Package: wqindex (via r-universe)

September 17, 2024

Type Package

Title Water Quality Index Calculation for British Columbia

Version 0.3.1.9001

Date 2018-08-17

Description Calculates water quality thresholds and water quality indices and plots water quality indices spatially and temporally for British Columbia.

URL https://github.com/bcgov/wqindex

BugReports https://github.com/bcgov/wqindex/issues

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LazyData true

Depends R (>= 3.1.2)

Imports assertthat (>= 0.1), checkr, plyr (>= 1.8.1), dplyr (>= 0.4.1), magrittr, grDevices, stats, tibble, boot (>= 1.3-14), tidyr (>= 0.2.0)

Suggests wqbc, testthat (>= 0.9.1), knitr (>= 1.8), ggplot2 (>= 1.0.0), sp (>= 1.0-17), rgdal (>= 0.9-1), rmarkdown, xtable (>= 1.7-4)

Remotes bcgov/wqbc

VignetteBuilder knitr

RoxygenNote 6.1.0

Roxygen list(markdown = TRUE)

Encoding UTF-8

Repository https://poissonconsulting.r-universe.dev

RemoteUrl https://github.com/poissonconsulting/wqindex

RemoteRef HEAD

RemoteSha 1406bd746531084918399231579f3b9395c4dcca

Contents

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calc_wqi   *Calculate Water Quality Index (WQI)*

Description

Calculates a water quality index for a series of variables, values with upper limits and optionally lower limits using the method detailed in the CCME Water Quality Index 1.0 User's Manual.

Usage

```
calc_wqi(x, by = NULL, messages = getOption("wqbc.messages", default =
  TRUE))
```

Arguments

x	A data.frame to calculate the WQI for.
by	An optional character vector of the columns in x to calculate the WQI by.
messages	A flag indicating whether to print messages.

Details

The upper limits can be generated using the [wqbc::calc_limits()](#) function or can be provided by the user. If values are zero and detection limits are provided then the values are set to be the detection limits. This is important when the variable has lower limits because otherwise the excursion will be infinity and it will not be possible to calculate the WQI. In this case calc_wqi throws an informative error. Finally it is important to note that in order for the WQI to be calculated the data set must include four variables each with non-missing values on at least four separate days. In addition to calculating the WQI the function also generates 95 intervals are generated by first spreading the data into wide format where each row represents one date and then resampling the rows with replacement to generate 1,000 replicates. The confidence intervals are the 2.5 percentiles of the replicate WQIs.

See Also

wqbc::calc_limits()

Examples

```
data(ccme)
calc_wqi(ccme, messages = TRUE)
calc_wqi(ccme, by = "Date", messages = TRUE)
```

---

categorize_wqi	*Categorize Water Quality Indices*

Description

Categorizes numbers between 1 and 100 into the categories defined in the CCME Water Quality Index 1.0 User's Manual.

Usage

```
categorize_wqi(x)
```

Arguments

x   A numeric vector of the WQI values to categorize.

Examples

```
categorize_wqi(seq(1,100,by = 5))
```

---

ccme	*CCME Water Quality Index User's Manual Example Data*

Description

The Canadian Council of Ministers of the Environment (CCME) Water Quality Index 1.0 User's Manual example dataset in tidy format.

Usage

```
ccme
```

Format

A data frame with 120 rows and 7 columns:

Date The date of the reading.

Variable The name of the variable.

Value The value of the reading.

DetectionLimit The detection limit.

LowerLimit The minimum permitted value.

UpperLimit The maximum permitted value.

Units The units of the value, detection limit and lower and upper limits.

Examples

```
demo(ccme)
```

---

dummy   *Dummy Water Quality Data*

Description

A dummy data set to illustrate various data cleaning functions.

Usage

```
dummy
```

Format

A data frame with 4 columns:

Date The date of the reading.

Variable The name of the variable.

Value The value of the reading.

Units The units of the value.

Examples

```
demo(dummy)
```

---

error	*Error*

Description

Throws an error without the call as part of the error message.

Usage

```
error(...)
```

Arguments

...	zero or more objects which can be coerced to character (and which are pasted together with no separator) or a single condition object.

See Also

base::stop

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get_category_colours	*Get Category Colours*

Description

Returns a named vector of the WQI category colours used for plotting.

Usage

```
get_category_colours()
```

---

plot_map	*Plot Map*

Description

Creates a ggplot2 object with a polygon of British Columbia. If any columns are required for additional layers in the plot or facetting then they should be specified in the keep argument.

Usage

```
plot_map(data, x = "Long", y = "Lat", size = 3, shape = 21,
  fill = 10, keep = NULL, input_proj = NULL)
```

Arguments

data	A data.frame with spatial information to map.
x	A string of the column in data to plot on the x axis.
y	A string of the column in data to plot on the y axis.
size	A number of the point size or a string of the column in data to represent by the size of points.
shape	An integer of the point shape (permitted values are 21 to 25) or a string of the column in data to represent by the shape of points.
fill	An integer of the point fill colour or a string of the column in data to represent by the fill colour of points.
keep	An optional character vector indicating which columns in addition to x and y to keep before dropping duplicated rows to avoid overplotting.
input_proj	An optional valid proj4string. Defaults to ("+proj=longlat +ellps=GRS80 +towgs84=0,0,0,0,0,0,0 +no_defs").

See Also

plot_map_wqis

Examples

```
library(ggplot2)
library(sp)
library(rgdal)
library(wqbc)

data(fraser)
plot_map(fraser)

## Not run:
 demo(fraser)

## End(Not run)
```

---

plot_map_wqis   *Plot Map of Water Quality Index Categories.*

Description

Creates a ggplot2 object with a polygon of British Columbia with the Water Quality Index categories indicated by the fill colour of points.

Usage

```
plot_map_wqis(data, x = "Long", y = "Lat", size = 3, shape = 21,
  keep = NULL, input_proj = NULL)
```

Arguments

data	A data.frame of WQI values to plot.
x	A string of the column in data to plot on the x axis.
y	A string of the column in data to plot on the y axis.
size	A number of the point size or string of the column in data to represent by the size of points.
shape	An integer of the point shape (permitted values are 21 to 25) or string of the column in data to represent by the shape of points.
keep	An optional character vector indicating which columns in addition to x and y to keep before dropping duplicated rows to avoid overplotting.
input_proj	An optional valid proj4string. Defaults to ("+proj=longlat +ellps=GRS80 +towgs84=0,0,0,0,0,0,0 +no_defs").

See Also

[plot_wqis](#) and [plot_map](#)

Examples

```
## Not run:
 demo(fraser)

## End(Not run)
```

---

plot_timeseries	*Plot Time Series Data*

Description

If by = NULL plot_timeseries returns a ggplot object. Otherwise it returns a list of ggplot objects.

Usage

```
plot_timeseries(data, by = NULL, y0 = TRUE, size = 1,
  messages = getOption("wqbc.messages", default = TRUE))
```

Arguments

data	A data frame of the data to plot.
by	A character vector of the columns to plot the time series by.
y0	A flag indicating whether to expand the y-axis limits to include 0.
size	A number of the point size.
messages	A flag indicating whether to print messages.

Examples

```
plot_timeseries(ccme[ccme$Variable == "As",])
plot_timeseries(ccme, by = "Variable")
```

---

plot_wqis   *Plot Water Quality Indices*

Description

Creates a ggplot2 scatterplot object with the y-limits expanded to include 0 and 100. Water Quality Index categories are indicated by the fill colour of points.

Usage

```
plot_wqis(data, x = "Tests", size = 3, shape = 21)
```

Arguments

data	A data.frame of WQI values to plot.
x	A string of the column in data to plot on the x axis.
size	A number of the point size or string of the column in data to represent by the size of points.
shape	An integer of the point shape (permitted values are 21 to 25) or string of the column in data to represent by the shape of points.

See Also

[plot_map_wqis](#)

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wqindex   *Water Quality Index Calculation*

Description

The wqindex package calculates water quality thresholds and indices for freshwater life in British Columbia. To the best of the package creator's knowledge the limits correspond to the approved Provincial thresholds on the date of release but wqbc comes with ABSOLUTELY NO WARRANTY. For further information on the use of the wqbc package please type vignette("wqindex") at the R console.

See Also

[calc_wqi](#) and [plot_wqis](#)

Examples

```
## Not run:
 demo(ccme)
 demo(dummy)
 demo(fraser)

## End(Not run)
```

Index