Package 'MinBAR'

October 12, 2022

Type Package

Title Determining the Minimal Background Area for Species Distribution Models

Version 1.1.3

Description A versatile tool that aims at (1) defining the minimum background extent necessary to fit Species Distribution Models reliable enough to extract ecologically relevant conclusions from them and (2) optimizing the modelling process in terms of computation demands. See Rotllan-Puig, X. & Traveset, A. (2021) <https://www.sciencedirect.com/science/article/pii/S0304380020304191>.

Depends R (>= 3.5.0)

Imports raster, rgdal, sp, maxnet, dismo (>= 1.1-4), ecospat (>= 2.2.0), geosphere (>= 1.5-5), lattice, latticeExtra

Suggests knitr, rmarkdown

VignetteBuilder knitr

License GPL-3

Encoding UTF-8

LazyData true

RoxygenNote 7.1.1

URL https://github.com/xavi-rp/MinBAR

BugReports https://github.com/xavi-rp/MinBAR/issues

NeedsCompilation no

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Repository CRAN

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`bioscrop` *Climate variables*

Description

A raster brick containing 3 climate variables (resolution: 5 minutes) to be used as predictors for modelling species distributions #' Coord. ref. : +init=EPSG:4326 +proj=longlat +datum=WGS84 +no_defs +ellps=WGS84 +towgs84=0,0,0.

Usage

```
bioscrop
```

Format

A raster brick with 3 variables:

bio1 Annual Mean Temperature

bio7 Temperature Annual Range

bio12 Annual Precipitation

Source

https://worldclim.org

References

Fick, S.E. and R.J. Hijmans, 2017. Worldclim 2: New 1-km spatial resolution climate surfaces for global land areas. International Journal of Climatology.

Examples

```
bioscrop <- raster::brick(paste0(system.file(package='MinBAR'), "/extdata/bioscrop.tif"))
names(bioscrop) <- c("bio1", "bio7", "bio12")
bioscrop
```

`minba()` *Determining the Minimal Background Area for Species Distribution Models*

Description

A versatile tool that aims at aims at (1) defining the minimum background extent necessary to fit SDMs reliable enough to extract ecologically relevant conclusions from them and (2) optimizing the modelling process in terms of computation demands. See Rotllan-Puig, X. & Traveset, A. (2021)

Usage

```
minba(
  occ = NULL,
  varbles = NULL,
  wd = NULL,
  prj = NULL,
  num_bands = 10,
  n_rep = 15,
  occ_prop_test = 0.3,
  maxent_tool = "maxnet",
  BI_part = NULL,
  BI_tot = NULL,
  SD_BI_part = NULL,
  SD_BI_tot = NULL
)
```

Arguments

`occ`	Data frame or character. Data set with presences (occurrences). A data frame with 3 columns: long, lat and species name (in this order)
`varbles`	Raster* object. A raster brick of the independent variables, or a directory where the rasters are. It will use all the rasters in the folder. Supported: .tif and .bil
`wd`	Character. A directory to save the results
`prj`	Numeric. Coordinates system (e.g. "4326" is WGS84; check https://spatialreference.org/)
`num_bands`	Numeric. Number of buffers (default is 10)
`n_rep`	Numeric. Number of replicates (default is 15)
`occ_prop_test`	Numeric. Proportion of presences (occurrences) set aside for testing (default is 0.3)
`maxent_tool`	Character. Either "dismo" or (default) "maxnet"
`BI_part`	Numeric. Maximum Boyce Index Partial to stop the process if reached
`BI_tot`	Numeric. Maximum Boyce Index Total to stop the process if reached

SD_BI_part	Numeric. Minimum SD of the Boyce Index Partial to stop the process if reached (last 3 buffers)
SD_BI_tot	Numeric. Minimum SD of the Boyce Index Total to stop the process if reached (last 3 buffers)

Details

Please check the article 'Determining the Minimal Background Area for Species Distribution Models: MinBAR Package' for further details on how to use this package, examples, etc.

Value

selfinfo_mod_, info_mod_ and info_mod_means_ (all followed by the name of the species). The first two tables are merely informative about how the modelling process has been developed and the results of each model. Whereas info_mod_means_ shows the means of the n models run for each buffer

Author(s)

Xavier Rotllan-Puig & Anna Traveset

References

Rotllan-Puig, X. & Traveset, A. 2021. Determining the Minimal Background Area for Species Distribution Models: MinBAR Package. Ecological Modelling. 439:109353. https://doi.org/10.1016/j.ecolmodel.2020.109353

Examples

```
## Not run:
minba(occ = sprecords, varbles = bioscrop,
      wd = tempdir(), prj = 4326, num_bands = 3, n_rep = 3,
      maxent_tool = "maxnet")

## End(Not run)
```

---

sprecords *Presences (occurrences) of Linaria alpina*

Description

A dataset containing the presences (1064) of Linaria alpina in Europe and North Africa. Coord. ref. : +init=EPSG:4326 +proj=longlat +datum=WGS84 +no_defs +ellps=WGS84 +towgs84=0,0,0.

Usage

```
sprecords
```

Format

A data frame with 1064 rows and 3 variables.

decimalLongitude DecimalLongitude, in degrees

decimalLatitude DecimalLatitude, in degrees

species Name of the species

Source

https://www.gbif.org/

References

GBIF.org (07 March 2018) GBIF Occurrence Download https://doi.org/10.15468/dl.phqgk3.

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