  
plot(dates, ens.mean, ylim = range(point.cfs$Data),  
     type = 'n', ylab = "tas - Daily Mean", xlab = "time")  
polygon(x = c(dates, rev(dates)),  
       y = c(quartiles[1, ], rev(quartiles[2, ])),  
       border = "transparent", col = rgb(0,0,1,.4))  
lines(dates, ens.mean)
```

