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## Trabalho final

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R

Documentation

`cut_raster()`

Extraction of specific area from the RasterLayer (Bioclimatic variables)

Description

`cut_raster` extract a specific area of the RasterLayer (Bioclimatic variables)

downloaded from Worldclim. See Note (Packages needed to manipulate geographic data).

Usage

```
lapply(X, cut_raster)
```

The function `cut_raster` is applied to objects RasterLayer (X), thereby requiring the

function `lapply` to be executed (see Note).

```
cut_raster = function(x)
```

```
{  
  function instructions  
  return (results)  
}
```

Arguments

x any R object.

## Details

The purpose of this function is to extract a specific area of the RasterLayer (Bioclimatic variables) downloaded from Worldclim (Hijmans et al. 2005). The RasterLayer obtained from Worldclim (bioclimatic variables) are for particular areas (Hijmans et al. 2005), which must be adjusted according to the area of interest that will be used in ecological niche modeling (Warren and Stephanie 2011). One way to do this procedure is to extract the area of interest one by one in the 19-bioclimatic variables. In addition is necessary also to modify the resolution of each RasterLayer obtained in the cut. Finally it is also necessary export each new RasterLayer to a specific format, because all environmental layers must be in ASCII format to run MaxEnt (Young 2011). The function cut\_raster performed these three procedures simultaneously on RasterLayer (Bioclimatic variables), according to the supplied specifications (size of area, resolution and format).

## Value

RasterLayer

## Note

Packages needed to manipulate geographic data

1. raster: Reading, writing, manipulating, analyzing and modeling of gridded spatial data
2. maptools: Set of tools for manipulating and reading geographic data
3. rgeos: Used to tackle problems with several variables defined in a space of any dimensions
4. rgdal: It is a translator library for raster and vector geospatial data formats that is released under an X/MIT style Open Source license by the Open Source Geospatial Foundation

## lapply

The function lapply (X, FUN) returns a list of the same length as X (RasterLayer), each element of which is the result of applying the function (cut\_raster) to the corresponding element of X (RasterLayer).

## Examples

Input files in directory

```

1. RasterLayer of bioclimatic variables of South America (see file:
Annual Mean
    Temperature in South America.asc).
2. Shapefile of area to be extracted in each RasterLayer of South
America
    (see file: shape_brazil).
Load the input files
list_RasterLayer=list.files("/name directory", pattern=".asc")
## List elements with asc. format (RasterLayer) found in the directory
shape=readShapePoly(file.choose())
##Interactively window for choose data from a polygon shapefile
(Shapefile)
plot(shape)
##Verify that the shapefile was loaded
cut_raster =function(x) {
  rasters=raster(x)
  cut=mask(rasters,shape)
  raster_final=aggregate(cut, fact=10)
  writeRaster(raster_final,
filename=paste(rasters@data@names,"BRAZIL",".asc", sep=""),
  format="ascii")
}
lapply(list_RasterLayer, cut_raster)
### The function lapply applies the function cut_raster on each
RasterLayer present
in the list_RasterLayer. It takes some minutes per each RasterLayer
References
Warren, D.L. S. N. Seifert. 2011. Ecological niche modeling in Maxent:
the importance
of model complexity and the performance of model selection criteria.
Ecological
Applications 21(2): 335-342
Hijmans, R.J., S.E. Cameron, J.L. Parra, P.G. Jones and A. Jarvis,
2005. Very high
resolution interpolated climate surfaces for global land areas.
International Journal
of Climatology 25: 1965-1978.
Young, N. 2011. A MaxEnt Model v3.3.3e Tutorial (ArcGIS v10).
[[http://ibis.colostate.edu/WebContent/WS/ColoradoView/TutorialsDownloads/A_
Maxent_Model_v7.pdf|Tutorial]].

```

## Código da Função

```

R Function: Function to extract a specific area of the RasterLayer
(Bioclimatic variables)
downloaded from Worldclim
Author: Jhon Jairo Ospina-Sarria
Packages required:
  install.packages("raster")
  install.packages("maptools")

```

```
install.packages("rgeos")
install.packages("rgdal")
Function
cut_raster =function(x)
### Argument is any R object
{
  rasters=raster(x)
  ### Create a RasterLayer which is applied to the R object (x)
  cut=mask(rasters, raster/shape)
  ### Create a file mask (cut) that has the same values as the raster,
except for
  the cells that are NA (or other maskvalue) in a 'mask'. The mask can be
either
  another RasterLayer of the same extent and resolution, or a Spatial object
in
  which case all cells that are not covered by the Spatial object are set to
updatevalue.
  raster_final=aggregate(cut, fact=X)
  ### Adjusting resolution of the RasterLayer created with the function mask
(cut).
  The function aggregate carry out the aggregation of rectangular areas
(cells) causing
  lower resolution (larger cells) in the new RasterLayer created
(raster_final). The
  function (fact=) expressed as number of cells in each direction
(horizontally and
  vertically), therefore this function to adjust the resolution of the
raster
  (example: fact=10 result in 10*10=100 times fewer cells in the RasterLayer
object).
  writeRaster(raster_final, filename=paste(rasters@data@names,"NAME",".asc",
sep=""),
  format="ascii")
  ### Write an entire RasterLayer object based on the file created in the
previous command line
  (raster_final). The function paste() indicates that each RasterLayer must
have the same name
  plus the inclusion of the word "NAME". With this function also indicates
that the output files
  (RasterLayer) must have the asc. format.
}
  The function cut_raster is applied to objects RasterLayer (X), thereby
requiring the function
  lapply to be executed (see Help)
```

## Arquivo da Função

[help.txt](#)

[code.txt](#)

[annual\\_mean\\_temperature\\_in\\_south\\_america.zip](#)

[shape\\_brazil.zip](#)

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