Seasonal forecast of extreme events with S2dverification

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Presentation of data

MODEL DATA: ENSEMBLES prediction system

ENSEMBLES Multi-model:

- INGV's ECHAM5/OPA

- IFM Kiel's ECHAM5/OM1

- ECMWF's IFS/HOPE

- Météo-France's ARPEGE/OPA

- UK Met Office's HadGEM2

9 members each, with different initial conditions.

Seasonal forecasts between 1979 until 2005

1 start dates: May

June July Augue

ERA-interim reanalysis data

Period 1979-Now.

Calculate monthly extreme variables

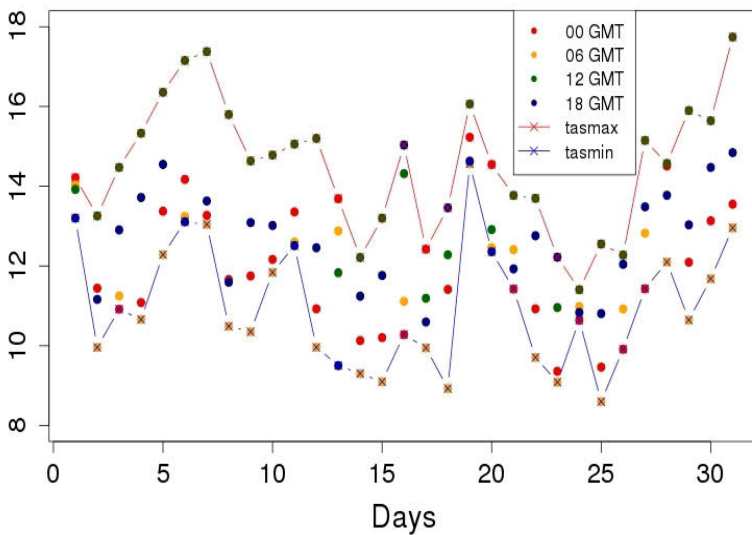**2 bash scripts developed at the IC3
(based on cdo and nco):**

- ERA-interim: monthly extreme ERAINT.sh
- ENSEMBLES: monthly extreme ENSEMBLES.sh

→ 4 variables (10m wind module,
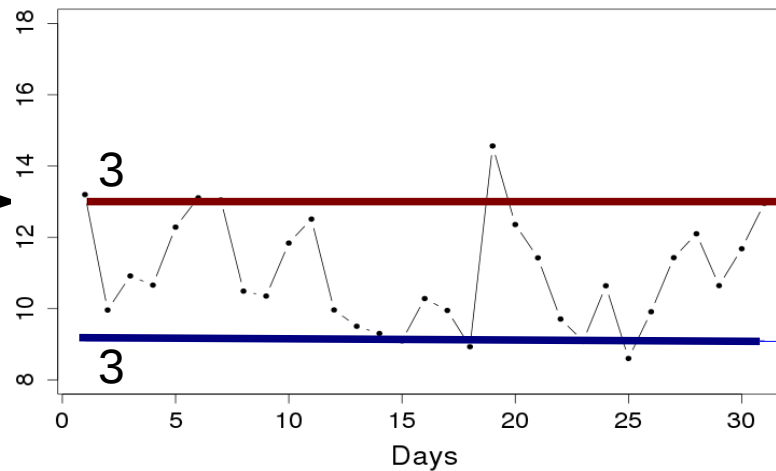precipitations, tasmin, tasmax)

Extreme variables

6 hourly and 12 hourly data

6-hourly temperature
Jan 2013 BCN
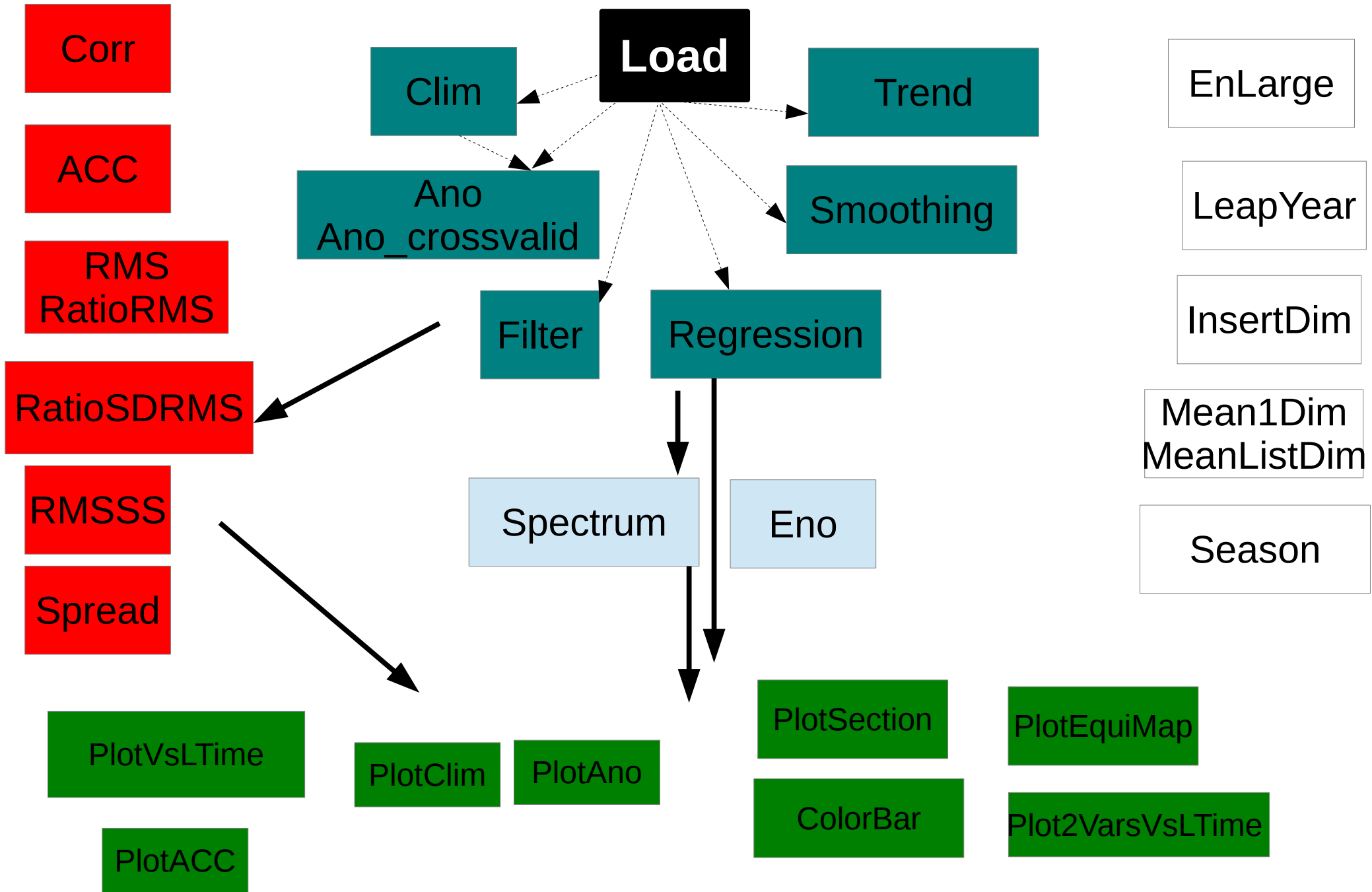
Calculate daily values
Tasmin/Tasmax
Total precipitations

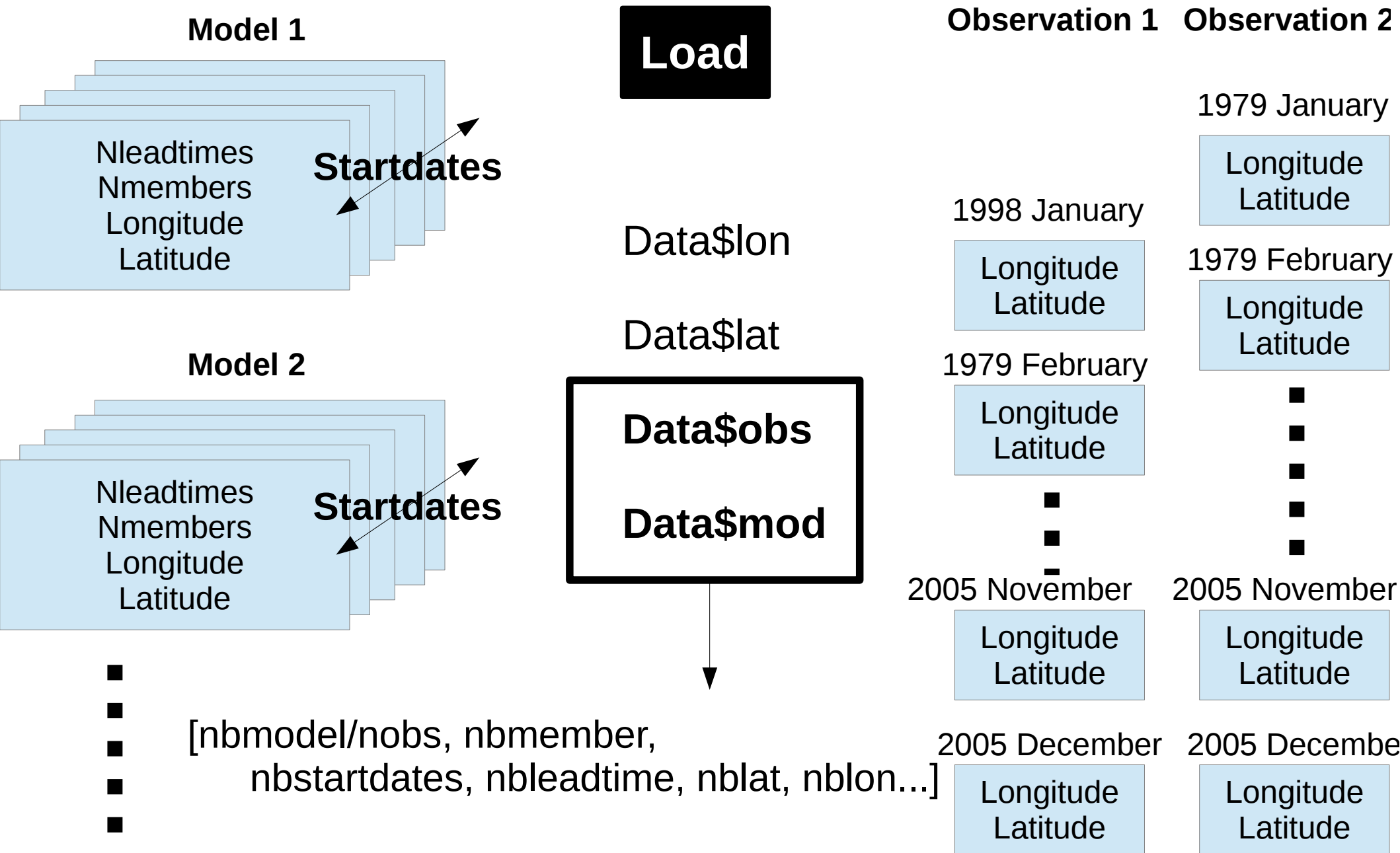Monthly extreme variables

90th percentile

10th percentile

Model 1

Nleadtimes
Nmembers
Longitude
Latitude

Startdates

Model 2

Nleadtimes
Nmembers
Longitude
Latitude

Startdates

■
■
■
■
■

[nbmodel/nobs, nbmember,
nbstartdates, nbleadtime, nblat, nblon...]

Load

Data$lon

Data$lat

Data$obs

Data$mod

Observation 1

1998 January

Longitude
Latitude

1979 February

Longitude
Latitude

■
■
■

2005 November

Longitude
Latitude

2005 December

Longitude
Latitude

Observation 2

1979 January

Longitude
Latitude

1979 February

Longitude
Latitude

■
■
■
■
■

2005 November

Longitude
Latitude

2005 December

Longitude
Latitude

IC3

Corr

ACC

**RMS
RatioRMS**

RatioSDRMS

RMSSS

Spread

Load

Data$lon

Data$lat

Data$obs

Data$mod

[nbmodel/nobs, nbmember,
nbstartdates, nbleadtime, nblat, nblon...]

Trend

Smoothing

Regression

Filter

Clim

Ano
Ano_crossvalid

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9 members each, with different initial conditions.

Seasonal forecasts between 1979 until 2005

1 start dates: May

June July August (1month leadtime)

[nbmodel, nbmember,
   nbstartdates, nbleadtime, nblat, nblon...]

dim(Datatas$mod):
   [5, 9, 27, 3, 73, 144]

dim(Datatasmax$mod):
   [5, 9, 27, 3, 73, 144]

ERA-interim reanalysis data

Period 1979-Now.

[nbobs, nbmember,
   nbstartdates, nbleadtime, nblat, nblon...]

dim(Datatas$obs):
   [1, 1, 27, 3, 73, 144]

dim(Datatasmax$obs):
   [5, 9, 27, 3, 73, 144]

Start!

Before opening R (directly in the terminal):
R_LIBS="/afs/ictp.it/public/c/cprodhom/R/x86_64-pc-linux-gnu-library/3.0"
export R_LIBS

Or in Rstudio:
.libPaths("/afs/ictp.it/public/c/cprodhom/R/x86_64-pc-linux-gnu-library/3.0")

Open R:

>Library(s2verification)

Open the R archive:
>load("/afs/ictp.it/public/c/cprodhom/tas-tasmax.RData")
    !not the same than Load of s2dverification

IC3

Correlation

Load

dim(Datatas$mod):
[5, 9, 27, 3, 144, 73]

dim(Datatas$obs):
[1, 1, 27, 3, 144, 73]

Ensemble Mean

Mean1Dim
MeanListDim

Ensmeanmod=Mean1Dim(Datatas$mod,2)

Ensmeanobs=Mean1Dim(Datatas$obs,2)

dim(Ensmeanmod) → [5, 27, 3, 73, 144]
dim(Ensmeanobs) → [1, 27, 3, 73, 144]

corrskill

Corr

cor=Corr(Ensmeanmod, Ensmeanobs,
posloop=1, poscor=2)

dim(Ensmeancor) → [5, 1, 3, 4, 73, 144]

Plot: corrskill for cmcc, August

corrskill

Corr

cor=Corr(Ensmeanmod, Ensmeanobs,
posloop=1, poscor=2)

dim(Ensmeancor)   → [5, 1, 3, 4, 73, 144]

colorbar

min=-1
max=1
int=(max-min)/20
interval=seq(min,max,int)
color=c("blue4","blue3","blue","dodgerblue3","dodgerblue2",
    "dodgerblue1","steelblue1","cadetblue2","cadetblue1",
    "white","white","gold","goldenrod","chocolate","orangered","firebrick1",
    "firebrick3","firebrick","firebrick4","red4")

Plot

PlotEquiMap

PlotEquiMap(cor[1,1,3,2,,], Datatas$lon, Datatas$lat,
        toptitle = "cmcc July start May" , sizetit = 0.6, units = "",
        brks = interval, cols = color, axelab = F, labW = F, intylat = 20, intxlon = 20,
        square=TRUE, filled.continents=FALSE)