Package 'datana'

November 3, 2022

Type Package

Title Data and Functions to Accompany Analisis De Datos Con R

Version 1.0.1

Date 2022-10-31

Description Datasets and Functions to Accompany Salas-Eljatib (2021, ISBN: 9789566086109) ``Analisis de datos con el programa estadistico R: una introduccion aplicada". The package helps carry out data management, exploratory analyses, and model fitting.

License GPL-3

URL https://eljatib.com/rlibro

Depends R (>= 3.5.0)

Imports ggplot2, stats, graphics

Suggests covr, knitr, rmarkdown, spelling, testthat

Encoding UTF-8

Language en-US

LazyData true

RoxygenNote 7.2.1

BuildResaveData best

R topics documented:

`datana-package` *Data and Functions to Accompany Analisis De Datos Con R*

Description

The datana package provides the data and functions that accompany the book "Análisis de datos con el programa estadístico R: una introducción aplicada" by Salas-Eljatib (2021, ISBN: 9789566086109). You can visit the book's website at https://eljatib.com/rlibro.

Notice that every dataframe has a similar one but using column names in Spanish. For instance, the dataframe *pinaster* has column names in English, but *pinaster2* has column names in Spanish. Both dataframes have the same data.

Details

The package contains several datasets for exploratory data analysis in an array of disciplines. Furthermore, datana provides functions as tools for descriptive statistics and plotting.

To see the preferable citation of the package, type citation("datana").

Author(s)

The datana development team is Christian Salas-Eljatib, Nicolas Pino and Joaquin Riquelme. Many other people have contributed to individual dataframes and functions: see credits in help pages.

References

Salas-Eljatib C. 2021. Análisis de datos con el programa estadístico R: una introducción aplicada. Santiago, Chile: Ediciones Universidad Mayor. ISBN: 9789566086109. https://tienda.zigzag.cl/9789566086109-analisis-de-datos-con-el-programa-estadistico-r.html

Examples

```
##scatter-plot and marginal histograms
library(datana)
data(treevolroble)
df <- treevolroble
xyHist(x=df$dbh,y=df$htot, xlab="Variable X",  ylab="Variable Y")

##scatter-plot and box-plots
data(fishgrowth)
df <- fishgrowth
xyBoxplot(x=df$length,y=df$scale)
```

`airquality` *Airquality data, from the datasets library.*

Description

Daily air quality measurements in New York, May to September 1973.

Usage

```
data(airquality)
```

Format

Contains 6 variables, as follows:

ozone numeric Ozone (ppb).

solar numeric Solar R (lang).

wind numeric Wind (mph).

temp numeric Temperature (degrees F).

month numeric Month (1–12).

day numeric Day of month (1–31).

Source

The data were obtained from the library 'datasets'.

References

Chambers J, Cleveland W, Kleiner B, Tukey P. 1983. Graphical Methods for Data Analysis. Belmont. CA: Wadsworth.

Examples

```
data(airquality)
head(airquality)
```

annualppCities *Time series of annual precipitations in cities of Chile.*

Description

Data contains annual precipitations in six cities in Chile (Santiago, Talca, Chillan, Temuco, Valdivia, and Puerto Montt) at different years.

Usage

```
data(annualppCities)
```

Format

The dataframe contains three variables as follows:

city Name of city.

year Year of registry.

annual Value of the annual precipitation of a given year (mm).

Source

The data were obtained from https://explorador.cr2.cl/.

Examples

```
data(annualppCities)
head(annualppCities)
```

anscombe *Anscombe quartet dataset*

Description

A dataset that contains four pairs of columns with the same descriptive statistics; however, there is a difference when representing the points through a graph.

Usage

```
data(anscombe)
```

Format

The data frame contains four variables as follows:

X1 Integers values that represent X-axis for Y1, Y2 and Y3 column

Y1 Float values that represent Y-axis for X1 column

Y2 Float values that represent Y-axis for X1 column

Y3 Float values that represent Y-axis for X1 column

X2 Integers values that represent X-axis for Y4 column

Y4 Float values that represent Y-axis for X2 column

Source

Data were assembled by Dr Christian Salas-Eljatib (Santiago, Chile).

References

Anscombe, Francis J. (1973). Graphs in statistical analysis. The American Statistician, 27, 17-21. doi: 10.2307/2682899.

Examples

```
data(anscombe)
head(anscombe)
```

`araucaria` *Contains plot-level variables in Araucaria araucana forests in southern Chile.*

Description

These are plot-level measurement data from the Araucaria araucana forests in southern Chile, measured in 2009. The data was based on fixed-area plots of 1000 m^2. They are two forest stands.

Usage

```
data(araucaria)
```

Format

Contains plot-level variables as follows:

stand Stand number

plot.no Plot sample identificator number

x.utm UTM coordinate in X-axis, in km

y.utm UTM coordinate in Y-axis, in km

slope Slope, in %

aspect Aspect, in degrees

eleva Elevation, in msnm

nha Tree density, in trees/ha

gha Basal area, in m^2/ha

hdom Dominant height, in m

vha Gross stand volume, m^3/ha

dg Diameter of the average basal area tree of the plot, in cm

Source

The data are provided courtesy of Dr Nelson Ojeda at Universidad de La Frontera (Temuco, Chile).

References

Salas C, Ene L, Ojeda N, Soto H. 2010. Metodos estadisticos parametricos y no parametricos para predecir variables de rodal basados en Landsat ETM+: una comparacion en un bosque de Araucaria araucana en Chile [Parametric and non-parametric statistical methods for predicting plotwise variables based on Landsat ETM+: a comparison in an Araucaria araucana forest in Chile]. Bosque 31(3): 179-194.

Examples

```
data(araucaria)
head(araucaria)
```

---

baiTreelines *Annual basal area increment for four tree species.*

Description

The dataset contains 157 observations of the last ten years in 6-8 adult trees of different species at three elevations of altitudinal gradients sampled in four locations in Chile and two in Spain.

Usage

```
data(baiTreelines)
```

Format

Contains seven columns, as follows:

climate Climate of each location, mediterranean and temperate.

site Name of Location of study (termmas:Termas de Chillan , antillanca:Antillanca area within Puyehue National Park, castillo:Cerro Castillo Natural Reserve, farellones:Farellones in Central Chile, pyrenees: Sierra de Cutas area in Spanish Central Pyrenees,sierra:Sierra Nevada).

species name species of study (lenga: Nothofagus pumilio, frangel: Kageneckia angustifolia, uncinata: Pinus uncinata, sylvestris: Pinus sylvestris).

elevation Type of elevation. "Treeline", intermediate named as "inter", and closed or montane forest named as low.

tree Id for tree.

bai Value of annual basal area increment.

mean.bai Mean of annual basal area increment.

Source

The data were obtained from the DRYAD repository at doi: 10.5061/dryad.ks97h.

References

Piper F, Vinegla B, Linares J, Camarero J, Cavieres L, Fajardo A. 2016. Mediterranean and temperate treelines are controlled by different environmental drivers. Journal Ecology. 104: 691-702.

Examples

```
data(baiTreelines)
head(baiTreelines)
```

`bears` *Age and physical measurement data for wild bears.*

Description

Wild bears were anaesthetised, and their bodies were measured and weighed. One goal of the study was to make a table (or perhaps a set of tables) for people interested in estimating the weight of a bear based on other measurements. Notice that there are missing values for some of the variables.

Usage

```
data(bears)
```

Format

Contains individual-level variables, as follows:

id Bear id

age age in months

month Diameter at breast height, in cm

sex 1 =male, 2 = female

headL length of head, in cm

headW width of head, in cm

neckG girth of neck, in cm

length body length, in cm

chestG girth of chest, in cm

weight body weight, in kg

obs observation number for bear

name name given to bear

Source

Minitab, Inc. The data description is courtesy of Prof. Timothy Gregoire at Yale University (USA).

References

According to Prof. Gregoire, This data set was supplied by Gary Alt. Entertaining references are in Reader's Digest April, 1979, and Sports Afield September, 1981.

Examples

```
data(bears)
head(bears)
```

---

bearsDepu *Age and physical measurement data for wild bears. Dataframe same as "bears" but without missing values.*

Description

Wild bears were anaesthetised, and their bodies were measured and weighed. One goal of the study was to make a table (or perhaps a set of tables) for people interested in estimating the weight of a bear based on other measurements.

Usage

```
data(bearsDepu)
```

Format

Contiene variables de nivel individual, como se describen a continuacion:

id Bear identificator

age age in months

month Diameter at breast height, in cm

sex 1 =male, 2 = female

headL length of head, in cm

headW width of head, in cm

neckG girth of neck, in cm

length body length, in cm

chestG girth of chest, in cm

weight body weight, in kg

obs observation number for bear

name name given to bear

Source

Minitab, Inc. The data description is courtesy of Prof. Timothy Gregoire at Yale University (New Haven, CT, USA).

References

According to Prof. Gregoire, This data set was supplied by Gary Alt. Entertaining references are in Reader's Digest April, 1979, and Sports Afield September, 1981.

Examples

```
data(bearsDepu)
head(bearsDepu)
```

`biomass` *Contains tree-level biomass data for several species in Canada.*

Description

These are tree-level variables for several species in Canada.

Usage

```
biomass
```

Format

treenum tree number.

spp species common name.

dbh diameter at breast height, in cm.

height total height, in m.

totbiom total biomass, in kg.

bolebiom stem biomass, in kg.

branchbiom branches biomass, in kg.

foliagebiom foliage biomass, in kg.

Source

The data are provided courtesy of Prof. Timothy Gregoire at the School of Forestry and Environmental Studies at Yale University (New Haven, CT, USA).

Examples

```
data(biomass)
head(biomass)
```

`carbohydrateTreelines` *Carbohydrates concentrations of tree species.*

Description

Dataset contains 863 observations, about of total soluble carbohydrate, starch, and non structural carbohydrates concentrations per mass unit and per volume unit, in three tissues in early summer and early autumn 6-8 adult trees of different species at three elevations of altitudinal gradients sampled in four locations of Chile and Spain.

Usage

```
data(carbohydrateTreelines)
```

Format

Contains 16 variables, as follows:

climate Climate of each location, mediterranean and temperate.

site Name of Location of study (termmas:Termas de Chillan , antillanca:Antillanca area within Puyehue National Park, castillo:Cerro Castillo Natural Reserve, farellones:Farellones in Central Chile, pyrenees: Sierra de Cutas area in Spanish Central Pyrenees,sierra:Sierra Nevada).

species name species of study (lenga: Nothofagus pumilio, frangel: Kageneckia angustifolia, uncinata: Pinus uncinata, sylvestris: Pinus sylvestris).

tissue Type of tissue, new developing twings, stem sapwood and branches.

time Meauserement season (spring or autumn).

elevation Type of elevation. "Treeline", intermediate named as "mid", and closed or montane forest named as "low".

tree Id for tree.

tree.site Id site for each location of study.

tss Value of concentrations soluble carbohydrate per mass unit.

st Value of concentrations starch per mass unit.

nsc Value of concentrations non structural carbohydrates per mass unit.

tss.nsc .

wd It might be 'wood density', but not sure.

tss.mv Value of concentrations soluble carbohydrate per volume unit.

st.mv Value of concentrations starch per volume unit.

nsc.mv Value of concentrations non structural carbohydrates per volume unit.

Source

The data were obtained from the DRYAD repository at doi: 10.5061/dryad.ks97h.

References

Piper F, Vinegla B, Linares J, Camarero J, Cavieres L, Fajardo A. 2016. Mediterranean and temperate treelines are controlled by different environmental drivers. Journal Ecology. 104: 691-702.

Examples

```
data(carbohydrateTreelines)
head(carbohydrateTreelines)
```

`chicksw` *Chicken growth data.*

Description

The body weights of the chicks were measured at birth and every second day thereafter until day 20. They were also measured on day 21. There were four groups on chicks on different protein diets.

Usage

```
data(chicksw)
```

Format

Contains four variables, as follows:

weight a numeric vector giving the body weight of the chick (gm).

time a numeric vector giving the number of days since birth when the measurement was made.

chick an ordered factor with levels different giving a unique identifier for the chick. The ordering of the levels groups chicks on the same diet together and orders them according to their final weight (lightest to heaviest) within diet.

diet a factor with levels 1,2,3 and 4 indicating which experimental diet the chick received.

Source

The data were obtained from the alr4 library.

References

Crowder M, Hand D. 1990. Analysis of Repeated Measures. Chapman and Hall

Examples

```
data(chicksw)
head(chicksw)
```

---

corkoak *Tree-level cork biomass data for Oak trees in Portugal.*

Description

Measurements of cork weight in sample trees of Quercus suber (Oak) in Portugal.

Usage

```
corkoak
```

Format

tree A correlative number for each sample tree.

csc is tree circumference at 1.3 m outside bark, in cm.

cbc is tree circumference at 1.3 m under bark, in cm.

bt bark thickness, in cm.

hdeb is debarking height, in m.

hblc height to base of live crown, in m.

nb number of branches debarked

crown.d crown diameter, in m.

w total green weight of the stripped cork, in kg

stratum Stratum

Source

Data supplied electronically to Prof. Timothy Gregoire (Yale University) by authors accompanied by a note which said "After the article was published we discovered a problem with 2 of the observations so Teresa and I decided it was best just to delete them."

References

- Fonseca TJ, Parresol BR. 2001. A new model for cork weight estimation in northern Portugal with methodology for construction of confidence intervals. Forest Ecology and Management 152(1):131–139.

Examples

```
data(corkoak)
head(corkoak)
```

`crownradii` *Tree crown radii*

Description

Crown radii measurements in cardinal directions for sample trees at the Rucamanque experimental forest, near Temuco, Chile. Data were collected within a sample plot of 250m^2, located in a secondary forest stand dominated by Nothofagus obliqua.

Usage

```
data(crownradii)
```

Format

Contains of variables, as follows:

spp Species code. Ro is Roble, Co is Coigue and Ol is Olivillo.

dbh Diameter at breast height, in cm.

htot Total height, in m.

r.n Crown radii towards the north, in m.

r.e Crown radii towards the east, in m.

r.s Crown radii towards the south, in m.

r.w Crown radii towards the west, in m.

x.coord Cardinal position at the X-axis, in m.

y.coord Cardinal position at the Y-axis, in m.

crown.d Crown diameter, in m.

Source

Data were provided by Dr Christian Salas-Eljatib (Santiago, Chile).

References

Salas C. 2001. Caracterizacion basica del relicto de biodiversidad Rucamanque [Basic characterization of the biodiversity remnant Rucamanque]. Bosque Nativo 29: 3–9.

Salas C, and Garcia O. 2006. Modelling height development of mature Nothofagus obliqua. Forest Ecology and Management 229 (1-3): 1–6.

Examples

```
data(crownradii)
head(crownradii)
```

`deadForestCA` *Data contains climatic, forest structure and forest mortality variable*

Description

The data file contains one row per unique 3.5km grid cell by year combination. The data frame covers all grid cells within the state of California where at least one Aerial Detection Survey (ADS) flight was taken between 2009 and 2015, so each grid cell position has between 1 and 7 years of data (reflected as 1 to 7 rows in the data file per grid cell position). The main response variables are mort.bin (presence of any mortality) and mort.tph (number of dead trees/ha within the given grid cell by year).

Usage

```
data(deadForestCA)
```

Format

The data frame contains four variables as follows:

live.bah Live basal area from the GNN dataset

live.tph Live trees per hectare from the GNN dataset

pos.x rank-order x-position of the grid cell (position 1 is western-most)

pos.y rank-order y-position of the grid cell (position 1 is northern-most)

alb.x x-coordinate of the grid cell centroid in California Albers (EPSG 3310)

alb.y y-coordinate of the grid cell centroid in California Albers (EPSG 3310)

mort.bin 1= dead trees observed in grid cell. 0= no dead trees observed

mort.tph Dead trees per hectare from the aggregated ADS dataset

mort.tpa Dead trees per acre from the aggregated ADS dataset

year Year of the ADS flight. Most flights occurred from May-August.

Defnorm Mean annual climatic water deficit for the grid cell, for Oct 1-Sept 31 water year, averaged from 1981-2015

Def0 Climatic water deficit for the grid cell during the Oct-Sept water year overlapping the summer ADS flight of the given year

Defz0 Z-score for climatic water deficit for the given grid cell/water year. Calculated as (Def0-Defnorm)/(standard deviation in deficit among all years 1981-2015 for the given grid cell)

Defz1 Z-score for climatic water deficit for the given grid cell in the preceeding water year.

Defz2 Z-score for climatic water deficit for the given grid cell two water years prior.

Tz0 Z-score for temperature for the given grid cell/year.

Pz0 Z-score for precipitation for the given grid cell/year.

Defquant FDCI variable. Quantile of Defnorm of the given grid cell, relative to the Defnorm of all other grid cells with a basal area within 2.5 m2 ha-1 of the given cell is basal area.

Source

The data were provided from DRYAD repository.

References

-Derek J. N. Young, Jens T. Stevens, J. Mason Earles, Jeffrey Moore, Adam Ellis, Amy L. Jirka, and Andrew M. Latimer. Long-term climate and competition explain forest mortality patterns under extreme drought.Ecology Letters, 20(1):78-86, 2017.

-C. Salas-Eljatib, Andres Fuentes-Ramirez, Timothy G. Gregoire, Adison Altamirano, and Valeska Yaitul. A study on the effects of unbalanced data when fitting logistic regression models in ecology. Ecological Indicators, 85:502-508, 2018

Examples

```
data(deadForestCA)
head(deadForestCA)
```

---

deadLianas

This dataset has 43 columns and 4247 rows. Each row corresponds to an epiphyte individual located on the reliable sections of the host trees

---

Description

This study is part of the project "Diversity and dynamics of vascular epiphytes in Colombian Andes" supported by COLCIENCIAS (contract 2115-2013). The data corresponds to the first large-scale assessment of vascular epiphyte mortality in the neotropics. Based on two consecutive annual surveys, we followed the fate of 4247 epiphytes to estimate the epiphyte mortality rate on 116 host trees at nine sites. Additional variables were taken from the area of study in order to find relationships with epiphyte mortality.

Usage

```
data(deadLianas)
```

Format

The data frame contains four variables as follows:

PlotSite Municipality name of the 9 study sites

Y.Plot Latitude of the plot in decimal degrees

X.Plot Longitude of the plot in decimal degrees

PhoroNo ID number of the sampled host trees in each site

EpiFam Epiphyte taxonomic family

EpiGen Epiphyte taxonomic genus

cf.aff Abbreviations of Latin terms in the context of taxonomy. cf. "confer" meaning "compare with". aff.: "affinis" meaning "similar to".

Species Epiphyte (morpho) species name

Author Author of the scientific name

EpiAzi Azimuth of the epiphyte individual on each host tree

BraAzi Azimuth of the branch in which the epiphyte individual was found

EpiDisTru Distance in meters from the trunk to the epiphyte attachment site on a branch

EpiSize Estimated size of the epiphyte individual in centimetres

EpiAttHei Epiphyte attachment height in meters

Date0 Date of the first census

Date1 Date of the final census

Location Section (roots, trunks, branches) of the host tree in which theepiphyte individual was found

Mortality Dichotomous variable. 0 if the epiphyte individual was dead in the final census and 1 if otherwise

MorCat Mechanical or non-mechanical cause of mortality

Elevation Elevation (m a.s.l.) of the plot

AP_bio12 Annual precipitation in the plot (mm yr-1)

PDM_bio14 Precipitation of driest month in the plot (mm)

PS_bio15 Precipitation seasonality in the plot (coefficient of variation)

MDT_bio2 Mean Diurnal Range (Mean of monthly (max temp - min temp)) in the plot (oC*10)

TS_bio4 Temperature seasonality in the plot (standard deviation*100)

ATR_bio7 Annual temperature range in the plot (10 celsius degrees)

AET Actual evapotranspiration in the plot (mm yr-1)

BasAre Basal area of trees with DBH major or equal to 5 cm (AB) in the plot (m2 ha-1)

BasAre5_10 Basal area of trees with greater or equal than 5 DBH and less than 10 cm in the plot (m2 ha-1)

BasAre10 Basal area of trees with greater or equal than 10 cm DBH in the plot (m2 ha-1)

Ind10 Number of canopy trees (with greater or equal than 10 cm DBH) in the plot

Ind5 Number of understory trees (with greater or equal than 5 DBH and less than 10 cm) in the plot

Ind5_10 Number of trees with greater or equal than 5 DBH and less than 10 cm in the plot

Ind10_15 Number of trees with greater or equal than 10 DBH and less than 15 cm in the plot

Ind15_20 Number of trees with greater or equal than 15 DBH and less than 20 cm in the plot

Ind20_25 Number of trees with greater or equal than 20 DBH and less than 25 cm in the plot

Ind25_30 Number of trees with greater or equal than 25 DBH and less than 30 cm in the plot

Ind30 Number of trees with DBH major or equal to 30 cm in the plot

TreeHei Total tree height in meters

MedHei Median height of trees in each plot

MaxHei Maximum height of trees in each plot

BranchNumb Number of branches of the host tree

Obs Observations and notes in Spanish

Source

Data were extracted from Zuleta, D., Benavides, A.M., Lopez-Ros, V. & Duque, A. 2016. Local and regional determinants of vascular epiphyte mortality in the Andean mountains of Colombia .

References

Zuleta, D., Benavides, A.M., Lopez-Rios, V. & Duque, A. 2016. Local and regional determinants of vascular epiphyte mortality in the Andean mountains of Colombia.

Examples

```
data(deadLianas)
head(deadLianas)
```

---

demograph *Contains information of demography of species.*

Description

Dataset contains 61 observations about life histories values for each species and site, as obtained from the parameterization carried out in studies that used the model SORTIE

Usage

```
data(demograph)
```

Format

Contains 15 variables, as follows:

sp Name specie.

site Name of site of study.

country Name of country.

site.n Code of site.

code Code of specie.

genus Genus of specie.

sps Abbreviated name specie.

family Family of specie.

phyl Type of phylogeny.

l.hab Type of leaf habit.

l.type .

leaf Type of leaf.

growth.l Growth at full light (time in years).

growth.d Growth in shade.

surv.d Survival in shade.

Source

The data were obtained from the DRYAD repository.

References

- Ameztegui A, Paquette A, Shipley B, Heym M, Messier C, Gravel D. 2016 . Shade tolerance and the functional trait: demography relationship in temperate and boreal forests. Functional Ecology, 31: 821-830.

Examples

```
data(demograph)
head(demograph)
```

`descstat` *A descriptive statistics table for continuous variables*

Description

descstat: Function that creates a descriptive statistics table for all continuous variables in a dataframe excluding missing values.

Usage

```
descstat(data = data, decnum = NA)
```

Arguments

`data`	a dataframe containing variables as columns
`decnum`	the number of decimals to be used in the output

Details

As always, please check the output after applying the function.

Value

This function wraps descriptive statistics into a summarize table having the following descriptive statistics: sample size, minimum, maximum, mean, median, SD, and coefficient of variation (

Author(s)

Christian Salas-Eljatib and Tomas Cayul.

Examples

```
#creating a fake dataframe
set.seed(1234)
df <- as.data.frame(cbind(variable1=rnorm(5, 0), variable2=rnorm(5, 2)))
## adding one missing value
df[3,1] <- NA
df
#using the function
descstat(data=df)
descstat(data=df,decnum=1)
descstat(df,2)
```

`election` *Presidential election data of Florida (USA) in 2000.*

Description

County-by-county vote for president in Florida in 2000 for Bush, Gore and Buchanan.

Usage

```
data(election)
```

Format

Contains 3 variables, as follows:

gore Vote for Gore.

bush Vote for Bush.

buchaman Vote for Buchaman.

Source

The data were obtained from the 'alr4' library.

References

Weisberg S. 2014. Applied Linear Regression. 4th edition. Hoboken NJ: Wiley

Examples

```
data(election)
head(election)
```

`eucaleaf` *Leaf measurements for Eucalyptus nitens trees in Tasmania, Australia.*

Description

The length, width, and area of Eucalyptus nitens leaves were measured.

Usage

```
data(eucaleaf)
```

Format

Contains leaf-level variables, as follows:

time Early or Late

tree an identificator for a given sample tree

shoot shoot description

l length of the leaf, in mm

w width of the leaf, in mm

la leaf area, in cm^2

Source

Although the original source of the measurements is the Dissertation of Dr Candy (1999), the data file used here was courtesy of Prof. Timothy Gregoire at Yale University (New Haven, CT, USA). Furthermore, these data were used by Gregoire and Salas (2009).

References

- Candy SG. 1999. Predictive models for integrated pest management of the leaf beetle Chrysophtharta bimaculata in Eucalyptus nitens in Tasmania. Doctoral dissertation, University of Tasmania, Hobart, Australia.

- Gregoire TG, and Salas C. 2009. Ratio estimation with measurement error in the auxiliary variate. Biometrics 65(2):590-598

Examples

```
data(eucaleaf)
head(eucaleaf)
```

eucaplot — *Data from a Eucalyptus globulus plantation near Gorbea, Region de La Araucania, Chile.*

Description

Tree-level data collected within a sample plot in a forestry plantation of Eucalyptus globulus near Gorbea, Southern Chile. The plot size is 500 square meters. The plantation is 15 yr-old and had been subject to three thinnings.

Usage

```
data(eucaplot)
```

Format

The dataframe contains four variables as follows:

dbh Diameter at breast height, in cm.

health health status (1: good, 2: medium, 3: bad).

shape stem shape for timber purposes (1: good, 2: medium, 3: bad).

crown.class Crown class (1: superior, 2: intermedium, 3: lower).

toth Total height, in m.

Source

The data were provided courtesy of Dr Christian Salas (Universidad Mayor, Santiago, Chile).

Examples

```
data(eucaplot)
head(eucaplot)
```

fertilizaexpe — *Fertilization experiment data.*

Description

Data contains volume data at plot-level for a fertilization experiment.

Usage

```
data(fertilizaexpe)
```

Format

Contains three variables, as follows:

treat Treatment level.

volume Plot-level volume, in m3/plot.

Source

The data were provided by Dr Christian Salas.

References

not yet

Examples

```
data(fertilizaexpe)
head(fertilizaexpe)
```

`fishgrowth` *Data on fish growth.*

Description

Data on samples of small mouth bass collected in West Bearskin Lake, Minnesota, in 1991. The file wblake includes only fish of ages 8 or younger.

Usage

```
data(fishgrowth)
```

Format

Contains 3 variables, as follows:

years Year at capture.

length Length at capture (mm).

scale radius of a key scale (mm).

Source

The data were obtained from the alr4 library of R.

References

Weisberg S. 2014. Applied Linear Regression. 4th edition. Hoboken NJ: Wiley

Examples

```
data(fishgrowth)
head(fishgrowth)
```

`floraChile` *Flora of Chile.*

Description

Dataset contains taxonomic level information segregatted by latitude.

Usage

```
data(floraChile)
```

Format

Contains seven columns, as follows:

family .

genus .

scientific.name .

author .

origin .

life.form .

lat... .

Source

The data are provided courtesy of Dr Jan Bannister at the Instituto Forestal (Chiloe, Chile).

References

- Bannister JR, Vidal OJ, Teneb E, Sandoval V. 2012. Latitudinal patterns and regionalization of plant diversity along a 4270-km gradient in continental Chile. Austral Ecology, 37(4), 500-509.

Examples

```
data(floraChile)
head(floraChile)
```

`football` *Anaerobic potential of soccer players.*

Description

Data about anaerobic variables of football players.

Usage

```
data(football)
```

Format

The data frame contains 13 variables as follows:

WPM

WPMk

WPm

WPmk

WTT

WTTk

WIF

W5

W10

W15

W20

W25

W30

Source

Data were provided by Dr Aquiles Yanez-Silva at Universidad Mayor (Santiago, Chile).

References

Not yet.

Examples

```
data(football)
head(football)
```

`forestFire` *Data of forest fire occurrence*

Description

Data of forest fire occurrence from Altamirano et al. (2013) as our population, containing 7210 total observations (N), with only 890 cases of fire occurrence (N 1) and 6320 cases of non occurrence (N 0). The binary variable (Y) is the occurrence of forest fire, where Y equal to 1 denotes occurrence and Y equal to 0 otherwise.

Usage

```
data(forestFire)
```

Format

The data frame contains four variables as follows:

fire Presence of forest fire (1 yes, 0 no)
xcoord Geographic coordinate x.utm
ycoord Geographic coordinate y.utm
aspect Exposure (degrees from north)
eleva Elevation (m)
slope Slope (degrees)
distr Distance to dirt roads
distcity Distance to cities
distriver Distance to paved roads
covera Land use classifications according to a polygon
coverb Land use classifications according to a polygon
tempe Minimum temperature of the coldest month
ppan Annual precipitation
ndii Normalized difference infrared index
nvdi Normalized difference vegetation index
tempe2 Minimum temperature of the warmest month
ppan2 Precipitation of the driest month
frec.fire Frequency of fires
perc.fire Percentage of fire frequency
fireClass Class for frecuency fire
asp.class Class of variable exposure
eleva.class Class of numerical variable elevation
slope.class Class of numerical variable slope
ndii.class Normalized difference infrared index class
nvdi.class Normalized difference vegetation index class

Source

Data were provided by Dr Adison Altamirano at the Universidad de La Frontera (Temuco, Chile).

References

Altamirano A, Salas C, Yaitul V, Smith-Ramirez C, Avila A. Infuencia de la heterogeneidad del paisaje en la ocurrencia de incendios forestales en Chile Central. Revista de Geografia del Norte Grande, 55:157-170, 2013.

Examples

```
data(forestFire)
head(forestFire)
```

---

forestHawaii *Contains information of forest plots across the Hawaiian archipelago.*

Description

Diameter at breast height (or occurrence) of individual trees, shrubs and tree ferns across 530 plots across the Hawaiian archipelago and includes native status and cultivated status of the 185 species.

Usage

```
data(forestHawaii)
```

Format

Contains 18 variables, as follows:

island Island name.

plot.id Unique numeric identifier for each plot.

study Brief name of study.

plot.area Plot area in m2.

longitude Longitude of plot in decimal degrees; WGS84 coordinate system.

latitude Latitude of plot in decimal degrees; WGS84 coordinate system.

year Year in which plot data was collected.

census Numeric identifier for each census.

tree.id Unique numeric identifier for each individual.

scientific.name Genus and species of each individual following TPL v. 1.1.

family Family of each individual following TPL v. 1.1.

angiosperm Binary variable (1 = yes, 0 = no) indicating whether an individual is classified as an angiosperm following APG III.

monocot Binary variable (1 = yes, 0 = no) indicating whether an individual is classified as a monocot following APG III.

native.status Categorical variable ("native", "alien", "uncertain") indicating alien status of each individual following Wagner et al. (2005).

cultivated.status Binary variable (1 = yes, 0 = no, NA = not applicable) indicating if species is cultivated following PIER.

abundance Number of individuals (all = 1).

abundance.ha Abundance of each individual on a per hectare basis.

dbh Diameter at 1.3 m (DBH in cm) for each individual; NA indicates that size was not measured, but was classified by size class.

Source

The data were obtained from the DRYAD repository at doi: 10.5061/dryad.1kk02qr.

References

- Craven D, Knight T, Barton K, Bialic-Murphy L, Cordell S, Giardina C, Gillespie T, Ostertag R, Sack L,Chase J. 2018. OpenNahele: the open Hawaiian forest plot database. Biodiversity Data Journal 6: e28406.

Examples

```
data(forestHawaii)
head(forestHawaii)
```

---

hawaii *Diameter growth increments of a tropical tree species in Hawaii*

Description

Tree size, competition, and diameter growth increment of Metrosideros polymorpha trees collected in the Kilauea Volcano, Hawaii. Data containing 64 observations at the current annual growth rate (defined as dbh increment within one calendar year) of each tree was measured from 1986 to 1988 using band dendrometers.

Usage

```
data(hawaii)
```

Format

The dataframe has the following columns:

tree.code Tree number identification. The first letter of the ID represents a cohort. Six cohorts representing a chronosequence were sampled.

dbh Initial stem diameter, in cm.

htot Total height, in m.

crown.area Crown outline area, in square meters.

comp.ind Competition index (Basal area of nearest neighbor divided by square of distance to nearest neighbor plus basal area of second nearest neighbor divided by square of distance to second nearest neighbor).

cai.1986 Current annual stem diameter increment during 1986, in mm.

cai.1987 Current annual stem diameter increment during 1987, in mm.

cai.1988 Current annual stem diameter increment during 1988, in mm.

Source

The data were obtained from Gerrish and Mueller-Dombois (1999).

References

Gerrish G, Mueller-Dombois D. 1999. Measuring stem growth rates for determining age and cohort analysis of a tropical evergreen tree. Pacific Science. 53(4): 418-429.

Examples

```
data(hawaii)
head(hawaii)
```

---

hgrowthDfir — *Tree height growth of Douglas-fir sample trees in the Northwest of the United States*

Description

Data contains 148 observations on the height growth of dominant trees of Pseudotsguga mensiezzi in the Northwest of the United States.

Usage

```
data(hgrowthDfir)
```

Format

The data frame contains seven variables as follows:

natfor.id Code identifier.

plot.code Plot number identification

tree.code Tree number identification.

dbh Diameter at breast height at sampling, in in.

htot Total height at sa,pling, in ft

age Age of tree, yr

height Height at a given age, in ft

Source

The data were provided by Dr Christian Salas.

References

Monserud RA. Height growth and site index curves for Inland Douglas- fir based on stem analysis data and forest habitat type. Forest Sci., 30(4):943-965, 1984.

Salas C, Stage AR, and Robinson AP. Modeling effects of overstory density and competing vegetation on tree height growth. Forest Sci., 54(1):107-122, 2008.

Examples

```
data(hgrowthDfir)
head(hgrowthDfir)
```

---

idahohd *Tree height-diameter data from Idaho (USA).*

Description

These data are forest inventory measures from the Upper Flat Creek stand of the University of Idaho Experimental Forest, dated 1991.

Usage

```
data(idahohd)
```

Format

Contains five variables, as follows:

plot plot number.

tree tree within plot.

species a factor with levels DF = Douglas-fir, GF = Grand fir, SF = Subalpine fir, WL = Western larch, WC = Western red cedar, WP = White pine.

dbh Diameter 137 cm perpendicular to the bole, mm.

height Height of the tree, in decimeters.

Source

The data were obtained from the alr4 library.

References

Weisberg S. 2014. Applied Linear Regression. 4th edition. New York: Wiley.

Examples

```
data(idahohd)
head(idahohd)
```

`invasivesRCI` *Contains regeneration microsite data in Robinson Crusoe Island forest*

Description

These are plot-level measurement (2x2 m) data from the forests in the Robinson Crusoe Island, located in the Pacific Ocean, 667 km from mainland Chile. Measurements were collected in transects of 100 to 240 meters in which, 398 squared plots (2x2 m) were set to include canopy gaps, gap borders and closed forest conditions.

Usage

```
data(invasivesRCI)
```

Format

Data has the following columns

plot.id Plot identification code

Gap.type Canopy gap classified as invaded=Inv, non invaded= Nat or treated =Treat(considering the estimated cover of invasive plant species)

Forest.zone Location of the plot (gap, border or forest)

Ferns Estimated cover of fern species (in 2x2 plots)

Moss.liverw Estimated cover of mosses and liverworts (in 2x2 plots)

Cwd Estimated cover of coarse woody debris > 3 cm diameter (in 2x2 plots)

Litter Estimated cover of litter (in 2x2 plots)

Ms Estimated cover of mineral soil (in 2x2 plots)

Rock Estimated cover of rocks (in 2x2 plots)

Est.age Age category for the canopy gap associated to each plot

Source

The data are provided courtesy of Prof. Rodrigo Vargas-Gaete at Universidad de La Frontera (Temuco, Chile).

References

Vargas-Gaete R, Salas-Eljatib C, Gärtner SM, Vidal OJ, Bannister JR, Pauchard A. 2018. Invasive plant species thresholds in the forests of Robinson Crusoe Island, Chile. Plant Ecology & Diversity, 11(2), 205-215.

`landCoverSantiago` *Land-cover, environmental and sociodemographic data for the 34 municipalities composing the Greater Santiago area, Santiago, Chile.*

Description

dataset contains 476 observations, 34 categorical and 442 numerical. Land-cover data was generated through remote sensing classification techniques using Sentinel-2 satellite images from year 2016. Temperatures were obtained from TIRS band 10 of Landsat 8 satellites images. Particulate matter concentrations were estimated using spatial modelling techniques from 10 pollution stations distributed in the city. Altitude was generated from a Digital Elevation Model. Population and poverty were gathered from Casen 2017 survey.

Usage

```
data(landCoverSantiago)
```

Format

The data frame contains four variables as follows:

Comuna Name of Municipality

p.Construido Percentage of surface covered by built-up area

p.Vegetacion Percentage of surface covered by vegetation

p.Desnudo Percentage of surface covered by bare soil

p.Pasto Percentage of surface covered by deciduous vegetation

p.Deciduo Percentage of surface covered by evergreen vegetation

p.Siempreverde Percentage of surface covered by evergreen vegetation

Temp Invierno Land surface temperature in celsius degrees at 2pm on a winter 0% cloud day

Temp Verano Land surface temperature in celsius degrees at 2pm on a summer 0% cloud day

PM10 Invierno Average particulate matter 10 micron during winter months

PM10 Verano Average particulate matter 10 micron during summer months

p.pobreza 2017 Percentage of people under poverty line year 2017

Altitud promedio Average altitude of municipal area

Poblacion Total population of municipality

Source

Data were provided by Dr Ignacio Fernandez at the Universidad Mayor (Santiago, Chile).

References

Not yet

Examples

```
data(landCoverSantiago)
head(landCoverSantiago)
```

---

lleuque *Contains species composition data of Prumnopitys andina (Lleuque) forests*

Description

Contains species composition data for forests with presence of Lleuque (Prumnopitys andina)

Usage

```
lleuque
```

Format

The dataframe has the following columns

stand Stand number

plot.num Plot number

Aus.chi Tree density/ha of Austrocedrus chilensis

May.dis Tree density/ha of Maytenus disticha

Not.obl Tree density/ha of Nothofagus obliqua

Pru.and Tree density/ha of Prumnopitys andina

Source

The data are provided courtesy of Prof. Rodrigo Vargas-Gaete at Universidad de La Frontera (Temuco, Chile).

References

Vargas-Gaete R, Salas-Eljatib C, Penneckamp D, Neira Z, Diez MC, Vargas-Picón, R. 2020. Estructura y regeneración de bosques de Prumnopitys andina en los Andes del sur de Chile. Gayana Botánica, 77(1), 48-58.

`orange` *Diameter growth of orange trees*

Description

The orange data frame has 35 rows and four columns of records of the growth of orange trees.

Usage

```
data(orange)
```

Format

A time series data containing the following columns:

tree.id an ordered factor indicating the tree on which the measurement is made. The ordering is according to increasing maximum diameter.

time a numeric vector giving the numbers of days since 1968/12/31

girth a numeric vector of trunk perimeter (mm). This is probably a circumference at breast height, a standard measurement in forestry.

dbh a numeric vector of diameter at breast height (mm).

site a factor variable, representing site conditions with two levels.

spp a factor variable, representing tree species with three levels.

Source

Modified by Christian Salas-Eljatib from the Orange R dataframe.

Examples

```
data(orange)

coplot(dbh ~ time | tree.id, data = orange, show.given = FALSE)
m1 <- nls(dbh ~ SSlogis(time, Asym, xmid, scal),
          data = orange, subset = tree.id == 3)
plot(dbh ~ time, data = orange, subset = tree.id == 3,
     xlab = "Time (number of days since 1968/12/31)",
```

```
     ylab = "Tree diameter (mm)", las = 1)
time <- seq(0, 1600, length.out = 101)
lines(time, predict(m1, list(time = time)))
```

`pinaster` *Tree volume for Pinus pinaster in the Baixo-Mino, Galicia, Spain.*

Description

These are volume measurements data of sample trees in the Baixo-Mino region in Galicia, Spain.

Usage

```
data(pinaster)
```

Format

Contains tree-level variables, as follows:

stand stand number from the sample tree was selected.

si Site index of the stand.

tree.no tree number.

dbh Diameter at breast height, in cm.

htot Total height, in m.

d4 Upper-stem diameter at 4 m, in cm.

vol.wb Tree gross volume, in m^3 with bark.

vol.wob Tree gross volume, in m^3 without bark.

Source

The data are provided courtesy of Dr Christian Salas at the Universidad Mayor (Santiago, Chile).

References

- Salas C, Nieto L, Irisarri A. 2005. Modelos de volumen para Pinus pinaster Ait. en la comarca del Baixo Mino, Galicia, Espana. Quebracho 12: 11-22. https://eljatib.com/publication/2005-01-01_modelos_de_volumen_p/

Examples

```
data(pinaster)
head(pinaster)
```

pinusContorta *Contains spatial location of Pinus contorta trees in sample plots.*

Description

These are tree-level measurement data, with cartesian location of each tree, from Pinus contorta invasion in Patagonian steppe in Coyhaique in southhern Chile, measured in 2011. There are 3 plots, each of 10.000 m^2.

Usage

```
data(pinusContorta)
```

Format

Contains 8 variables, as follows:

plot.id Plot sample ID.

tree.id Tree identificator number in each plot. Same indv/id for multi-stem trees.

y.coord coordinate of S latitude.

x.coord coordinate of W longitude.

substrate Ground cover in which each pine grow. Bare soil, Festuca pallescens, Baccharis magellanica, Oreopulus glacialis, Acaena integerrima and others species.

drc Diameter at the root collar on trees, in mm.

h Height of trees, in cm.

canopy.area Proyection of canopy area of each tree, in square meters.

Source

The data are provided courtesy of Drs. Anibal Pauchard and Rafael Garcia at the Laboratorio de Invasiones Biologicas, Universidad de Concepcion (Chile).

References

Pauchard A, Escudero A, Garcia RA, de la Cruz M, Langdon B, Cavieres LA, Esquivel J. 2016. Pine invasions in treeless environments: dispersal overruns microsite heterogeneity. Ecology and Evolution. 6(2): 447–459. doi: 10.1002/ece3.1877

Examples

```
data(pinusContorta)
head(pinusContorta)
unique(pinusContorta$plot.id)
```

pinusSpp *Tree-level variables of several sample plots of invasive Pinus spp in Chile.*

Description

These are tree-lavel measurement data from Pinus spp invasion in Araucaria-Nothofagus forests in the Malalcahuello National Reserve in La Araucania region in southhern Chile, measured in 2012. There are 26 plots and plot size is 100 m^2.

Usage

```
data(pinusSpp)
```

Format

Contains 8 variables, as follows:

plot.id Plot sample ID.

plot.size Plot size, en m^2.

lat.s Decimal coordinate of S latitude.

long.w Decimal coordinate of W longitude.

indv.id Tree identificator number in each plot. Same indv/id for multi-stem trees.

stem.id Stem identificator number in each plot.

spp Specie.

dbh Diameter at breast-height, in cm.

h Height, in m.

hcb Height to crown base, in m.

crown.lenght Crown lenght, in m.

obs Extra information.

Source

The data are provided courtesy of Drs. Anibal Pauchard and Rafael Garcia at the Laboratorio de Invasiones Biologicas, Universidad de Concepcion (Chile).

References

Cobar-Carranza A, Garcia R, Pauchard A, Pena E. 2014. Effect of Pinus contorta invasion on forest fuel properties and its potential implications on the fire regime of Araucaria araucana and Nothofagus antarctica forests. Biological Invasions. 16(11): 2273 - 2291. doi: 10.1007/s10530014-06638

Examples

```
data(pinusSpp)
head(pinusSpp)
length(unique(pinusSpp$plot.id))
boxplot(dbh~plot.id, data=pinusSpp)
```

`plantsHawaii` *Maximum plant size in the Hawaiian archipelago.*

Description

Maximum plant size of 58 tree, shrub and tree fern species that occur in 530 forest plots across the Hawaiian archipelago.

Usage

```
data(plantsHawaii)
```

Format

Contains 6 variables, as follows:

scientific.name Genus and epithet of each individual following The Plant List v. 1.1 (2013).

family Family of each individual following The Plant List v. 1.1 (2013).

native.status Categorical variable ('native', 'alien', 'uncertain') indicating alien status of each individual following Wagner et al. (2005).

n Number of individuals used to estimate maximum plant size.

d.95 Maximum plant size, estimated as D950.1 (King et al. 2006).

d.max.3 Maximum plant size, estimated as Dmax3 (King et al. 2006).

Source

The data were obtained from the DRYAD repository at doi: 10.5061/dryad.1kk02qr.

References

- Craven D, Knight T, Barton K, Bialic-Murphy L, Cordell S, Giardina C, Gillespie T, Ostertag R, Sack L,Chase J. 2018. OpenNahele: the open Hawaiian forest plot database. Biodiversity Data Journal 6: e28406.

Examples

```
data(plantsHawaii)
head(plantsHawaii)
```

presenceIce *Presence or absence of sea ice from logbook records of annual cruises*

Description

Data containing 52717 observations about presence of sea ice from logbook records of annual cruises to the B-C-B in an unbroken record between years 1850 to 1910.

Usage

```
data(presenceIce)
```

Format

The dataframe contains the following columns:

ship.id The code number for ships.

move.type Type of movement of ships. 0 indicates a sail-powered vessel and 1 indicates an auxiliary-powered vessel.

year Year of registry.

month Month of registry.

day Day of registry.

lat.dec Decimal latitude.

long.dec Decimal longitude.

e.w East or west of the Prime Meridian.

ice.cov Sea Ice Observed. 0 no see (Not registered) and 1 presence sea ice (Registered).

Source

The data were provided from Sea Ice Group at the Geophysical Institute.

References

Mahoney A, Bockstoce J, Botkin D, Eicken H, Nisbet R. 2011. Sea-Ice Distribution in the Bering and Chukchi Seas: Information from Historical Whaleships' Logbooks and Journals ARCTIC. 64(4): 465-477.

Examples

```
data(presenceIce)
head(presenceIce)
```

`presidentChile` *2021 presidential election in Chile.*

Description

Voting table-level data of the 2021 presidential election in Chile. The election was held on December 19, 2021.

Usage

```
data(presidentChile)
```

Format

The dataframe contains the following columns:

region.no Administrative region number of Chile.

region Administrative region name.

provincia Province.

circu.senatorial Senatorial constituency.

distrito Distrit.

comuna County.

region Senatorial constituency.

provincia Province.

circu.elec Electoral constituency.

local Place.

no.mesa Voting table.

tipo.mesa Voting table type.

mesas.fusionadas Merged voting tables.

electores Electors.

nro.en.voto .

candidato Candidate. Gabriel Boric and Jose A. Kast

votos.tricel Total number of votes.

Source

The data were obtained from the electoral service of the Chilean Government (SERVEL) at https://www.servel.cl/resultados-definitivos-elecciones-segunda-votacion-presidencia-2021/. The datafile name was "Resultados_mesa_presidencial_TRICEL_2v_2021-1.xlsx", and was downloaded on October 24, 2022.

Examples

```
data(presidentChile)
head(presidentChile)
```

pspLlancahue *Tree locations for a sample plot in the Llancahue experimental forest, near Valdivia, Chile.*

Description

The Cartesian position, species, and diameter of trees within a plot were measured. The sample plot is rectangular of 130 m by 70 m. Further details can be #' reviewed in the reference.

Usage

```
data(pspLlancahue)
```

Format

Contains tree-level variables, as follows:

tree.code Tree identificator

spp.name species abreviation as follows: AP= Aextocicon puncatatum, EC=Eucryphia cordifolia, GA=Gevuina avellana, LP= Laureliopsis philippiana, LS= Laurelia sempervirens, ND=Nothofagus dombeyi, Ot=Other, PS=Podocarpus saligna

dbh diameter at breast height, in cm

x.coord Cartesian position in the X-axis, in m

y.coord Cartesian position in the Y-axis, in m

Source

The data are provided courtesy of Prof. Daniel Soto at Universidad de Aysen (Coyhaique, Chile).

References

- Soto DP, Salas C, Donoso PJ, Uteau D. 2010. Heterogeneidad estructural y espacial de un bosque mixto dominado por Nothofagus dombeyi despues de un disturbio parcial. Revista Chilena de Historia Natural 83(3): 335-347.

Examples

```
data(pspLlancahue)
head(pspLlancahue)
```

pspRuca *Tree-level measurements and spatial coordinates in rucamanque property*

Description

Tree level measurements and spatial coordinates in a permanent sample plot of 1 ha (100 x 100m) in the Rucamanque Experimental Forests, near Temuco, Chile.

Usage

```
data(pspRuca)
```

Format

The data frame contains four variables as follows:

tree.no tree number

spp Species name, "N. obliqua" is Nothofagus obliqua, "Ap" is Aexitocicum puncatatum, etc.

status 1 alive, 0 standing-dead

dbh diameter at breast-height, in cm

x.coord Cartesian position at the X-axis, in m

y.coord Cartesian position at the Y-axis, in m

crown.class Crown class (1: superior, 2: intermediate, 3; inferior)

Source

Data were provided by Dr Christian Salas-Eljatib (Universidad Mayor, Santiago, Chile).

References

Salas C, LeMay V, Nunez P, Pacheco P, and Espinosa A. 2006. Spatial patterns in an old-growth Nothofagus obliqua forest in south-central Chile. Forest Ecology and Management 231(1-3): 38-46.

Examples

```
data(pspRuca)
head(pspRuca)
```

ptaeda *Height growth of Pinus taeda (Loblolly pine) trees*

Description

The Loblolly data frame has 84 rows and tree columns of records of the tree height growth of Loblolly pine trees. This dataframe is a slight modification to the original dataframe "Loblolly" from the datasets R package.

Usage

```
data(ptaeda)
```

Format

An object of class c("nfnGroupedData", "nfGroupedData", "groupedData", "data.frame") containing the following columns:

seed.id an ordered factor indicating the seed source for the tree. The ordering is according to increasing maximum height.

age a numeric vector of tree ages, in yr.

height a numeric vector of tree heights, in m.

Source

Pinheiro, J. C. and Bates, D. M. (2000) Mixed-effects Models in S and S-PLUS. Springer.

Examples

```
data(ptaeda)
plot(height ~ age, data = ptaeda, subset = seed.id == 329,
     xlab = "Tree age (yr)", las = 1,
     ylab = "Tree height (m)",
     main = "Loblolly data and fitted curve (seed.id 329 only)")
fm1 <- nls(height ~ SSasymp(age, Asym, R0, lrc),
           data = ptaeda, subset = seed.id == 329)
age <- seq(0, 30, length.out = 101)
lines(age, predict(fm1, list(age = age)))
```

radiatapl *Sampling plots data from a Pinus radiata plantation near Capitan Pastene, Region de La Araucania, Chile.*

Description

Tree-level information collected within sample plots in a forestry plantation of Pinus radiata near Capitan Pastene, Southern Chile. Sample plots size is 150 square meters.

Usage

```
data(radiatapl)
```

Format

The data frame contains four variables as follows:

plot Plot number identification.

tree Tree number identification.

dbh Diameter at breast height, in cm.

heigth Total height, in m.

Source

The data are provided courtesy of Mr. Mauricio Lobos-Beneventi (Temuco, Chile).

Examples

```
data(radiatapl)
head(radiatapl)
```

raulihg *Height growth of Nothofagus alpina trees in Chile.*

Description

Time series data of height for Nothofagus alpina (rauli) trees in south-central Chile. These sampled trees are part of the ones used in the following article: * Salas-Eljatib C. 2021. An approach to quantify climate-productivity relationships: an example from a widespread Nothofagus forest. Ecological Applications 31(4): e02285.

Usage

```
data(raulihg)
```

Format

The data frame contains four variables as follows:

tree.code tree id code

spp species common name

bha.t breast-height age, in yrs.

h.t total height, in m.

Source

Data were provided by Dr Christian Salas-Eljatib (Santiago, Chile).

References

Salas-Eljatib C. 2021. An approach to quantify climate-productivity relationships: an example from a widespread Nothofagus forest. Ecological Applications 31(4): e02285. Salas-Eljatib, C. 2021. Time series height-data for Nothofagus alpina trees. doi: 10.6084/m9.figshare.13521602.v5

Examples

```
data(raulihg)
head(raulihg)
```

---

regNothofagus *Contains information about regeneration of Nothofagus seedlings.*

Description

Dataset contains 442 observations.

Usage

```
data(regNothofagus)
```

Format

Contains 15 variables, as follows:

site Id site of study.

plot Number of plot.

scar Scarification in percentage of total area.

x.trans.total Transmitted radiation in percentage.

kPa Soil resistance to penetration.

SWC Soil water content.

SM Exposed mineral soil.

litter Litter cover in percentage.

CWD Ocular estimation in the regeneration plot in percentage.

MT Microtopography. 1 plane, 2 convex, 3 concave, 4 mixed (convex and concave) in the regeneration plot.

S Ground-layer vascular species richness in the regeneration plot..

LLES Long-lived early-seral tree species (N. dombeyi , N. alpina , Nothofagus pumilio).

SLES Short-lived early-seral plants (Ribes spp. and Fuchsia sp).

LLLS Long-lived late-seral tree species (L. philippiana and Dasyphyllum diacantaoides).

log.bam Logarithm of the cover of bamboo (%) in the regeneration plot.

Source

The data were obtained from the DRYAD repository at doi: 10.5061/dryad.3q977

References

Soto D, Puettmann K.2018. Topsoil removal through scarification improves natural regeneration in high-graded Nothofagus old-growth forests. Journal Applied Ecology. 55: 967- 976.

Examples

```
data(regNothofagus)
head(regNothofagus)
```

---

simula *Simulated yield of forestry plantations of exotic species in Chile.*

Description

The yield tables of simulated plantations of Pinus radiata, Eucalyptus globulus, and Eucalyptus nitens are obtained from the Radiata simulator and EucaSim simulator built in Chile. Several stand-level variables are part of the output.

Usage

```
data(simula)
```

Format

Contains stand-level variables, as follows:

species "P. radiata" is Pinus radiata, "E. globulus" is Eucalyptus globulus, and "E. nitens" is Eucalyptus nitens.

age plantation age, in years

tph Tree density, in trees/ha

gha Basal area, in m^2/ha

toph Dominant height, in m

qmd quadratic mean diameter, in cm

totvol gross stand volume, in m^3/ha

viu.10 stand volume below an utilizacion index of 10 cm, in m^3/ha

viu.15 stand volume below an utilizacion index of 15 cm, in m^3/ha

viu.20 stand volume below an utilizacion index of 20 cm, in m^3/ha

viu.25 stand volume below an utilizacion index of 25 cm, in m^3/ha

Source

The data were obtained as outputs for plantations without management in Chile. The academic version of the simulator was used. You can visit mnssimulacion.cl

Examples

```
data(simula)
```

`slashpine` *Biomass dataset*

Description

Dataset that contains nine pairs of columns with information about biomass of 40 samples.

Usage

```
data(slashpine)
```

Format

The data frame contains nine variables as follows:

tree_id tree code

dbh diameter

h heigth

lcl live crown lenght

age age tree

wood wood biomass

bark bark biomass

crown crown biomass

tree tree biomass

Source

Data were provided by Dr Christian Salas-Eljatib (Universidad Mayor, Santiago, Chile).

References

Parresol BR. 2001. Additivity of nonlinear biomass equations. Canadian Journal of For Research, 31:865-878.

Examples

```
data(slashpine)
head(slashpine)
```

---

sludge *ludge data are at different cities, with a value of concentration zinc.*

Description

Dataset contains 36 observations

Usage

```
data(sludge)
```

Format

Contains four variables, as follows:

city Name of city.

rate Concentration rate of sludge.

zinc Value of concentration (in ppm).

trt.comb Combination between city and rate factors.

Source

The data were provided from.

References

not yet

Examples

```
data(sludge)
head(sludge)
```

`snaspeChile` *On the National System of State Protected Wild Areas (SNASPE) of Chile.*

Description

Dataset contains the protected wild areas of Chile that are part of the National System of State Protected Wild Areas (SNASPE).

Usage

```
data(snaspeChile)
```

Format

Contains the following variables:

unit.id Number for the unit.

unit Name of the protected area.

category Category of the unit. It can be either a National Park, a National Reserve or a Natural Monument.

commune Name of the commune (the smallest Chilean territorial division) where the unit is located.

province Province where the comunne is located (one territorial division level above the commune).

region Region where the province is located (one territorial division level above the province and the biggest Chilean territorial division).

perim.km Perimeter, in km.

area.ha Area, in hectares.

area.m2 Area, in m^2.

Source

These data is freely available at https://ide.minagri.gob.cl/geoweb/2019/11/21/medio-ambiente/

References

The SNASPE has been created and is currently managed by the National Forest Corporation (CONAF). More information and documentation can be found at https://www.conaf.cl/parques-nacionales/parques-de-chile/

Examples

```
data(snaspeChile)
head(snaspeChile)
```

spatAustria *Tree locations for several plots of Norway spruce*

Description

The Cartesian position, species, year, ID tree , and diameter of trees within a plot were measured.

Usage

```
data(spatAustria)
```

Format

Contains cartesian position of trees, and covariates, in sample plots, as follows:

plot.code Plot identificator

tree.code Tree identificator

spp.name species abreviation as follows: PCAB=Picea abies, FASY= Fagus sylvatica, QCPE=Quercus petraea , PNSY= Pinus Sylvestris, LADC=Larix decidua

x.coord Cartesian position in the X-axis, in m

y.coord Cartesian position in the Y-axis, in m

year Measurement year

dbh diameter at breast-height, in cm

References

- Kindermann G. Kristofel F, Neumann M, Rossler G, LedermannT & Schueler. 2018. 109 years of forest growth measurements from individual Norway spruce trees. Sci. Data 5:180077 doi: 10.1038/sdata.2018.77

Examples

```
data(spatAustria)
head(spatAustria)
pos<-spatAustria
oldpar<-par(mar=c(4,4,0,0))
bord<-data.frame(x=c(min(pos$x.coord),max(pos$x.coord),min(pos$x.coord),max(pos$x.coord)),
                 y=c(min(pos$y.coord),min(pos$y.coord),max(pos$y.coord),min(pos$y.coord)))
plot(bord,type="n", xlab="x (m)", ylab="y (m)", asp=1, bty='n')
points(pos$x.coord,pos$y.coord,col=pos$plot.code,cex=0.5)
par(oldpar)
```

speciesList *Names and other information of plant species (mainly trees)*

Description

This data set provides names (taxonomy), of plant species. Includes codes and name abbreviations used by the Biometrics group at the Center for Ecosystem Modeling (CEM), Universidad Mayor, Santiago, Chile.

Usage

```
data(speciesList)
```

Format

A data frame with 63 observations on 31 variables

nesp Unique correlative specie number

spp.ci.name Species scientific name

spp.ci.abb Species scientific name abbreviation

common.name Species common name. No blank spaces, no special characters

common.nameBlank Species common name. With blank spaces, no special characters

esp Species code: code given by CEM Biometrics to identify species for different processing routines

common.nameLatex Species common name formatted for Latex

nTaxon Unique number of the taxon (i.e., species)

kingdom Taxonomic rank Kingdom. In this datase, all species belong to the Kingdom Plantae

division Taxonomic rank division or phylum within the Kingdom

class Taxonomic rank Class within the Kingdom

order Taxonomic rank Order within the Class

family Taxonomic rank Family within the Order

spp.ci.full Full scientific name including author

genus Taxonomic rank Genus within the Family

epithet Specific epithet

sppAuthor Species author

subSpp Subespecies: one of two or more populations of a species varying from one another by morphological characteristics

subSppAuthor Subespecies author

varSpp Species variety or varietas

varSppAuthor Variety author

formSpp Form or forma

formSppAuthor Form author

commonNamesList List of common names per species, separated by commas

synonyms Synonyms of the scientific name by which the species has been or is known

borCountries Border countries given the species distribution range

habit Habit. The general appearance, growth form, or architecture e.g., tree, shrub, grass

lifeCycle Life cycle

statusOri Status according to the species origin: Native or Endemic

regDist Distribution range of the species, within Chile administrative regions

elevRange Distribution range of the species, in terms of elevation. Meters above sea level

notes Notes

Source

Data provided from https://investigacion.conaf.cl/repositorio/documento/ficha-repositorio.php?redo_id=1080946

References

Proyecto 004/2016 Lista sistematica actualizada de la flora vascular nativa de Chile, origen y distribucion geografica. VII Concurso del Fondo de Investigacion del Bosque Nativo

---

sppAbundance *Contains information of abundance of plant species in the central-southern Andes of Chile.*

Description

Abundance of plant species [50 total] (at parcel scale [100 m2]) in burned Araucaria-Nothofagus forests with different levels of fire severity (ie, unburned = unburned, low_sev = low severity, mid_sev = medium severity , high_sev = high severity) in the China Muerta National Reserve, Andes of central-southern Chile.

Usage

```
data(sppAbundance)
```

Format

Contains 6 variables, as follows:

sp.name name of specie.

sp.code.name code of specie

unburned Abundance of plants unburned.

low.sev Abundance of plants for low severity of burned.

mid.sev Abundance of plants for middle severity of burned.

high.sev Abundance of plants for high severity of burned.

Source

The data are provided courtesy of Dr Andres Fuentes at the Universidad of La Frontera (Temuco, Chile)

References

- Fuentes A, Salas C, Gonzalez M, Urrutia J, Arroyo P, Santibanez P. 2020. Initial response of understorey vegetation and tree regeneration to a mixed-severity fire in old-growth Araucaria-Nothofagus forests.Applied Vegan Science. 23:210-222.

Examples

```
data(sppAbundance)
head(sppAbundance)
```

---

sppTraits *Contains information of functional traits of species.*

Description

Dataset contains 48 observations about about functional trait values for each of the 48 study species, including 23 evergreen and 25 deciduous.

Usage

```
data(sppTraits)
```

Format

Contains 17 variables, as follows:

sp Abbreviated name of specie.

sp.name Name of specie.

family Family of specie.

genus Genus of specie.

phyl Type of phylogeny.

l.hab Type of leaf habit.

leaf Type of leaf.

lt .

lma Leaf mass area.

amass Photosynthetic capacity per unit leaf mass.

n.mass Leaf N content per unit mass.

pmass Leaf P content per unit mass.

l.lifespan Leaf life span.

l.length Leaf length.

sem Seed mass.

wd Wood density.

max.h Maximum height.

Source

The data were provided from DRYAD repository

References

- Ameztegui A, Paquette A, Shipley B, Heym M, Messier C, Gravel D. 2016 . Shade tolerance and the functional trait: demography relationship in temperate and boreal forests. Functional Ecology, 31: 821-830.

Examples

```
data(sppTraits)
head(sppTraits)
```

`standLleuque` *Plot-level data with variables from Andean Prumnopitys forests*

Description

Data on density, basal area, mean square diameter and other variables of 24 plots for Lleuque is provided.

Usage

```
data(standLleuque)
```

Format

The data frame contains seven variables as follows:

rodal number of stand

plot.id code of plot

nha Density of plot

gha Basal area of plot

qmd Quadratic mean diameter of plot

toph Dominant height of plot

structure Forest structure level: open, secondary adult, pure

Source

The data are provided courtesy of Prof. Rodrigo Vargas-Gaete at Universidad de La Frontera (Temuco, Chile).

References

Vargas-Gaete R, Salas-Eljatib C, Penneckamp D, Neira Z, Diez MC, Vargas-Picón, R. 2020. Estructura y regeneración de bosques de Prumnopitys andina en los Andes del sur de Chile. Gayana Botánica, 77(1), 48-58.

Examples

```
data(standLleuque)
head(standLleuque)
```

`trailCameraTrap` *Contains information of Camera trap data on medium to large terrestrial mammals collected at 54 camera stations in Ruaha National Park, southern Tanzania.*

Description

Dataset contains 14604 observations and sampling was carried out for two months during the dry season of 2013 and two months during the wet season of 2014. Each camera station is associated with a randomly placed camera and a trail-based camer, with the aim of comparing communities resulting from the two camera trap placement strategies.

Usage

```
data(trailCameraTrap)
```

Format

Contains 6 variables, as follows:

reference Number of observation od datasets.

placement Type of "placement" placed in each station (random or trail).

season Season where were made the samplings.

station Station where were collected the data.

specie Name of specie medium to large terrestrial mammals.

date.time The date and time of each photographic event is also given.

Source

The data were provided by Dr Jeremy Cusack at Universidad Mayor (Santiago, Chile)

References

- Cusack J, Dickman A, Rowcliffe M, Carbone C, Macdonald D, Coulson T. 2016 . Random versus game trail-based camera trap placement strategy for monitoring terrestrial mammal communities. PLoS ONE 10(5): e0126373.

Examples

```
data(trailCameraTrap)
head(trailCameraTrap)
```

---

traits *Functional traits of vegetative species in Chile.*

Description

Functional traits of vegetative species in Chile. Includes column with codified name (esp)

Usage

```
data(traits)
```

Format

esp species codified name

shadeTolerance indicates the species tolerance to shape. There are three main classes: shade-tolerant, shade-midtolerant and shade-intolerant

spp.ci.name Scientific name.

spp.ci.abb. .

wd wood density in kg per cubic meters.

Source

Some of the information on shade tolerance can be found in Soto et al 2010.

References

- Soto DP, Salas C, Donoso PJ, Uteau D. 2010. Heterogeneidad estructural y espacial de un bosque mixto dominado por Nothofagus dombeyi despues de un disturbio parcial. Revista Chilena de Historia Natural 83(3): 335-347.

`treegrowth` *Diameter and height growth of Grand-fir sample trees.*

Description

Diameter and height growth of 66 Grand-fir trees. Data derived from stem analysis sample trees collected by Dr Albert Stage (US Forest Service, Moscow, ID, USA.)

Usage

```
data(treegrowth)
```

Format

Contains seven column, as follows:

tree.id Tree number identificator. An unique number to each sample tree.

forest Forest type.

habitat Forest habitat type.

tree.code A composite tree code representing the following columns: tree.id-forest-habitat

age Age, in yr

dbh Diameter at breast-height, in cm.

htot Total height, in m.

Source

Originally, the data were provided by Dr Albert Stage (R.I.P) to Professor Andrew Robinson (University of Idaho, USA), whom used them to explain the fitting of statistical models. Dr Christian Salas-Eljatib was a former graduate student of Statistics of Prof Robinson at the Univ. of Idaho.

References

Stage, A. R., 1963. A mathematical approach to polymorphic site index curves for Grand fir. Forest Science 9 (2), 167–180.

Examples

```
data(treegrowth)
head(treegrowth)
```

`treelistinve` *Tree-list data in a forest inventory.*

Description

Tree-level variables measured within 3 sample plots in a forest inventory. Notice that not all plots have the same size.

Usage

```
data(treelistinve)
```

Format

Contains tree-level variables, as follows:

plot Plot number.

plot.size Plot size, in m2.

tree Tree identificator

species species common name as follows: Olivillo= Aextocicon puncatatum, Tepa= Laureliopsis philippiana, Lingue= Persea lingues, Coigue=Nothofagus dombeyi, Roble=Nothofagus obliqua, Other=Other

dbh Diameter at breast-height, in cm

htot Total height, in m. Only measured for some sample trees.

Source

The data are provided courtesy of Prof. Christian Salas-Eljatib (Chile).

References

- Salas C. 2001. Caracterización básica del relicto de Biodiversidad Rucamanque. Bosque Nativo, 29:3-9. https://eljatib.com/publication/2001-01-01_caracterizacion_basi/ - Salas C. 2002. Ajuste y validación de ecuaciones de volumen para un relicto del bosque de Roble-Laurel-Lingue. Bosque 23(2): 81-92. doi: 10.4067/S071792002002000200009

Examples

```
data(treelistinve)
head(treelistinve)
```

treevol *Diameter, height and volume for Black Cherry Trees*

Description

This data set provides measurements of the diameter, height and volume of timber in 31 felled black cherry trees. This dataframe is a slight modification to the original dataframe "trees" from the datasets R package.

Usage

```
data(treevol)
```

Format

A data frame with 31 observations and three variables

dbh diameter at breast height, in cm

htot total height, in m

volume volume of timber, in cubic meters

Source

Ryan, T. A., Joiner, B. L. and Ryan, B. F. (1976) The Minitab Student Handbook. Duxbury Press.

Examples

```
pairs(treevol, panel = panel.smooth, main = "treevol dataframe")
plot(volume ~ dbh, data = treevol, log = "xy")
coplot(log(volume) ~ log(dbh) | htot, data = treevol,
       panel = panel.smooth)
summary(m1 <- lm(log(volume) ~ log(dbh), data = treevol))
summary(m2 <- update(m1, ~ . + log(htot), data = treevol))
anova(m1,m2)
```

treevolroble *Contains tree-level variables for roble (Nothofagus obliqua) in the Rucamanque experimental forest, near Temuco, Chile.*

Description

These are tree-level measurement data of sample trees in the Rucamanque experimental forest, near Temuco, in the Araucania region in south-centralChile, measured in 1999. The data are the same as in the dataframe "treevolruca", but only having observations for the species roble (Nothofagus obliqua).

Usage

```
data(treevolroble)
```

Format

Contains tree-level variables, as follows:

tree.no Tree id

dbh Diameter at breast height, in cm

htot Total height, in m.

d6 Upper-stem diameter at 6 m, in cm

vtot Tree gross volume, in m^3 with bark.

Source

The data are provided courtesy of Dr Christian Salas at the Universidad Mayor (Santiago, Chile).

References

Salas C. 2002. Ajuste y validación de ecuaciones de volumen para un relicto del bosque de Roble-Laurel-Lingue [Fitness and validation of volume equations for a relict forest of Roble-Laurel-Lingue]. Bosque 23(2): 81-92.

Examples

```
data(treevolroble)
head(treevolroble)
```

---

treevolruca *Contains tree-level variables of several species in the Rucamanque experimental forest, near Temuco, Chile.*

Description

These are tree-level measurement data of sample trees in the Rucamanque experimental forest, near Temuco, in the Araucania region in south-centralChile, measured in 1999. The following species are part of the data: laurel (laurelia sempervirens), lingue (Persea lingue), olivillo (Aextocicon puncatum), roble (Nothofagus obliqua), tepa (Laureliosis philippiana), y tineo (Weinmannia trichosperma).

Usage

```
data(treevolruca)
```

Format

Contains tree-level variables, as follows:

tree.no Tree id.

spp Species.

dbh Diameter at breast height, in cm.

htot Total height, in m.

d6 Upper-stem diameter at 6 m, in cm.

vtot Tree gross volume, in m^3 with bark.

Source

The data were provided courtesy of Dr Christian Salas (Universidad Mayor, Santiago, Chile).

References

Salas C. 2002. Ajuste y validación de ecuaciones de volumen para un relicto del bosque de Roble-Laurel-Lingue [Fitness and validation of volume equations for a relict forest of Roble-Laurel-Lingue]. Bosque 23(2): 81-92.

Examples

```
data(treevolruca)
head(treevolruca)
```

---

xyBoxplot *xyBoxplot: Function for a scatter-plot with boxplots*

Description

Creates a scatter-plot with boxplots for the Y-axis variable.

Usage

```
xyBoxplot(x = x, y = y, col.dots = "blue", xlab = NULL, ylab = NULL)
```

Arguments

x	A numeric vector representing the X-axis variable
y	A numeric vector representing the Y-axis variable
col.dots	(optional) A string specifying the dot colors. Default is "blue".
xlab	(optional) A string specifying X-axis label.
ylab	(optional) A string specifying Y-axis label.

Value

Result of calculation

Examples

```
library(datana)
data(fishgrowth)
df <- fishgrowth
xyBoxplot(x=df$age,y=df$length)
xyBoxplot(x=df$age,y=df$length)
```

`xyHist` *xyHist: Function for a scatter-plot with marginal histograms*

Description

It creates a scattter-plot with histograms in both axys.

Usage

```
xyHist(
  x = x,
  y = y,
  col.x = "blue",
  col.y = "red",
  xlab = NULL,
  ylab = NULL,
  x.lim = NULL,
  y.lim = NULL
)
```

Arguments

`x`	A numeric vector representing the X-axis variable
`y`	A numeric vector representing the Y-axis variable
`col.x`	(optional) A string specifying the color of the histogram of the X-variable. Default is "blue".
`col.y`	(optional) A string specifying the color of the histogram of the Y-variable. Default is "red".
`xlab`	(optional) A string specifying X-axis label. Default is "xvar".
`ylab`	(optional) A string specifying Y-axis label. Default is "yvar".
`x.lim`	(optional) A vector of two elements with the limits of the Y-axis. Default is the range of the X-variable.
`y.lim`	(optional) A vector of two elements with the limits of the Y-axis. Default is the range of the Y-variable.

Value

Result of calculation

Examples

```
library(datana)
data(treevolroble)
df <- treevolroble
head(df)
xyHist(x=df$dbh,y=df$htot)
xyHist(x=df$dbh,y=df$htot, xlab="Variable X",  ylab="Variable Y")
xyHist(x=df$dbh,y=df$htot, xlab="Variable X", ylab="Variable Y",
  col.x = "gray",col.y="white")
```

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