Package 'rhobo'

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Type Package

Title Quality control assistant for HOBO data

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Author Rosalie Bruel [aut, cre],
Sophie Guillon [aut]

Maintainer Rosalie Bruel <rosaliebruel@gmail.com>

Description The R package allows to read in the raw HOBO files downloaded through the HOBO software and compute the dissolved oxygen correction factors. Functions are also included to help append new data to previous data files.

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Encoding UTF-8

LazyData true

Roxygen list(markdown = TRUE)

RoxygenNote 7.2.3

VignetteBuilder knitr

Imports LakeMetabolizer,
lubridate,
dplyr,
stringr,
ggplot2

Suggests testthat (>= 3.0.0),
knitr,
rmarkdown

Config/testthat/edition 3

R topics documented:

`append.new.HOBO.file` *Combine previous HOBO file with new HOBO file*

Description

Takes the previously QC'd HOBO file and append the new dataset.

Usage

```
append.new.HOBO.file(
  newfile,
  file2append,
  CF_init = 1,
  TM_init,
  CF_end = 1,
  TM_end
)
```

Arguments

`newfile`	data frame of new HOBO dataset that need to be appended to the old one. "datetime" format has been formated within the read.hobo() function.
`file2append`	data frame of old HOBO dataset the new HOBO data frame will be appended to. The "datetime" format is formated within the current function.
`CF_init`	correction factor at the beginning
`TM_init`	Time measurement initialization : when probes are back in the lakes
`CF_end`	correction factor at the end
`TM_end`	Time measurement end: when probes are taken out of the lakes
`ind_init`	index of when to start correcting the measurements
`ind_end`	index of when to stop correcting the measurements

Author(s)

Rosalie Bruel

correction.factor.do *Compute dissolved oxygen correction factors*

Description

Compute dissolved oxygen correction factor pre- and post-deployment by calculating the ratio between the theoritical dissolved oxygen concentration at saturation with the measured oxygen concentration. Requires the atmospheric pressure and the time the calculation can be made for (i.e., when the sensors are taken out their bubble bath, where the oxygen saturation should be at the maximum).

Usage

```
correction.factor.do(
  filename,
  TC_pre,
  TC_post,
  Pbaro_mbar_init,
  Pbaro_mbar_end,
  n = 4
)
```

Arguments

filename	path to file we need to calculate the correction factors for. The file is a raw HOBO file, with temperature and oxygen.
TC_pre	datetime of end of the "initialization" calibration (pre-deployment)
TC_post	datetime of end of the "end of deployement" calibration (post-deployment)
Pbaro_mbar_init	Atmospheric pressure in millibars during the "initialization" calibration (pre-deployment)
Pbaro_mbar_end	Atmospheric pressure in millibars during the "end of deployement" calibration (post-deployment)
n	number of observations PRIOR to TC_pre and TC_post used to compute the oxygen mean for computing correction factor. Default to n = 4.

Author(s)

Rosalie Bruel

interp.p *Interpolate the correction factor*

Description

Interpolate the correction factor at each time step between the start and end of deployment.

Usage

```
interp.p(x, ind_init, ind_end, CF_init, CF_end)
```

Arguments

x	HOBO dataset
ind_init	index of when to start correcting the measurements (start of deployment)
ind_end	index of when to stop correcting the measurements (end of deployment)
CF_init	correction factor at the beginning
CF_end	correction factor at the end

Author(s)

Sophie Guillon

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list.recent.files *List most recent files*

Description

Will find inside the folder with all the files the file with the recent-most data, per lake. Name of each data file sould follow the format: "lacXX_data_compile_YYYYMM_YYYYMM.txt" or "lacXX_data_compile_YYYYMM.txt"

Usage

```
list.recent.files(path)
```

Arguments

path	Path to folder with all the files. Format of files within the path should be "lacXX_data_compile_YYYYMM_YYYYMM.txt". lacXX gives the lac number, and YYYYMM are the start and end dates of the recording. The second date will be used to filter out the most recent file.

Author(s)

Rosalie Bruel

pCF *Visualize correction factors at the beginning and end of deployment*

Description

ggplot visual of correction factors, per lake

Usage

```
pCF(x = NULL)
```

Arguments

x	output dataframe from the correction.factor.do function

Author(s)

Rosalie Bruel

pCF.all *Visualize correction factors at the beginning and end of deployment*

Description

ggplot visual of correction factors, per lake. Uses

Usage

```
pCF.all(
  x = NULL,
  alldat = TRUE,
  lakename = "Lake",
  orderby = "number",
  order = NULL,
  xmin = NULL,
  xmax = NULL
)
```

Arguments

x	output dataframe from the correction.factor.do function
alldat	logical argument, default = TRUE. Whether to include all the previous metadata file or not
lakename	Character string indicating the name of the column with the lake name information in the x dataset, or alternatively, the column index.
orderby	Choose one of c("number", "treatment", "quadrat", "own") to select the order of lakes. Default: "number".
order	Default = NULL, or must be a numeric vector with 16 numbers, specified by the user to choose an order, e.g., c(7,8,1:4, 6, 5, 9:16).
xmin	Minimum x you want to see. Format = "YYYY-MM-DD"
xmax	Maximum x you want to see. Format = "YYYY-MM-DD"

Author(s)

Rosalie Bruel

`read.hobo` *Read in a HOBO file*

Description

The function read in a hobo file in the format it is exported as at the CEREEP-Ecotron, i.e., as a .csv file. The columns are renamed and the date time format is converted to a date time format R understands.

Usage

```
read.hobo(filename)
```

Arguments

`filename`	path to HOBO dataset to read

Author(s)

Rosalie Bruel and Sophie Guillon

`rhobo.append` *Routine HOBO part 2: Apply correction factors and append to previous files*

Description

Apply the correction factors to measured dissolved oxygen and append file for each lake to previous file. If no previous file was found, only the new file is kept.

Usage

```
rhobo.append(
  metadata_QAQC,
  path2data,
  foldername,
  TM_init,
  TM_end,
  write = TRUE
)
```

Arguments

metadata_QAQC	output from the rhobo.CF() function. Data frame with the correction factors for all the new HOBO files.
path2data	User's path to the folder where the data are stored. Within that folder, there should be two subfolders with the raw data (Hobo_Raw) and the processed data (Hobo_Process)
foldername	Folder name of the newest data that have been downloaded post-HOBO deployment. Folder name should be the date of the end of the deployment with the format YYYY_MM_DD, e.g., 2021_07_27
TM_init	Time measurement initialization : when probes are back in the lakes
TM_end	Time measurement end: when probes are taken out of the lakes
write	Whether to save the output file or not. Logical.

Author(s)

Rosalie Bruel and Sophie Guillon

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rhobo.CF *Routine HOBO part 1: compute DO correction factors*

Description

First part of the QC routine: read in the raw file and compute dissolved oxygen correction factors.

Usage

```
rhobo.CF(
  path2data,
  foldername,
  TC_pre,
  TC_post,
  Pbaro_mbar_init,
  Pbaro_mbar_end,
  n = 4
)
```

Arguments

path2data	User's path to the folder where the data are stored. Within that folder, there should be two subfolders with the raw data (Hobo_Raw) and the processed data (Hobo_Process)
foldername	Folder name of the newest data that have been downloaded post-HOBO deployment. Folder name should be the date of the end of the deployment with the format YYYY_MM_DD, e.g., 2021_07_27
TC_pre	datetime of end of the "initialization" calibration (pre-deployment)
TC_post	datetime of end of the "end of deployement" calibration (post-deployment)
Pbaro_mbar_init	Atmospheric pressure in millibars during the "initialization" calibration (pre-deployment)

Pbaro_mbar_end	Atmospheric pressure in millibars during the "end of deployement" calibration (post-deployment)
n	number of observations PRIOR to TC_pre and TC_post used to compute the oxygen mean for computing correction factor. Default to n = 4.

Author(s)

Rosalie Bruel and Sophie Guillon

`rhobo.check.inputs` *Check inputs before HOBO QC*

Description

Take as input all the parameters and does some basic checks (chronological order for dates, files are present in the folder, pressure is in millibar)

Usage

```
rhobo.check.inputs(
  path2data = NULL,
  foldername = NULL,
  TC_pre = NULL,
  TC_post = NULL,
  TM_init = NULL,
  TM_end = NULL,
  Pbaro_mbar_init = NULL,
  Pbaro_mbar_end = NULL
)
```

Arguments

path2data	User's path to the folder where the data are stored. Within that folder, there should be two subfolders with the raw data (Hobo_Raw) and the processed data (Hobo_Process)
TC_pre	datetime of end of the "initialization" calibration (pre-deployment)
TC_post	datetime of end of the "end of deployement" calibration (post-deployment)
TM_init	Time measurement initialization : when probes are back in the lakes
TM_end	Time measurement end: when probes are taken out of the lakes
Pbaro_mbar_init	Atmospheric pressure in millibars during the "initialization" calibration (pre-deployment)
Pbaro_mbar_end	Atmospheric pressure in millibars during the "end of deployement" calibration (post-deployment)
filename	path to file we need to calculate the correction factors for. The file is a raw HOBO file, with temperature and oxygen.

Author(s)

Rosalie Bruel

rhobo.treatments *Assign treatments*

Description

Create a new column for any data frame with lake treatments, based on lake names. Order the lakes by name (default) or treatment

Usage

```
rhobo.treatments(x, lakename = NULL, orderby = "number", order = NULL)
```

Arguments

x	Input dataset
lakename	Character string indicating the name of the column with the lake name information in the x dataset, or alternatively, the column index.
orderby	Choose one of c("number", "treatment", "quadrat", "own") to select the order of lakes. Default: "number".
order	Default = NULL, or must be a numeric vector with 16 numbers, specified by the user to choose an order, e.g., c(7,8,1:4, 6, 5, 9:16).

Author(s)

Rosalie Bruel

specify.DO.CF *Specify DO correction factor manually*

Description

After visual inspection, the user can decide to specify a correction factor manually.

Usage

```
specify.DO.CF(x, name, time, CF)
```

Arguments

x	the dataframe with the output
name	name of the lake as character, e.g., "lac01"
time	"Init" or "End"
CF	manual correction factor to enter

Author(s)

Rosalie Bruel

struct.dir *Help showing the structure of the directory*

Description

Print in the console the folder structure were all the data needed to run the rhobo routine should be.

Usage

```
struct.dir()
```

Author(s)

Rosalie Bruel

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