Package 'REddyProcNCDF'

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Type Package

Version 1.1.4

Title Reading Data from NetCDF Files for 'REddyProc'

Description Extension to 'REddyProc' that allows reading data from netCDF files.

URL https://github.com/bgctw/REddyProcNCDF

License GPL (>= 2)

Encoding UTF-8

LazyData true

Depends R (>= 3.0.0), REddyProc

Suggests ncdf4, RNetCDF, testthat, knitr, rmarkdown

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NeedsCompilation no

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Repository CRAN

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Contents

REddyProcNCDF-package *Reading data from NetCDF files for REddyProc*

Description

This package enhances REddyProc a package for standard and extensible Eddy-Covariance data post-processing includes uStar-filtering, gap-filling, and flux-partitioning. A general description and an online tool based on this REddyProc can be found here: https://www.bgc-jena.mpg.de/bgi/index.php/Services/REddyProcWeb.

This package adds functionality to read data from netCDF files.

Details

Reading data from NetCDF files was formerly part of REddyProc, but has been factored to this own package to decrease the number of dependencies in REddyProc.

The main functions

- Reading standard data from a NetCDF file: `fLoadFluxNCIntoDataframe`
- Reading a specific variable from a NetCDF file: `fAddNCFVar`

The package works with alternative backend-packages that are installed. For the default is the first entry of argument `packageNames` in `requireNetCDFPackage`. If the preference order for a specific package is changed, provide argument use: `prefNcPkg = requireNetCDFPackage(myPreferenceNameVector)` and subsequently specify argument `ncPkg = prefNcPkg` to other functions.

Time may be stored in different formats, and `fLoadFluxNCIntoDataframe` is parameterized by a argument `fReadTime`. The following functions are provided to construct time from different formats: These functions help with the preparation of your data for the analysis:

- from columnns 'year',...,'hour': `fReadTimeSeveralCols`
- from column in ISODate integer format: `fReadTimeBerkeley`

Further functionality.

- Get site information from BGI NetCDF files: `fLoadFluxNCInfo`

Author(s)

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fAddNCFVar *fAddNCFVar*

Description

Add variable from NetCDF file to data frame

Usage

```
fAddNCFVar(data, varNames, fileName, ncPkg = requireNetCDFPackage(),
    callingFunction = "", varRenames = varNames,
    ...)
```

Arguments

data	Data frame
varNames	Variable name or names (vector of strings)
fileName	NetCDF file name as a string
ncPkg	scalar string of package name to be used to be tried to used in this order
callingFunction	Name (string) of function called from
varRenames	Name (string) of the variable in data, offer renaming
...	further arguments to var.get.nc or ncvar_get , such as start and count

Value

Data frame with new nc variable added.

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See Also

fLoadFluxNCIntoDataframe

`fLoadFluxNCInfo` *Get site information from BGI NetCDF files*

Description

Load site information attributes such as latitude, longitude and others from BGI NetCDF files

Usage

```
fLoadFluxNCInfo(fileName, ncPkg = requireNetCDFPackage(),
    callingFunction = "")
```

Arguments

`fileName`	NetCDF file name as a string
`ncPkg`	scalar string of package name to be used
`callingFunction`	Name (string) of function called from

Details

Description of attribute list:

ID SiteID

DIMS Number of data rows

LON Longitude

LAT Latitude

TZ Time zone

ELEV Elevation

IGBP IGBP class

Value

Attibute list

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See Also

`fLoadFluxNCIntoDataframe`

fLoadFluxNCIntoDataframe *Load data from a NetCDF file*

Description

Load specified variables and time stamp information from NetCDF file in Fluxnet BGI format. The time stamp information needs to be provided as variables 'year', 'month', 'day', 'hour'.

Usage

```
fLoadFluxNCIntoDataframe(varNames, fileName,
    ncPkg = requireNetCDFPackage(), fReadTime = fReadTimeSeveralCols,
    ...)
```

Arguments

varNames	string vector of variables to be read in
fileName	File name as a string
ncPkg	scalar string of package name to be used
fReadTime	function that reads time columns It must append columns year (from 0AD), month, day, and hour (fractional) See fReadTimeSeveralCols
...	further arguments to var.get.nc or ncvar_get, such as start and count

Value

Data frame with data from nc file.

Author(s)

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Examples

```
examplePath <- system.file(
file.path('examples','Example_DE-Tha.1996.1998.hourly_selVars.nc')
, package = "REddyProcNCDF")
EddyNCData <- fLoadFluxNCIntoDataframe(c('NEE', 'Rg', 'NEE_f'), examplePath)
```

fReadTimeBerkeley *fReadTimeBerkeley*

Description

Reads time columns (year, month, day, hour) from column in ISODate integer format

Usage

```
fReadTimeBerkeley(data, fileName, ncPkg = requireNetCDFPackage(),
    callingFunction = "", colTime = "TIMESTAMP_END",
    ...)
```

Arguments

data	Data frame
fileName	NetCDF file name as a string
ncPkg	scalar string of package name to be used
callingFunction	Name (string) of function called from
colTime	the column name (string) holding time with format described in details
...	further arguments to var.get.nc or ncvar_get, such as start and count

Details

In the Berkeley-Release of the fluxnet data, the time is stored as an integer with base10-digits representing YYYYMMddhhmm

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See Also

fReadTimeSeveralCols

fLoadFluxNCIntoDataframe

`fReadTimeSeveralCols` *fReadTimeSeveralCols*

Description

Constructing time from columns 'year',...,'hour'

Usage

```
fReadTimeSeveralCols(data, fileName, ncPkg = requireNetCDFPackage(),
    callingFunction = "", colYear = "year",
    colMonth = "month", colDay = "day", colHour = "hour",
    defaultHour = 0, ...)
```

Arguments

`data`	Data frame
`fileName`	NetCDF file name as a string
`ncPkg`	scalar string of package name to be used
`callingFunction`	Name (string) of function called from
`colYear`	Name (string) of variable holding the year
`colMonth`	Name (string) of variable holding the month
`colDay`	Name (string) of variable holding the day
`colHour`	Name (string) of variable holding the hour
`defaultHour`	(numeric) default that is used when colHour = NA , when only days are specified
`...`	further arguments to var.get.nc or ncvar_get , such as start and count

Details

Time may be stored in different formats, and `fLoadFluxNCIntoDataframe` is parameterized by a argument `fReadTime`. The following functions are provided to construct time from different formats: These functions help with the preparation of your data for the analysis:

- from columns 'year',...,'hour': fReadTimeSeveralCols (this function)
- from column in ISODate integer format: `fReadTimeBerkeley`

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See Also

`fLoadFluxNCIntoDataframe`

requireNetCDFPackage *requireNetCDFPackage*

Description

require namespace of given NetCDF package

Usage

```
requireNetCDFPackage(packageNames = c("RNetCDF",
    "ncdf4"))
```

Arguments

packageNames	string vector: Name of R NetCDF packages to be tried to used in this order

Details

currently 'RNetCDF' and 'ncdf4' are supported Loading package namespace is tried in the order of occurrence in packageNames

Value

The package name whose namespace has been loaded

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