Package 'FlowRegEnvCost'

September 15, 2017

Type Package

Title The environmental costs of flow regulaation

Version 0.1.0

Author Silvestre García de Jalón <silvestre.garciadejalon@bc3research.org>; Javier Martínez-López <javier.martinez@bc3research.org>

Maintainer
Silvestre García de Jalón <silvestre.garciadejalon@bc3research.org>; Javier Martínez-López <javier.martinez@bc3research.org>

Description An application to calculate the daily environmental costs of river flow regulation by dams.

URL https://github.com/garciadejalon/FlowRegEnvCost

BugReports https://github.com/garciadejalon/FlowRegEnvCost/issues

License MIT

Encoding UTF-8

LazyData true

RoxygenNote 6.0.1

NeedsCompilation no

R topics documented:

1

---

f_adm_range4   *Calculates the admissible range of flow variability*

Description

Calculates the admissible range of flow variability

Usage

```
f_adm_range4(First_year, Last_year, Year_impact)
```

Arguments

First_year	First year to consider in the analysis starting on October 1st (e.g.: First_year = 1964)
Last_year	First year to consider in the analysis finishing on September 30th (e.g.: Last_year = 2011)
Year_impact	Year when the human impact started (the construction of a dam) (e.g.: Year_impact = 1988)

Value

Calculates the admissible range of flow variability based on the flow data during the pre-impact period.

---

f_daily_costs6   *Calculates the daily environmental costs of flow regulation*

Description

Calculates the daily environmental costs of flow regulation

Usage

```
f_daily_costs6(First_year, Last_year, Year_evaluated, Year_impact, a_low,
  a_high, b_low, b_high)
```

Arguments

First_year	First year to consider in the analysis starting on October 1st (e.g.: First_year = 1964)
Last_year	First year to consider in the analysis finishing on September 30th (e.g.: Last_year = 2011)
Year_evaluated	Year when the environmental impact is evaluated (e.g.: Year_evaluated = 2010)

`Year_impact`	Year when the human impact started (the construction of a dam) (e.g.: Year_impact = 1988)
`a_low`	Coefficient a of Low-flow impact of function ku (e.g.: a_low = 0.05)
`a_high`	Coefficient a of High-flow impact of function ku (e.g.: a_high = 0.01)
`b_low`	Coefficient b of Low-flow impact of function ku (e.g.: b_low = 2)
`b_high`	Coefficient b of High-flow impact of function ku (e.g.: b_high = 2)

Value

Calculates the daily environmental costs of flow regulation for a specific year evaluated.

`f_daily_costs_plot6`   *Plots the daily environmental costs of flow regulation*

Description

Plots the daily environmental costs of flow regulation

Usage

```
f_daily_costs_plot6(River_name, First_year, Last_year, Year_evaluated,
  Year_impact, a_low, a_high, b_low, b_high)
```

Arguments

`River_name`	Name of the river written as character (e.g.: River_name = "Ebro")
`First_year`	First year to consider in the analysis starting on October 1st (e.g.: First_year = 1964)
`Last_year`	First year to consider in the analysis finishing on September 30th (e.g.: Last_year = 2011)
`Year_evaluated`	Year when the environmental impact is evaluated (e.g.: Year_evaluated = 2010)
`Year_impact`	Year when the human impact started (the construction of a dam) (e.g.: Year_impact = 1988)
`a_low`	Coefficient a of Low-flow impact of function ku (e.g.: a_low = 0.05)
`a_high`	Coefficient a of High-flow impact of function ku (e.g.: a_high = 0.01)
`b_low`	Coefficient b of Low-flow impact of function ku (e.g.: b_low = 2)
`b_high`	Coefficient b of High-flow impact of function ku (e.g.: b_high = 2)

Value

Plots the daily environmental costs of flow regulation for a specific year evaluated.

| f_impact5 | *Calculates the daily environmental impact of flow regulation (high-and low-flow impact)* |

Description

Calculates the daily environmental impact of flow regulation (high- and low-flow impact)

Usage

```
f_impact5(First_year, Last_year, Year_evaluated, Year_impact)
```

Arguments

First_year	First year to consider in the analysis starting on October 1st (e.g.: First_year = 1964)
Last_year	First year to consider in the analysis finishing on September 30th (e.g.: Last_year = 2011)
Year_evaluated	Year when the environmental impact is evaluated (e.g.: Year_evaluated = 2010)
Year_impact	Year when the human impact started (the construction of a dam) (e.g.: Year_impact = 1988)

Value

Calculates the daily environmental impact of flow regulation (high- and low-flow impact).

| f_multi_plot_impact5 | *Plots the daily environmental impact of flow regulation for multiple years* |

Description

Plots the daily environmental impact of flow regulation for multiple years

Usage

```
f_multi_plot_impact5(River_name, First_year, Last_year, Year_evaluated,
  Year_impact, x_coef)
```

Arguments

`River_name`	Name of the river written as character (e.g.: River_name = "Ebro")
`First_year`	First year to consider in the analysis starting on October 1st (e.g.: First_year = 1964)
`Last_year`	First year to consider in the analysis finishing on September 30th (e.g.: Last_year = 2011)
`Year_evaluated`	Year when the environmental impact is evaluated (e.g.: Year_evaluated = 2010)
`Year_impact`	Year when the human impact started (the construction of a dam) (e.g.: Year_impact = 1988)
`x_coef`	A coeficient to change the font size in the graphs proportionally to the number of graphs plotted (e.g.: x_coef = 0.8)

Value

Plots the daily environmental impact of flow regulation for multiple years.

`f_multi_plot_impact7`	*Plots the daily environmental impact of flow regulation for multiple years*

Description

Plots the daily environmental impact of flow regulation for multiple years

Usage

```
f_multi_plot_impact7(Row, Column, sp_years, River_name, First_year, Last_year,
   Year_impact)
```

Arguments

`Row`	Number of rows in the figure to compare multiple years in separated graphs (e.g.: Row = 2)
`Column`	Number of columns in the figure to compare multiple years in separated graphs (e.g.: Column = 5)
`sp_years`	A vector specifying the years to be plotted (e.g.: sp_years = c(1965,1966,1967,1968,1969,2006,2007,2008
`River_name`	Name of the river written as character (e.g.: River_name = "Ebro")
`First_year`	First year to consider in the analysis starting on October 1st (e.g.: First_year = 1964)
`Last_year`	First year to consider in the analysis finishing on September 30th (e.g.: Last_year = 2011)
`Year_impact`	Year when the human impact started (the construction of a dam) (e.g.: Year_impact = 1988)

Value

Plots the daily environmental impact of flow regulation for multiple years.

`f_plot_adm_range4`	*Plots the admissible range of flow variability*

Description

Plots the admissible range of flow variability

Usage

```
f_plot_adm_range4(River_name, First_year, Last_year, Year_impact)
```

Arguments

`River_name`	Name of the river as character (e.g.: River_name = "Ebro")
`First_year`	First year to consider in the analysis starting on October 1st (e.g.: First_year = 1964)
`Last_year`	First year to consider in the analysis finishing on September 30th (e.g.: Last_year = 2011)
`Year_impact`	Year when the human impact started (the construction of a dam) (e.g.: Year_impact = 1988)

Value

Plots the admissible range of flow variability based on the flow data during the pre-impact period.

`f_plot_impact5`	*Plots the daily environmental impact of flow regulation (high- and low-flow impact)*

Description

Plots the daily environmental impact of flow regulation (high- and low-flow impact)

Usage

```
f_plot_impact5(River_name, First_year, Last_year, Year_evaluated, Year_impact)
```

Arguments

River_name	Name of the river written as character (e.g.: River_name = "Ebro")
First_year	First year to consider in the analysis starting on October 1st (e.g.: First_year = 1964)
Last_year	First year to consider in the analysis finishing on September 30th (e.g.: Last_year = 2011)
Year_evaluated	Year when the environmental impact is evaluated (e.g.: Year_evaluated = 2010)
Year_impact	Year when the human impact started (the construction of a dam) (e.g.: Year_impact = 1988)

Value

Plots the daily environmental impact of flow regulation (high- and low-flow impact).

---

f_structure_date1   *Transforms and reorders the flow data*

Description

Transforms and reorders the flow data

Usage

```
f_structure_date1(S_Day, S_Month, S_Year)
```

Arguments

S_Day	Position in Date string of the first digit of two-digits day
S_Month	Position in Date string of the first digits of two-digits month
S_Year	Position in Date string of the first digits of four-digits year

Value

The transformed dataframe on a daily basis sohuld now be ready for calculations

---

f_summary_flow3   *Provides a summary of flow data during the pre-impact period*

Description

Provides a summary of flow data during the pre-impact period

Usage

```
f_summary_flow3(First_year, Last_year, Year_impact)
```

Arguments

First_year	First year to consider in the analysis starting on October 1st (e.g.: First_year = 1964)
Last_year	First year to consider in the analysis finishing on September 30th (e.g.: Last_year = 2011)
Year_impact	Year when the human impact started (the construction of a dam) (e.g.: Year_impact = 1988)

Value

Provides a dataframe on a daily basis of mean, min, p10, p25, median, p75, p90 and max values during the pre-impact period.

---

f_years2   *Sorts the flow data per years - Each year is a column*

Description

Sorts the flow data per years - Each year is a column

Usage

```
f_years2(First_year, Last_year)
```

Arguments

First_year	First year to consider in the analysis starting on October 1st (e.g.: First_year = 1964)
Last_year	First year to consider in the analysis finishing on September 30th (e.g.: Last_year = 2011)

Value

The transformed dataframe per year is ready for calculations

Index