

# Package ‘Wats’

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**Title** Wrap Around Time Series graphics

**Description** Wrap-around Time Series (WATS) Plots for Interrupted Time Series Designs

**Version** 0.1-7

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**URL** <https://github.com/wibeasley/Wats>, <https://r-forge.r-project.org/projects/wats/>

**Depends** R (>= 3.0.0), stats

**Imports** colorspace, ggplot2, lubridate, plyr, RColorBrewer, testit, zoo

**Suggests** devtools, knitr, testthat

**License** GPL (>= 2)

**LazyData** true

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AnnotateData

*Finds midpoints and bands for the within and between cycles.*


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## Description

Finds midpoints and bands for the within and between cycles.

## Usage

```
AnnotateData(dsLinear, dvName, centerFunction, spreadFunction,
  cycleTallyName = "CycleTally", stageIDName = "StageID",
  proportionThroughCycleName = "ProportionThroughCycle",
  proportionIDName = "ProportionID",
  terminalPointInCycleName = "TerminalPointInCycle")
```

## Arguments

dsLinear	The data.frame to containing the detailed data.
dvName	The name of the dependent/criterion variable.
centerFunction	A function to calculate the center of a subsample.
spreadFunction	A function to calculate the bands of a subsample.
cycleTallyName	The variable name indicating how many cycles have been completed.
stageIDName	The variable name indicating the stage. In a typical interrupted time series, these values are 1 before the interruption and 2 after.
proportionThroughCycleName	The variable name indicating how far the point is through a cycle. For example, 0 degrees would be 0, 180 degrees would be 0.5, 359 degrees would be 0.9972, and 360 degrees would be 0.
proportionIDName	The variable name indicating the ordinal position through a cycle.
terminalPointInCycleName	The variable name indicating the last point within a given cycle.

## Value

Returns a data.frame with additional variables «Say what they are».

## Examples

```
a <- 32+323
```

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AugmentCycleData	<i>Calculates variables necessary for WATS Plots</i>
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**Description**

Calculates variables necessary for WATS Plots

**Usage**

```
AugmentYearDataWithMonthResolution(dsLinear, dateName, stageIDName)
```

**Arguments**

dsLinear	The data.frame to containing the detailed data.
dateName	The variable name in dsLinear containing the date or datetime value.
stageIDName	The variable name indicating the stage. In a typical interrupted time series, these values are 1 before the interruption and 2 after.

**Value**

Returns a data.frame with additional variables: CycleTally, ProportionThroughCycle, ProportionID, and TerminalPointInCycle.

**Examples**

```
a <- 32+323
```

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LinearRollingPlot	<i>Linear Plot with Rolling Summaries</i>
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**Description**

Shows the interrupted time series in Cartesian coordinates without a periodic/cyclic components.

**Usage**

```
LinearRollingPlot(dsLinear, xName, yName, stageIDName,
  rollingLowerName = "RollingLower", rollingCenterName = "RollingCenter",
  rollingUpperName = "RollingUpper", paletteDark = NULL,
  paletteLight = NULL, colorPeriodic = "brown", changePoints = NULL,
  changePointLabels = NULL, drawJaggedLine = TRUE, drawRollingLine = TRUE,
  drawRollingBands = TRUE, drawPeriodicLineAndPoints = TRUE,
  jaggedPointSize = 4, jaggedLineSize = 0.5, rollingLineSize = 1,
  periodicPointSize = 4, periodicLineSize = 0.5, bandAlpha = 0.3,
  changeLineAlpha = 0.5, changeLineSize = 5, title = NULL,
  xTitle = NULL, yTitle = NULL)
```

**Arguments**

<code>dsLinear</code>	The <code>data.frame</code> to containing the data.
<code>xName</code>	The variable name containing the date.
<code>yName</code>	The variable name containing the dependent/criterion variable.
<code>stageIDName</code>	The variable name indicating which stage the record belongs to. For example, before the first interruption, the <code>StageID</code> is 1, and is 2 afterwards.
<code>rollingLowerName</code>	The variable name showing the lower bound of the rolling estimate.
<code>rollingCenterName</code>	The variable name showing the rolling estimate.
<code>rollingUpperName</code>	The variable name showing the upper bound of the rolling estimate.
<code>paletteDark</code>	A vector of colors used for the dark/heavy graphical elements. The vector should have one color for each <code>StageID</code> value. If no vector is specified, a default will be chosen, based on the number of stages.
<code>paletteLight</code>	A vector of colors used for the light graphical elements. The vector should have one color for each <code>StageID</code> value. If no vector is specified, a default will be chosen, based on the number of stages.
<code>colorPeriodic</code>	The color of the ‘slowest’ trend line, which plots only one value per cycle.
<code>changePoints</code>	A vector of values indicate the interruptions between stages. It typically works best as a <code>Date</code> or a <code>POSIXct</code> class.
<code>changePointLabels</code>	The text plotted above each interruption.
<code>drawJaggedLine</code>	A boolean value indicating if a line should be plotted that connects the observed data points.
<code>drawRollingLine</code>	A boolean value indicating if a line should be plotted that connects the rolling estimates specified by <code>rollingCenterName</code> .
<code>drawRollingBands</code>	A boolean value indicating if a band should be plotted that envelopes the rolling estimates (whose values are take from the <code>rollingLowerName</code> and <code>rollingUpperName</code> ).
<code>drawPeriodicLineAndPoints</code>	A boolean value indicating if the periodic line and points should be plotted.
<code>jaggedPointSize</code>	The size of the observed data points.
<code>jaggedLineSize</code>	The size of the line connecting the observed data points.
<code>rollingLineSize</code>	The size of the line connecting the rolling estimates.
<code>periodicPointSize</code>	The size of the periodic estimates.
<code>periodicLineSize</code>	The size of the line connecting the periodic estimates.
<code>bandAlpha</code>	The amount of transparency of the rolling estimate band.
<code>changeLineAlpha</code>	The amount of transparency marking each interruption.
<code>changeLineSize</code>	The width of a line marking an interruption.
<code>title</code>	The string describing the plot.
<code>xTitle</code>	The string describing the <i>x</i> -axis.
<code>yTitle</code>	The string describing the <i>y</i> -axis.

Value

Returns a ggplot2 graphing object

Examples

```
filePathOutcomes <- file.path(devtools::inst(name="Wats"), "extdata", "BirthRatesOk.txt")
dsLinear <- read.table(filePathOutcomes, header=TRUE, sep="\t", stringsAsFactors=FALSE)
dsLinear$Date <- as.Date(dsLinear$Date)
dsLinear$MonthID <- NULL
changeMonth <- as.Date("1996-02-15")
dsLinear$StageID <- ifelse(dsLinear$Date < as.Date("1996-02-15"), 1L, 2L)
dsLinear <- Wats::AugmentYearDataWithMonthResolution(dsLinear=dsLinear, dateName="Date")
hSpread <- function( scores) { return( quantile(x=scores, probs=c(.25, .75)) ) }
dsCombined <- Wats::AnnotateData(
  dsLinear,
  dvName = "BirthRate",
  centerFunction = median,
  spreadFunction = hSpread
)

LinearRollingPlot(
  dsCombined$dsLinear,
  xName = "Date",
  yName = "BirthRate",
  stageIDName = "StageID",
  changePoints = as.Date("1996-02-15"),
  changePointLabels = "Bombing Effect")
```

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