

Package ‘rnrfa’

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Type Package

Title UK National River Flow Archive data from R

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Description Utility functions to retrieve data from the UK National River Flow Archive. The package contains R wrappers to the UK NRFA data temporary-API (<http://www.ceh.ac.uk/data/nrfa/>). There are functions to retrieve stations falling in a bounding box, to generate a map and extracting time series and general information. It also contain the dataset `{StationSummary}`.

Depends R (>= 3.0.2), utils

Imports XML2R, RCurl, zoo, rjson, rgdal, sp, stringr

License GPL (>= 3)

Encoding UTF-8

LazyLoad yes

URL http://cvitolo.github.io/r_rnrfa/

NeedsCompilation no

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FindInfo	<i>Extract info from the waterml2.</i>
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Description

This function retrieves the most important info from the waterml2 file given as a list.

Usage

```
FindInfo(myList)
```

Arguments

myList	this is a nested list which comes from the conversion of waterml2 data
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Value

named vector containing the following information: stationName, Latitude, Longitude, typeOfMeasurement, timeZone, remarks

Author(s)

Claudia Vitolo

FindTS	<i>This function retrieves time series of gauged daily flow from the NRFA database.</i>
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Description

This function retrieves time series of gauged daily flow from the NRFA database and stores it in zoo format.

Usage

```
FindTS(myList)
```

Arguments

myList	this is a nested list which comes from the conversion of waterml2 data.
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Value

time series of class zoo

Author(s)

Claudia Vitolo

GetStationSummary *List of stations from UK NRFA*

Description

This function pulls the list of stations (and related metadata), falling within a given bounding box, from the CEH National River Flow Archive website.

Usage

```
GetStationSummary(lonMin = -10, lonMax = 10, latMin = 48, latMax = 62,  
  metadataColumn = NULL, entryValue = NULL, minRec = NULL)
```

Arguments

lonMin	Minimum latitude of bounding box
lonMax	Maximum latitude of bounding box
latMin	Minimum longitude of bounding box
latMax	Maximum longitude of bounding box
metadataColumn	name of column to filter
entryValue	string to search in metadataColumn#'
minRec	minimum number of recording years

Details

coordinates of bounding box are required in WGS84 (EPSG: 4326). If BB coordinates are missing, the function returns the list corresponding to the maximum extent of the network.

Value

data.frame with list of stations and related metadata

Author(s)

Claudia Vitolo

Examples

```
x <- GetStationSummary() # this returns all the stations in the network  
x <- GetStationSummary(lonMin=-1, lonMax=1, latMin=49, latMax=51) # this returns 31 stations
```

OSG2LatLon

Converts easting/northing to latitude/longitude.

Description

This function converts easting and northing coordinates (UK National Grid, epsg:27700) and converts them to longitude and latitude (WGS84, epsg:4326). It uses rgdal and sp functionalities for coordinates transformations.

Usage

```
OSG2LatLon(en)
```

Arguments

en this is a vector containing the easting and northing coordinates.

Value

vector made of two elements: the latitude and longitude.

Author(s)

Claudia Vitolo

References

This function is based on the following forum post: <https://stat.ethz.ch/pipermail/r-sig-geo/2010-November/010141.htm>

Examples

```
# single entry
OSG2LatLon(c(572200,121300))

# use result from OSGParse() function
OSG2LatLon(OSGParse("TQ722213"))

# multiple entries & use result from OSGParse() function
OSG2LatLon(OSGParse(c("SN831869","SN829838","SN824853","SN824842","SN826854")))
```

OSGParse	<i>Converts UK National Grid Reference to easting/northing coordinates (epsg:27700).</i>
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Description

This function converts an OS reference to easting/northing coordinates (UK National Grid, epsg:27700).

Usage

```
OSGParse(gridRef)
```

Arguments

gridRef This is a string that expresses the UK Grid Reference.

Value

vector made of two elements: the easting and northing coordinates.

Author(s)

Claudia Vitolo

References

This function is based on the following post: <http://stackoverflow.com/questions/23017053/how-to-convert-uk-grid-reference-to-latitude-and-longitude-in-r/23023744?noredirect=1#23023744>

Examples

```
# single entry
OSGParse("TQ722213")

# multiple entries
OSGParse(c("SN831869", "SN829838", "SN824853", "SN824842", "SN826854"))
```

SearchNRFA	<i>This function retrieves time series of gauged daily flow from the NRFA database.</i>
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Description

Given the station ID number(s), this function retrieves data (time series in zoo format) and metadata.

Usage

```
SearchNRFA(ID)
```

Arguments

ID station ID number(s), each number should be in the range [3002,236051].

Value

list composed of as many objects as in the list of station ID numbers. Each object can be accessed as x[[1]], x[[2]], and so forth. Each object contains a list of other two objects: data and metadata.

Author(s)

Claudia Vitolo

Examples

```
# One station
SearchNRFA(3001)
# Multiple stations
# SearchNRFA(c(3001,3002,3003)); plot(x[[1]]$data)
```

stationSummary	<i>stationSummary</i>
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Description

table containing details for 1537 stations.

Usage

```
data(stationSummary)
```

Format

A data frame with 1537 observations on the following 20 variables.

id a list vector
name a list vector
location a list vector
river a list vector
stationDescription a list vector
catchmentDescription a list vector
hydrometricArea a list vector
operator a list vector
haName a list vector
gridReference a list vector
stationType a list vector
catchmentArea a list vector
gdfStart a list vector
gdfEnd a list vector
farText a list vector
categories a list vector
altitude a list vector
sensitivity a list vector
Latitude a numeric vector
Longitude a numeric vector

Details

This is the full set of river station that can be retrieved using UK NRFA APIs.

Source

<http://www.ceh.ac.uk/data/nrfa/>

Examples

`data(stationSummary)`

ToJSONarray *Transforms a data.frame into a JSON array in a format compatible with D3.js and Protovis (source by: <http://theweiluo.wordpress.com/2011/09/30/r-to-json-for-d3-js-and-protovis/>)*

Description

This function transforms a R data frame into a JSON array such that each row in R becomes an JSON object in the array.

Usage

```
ToJSONarray(dtf)
```

Arguments

dtf this is a data.frame

Details

The rjson/RJSONIO packages convert a data frame into a JSON hashmap, in which each column of the data frame becomes a named array.

Value

JSON array in a format compatible with D3.js and Protovis

Author(s)

Claudia Vitolo

Examples

```
# ToJSONarray(dtf)
```


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