

Package ‘MinBAR’

November 4, 2020

Type Package

Title Determining the Minimal Background Area for Species Distribution Models

Version 1.1.2

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 6.1.1

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	<i>Climate variables</i>
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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()	<i>Determining the Minimal Background Area for Species Distribution Models</i>
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Description

A versatile tool that 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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