

# Package ‘spThin’

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**Type** Package

**Title** Functions for Spatial Thinning of Species Occurrence Records for Use in Ecological Models

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**Description** spThin is a set of functions that can be used to spatially thin species occurrence data. The resulting thinned data can be used in ecological modeling, such as ecological niche modeling.

**Depends** spam, grid, fields, knitr

**LazyData** TRUE

**License** GPL-3

**VignetteBuilder** knitr

**NeedsCompilation** no

**Repository** CRAN

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Heteromys\_anomalus\_South\_America

*Occurrence record locations for Heteromys anomalus*

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### Description

A dataset containing compiled occurrence record locations for *Heteromys anomalus* in northern coastal South America. These records have been examined to check for accurate species identification.

### Format

A data frame with 201 rows and 4 variables

### Details

- SPEC. species name assigned to occurrence record
- LAT. decimal degree latitude value
- LONG. decimal degree longitude value
- REGION. region, or island, of occurrence

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plotThin

*Plot diagnosis for results of thin function*

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### Description

Three plots (selected by which) are currently available: a plot of the number of repetitions versus the number of maximum records retained at each repetition ([1] observed values; [2] log transformed) and a histogram of the maximum records retained [3].

### Usage

```
plotThin(thinned, which = c(1:3), ask = prod(par("mfcol")) < length(which)
  && dev.interactive(), ...)
```

### Arguments

|         |  |
|---------|--|
| thinned | A list of data.frames returned by <a href="#">thin</a> function.                   |
| which   | if a subset of the plots is required, specify a subset of the numbers 1:3.         |
| ask     | logical; if TRUE, the user is asked before each plot, see <code>par(ask=)</code> . |
| ...     | other parameters to be passed through to plotting functions.                       |

### See Also

[thin.algorithm](#)  
[thin](#)

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|-------------|--|
| summaryThin | <i>Summary method for results of thin function</i> |
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**Description**

Summarize the results of thin function.

**Usage**

```
summaryThin(thinned, show = TRUE)
```

**Arguments**

|         |  |
|---------|--|
| thinned | A list of data.frames returned by <a href="#">thin</a> function. |
| show    | logical; if TRUE, the summary values are printed at the console. |

**Value**

Returns a list with the (1) maximum number of records, (2) number of data frames with maximum number of records and (3) a table with the number of data frames per number of records.

**See Also**

[thin.algorithm](#)  
[thin](#)

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|------|---|
| thin | <i>Spatially thin species occurrence data</i> |
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**Description**

thin returns spatially thinned species occurrence data sets. A randomization algorithm ([thin.algorithm](#)) is used to create data set in which all occurrence locations are at least thin.par distance apart. Spatial thinning helps to reduce the effect of uneven, or biased, species occurrence collections on spatial model outcomes.

**Usage**

```
thin(loc.data, lat.col = "LAT", long.col = "LONG", spec.col = "SPEC",
     thin.par, reps, locs.thinned.list.return = FALSE, write.files = TRUE,
     max.files = 5, out.dir, out.base = "thinned_data",
     write.log.file = TRUE, log.file = "spatial_thin_log.txt",
     verbose = TRUE)
```

**Arguments**

|                          |   |
|--------------------------|---|
| loc.data                 | A data.frame of occurrence locations. It can include several columns, but must include at minimum a column of latitude and a column of longitude values                   |
| lat.col                  | Name of column of latitude values. Caps sensitive.  |
| long.col                 | Name of column of longitude values. Caps sensitive.   |
| spec.col                 | Name of column of species name. Caps sensitive.   |
| thin.par                 | Thinning parameter - the distance (in kilometers) that you want records to be separated by.   |
| reps                     | The number of times to repeat the thinning process. Given the random process of removing nearest-neighbors there should be 'rep' number of different sets of coordinates. |
| locs.thinned.list.return | TRUE/FALSE - If true, the 'list' of the data.frame of thinned locs resulting from each replication is returned (see Returns below).                                       |
| write.files              | TRUE/FALSE - If true, new *.csv files will be written with the thinned locs data  |
| max.files                | The maximum number of *.csv files to be written based on the thinned data   |
| out.dir                  | Directory to write new *.csv files to   |
| out.base                 | A file basename to give to the thinned datasets created   |
| write.log.file           | TRUE/FALSE create/append log file of thinning run   |
| log.file                 | Text log file   |
| verbose                  | TRUE/FALSE - If true, running details of the function are print at the console.   |

**Value**

locs.thinned.dfs A list of data.frames, each data.frame the spatially thinned locations of the algorithm for a single replication. This list will have 'reps' elements.

**See Also**

[thin.algorithm](#)

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|                |   |
|----------------|---|
| thin.algorithm | <i>Implements random spatial thinning algorithm</i> |
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**Description**

thin.algorithm implements a randomization approach to spatially thinning species occurrence data. This function is the algorithm underlying the [thin](#) function.

**Usage**

```
thin.algorithm(rec.df.orig, thin.par, reps)
```

**Arguments**

|                          |   |
|--------------------------|---|
| <code>rec.df.orig</code> | A data frame of long/lat points for each presence record. The data.frame should be a two-column data frame, one column of long and one of lat                             |
| <code>thin.par</code>    | Thinning parameter - the distance (in kilometers) that you want records to be separated by.   |
| <code>reps</code>        | The number of times to repete the thinning process. Given the random process of removing nearest-neighbors there should be 'rep' number of different sets of coordinates. |

**Value**

`reduced.rec.dfs`: A list object of length 'rep'. Each list element is a different data.frame of spatially thinned presence records.

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