Package ‘TTAinterfaceTrendAnalysis’

March 26, 2013

Type Package

Title Temporal Trend Analysis Graphical Interface

Version 1.04

Date 2013-03-19

Description This interface was created to develop a standard procedure of temporal trend analysis in the framework of the OSPAR convention. It is based on 4 successive steps: simply manipulate your database, select the parameters you want to analyse, build your regulated time series, perform analysis and read the results all in one easy to use interface. Statistical analysis call other package function such as Kendall tests (wq package) or cusum function (Pastec package).

License GPL (>= 2)

Depends R (>= 2.15.0), Hmisc, pastecs, reshape, wq, stats, e1071, nlme, timeSeries, fBasics, relimp, tcltk, utils, base, zoo

SystemRequirements BWidget

URL http://cran.at.r-project.org/package=TTAinterfaceTrendAnalysis

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**TTAinterface-package**

*Interface Package for Temporal Trend Analysis*

### Description

A friendly interface to perform Temporal Trend Analyses (MannKendall tests). Just follow the successive step from the data formatting to the results sorting.

### Details

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### Author(s)

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**Envir**

*A temporary environment to stock data and objects*

### Description

The function create an environment where the data, arguments and objects that are used between the different function of the package will be stock for better exchange processes.
fixdata

Usage

Envir()

Details

Objects passed through the environment 'Envir' are called in the other function as Envir$objects

---

**fixdata**  
*Fixdata function*

---

**Description**

Simply modify your database through the interface

Usage

fixdata()

Value

The edited database that is automatically read by the interface to replace former values

Note

fixdata() call the function fix() that act on the raw data base. The fix() function itself call the function edit() from the package utils

See Also

fix edit

---

**FULLoption**  
*Main function*

---

**Description**

This is the core function of the interface. It receive arguments from the interface (see the function <TTAinterface>) and build regularized time series, perform diagnostics and analyses.
FULLoption

Usage

FULLoption(param, depth = NULL, sal = NULL, site = NULL, rawdata = "NO",
            select = "NO", resume.reg = "NO", test.normality = "NO",
            plotB = "NO", selectBox="ByYears", plotZ = "NO", datashow = "NO"
            , help.timestep = "NO", auto.timestep = "NO", time.step = NULL
            , help.aggreg = "NO", auto.aggreg = "NO", aggreg = NULL, mix = "YES"
            , outliers.re = "NO", na.replace = "NO", start = NULL, end = NULL
            , months = c(1:12), norm = "NO", npsu = 30, autocorr = "NO"
            , spectrum = "NO", anomaly = "NO", zsmooth = "NO", local.trend = "NO"
            , test = "MK")

Arguments

param The name of the parameter you want to analyse it must be the name of the
      column where are your data. Have to be enter like this : "yourparam".

depth If existing, the depth interval where your data will be analyse. If values are dif-
      ferent from depth max and depth min, missing value are exclude Depth column
      must be name as 'DEPTH'. Enter the value like this : c(a,b). For analysis at one
      specific depth you can enter c(a,a).

sal Same thing as for the depth Salinity column must be name as 'S'.

site Labels of sampling site as they appears in the database Enter the value like this
      c("S1", "S2").

rawdata Peform desciptive statistics on raw database, can be "YES" or "NO" (the de-
      fault).

select Peform desciptive statistics on selected parameter and site, can be "YES" or
      "NO" (the default).

resume.reg Peform desciptive statistics on regularized time series, can be "YES" or "NO"
      (the default).

test.normality Perform a Shapiro-Wilk normality test on selected parameter, can be "YES" or
      "NO" (the default).

plotB Display a boxplot of rawdata with outliers identified as cirle, can be "YES" or
      "NO" (the default).

selectBox Options for plotB: allow to choose between boxplot by years or by months.

plotZ Display a plot of the regularized time series, can be "YES" or "NO" (the default).

datashow Show a table of the regularized data, can be "YES" or "NO" (the default).

help.timestep Display an advice for time step selection, base on the mean time that separate
      two successive measurments. Can be "YES" or "NO" (the default).

auto.timestep Autoexecute the advice without display it.

time.step Choice of the time step for data aggregation during the build of the time series,
      can be "Fortnight", "Semi-fortnight", "Mensual", "Annual" or "Mono-mensual" for an aggregation of the data of a month of all years (e.g. all January data).

help.aggreg Display an advice for method of aggregation selection, base on Wilcoxon p.value
      between rawdata and the different method. Can be "YES" or "NO" (the default).
FULLoption

auto.aggreg  Autoexecute the advice without display it.

aggreg  Choice of the method of aggregation during the build of the time series, can be "Mean", "Median", "Max" for maximal value selection or "Quantile" for selection of the quantile 90

mix  Allow to mix the data of all sampling site during analysis? Can be "YES" (the default) or "NO".

outliers.re  Remove the outliers from the rawdata, the outliers list is save in a .csv file. (for outliers visual identification see boxplot section).

na.replace  Replace missing values with median of the corresponding cycle (week, month...) for lags longer than 3 days and linear regression for shorter missed period. Can be "YES" or "NO" (the default).

start  Define the first year of data analysis (by default the first of the database).

end  Define the last year of data analysis (by default the last of the database).

months  Define the months of data analysis (by default the twelve months).

norm  Compute normalised values of nutrients at the salinity npsu for each years, can be "YES" or "NO" (the default).

npsu  Compute normalised values of nutrients at the salinity npsu for each years, 30 by default.

autocorr  Display the autocorrelation diagramme of the regularized time series using the acf function with arguments : lag.max = ((nrow(TimeSerie))/2), na.action = na.pass. Can be "YES" or "NO" (the default)

spectrum  Display the Fourrier spectrum of the regularized time series using the spectrum function with span arguemtns =c(3,5). Can be "YES" or "NO" (the default).

anomaly  Display a color box (function filled.contour) plot by year each time.step (months or weeks) minus the mean of the time.step of all years. Red colors show positive anomalies and blue colors negative anomalies. Can be "YES" or "NO" (the default).

zsmooth  Display a detrended plot of the time series using the stl function with arguments s.window="periodic", na.action=na.fail. Can be "YES" or "NO" (the default).

local.trend  Display the interactive cusum plot of the time series (local.trend of the pastecs package) that allow to manually identify the period of change in the tendency using the function identify and perform a Kendall familly test on each identified period (see test section). Can be "YES" or "NO" (the default).

test  Perform a test to evaluate the presence and the magnitude of a temporal trend on the time series. Can be "MK" for Seasonal Mann-Kendall test (the default), "SMK" for the same test with detail for each time step, "LOESS" that fit a polynomial surface determined by one or more numerical predictors, using local fitting; a MK is perform on this fitting.

Value

Results are return as .png figures or .csv files Results are also directly readable through the panel 5 of the interface.
Savepath can be choose using the option 'Select directory' (see the function selectdirectory more more informations)

Name of saved file follow the nomenclature: Original.file.name_analysis.name_parameter.csv/png
or for multiple period analysis (see cusum for more details): Original.file.name_analysis.name_parameter_starting.year_ending.years.csv

analysis.names are:

Author(s)

David Devreker

See Also

boxplot impute shapiro.test summary acf spectrum filled.contour stl local.trend mannKen seasonTrend seaKen loess

Description

Call the libraries require to run the interface. If libraries are not present on the computer they will be automatically downloaded on the CRAN server (require an internet connexion).

Usage

Lib()
selectdirectory

Saved path selection

Description

Allow to chose the directory where results (.csv and .png files) will be saved.

Usage

selectdirectory()

Details

It select the main save directory; the package will create appropiate sub-folder as function of selected parameters, statistics, methods etc. Then you will be able to perform successive analyses wihtout overwriting the previous results.

SRNDunkerque

Coastal survey near the Gravelines power plant form 1995 to 2010

Description

Variation in temperature, salinity and chlorophyll-a concentration (microg/l) monthly measured between 1995 and 2010 at three different stations distributed onshore to offshore (North See) near the city of Dunkerque (north of France) for the SRN monitoring program (Ifremer). This database contain many missing values.

Usage

SRNDunkerque

Format

A data.frame (CSV) containing 1561 measurements of temperature, salinity and chlorophyll-a concentration

Source

The Ifremer QUADRIGE_2 meta-database
**TTAinterface**

---

**Graphic Interface For Temporal Trend Analysis**

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**Description**

A friendly user graphic interface to perform temporal trend analysis. The interface offer multiple options to select parameters and build time series that the user can follow step by step. Some options are selected by default to let the hurry user to do really quick analysis. Some diagnostic tools are also present.

**Usage**

`TTAinterface()`

**Value**

Results are saved in .csv files or .png figures in the desire directory (see `selectdirectory`). See 'FULLoption' values fore more details.

**Author(s)**

David Devreker

**See Also**

`FULLoption fixdata selectdirectory`
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