Package 'NonlinearTemp'

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Title Calculate daily degree days and time in each degree

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Description NonlinearTemp calculates nonlinear temperature distributions using an integrated sine technique. Degree days define time above a specified temperature threshold (e.g. degree days above 30C) and time in each degree define time within a specified temperature threshold (e.g. time in 30C).

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RoxygenNote 6.0.1

URL https://github.com/johnwoodill/NonlinearTemp

BugReports https://github.com/johnwoodill/NonlinearTemp/issues

Depends R (>= 3.1)

R topics documented:

`degree_days` *Caclulate degree days*

Description

`degree_days` returns a data frame with calculated daily degree days within a specified thresholds.

Usage

```
degree_days(data, thresholds)
```

Arguments

data	data in wide format with minimum temperature labeled as tmin and maximum temperature labeled as tmax
thresholds	threshold of temperature intervals to calculate degree days

Details

To generate degree days the data must be in wide format with minimum temperature column labeled as tmin and maximum temperature labeled as tmax.

Degree days are calcuated from the following cases:

(1) Minimum temperature >= threshold

dday = (tmax - tmin/2) - threshold

(2) Minimum temperature < Threshold < Maximum Temperature

dday = (W integral_theta^pi/2 sin(t)dt - integral_theta^pi/2 (threshold - tmin)dt) / pi

W = (tmax - tmin)/2

theta = sin^-1 [(tmax - tmin)/W]

(3) Otherwise, degree days = 0

References

Snyder, Richard L. "Hand calculating degree days." Agricultural and forest meteorology 35, no. 1-4 (1985): 353-358.

Woodill, A. John "United States Temperature Exposure 1900-2013." (2016) http://johnwoodill.blogspot.com/2016/06/us-degree-days-heat-map-interesting.html

Examples

```
data(napa)
degree_days(napa, thresholds = c(0:35))
```

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degree_time *Calculate time in each degree*

Description

degree_time returns a data frame with calculated time in each degree at one degree intervals within a specified thresholds.

Usage

```
degree_time(data, thresholds)
```

Arguments

data	data in wide format with minimum temperature labeled as tmin and maximum temperature labeled as tmax
thresholds	threshold of temperature intervals to calculate time in each degree

Details

To generate time in each degree the data passed must be in wide format with minimum temperature column labeled as tmin and maximum temperature labeled as tmax.

Examples

```
data(napa)
degree_time(napa, thresholds = c(0:35))
```

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