Package 'pRecipe'

May 9, 2026

Title Precipitation R Recipes

Version 3.0.3

Description An open-access tool/framework to download, validate, visualize, and analyze multi-source precipitation data. More information and an example of implementation can be found in Vargas Godoy and Markonis (2023, <doi:10.1016/j.envsoft.2023.105711>).

Depends R (>= 4.0.0)

Imports grDevices, methods, stats, utils, data.table, ggplot2, ggpubr, magrittr, openair, raster, scales, twc

License GPL-3

Encoding UTF-8

URL https://github.com/MiRoVaGo/pRecipe

BugReports https://github.com/MiRoVaGo/pRecipe/issues

SystemRequirements PROJ (>= 6, https://proj.org/download.html), GDAL (>= 3, https://gdal.org/en/latest/download.html), NetCDF(>= 4, https://www.unidata.ucar.edu/software/netcdf/).

RoxygenNote 7.3.2

Suggests cowplot, foreach, kableExtra, knitr, rmarkdown, spelling, testthat (>= 3.0.0), tibble

Config/testthat/edition 3

Language en-US

VignetteBuilder knitr

NeedsCompilation no

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Repository CRAN

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Contents

`csi` *Probability of Detection*

Description

Function for calculating the critical success index.

Usage

```
csi(x, ref, th)
```

Arguments

`x`	a data.table generated by `fldmean`
`ref`	a data.table with data used for evaluation
`th`	numeric. The value for detection threshold

Value

numeric

`download_data` *Download various precipitation data products*

Description

The function `download_data` downloads the selected data product.

Usage

```
download_data(
  dataset = "all",
  path = ".",
  domain = "raw",
  timestep = "monthly"
)
```

Arguments

`dataset` a character string with the name(s) of the desired data set. Suitable options are:

- "all" for all of the below listed data sets (default),
- "20cr" for 20CR v3,
- "chirps" for CHIRPS v2.0,
- "cmap" for CMAP standard version,
- "cmorph" for CMORPH,
- "cpc" for CPC-Global,
- "cru-ts" for CRU_TS v4.06,
- "em-earth" for EM-EARTH,
- "era20c" for ERA-20C,
- "era5" for ERA5,
- "fldas" for FLDAS,
- "ghcn" for GHCN-M v2,
- "gldas-clsm" for GLDAS CLSM,
- "gldas-noah" for GLDAS NOAH,
- "gldas-vic" for GLDAS VIC,
- "gpcc" for GPCC v2020,
- "gpcp" for GPCP v2.3,
- "gpm_imerg" for GPM IMERGM Final v06,
- "jra55" for JRA-55,
- "merra2" for MERRA-2,
- "mswep" for MSWEP v2.8,
- "ncep-doe" for NCEP/DOE,
- "ncep-ncar" for NCEP/NCAR,
- "persiann" for PERSIANN-CDR,

- "precl" for PREC/L,
- "terraclimate" for TerraClimate,
- "trmm-3b43" for TRMM 3B43 v7,
- "udel" for UDEL v501.

`path` a character string with the path where the database will be downloaded.

`domain` a character string with the desired domain data set. Suitable options are:

- "raw" for default available spatial coverage,
- "global" for data sets with global (land and ocean) coverage,
- "land" for data sets with land only coverage,
- "ocean", for data sets with ocean only coverage.

`timestep` a character string with the desired time resolution. Suitable options are:

- "monthly",
- "yearly".

Value

No return value, called to download the required data sets.

Examples

```
download_data("gldas-vic", tempdir(), timestep = "yearly")
```

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far *False Alarm Rate*

Description

Function for calculating the false alarm rate.

Usage

```
far(x, ref, th)
```

Arguments

`x` a data.table generated by `fldmean`

`ref` a data.table with data used for evaluation

`th` numeric. The value for detection threshold

Value

numeric

nse *Nash–Sutcliffe Efficiency*

Description

Function for calculating the Nash–Sutcliffe efficiency.

Usage

```
nse(x, ref)
```

Arguments

x	a data.table generated by fldmean
ref	a data.table with data used for evaluation

Value

numeric

plot_box *Boxplot ggplot*

Description

Convenient and aesthetic visualization of data in a boxplot.

Usage

```
plot_box(x, var = "Precipitation", unit = "mm")

## S4 method for signature 'Raster'
plot_box(x, var = "Precipitation", unit = "mm")

## S4 method for signature 'data.table'
plot_box(x, var = "Precipitation", unit = "mm")

## S4 method for signature 'character'
plot_box(x, var = "Precipitation", unit = "mm")
```

Arguments

x	Raster* object; data.table (see details); filename (character, see details)
var	character (see details)
unit	character (see details)

Details

If ‘x‘ is a data.table, its columns should be named: "lon", "lat", "date", and "value"

If ‘x‘ is a filename, it should point to a *.nc file.

‘var‘ is a character string describing the variable to be used for the plot title

‘unit‘ is a character string describing the unit of measurement to be used for the plot title

Value

ggplot object

Examples

```
## Not run:
download_data("gldas-vic", tempdir(), timestep = "yearly")
r <- raster::brick(paste0(tempdir(),
"/gldas-vic_tp_mm_land_194801_201412_025_yearly.nc"))
s <- plot_box(r)

## End(Not run)
```

`plot_density` *Histogram ggplot*

Description

Convenient and aesthetic visualization of data in a histogram.

Usage

```
plot_density(x, var = "Precipitation", unit = "mm")

## S4 method for signature 'Raster'
plot_density(x, var = "Precipitation", unit = "mm")

## S4 method for signature 'data.table'
plot_density(x, var = "Precipitation", unit = "mm")

## S4 method for signature 'character'
plot_density(x, var = "Precipitation", unit = "mm")
```

Arguments

`x`	Raster* object; data.table (see details); filename (character, see details)
`var`	character (see details)
`unit`	character (see details)

Details

If ‘x‘ is a data.table, its columns should be named: "lon", "lat", "date", and "value"

If ‘x‘ is a filename, it should point to a *.nc file.

‘var‘ is a character string describing the variable to be used for the axis title

‘unit‘ is a character string describing the unit of measurement to be used for the axis title

Value

ggplot object

Examples

```
## Not run:
download_data("gldas-vic", tempdir(), timestep = "yearly")
r <- raster::brick(paste0(tempdir(),
"/gldas-vic_tp_mm_land_194801_201412_025_yearly.nc"))
s <- plot_density(r)

## End(Not run)
```

---

plot_heatmap *Heatmap ggplot*

Description

Convenient and aesthetic visualization of data in a heatmap.

Usage

```
plot_heatmap(x, unit = "mm")

## S4 method for signature 'Raster'
plot_heatmap(x, unit = "mm")

## S4 method for signature 'data.table'
plot_heatmap(x, unit = "mm")

## S4 method for signature 'character'
plot_heatmap(x, unit = "mm")
```

Arguments

x	Raster* object; data.table (see details); filename (character, see details)
unit	character (see details)

Details

If ‘x‘ is a data.table, its columns should be named: "lon", "lat", "date", and "value"

If ‘x‘ is a filename, it should point to a *.nc file.

‘unit‘ is a character string describing the unit of measurement to be used for the axis title

Value

ggplot object

Examples

```
## Not run:
download_data("gldas-vic", tempdir(), timestep = "yearly")
r <- raster::brick(paste0(tempdir(),
"/gldas-vic_tp_mm_land_194801_201412_025_yearly.nc"))
s <- plot_heatmap(r)

## End(Not run)
```

---

plot_line *Line ggplot*

Description

Convenient and aesthetic visualization of data in a line plot.

Usage

```
plot_line(x, var = "Precipitation", unit = "mm")

## S4 method for signature 'Raster'
plot_line(x, var = "Precipitation", unit = "mm")

## S4 method for signature 'data.table'
plot_line(x, var = "Precipitation", unit = "mm")

## S4 method for signature 'character'
plot_line(x, var = "Precipitation", unit = "mm")
```

Arguments

x	Raster* object; data.table (see details); filename (character, see details)
var	character (see details)
unit	character (see details)

Details

If ‘x‘ is a data.table, its columns should be named: "lon", "lat", "date", and "value"

If ‘x‘ is a filename, it should point to a *.nc file.

‘var‘ is a character string describing the variable to be used for the axis title

‘unit‘ is a character string describing the unit of measurement to be used for the axis title

Value

ggplot object

Examples

```
## Not run:
download_data("gldas-vic", tempdir(), timestep = "yearly")
r <- raster::brick(paste0(tempdir(),
"/gldas-vic_tp_mm_land_194801_201412_025_yearly.nc"))
s <- plot_line(r)

## End(Not run)
```

`plot_map` *Map ggplot*

Description

Convenient and aesthetic visualization of data in a map

Usage

```
plot_map(x, layer = 1, unit = "mm", timestamp = TRUE)

## S4 method for signature 'Raster'
plot_map(x, layer = 1, unit = "mm", timestamp = TRUE)

## S4 method for signature 'data.table'
plot_map(x, layer = 0, unit = "mm", timestamp = TRUE)

## S4 method for signature 'character'
plot_map(x, layer = 1, unit = "mm", timestamp = TRUE)
```

Arguments

`x`	Raster* object; data.table (see details); filename (character, see details)
`layer`	numeric
`unit`	character
`timestamp`	logical

Details

If ‘x‘ is a data.table, its columns should be named: "lon", "lat", "date", and "value"

If ‘x‘ is a filename, it should point to a *.nc file.

‘unit‘ is a character string describing the unit of measurement to be used for the legend title

‘layer‘ is the layer number to be plotted.

‘timestamp‘ if TRUE (default) the plot title is the layer’s date

Value

ggplot object

`plot_summary` *Summary ggplot*

Description

Convenient and aesthetic visualization of data in a summary plot.

Usage

```
plot_summary(x, var = "Precipitation", unit = "mm")

## S4 method for signature 'Raster'
plot_summary(x, var = "Precipitation", unit = "mm")

## S4 method for signature 'data.table'
plot_summary(x, var = "Precipitation", unit = "mm")

## S4 method for signature 'character'
plot_summary(x, var = "Precipitation", unit = "mm")
```

Arguments

`x`	Raster* object; data.table (see details); filename (character, see details)
`var`	character (see details)
`unit`	character (see details)

Details

If ‘x‘ is a data.table, its columns should be named: "lon", "lat", "date", and "value"

If ‘x‘ is a filename, it should point to a *.nc file.

‘var‘ is a character string describing the variable to be used for the axis title

‘unit‘ is a character string describing the unit of measurement to be used for the axis title

Value

ggplot object

Examples

```
## Not run:
download_data("gldas-vic", tempdir(), timestep = "yearly")
r <- raster::brick(paste0(tempdir(),
"/gldas-vic_tp_mm_land_194801_201412_025_yearly.nc"))
s <- plot_summary(r)

## End(Not run)
```

`plot_taylor` *Taylor diagram*

Description

Convenient and aesthetic visualization of data in a Taylor diagram.

Usage

```
plot_taylor(x, y, groups = "default", ...)
```

Arguments

`x`	data.table
`y`	data.table
`groups`	character
`...`	see details

Details

'x' columns should be named: "lon", "lat", "date", "value", "dataset", and "source".

'y' columns should be named: "lon", "lat", "date", "value", "dataset", and "source".

'groups' character to define panels. Suitable options are:

- "default" (only one panel)
- "source"
- "seasons" (only works properly with monthly data)

'...' extra arguments passed on to `openair::TaylorDiagram`

Value

plot object

pod *Probability Of Detection*

Description

Function for calculating the probability of detection.

Usage

```
pod(x, ref, th)
```

Arguments

x	a data.table generated by fldmean
ref	a data.table with data used for evaluation
th	numeric. The value for detection threshold

Value

numeric

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