# Package 'datana'

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Type Package

Title Data and functions to accompany Analisis de datos con el programa estadistico R: una introduccion aplicada

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#### Description

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

License GPL-2

NeedsCompilation no

URL https://eljatib.com/rlibro/

**Depends** R (>= 2.15),

Imports ggplot2, graphics, stats, utils

Suggests nlme, lattice

RoxygenNote 7.1.2

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datana-package
```

Data and functions to accompany Analisis de datos con el programa estadistico R: una introduccion aplicada

#### 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).

## Details

The data in the datana package contain several datasets for exploratory data analysis in an array of disciplines. Together with the ggplotv package, the datana package provides functions as tools for descriptive statistics and plotting.

The datana package is developed at GitHub (https://github.com/cseljatib/datana/). GitHub provides up-to-date information and forums for bug reports. Most important changes in vegan documents can be read with news(package="datana") and vignettes can be browsed with browseVignettes("datana"). The vignettes include a datana FAQ. 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-estadístico-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")</pre>
```

##scatter-plot and box-plots

airquality

```
library(datana)
data(fishgrowth)
df <- fishgrowth
xyBoxplot(x=df$length,y=df$scale)</pre>
```

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 provided from datasets 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)

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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

Dataset that contains four pairs of columns with the same descriptive statistics, however there is a difference when representing the points by means of 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 provided by Dr. Christian Salas-Eljatib de la Universidad Mayor (Santiago, Chile).

## References

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

## Examples

data(anscombe)
head(anscombe)

araucaria	Contains plot-level variables in Araucaria araucana forests in south-
	ern 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<sup>2</sup>. 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 %

## baiTreelines

aspect Aspect, in degrees
eleva Elevation, in msnm
nha Tree density, in trees/ha
gha Basal area, in m<sup>2</sup>/ha
hdom Dominant height, in m
vha Gross stand volume, in m<sup>3</sup>/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 the 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 (BAI) for four tree species.

#### Description

Dataset contains 157 observations, of the last 10 years in 6-8 adult trees of different species at three elevations of altitudinal gradients sampled in four locations of 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 https://doi.org/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 anesthetized, 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. This would be used because in the forest it is easier to measure the length of a bear, for example, than it is to weigh it. 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

## bearsDepu

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 anesthetized, 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. This would be used because in the forest it is easier to measure the length of a bear, for example, than it is to weigh it.

#### 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

## biomass

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.

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#### carbohydrateTreelines

## 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.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.

tree Id for tree.

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 https://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.

#### crownradii

#### References

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

## Examples

data(chicksw)
head(chicksw)

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<sup>2</sup>, 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 (Universidad Mayor, 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.

## deadLianas

## 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

## demograph

## 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	2
----------	---

A descriptive statistics table for continuous variables

## Description

It 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.

# election

## 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

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

eucaleaf

# 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<sup>2</sup>

## 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 data frame 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

# floraChile

# 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

# Usage

data(football)

# Format

The data frame contains 13 variables as follows:

WPM WPMk WPmk WTT WTTk WIF W5 W10 W15 W20 W25 W30

# Source

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

# References

Not yet.

# Examples

data(football)
head(football)

forestFire

#### 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

A. Altamirano, C. Salas, V. Yaitul, C. Smith-Ramirez, and A.Avila. 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.

## hawaii

- **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 https://doi.org/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

Metrosideros polymorpha in Hawaii

# Description

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 data frame contains eight variables as follows:

tree.code Tree number identification.

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 provided from .

#### 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

# idahohd

## 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

lleuque

## 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.

32

orange

## 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.

```
#data(orange)
```

pinaster

## Description

These are tree-level measurement 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<sup>^3</sup> with bark.

vol.wob Tree gross volume, in m<sup>^3</sup> 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.

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

pinusContorta

## Description

These are tree-lavel measurement data, with x,y location of each tree, from Pinus contorta invasion in Patagonian steppe in Coyhaique in southhern Chile, measured in 2011. The plots area was 10000 square meters.

### 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

```
data(pinusContorta)
head(pinusContorta)
```

#### pinusSpp

## 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. The plots area was 100 square meters

#### Usage

data(pinusSpp)

#### Format

Contains 8 variables, as follows:

plot.id Plot sample ID.

**size.plot** Plot size in square meters.

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.

sp Specie.

dbh Diameter at breast height on trees, in cm.

**h** Height of trees, in m.

canopy.h Height at which the live canopy begins, in m.

canopy.lenght Lenght of live canopy, 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

## Examples

data(pinusSpp)
head(pinusSpp)

plantsHawaii

#### 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 https://doi.org/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.

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

## 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 data frame contains nine variables as follows:

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.

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

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.

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

pspRuca

## 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

## 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.

```
#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)))</pre>
```

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.

height 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)

## regNothofagus

## 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 (Universidad Mayor, 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. figshare. Dataset. https://doi.org/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)

## Source

The data were obtained from the DRYAD repository at https://doi.org/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

# 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<sup>2</sup>/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

# 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).

# Examples

data(slashpine)
head(slashpine)

sludge

## 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)

# 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)

## spatAustria

## Format

Contains of variables, as follows:

## g.id Id.

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 of the unit in kilometers.

area.ha Area of the unit in hectares.

area.m2 Area of the unit in square meters.

## Source

These data is freely available at http://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

## Description

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

## Usage

data(spatAustria)

## Format

Contains tree-level variables, 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, Ledermann T & Schueler. 2018. 109 years of forest growth measurements from individual Norway spruce trees. Sci. Data 5:180077 doi.org/ 10.1038/sdata.2018.77

#### Examples

```
# data(spatAustria)
#head(spatAustria)
#graphics for tree by plots
#pos<-data(spatAustria)
#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$y.coord),min($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)</pre>
```

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)

48

#### 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.

# sppTraits

## 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.

## trailCameraTrap

## Examples

data(standLleuque)
head(standLleuque)

```
trailCameraTrap Contains information of Camera trap data on medium to large ter-
restrial 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

## 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. Heterogeneidad estructural y espacial de un bosque mixto dominado por Nothofagus dombeyi despues de un disturbio parcial. Revista Chilena de Historia Natural 83: 335-347, 2010

treegrowth

Diameter and height growth of Grand-fir sample trees.

#### Description

Diameter and height growth of 66 grand-fir trees. Data obtained from the Dr. Albert Stage (USDA, For.Service)

#### Usage

data(treegrowth)

# treevol

# Format

Contains seven variables, as follows:

tree.id id tree.forest Type forest.habitat type habitat.tree.code code tree.

age age.

dbh diameter.

htot height.

# Source

The data were provided.

## References

not yet

# Examples

data(treegrowth)
head(treegrowth)

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)</pre>
```

treevollaurel

*Contains tree-level variables for laurel (laurelia sempervirens) 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 laurel (laurelia sempervirens).

#### Usage

```
data(treevollaurel)
```

## Format

Contains tree-level variables, as follows:

tree.no Tree id

dbh Diameter at breast height, in cm

htot Total height (m)

d6 Upper-stem diameter at 6 m, in cm

vtot Tree gross volume, in m<sup>3</sup> with bark.

# Source

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

## References

Salas C. 2002. Ajuste y validacion 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.

## treevollingue

## Examples

```
data(treevollaurel)
head(treevollaurel)
```

treevollingue	Contains tree-level variables for lingue (Persea lingue) in the Ruca
	manque 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 lingue (Persea lingue).

## Usage

data(treevollingue)

# Format

Contains tree-level variables, as follows:

tree.no Tree id

dbh Diameter at breast height, in cm

htot Total height (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 validacion 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.

```
data(treevollingue)
head(treevollingue)
```

treevololivillo

Contains tree-level variables for olivillo (Aextocicon puncatum) 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 olivillo (Aextoxicon puncatum).

#### Usage

data(treevololivillo)

## Format

Contains tree-level variables, as follows:

tree.no Tree id

dbh Diameter at breast height, in cm

htot Total height (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 validacion 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.

```
data(treevololivillo)
head(treevololivillo)
```

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 (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 validacion 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.

```
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 validacion 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)

treevoltepa

Contains tree-level variables for tepa (Laureliosis philippiana) 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 tepa (Laureliosis philippiana).

#### Usage

data(treevoltepa)

## Format

Contains tree-level variables, as follows:

tree.no Tree id

dbh Diameter at breast height, in cm

htot Total height (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 validacion 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.

```
data(treevoltepa)
head(treevoltepa)
```

treevoltineo

Contains tree-level variables for tineo (Weinmannia trichosperma) 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 tineo (Weinmannia trichosperma).

#### Usage

data(treevoltineo)

## Format

Contains tree-level variables, as follows:

tree.no Tree id

dbh Diameter at breast height, in cm

htot Total height (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 validacion 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.

```
data(treevoltineo)
head(treevoltineo)
```

treevolulmo

Contains tree-level variables for ulmo (Eucryphia cordifolia) 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 ulmo (Eucryphia cordifolia).

## Usage

data(treevolulmo)

## Format

Contains tree-level variables, as follows:

tree.no Tree id

dbh Diameter at breast height, in cm

htot Total height (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 validacion 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(treevolulmo)
head(treevolulmo)

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