Package: Z10 (via r-universe)

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Type Package

Title Simple Ecological Statistics from the NEON Network

Version 0.1.0

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Description Provides simple statistics from instruments and observations at sites in the NEON network, and acts as a simple interface for v0 of the National Ecological Observatory Network (NEON) API. Statistics are generated for meteorologic and soil-based observations, and are presented for daily, annual, and one-time observations at all available NEON sites. Users can also retrieve any dataset publicly hosted by NEON. Metadata for NEON sites and data products can be returned, as well as information on data product availability by site and date. For more information on NEON, please visit <https://www.neonscience.org>. For detailed data product information, please see the NEON data product catalog at <https://data.neonscience.org/data-product-catalog>.

License GPL-3

Encoding UTF-8

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Imports rjson, stringr, magrittr, lubridate, dplyr

Suggests RNRCS, metScanR, rnoaa, neonUtilities

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Contents

`daily.precip.totals` *Return daily precipitation totals for a site*

Description

This function calculates the daily precipitation totals over the specified date range

Usage

```
daily.precip.totals(site, bgn.date, end.date)
```

Arguments

`site`	Parameter of class character. The NEON site data should be downloaded for.
`bgn.date`	Optional. The start date of the period to generate statistics for. If not supplied, the first date of NEON data will be used.
`end.date`	Optional. The end date of the period to generate statistics for. If not supplied, the last date of NEON data will be used.

Value

A data frame of primary and secondary precipitation totals by date. Totals are in millimeters.

Author(s)

Robert Lee <rhlee@colorado.edu>

See Also

Currently none

Examples

```
## Not run:
# Return the entire period of record at CPER
cper=Z10::daily.precip.totals(site = "CPER")

## End(Not run)
```

`daily.rad.stats` *Return daily total radiation statistics for a site*

Description

This function calculates the daily daylight mean and maximum total solar radiation values for a site over the specified date range.

Usage

```
daily.rad.stats(site, bgn.date, end.date)
```

Arguments

`site`	Parameter of class character. The NEON site data should be downloaded for.
`bgn.date`	Optional. The start date of the period to generate statistics for. If not supplied, the first date of NEON data will be used.
`end.date`	Optional. The end date of the period to generate statistics for. If not supplied, the last date of NEON data will be used.

Value

Mean and maximum daylight total solar radiation values by date, in watts per meter squared.

Author(s)

Robert Lee <rhlee@colorado.edu>

See Also

Currently none

Examples

```
## Not run:
# Return radiaiton stats for CPER over the summer solstice
cper=Z10::daily.rad.stats(site = "CPER")
# More information on the radiation data product used:
Z10::get.dp.meta("DP1.00014.001")$product.abstract

## End(Not run)
```

`daily.soil.temp.mean` *Return daily soil temperature means by horizon*

Description

This function calculates the daily miniumum, mean, and maximum temperature values for a site over its period of record for soil sensors located in plot 1 of the site, at the lowest available instrument in each soil horizon.

Usage

```
daily.soil.temp.mean(site, bgn.date, end.date)
```

Arguments

`site`	Parameter of class character. The NEON site data should be downloaded for.
`bgn.date`	Optional. The start date of the period to generate statistics for. If not supplied, the first date of NEON data will be used.
`end.date`	Optional. The end date of the period to generate statistics for. If not supplied, the last date of NEON data will be used.

Value

A mean daily soil temperatures, by soil horizon, in degrees centigrade.

Author(s)

Robert Lee <rhlee@colorado.edu>

See Also

Currently none

Examples

```
## Not run:
cper=Z10::daily.soil.temp.mean(site = "CPER")

## End(Not run)
```

daily.temp.stats *Return daily temperature statistics for a site*

Description

This function calculates the daily miniumum, mean, and maximum temperature values for a site over its period of record.

Usage

```
daily.temp.stats(site, bgn.date, end.date)
```

Arguments

site	Parameter of class character. The NEON site data should be downloaded for.
bgn.date	Optional. The start date of the period to generate statistics for. If not supplied, the first date of NEON data will be used.
end.date	Optional. The end date of the period to generate statistics for. If not supplied, the last date of NEON data will be used.

Value

A list of min, mean and max temperature values at the site, in centigrade

Author(s)

Robert Lee <rhlee@colorado.edu>

See Also

Currently none

Examples

```
## Not run:
cper=Z10::daily.temp.stats(site = "CPER")

## End(Not run)
```

dp.avail *Query for data product availability*

Description

Get dates of data product availability by NEON site.

Usage

```
dp.avail(dp.id)
```

Arguments

dp.id	Parameter of class character. The data product code in question. See http://data.neonscience.org/data-product-catalog for a complete list.

Value

A list of named data frames

Author(s)

Robert Lee <rhlee@colorado.edu>

See Also

Currently none

Examples

```
## Not run:
wind=Z10::dp.avail(dp.id = "DP1.00002.001")

## End(Not run)
```

dp.search *Return data product IDs based on a search keyword*

Description

For a given keyword or search string, a data frame of possible data products will be returned. The search is performed against the data product names, not full data product descriptions. If the R session is interactive, candidate data product information will also print in the console. The data product IDs are used in other Z10 functions to return data.

Usage

```
dp.search(keyword)
```

Arguments

keyword	Parameter of class character. The search phrase used when searching through data product names.

Value

A data frame of data product names and their associated data product IDs

Author(s)

Robert Lee <rhlee@colorado.edu>

See Also

Currently none

Examples

```
## Not run:
names=Z10::dp.search(keyword="fish")

## End(Not run)
```

---

get.data *Download data for a specified data product*

Description

For the specified dates, site, package parameters, and data product or name of family of data products, data are downloaded and saved to the specifed directory.

Usage

```
get.data(dp.id, site, month, save.dir)
```

Arguments

dp.id	Parameter of class character. The data product code in question. See http://data.neonscience.org/data-product-catalog for a complete list.
site	Parameter of class character. The NEON site data should be downloaded for.
month	Parameter of class character. The year-month (e.g. "2017-01") of the month to get data for.d, defaults to basic.
save.dir	Optional, parameter of class character. The local directory where data files should be saved.

Value

A list of named data frames

Author(s)

Robert Lee <rhlee@colorado.edu>

See Also

Currently none

Examples

```
## Not run:
cper_wind=Z10::get.data(site = "CPER", dp.id = "DP1.00002.001", month = "2017-04")

## End(Not run)
```

`get.dp.meta` *Return NEON data product metadata*

Description

Return detailed NEON data product metadata.

Usage

```
get.dp.meta(dp.id)
```

Arguments

`dp.id`	Parameter of class character. The data product code in question.

Value

Nested lists of data product metadata

Author(s)

Robert Lee <rhlee@colorado.edu>

See Also

Currently none

Examples

```
## Not run:
wind_meta=get.dp.meta(dp.id = "DP1.00002.001")

## End(Not run)
```

`get.site.meta` *Return NEON site metadata*

Description

Return detailed NEON site metadata.

Usage

```
get.site.meta(site)
```

Arguments

`site`	Parameter of class character. The NEON site data should be downloaded for.

Value

A list of named data frames

Author(s)

Robert Lee <rhlee@colorado.edu>

See Also

Currently none

Examples

```
## Not run:
cper=Z10::get.site.meta(site = "CPER")

## End(Not run)
```

map *Return the Mean Annual Precipitation statistics for a site*

Description

This function calculates the daily miniumum, mean, and maximum precipitation values for a site over its period of record.

Usage

```
map(site)
```

Arguments

site	Parameter of class character. The NEON site data should be downloaded for.

Value

A list of min, mean and max precipitaiton values at the site, in milimeters

Author(s)

Robert Lee <rhlee@colorado.edu>

See Also

Currently none

Examples

```
## Not run:
cper=Z10::map(site = "CPER")

## End(Not run)
```

mat *Return the Mean Annual Temperature at a site*

Description

This function calculates the miniumum, mean, and maximum temperature values for a site over its period of record.

Usage

```
mat(site)
```

Arguments

site	Parameter of class character. The NEON site data should be downloaded for.

Value

A list of min, mean and max temperature values at the site, in centigrade

Author(s)

Robert Lee <rhlee@colorado.edu>

See Also

Currently none

Examples

```
## Not run:
cper=Z10::mat(site = "CPER")

## End(Not run)
```

---

root.mass *Return Mean Root Masses by Depth*

Description

This function summarizes the root masses from all live roots in 10 cm depth increments

Usage

```
root.mass(site)
```

Arguments

site	Parameter of class character. The NEON site data should be downloaded for.

Value

Data frame of the average root mass measured in a given depth range

Author(s)

Robert Lee <rhlee@colorado.edu>

See Also

Currently none

Examples

```
## Not run:
SCBI=Z10::root.mass(site = "SCBI")

## End(Not run)
```

`site.litter.isotopes` *Return Mean Delta Values of Stable Isotopes in Litterfall*

Description

This function calculates the mean delta values for nitrogen-15 and carbon-13 isotopes over the period of record at a site.

Usage

```
site.litter.isotopes(site)
```

Arguments

`site`	Parameter of class character. The NEON site data should be downloaded for.

Value

A list of min, mean and max net solar radiation values at the site, in watts per meter squared

Author(s)

Robert Lee <rhlee@colorado.edu>

See Also

Currently none

Examples

```
## Not run:
cper=Z10::site.litter.isotopes(site = "SCBI")

## End(Not run)
```

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