Package ‘tbrf’

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Maintainer Michael Schramm <michael.schramm@ag.tamu.edu>
Description Provides rolling statistical functions based on date and time windows instead of n-lagged observations.

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Author Michael Schramm [aut, cre] (https://orcid.org/0000-0003-1876-6592),
Frank Harrell [ctb]
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R topics documented:

Dissolved_Oxygen .................................................. 2
tbr_binom .......................................................... 3
tbr_gmean .......................................................... 4
tbr_mean ........................................................ 5
**Dissolved_Oxygen**

Data from the Texas Commission on Environmental Quality Surface Water Quality Monitoring Information System. The 'AverageDO' field is the mean of dissolved oxygen concentrations (mg/L) measured at a field site at that day. The MinDO is the minimum dissolved oxygen concentration measured at that site on that day.

**Usage**

```r
data(Dissolved_Oxygen)
```

**Format**

A data frame with 236 rows and 6 variables:

- **Station_ID** unique water quality monitoring station identifier
- **Date** sampling date in yyyy-mm-dd format
- **Param_Code** unique parameter code
- **Param_Desc** parameter description with units
- **Average_DO** mean of dissolved oxygen measurement, in mg/L
- **Min_DO** minimum of dissolved oxygen measurement, in mg/L

**Source**

https://www80.tceq.texas.gov/SwqmisPublic/public/default.htm
**tbr_binom**

**Time-Based Rolling Binomial Probability**

**Description**

Produces a rolling time-window based vector of binomial probability and confidence intervals.

**Usage**

```
tbr_binom(.tbl, x, tcolumn, unit = "years", n, alpha = 0.05)
```

**Arguments**

- `.tbl` dataframe with two variables.
- `x` indicates the variable column containing "success" and "failure" observations coded as 1 or 0.
- `tcolumn` indicates the variable column containing Date or Date-Time values.
- `unit` character, one of "years", "months", "weeks", "days", "hours", "minutes", "seconds"
- `n` numeric, describing the length of the time window in the selected units.
- `alpha` numeric, probability of a type 1 error, so confidence coefficient = 1-alpha

**Value**

tibble with binomial point estimate and confidence intervals.

**See Also**

`binom_ci`

**Examples**

```
## Generate Sample Data
df <- tibble::tibble(
  date = sample(seq(as.Date('2000-01-01'), as.Date('2015/12/30'), by = "day"), 100),
  value = rbinom(100, 1, 0.25)
)

## Run Function
tbr_binom(df, x = value,
          tcolumn = date, unit = "years", n = 5,
          alpha = 0.1)
```
tbr_gmean  Time-Based Rolling Geometric Mean

Description

Produces a rolling time-window based vector of geometric means and confidence intervals.

Usage

`tbr_gmean(.tbl, x, tcolumn, unit = "years", n, ...)`

Arguments

- `.tbl`: a data frame with at least two variables; time column formatted as date, date/time and value column.
- `x`: column containing the values to calculate the geometric mean.
- `tcolumn`: formatted time column.
- `unit`: character, one of "years", "months", "weeks", "days", "hours", "minutes", "seconds"
- `n`: numeric, describing the length of the time window.
- `...`: additional arguments passed to `gm_mean_ci`

Value

tibble with columns for the rolling geometric mean and upper and lower confidence levels.

See Also

- `gm_mean_ci`

Examples

```r
## Return a tibble with new rolling geometric mean column
tbr_gmean(Dissolved_Oxygen, x = Average_DO, tcolumn = Date, unit = "years", n = 5)

## Not run:
## Return a tibble with rolling geometric mean and 95% CI
tbr_gmean(Dissolved_Oxygen, x = Average_DO, tcolumn = Date, unit = "years", n = 5, conf = .95)
## End(Not run)
```
**tbr_mean**

*Time-Based Rolling Mean*

### Description

Produces a rolling time-window based vector of means and confidence intervals.

### Usage

```r
 tbr_mean(.tbl, x, tcolumn, unit = "years", n, ...)
```

### Arguments

- `.tbl` a data frame with at least two variables; time column formatted as date, date/time and value column.
- `x` column containing the numeric values to calculate the mean.
- `tcolumn` formatted time column.
- `unit` character, one of "years", "months", "weeks", "days", "hours", "minutes", "seconds"
- `n` numeric, describing the length of the time window.
- `...` additional arguments passed to `mean_ci`.

### Value

tibble with columns for the rolling mean and upper and lower confidence intervals.

### See Also

`mean_ci`

### Examples

```r
## Return a tibble with new rolling mean column
 tbr_mean(Dissolved_Oxygen, x = Average_DO, tcolumn = Date, unit = "years", n = 5)

## Not run:
## Return a tibble with rolling mean and 95% CI
 tbr_mean(Dissolved_Oxygen, x = Average_DO, tcolumn = Date, unit = "years", n = 5, conf = .95)
## End(Not run)
```
tbr_median

Time-Based Rolling Median

Description

Produces a rolling time-window based vector of medians and confidence intervals.

Usage

`tbr_median(.tbl, x, tcolumn, unit = "years", n, ...)`

Arguments

- `.tbl` a data frame with at least two variables; time column formatted as date, date/time and value column.
- `x` column containing the numeric values to calculate the mean.
- `tcolumn` formatted time column.
- `unit` character, one of "years", "months", "weeks", "days", "hours", "minutes", "seconds"
- `n` numeric, describing the length of the time window.
- `...` additional arguments passed to `median_ci`

Value

tibble with columns for the rolling median and upper and lower confidence intervals.

See Also

`median_ci`

Examples

```r
## Return a tibble with new rolling median column
tbr_median(Dissolved_Oxygen, x = Average_DO, tcolumn = Date, unit = "years", n = 5)

## Not run:
## Return a tibble with rolling median and 95% CI
# tbr_median(Dissolved_Oxygen, x = Average_DO, tcolumn = Date, unit = "years", n = 5, conf = .95)
## End(Not run)
```
**tbr_misc**

*Use Generic Functions with Time Windows*

**Description**

Use Generic Functions with Time Windows

**Usage**

```
tbr_misc(.tbl, x, tcolumn, unit = "years", n, func, ...)
```

**Arguments**

- `.tbl` a data frame with at least two variables; time column formatted as date, date/time and value column.
- `x` column containing the values the function is applied to.
- `tcolumn` formatted time column.
- `unit` character, one of "years", "months", "weeks", "days", "hours", "minutes", "seconds"
- `n` numeric, describing the length of the time window.
- `func` specified function
- `...` optional additional arguments passed to function `func`

**Value**

tibble

**Examples**

```
tbr_misc(Dissolved_Oxygen, x = Average_DO, tcolumn = Date, unit = "years", n = 5, func = mean)
```  

---

**tbr_sd**

*Time-Based Rolling Standard Deviation*

**Description**

Time-Based Rolling Standard Deviation

**Usage**

```
tbr_sd(.tbl, x, tcolumn, unit = "years", n, na.rm = FALSE)
```
tbr_sum

Time-Based Rolling Sum

Description

Time-Based Rolling Sum

Usage

tbr_sum(.tbl, x, tcolumn, unit = "years", n, na.rm = FALSE)

Arguments

- `.tbl`: a data frame with at least two variables; time column formatted as date, date/time and value column.
- `x`: column containing the values to calculate the sum.
- `tcolumn`: formatted time column.
- `unit`: character, one of "years", "months", "weeks", "days", "hours", "minutes", "seconds"
- `n`: numeric, describing the length of the time window.
- `na.rm`: logical. Should missing values be removed?

Value

tibble with column for the rolling sd.

See Also

sd

Examples

tbr_sd(Dissolved_Oxygen, x = Average_DO, tcolumn = Date, unit = "years", n = 5)
Value
dataframe with column for the rolling sum.

See Also
sum

Examples

tbr_sum(Dissolved_Oxygen, x = Average_DO, tcolumn = Date, unit = "years", n = 5)
Index

* datasets
  Dissolved_Oxygen, 2

binom_ci, 3
Dissolved_Oxygen, 2
gm_mean_ci, 4
mean_ci, 5
median_ci, 6
sd, 8
sum, 9
tbr_binom, 3
tbr_gmean, 4
tbr_mean, 5
tbr_median, 6
tbr_misc, 7
tbr_sd, 7
tbr_sum, 8