

Package: BioSIM (via r-universe)

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Type Package

Title 'BioSIM' Client for 'BioSIM' Web API

Version 1.1.2

Description Provide a client that retrieves the climate variables from the original 'BioSIM' application hosted on a server. The 'BioSIM' application is being developed and maintained by the Canadian Forest Service.

URL https://github.com/RNCan/BioSimClient_R/wiki

Depends R (>= 3.5.0)

Imports J4R (>= 1.3.0)

Remotes CWFC-CCFB/J4R

License LGPL-3

BugReports https://github.com/RNCan/BioSimClient_R/issues

Encoding UTF-8

LazyData true

RoxygenNote 7.3.3

SystemRequirements Java 8

Suggests testthat

Config/roxygen2/version 8.0.0

Config/pak/sysreqs default-jdk

Repository <https://predictiveecology.r-universe.dev>

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Contents

allMonths	2
biosimclient.config	2
biosimclient.getConfiguration	3
generateWeather	4
getAnnualNormals	5
getModelDefaultParameters	6
getModelHelp	6
getModelList	7
getMonthlyNormals	7
getNormals	8
settingEnv	9
shutdownClient	10
shutdownJava	10
twoLocationsInSouthernQuebec	11
Index	12

allMonths	<i>The list of all months</i>
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Description

The list of all months

Usage

allMonths

biosimclient.config	<i>Configure the client</i>
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Description

The forceClimateGenerationEnabled argument forces BioSIM to generate climate for past dates instead of using the observations from the climate stations. By default this option is set to false. The nbNearestNeighbours argument sets the number of stations for the imputation of climate variables.

Usage

```
biosimclient.config(  
  forceClimateGenerationEnabled = NULL,  
  nbNearestNeighbours = NULL,  
  isTestModeEnabled = NULL  
)
```

Arguments

forceClimateGenerationEnabled
a logical
nbNearestNeighbours
an integer
isTestModeEnabled
a logical (only for test purpose)

Details

If an argument is set to null, there is no effect at all. If all the arguments are set to null, then the configuration is reset to its default value: the climate variables of past dates relies on observations and the number of climate stations is set to 4.

Examples

```
## Not run:  
### enables the climate generation for past dates and uses 20 climate stations  
biosimclient.config(T, 20)  
  
### reset the configuration  
biosimclient.config()  
## End(Not run)
```

```
biosimclient.getConfiguration
```

Report of the climate generation settings

Description

The isForceClimateGenerationEnabled setting forces BioSIM to generate climate for past dates instead of using the observations from the climate stations. By default this option is set to false. The nbNearestNeighbours setting is the number of stations used to impute climate variables to a particular location.

Usage

```
biosimclient.getConfiguration()
```

Details

All the settings can be changed through the biosimclient.config function.

Value

a data.frame object

generateWeather	<i>Generate a meteorological time series and apply one or many models.</i>
-----------------	--

Description

This function generated a meteorological time series for some locations and applies one or many models on this series. Default RCP and Climate model are RCP45 and RCM4. The `CONSTANT_CLIMATE` rcp option actually reproduces the climate observed between 1991 and 2020.

Usage

```
generateWeather(  
  modelNames,  
  fromYr,  
  toYr,  
  id,  
  latDeg,  
  longDeg,  
  elevM = rep(NA, length(longDeg)),  
  rep = 1,  
  repModel = 1,  
  rcp = "RCP45",  
  climModel = "RCM4",  
  additionalParms = NULL  
)
```

Arguments

modelNames	a character or a vector of character. Should be one or some models listed in the available models (see the <code>getModelList()</code> method)
fromYr	the starting date (yr) of the period (inclusive)
toYr	the ending date (yr) of the period (inclusive)
id	a vector with the ids of the plots
latDeg	the latitudes of the plots
longDeg	the longitudes of the plots
elevM	the elevations of the plots (can contain some NA or can be NULL, in which cases BioSim relies on a digital elevation model)
rep	number of replicates of generated climate (is set to 1 by default)
repModel	number of replicates on the model end (is set to 1 by default)
rcp	an representative concentration pathway (either "CONSTANT_CLIMATE", "RCP45" or "RCP85")
climModel	a climatic model (either "RCM4", "GCM4" or "Hadley")
additionalParms	a list of named vectors with the additional parameters if needed

Value

a list of data.frame objects

Examples

```
locations <- BioSIM::twoLocationsInSouthernQuebec
addParms <- c("LowerThreshold"=5)
## Not run:
degreeDays <- generateWeather("DegreeDay_Annual", 2017, 2021, locations$Name, locations$Latitude,
                             locations$Longitude, locations$Elevation,
                             rcp = "RCP85", climModel = "GCM4",
                             additionalParms = list(addParms))
## End(Not run)
```

getAnnualNormals	<i>Return the annual normals for a period</i>
------------------	---

Description

Return the annual normals for a period

Usage

```
getAnnualNormals(
  period,
  id,
  latDeg,
  longDeg,
  elevM = rep(NA, length(longDeg)),
  rcp = "RCP45",
  climModel = "RCM4"
)
```

Arguments

period	a string representing the period (either "1951_1980", "1961_1990", "1971_2000", "1981_2010" up to "2071_2100")
id	a vector with the ids of the plots
latDeg	the latitudes of the plots
longDeg	the longitudes of the plots
elevM	the elevations of the plots (can contain some NA, in which case BioSim relies on a digital elevation model)
rcp	an representative concentration pathway (either "RCP45" or "RCP85")
climModel	a climatic model (either "RCM4", "GCM4" or "Hadley")

Value

a data.frame object

Examples

```
locations <- BioSIM::twoLocationsInSouthernQuebec
## Not run:
annualNormals <- getAnnualNormals("1981_2010", locations$Name, locations$Latitude,
                                   locations$Longitude, locations$Elevation)
## End(Not run)
```

```
getModelDefaultParameters
```

Provide help for a particular model

Description

Provide help for a particular model

Usage

```
getModelDefaultParameters(modelName)
```

Arguments

modelName should be one of the character string returned by the getModelList function

Examples

```
## Not run:
getModelHelp("Spruce_Budworm_Biology")
## End(Not run)
```

```
getModelHelp
```

Provide help for a particular model

Description

Provide help for a particular model

Usage

```
getModelHelp(modelName)
```

Arguments

modelName should be one of the character string returned by the getModellList function

Examples

```
## Not run:  
getModelHelp("Spruce_Budworm_Biology")  
## End(Not run)
```

getModellList	<i>Return the list of models available in BioSim</i>
---------------	--

Description

Provide the list of model that can be used in BioSIM after generating the climate for some locations.

Usage

```
getModellList()
```

Examples

```
## Not run:  
getModellList()  
## End(Not run)
```

getMonthlyNormals	<i>Return the monthly normals for a period</i>
-------------------	--

Description

Return the monthly normals for a period

Usage

```
getMonthlyNormals(  
  period,  
  id,  
  latDeg,  
  longDeg,  
  elevM = rep(NA, length(longDeg)),  
  rcp = "RCP45",  
  climModel = "RCM4"  
)
```

Arguments

period	a string representing the period (either "1951_1980", "1961_1990", "1971_2000", "1981_2010" up to "2071_2100")
id	a vector with the ids of the plots
latDeg	the latitudes of the plots
longDeg	the longitudes of the plots
elevM	the elevations of the plots (can contain some NA, in which case BioSim relies on a digital elevation model)
rcp	an representative concentration pathway (either "RCP45" or "RCP85")
climModel	a climatic model (either "RCM4", "GCM4" or "Hadley")

Value

a data.frame object

Examples

```
locations <- BioSIM::twoLocationsInSouthernQuebec
## Not run:
monthlyMeans <- getMonthlyNormals("1981_2010", locations$Name, locations$Latitude,
                                   locations$Longitude, locations$Elevation)
## End(Not run)
```

getNormals	<i>Return the normals for a period</i>
------------	--

Description

If the argument `averageOverTheseMonths` is left NULL or empty, the monthly normals are provided. If this argument is filled with some months, then the normal are aggregated over these months.

Usage

```
getNormals(
  period,
  id,
  latDeg,
  longDeg,
  elevM = rep(NA, length(longDeg)),
  averageOverTheseMonths,
  rcp = "RCP45",
  climModel = "RCM4"
)
```

Arguments

period	a string representing the period (either "1951_1980", "1961_1990", "1971_2000", "1981_2010" up to "2071_2100")
id	a vector with the ids of the plots
latDeg	the latitudes of the plots
longDeg	the longitudes of the plots
elevM	the elevations of the plots (can contain some NA, in which case BioSim relies on a digital elevation model)
averageOverTheseMonths	a vector with some months if there is a need for aggregating the climate variables
rcp	an representative concentration pathway (either "RCP45" or "RCP85")
climModel	a climatic model (either "RCM4", "GCM4" or "Hadley")

Value

a data.frame object

Examples

```
locations <- BioSIM::twoLocationsInSouthernQuebec
## Not run:
summerMean <- getNormals("1981_2010", locations$Name, locations$Latitude,
                          locations$Longitude, locations$Elevation,
                          c("June", "July", "August"))
## End(Not run)
```

 settingEnv

The settings environment for this package

Description

This environment contains the general settings of the package.

Usage

```
settingEnv
```

shutdownClient	<i>Shut down the Java server</i>
----------------	----------------------------------

Description

This method overrides the original function of the J4R package. It only adds a call to the clearCache function before calling the original function of the J4R package.

Usage

```
shutdownClient()
```

Examples

```
## Not run:  
shutdownClient()  
## End(Not run)
```

shutdownJava	<i>Shut down the Java server</i>
--------------	----------------------------------

Description

This method overrides the original function of the J4R package. It only adds a call to the clearCache function before calling the original function of the J4R package.

Usage

```
shutdownJava()
```

Examples

```
## Not run:  
shutdownJava()  
## End(Not run)
```

`twoLocationsInSouthernQuebec`

A list of two plots located in southern Quebec

Description

A list of two plots located in southern Quebec

Usage

```
data(twoLocationsInSouthernQuebec)
```

Format

An object of class `data.frame` with 2 rows and 5 columns.

Examples

```
data(twoLocationsInSouthernQuebec)
```

Index

* **datasets**

twoLocationsInSouthernQuebec, [11](#)

allMonths, [2](#)

biosimclient.config, [2](#)

biosimclient.getConfiguration, [3](#)

generateWeather, [4](#)

getAnnualNormals, [5](#)

getModelDefaultParameters, [6](#)

getModelHelp, [6](#)

getModelList, [7](#)

getMonthlyNormals, [7](#)

getNormals, [8](#)

settingEnv, [9](#)

shutdownClient, [10](#)

shutdownJava, [10](#)

twoLocationsInSouthernQuebec, [11](#)