

# Package ‘datana’

November 16, 2021

**Type** Package

**Title** Data and functions to accompany Analisis de datos con el programa estadístico R: una introducción aplicada

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**Maintainers**

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**Description** The package provides datasets and functions to Accompany Salas-Eljatib (2021, ISBN: 9789566086109) "Análisis de datos con el programa estadístico R: una introducción aplicada". The 'datana' package helps carry out data management, exploratory analyses, and statistical model fitting.

**License** GPL-2

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**Imports**

**Depends** R (>= 2.10)

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<i>datana-package</i>	<i>Data and functions to accompany Analisis de datos con el programa estadistico R: una introduccion aplicada</i>
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**Description**

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

**Details**

The DESCRIPTION file: This package was not yet installed at build time.

Index: This package was not yet installed at build time.

~~ An overview of how to use the package, including the most important functions ~~

**Author(s)**

NA

Maintainer: NA

**References**

~~ Literature or other references for background information ~~

---

<i>airquality</i>	<i>Contains information of data airquality of datasets library.</i>
-------------------	---

---

**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)
```

---

annualppCities

*Contains information 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 data frame 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 provided from <http://explorador.cr2.cl/>.

**Examples**

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

---

anscombe

*Anscombe quartet dataset*

---

**Description**

Dataset that contains 4 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.  
doi: [10.2307/2682899](https://doi.org/10.2307/2682899).

**Examples**

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

---

araucaria	<i>Contains plot-level variables in Araucaria araucana forests in southern Chile.</i>
-----------	---

---

### Description

These are plot-level measurement data from the Araucaria araucana forests in the Araucania region in southern Chile, measured in 2009. The data inventory 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 %  
**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	<i>Contains information of annual basal area increment (BAI) for different species.</i>
--------------	---

---

**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.

**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. DOI:10.1111/1365-2745.12555

**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  
**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	<i>Age and physical measurement data for wild bears. Dataframe same as "bears" but without missing values.</i>
-----------	--

---

## 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 identifier  
**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 Afild September, 1981.

## Examples

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

---

biomass	<i>Contains tree-level biomass data for several species in Canada.</i>
---------	--

---

### 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	<i>Contains information of carbohydrates concentrations .</i>
-----------------------	---

---

### 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 specie 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 (termas: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 twigs, stem sapwood and branches.

**time** Measurement 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** .

**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://datadryad.org/stash/dataset/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. DOI:10.1111/1365-2745.12555

**Examples**

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

---

`chicksw`*Contains information of ChichWeigth data of alr4 library.*

---

### 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 4 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 provided from alr4 library of R.

### References

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

### Examples

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

---

crownradii	<i>Data with information radios crown for different directions on site rucamanque</i>
------------	---

---

## Description

Crown radii measurements in cardinal directions for sample trees at the Rucamanque experimental forest, near Temuco, Chile.

## Usage

```
data(crownradii)
```

## Format

Contains of variables, as follows:

**specie** Code of specie. ro is Roble, co is Coigue and ol is Olivillo.

**dap** Diameter at breast height.

**htot** Total height in meters.

**north** Radio of crown in direction north in meters.

**east** Radio of crown in direction east in meters.

**south** Radio of crown in direction south in meters.

**west** Radio of crown in direction west in meters.

**x** Coordinate x.

**y** Coordinate y.

**crown** Diameter of crown in meters.

## Source

not yet

## References

not yer

## 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  $(Def0 - Defnorm) / (\text{standard deviation in deficit among all years 1981-2015 for the given grid cell})$

**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 m<sup>2</sup> ha<sup>-1</sup> 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	<i>This dataset has 43 columns and 4247 rows. Each row corresponds to an epiphyte individual located on the reliable sections of the host trees</i>
------------	---

---

## 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 the epiphyte 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 (°C\*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 (m<sup>2</sup> ha-1)

**BasAre5\_10** Basal area of trees with greater or equal than 5 DBH and less than 10 cm in the plot (m<sup>2</sup> ha-1)

**BasAre10** Basal area of trees with greater or equal than 10 cm DBH in the plot (m<sup>2</sup> 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. DOI:10.1111/1365-2435.12804

## Examples

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

---

descstat	<i>A descriptive statistics table for continuous variables</i>
----------	--

---

## 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.

### 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

*Contains information of florida datasets of alr4 library .*

---

### 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 provided from alr4 library of R.

### 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 identifier 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 (2008).

## 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)
```

---

fertilizaexpe	<i>Contains information of .</i>
---------------	----------------------------------

---

**Description**

Data contains.

**Usage**

```
data(fertilizaexpe)
```

**Format**

Contains 3 variables, as follows:

**years** Year at capture.

**length** Length at capture (mm).

**Source**

The data were provided.

**References**

not yet

**Examples**

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

---

fishgrowth	<i>Contains information of wblake datasets of alr4 library .</i>
------------	--

---

**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 provided from alr4 library of R.

**References**

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

**Examples**

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

---

floraChile

*Contains information of .*

---

**Description**

Dataset contains E

**Usage**

```
data(floraChile)
```

**Format**

Contains xx variables, as follows:

**family** .

**genus** .

**scientific.name** .

**author** .

**origin** .

**life.form** .

**lat...** .

**Source**

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

**References**

not yet

**Examples**

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

---

football	<i>Data of potency Anaerobia.</i>
----------	-----------------------------------

---

**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 the 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  
**nvd** 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 frequency 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  
**nvd.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. Influencia 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	<i>Contains information of forest plots across the Hawaiian archipelago.</i>
--------------	--

---

## 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 <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	<i>Contains information on the growth in height of a sample trees in the Northwest of the United States</i>
-------------	---

---

## Description

Data contains 148 observations on the height growth of dominant trees of *Pseudotsuga 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 (in).

**htot** Total height (ft)

**age** Age of tree

**height** Height for each age of the tree (ft)

### Source

The data were provided from Christian Salas.

### References

R. A. Monserud. 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.

C. Salas, Albert R. Stage, and Andrew P. Robinson. 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

*Contains information of data ufc of alr4 library.*

---

### 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 5 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 provided from alr4 library of R.

### References

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

**Examples**

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

---

invasivesRCI	<i>Contains regeneration microsite data in Robinson Crusoe Island forest</i>
--------------	--

---

**Description**

These are plot-level measurement data from the forests in the Robinson Crusoe Island, located in the Pacific Ocean, 667 km from mainland Chile. Measurements correspond to transects of 100 to 240 meters

**Usage**

```
data(invasivesRCI)
```

**Format**

Base de datos que contiene 14 columnas y 51 filas:

**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 R, Salas C, Gartner 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	<i>Contains information of land-cover, environmental and sociodemographic data for the 34 municipalities composing the Greater Santiago area, Santiago, Chile.</i>
-------------------	--

---

### 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)
```

### Source

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

### References

Not yet

### Examples

```
data(LandCoverSantiago)
head(LandCoverSantiago)
```

---

lleuque	<i>Contains specie composition data Lleuque forest</i>
---------	--

---

### Description

—

### Usage

```
lleuque
```

**Format**

Base de datos que contiene 72 columnas y 26 filas:

**stand** —

**plot.num** —

**Aus.chi** —

**May.dis** —

**Not.obl** —

**Pru.and** —

**Source**

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

**References**

Vargas R, Salas C, Penneckamp D, Neira Z, Diez C, Vargas R. 2020. Estructura y regeneracion de bosques de Prumnopitys andina en los Andes del sur de Chile. Gayana botanica (to appear)

---

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**

An object of class c("nfnGroupedData", "nfGroupedData", "groupedData", "data.frame") 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).

**Source**

Draper NR and Smith H. (1998), Applied Regression Analysis (3rd ed), Wiley (exercise 24.N).

## Examples

```
#data(orange)

#coplot(dbh ~ time | tree.id, data = orange, show.given = FALSE)
#m1 <- nls(dbh ~ SSlogis(age, 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,
#      main = "Diameter growth data of orange trees and fitted model (tree.id 3 only)")
#time <- seq(0, 1600, length.out = 101)
#lines(time, predict(m1, list(time = time)))
```

---

pinaster	<i>Contains tree-level variables for Pinus pinaster in the Baixo-Mino, Galicia, Spain.</i>
----------	--

---

## 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.



**Examples**

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

---

pinusContorta	<i>Contains information of invasive of pinus contorta.</i>
---------------	--

---

**Description**

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

**Usage**

```
data(pinusContorta)
```

**Format**

Contains 8 variables, as follows:

**plot.id** Plot sample identificativo number.

**tree.id** Tree identifier number in each plot. Same indiv/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** Projection 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, A Escudero, RA Garcia, M de la Cruz, B Langdon, LA Cavieres & J Esquivel. 2016. Pine invasions in treeless environments: dispersal overruns microsite heterogeneity. Ecology and Evolution. 6(2): 447 - 459

**Examples**

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

---

pinusSpp

*Contains information of invasive of pinus spp.*


---

## Description

These are tree-level measurement data from Pinus spp invasion in Araucaria-Nothofagus forests in the Malalcahuello National Reserve in La Araucania region in southern Chile, measured in 2012. The plots area was 100 square meters

## Usage

```
data(pinusSpp)
```

## Format

Contains 8 variables, as follows:

**plot.id** Plot sample indentificator number.

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

**Lat.s** Decimal coordinate of S latitude.

**Long.w** Decimal coordinate of W longitude.

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

**stem.id** Stem identifier 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	<i>Contains information of maximum plant size in the Hawaiian archipelago.</i>
--------------	--

---

## 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.

## Examples

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

---

plotLleuque	<i>Contains plot level data Lleuque forest</i>
-------------	--

---

## Description

—

## Usage

plotLleuque

## Format

Base de datos que contiene 15 columnas y 26 filas:

**stand** —

**plot.num** —

**elevation** —

**aspect** —

**slope** —

**stump** —

**cattle.faeces** —

**dist.to.river** —

**fruits.ha** —

**browse** —

## Source

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

## References

Vargas R, Salas C, Penneckamp D, Neira Z, Diez C, Vargas R. Estructura y regeneracion de bosques de Prumnopitys andina en los Andes del sur de Chile (in Press). Gayana botanica

---

presenceIce	<i>Presence or absence of sea ice from logbook records of annual cruises</i>
-------------	--

---

### 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, Bockstoe 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)
```

---

pspLlancahue	<i>Tree locations for a sample plot in the Llancahue experimental forest, near Valdivia, Chile.</i>
--------------	---

---

### 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 identifier

**spp.name** species abbreviation as follows: AP= Aextocicon punctatum, 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	<i>Tree-level measurements and spatial coordinates in rucamanque property</i>
---------	---

---

## 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 punctatum, 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 de la 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 ~ SSasym(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	<i>Data from a Pinus radiata plantation near Capitan Pastene, Region de La Araucania, Chile.</i>
-----------	--

---

### 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 Dr. Christian Salas at the Universidad Mayor (Santiago, Chile).

### Examples

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

---

rauliHg	<i>Data with information on the growth of Nothofagus alpina.</i>
---------	--

---

### Description

Time series data of height for *Nothofagus alpina* sampled trees in south-central Chile.

### 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 de la 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. <https://doi.org/10.1002/eap.2285>

**Examples**

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

---

regNothofagus

*Contains information about regeneration of nothofagus.*

---

**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`*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<sup>2</sup>/ha

**toph** Dominant height, in m

**qmd** quadratic mean diameter, in cm

**totvol** gross stand volume, in m<sup>3</sup>/ha

**viu.10** stand volume below an utilization index of 10 cm, in m<sup>3</sup>/ha

**viu.15** stand volume below an utilization index of 15 cm, in m<sup>3</sup>/ha

**viu.20** stand volume below an utilization index of 20 cm, in m<sup>3</sup>/ha

**viu.25** stand volume below an utilization index of 25 cm, in m<sup>3</sup>/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](http://mnssimulacion.cl)

## Examples

```
data(simula)
```

---

sludge	<i>Contains information of sludge in a different cities, with a value of concentration zinc.</i>
--------	--

---

**Description**

Dataset contains 36 observations

**Usage**

```
data(sludge)
```

**Format**

Contains 4 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	<i>Data with information on the National System of State Protected Wild Areas (SNASPE)</i>
-------------	--

---

**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 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 commune 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

*Tree locations for different plots of the spruce Norway*


---

## 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 identifier

**tree.code** Tree identifier

**spp.name** species abbreviation 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)
#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$y.coord),min(pos$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)
```

---

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 dataset, 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** Subspecies: one of two or more populations of a species varying from one another by morphological characteristics

**subSppAuthor** Subspecies 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](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	<i>Contains information of abundance of plant species in the central-southern Andes of Chile.</i>
--------------	---

---

## Description

Abundance of plant species [50 total] (at parcel scale [100 m<sup>2</sup>]) 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 Vegetation 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.  
**p.mass** 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. DOI:10.1111/1365-2435.12804

## Examples

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

---

standLleuque

---

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


---

## Description

Information 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

**estructura** Structure of forest. Open, secondary adult, or pure

## Source

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

## References

Vargas R, Salas C, Penneckamp D, Neira Z, Diez C, Vargas R. Estructura y regeneracion de bosques de Prumnopitys andina en los Andes del sur de Chile (in Press). *Gayana botanica*

## Examples

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

---

trailCameraTrap	<i>Contains information of Camera trap data on medium to large terrestrial mammals collected at 54 camera stations in Ruaha National Park, southern Tanzania.</i>
-----------------	---

---

## 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 camera, 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 of 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 are provided courtesy of Dr. Jeremy Cusack at the 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	<i>Contains information of functional traits of vegetative species in Chile.</i>
--------	--

---

### 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 shade. 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* después de un disturbio parcial. Revista Chilena de Historia Natural 83: 335-347, 2010

---

treegrowth	<i>Contains information of .</i>
------------	----------------------------------

---

### Description

Data contains.

### Usage

```
data(treegrowth)
```

**Format**

Contains 7 variables, as follows:

**tree.id** .  
**forest** .  
**habitat** .  
**tree.code** .  
**age** .  
**dbh** .  
**htot** .

**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 on 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)
```

---

treevollaurel	<i>Contains tree-level variables for laurel (laurelia sempervirens) in the Rucamanque experimental forest, near Temuco, Chile.</i>
---------------	--

---

## Description

These are tree-level measurement data of sample trees in the Rucamanque experimental forest, near Temuco, in the Araucania region in south-central Chile, 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.

### Examples

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

---

treevollingue	<i>Contains tree-level variables for lingue (Persea lingue) in the Rucamanque experimental forest, near Temuco, Chile.</i>
---------------	--

---

### Description

These are tree-level measurement data of sample trees in the Rucamanque experimental forest, near Temuco, in the Araucania region in south-central Chile, 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<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.

### Examples

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

---

treevololivillo	<i>Contains tree-level variables for olivillo (Aextocicon punctatum) in the Rucamanque experimental forest, near Temuco, Chile.</i>
-----------------	---

---

## Description

These are tree-level measurement data of sample trees in the Rucamanque experimental forest, near Temuco, in the Araucania region in south-central Chile, measured in 1999. The data are the same as in the dataframe "treevolruca", but only having observations for the species olivillo (*Aextocicon punctatum*).

## 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<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.

## Examples

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



---

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

---

### Description

These are tree-level measurement data of sample trees in the Rucamanque experimental forest, near Temuco, in the Araucania region in south-central Chile, 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<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.

### Examples

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

---

treevolruca	<i>Contains tree-level variables of several species in the Rucamanque experimental forest, near Temuco, Chile.</i>
-------------	--

---

## Description

These are tree-level measurement data of sample trees in the Rucamanque experimental forest, near Temuco, in the Araucania region in south-central Chile, measured in 1999. The following species are part of the data: laurel (*laurelia sempervirens*), lingue (*Persea lingue*), olivillo (*Aextocicon punctatum*), roble (*Nothofagus obliqua*), tepa (*Laurelissis 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<sup>3</sup> with bark.

## Source

The data are provided courtesy of Dr. Christian Salas of the Universidad Mayor (Santiago, Chile). The data were used in the study of Salas (2002).

## 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	<i>Contains tree-level variables for tepa (Laurelissis philippiana) in the Rucamanque experimental forest, near Temuco, Chile.</i>
-------------	--

---

## Description

These are tree-level measurement data of sample trees in the Rucamanque experimental forest, near Temuco, in the Araucania region in south-central Chile, measured in 1999. The data are the same as in the dataframe "treevolruca", but only having observations for the species tepa (*Laurelissis 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<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.

## Examples

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

---

treevoltineo	<i>Contains tree-level variables for tineo (Weinmannia trichosperma) in the Rucamanque experimental forest, near Temuco, Chile.</i>
--------------	---

---

## Description

These are tree-level measurement data of sample trees in the Rucamanque experimental forest, near Temuco, in the Araucania region in south-central Chile, 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<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.

## Examples

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

---

treevolulmo	<i>Contains tree-level variables for ulmo (Eucryphia cordifolia) in the Rucamanque experimental forest, near Temuco, Chile.</i>
-------------	---

---

### Description

These are tree-level measurement data of sample trees in the Rucamanque experimental forest, near Temuco, in the Araucania region in south-central Chile, 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<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.

### Examples

```
data(treevolulmo)  
head(treevolulmo)
```

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