Package 'adw'

October 12, 2022

Title Angular Distance Weighting Interpolation

Version 0.2.1

Description
The irregularly-spaced data are interpolated onto regular latitude-longitude grids by weighting each station according to its distance and angle from the center of a search radius.

License GPL-3

Encoding UTF-8

URL https://github.com/PanfengZhang/adw

BugReports https://github.com/PanfengZhang/adw/issues

Imports terra, geosphere, methods

RoxygenNote 7.2.1

NeedsCompilation no

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R topics documented:

adw 2

Index **4**

adw *Angular Distance Weighting Interpolation.*

Description

The irregularly-spaced data are interpolated onto regular latitude-longitude grids by weighting each station according to its distance and angle from the center of a search radius.

Usage

```
adw(
  ds,
  extent = NULL,
  gridsize = 1,
  cdd = 1e+06,
  m = 4,
  nmin = 3,
  nmax = 10,
  maskON = TRUE
)
```

Arguments

ds	a input dataframe which contains the column names of lon, lat, value.
extent	a extent numeric vector of length 4 in the order c(xmin, xmax, ymin, ymax); or a SpatVector polygons object, assume that the coordinate reference system is WGS1984 (EPSG: 4326); if extent is a NULL value (i.e. no extent is inputted), the extent vector will be calculated from the input data.
gridsize	the grid size (resolution). units: degree.
cdd	correlation decay distance, i.e. the maximum search radius. unit: meter. default value: 1e6.
m	is used to adjust the weighting function further, higher values of m increase the rate at which the weight decays with distance. default value 4.
nmin	the minimum number of observation points required to interpolate a grid within the search radius (i.e. cdd); if the number of stations within the search ridius (cdd) is less than nmin, a missing value will be generated to fill this grid. default value 3.
nmax	The number of nearest points within the search radius to use for interpolation. default value 10.
maskON	Logical value; whether to mask (remove) grids that are outside the SpatVector polygon (extent). default TRUE. Parameter 'maskON' only works when the class of parameter 'extent' is 'SpatVector'.

Value

a regular latitude-longitude dataframe grid (interpoled values).

References

Caesar, J., L. Alexander, and R. Vose, 2006: Large-scale changes in observed daily maximum and minimum temperatures: Creation and analysis of a new gridded data set. Journal of Geophysical Research, 111, https://doi.org/10.1029/2005JD006280.

Examples

```
set.seed(2)
dd <- data.frame(lon = runif(100, min = 110, max = 117),
                 lat = runif(100, min = 31, max = 37),
                 value = runif(100, min = -10, max = 10))
head(dd)

# example 1
grd <- adw(dd, extent = c(110, 117, 31, 37), gridsize = 0.5, cdd = 1e5)
head(grd)

# example 2
urlmap <- "https://geo.datav.aliyun.com/areas_v3/bound/410000.json"
hmap <- terra::vect(urlmap) # return a 'SpatVector' object.
grd <- adw(dd, extent = hmap, gridsize = 0.5, cdd = 1e5)
head(grd)
```

Index

adw, 2