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*Supplement of*

## **CPLFD-GDPT5: High-resolution gridded daily precipitation and temperature data set for two largest Polish river basins**

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#The code below require
#(1) Basic knowledge of GIS and R.
#(2) The daily .tif files for precipitation in March 1993 and the TmaxForYears.nc
# file were downloaded into a local drive.
#(3) An aoi.shp file with defined projection (e.g. WGS84) is created by a user.
# This file should be a polygon and should lay in the spatial
# extent of the CPLFD-GDPT5 (roughly - in Poland) and should present
# an area from which a user want to extract data.
#(2) The directory structure:
# -r (working directory for R, the aoi.shp should be placed here)
#   |-nc (directory with the TmaxForYears.nc file)
#   |-tif (directory with the daily .tif files for precipitation in March 1993)
#(3) the raster and rgdal packages are installed,
#     if not, use install.packages("raster") and install.packages("rgdal")
#
#Tested with R 3.2.2 on Windows on 3/11/2015
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```

```

> library(raster)
> library(rgdal)
> tifs <- dir("tif") #list the tif files
> tifs
[1] "pre19930301.tif" "pre19930302.tif" "pre19930303.tif" "pre19930304.tif"
[5] "pre19930305.tif" "pre19930306.tif" "pre19930307.tif" "pre19930308.tif"
[9] "pre19930309.tif" "pre19930310.tif" "pre19930311.tif" "pre19930312.tif"
...
> precipitation = stack(file.path("tif",tifs)) #load the tifs as a raster stack
> spplot(precipitation) #plot the dataset
> readOGR("aoi.shp","aoi")->aoi #an AOI used to extract the data
OGR data source with driver: ESRI Shapefile
Source: "aoi.shp", layer: "aoi"
with 1 features
It has 1 fields
> proj4string(aoi) #check if projection match...
[1] "+proj=longlat +datum=WGS84 +no_defs +ellps=WGS84 +towgs84=0,0,0"
> proj4string(precipitation)
[1] "+proj=tmerc +lat_0=0 +lon_0=19 +k=0.9993 +x_0=500000 +y_0=-5300000 +ellps=GRS80
...
> aoi.proj <- spTransform(aoi,proj4string(precipitation)) #transform to match the
projections
> aoi.lay <- list("sp.polygons", as(aoi.proj,"SpatialLines"), col = "red")
> spplot(precipitation,sp.layout=list(aoi.lay))
> extract(precipitation,aoi.proj,fun=mean) #extract the mean precipitation in the
AOI
pre19930301 pre19930302 pre19930303 pre19930304 pre19930305 pre19930306
[1,] 0 0 0 0.06510539 0.1309134 1.777518
pre19930307 pre19930308 pre19930309 pre19930310 pre19930311 pre19930312
[1,] 0.1620609 0 0 0.008899298 0 0
pre19930313 pre19930314 pre19930315 pre19930316 pre19930317 pre19930318
[1,] 0 0 0.2899297 3.258782 2.449649 1.812178
pre19930319 pre19930320 pre19930321 pre19930322 pre19930323 pre19930324
[1,] 0.3864169 0 0 0.8313817 4.629508 0
pre19930325 pre19930326 pre19930327 pre19930328 pre19930329 pre19930330
[1,] 0.9009368 0.2791569 0.1180328 11.13326 2.703279 4.529977
pre19930331
[1,] 0.2512881
> stack("nc/TmaxForYears.nc")->temperatures #load the .nc file as a raster stack
> temperatures

```

```

class      : RasterStack
dimensions : 132, 166, 21912, 63  (nrow, ncol, ncell, nlayers)
resolution : 5000, 5000  (x, y)
extent     : 120881.3, 950881.3, 120483.6, 780483.6  (xmin, xmax, ymin, ymax)
coord. ref.: +proj=tmerc +lon_0=19 +lat_0=0 +k_0=0.9993 +x_0=5e+05 +y_0=-5300000
+ellps=WGS84
names      : X1951.01.01, X1952.01.01, X1953.01.01, X1954.01.01, ...
> spplot(temperatures)
> aoi.temperature <- extract(temperatures,aoi.proj,fun=mean) #extract the mean
temperature
> t.axis <- colnames(aoi.temperature) #extract the dates in order to change them
later into a valid axis
> t.axis
[1] "X1951.01.01" "X1952.01.01" "X1953.01.01" "X1954.01.01" "X1955.01.01"
...
> t.axis <- gsub("X","",t.axis)
> t.axis
[1] "1951.01.01" "1952.01.01" "1953.01.01" "1954.01.01" "1955.01.01"
...
> t.axis <- as.POSIXct(t.axis,format="%Y.%m.%d",origin="1970-01-01")
> t.axis
[1] "1951-01-01 CET" "1952-01-01 CET" "1953-01-01 CET" "1954-01-01 CET"
...
> aoi.temperature <- data.frame(time=t.axis,temperature=as.vector(aoi.temperature))
> aoi.temperature
      time temperature
1 1951-01-01    13.34028
2 1952-01-01    11.41429
3 1953-01-01    13.13349
...
> plot(aoi.temperature)

```