Package 'NitrogenUptake2016'

October 12, 2022

R topics documented:

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allometry	*Data: Stem masses and heights for plants collected from Colt State Park, Rhode Island, USA, during summer 2016*

Description

A dataframe of masses and heights of stems of Spartina alterniflora and Distichlis spicata. Samples were collected from Colt State Park, Bristol, RI, USA, during May-July 2016. Column descriptions:

Usage

```
allometry
```

Format

A dataframe with 170 observations of 6 variables:

site Study location (Colt State Park, RI)

samplingDate Sampling dates

status Indicates whether plant was live or dead

height_cm Stem height, in centimeters, from the sediment surface to the tip of the longest leaf

sample Biomass, grams

spp Species (SPAL or DISP)

References

Hill, T.D., N.R. Sommer, C.R. Kanaskie, E.A. Santos, A.J. Oczkowski. 2018. Data and source code from: Nitrogen uptake and allocation estimates for Spartina alterniflora and Distichlis spicata. Data In Brief. 21: 466-472. https://doi.org/10.1016/j.dib.2018.09.133.

Hill, T.D., N.R. Sommer, C.R. Kanaskie, E.A. Santos, A.J. Oczkowski. 2018. Nitrogen uptake and allocation estimates for Spartina alterniflora and Distichlis spicata. Journal of Experimental Marine Biology and Ecology 507: 53-60. https://doi.org/10.1016/j.jembe.2018.07.006.

Examples

```
### export to .csv:
write.csv(allometry, file = file.path(tempdir(), "allometry.csv"))
```

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ap *Convert per mil isotope values to atom percent*

Description

Convert per mil isotope values to atom percent

Usage

```
ap(perMilValues, isotope = "15N")
```

Arguments

perMilValues	Value to be converted, in per mil notation
isotope	can be 13C or 15N

Value

a numeric value or vector

Examples

```
ap(10); ap(1000)
```

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bCM *Parameterize Box-Cox model for mass-height allometry (based on Lu et al. 2016)*

Description

Parameterize Box-Cox model for mass-height allometry (based on Lu et al. 2016)

Usage

```
bCM(dat, mass = "sample", height = "height_cm", lam.avail = c(-2,
  -1.5, -1, -2/3, -1/2, -1/3, 0, 1/3, 1/2, 2/3, 1, 1.5, 2),
  lam.only = FALSE)
```

Arguments

dat	dataframe with data
mass	mass column
height	height column
lam.avail	set of possible lambda values
lam.only	if TRUE, lambda is returned. If FALSE, model is returned

Value

if lam.only is FALSE, a model is returned. If lam.only is TRUE, lambda value is returned.

References

Lu, Meng, Caplan, Joshua S., Bakker, Jonathan D., Mozdzer, Thomas J., Drake, Bert G., Megonigal, J. Patrick, and Langley, J. Adam. 2016. Allometry data and equations for coastal marsh plants. Ecology. https://doi.org/10.1002/ecy.1600.

Examples

```
### get allometry model for each species
CSP <- plyr::dlply(allometry, c("spp"), bCM)
CSP.coef <- plyr::ldply(CSP, stats::coef)
### add lambda value
CSP.coef$lam <- plyr::ddply(allometry, c("spp"), function(df)
                 bCM(df, lam.only = TRUE))[, "V1"]
```

CN_mass_data	*Data: Nutrient concentrations, stable isotope ratios, and biomass from destructive mesocosm harvests*

Description

Data: Nutrient concentrations, stable isotope ratios, and biomass from destructive mesocosm harvests

Usage

```
CN_mass_data
```

Format

A dataframe with 1192 observations of 16 variables:

time Time point of harvest (harvested at one-week intervals)

new.core.id Unique mesocosm identifier, including species (SA or DS) and mesocosm number

depth_bottom Depth at bottom of sample (only applicable for belowground data)

sample.type Sample material; tissue type

interval Depth interval for sample; indicates the top and bottom depths (e.g., an entry of "5_10" covers the depth interval from 5-10 cm)

pool_label Label for each pool (combination of "sample.type" and "depth_bottom")

id Same as "pool_label" but with mesocosm ID included

species Spartina alterniflora (SA) or Distichlis spicata (DS)

d15n 15-N isotope ratio in per mille units

n_pct Nitrogen content, decimal fraction (0.015 = 1.5 percent)

d13c 13-C isotope ratio in per mille units

c_pct Carbon content, decimal fraction (0.015 = 1.5 percent)

total_volume_cm3 Total volume of interval (only applicable for belowground data)

depth_top Depth at top of sample (only applicable for belowground data)

sample.type2 Simplified "sample.type" column; leaf numbers dropped, and belowground stems included as "stems"

g_core Total mass (grams) in entire pool; corrects for subsampling of depth intervals

References

Hill, T.D., N.R. Sommer, C.R. Kanaskie, E.A. Santos, A.J. Oczkowski. 2018. Data and source code from: Nitrogen uptake and allocation estimates for Spartina alterniflora and Distichlis spicata. Data In Brief. 21: 466-472. https://doi.org/10.1016/j.dib.2018.09.133.

Hill, T.D., N.R. Sommer, C.R. Kanaskie, E.A. Santos, A.J. Oczkowski. 2018. Nitrogen uptake and allocation estimates for Spartina alterniflora and Distichlis spicata. Journal of Experimental Marine Biology and Ecology 507: 53-60. https://doi.org/10.1016/j.jembe.2018.07.006.

Examples

```
### export to .csv:
write.csv(CN_mass_data, file = file.path(tempdir(), "CN_mass_data.csv"))
```

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dea	*Data: Denitrification enzyme activity and in vitro N2O production rates*

Description

Data: Denitrification enzyme activity and in vitro N2O production rates

Usage

```
dea
```

Format

A dataframe with six rows and five columns:

pot Mesocosm ID; equivalent to "new.core.id" in other datasets

DEA Denitrification enzyme activity (units = nanomoles N2O / gram dry mass / hour)

IV "In vitro" N2O production; no nutrient solution added, just filtered seawater (units = nanomoles N2O / gram dry mass / hour)

mcf Moisture correction factor (1 - gravimetric water content)

bd_gcm3 Bulk density (grams per cubic centimeter)

References

Hill, T.D., N.R. Sommer, C.R. Kanaskie, E.A. Santos, A.J. Oczkowski. 2018. Data and source code from: Nitrogen uptake and allocation estimates for Spartina alterniflora and Distichlis spicata. Data In Brief. 21: 466-472. https://doi.org/10.1016/j.dib.2018.09.133.

Hill, T.D., N.R. Sommer, C.R. Kanaskie, E.A. Santos, A.J. Oczkowski. 2018. Nitrogen uptake and allocation estimates for Spartina alterniflora and Distichlis spicata. Journal of Experimental Marine Biology and Ecology 507: 53-60. https://doi.org/10.1016/j.jembe.2018.07.006.

Examples

```
### export to .csv:
write.csv(dea, file = file.path(tempdir(), "dea.csv"))
```

---

nappCalc2   *Calculate net aboveground primary production*

Description

Calculate net aboveground primary production

Usage

```
nappCalc2(dataset, liveCol = "mass", deadCol = "dead",
  yearCol = "year", siteCol = "pot2", timeCol = "day",
  annualReset = "TRUE", MilnerHughes = "TRUE", EOS = "FALSE",
  EOS_window = 1, summarize = "TRUE")
```

Arguments

dataset	data
liveCol	live biomass
deadCol	dead biomass
yearCol	year
siteCol	site/plot/experimental unit identifier
timeCol	time column (sequential measurements within each year)
annualReset	should data be reset to zero each year
MilnerHughes	If "TRUE", Milner-Hughes NAPP is calculated
EOS	If "TRUE", end-of-season live biomass is reported
EOS_window	window for EOSL
summarize	If "TRUE", output will be a list with two elements: incremental data and summary data

Value

list

nmolHr_mgDay	*Convert N2O units from nanomoles of N2O per hour to milligrams of N per day*

Description

Convert N2O units from nanomoles of N2O per hour to milligrams of N per day

Usage

```
nmolHr_mgDay(x)
```

Arguments

x   numeric or integer value(s)

Value

numeric value

Examples

```
nmolHr_mgDay(dea$DEA)
```

se	*Calculates standard error*

Description

Calculates standard error

Usage

```
se(x)
```

Arguments

x   numeric or integer

Value

value

Examples

```
se(CN_mass_data$n_pct)
plyr::ddply(CN_mass_data, plyr::.(species, pool_label), plyr::summarise, se = se(n_pct))
```

| stemHeights | *Data: Stem heights for each mesocosm and each measurement date* |

Description

A dataframe of Spartina alterniflora and Distichlis spicata stem heights, from the mesocosms used in 15N study. Samples were collected from Colt State Park, Bristol, RI, USA, and grown in the US EPA Atlantic Ecology Division greenhouse.

Usage

```
stemHeights
```

Format

A dataframe with 3315 observations of 10 variables:

date Measurement date

core_num Mesocosm number

species Species, either Spartina alterniflora (SA) or Distichlis spicata (DS)

dead_live Indicates whether plant was live or dead

plant_num Plants were tagged to permit growth rate calculations; this is the plant tag number

height_cm Stem height, in centimeters, from the sediment surface to the tip of the longest leaf

id Unique plant identifier, combining species, mesocosm number, and plant tag number

day Measurement date expressed in YYYY-MM-DD format (and structured as a POSIXct column in R)

timeSinceLast Days since last measurement

new.core.id Mesocosm ID, including species and a unique mesocosm number (time-zero mesocosms re-numbered as mesocosms 13, 14, and 15)

References

Hill, T.D., N.R. Sommer, C.R. Kanaskie, E.A. Santos, A.J. Oczkowski. 2018. Data and source code from: Nitrogen uptake and allocation estimates for Spartina alterniflora and Distichlis spicata. Data In Brief. 21: 466-472. https://doi.org/10.1016/j.dib.2018.09.133.

Hill, T.D., N.R. Sommer, C.R. Kanaskie, E.A. Santos, A.J. Oczkowski. 2018. Nitrogen uptake and allocation estimates for Spartina alterniflora and Distichlis spicata. Journal of Experimental Marine Biology and Ecology 507: 53-60. https://doi.org/10.1016/j.jembe.2018.07.006.

Examples

```
### export to .csv:
write.csv(stemHeights, file = file.path(tempdir(), "stemHeights.csv"))
```

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