

Package ‘neonUtilities’

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Title Utilities for Working with NEON Data

Description NEON data packages can be accessed through the NEON Data Portal <<https://data.neonscience.org/home>> or through the NEON Data API (see <<https://data.neonscience.org/data-api>> for documentation). Data delivered from the Data Portal are provided as monthly zip files packaged within a parent zip file, while individual files can be accessed from the API. This package provides tools that aid in discovering, downloading, and reformatting data prior to use in analyses. This includes downloading data via the API, merging data tables by type, and converting formats. For more information, see the readme file at <<https://github.com/NEONScience/NEON-utilities>>.

Depends R (>= 3.4.0)

biocViews

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Suggests rhdf5, raster, R.utils, sp, testthat, magrittr

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URL <https://github.com/NEONScience/NEON-utilities>

BugReports <https://github.com/NEONScience/NEON-utilities/issues>

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byFileAOP

*Serially download all AOP files for a given site, year, and product***Description**

Query the API for AOP data by site, year, and product, and download all files found, preserving original folder structure. Downloads serially to avoid overload; may take a very long time.

Usage

```
byFileAOP(dpID, site, year, check.size = TRUE, savepath = NA, token = NA)
```

Arguments

dpID	The identifier of the NEON data product to pull, in the form DPL.PRNUM.REV, e.g. DP1.10023.001
site	The four-letter code of a single NEON site, e.g. 'CLBJ'.
year	The four-digit year to search for data. Defaults to 2017.
check.size	T or F, should the user approve the total file size before downloading? Defaults to T. When working in batch mode, or other non-interactive workflow, use check.size=F.
savepath	The file path to download to. Defaults to NA, in which case the working directory is used.
token	User specific API token (generated within neon.datascience user accounts)

Value

A folder in the working directory, containing all files meeting query criteria.

Author(s)

Claire Lunch <clunch@battelleecology.org> Christine Laney <claney@battelleecology.org>

References

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Examples

```
## Not run:
# To download 2017 vegetation index data from San Joaquin Experimental Range:
byFileAOP(dpID="DP3.30026.001", site="SJER", year="2017")

## End(Not run)
```

byTileAOP	<i>Download AOP tiles overlapping specified coordinates for a given site, year, and product</i>
-----------	---

Description

Query the API for AOP data by site, year, product, and tile location, and download all files found. Downloads serially to avoid overload; may take a very long time.

Usage

```
byTileAOP(
  dpID,
  site,
  year,
  easting,
  northing,
  buffer = 0,
  check.size = TRUE,
  savepath = NA,
  token = NA
)
```

Arguments

dpID	The identifier of the NEON data product to pull, in the form DPL.PRNUM.REV, e.g. DP1.10023.001
site	The four-letter code of a single NEON site, e.g. 'CLBJ'.
year	The four-digit year to search for data. Defaults to 2017.
easting	A vector containing the easting UTM coordinates of the locations to download.
northing	A vector containing the northing UTM coordinates of the locations to download.
buffer	Size, in meters, of the buffer to be included around the coordinates when determining which tiles to download. Defaults to 0. If easting and northing coordinates are the centroids of NEON TOS plots, use buffer=20.
check.size	T or F, should the user approve the total file size before downloading? Defaults to T. When working in batch mode, or other non-interactive workflow, use check.size=F.
savepath	The file path to download to. Defaults to NA, in which case the working directory is used.
token	User specific API token (generated within neon.datascience user accounts)

Value

A folder in the working directory, containing all files meeting query criteria.

Author(s)

Claire Lunch <clunch@battelleecology.org> Christine Laney <claney@battelleecology.org>

References

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convByteSize *Convert a number of bytes into megabytes or gigabytes*

Description

For any number of bytes, convert to a number of MB or GB

Usage

convByteSize(objSize)

Arguments

objSize The size in bytes

Value

The size of the file in megabytes or gigabytes

Author(s)

Claire Lunch <clunch@battelleecology.org>

References

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`footRaster`*Extract eddy covariance footprint data from HDF5 format*

Description

Create a raster of flux footprint data. Specific to expanded package of eddy covariance data product: DP4.00200.001

Usage

```
footRaster(filepath)
```

Arguments

`filepath` One of: a folder containing NEON EC H5 files, a zip file of DP4.00200.001 data downloaded from the NEON data portal, a folder of DP4.00200.001 data downloaded by the `neonUtilities::zipsByProduct()` function, or a single NEON EC H5 file. Filepath can only contain files for a single site. [character]

Details

Given a filepath containing H5 files of expanded package DP4.00200.001 data, extracts flux footprint data and creates a raster.

Value

A `rasterStack` object containing all the footprints in the input files, plus one layer (the first in the stack) containing the mean footprint.

Author(s)

Claire Lunch <clunch@battelleecology.org>

References

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Examples

```
## Not run:  
# To run the function on a zip file downloaded from the NEON data portal:  
ftprnt <- footRaster(filepath="~/NEON_eddy-flux.zip")  
  
## End(Not run)
```

getAPI	<i>Get the data from API</i>
--------	------------------------------

Description

Accesses the API with options to use the user-specific API token generated within neon.datascience user accounts.

Usage

```
getAPI(apiURL, token = NA)
```

Arguments

apiURL	The API endpoint URL
token	User specific API token (generated within neon.datascience user accounts). Optional.

Author(s)

Nate Mietkiewicz <mietkiewicz@battelleecology.org>

References

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getAvg	<i>Get a list of the available averaging intervals for a data product</i>
--------	---

Description

Most IS products are available at multiple averaging intervals; get a list of what's available for a given data product

Usage

```
getAvg(dpID, token = NA_character_)
```

Arguments

dpID	The identifier of the NEON data product, in the form DPL.PRNUM.REV, e.g. DP1.00006.001
token	User specific API token (generated within neon.datascience user accounts)

Value

A vector of the available averaging intervals, typically in minutes.

Author(s)

Claire Lunch <clunch@battelleecology.org>

References

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Examples

```
# Get available averaging intervals for PAR data product
getAvg("DP1.00024.001")
```

getDatatable	<i>Get NEON data table</i>
--------------	----------------------------

Description

This is a function to retrieve a data table from the NEON data portal for sites and dates provided by the enduser. NOTE that this function only works for NEON Observation System (OS) data products, and only for select tables

Usage

```
getDatatable(
  dpid = NA,
  data_table_name = NA,
  sample_location_list = NA,
  sample_location_type = "siteID",
  sample_date_min = "2012-01-01",
  sample_date_max = Sys.Date(),
  sample_date_format = "%Y-%m-%d",
  data_package_type = "basic",
  url_prefix_data = "https://data.neonscience.org/api/v0/data/",
  url_prefix_products = "https://data.neonscience.org/api/v0/products/",
  token = NA_character_
)
```

Arguments

dpid	character sting for NEON data product ID
data_table_name	character sting for name of the data table to download, e.g., 'sls_soilCoreCollection'

sample_location_list	list of sites, domains, etc. If NA, retrieve all data for the given data table / dpid combination.
sample_location_type	character sting for location type, such as 'siteID'. Must be one of the NEON controlled terms. If you're unsure, use 'siteID'
sample_date_min	start date for query. Default is 1-Jan-2012, and this should capture the earliest NEON data record.
sample_date_max	end date for query. Default is current date.
sample_date_format	date format. Default/expected format is yyyy-mm-dd
data_package_type	package type, either 'basic' or 'expanded'. If unsure, use 'expanded'
url_prefix_data	data endpoint for NEON API.
url_prefix_products	products endpoint for NEON API.
token	User specific API token (generated within neon.datascience user accounts)

Value

data frame with selected NEON data

Author(s)

Eric R. Sokol <esokol@battelleecology.org>

References

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Examples

```
sls_soilCoreCollection <- getDatatable(  
  sample_location_list = c('CPER', 'TALL'),  
  sample_date_min = '2014-01-01',  
  sample_date_max = '2014-02-01',  
  dpid = "DP1.10086.001",  
  data_table_name = 'sls_soilCoreCollection')
```

getFileUrls	<i>Get and store the file names, S3 URLs, file size, and download status (default = 0) in a data frame</i>
-------------	--

Description

Used to generate a data frame of available AOP files.

Usage

```
getFileUrls(m.urls, token = NA)
```

Arguments

m.urls	The monthly API URL for the AOP files
token	User specific API token (generated within neon.datascience user accounts)

Value

A dataframe comprised of file names, S3 URLs, file size, and download status (default = 0)

Author(s)

Claire Lunch <clunch@battelleecology.org> Christine Laney <claney@battelleecology.org>

References

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getPackage	<i>Get NEON data package</i>
------------	------------------------------

Description

Get a zipped file for a single data product, site, and year-month combination. Use the NEON data portal or API to determine data availability by data product, site, and year-month combinations.

Usage

```
getPackage(dpID, site_code, year_month, package = "basic", savepath = getwd())
```

Arguments

dpID	The identifier of the NEON data product to pull, in the form DPL.PRNUM.REV, e.g. DP1.10023.001
site_code	A four-letter NEON research site code, such as HEAL for Healy.
year_month	The year and month of interest, in format YYYY-MM.
package	Either 'basic' or 'expanded', indicating which data package to download. Defaults to basic.
savepath	The location to save the output files to

Value

A zipped monthly file

Author(s)

Christine Laney <claney@battelleecology.org>

References

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getProductInfo	<i>Get NEON data product information</i>
----------------	--

Description

Use the NEON API to get data product information such as availability, science team, etc.

Usage

```
getProductInfo(dpID = "", token = NA)
```

Arguments

dpID	The data product id (optional), formatted as DP#.#####.###
token	User specific API token (generated within neon.datascience user accounts)

Value

A named list of metadata and availability information for a single data product. If the dpID argument is omitted, a table of information for all data products in the NEON catalog.

Author(s)

Christine Laney <claney@battelleecology.org>

References

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Examples

```
# Get documentation and availability of plant foliar properties data product
cfcInfo <- getProductInfo("DP1.10026.001")
```

getProductSensors	<i>Get data product-sensor relationships</i>
-------------------	--

Description

Pull all data from the NEON API /products endpoint, create a data frame with data product ID, data product name, and sensor type.

Usage

```
getProductSensors()
```

Value

A data frame

Author(s)

Christine Laney <claney@battelleecology.org>

References

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Examples

```
## Not run:
sensors <- getProductSensors()

## End(Not run)
```

`getReadmePublicationDate`*Scrape the publication date from each ReadMe file*

Description

Given a directory, this will recursively list all of the ReadMe files that were unzipped. This should result in a single text file with a list of all of the publication dates from the ReadMe file.

Usage

```
getReadmePublicationDate(savepath, out_filepath, dpID)
```

Arguments

<code>savepath</code>	The root folder directory where the ReadMe files are located.
<code>out_filepath</code>	The output directory and filename.
<code>dpID</code>	The data product identifier

Author(s)

Nathan Mietkiewicz <mietkiewicz@battelleecology.org>

References

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`getRecentPublication` *Returns the most recent files for those that do not need stacking*

Description

Given a list of files, this will order and return the file with the most recent publication date.

Usage

```
getRecentPublication(inList)
```

Arguments

<code>inList</code>	The list of files.
---------------------	--------------------

Author(s)

Nathan Mietkiewicz <mietkiewicz@battelleecology.org>

References

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getTaxonTable	<i>Get NEON taxon table</i>
---------------	-----------------------------

Description

This is a function to retrieve a taxon table from the NEON data portal for the taxon type by the enduser.

Usage

```
getTaxonTable(
  taxonType = NA,
  recordReturnLimit = NA,
  stream = "true",
  token = NA
)
```

Arguments

taxonType	Character string for the taxonTypeCode. Must be one of ALGAE, BEETLE, BIRD, FISH, HERPETOLOGY, MACROINVERTEBRATE, MOSQUITO, MOSQUITO_PATHOGENS, SMALL_MAMMAL, PLANT, TICK
recordReturnLimit	Integer. The number of items to limit the result set to. If NA, will return all records in table.
stream	Character string, true or false. Option to obtain the result as a stream. Utilize for large requests.
token	User specific API token (generated within neon.datascience user accounts)

Value

data frame with selected NEON data

Author(s)

Eric R. Sokol <esokol@battelleecology.org>

References

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Examples

```
# taxonTypeCode must be one of
# ALGAE, BEETLE, BIRD, FISH,
# HERPETOLOGY, MACROINVERTEBRATE,
# MOSQUITO, MOSQUITO_PATHOGENS,
# SMALL_MAMMAL, PLANT, TICK
#####
# return the first 4 fish records
taxa_table <- getTaxonTable('FISH', recordReturnLimit = 4)
```

getTileUrls	<i>Get and store the file names, S3 URLs, file size, and download status (default = 0) in a data frame</i>
-------------	--

Description

Produces a data frame that is populated by available tiles for the AOP product.

Usage

```
getTileUrls(m.urls, tileEasting, tileNorthing, token = NA_character_)
```

Arguments

m.urls	The monthly API URL for the AOP tile.
tileEasting	A vector containing the easting UTM coordinates of the locations to download.
tileNorthing	A vector containing the northing UTM coordinates of the locations to download.
token	User specific API token (generated within neon.datascience user accounts). Optional.

Value

A dataframe comprised of file names, S3 URLs, file size, and download status (default = 0)

Author(s)

Claire Lunch <clunch@battelleecology.org> Christine Laney <claney@battelleecology.org>

References

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getTimeIndex *Get a list of the available time intervals for a data product*

Description

Most IS products are available at multiple time intervals; get a list of what's available for a given data product

Usage

```
getTimeIndex(dpID, token = NA_character_)
```

Arguments

dpID	The identifier of the NEON data product, in the form DPL.PRNUM.REV, e.g. DP1.00006.001
token	User specific API token (generated within neon.datascience user accounts)

Value

A vector of the available time intervals, typically in minutes.

Author(s)

Claire Lunch <clunch@battelleecology.org>

References

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Examples

```
# Get available time intervals for PAR data product
getTimeIndex("DP1.00024.001")
```

getVarsEddy *Extract list of eddy covariance tables from HDF5 files*

Description

Extracts a list of table metadata from a single HDF5 file. Specific to eddy covariance data product: DP4.00200.001. Can inform inputs to stackEddy(); variables listed in 'name' are available inputs to the 'var' parameter in stackEddy().

Usage

```
getVarsEddy(filepath)
```


Arguments

filepath The folder containing the H5 file [character]

Value

A data frame of the metadata for each data table in the HDF5 file

Author(s)

Claire Lunch <clunch@battelleecology.org>

References

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Examples

```
## Not run:
# read variables from a file in a hypothetical filepath
ec.vars <- getVarsEddy(filepath='/data/NEON.D19.BONA.DP4.00200.001.nsae.2017-12.basic.h5')

## End(Not run)
```

getZipUrls	<i>Get and store the file names, S3 URLs, file size, and download status (default = 0) in a data frame</i>
------------	--

Description

Used to generate a data frame of available zipfile URLs.

Usage

```
getZipUrls(month.urls, avg, package, dpID, messages, token = NA_character_)
```

Arguments

month.urls The monthly API URL for the URL files
 avg Global variable for averaging interval
 package Global variable for package type (basic or expanded)
 dpID Global variable for data product ID
 messages Error/warning messages from previous steps
 token User specific API token (generated within neon.datascience user accounts)

Value

A dataframe comprised of file names, S3 URLs, file size, and download status (default = 0)

Author(s)

Claire Lunch <clunch@battelleecology.org> Christine Laney <claney@battelleecology.org>

References

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listFilesInZip	<i>Get a data frame with the names of all files within a zipped NEON data package</i>
----------------	---

Description

Given the top level zip file, return dataframe of all of the files within it without unzipping the file

Usage

```
listFilesInZip(zippath)
```

Arguments

zippath The path to a zip file

Value

A list of filenames within the given zip file

Author(s)

Christine Laney <claney@battelleecology.org>

References

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listZipfiles	<i>Get all zip file names within a zipped NEON data package</i>
--------------	---

Description

Given the data frame of all the files within the top level zip file, return an array of just the zip file names (no pdf, xml, or other files).

Usage

```
listZipfiles(zippath)
```

Arguments

zippath	The path to a zip file
---------	------------------------

Value

An array of all zip files contained within the focal zip file

Author(s)

Christine Laney <claney@battelleecology.org>

References

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loadByProduct	<i>Get files from NEON API, stack tables, and load into the current environment</i>
---------------	---

Description

Pull files from the NEON API, by data product, merge data for each table, and read into the current R environment

Usage

```
loadByProduct(  
  dpID,  
  site = "all",  
  startdate = NA,  
  enddate = NA,  
  package = "basic",  
  timeIndex = "all",
```

```

    check.size = TRUE,
    nCores = 1,
    forceParallel = FALSE,
    token = NA,
    avg = NA
  )

```

Arguments

dpID	The identifier of the NEON data product to pull, in the form DPL.PRNUM.REV, e.g. DP1.10023.001
site	Either the string 'all', meaning all available sites, or a character vector of 4-letter NEON site codes, e.g. c('ONAQ', 'RMNP'). Defaults to all.
startdate	Either NA, meaning all available dates, or a character vector in the form YYYY-MM, e.g. 2017-01. Defaults to NA.
enddate	Either NA, meaning all available dates, or a character vector in the form YYYY-MM, e.g. 2017-01. Defaults to NA.
package	Either 'basic' or 'expanded', indicating which data package to download. Defaults to basic.
timeIndex	Either the string 'all', or the time index of data to download, in minutes. Only applicable to sensor (IS) data. Defaults to 'all'.
check.size	T or F, should the user approve the total file size before downloading? Defaults to T. When working in batch mode, or other non-interactive workflow, use check.size=F.
nCores	The number of cores to parallelize the stacking procedure. By default it is set to a single core.
forceParallel	If the data volume to be processed does not meet minimum requirements to run in parallel, this overrides. Set to FALSE as default.
token	User specific API token (generated within neon.datascience user accounts)
avg	Deprecated; use timeIndex

Details

All available data meeting the query criteria will be downloaded. Most data products are collected at only a subset of sites, and dates of collection vary. Consult the NEON data portal for sampling details. Dates are specified only to the month because NEON data are provided in monthly packages. Any month included in the search criteria will be included in the download. Start and end date are inclusive.

Value

A named list of all the data tables in the data product downloaded, plus a validation file and a variables file, as available.

Author(s)

Claire Lunch <clunch@battelleecology.org>

References

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Examples

```
## Not run:  
# To download plant foliar properties data from all sites, expanded data package:  
cfc <- loadByProduct(dpID="DP1.10026.001", site="all", package="expanded")  
  
## End(Not run)
```

quietMessages	<i>Will suppress all output messages, while retaining the output dataframe</i>
---------------	--

Description

Used to quiet all output messages

Usage

```
quietMessages(toBeQuieted)
```

Arguments

toBeQuieted Input to be quieted

Value

The expected output without associated messages/warnings.

Author(s)

Nate Mietkiewicz <mietkiewicz@battelleecology.org>

References

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readTableNEON	<i>Read a NEON data table with correct data types for each variable</i>
---------------	---

Description

Load a table into R, assigning classes to each column based on data types in variables file; or convert a table already loaded

Usage

```
readTableNEON(dataFile, varFile)
```

Arguments

dataFile	A data frame containing a NEON data table, or the filepath to a data table to load
varFile	A data frame containing the corresponding NEON variables file, or the filepath to the variables file

Value

A data frame of a NEON data table, with column classes assigned by data type

Author(s)

Claire Lunch <clunch@battelleecology.org>

References

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shared_flights	<i>Flight coverage information</i>
----------------	------------------------------------

Description

A dataset containing NEON site codes for places where a single AOP flight may cover multiple sites

Usage

```
shared_flights
```

Format

A data frame with 2 variables:

site site code of a NEON site

flightSite site code that matches the file naming for flights that may include "site"

Source

NEON flight plans

stackByTable

Join data files in a zipped NEON data package by table type

Description

Given a zipped data file, do a full join of all data files, grouped by table type. This should result in a small number of large files.

Usage

```
stackByTable(
  filepath,
  savepath = NA,
  folder = FALSE,
  saveUnzippedFiles = FALSE,
  dpID = NA,
  nCores = 1
)
```

Arguments

filepath	The location of the zip file
savepath	The location to save the output files to
folder	T or F: does the filepath point to a parent, unzipped folder, or a zip file? If F, assumes the filepath points to a zip file. Defaults to F. No longer needed; included for back compatibility.
saveUnzippedFiles	T or F: should the unzipped monthly data folders be retained?
dpID	Data product ID of product to stack. Not needed; defaults to NA, included for back compatibility
nCores	The number of cores to parallelize the stacking procedure. To automatically use the maximum number of cores on your machine we suggest setting nCores=parallel::detectCores(). By default it is set to a single core.

Value

All files are unzipped and one file for each table type is created and written. If savepath="envt" is specified, output is a named list of tables; otherwise, function output is null and files are saved to the location specified.

Author(s)

Christine Laney <claney@battelleecology.org> Claire Lunch <clunch@battelleecology.org>

References

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Examples

```
## Not run:
# To unzip and merge files downloaded from the NEON Data Portal
stackByTable("~/NEON_par.zip")

# To unzip and merge files downloaded using zipsByProduct()
stackByTable("~/filesToStack00024")

## End(Not run)
```

stackDataFilesParallel

Join data files in a unzipped NEON data package by table type

Description

Given a folder of unzipped files (unzipped NEON data file), do a full join of all data files, grouped by table type. This should result in a small number of large files.

Usage

```
stackDataFilesParallel(folder, nCores = 1, dpID)
```

Arguments

folder	The location of the data
nCores	The number of cores to parallelize the stacking procedure. To automatically use the maximum number of cores on your machine we suggest setting 'nCores=parallel::detectCores()'. By default it is set to a single core. If the files are less than 25000 bytes the userdefined nCores will be overridden to a single core.
dpID	The data product identifier

Value

One file for each table type is created and written.

Author(s)

Christine Laney <claney@battelleecology.org>

References

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stackEddy

Extract eddy covariance data from HDF5 format

Description

Convert data of choice from HDF5 to tabular format. Specific to eddy covariance data product: DP4.00200.001

Usage

```
stackEddy(filepath, level = "dp04", var = NA, avg = NA)
```

Arguments

filepath	One of: a folder containing NEON EC H5 files, a zip file of DP4.00200.001 data downloaded from the NEON data portal, a folder of DP4.00200.001 data downloaded by the neonUtilities::zipsByProduct() function, or a single NEON EC H5 file [character]
level	The level of data to extract; one of dp01, dp02, dp03, dp04 [character]
var	The variable set to extract, e.g. co2Turb [character]
avg	The averaging interval to extract, in minutes [numeric]

Details

Given a filepath containing H5 files of DP4.00200.001 data, extracts variables, stacks data tables over time, and joins variables into a single table. For data product levels 2-4 (dp02, dp03, dp04), joins all available data, except for the flux footprint data in the expanded package. For dp01, an averaging interval and a set of variable names must be provided as inputs.

Value

A named list of data frames. One data frame per site, plus one data frame containing the metadata (objDesc) table and one data frame containing units for each variable (variables).

Author(s)

Claire Lunch <clunch@battelleecology.org>

References

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Examples

```
## Not run:
# To extract and merge Level 4 data tables, where data files are in the working directory
flux <- stackEddy(filepath=getwd(), level='dp04', var=NA, avg=NA)

## End(Not run)
```

table_types	<i>Publication table information</i>
-------------	--------------------------------------

Description

A dataset containing publication table names, descriptions, type (site-date, site-all, lab-all, lab-current), and a time index

Usage

table_types

Format

A data frame with 5 variables. Number of rows changes frequently as more tables are added:

productID data product ID

tableName name of table

tableDesc description of table

tableType type of table (important for knowing which tables to stack, and how to stack)

tableTMI a time index (e.g., 0 = native resolution, 1 = 1 minute, 30 = 30 minute averages or totals)

Source

NEON database

transformFileToGeoCSV *Transform NEON CSV file to GeoCSV*

Description

Read in a NEON monthly data zip file and parse the respective variables file to create a new GeoCSV file

Usage

```
transformFileToGeoCSV(infile, varfile, outfile)
```

Arguments

infile	The path to the file that needs to be parsed
varfile	The path to the variables file needed to parse the infile
outfile	The path where the new GeoCSV file should be placed

Value

The same data file with a GeoCSV header

Author(s)

Christine Laney <claney@battelleecology.org>

References

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unzipZipfileParallel *Unzip a zip file either at just the top level or recursively through the file*

Description

Unzip a zip file either at just the top level or recursively through the file

Usage

```
unzipZipfileParallel(  
  zippath,  
  outpath = substr(zippath, 1, nchar(zippath) - 4),  
  level = "all",  
  nCores = 1  
)
```

Arguments

zippath	The filepath of the input file
outpath	The name of the folder to save unpacked files to
level	Whether the unzipping should occur only for the 'top' zip file, or unzip 'all' recursively, or only files 'in' the folder specified
nCores	Number of cores to use for parallelization

Author(s)

Christine Laney <claney@battelleecology.org> Claire Lunch <clunch@battelleecology.org>

References

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zipsByProduct	<i>Get files from NEON API to feed the stackByTable() function</i>
---------------	--

Description

Pull files from the NEON API, by data product, in a structure that will allow them to be stacked by the stackByTable() function

Usage

```
zipsByProduct(
  dpID,
  site = "all",
  startdate = NA,
  enddate = NA,
  package = "basic",
  timeIndex = "all",
  check.size = TRUE,
  savepath = NA,
  load = F,
  token = NA,
  avg = NA
)
```

Arguments

dpID	The identifier of the NEON data product to pull, in the form DPL.PRNUM.REV, e.g. DP1.10023.001
site	Either the string 'all', meaning all available sites, or a character vector of 4-letter NEON site codes, e.g. c('ONAQ', 'RMNP'). Defaults to all.

startdate	Either NA, meaning all available dates, or a character vector in the form YYYY-MM, e.g. 2017-01. Defaults to NA.
enddate	Either NA, meaning all available dates, or a character vector in the form YYYY-MM, e.g. 2017-01. Defaults to NA.
package	Either 'basic' or 'expanded', indicating which data package to download. Defaults to basic.
timeIndex	Either the string 'all', or the time index of data to download, in minutes. Only applicable to sensor (IS) data. Defaults to 'all'.
check.size	T or F, should the user approve the total file size before downloading? Defaults to T. When working in batch mode, or other non-interactive workflow, use check.size=F.
savepath	The location to save the output files to
load	T or F, are files saved locally or loaded directly? Used silently with loadByProduct(), do not set manually.
token	User specific API token (generated within neon.datascience user accounts). Optional.
avg	Deprecated; use timeIndex

Details

All available data meeting the query criteria will be downloaded. Most data products are collected at only a subset of sites, and dates of collection vary. Consult the NEON data portal for sampling details. Dates are specified only to the month because NEON data are provided in monthly packages. Any month included in the search criteria will be included in the download. Start and end date are inclusive. timeIndex: NEON sensor data are published at pre-determined averaging intervals, usually 1 and 30 minutes. The default download includes all available data. Download volume can be greatly reduced by downloading only the 30 minute files, if higher frequency data are not needed. Use getTimeIndex() to find the available averaging intervals for each sensor data product.

Value

A folder in the working directory (or in savepath, if specified), containing all zip files meeting query criteria.

Author(s)

Claire Lunch <clunch@battelleecology.org>

References

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Examples

```
## Not run:
# To download plant foliar properties data from all sites, expanded data package:
zipsByProduct(dpID="DP1.10026.001", site="all", package="expanded")

## End(Not run)
```

zipsByURI

*Get files from NEON ECS Bucket using URLs in stacked data***Description**

Read in a set of URLs from NEON data tables and then download the data from the NEON ECS buckets. Assumes data tables are in the format resulting from merging files using `stackByTable()`. File downloads from ECS can be extremely large; be prepared for long download times and large file storage.

Usage

```
zipsByURI(
  filepath,
  savepath = paste0(filepath, "/ECS_zipFiles"),
  pick.files = FALSE,
  check.size = TRUE,
  unzip = TRUE,
  saveZippedFiles = FALSE
)
```

Arguments

<code>filepath</code>	The location of the NEON data containing URIs
<code>savepath</code>	The location to save the output files from the ECS bucket, optional. Defaults to creating a "ECS_zipFiles" folder in the filepath directory.
<code>pick.files</code>	T or F, should the user be told the name of each file before downloading? Defaults to F. When working in batch mode, or other non-interactive workflow, use <code>pick.files=F</code> .
<code>check.size</code>	T or F, should the user be told the total file size before downloading? Defaults to T. When working in batch mode, or other non-interactive workflow, use <code>check.size=F</code> .
<code>unzip</code>	T or F, indicates if the downloaded zip files from ECS buckets should be unzipped into the same directory, defaults to T. Supports .zip and .tar.gz files currently.
<code>saveZippedFiles</code>	T or F: should the zip files be retained after unzipping? Defaults to F.

Value

A folder in the working directory (or in `savepath`, if specified), containing all files meeting query criteria.

Author(s)

Kaelin Cawley <kcawley@battelleecology.org>

References

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Examples

```
## Not run:  
# To download stream morphology data from stacked data:  
zipsByURI(filepath="~/filesToStack00131/stackedFiles")  
  
## End(Not run)
```

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