

# Package ‘datana’

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**Type** Package

**Title** Data and Functions to Accompany Analisis De Datos Con R

**Version** 1.0.3

**Date** 2023-06-20

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

**License** GPL-3

**URL** <https://eljatib.com/rlibro>

**Depends** R (>= 3.5.0)

**Imports** lattice, ggplot2, stats, graphics

**Suggests** covr, knitr, rmarkdown, spelling, testthat

**Encoding** UTF-8

**Language** en-US

**LazyData** true

**RoxygenNote** 7.2.1

**BuildResaveData** best

**NeedsCompilation** no

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## Description

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

Notice that every data frame (with columns in English) has an identical one but has column names in Spanish. You just need to add '2' (i.e., number two) after the data frame, and you will find the Spanish version of the data. For instance, the data frame 'pinaster' has column names in English, but 'pinaster2' has column names in Spanish. Both data frames have the same data.

## Details

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

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

## Author(s)

The datana development team is led by Christian Salas-Eljatib (<https://eljatib.com>), and Nicolas Pino and Joaquin Riquelme-Alarcon have contributed as well. Many others have also helped by providing data frames and enhancing functions: see credits in help pages.

## References

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

## Examples

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

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

---

`airquality`*Air quality data, from the 'datasets' library.*

---

**Description**

Daily air quality measurements in New York, May to September 1973. Be aware that some variables have missing values.

**Usage**

```
data(airquality)
```

**Format**

Contains six variables, as follows:

**ozone** Ozone (ppb).

**solar** Solar R (lang).

**wind** Wind (mph).

**temp** Temperature (degrees F).

**month** Month (1–12).

**day** Day of the month (1–31).

**Source**

The data were obtained from the library 'datasets'.

**References**

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

**Examples**

```
data(airquality)
summary(airquality)
```

---

`airquality2`*Contiene información de calidad del aire.*

---

**Description**

Calidad del aire diario medido en New York, de Mayo a Septiembre de 1973. Algunas variables tienen observaciones perdidas.

**Usage**

```
data(airquality)
```

**Format**

Contiene seis variables:

**ozone** Ozono (ppb).

**solar** Solar R (largo).

**wind** Viento (mph).

**temp** Temperatura (grados F).

**month** Mes del año (1–12).

**day** Día del mes (1–31).

**Source**

Los datos fueron obtenidos desde la librería 'datasets'.

**References**

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

**Examples**

```
data(airquality2)
summary(airquality2)
```

---

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

---

### Description

The data frame has annual precipitation in six cities of Chile (i.e., Santiago, Talca, Chillan, Temuco, Valdivia, and Puerto Montt) in different years, from 1950 to 2019. @usage data(annualppCities)

### Usage

```
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 obtained from <https://explorador.cr2.cl/>.

### Examples

```
head(annualppCities)
range(annualppCities$year)
```

---

annualppCities2      *Serie de tiempo de precipitaciones anuales en Chile.*

---

### Description

Precipitaciones anuales en seis ciudades de Chile (i.e., Santiago, Talca, Chillan, Temuco, Valdivia, and Puerto Montt) registradas en distintos años, desde 1950 al 2019.

### Usage

```
data(annualppCities2)
```

### Format

La data frame tiene tres variables:

**ciudad** Nombre de la ciudad.

**anho** Año de registro.

**pp.anual** Valor de la precipitación anual (mm).



**Source**

Los datos fueron obtenidos desde <https://explorador.cr2.cl/>.

**Examples**

```
head(annualppCities2)
range(annualppCities2$anho)
```

---

anscombe

*Anscombe quartet dataset*

---

**Description**

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

**Usage**

```
data(anscombe)
```

**Format**

The data frame contains four variables as follows:

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

**Y1** Float values that represent Y-axis for X1 column

**Y2** Float values that represent Y-axis for X1 column

**Y3** Float values that represent Y-axis for X1 column

**X2** Integers values that represent X-axis for Y4 column

**Y4** Float values that represent Y-axis for X2 column

**Source**

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

**References**

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

**Examples**

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

---

anscombe2

*Cuarteto de Anscombe*

---

## Description

Dataset que contiene 4 pares de columnas con la mismos estadísticos descriptivos, sin embargo si existe diferencia al representar los puntos mediante un gráfico.

## Usage

```
data(anscombe2)
```

## Format

Variables se describen a continuacion::

**X1** Valores enteros que representan el eje X para las columnas Y1, Y2 e Y3

**Y1** Valores flotantes que representan el eje Y para la columna X1

**Y2** Valores flotantes que representan el eje Y para la columna X1

**Y3** Valores flotantes que representan el eje Y para la columna X1

**X2** Valores enteros que representan el eje X para las columnas Y4

**Y4** Valores flotantes que representan el eje Y para la columna X2

## Source

Datos fueron contribuidos por el Dr Christian Salas-Eljatib (Universidad Mayor, Santiago, Chile).

## References

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

## Examples

```
data(anscombe2)
head(anscombe2)
```

---

araucaria	<i>Stand variables for sampling plots in Araucaria araucana forests in southern Chile.</i>
-----------	--

---

### Description

These are plot-level data from Araucaria araucana-dominated forests in southern Chile. The data are based on tree-level measurements from fixed-area plots of 1000 m<sup>2</sup>, and there are two forest stands.

### Usage

```
data(araucaria)
```

### Format

Contains plot-level variables as follows:

**stand** Stand number.

**plot.no** Plot sample identifier 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, 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 (Universidad de La Frontera, Temuco, Chile) and further details can be found in Salas et al (2010).

### 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 comparación en un bosque de Araucaria araucana en Chile. Bosque 31(3): 179-194.

### Examples

```
head(araucaria)
tapply(araucaria$plot.no, araucaria$stand, length)
```

---

araucaria2	<i>Variables de estado de rodal para parcelas de muestreo en bosques de Araucaria araucana el sur de Chile.</i>
------------	---

---

### Description

Variables de estado de rodal para parcelas de muestreo establecidas en bosques de Araucaria araucana en el sur de Chile. Estas variables se basan en mediciones a nivel de árbol realizadas en parcelas de muestreo de superficie de 1000 m<sup>2</sup>. Hay dos rodales y las mediciones fueron realizadas en el 2009.

### Usage

```
data(araucaria2)
```

### Format

Contiene las siguientes variables a nivel de parcela:

**rodal** Número del rodal.  
**parcela** Número identificador de la parcela de muestreo.  
**x.utm** Coordenada UTM en el ejex-X, en km  
**y.utm** Coordenada UTM en el ejex-Y, en km  
**pendiente** Pendiente, en %  
**exposicion** Exposición, en grados.  
**altitud** Altitud, en msnm  
**nha** Densidad, en arb/ha  
**gha** Área basal, en m<sup>2</sup>/ha  
**hdom** Altura dominante, en m  
**vha** Volumen bruto, en m<sup>3</sup>/ha  
**dg** Diámetro medio cuadrático, en cm

### Source

Los datos a nivel de árbol fueron cedidos por el Dr Nelson Ojeda (Universidad de La Frontera, Temuco, Chile) y más antecedentes pueden encontrarse en Salas et al (2010).

### References

Salas C, Ene L, Ojeda N, Soto H. 2010. Metodos estadísticos paramétricos y no paramétricos para predecir variables de rodal basados en Landsat ETM+: una comparación en un bosque de Araucaria araucana en Chile. Bosque 31(3):179-194.

### Examples

```
head(araucaria2)  
tapply(araucaria2$parcela,araucaria2$rodal,length)
```

---

baiTreelines

*Annual basal area increment for four tree species.*

---

### Description

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

### Usage

```
data(baiTreelines)
```

### Format

Contains seven columns, as follows:

**climate** Climate of each location, mediterranean and temperate.

**site** Name of Location of study (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).

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

**tree** Sample tree code.

**delta.g** Increment in basal area (in cm<sup>2</sup>) during the last 10 years.

**pai.g** Periodic annual increment of basal area (in cm<sup>2</sup>/yr), during the last 10 years.

### Source

The data were obtained from the DRYAD repository at [doi:10.5061/dryad.ks97h](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)
with(baiTreelines, tapply(pai.g, list("Elevation"=elevation.class, "Climate"=climate), mean))
```

---

 baiTreelines2

*Incremento anual en área basal de cuatro especies arbóreas.*


---

### Description

Este set de datos contiene 157 observaciones, de los últimos 10 años en 6-8 árboles adultos de cuatro especies en un gradiente altitudinal. Las muestras se distribuyeron en cuatro localidades o sitios de Chile y dos en España.

### Usage

```
data(baiTreelines2)
```

### Format

Contiene siete columnas, como las siguientes:

**clima** Clase de clima de cada sitio: mediterráneo y templado.

**sitio** Nombre del sitio de estudio (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).

**especie** Nombre de la especie (lenga: Nothofagus pumilio, frangel: Kageneckia angustifolia, uncinata: Pinus uncinata, sylvestris: Pinus sylvestris).

**clase.altitud** Clase de altitud. "Treeline", intermedia es "inter", y cercana a bosque como bajo.

**arbol** Código del árbol muestra.

**delta.g** Incremento en área basal (en cm<sup>2</sup>) durante los últimos 10 años.

**ipa.g** Incremento periódico anual en área basal (en cm<sup>2</sup>/año), durante los últimos 10 años.

### Source

Los datos fueron obtenidos desde el repositorio DRYAD en [doi:10.5061/dryad.ks97h](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(baiTreelines2)
head(baiTreelines2)
with(baiTreelines2, tapply(ipa.g, list("Altitud"=clase.altitud, "Clima"=clima), mean))
```

---

bears

*Age and physical measurement data for wild bears.*

---

### Description

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

### Usage

```
data(bears)
```

### Format

Contains individual-level variables, as follows:

**id** Bear id

**age** age in months

**month** Diameter at breast height, in cm

**sex** 1 =male, 2 = female

**headL** length of head, in cm

**headW** width of head, in cm

**neckG** girth of neck, in cm

**length** body length, in cm

**chestG** girth of chest, in cm

**weight** body weight, in kg

**obs** observation number for bear

**name** name given to bear

### Source

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

### References

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

### Examples

```
data(bears)
```

```
head(bears)
```

---

bears2

*Age and physical measurement data for wild bears.*

---

### Description

Los osos salvajes fueron anestesiados y sus cuerpos fueron medidos y pesados. Uno de los objetivos del estudio fue hacer una tabla (o quizás un conjunto de tablas) para las personas interesadas en estimar el peso de un oso basándose en otras medidas. Esto se usará porque en el bosque es más fácil medir la longitud de un oso, por ejemplo, que pesarlo. Observe que faltan valores para algunas de las variables.

### Usage

```
data(bears2)
```

### Format

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

**id** Identificador de oso

**age** edad en meses

**month** diámetro a la altura del pecho, en cm

**sex** 1 = hombre, 2 = mujer

**headL** longitud de la cabeza, en cm

**headW** ancho de la cabeza, en cm

**neckG** circunferencia del cuello, en cm

**length** longitud del cuerpo, en cm

**chestG** circunferencia del pecho, en cm

**weight** peso corporal, en kg

**obs** número de observación para el oso

**name** nombre dado al oso

### 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(bears2)
```

```
head(bears2)
```



---

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

---

### Description

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

### Usage

```
data(bearsDepu)
```

### Format

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

**id** Bear 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 Afield September, 1981.

### Examples

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

---

bearsDepu2	<i>Age and physical measurement data for wild bears. Data frame same as "bears" but without missing values.</i>
------------	---

---

### Description

Los osos salvajes fueron anestesiados y sus cuerpos fueron medidos y pesados. Uno de los objetivos del estudio fue hacer una tabla (o quizás un conjunto de tablas) para las personas interesadas en estimar el peso de un oso basándose en otras medidas. Esto se usará porque es más fácil medir la longitud de un oso, por ejemplo, que pesarlo. Observe que faltan valores para algunas de las variables.

### Usage

```
data(bearsDepu2)
```

### Format

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

**id** Identificador de oso  
**age** edad en meses  
**month** diámetro a la altura del pecho, en cm  
**sex** 1 = hombre, 2 = mujer  
**headL** longitud de la cabeza, en cm  
**headW** ancho de la cabeza, en cm  
**neckG** circunferencia del cuello, en cm  
**length** longitud del cuerpo, en cm  
**chestG** circunferencia del pecho, en cm  
**weight** peso corporal, en kg  
**obs** número de observación para el oso  
**name** nombre dado al oso

### 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(bearsDepu2)  
head(bearsDepu2)
```

beetles

*Population density of beetles on time.***Description**

Time series of population densities of experiments under controlled conditions in which flour beetles (*Tribolium confusum*) are kept in environments of known size. The period from egg to adult is approximately forty days at 27C degrees, and beetles were subject to different diets of whole wheat flour. The data are fully documented in Chapman (1928).

**Usage**

```
data(beetles)
```

**Format**

The data contains the following four columns:

**days** days since the beginning of the experiment.

**diet** diet of whole wheat flour, in gr.

**type** type of individual: egg, larvae, pupae, adult.

**density** number of individuals.

**Source**

Data were digitized by Yamara Arancibia, an undergraduate student of Prof Christian Salas-Eljatib at the Universidad Mayor, Santiago, Chile.

**References**

- Chapman RN. 1928. The Quantitative Analysis of Environmental Factors. *Ecology* 9(2):111-122. [doi:10.2307/1929348](https://doi.org/10.2307/1929348)

**Examples**

```
data(beetles)
df<-beetles
name.diets<-unique(df$diet)
num.diets<-length(name.diets)
#Time series curves, such as in Fig.1 of the paper
#(i) firstly, we need to compute the following
alys<-with(df,tapply(density, list(as.factor(days),as.factor(diet)),sum))
out<-as.data.frame(alys)
out$time<-row.names(out)
#(ii) secondly, to plot
matplot(out[,"time"], out[,1:num.diets], las=1, type=c("b"),pch=1,
        xlab="Time in days",ylab="Total individuals")
legend("topleft", legend = name.diets, title = "Diet (gr)",
       col = 1:num.diets, lty = 1:num.diets, pch = 1)
```

beetles2

*Densidad poblacion de escarabajos en el tiempo.***Description**

Serie de tiempo de densidad poblacion de un experimento controlado en donde escarabajos (*Tribolium confusum*) son mantenidos en condiciones constantes. El periodo desde huevo a adulto es aproximadamente de 40 dias a 27 grados Celsius, y los escarabajos fueron sometidos a diferentes dietas de harina. Los datos son mayormente detallados en Champman (1928).

**Usage**

```
data(beetles2)
```

**Format**

Los datos contienen las siguientes cuatro columnas:

**dias** dias desde el comienzo del experimento.

**dieta** dieta de harina de trigo, en gr.

**tipo** tipo de individuo: egg, larvae, pupae, adult.

**densidad** numero de individuos.

**Source**

Los datos fueron digitados por la Srta. Yamara Arancibia, una estudiante de pregrado del Profesor Christian Salas-Eljatib en la Universidad Mayor, Santiago, Chile.

**References**

- Champman RN. 1928. The Quantitative Analysis of Environmental Factors. *Ecology* 9(2):111-122. doi:10.2307/1929348

**Examples**

```
data(beetles2)
df<-beetles2
nombre.dietas<-unique(df$dieta)
num.dietas<-length(nombre.dietas)
#Grafico de serie de tiempo, tal como en la Fig.1 del paper
#(i) primero se necesita calcular
alys<-with(df, tapply(densidad, list(as.factor(dias), as.factor(dieta)), sum))
out<-as.data.frame(alys)
out$tiempo<-row.names(out)
#(ii) segundo, graficar
matplot(out[, "tiempo"], out[, 1:num.dietas], las=1, type=c("b"), pch=1,
        xlab="Tiempo en dias", ylab="Individuos totales")
legend("topleft", legend = nombre.dietas, title = "Dieta (gr)",
        col = 1:num.dietas, lty = 1:num.dietas, pch = 1)
```

---

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

---

### Description

Biomass component measurements for sample trees of four species. The species are Balsam fir (*Abies balsamea*), Black spruce (*Picea mariana*), White birch (*Betula papyrifera*), and White spruce (*Picea glauca*).

### 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

```
head(biomass)
table(biomass$spp)
```

---

`biomass2`*Biomasa a nivel de árbol para especies arbóreas de Canadá.*

---

### Description

Mediciones de componentes de biomasa de árboles muestra de cuatro especies. Las especies son Balsam fir (*Abies balsamea*), Black spruce (*Picea mariana*), White birch (*Betula papyrifera*), y White spruce (*Picea glauca*).

### Usage

`biomass2`

### Format

**arbol** Numero del árbol.

**spp** Nombre comun de la especie.

**dap** Diametro a la altura del pecho, en cm.

**altura** Altura total, en m.

**biomt** Biomasa total, en kg.

**biomfuste** Biomasa del fuste, en kg.

**biomramas** Biomasa de las ramas, en kg.

**biomfollaje** Biomasa del follaje, en kg.

### Source

Los datos fueron cedidos por el Prof. Timothy Gregoire de la School of Forestry and Environmental Studies de Yale University (New Haven, CT, USA).

### Examples

```
head(biomass2)
table(biomass2$spp)
```

---

`boreal`*Spatial coordinates of trees in a boreal forest (Finland).*

---

### Description

Tree location of trees from a 8.8ha sample plot established in subarctic old-growth forest located in the Varriostriict nature reserve, northeastern Fennoscandia (67 44 N, 29 34 E), in Finland. The plot was rectangular (180 m × 500 m), but for practical reasons, missing a smaller rectangle (20 m × 100 m) in its south-east corner.

### Usage

```
data(boreal)
```

### Format

The data frame contains six variables as follows:

**id** tree id

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

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

**dbh** Diameter at breast-height, in cm.

**height** Total height, in m.

**species** Species name.

### Source

Data were obtained from the files available at [doi:10.6084/m9.figshare.19698352.v1](https://doi.org/10.6084/m9.figshare.19698352.v1).

### References

Pouta P, Kulha N, Kuuluvainen T, Aakala T. 2022. Partitioning of Space Among Trees in an Old-Growth Spruce Forest in Subarctic Fennoscandia. *Frontiers in Forests and Global Change* 5: 817248. [doi:10.3389/ffgc.2022.817248](https://doi.org/10.3389/ffgc.2022.817248)

### Examples

```
data(boreal)
head(boreal)
tapply(boreal$dbh, boreal$species, mean)
library(lattice)
histogram(~dbh|species, data=boreal)
```

---

`boreal2`*Ubicación espacial de árboles en un bosque boreal (Finlandia).*

---

### Description

Ubicación espacial de árboles en una parcela de muestreo de 8.8ha establecida en un bosque adulto sub-artico ubicado en la reserva natural Varriostrikt, en el nor-este de Fennoscandia (67 44 N, 29 34 E), en Finlandia. La parcela es rectangular (180 m × 500 m), pero por razones practicas, un porción menor rectangular (20 m × 100 m) se perdio en la esquina sur-este.

### Usage

```
data(boreal2)
```

### Format

Las columnas son las siguientes:

**id** tree id

**x** Posición cartesiana en el eje-X, en m.

**y** Posición cartesiana en el eje-Y, en m.

**dap** Diametro a la altura del pecho, en cm.

**atot** Altura total, en m.

**species** Especie.

### Source

Datos fueron obtenidos desde los archivos disponibles en [doi:10.6084/m9.figshare.19698352.v1](https://doi.org/10.6084/m9.figshare.19698352.v1).

### References

Pouta P, Kulha N, Kuuluvainen T, Aakala T. 2022. Partitioning of Space Among Trees in an Old-Growth Spruce Forest in Subarctic Fennoscandia. *Frontiers in Forests and Global Change* 5: 817248. [doi:10.3389/ffgc.2022.817248](https://doi.org/10.3389/ffgc.2022.817248)

### Examples

```
data(boreal2)
head(boreal2)
tapply(boreal2$dap, boreal2$especie, mean)
library(lattice)
histogram(~dap|especie, data=boreal2)
```



---

 carbohydrates

*Carbohydrates concentrations in tissues of several tree species.*


---

### Description

Dataset contains 863 observations, about 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(carbohydrates)
```

### Format

Contains 16 variables, as follows:

**climate** Climate of each location, mediterranean and temperate.

**site** Name of Location of study (termmas:Terma 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.

**season** 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** It might be 'wood density', but not sure.

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

**st.mv** Value of concentrations starch per volume unit.

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

### Source

The data were obtained from the DRYAD repository at [doi:10.5061/dryad.ks97h](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(carbohydrates)
head(carbohydrates)
boxplot(nsc~species, data=carbohydrates)
with(carbohydrates, tapply(tss, list("Elevation"=elevation.class, "Species"=species), mean))
```

---

carbohydrates2

*Concentracion de carbohydrates en tejidos de especies arboreas.*

---

## Description

Los datos contienen 863 observaciones, de carbohidratos totales solubles, almidon, y carbohidratos no estructurales. Las concentraciones por unidad de masa y por unidad de volumen, en tres tipos de tejidos al principio de la primavera y del otoño en 6-8 arboles adultos de diferentes especies en tres clases de altitudes, muestreados en sitios de Chile y España.

## Usage

```
data(carbohydrates2)
```

## Format

Contiene 16 variables, como sigue:

**clima** Clima de cada sitio: mediterraneo y templado.

**sitio** Sitio o localidad (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).

**especie** Nombre de la especie (lenga: Nothofagus pumilio, frangel: Kageneckia angustifolia, uncinata: Pinus uncinata, sylvestris: Pinus sylvestris).

**tejido** Tipo de tejido, new developing twings, stem sapwood and branches.

**temporada** Temporada de medicion (primavera y otoño).

**clase.altitud** Clase de altitud. "Treeline", intermediate named as "mid", and closed or montane forest named as "low".

**arbol** Código para el arbol muestra.

**sitio.arbol** Código que combina sitio y arbol.

**tss** Value of concentrations soluble carbohydrate per mass unit.

**st** Value of concentrations starch per mass unit.

**nsc** Value of concentrations non structural carbohydrates per mass unit.

**tss.nsc** .

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

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

**st.mv** Value of concentrations starch per volume unit.

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

### Source

Los datos fueron obtenidos desde el repositorio DRYAD en [doi:10.5061/dryad.ks97h](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(carbohydrates2)
head(carbohydrates2)
boxplot(nsc~especie, data=carbohydrates2)
with(carbohydrates2, tapply(tss, list("Altitud"=clase.altitud, "Especies"=especie), mean))
```

---

chickgr

*Chicken growth data.*

---

### Description

Time series data. 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(chickgr)
```

### Format

Contains four variables, as follows:

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

**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.

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

**weight** a numeric vector giving the body weight of the chick, in gr.

**Source**

The data were obtained from the 'alr4' library.

**References**

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

**Examples**

```
data(chickgr)
head(chickgr)
library(lattice)
xyplot(weight~time|as.factor(diet), groups=as.factor(chick), type="b",data=chickgr)
```

---

chickgr2

*Serie de tiempo para el peso de pollos.*

---

**Description**

Datos de series de tiempo. El peso de los pollos fue medido al momento del nacimiento y cada dos días después hasta el día 20. Ellos también fueron medidos el día 21. Hay cuatro grupos de dietas de proteínas.

**Usage**

```
data(chickgr2)
```

**Format**

Contiene cuatro variables, como sigue:

**dieta** Un factor de 4 niveles que indica cuál dieta recibió el pollo.

**pollo** Un código numérico único asignado a cada pollo. El número se asignó de acuerdo a la dieta.

**tiempo** El número de días desde el nacimiento hasta la medición.

**peso** Peso del cuerpo del pollo, en gr.

**Source**

Los datos fueron obtenidos desde la librería 'alr4'.

**References**

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

**Examples**

```
data(chickgr2)
head(chickgr2)
library(lattice)
xyplot(peso~tiempo|as.factor(dieta), groups=as.factor(pollo), type="b",data=chickgr2)
```

---

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

---

**Description**

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

**Usage**

```
corkoak
```

**Format**

**tree** A correlative number for each sample tree.

**csc** Circumference at 1.3 m outside bark, in cm.

**cbc** Circumference at 1.3 m under bark, in cm.

**bt** Bark thickness, in cm.

**hdeb** Debarking height, in m.

**hblc** Height to base of live crown, in m.

**nb** number of branches debarked

**crown.d** crown diameter, in m.

**w** total green weight of the stripped cork, in kg

**stratum** Stratum

**Source**

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

**References**

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

**Examples**

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

---

corkoak2

*Datos de biomasa de corcho en árboles de Encino en Portugal.*

---

### Description

Mediciones de peso de corcho en árboles muestra de *Quercus suber* en Portugal.

### Usage

corkoak2

### Format

**arbol** A correlative number for each sample tree.

**perimetro.cc** is tree circumference at 1.3 m outside bark, in cm.

**perimetro.sc** is tree circumference at 1.3 m under bark, in cm.

**e.corteza** bark thickness, in cm.

**h.desc** is debarking height, in m.

**hcc** height to base of live crown, in m.

**num.ram** number of branches debarked

**diam.copa** crown diameter, in m.

**biomasa** total green weight of the stripped cork, in kg

**estrato** Estrato

### Source

Datos cedidos por Prof. Timothy Gregoire (Yale University) y los autores originales mencionaron "After the article was published we discovered a problem with 2 of the observations so Teresa and I decided it was best just to delete them."

### References

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

### Examples

```
data(corkoak2)
head(corkoak2)
```

---

`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 (Chile).

### References

- Salas C. 2001. Caracterización básica del relicto de Biodiversidad Rucamanque. Bosque Nativo, 29:3-9. [https://eljatib.com/publication/2001-06-01\\_caracterizacion\\_basi/](https://eljatib.com/publication/2001-06-01_caracterizacion_basi/)

Salas C, and Garcia O. 2006. Modelling height development of mature *Nothofagus obliqua*. Forest Ecology and Management 229 (1-3): 1-6. doi:10.1016/j.foreco.2006.04.015

### Examples

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

---

`crownradii2`*Radios de copa de árboles*

---

**Description**

Mediciones de radios de copa en puntos cardinales para árboles muestra en el bosque de Rucamanque (Temuco, Chile). Los datos fueron colectados en una parcela de muestreo de 250m<sup>2</sup>, establecida en un bosque secundario de *Nothofagus obliqua* (roble).

**Usage**

```
data(crownradii2)
```

**Format**

Tiene las siguientes columnas:

**esp** Código de especie. Ro es Roble, Co es Coigue y Ol is Olivillo.

**dap** Diametro a la altura del pecho, en cm.

**atot** Altura total, en m.

**r.n** Radio de copa hacia el Norte, en m.

**r.e** Radio de copa hacia el Este, en m.

**r.s** Radio de copa hacia el Sure, en m.

**r.w** Radio de copa hacia el Oeste, en m.

**x.coord** Posición cartesiana en el eje-X, en m.

**y.coord** Posición cartesiana en el eje-Y, en m.

**dcopa** Diametro de copa, en m.

**Source**

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

**References**

- Salas C. 2001. Caracterización básica del relicto de Biodiversidad Rucamanque. Bosque Nativo, 29:3-9. [https://eljatib.com/publication/2001-06-01\\_caracterizacion\\_basi/](https://eljatib.com/publication/2001-06-01_caracterizacion_basi/)

Salas C, and Garcia O. 2006. Modelling height development of mature *Nothofagus obliqua*. Forest Ecology and Management 229 (1-3): 1–6. [doi:10.1016/j.foreco.2006.04.015](https://doi.org/10.1016/j.foreco.2006.04.015)

**Examples**

```
data(crownradii2)
head(crownradii2)
```



---

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 preceding 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 derived from the following repository [doi:10.5061/dryad.7vt36](https://doi.org/10.5061/dryad.7vt36), having details and data about the paper of Young et al (2017). This data frame was built, and used, for the research conducted by Salas-Eljatib et al (2018).

## References

-Young DJN, Stevens JT, Earles JM, Moore J, Ellis A, Jirka AL, Latimer AM. 2017. Long-term climate and competition explain forest mortality patterns under extreme drought. *Ecology Letters* 20(1):78-86. [doi:10.1111/ele.12711](https://doi.org/10.1111/ele.12711)

-Salas-Eljatib C, Fuentes-Ramirez A, Gregoire TG, Altamirano A, Yaitul V. 2018. A study on the effects of unbalanced data when fitting logistic regression models in ecology. *Ecological Indicators*, 85:502-508. [doi:10.1016/j.ecolind.2017.10.030](https://doi.org/10.1016/j.ecolind.2017.10.030)

## Examples

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

---

deadForestCA2	<i>Los datos contienen variables climaticas, de estructura forestal y de mortalidad forestal.</i>
---------------	---

---

## Description

El archivo de datos contiene una fila por combinación única de celda de cuadrícula de 3,5 km por año. El marco de datos cubre todas las celdas de la cuadrícula dentro del estado de California donde se tomó al menos un vuelo de la Encuesta de detección aérea (ADS) entre 2009 y 2015, por lo que cada posición de celda de la cuadrícula tiene entre 1 y 7 años de datos (reflejados como 1 a 7 filas en el archivo de datos por posición de celda de cuadrícula). Las principales variables de respuesta son `mort.bin` (presencia de alguna mortalidad) y `mort.tph` (número de árboles muertos / ha dentro de la celda de la cuadrícula por año).

## Usage

```
data(deadForestCA2)
```

## Format

Variables se describen a continuación::

**live.bah** Área basal viva del conjunto de datos GNN

**live.tph** Árboles vivos por hectarea del conjunto de datos GNN

**pos.x** posición x del orden de clasificación de la celda de la cuadrícula (la posición 1 es la más occidental)

**pos.y** posición y del orden de clasificación de la celda de la cuadrícula (la posición 1 es la más al norte)

- alb.x** coordenada x del centroide de la celda de la cuadrícula en California Albers (EPSG 3310)
- alb.y** coordenada y del centroide de la celda de la cuadrícula en California Albers (EPSG 3310)
- mort.bin** 1 = árboles muertos observados en la celda de la cuadrícula. 0 = no se observaron árboles muertos
- mort.tph** Árboles muertos por hectarea del conjunto de datos ADS agregado
- mort.tpa** Árboles muertos por acre del conjunto de datos ADS agregado
- year** Año del vuelo de ADS. La mayoría de los vuelos se realizaron entre mayo y agosto
- Defnorm** Deficit hidrico climatico anual medio para la celda de la cuadrícula, para el año hidrico del 1 de octubre al 31 de septiembre, promediado de 1981 a 2015
- Def0** Deficit de agua climatica para la celda de la cuadrícula durante el año hidrológico de octubre a septiembre que se superpone al vuelo ADS de verano del año dado
- Defz0** Puntaje Z para el deficit hidrico climatico para la celda de cuadrícula / año hidrico dado. Calculado como  $(Def0 - Defnorm) /$  (desviación estandar en el deficit entre todos los años 1981-2015 para la celda de la cuadrícula dada
- Defz1** Puntuación Z para el deficit hidrico climatico para la celda de la cuadrícula dada en el año hidrológico anterior.
- Defz2** Puntuación Z para el deficit hidrico climatico para la celda de la cuadrícula dada dos años antes.
- Tz0** Puntaje Z para la temperatura para la celda de cuadrícula / año dado.
- Pz0** Puntaje Z para la precipitación para la celda / año de la cuadrícula dado.
- Defquant** Variable FDCI. Cuantil de Defnorm de la celda de la cuadrícula dada, en relación con la Defnorm de todas las demás celdas de la cuadrícula con un área basal dentro de 2.5 m<sup>2</sup> ha<sup>-1</sup> de la celda dada

### Source

Los datos fueron derivados desde el repositorio [doi:10.5061/dryad.7vt36](https://doi.org/10.5061/dryad.7vt36), que contiene detalles y datos sobre el paper de Young et al (2017). Estos datos fueron ordenados, y empleados, para el trabajo de Salas-Eljatib et al (2018).

### References

- Young DJN, Stevens JT, Earles JM, Moore J, Ellis A, Jirka AL, Latimer AM. 2017. Long-term climate and competition explain forest mortality patterns under extreme drought. *Ecology Letters* 20(1):78-86. [doi:10.1111/ele.12711](https://doi.org/10.1111/ele.12711)
- Salas-Eljatib C, Fuentes-Ramirez A, Gregoire TG, Altamirano A, Yaitul V. 2018. A study on the effects of unbalanced data when fitting logistic regression models in ecology. *Ecological Indicators*, 85:502-508. [doi:10.1016/j.ecolind.2017.10.030](https://doi.org/10.1016/j.ecolind.2017.10.030)

### Examples

```
data(deadForestCA2)
head(deadForestCA2)
```

---

 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 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 (oC\*10)

**TS\_bio4** Temperature seasonality in the plot (standard deviation\*100)

**ATR\_bio7** Annual temperature range in the plot (10 celsius degrees)

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

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

**BasAre5\_10** Basal area of trees with greater or equal than 5 DBH and less than 10 cm in the plot (m2 ha-1)

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

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

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

**Ind5\_10** Number of trees with greater or equal than 5 DBH and less than 10 cm in the plot

**Ind10\_15** Number of trees with greater or equal than 10 DBH and less than 15 cm in the plot

**Ind15\_20** Number of trees with greater or equal than 15 DBH and less than 20 cm in the plot

**Ind20\_25** Number of trees with greater or equal than 20 DBH and less than 25 cm in the plot

**Ind25\_30** Number of trees with greater or equal than 25 DBH and less than 30 cm in the plot

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

**TreeHei** Total tree height in meters

**MedHei** Median height of trees in each plot

**MaxHei** Maximum height of trees in each plot

**BranchNumb** Number of branches of the host tree

**Obs** Observations and notes in Spanish

### Source

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

### References

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

### Examples

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

---

 deadLianas2

*Este conjunto de datos tiene 43 columnas y 4247 filas. Cada fila corresponde a un individuo epifito ubicado en el secciones confiables de los árboles hospedantes*

---

## Description

Este estudio es parte del proyecto "Diversidad y dinamica de epifitas vasculares en los Andes colombianos". apoyado por COLCIENCIAS (contrato 2115-2013). Los datos corresponden a la primera gran escala evaluación de la mortalidad de epifitas vasculares en los neotropicos. Basado en dos encuestas anuales consecutivas, Seguimos el destino de 4247 epifitas para estimar la tasa de mortalidad de epifitas en 116 árboles hospedantes. en nueve sitios. Se tomaron variables adicionales del area de estudio para encontrar relaciones con mortalidad de epifitas.

## Usage

```
data(deadLianas2)
```

## Format

Variables se describen a continuacion::

**PlotSite** Nombre del municipio de los 9 sitios de estudio

**Y.Plot** Latitud del grafico en grados decimales

**X.Plot** Longitud de la grafica en grados decimales

**PhoroNo** numero de identificación de los árboles hospedantes muestreados en cada sitio

**EpiFam** Familia taxonomica de epifitas

**EpiGen** Genero taxonomico de epifitas

**cf.aff** Abreviaturas de terminos latinos en el contexto de la taxonomia. cf. "conferir" que significa "comparar con". aff .: "affinis" que significa "similar a"

**Species** Nombre de la especie epifita (morfo)

**Author** Autor del nombre científico

**EpiAzi** Azimut del individuo epifito en cada árbol huesped

**BraAzi** Azimut de la rama en la que se encontro el individuo epifito

**EpiDisTru** Distancia en metros desde el tronco hasta el sitio de union de la epifita en una rama

**EpiSize** Tamaño estimado del individuo epifito en centímetros

**EpiAttHei** Altura del accesorio de la epifita en metros

**Date0** Fecha del primer censo

**Date1** Fecha del censo final

**Location** Sección (raices, troncos, ramas) del árbol anfitrión en el que se encontro el individuo epifito

**Mortality** Variable dicotomica. 0 si el individuo epifito estaba muerto en el censo final y 1 si no

**MorCat** Causa de mortalidad mecanica o no mecanica  
**Elevation** Elevación (msnm) de la parcela  
**AP\_bio12** Precipitación anual en la parcela (mm año-1)  
**PDM\_bio14** Precipitación del mes mas seco en la parcela (mm)  
**PS\_bio15** Estacionalidad de la precipitación en la parcela (coeficiente de variacion)  
**MDT\_bio2** Rango diurno medio (Media mensual (temperatura maxima - temperatura minima)) en la grafica (10 grados celsius)  
**TS\_bio4** Estacionalidad de la temperatura en la grafica (desviación estandar \* 100)  
**ATR\_bio7** Rango de temperatura anual en la parcela (10 grados centigrados)  
**AET** Evapotranspiración real en la parcela (mm año-1)  
**BasAre** Área basal de árboles con DAP mayor o igual a 5 cm (AB) en la parcela (m2 ha-1)  
**BasAre5\_10** Área basal de árboles con DAP mayor o igual a 5 y menor a 10 cm en la parcela (m2 ha-1)  
**BasAre10** Área basal de árboles con DAP mayor o igual a 10 cm en la parcela (m2 ha-1)  
**Ind10** Numero de árboles del dosel (con un DAP superior o igual a 10 cm) en la parcela  
**Ind5** Numero de árboles de sotobosque (con DAP mayor o igual a 5 y menor a 10 cm) en la parcela  
**Ind5\_10** Numero de árboles con un DAP mayor o igual a 5 y menos de 10 cm en la parcela  
**Ind10\_15** Numero de árboles con un DAP mayor o igual a 10 y menos de 15 cm en la parcela  
**Ind15\_20** Numero de árboles con un DAP mayor o igual a 15 y menos de 20 cm en la parcela  
**Ind20\_25** Numero de árboles con un DAP mayor o igual a 20 y menos de 25 cm en la parcela  
**Ind25\_30** Numero de árboles con un DAP mayor o igual a 25 y menos de 30 cm en la parcela  
**Ind30** Numero de árboles con DAP mayor o igual a 30 cm en la parcela  
**TreeHei** Altura total del árbol en metros  
**MedHei** Altura media de los árboles en cada parcela  
**MaxHei** Altura maxima de los árboles en cada parcela  
**BranchNumb** Numero de ramas del árbol anfitrión  
**Obs** Observaciones y notas en español

### Source

Data fue extraida desde 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(deadLianas2)
head(deadLianas2)
```

deleteRight

*This function deletes the last n-characters of a string.*

---

**Description**

It deletes the last n-characters of a string from the right-hand side.

**Usage**

```
deleteRight(fac, n)
```

**Arguments**

fac            is an object of class string or factor  
n              is the number of characters to be deleted of a the string given in fac.

**Value**

This function returns an object having n-less characters from the right-hand side.

**Author(s)**

Christian Salas-Eljatib.

**Examples**

```
last.names.id <- c("Stage-1924","Gregoire-1958","Robinson-1967")  
deleteRight(last.names.id,5)  
deleteRight(last.names.id,4)
```

---

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:

**species** Name specie.

**site** Name of site of study.

**country** Name of country.

**site.num** Code of site.

**code** Species code.

**genus** Species genus.

**spp** Abbreviated name of the species.

**family** Family of the species.

**phyl** Type of phylogeny: Angiosperm/Gymnosperm

**l.hab** Leaf habit: Deciduous/Evergreen

**l.type** .

**leaf** Combination of phylogeny and leaf habit: evergreen gymnosperms; deciduous angiosperms and evergreen angiosperms.

**growth.l** Growth at full light, in years. Defined as the time needed for a sapling with DBH= 1cm to become an adult (DBH=7.5 cm) when light = 100%.

**growth.d** Growth in shade, in years. Defined as the time needed for a sapling with DBH= 1cm to become an adult (DBH=7.5 cm) when light = 1%

**surv.d** Survival in shade, in %. Defined as the 5-year survivorship of a sapling with DBH = 1cm when light = 1%.

**Source**

The data were obtained from the DRYAD repository [doi:10.5061/dryad.12b0h](https://doi.org/10.5061/dryad.12b0h).

**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)
```

---

demograph2

*Información demográfica de especies arbóreas.*

---

### Description

Contiene 61 observaciones sobre variables de historia de vida según especie y sitio, según el estilo de los estudios que se usan en el modelo de crecimiento forestal SORTIE.

### Usage

data(demograph2)

### Format

Contiene 15 variables, como sigue:

**especie** Nombre de la especie.

**sitio** Nombre del sitio.

**pais** País.

**sitio.num** Código del sitio.

**codigo** Código de la especie.

**genero** Género de la especie.

**spp** Código abreviado de la especie.

**familia** Familia de la especie.

**filogenia** Tipo de filogenia: Angiosperma/Gimnosperma

**h.hab** Tipo de hábitat de la hoja: Decidua/Siempreverde.

**h.tipo** Tipo de hoja.

**hoja** Combinación de filogenia y tipo de hábitat de la hoja.

**creci.luz** Growth at full light, in years. Defined as the time needed for a sapling with DBH= 1cm to become an adult (DBH=7.5 cm) when light = 100%.

**creci.sombra** Growth in shade, in years. Defined as the time needed for a sapling with DBH= 1cm to become an adult (DBH=7.5 cm) when light = 1%

**sobre.sombra** Survival in shade, en %. Defined as the 5-year survivorship of a sapling with DBH = 1cm when light = 1%.

### Source

Los datos se obtuvieron desde el repositorio Dryad [doi:10.5061/dryad.12b0h](https://doi.org/10.5061/dryad.12b0h).

### 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(demograph2)
head(demograph2)
```

---

descstat	<i>A function that prepares a descriptive statistics table for continuous variables.</i>
----------	--

---

**Description**

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

**Usage**

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

**Arguments**

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

**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)
```

---

dgorange

*Diameter growth of Orange trees*

---

## Description

Growth diameter measurements for Orange trees. Notice that columns `site` and `specie` are fictitious and are only created for academic purposes.

## Usage

```
data(dgorange)
```

## 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

The data come from the dataframe 'Orange' of the 'datasets' package, but some columns were created for academic reasons only.

## Examples

```
data(dgorange)
```

```
coplot(dbh ~ time | tree.id, data = dgorange, show.given = FALSE)
plot(dbh ~ time, data = dgorange, subset = tree.id == 3,
     xlab = "Time (number of days since 1968/12/31)",
     ylab = "Tree diameter (mm)", las = 1)
```

---

dgorange2

*Crecimiento diametral de árboles de naranjo*

---

## Description

Mediciones de crecimiento diametral de árboles de Naranjo. Note que las columnas sitio y especie son ficticias y solo creadas por propositos academicos.

## Usage

```
data(dgorange2)
```

## Format

Series de tiempo de diámetro, que contienen las siguientes columnas:

**arbol** Identificador del árbol.

**tiempo** Número de dias desde el 31 de diciembre de 1968.

**peri** El perimetro del tronco (mm), medido a la altura del pecho.

**dap** Diámetro a la altura del pecho (mm).

**sitio** un factor, representando condiciones de sitio, en dos niveles. Esta columna es ficticia.

**especie** un factor, representando especie del árbol, en tres niveles. Esta columna es ficticia.

## Source

Los numeros de estos datos provienen de la dataframe 'Orange' de la libreria 'datasets', pero las columnas fueron creadas solo para fines academicos.

## Examples

```
data(dgorange2)
```

```
coplot(dap ~ tiempo | arbol, data = dgorange2, show.given = FALSE)
plot(dap ~ tiempo, data = dgorange2, subset = arbol== 3,
     xlab = "Tiempo (numero de dias desde 31/12/1968)",
     ylab = "Diametro (mm)", las = 1)
```

---

`diamgr`*Diameter growth of Norway spruce (Picea abies) trees.*

---

**Description**

von Guttenberg (1915) diameter growth data of Norway spruce trees in the Alps. The data contain measurements of 107 average-size trees from seven locations that encompassed five different sites from healthy, fully stocked stands growing in the Alps. These data are more fully documented in Zeide (1993).

**Usage**

```
data(diamgr)
```

**Format**

The data frame contains the following columns:

**site** site

**location** location

**tree** Tree number

**age** Total age, in yrs.

**htot** Total height, in m.

**dbh** Diameter at breast height, in cm.

**volume** Total volume, in m<sup>3</sup>.

**bha** Breast-height age, in yrs.

**tree.id** Tree code, merging site, location and tree number.

**Source**

Data were provided by Prof. Andrew Robinson, for his Statistical lectures at the University of Idaho (USA), meanwhile Dr Christian Salas-Eljatib was a student there.

**References**

- von Guttenberg, A. R., 1915. Growth and yield of spruce in Hochgebirge. Franz Deuticke, Vienna (in German). - Zeide, B., 1993. Analysis of growth equations. Forest Science 39 (3), 549-616. [doi:10.1093/forestscience/39.3.594](https://doi.org/10.1093/forestscience/39.3.594)

**Examples**

```
data(diamgr)
head(diamgr)
library(lattice)
xyplot(dbh ~ age | tree.id, type="b", data=diamgr)
```

---

`diamgr2`*Crecimiento diametral de árboles de abeto Noruego (Picea abies) .*

---

**Description**

Datos de crecimiento diametral de von Guttenberg (1915) de árboles de abeto Noruego en los Alpes. Los datos contienen mediciones de 107 árboles muestras desde siete localidades que cubrían cinco sitios, seleccionados desde rodales de buena sanidad y de densidad completa en los Alpes. Estos datos son mejor documentados en Zeide (1993).

**Usage**

```
data(diamgr2)
```

**Format**

Los datos contienen las siguientes columnas:

**sitio** sitio

**localidad** localidad

**arbol** Numero de árbol

**edad** Edad, en años.

**atot** Altura total, en m.

**dap** Diametro a la altura del pecho, en cm.

**vtot** Volumen total, en m<sup>3</sup>.

**edap** Edad a la altura del pecho, en años.

**arbol.id** Codigo del árbol, que mezcla sitio, localidad y numero del árbol.

**Source**

Los datos fueron cedidos por el Prof. Andrew Robinson, durante sus clases de estadística en la University of Idaho (USA), mientras el Dr Christian Salas-Eljatib fue un estudiante ahí.

**References**

- von Guttenberg, A. R., 1915. Growth and yield of spruce in Hochgebirge. Franz Deuticke, Vienna (in German). - Zeide, B., 1993. Analysis of growth equations. Forest Science 39 (3), 549-616. [doi:10.1093/forestscience/39.3.594](https://doi.org/10.1093/forestscience/39.3.594)

**Examples**

```
data(diamgr2)
head(diamgr2)
library(lattice)
xyplot(dap ~ edad | arbol.id, type="b", data=diamgr2)
```

---

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 three variables, as follows:

**gore** Vote for Gore.

**bush** Vote for Bush.

**buchaman** Vote for Buchaman.

### Source

The data were obtained from the 'alr4' library.

### References

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

### Examples

```
head(election)
colSums(election)
```

---

election2

*Elección presidencial en el estado de Florida (USA) en el 2000.*

---

### Description

Votos para cada candidato (i.e., Bush, Gore y Buchanan) por condado en la elección presidencial del 2000 en el estado de Florida (USA).

### Usage

```
data(election2)
```



**Format**

Contiene tres variables, como sigue:

**gore** Votos para Gore.

**bush** Votos para Bush.

**buchaman** Votos para Buchaman.

**Source**

Los datos se obtuvieron desde el paquete 'alr4' de R.

**References**

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

**Examples**

```
head(election2)
colSums(election2)
```

---

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 (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)
```

---

eucaleaf2	<i>Mediciones foliares para árboles de Eucalyptus nitens en Tasmania, Australia.</i>
-----------	--

---

## Description

Mediciones de largo, ancho y area de hojas de *Eucalyptus nitens*.

## Usage

```
data(eucaleaf)
```

## Format

Contiene variables a nivel de hoja, como sigue:

- tiempo** factor a dos niveles: Temprano o Tardío
- arbol** un identificador del árbol muestra
- meristema** descripción del meristema
- largo** largo de la hoja, en mm
- ancho** ancho de la hoja, en mm
- area** area foliar, en cm<sup>2</sup>

## Source

Aunque la fuente original de estas mediciones proviene de la tesis del Dr Candy (1999), el archivo de datos fue cortesía del Prof. Timothy Gregoire de Yale University (New Haven, CT, USA). Además, estos datos fueron ocupados en el estudio de Gregoire y 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, y Salas C. 2009. Ratio estimation with measurement error in the auxiliary variate. *Biometrics* 65(2):590-598

## Examples

```
data(eucaleaf2)
head(eucaleaf2)
```

---

eucaplot	<i>Data from a Eucalyptus globulus plantation near Gorbea, Region de La Araucania, Chile.</i>
----------	---

---

## 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 m<sup>2</sup>. 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-Eljatib (Chile).

## Examples

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

---

eucaplot2	<i>árboles dentro de parcelas de muestreo en una plantación de Eucalyptus globulus, Chile.</i>
-----------	--

---

**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 m<sup>2</sup>. The plantation is 15 yr-old and had been subject to three thinnings.

**Usage**

```
data(eucaplot2)
```

**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-Eljatib (Chile).

**Examples**

```
data(eucaplot2)
head(eucaplot2)
```

---

eucaplotsampleh	<i>A sample plot from a Eucalyptus globulus plantation, with height measurements in a sub-sample of trees.</i>
-----------------	--

---

**Description**

Data from a sample plot, but height measurements are only available for a sub-sample of trees. The sample plot (500 m<sup>2</sup> of size) was established in a forestry plantation of *Eucalyptus globulus* near Gorbea, Southern Chile. The plantation is 15 yr-old and had been subject to three thinnings.

**Usage**

```
data(eucaplotsampleh)
```

**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. Only measured in a sub-sample of trees.

**Source**

The data were provided courtesy of Dr Christian Salas-Eljatib (Chile).

**Examples**

```
data(eucaplotsampleh)
head(eucaplotsampleh)
```

---

eucaplotsampleh2	<i>Una parcela de muestreo en una plantación de Eucalyptus globulus, con medición de altura en una submuestra de árboles.</i>
------------------	---

---

**Description**

Datos de una parcela de muestreo, pero las alturas fueron solo medidos en una submuestra de árboles. La parcela de muestreo (de 500 m<sup>2</sup> de superficie) fue establecida en una plantación forestal de Eucalyptus globulus cerca a Gorbea, en el Sur de Chile. La plantación tiene 15 años y ha estado sometida a tres raleos.

**Usage**

```
data(eucaplotsampleh2)
```

**Format**

Los datos contienen las siguientes columnas:

**dap** Diametro a la altura del pecho, en cm.

**sanidad** clase de sanidad (1: buena, 2: media, 3: mala).

**forma** clase de forma fustal (1: buena, 2: media, 3: mala).

**dominancia** Dominancia (1: superior, 2: intermedio, 3: inferior).

**atot** Altura total, en m. Solo medida en una submuestra de árboles.

**Source**

Los datos son cedidos por el Dr Christian Salas-Eljatib (Chile).

**Examples**

```
data(eucaplotsampleh2)
head(eucaplotsampleh2)
```

---

**extractRight***This function extracts the last n-characters of a string.*

---

**Description**

It extracts the last n-characters of a string from the right-hand side.

**Usage**

```
extractRight(fac, n)
```

**Arguments**

**fac** is an object (vector or scalar) of class string or factor  
**n** is the number of characters to be extracted of a the string given in 'fac'.

**Value**

This function returns an object having the last-n characters of the object 'fac'

**Author(s)**

Christian Salas-Eljatib.

**Examples**

```
last.names.id <- c("Stage-1924", "Gregoire-1958", "Robinson-1967")
extractRight(last.names.id, 5)
years <- extractRight(last.names.id, 4)
years
```

---

fertilizaexpe	<i>Fertilization experiment data.</i>
---------------	---------------------------------------

---

**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 m<sup>3</sup>/plot.

**Source**

The data were provided by Dr Christian Salas.

**References**

not yet

**Examples**

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

---

fertilizaexpe2	<i>Datos a nivel de parcela de un experimento de fertilizacion.</i>
----------------	---

---

**Description**

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

**Usage**

```
data(fertilizaexpe2)
```

**Format**

Contains three variables, as follows:

**treat** Treatment level.

**volume** Plot-level volume, in m<sup>3</sup>/plot.

**Source**

The data were provided by Dr Christian Salas.

**References**

not yet

**Examples**

```
data(fertilizaexpe2)
head(fertilizaexpe2)
```

---

findColumn.byname      *A function that finds the position of a specific variable.*

---

**Description**

This function finds the column-position of a specified column-name in an object (either a data frame or vector).

**Usage**

```
findColumn.byname(data = data, col.name = col.name)
```

**Arguments**

data	a dataframe containing variables as columns
col.name	is a string specifying the name of the variable

**Value**

The number representing the column position in the dataframe of the requested column-name. It can also be used for several names, thus, will return a vector of numbers.

**Note**

It can be used for a vector of specified column-names as well.

**Author(s)**

Christian Salas-Eljatib

**Examples**

```
data(deadForestCA)
df <- deadForestCA
names(df)
findColumn.byname(df, "Defz2")
findColumn.byname(df, c("Defnorm", "mort.bin"))
```



---

`fishgrowth`*Data on fish growth.*

---

**Description**

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

**Usage**

```
data(fishgrowth)
```

**Format**

Contains 3 variables, as follows:

**years** Year at capture.

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

**scale** radius of a key scale (mm).

**Source**

The data were obtained from the alr4 library of R.

**References**

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

**Examples**

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

---

`fishgrowth2`*Crecimiento de peces*

---

**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(fishgrowth2)
```

**Format**

Contiene tres variables, como sigue:

**edad** Year at capture.

**largo** Length at capture, en mm.

**escala** radius of a key scale, en mm.

**Source**

Datos obtenidos desde el paquete 'alr4' de R.

**References**

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

**Examples**

```
data(fishgrowth2)
head(fishgrowth2)
```

---

floraChile

*Flora of Chile.*

---

**Description**

Dataset contains taxonomic level information segregated 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)
```

---

floraChile2

*Flora de Chile.*

---

**Description**

Contiene información taxonomica segregada por latitud.

**Usage**

```
data(floraChile)
```

**Format**

Contains seven columns, as follows:

```
family .
genus .
scientific.name .
author .
origin .
life.form .
lat... .
```

**Source**

Datos cedidos por el Dr Jan Bannister del 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(floraChile2)
head(floraChile2)
```

---

football

*Anaerobic potential of soccer players.*

---

### Description

Data about anaerobic variables of football players.

### Usage

```
data(football)
```

### Format

The data frame contains 13 variables as follows:

**WPM** Watt Peak Max.

**WPMk** Watt Peak Max relative.

**Wpm** Watt Peak media.

**Wpmk** Watt Peak media relative.

**WTT** Watt Total Work.

**WTTk** Watt Total Work relative.

**WIF** Watt Index Fatigue.

**W5** Watt 5 seg.

**W10** Watt 10 seg.

**W15** Watt 15 seg.

**W20** Watt 20 seg.

**W25** Watt 25 seg.

**W30** Watt 30 seg.

### Source

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

### References

Not yet.

### Examples

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

---

`football2`*Potencia anaerobica de jugadores de football.*

---

**Description**

Datos sobre potencia anaerobica de jugadores de football.

**Usage**

```
data(football2)
```

**Format**

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

**WPM** Watt Peak Max.

**WPMk** Watt Peak Max relative.

**Wpm** Watt Peak media.

**Wpmk** Watt Peak media relative.

**WTT** Watt Total Work.

**WTTk** Watt Total Work relative.

**WIF** Watt Index Fatigue.

**W5** Watt 5 seg.

**W10** Watt 10 seg.

**W15** Watt 15 seg.

**W20** Watt 20 seg.

**W25** Watt 25 seg.

**W30** Watt 30 seg.

**Source**

Los datos fueron cedidos por el Dr Aquiles Yanez-Silva de la Universidad Mayor (Santiago, Chile).

**References**

Not yet.

**Examples**

```
data(football2)
head(football2)
```

---

 forestFire

*Data of forest fire occurrence*


---

### Description

Data of forest fire occurrence from Altamirano et al. (2013) as the population under study, containing 7210 total observations, with only 890 cases of fire occurrence and 6320 cases of non-occurrence. 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  
**nvgi** 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  
**nvgi.class** Normalized difference vegetation index class

**Source**

Data were compiled by Dr Adison Altamirano (Universidad de La Frontera, Temuco, Chile) from the Chilean Forest Service (CONAF).

**References**

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

**Examples**

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

---

forestFire2

*Datos de ocurrencia de incendios forestales*

---

**Description**

Datos de ocurrencia de incendios forestales de Altamirano et al. (2013) como la población bajo estudio, que contiene 7210 observaciones totales, con solo 890 casos de ocurrencia de incendios y 6320 casos de no ocurrencia. La variable binaria (Y) es la ocurrencia de un incendio forestal, donde Y igual a 1 denota ocurrencia e igual a 0 en caso contrario.

**Usage**

```
data(forestFire2)
```

**Format**

Variables se describen a continuación:

- fire** Presencia de incendio forestal (1 si, 0 no)
- xcoord** Coordenada geografica x.utm
- ycoord** Coordenada geografica y.utm
- aspect** Exposición (grados desde el norte)
- eleva** Elevación (m)
- slope** Pendiente (grados)
- distr** Distancia a caminos de tierra
- distcity** Distancia a ciudades
- distriver** Distancia a caminos pavimentados
- covera** Clasificaciones de uso del suelo segun un poligono
- coverb** Clasificaciones de uso del suelo segun un poligono

**tempe** Temperatura minima del mes mas frio  
**ppan** Precipitación anual  
**ndii** Indice infrarrojo de diferencia normalizado  
**nvdI** Indice de vegetación de diferencia normalizado  
**tempe2** Temperatura minima del mes mas calido  
**ppan2** Precipitación del mes mas seco  
**frec.fire** Frecuencia de incendios  
**perc.fire** Porcentajede la frecuencia de incendios  
**fireClass** Clase para variable frecuencia de incendio  
**asp.class** Clase de variable exposición  
**eleva.class** Clase de variable numerica elevacion  
**slope.class** Clase de variable numerica pendiente  
**ndii.class** Clase de indice infrarrojo de diferencia normalizado  
**nvdI.class** Clase de indice de vegetación de diferencia normalizado

### Source

Datos fueron compilados por el Dr Adison Altamirano (Universidad de La Frontera, Temuco, Chile) desde la Corporación Nacional Forestal (Chile).

### References

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

### Examples

```
data(forestFire2)
head(forestFire2)
```

---

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 m<sup>2</sup>.

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

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

**year** Year in which plot data was collected.

**census** Numeric identifier for each census.

**tree.id** Unique numeric identifier for each individual.

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

**family** Family of each individual following TPL v. 1.1.

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

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

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

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

**abundance** Number of individuals (all = 1).

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

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

**Source**

The data were obtained from the DRYAD repository at [doi:10.5061/dryad.1kk02qr](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)
```

---

`grGrandfir`*Height and diameter growth of Grand fir (Abies grandis) trees.*

---

### Description

Height and diameter growth data of Grand fir (*Abies grandis*) trees in Idaho, USA. The data contain measurements of 66 dominant trees from national forests in Idaho, USA. These data are fully documented in Stage (1963).

### Usage

```
data(grGrandfir)
```

### Format

The data frame contains the following columns:

**forest** national forest

**forest.id** national forest code

**habtype** habitat type

**hab.id** habitat type code

**tree.id** Tree code

**decade** Decade, as an integer.

**age** Total age, in yrs.

**dbh** Diameter at breast height, in cm.

**htot** Total height, in m.

### Source

Data were collected by Dr Albert Stage (R.I.P.), from the US Forest Service in Moscow, Idaho, USA. Data were compiled by Prof. Andrew Robinson, for his Statistical lectures at the University of Idaho (USA), meanwhile Dr Christian Salas-Eljatib was a student there.

### References

- Stage, A. R., 1963. A mathematical approach to polymorphic site index curves for Grand fir. *Forest Science* 9 (2), 167-180. doi:[10.1093/forestscience/9.2.167](https://doi.org/10.1093/forestscience/9.2.167)

### Examples

```
data(grGrandfir)
head(grGrandfir)
library(lattice)
xyplot(dbh ~ age | tree.id, type="b", data=grGrandfir)
```

---

`grGrandfir2`*Crecimiento en altura y diametro de árboles de Abies grandis.*

---

**Description**

Crecimiento en altura y diametro de árboles de *Abies grandis* en Idaho, USA. Los datos contienen mediciones de 66 árboles dominantes seleccionados desde reservas nacionales forestales en el estado de Idaho, USA. Los datos estan mas detallados en Stage (1963).

**Usage**

```
data(grGrandfir2)
```

**Format**

Los datos contienen las siguientes columnas:

**bosque** Reserva forestal nacional

**bosque.id** Codigo de reserva forestal nacional

**tipo.hab** Tipo de habitat

**hab.id** Codigo de tipo de habitat

**arbol.id** Codigo del árbol

**decada** Decada, como un entero.

**edad** Edad total, en años.

**dap** Diametro a altura del pecho, en cm.

**atot** Altura total, en m.

**Source**

Los datos fueron medidos por el Dr Albert Stage (Q.E.P.D.), del US Forest Service en Moscow, Idaho, USA. Los datos fueron compilados por el Prof. Andrew Robinson para sus clases de estadística en la University of Idaho (USA), mientras el Dr Christian Salas-Eljatib era un estudiante ahi, y alumno tesista del Dr Stage.

**References**

- Stage, A. R., 1963. A mathematical approach to polymorphic site index curves for Grand fir. Forest Science 9(2):167-180. [doi:10.1093/forestscience/9.2.167](https://doi.org/10.1093/forestscience/9.2.167)

**Examples**

```
data(grGrandfir2)
head(grGrandfir2)
library(lattice)
xyplot(dap ~ edad | arbol.id, type="b", data=grGrandfir2)
```

---

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

---

**Description**

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

**Usage**

```
data(hawaii)
```

**Format**

The data frame has the following columns:

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

**dbh** Initial stem diameter, in cm.

**htot** Total height, in m.

**crown.area** Crown outline area, in m<sup>2</sup>.

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

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

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

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

**Source**

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

**References**

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

**Examples**

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

---

hawaii2	<i>Incremento corriente anual en diametro de una especie tropical en Hawaii</i>
---------	---

---

### Description

Tamaño del árbol, competencia, e incremento corriente anual de árboles de *Metrosideros polymorpha* colectado en el volcán Kilauea, en Hawaii. Los datos contienen 64 observaciones de incremento corriente anual (definido como el incremento en diámetro en un año calendario) de cada árbol. Estos incrementos fueron medidos desde el año 1986 a 1988 usando bandas dendrométricas.

### Usage

```
data(hawaii)
```

### Format

Estos datos contienen las siguientes columnas:

**arb.id** Código identificador del árbol. La primera letra del ID representa un cohorte. Hay seis cohortes que representan una cronosecuencia.

**dap** Diámetro a la altura del pecho, en cm.

**htot** Altura total, en m.

**area.copa** Área de copa, en metros cuadrados.

**ind.comp** 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).

**ica.1986** Incremento corriente anual durante el año 1986, en mm.

**ica.1987** Incremento corriente anual durante el año 1987, en mm.

**ica.1988** Incremento corriente anual durante el año 1988, en mm.

### Source

Los datos fueron obtenidos desde Gerrish and Mueller-Dombois (1999).

### References

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

### Examples

```
data(hawaii2)
head(hawaii2)
```

---

`hdptorico`*Tree height-diameter data of Homalium racemosum in Puerto Rico.*

---

**Description**

Height and diameter data for *Homalium racemosum* trees growing in the Caribbean National Forest on the tropical island of Puerto Rico and represent a typical species growing in the subtropical wet life zone.

**Usage**

```
data(hdptorico)
```

**Format**

Contains three variables, as follows:

**tree** Tree id code.

**dbh** Diameter at breast height, in cm.

**height** Total height of the tree, in meters.

**Source**

Consider the 40 height-diameter pairs listed in table 1 and were typed by Vivian Marschhausen, a student of Prof Christian Salas-Eljatib.

**References**

Yuancai L, Parresol B. 2001. Remarks on Height-Diameter Modeling. Res. Note SE-10. U.S. Department of Agriculture, Forest Service, Southeastern Forest Experiment Station. 8 p.

**Examples**

```
data(hdptorico)
head(hdptorico)
```

---

hdptorico2	<i>Altura y diametro para árboles de Homalium racemosum en Puerto Rico.</i>
------------	---

---

### Description

Altura y diametro medidos en árboles de Homalium racemosum en el bosque nacional del caribe en la isla tropical de Puerto Rico y representa a una especie típica de la zona subtropical húmeda.

### Usage

```
data(hdptorico2)
```

### Format

Contiene tres variables, como sigue:

**arbol** Código indentificador del árbol.

**dap** Diametro a la altura del pecho, en cm.

**atot** Altura total, in meters.

### Source

Los datos provienen del Cuadro No. 1 de Yuancai and Parresol (2001) y fueron digitados por Vivian Marschhausen, una estudiante del Prof Christian Salas-Eljatib.

### References

Yuancai L, Parresol B. 2001. Remarks on Height-Diameter Modeling. Res. Note SE-10. U.S. Department of Agriculture, Forest Service, Southeastern Forest Experiment Station. 8 p.

### Examples

```
data(hdptorico2)
head(hdptorico2)
```

---

hgrowthDfir	<i>Tree height growth of Douglas-fir 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 at sampling, in in.

**htot** Total height at sa,pling, in ft

**age** Age of tree, yr

**height** Height at a given age, in ft

**Source**

The data were provided by Dr Christian Salas.

**References**

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

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

**Examples**

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

---

hgrowthDfir2	<i>Crecimiento en altura de una muestra de árboles en los Estados Unidos</i>
--------------	--

---

**Description**

Data contiene 148 observaciones sobre el crecimiento en altura de árboles dominantes de Pseudotsuga mensiezzi en el Nor-Oeste de los Estados Unidos

**Usage**

```
data(hgrowthDfir2)
```



**Format**

La data frame contiene siete variables:

**bosque.id** Código identificador del bosque.

**parcela** Código identificador de la parcela.

**arbol** Numero de identificación árbol.

**dap** Diametro a la altura del pecho, en pulgadas.

**htot** Altura total, en pies

**edad** Edad, en años

**altura** Altura para cada edad del árbol, en pies

**Source**

La data fue cedida por el Dr Christian Salas-Eljatib.

**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(hgrowthDfir2)
head(hgrowthDfir2)
```

---

hgrowthlenga

*Height growth of Nothofagus pumilio (lenga) saplings.*

---

**Description**

Tree height growth of lenga saplings in the Ultima Esperanza province, on the XII Region (Patagonia) of Chile.

**Usage**

```
data(hgrowthlenga)
```

**Format**

Data having the following columns:

**plot** Sample plot number.

**tree** Tree code.

**hst** Stump height, in m.

**year** Year of establishment.

**age** Tree age, in yrs.

**height** Tree height, in m.

**site** Site code.

**cluster** Cluster code.

**Source**

The data were typed by Valentina Venegas, a student of Prof Christian Salas-Eljatib.

**References**

Ugalde G. (2006) Crecimiento en altura de renovales de lenga (*Nothofagus pumilio* (Poepp. et Endl.) Krasser) en Monte Alto(XII Region) en función de la calidad del sitio. Tesis Ingeniero Forestal, Universidad de Chile, Santiago, Chile.

**Examples**

```
data(hgrowthlenga)
summary(hgrowthlenga)
```

---

hgrowthlenga2

*Crecimiento en altura de brinzales de Nothofagus pumilio (lenga).*

---

**Description**

Datos de crecimiento en brinzales de lenga en la provincia de Ultima Esperanza province, en la XII Region (Patagonia) de Chile.

**Usage**

```
data(hgrowthlenga2)
```

**Format**

Los datos tienen las siguientes columnas:

**parce** Numero de la parcela de muestreo.

**arbol** Codigo del árbol.

**htoc** Altura de tocon, en m.

**anho** Año de establecimiento.

**edad** Edad del árbol, en años.

**altura** Altura total, en m.

**sitio** Codigo del sitio.

**conglo** Codigo del conglomerado.

**Source**

Los datos fueron digitados por Valentina Venegas, una estudiante del Prof Christian Salas-Eljatib.

**References**

Ugalde G. (2006) Crecimiento en altura de renovales de lenga (*Nothofagus pumilio* (Poepp. et Endl.) Krasser) en Monte Alto(XII Region) en función de la calidad del sitio. Tesis Ingeniero Forestal, Universidad de Chile, Santiago, Chile.

**Examples**

```
data(hgrowthlenga2)
summary(hgrowthlenga2)
```

---

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)
```

---

idahohd2

*Altura-diámetro de árboles en el estado de Idaho (USA).*

---

**Description**

Estos datos provienen de un muestreo en un bosque de Upper Flat Creek en el bosque experimental de la University of Idaho, medido en 1991.

**Usage**

```
data(idahohd2)
```

**Format**

Contiene cinco variables, como sigue:

**parce** numero de la parcela de muestreo.

**narb** numero del árbol dentro de la parcela.

**spp** especie del árbol, una variable factor con niveles DF = Douglas-fir, GF = Grand fir, SF = Subalpine fir, WL = Western larch, WC = Western red cedar, WP = White pine.

**d** diámetro del tronco a los 1.3m sobre el suelo, en cm.

**h** Altura del árbol, en m.

**Source**

Los datos fueron obtenidos desde la librería 'alr4'.

**References**

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

**Examples**

```
data(idahohd2)
head(idahohd2)
```

---

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

---

**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	<i>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)
```

## Format

The data frame contains four variables as follows:

**Comuna** Name of Municipality

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

**p.Vegetacion** Percentage of surface covered by vegetation

**p.Desnudo** Percentage of surface covered by bare soil

**p.Pasto** Percentage of surface covered by deciduous vegetation

**p.Deciduo** Percentage of surface covered by evergreen vegetation

**p.Siempreverde** Percentage of surface covered by evergreen vegetation

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

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

**PM10 Invierno** Average particulate matter 10 micron during winter months

**PM10 Verano** Average particulate matter 10 micron during summer months

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

**Altitud promedio** Average altitude of municipal area

**Poblacion** Total population of municipality

## Source

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

**References**

Not yet

**Examples**

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

---

landCoverSantiago2	<i>Cobertura territorial, ambiental y sociodemografica de los 34 municipios que componen el area del Gran Santiago, Santiago, Chile..</i>
--------------------	---

---

**Description**

El conjunto de datos contiene 476 observaciones, 34 categoricas y 442 numericas. Los datos de cobertura terrestre se generaron mediante tecnicas de clasificación de teledetección utilizando imagenes de satelite Sentinel-2 del año 2016. Las temperaturas se obtuvieron de la banda TIRS 10 de las imagenes de los satelites Landsat 8. Las concentraciones de material particulado se estimaron mediante tecnicas de modelado espacial de 10 estaciones de contaminación distribuidas en la ciudad. La altitud se genero a partir de un modelo de elevación digital. La población y la pobreza se obtuvieron de la encuesta Casen 2017.

**Usage**

```
data(landCoverSantiago2)
```

**Format**

Variables se describen a continuacion:

**Comuna** Name of Municipality

**p.Construido** Porcentaje de superficie cubierta por area construida

**p.Vegetacion** Porcentaje de superficie cubierta por vegetacion

**p.Desnudo** Porcentaje de superficie cubierta por suelo desnudo

**p.Pasto** Porcentaje de superficie cubierta por cesped

**p.Deciduo** Porcentaje de superficie cubierta por vegetación de hoja caduca

**p.Siempreverde** Porcentaje de superficie cubierta por vegetación siempre verde

**Temp Invierno** Temperatura de la superficie terrestre en grados celsius a las 2 p.m. en un día de invierno con 0% de nubes

**Temp Verano** Temperatura de la superficie de la tierra en grados celsius a las 2 p.m. en un día de verano con 0% de nubes

**PM10 Invierno** Material particulado promedio de 10 micrones durante los meses de invierno

**PM10 Verano** Material particulado promedio de 10 micrones durante los meses de verano

**p.pobreza 2017** Porcentaje de personas por debajo de la linea de pobreza año 2017

**Altitud promedio** Altitud media del termino municipal

**Poblacion** población total del municipio

**Source**

Los datos fueron cedidos por el Dr Ignacio Fernandez de la Universidad Mayor (Santiago, Chile).

**References**

Not yet

**Examples**

```
data(landCoverSantiago2)
head(landCoverSantiago2)
```

---

lleuque	<i>Contains species composition data of Prumnopitys andina (Lleuque) forests</i>
---------	--

---

**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.



---

pinaster

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

---

### Description

Tree-level volume data of sample trees in the Baixo-Miño region, Galicia, Spain.

### Usage

```
data(pinaster)
```

### Format

Contains tree-level variables, as follows:

**stand** Stand from where the sample tree was collected.

**si** Site index of the stand, in m.

**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-Eljatib.

### References

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

### Examples

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

---

pinaster2

*Datos de volumen individual de árboles de Pinus pinaster en Galicia, España.*

---

### Description

VARIABLES de volumen, y otras, a nivel de árbol para una muestra de árboles de Pinus pinaster en la comarca del Baixo-Miño en Galicia, España.

### Usage

```
data(pinaster2)
```

### Format

Contiene las siguientes variables a nivel de árbol:

**rodal** Rodal desde donde el árbol fue muestreado

**ind.sitio** Índice de sitio del rodal, en m.

**arbol** Numero del árbol.

**dbh** diámetro a la altura del pecho, en cm.

**htot** Altura total, en m.

**d4** diámetro fustal a los 4 m, en cm.

**vt.cc** Volumen bruto total con corteza, en m<sup>3</sup>.

**vt.sc** Volumen bruto total sin corteza, en m<sup>3</sup>.

### Source

Los datos fueron cedidos por el Dr Christian Salas-Eljatib.

### References

- Salas C, Nieto L, Irisarri A. 2005. Modelos de volumen para Pinus pinaster Ait. en la comarca del Baixo Mino, Galicia, España. Quebracho 12: 11-22. [https://eljatib.com/publication/2005-12-01\\_modelos\\_de\\_volumen\\_p/](https://eljatib.com/publication/2005-12-01_modelos_de_volumen_p/)

### Examples

```
data(pinaster2)
head(pinaster2)
```

---

pinusContorta	<i>Contains spatial location of Pinus contorta trees in sample plots.</i>
---------------	---

---

### Description

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

### Usage

```
data(pinusContorta)
```

### Format

Contains 8 variables, as follows:

**plot.id** Plot sample ID.

**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 Concepción (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.

### Examples

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

---

pinusContorta2	<i>Ubicación espacial de árboles de Pinus contorta en parcelas de muestreo.</i>
----------------	---

---

### Description

Mediciones a nivel de árbol, con la ubicación cartesian de cada árbol de Pinus contorta, en parcelas de muestreo para estudio de invasión en la estepa Patagonica en Coyhaique en el sur de Chile. Hay tres parcelas, cada una de 10.000 m<sup>2</sup>.

### Usage

```
data(pinusContorta2)
```

### Format

Contiene ocho variables, como siguen:

**parcela** Parcela.

**arbol** Numero de árbol en cada parcela. Mismo árbol/id para árboles multifustales.

**coord.y** coordenada de latitud W.

**coord.x** coordenada de longitud W.

**substrato** Cobertura del suelo donde cada pino crece. Bare soil, Festuca pallescens, Baccharis magellanica, Oreopulus glacialis, Acaena integerrima and others species.

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

**diam.cuello** diámetro del cuello, en mm.

**area.copa** Área de copa, en m<sup>2</sup>.

### Source

Los datos fueron cedidos por los Drs. Anibal Pauchard y Rafael Garcia del Laboratorio de Invasiones Biologicas, Universidad de Concepción (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.

### Examples

```
data(pinusContorta2)
head(pinusContorta2)
unique(pinusContorta2$plot.id)
```

---

pinusSpp	<i>Tree-level variables of several sample plots of invasive Pinus spp in Chile.</i>
----------	---

---

### 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. There are 26 plots and plot size is 100 m<sup>2</sup>.

### Usage

```
data(pinusSpp)
```

### Format

Contains 8 variables, as follows:

**plot.id** Plot sample ID.

**plot.size** Plot size, en m<sup>2</sup>.

**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.

**spp** Specie.

**dbh** Diameter at breast-height, in cm.

**h** Height, in m.

**hcb** Height to crown base, in m.

**crown.lenght** Crown lenght, in m.

**obs** Extra information.

### Source

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

### References

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

**Examples**

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

---

pinusSpp2	<i>Variables a nivel de árbol en parcelas de muestreo de Pinus spp en Chile.</i>
-----------	--

---

**Description**

Mediciones a nivel de árbol para estudiar la invasión de *Pinus spp* en bosques de *Araucaria-Nothofagus* en la Reserva Nacional Malalcahuello en la región de la Araucanía en el sur de Chile. Hay 26 parcelas, y la superficie de cada una es de 100 m<sup>2</sup>.

**Usage**

```
data(pinusSpp2)
```

**Format**

Contains 8 variables, as follows:

**parcela** Numero de la parcela.

**sup.parcela** Superficie de la parcela, en m<sup>2</sup>.

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

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

**indv.id** Identificador del árbol en la parcela each plot. Same indv/id for multi-stem trees.

**fuste.id** Identificador del fuste.

**especie** Especie.

**dap** diámetro a la altura del pecho, en cm.

**h** Altura total, en m.

**hcc** Altura comienzo de copa, en m.

**largo.copa** Largo de copa, en m.

**obs** Observacion.

**Source**

Los datos fueron cedidos por los Drs. Anibal Pauchard y Rafael Garcia del Laboratorio de Invasiones Biológicas, Universidad de Concepción (Chile).

## References

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

## Examples

```
data(pinusSpp2)
head(pinusSpp2)
length(unique(pinusSpp2$parcela))
boxplot(dap~parcela, data=pinusSpp2)
```

---

plantsHawaii

*Maximum plant size in the Hawaiian archipelago.*

---

## Description

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

## Usage

```
data(plantsHawaii)
```

## Format

Contains six variables, as follows:

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

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

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

**n** Number of individuals used to estimate maximum plant size.

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

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

## Source

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

## References

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

**Examples**

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

---

populavolplots	<i>A population of forest sample plots.</i>
----------------	---

---

**Description**

Tree standing volume in 576 contiguous 10m\*10m square plots. Thus, the population covers 5.76 hectares. The data came from a 22 years-old radiata pine plantation near Valdivia, Chile.

**Usage**

```
data(populavolplots)
```

**Format**

Data has a single column:

y Stand volume of the sample plot, in m<sup>3</sup>. Therefore, the volume in m<sup>3</sup>/ha can be obtained by multiplying this value by the expansion factor (100).

**Source**

The data were typed by Natalia Pizarro, Javiera Zuñiga and Jose Osses, all of them students of Prof Christian Salas-Eljatib.

**References**

Wrann JH. 1970. Efectividad de los distintos sistemas de muestreo y metodos de calculo en el inventario de un rodal de pino insigne. Tesis Ingeniero Forestal, Universidad Austral de Chile, Valdivia, Chile. 51p.

**Examples**

```
data(populavolplots)
summary(populavolplots$volume)
hist(populavolplots$volume)
```



---

populavolplots2

*Una población de parcelas de muestreo con datos de volumen.*

---

### **Description**

Volumen agregado de árboles en 576 parcelas contiguas de 10m\*10m. Por lo tanto, la población cubre 5.76 ha. Los datos provienen de una plantación de *Pinus radiata* de 22 años ubicada a 15 Km al NorOeste de Valdivia, Chile.

### **Usage**

```
data(populavolplots2)
```

### **Format**

Los datos contienen una sola columna:

y Volumen agregado de la parcela, en m<sup>3</sup>. En este caso el volumen en m<sup>3</sup>/ha se obtendría al multiplicarlo por el factor de expansión (100).

### **Source**

Los datos fueron digitados por Natalia Pizarro, Javiera Zuñiga y Jose Osses, todos ellos estudiantes del Profesor Christian Salas-Eljatib.

### **References**

Wrann JH. 1970. Efectividad de los distintos sistemas de muestreo y métodos de cálculo en el inventario de un rodal de pino insigne. Tesis Ingeniero Forestal, Universidad Austral de Chile, Valdivia, Chile. 51p.

### **Examples**

```
data(populavolplots2)
summary(populavolplots2$volumen)
hist(populavolplots2$volumen)
```

---

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 the following columns:

**ship.id** The code number for ships.

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

**year** Year of registry.

**month** Month of registry.

**day** Day of registry.

**lat.dec** Decimal latitude.

**long.dec** Decimal longitude.

**e.w** East or west of the Prime Meridian.

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

**Source**

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

**References**

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

**Examples**

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

---

presidentChile	<i>2021 presidential election in Chile.</i>
----------------	---

---

### Description

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

### Usage

```
data(presidentChile)
```

### Format

The data frame contains the following columns:

**region.no** Administrative region number of Chile.

**region** Administrative region name.

**province** Province.

**circu.senate** Senatorial constituency.

**distrite** Distrit.

**county** County.

**elec.distri** Electoral constituency.

**local** Place.

**table.no** Voting table number.

**table.type** Voting table type: M (women), V (men).

**merged.tables** Merged voting tables.

**electors** Electors.

**number.in.voto** Numero del candidato en el voto.

**candidate** Candidate: Gabriel Boric, Jose A. Kast, Nule votes, Empty votes.

**total.votes** Total number of votes.

### Source

The data were obtained from the electoral service of the Chilean Government (SERVEL) at <https://www.servel.cl/centro-de-datos/procesos-electorales-detalle/?id=27>. The datafile name was "Resultados\_mesa\_presidencial\_TRICEL\_2v\_2021-1.xlsx", and was downloaded on October 24, 2022.

### Examples

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

---

presidentChile2      *2021 presidential election in Chile.*

---

### Description

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

### Usage

```
data(presidentChile)
```

### Format

The data frame contains the following columns:

**region.no** Administrative region number of Chile.

**region** Administrative region name.

**provincia** Province.

**circu.senatorial** Circunscripción senatorial.

**distrito** Distrito.

**comuna** Comuna.

**circu.elec** Circunscripción electoral.

**local** Lugar de votacion.

**no.mesa** Numero de mesa de votacion.

**tipo.mesa** Tipo de mesa: M (Mujeres), V (Varones).

**mesas.fusionadas** Mesas funcionadas.

**electores** Total de electores de la mesa.

**nro.en.voto** Numero del candidato en el voto.

**candidato** Candidato: Gabriel Boric, Jose A. Kast, Votos nulos, Votos en blanco.

**votos.tricel** Numero total de votos de la mesa

### Source

Los datos fueron obtenidos desde el servicio electoral del Gobierno de Chile (SERVEL) en <https://www.servel.cl/centro-de-datos/procesos-electorales-detalle/?id=27>. El archivo de datos tenia el nombre "Resultados\_mesa\_presidencial\_TRICEL\_2v\_2021-1.xlsx", y fue descargado el 24 de Octubre del 2022.

### Examples

```
data(presidentChile2)
head(presidentChile2)
```

---

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.

**spp.ori** Original species abbreviation.

### 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)
tapply(pspLlancahue$dbh,pspLlancahue$spp.name,length)
boxplot(dbh~spp.name, data=pspLlancahue)
```

---

 pspLlancahue2

*Ubicación espacial de árboles dentro de una parcela de muestreo en el bosque de Llancahue, Valdivia, Chile.*


---

### Description

Posición cartesiana, especie, y diámetro de árboles dentro de una parcela rectangular de 130 m por 70 m.

### Usage

```
data(ospLlancahue2)
```

### Format

Contiene las siguientes variables a nivel de árbol

**arbol** Código identificador del árbol.

**especie** Abreviación de la especie: AP= Aextocicon punctatum, EC=Eucryphia cordifolia, GA=Gevuina avellana, LP= Laureliopsis philippiana, LS= Laurelia sempervirens, ND=Nothofagus dombeyi, Ot=Other, PS=Podocarpus saligna

**dap** diámetro a la altura del pecho, en cm.

**coord.x** Posición cartesiana en el eje-X, en m.

**coord.y** Posición cartesiana en el eje-Y, en m.

**especie.ori** Abreviación original para las especies.

### Source

Los datos fueron cedidos por el Prof. Daniel Soto de la 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 después de un disturbio parcial. Revista Chilena de Historia Natural 83(3): 335-347.

### Examples

```
data(ospLlancahue2)
head(ospLlancahue2)
tapply(ospLlancahue2$dap, ospLlancahue2$especie, length)
boxplot(dap~especie, data=ospLlancahue2)
```

---

pspRuca	<i>Tree-level measurements and spatial coordinates in a sample plot in the Rucamanque experimental forest, Temuco, Chile.</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, "A. punctatum" is Aexitocicon 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 (Chile). Further details can be found at Salas et al (2006).

### 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. [doi:10.1016/j.foreco.2006.04.037](https://doi.org/10.1016/j.foreco.2006.04.037)

### Examples

```
data(pspRuca)
head(pspRuca)
tapply(pspRuca$dbh, pspRuca$spp, summary)
```

---

pspRuca2

*Coordenadas espaciales y variables a nivel de árbol en parcela de muestreo en predio Rucamanque, Temuco, Chile*

---

### Description

Medidas a nivel de árbol y coordenadas espaciales en un parcela de muestreo permanente de 1 ha (100 x 100m) en el bosque de Rucamanque, cerca de Temuco, Chile.

### Usage

```
data(pspRuca2)
```

### Format

Variables se describen a continuacion::

**arbol** Numero de árbol.

**especie** Nombre de la especie, "N. obliqua" es Nothofagus obliqua, "A. punctatum" es Aexitocicon punctatum, etc.

**estado** Estado del árbol: 1 vivo, 0 muerto en pie.

**dap** Diametro a la altura del pecho, en cm.

**coord.x** Posición cartesiana en el eje X, en m.

**coord.y** Posición cartesiana en el eje Y, en m.

**clase.copa** Clase de copa (1: superior, 2: intermedio, 3; inferior).

### Source

Los datos fueron cedidos por el Dr Christian Salas-Eljatib. Mayores detalles pueden encontrarse en Salas et al (2006).

### 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. [doi:10.1016/j.foreco.2006.04.037](https://doi.org/10.1016/j.foreco.2006.04.037)

### Examples

```
data(pspRuca2)
head(pspRuca2)
tapply(pspRuca2$dap, pspRuca2$especie, summary)
```



---

psptime	<i>Remeasurements of a permanent sample plot in a radiata pine plantation (Chile).</i>
---------	--

---

### Description

Annual remeasurements of trees within a 1600 m<sup>2</sup> permanent sample plot established in a radiata pine plantation in Chile. Besides, the trees location are available. The plot is square (40 m × 40 m), and if a tree is found dead, the column dead=1.

### Usage

```
data(psptime)
```

### Format

The data frame contains the following columns:

**plot.no** plot id

**tree.no** tree id

**dbh** Diameter at breast-height, in cm.

**year** Measurement year.

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

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

**dead** if the tree is dead, this column is equal to 1, and 0 otherwise.

### Source

Data were obtained from the files available at <https://zenodo.org/record/7341482>.

### References

Pommerening A, Trincado G, Salas-Eljatib C, Burkhardt H. 2023. Understanding and modelling the dynamics of data point clouds of relative growth rate and plant size. *Forest Ecology and management* Volume 529, 1206525 doi:10.1016/j.foreco.2022.120652

### Examples

```
data(psptime)
head(psptime)
tapply(psptime$dbh, psptime$year, mean)
library(lattice)
histogram(~dbh|as.factor(year), data=psptime)
```

---

psptime2

*Remediciones en una parcela permanente de muestreo en una plantación de pino radiata (Chile).*

---

### Description

Remediciones anuales de árboles en una parcela permanente de 1600 m<sup>2</sup> establecida en una plantación de pino insigne en Chile. Además, la ubicación espacial de cada árbol está disponible. La parcela es cuadrada (40 m × 40 m), y si un árbol se encuentra muerto en una medición, la columna muerto=1.

### Usage

```
data(psptime2)
```

### Format

Los datos tienen las siguientes columnas:

**plot.no** Identificador de la parcela

**arbol** Identificador del árbol.

**dap** Diámetro a la altura del pecho, en cm.

**anho** Año de medición.

**x** Posición Cartesiana en el eje X, en m.

**y** Posición Cartesiana en el eje Y, en m.

**muerto** si el árbol está muerto, esta columna es igual a 1, y 0 en cualquier otro caso.

### Source

Los datos fueron obtenidos de los archivos disponibles en <https://zenodo.org/record/7341482>.

### References

- Pommerening A, Trincado G, Salas-Eljatib C, Burkhardt H. 2023. Understanding and modelling the dynamics of data point clouds of relative growth rate and plant size. Forest Ecology and management Volume 529, 1206525 doi:10.1016/j.foreco.2022.120652

### Examples

```
data(psptime2)
head(psptime2)
tapply(psptime2$dap, psptime2$anho, mean)
library(lattice)
histogram(~dap | as.factor(anho), data=psptime2)
```

---

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

Data having the following columns:

**tree** 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 = tree == 329,
      xlab = "Tree age (yr)", las = 1,
      ylab = "Tree height (m)",
      main = "Loblolly data and fitted curve (tree 329 only)")
m1 <- nls(height ~ SSasymp(age, Asym, R0, lrc),
          data = ptaeda, subset = tree == 329)
age <- seq(0, 30, length.out = 101)
lines(age, predict(m1, list(age = age)))
```

---

ptaeda2

*Crecimiento en altura de árboles de Pinus taeda (Loblolly pine)*

---

### Description

Esta dataframe contiene 84 filas y tres columnas del crecimiento en altura de árboles de Pinus taeda. Estos datos son un pequeña modificación de la dataframe "Loblolly" del paquete datasets de R.

### Usage

```
data(ptaeda2)
```

### Format

Estos datos tienen las siguientes columnas:

**arbol** un factor que indica la fuente de semilla del árbol. Esta ordenado acuerdo al valor de la altura.

**edad** un vector numerico de las edades, en años.

**altura** la altura total del árbol en cada edad, en m.

### Source

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

### Examples

```
data(ptaeda2)
plot(altura ~ edad, data = ptaeda2, subset = arbol== 329,
     xlab = "Edad del arbol (anhos)", las = 1,
     ylab = "Altura (m)",
     main = "Datos de ptaeda2 y ajuste de curva (solo árbol 329)")
m1 <- nls(altura ~ SSasym(edad, Asym, R0, lrc),
         data = ptaeda2, subset = arbol == 329)
edad <- seq(0, 30, length.out = 101)
lines(edad, predict(m1, list(edad = edad)))
```

---

radiatapl	<i>Sampling plots 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.

**heighth** Total height, in m.

**Source**

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

**Examples**

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

---

rauliHg	<i>Height growth of Nothofagus alpina trees in Chile.</i>
---------	---

---

**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 cited article (reference section).

**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.

**References**

- Salas-Eljatib C. 2021. An approach to quantify climate-productivity relationships: an example from a widespread Nothofagus forest. *Ecological Applications* 31(4): e02285.

- Salas-Eljatib, C. 2021. Time series height-data for Nothofagus alpina trees. [doi:10.6084/m9.figshare.13521602.v5](https://doi.org/10.6084/m9.figshare.13521602.v5)

**Examples**

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

---

raulihg2

*Crecimiento en altura de árboles de Nothofagus alpina.*

---

**Description**

Datos de series de tiempo de altura para árboles muestreados de Nothofagus alpina (rauli) en el centro-sur de Chile. Estos árboles son parte de los usados en artículo de referencia.

**Usage**

```
data(raulihg2)
```

**Format**

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

**arbol** Código del árbol

**especie** Nombre común especie

**bha.t** Edad a la altura del pecho, en años.

**h.t** Altura total, en m.

**Source**

Datos cedidos por el Dr Christian Salas-Eljatib.

## References

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

## Examples

```
data(raulihg2)
head(raulihg2)
```

---

redoakvol	<i>Contains tree-level merchantable volume data for red oak (Quercus rubra).</i>
-----------	--

---

## Description

Merchantable volume of 236 sample trees of Red oak from Pennsylvania (USA).

## Usage

```
redoakvol
```

## Format

**tree** Tree number.

**dbh** Diameter at breast height, in cm.

**merc.h** Merchantable height to a 4.5 inch dob, in m.

**merc.vol** Merchantable peeled volume to a minimum 4.5-inch outside bark diameter, in m<sup>3</sup>.

## 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).

## References

- Beers TW, Gingrich SF. 1958. Construction of Cubic-foot Volume Tables for Red Oak in Pennsylvania. *Journal of Forestry* 56(3):210-214.
- Moser JW, Beers TW. 1969. Parameter Estimation in Nonlinear Volume Equations. *Journal of Forestry* 67(12):878-879.

## Examples

```
head(redoakvol)
```

---

redoakvol2

*Volumen comercial de árboles de red oak (Quercus rubra).*

---

### Description

Volumen comercial de 236 árboles muestra de *Quercus rubra* (red oak) en el estado de Pennsylvania (USA).

### Usage

redoakvol2

### Format

**arbol** Numero del árbol.

**dap** Diametro a la altura del pecho, en cm.

**hiu** Altura comercial donde el fuste tiene 4.5 pulgadas con corteza, en m.

**vol.iu** Volumen comercial a un indice de utilización de 4.5 pulgadas de diametro con corteza, in m<sup>3</sup> sin corteza.

### 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).

### References

- Beers TW, Gingrich SF. 1958. Construction of Cubic-foot Volume Tables for Red Oak in Pennsylvania. *Journal of Forestry* 56(3):210-214.

- Moser JW, Beers TW. 1969. Parameter Estimation in Nonlinear Volume Equations. *Journal of Forestry* 67(12):878-879.

### Examples

```
head(redoakvol2)
```



---

regNothofagus	<i>Contains information about regeneration of Nothofagus seedlings.</i>
---------------	---

---

**Description**

Dataset contains 442 observations.

**Usage**

```
data(regNothofagus)
```

**Format**

Contains 15 variables, as follows:

**site** Id site of study.

**plot** Number of plot.

**scar** Scarification in percentage of total area.

**x.trans.total** Transmitted radiation in percentage.

**kPa** Soil resistance to penetration.

**SWC** Soil water content.

**SM** Exposed mineral soil.

**litter** Litter cover in percentage.

**CWD** Ocular estimation in the regeneration plot in percentage.

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

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

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

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

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

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

**Source**

The data were obtained from the DRYAD repository at [doi:10.5061/dryad.3q977](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 utilización index of 10 cm, in m<sup>3</sup>/ha

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

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

**viu.25** stand volume below an utilización 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)
```

---

`slashpine`*Biomass dataset*

---

**Description**

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

**Usage**

```
data(slashpine)
```

**Format**

The data frame contains nine variables as follows:

**tree\_id** tree code

**dbh** diameter

**h** heighth

**lcl** live crown lenght

**age** age tree

**wood** wood biomass

**bark** bark biomass

**crown** crown biomass

**tree** tree biomass

**Source**

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

**References**

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

**Examples**

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

---

`slashpine2`*Biomasa*

---

**Description**

Dataset que contiene 9 pares de columnas con información sobre la biomasa de 40 árboles.

**Usage**

```
data(slashpine2)
```

**Format**

Variables se describen a continuacion::

**tree\_id** Identificador árbol

**dbh** diametro

**h** altura total

**lcl** largo de copa

**age** edad árbol

**wood** biomasa madera

**bark** biomasa corteza

**crown** biomasa copa

**tree** biomasa árbol

**Source**

Datos fueron contribuidos por el Dr Christian Salas-Eljatib (Universidad Mayor, Santiago, Chile).

**References**

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

**Examples**

```
data(slashpine2)
head(slashpine2)
```

---

sludge	<i>ludge data are at different cities, with a value of concentration zinc.</i>
--------	--

---

**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	<i>On the National System of State Protected Wild Areas (SNASPE) of Chile.</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 the following variables:

**unit.id** Number for the unit.

**unit** Name of the protected area.

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

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

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

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

**perim.km** Perimeter, in km.

**area.ha** Area, in hectares.

**area.m2** Area, in m<sup>2</sup>.

**Source**

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

**References**

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

**Examples**

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

---

snaspeChile2

*Sistema nacional de areas protegidas del estado (SNASPE) de Chile*

---

**Description**

Contiene variables general de las unidades del sistema de areas protegidas por el estado de Chile (SNASPE).

**Usage**

```
data(snaspeChile2)
```

**Format**

Contiene las siguientes variables para cada unidad del SNASPE:

**uni.id** numero indentificador de la unidad.

**unidad** Nombre de la unidad.

**categoria** Categoría de la unidad. It can be either a National Park, a National Reserve or a Natural Monument.

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

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

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

**perim.km** Perimeter, in km.

**area.ha** Area, in hectares.

**area.m2** Area, in m<sup>2</sup>.

**Source**

Estos datos fueron obtenidos desde <https://ide.minagri.gob.cl/geoweb/2019/11/21/medio-ambiente/>

**References**

EL SNASPE esta bajo la administración de la Corporación Nacional Forestal (CONAF) de Chile.

Mayor información y documentación se puede encontrar en <https://www.conaf.cl/parques-nacionales/parques-de-chile/>

**Examples**

```
data(snaspeChile2)
head(snaspeChile2)
```

---

soiltreat

*Soil treatments on the height growth of 2-year-old seedlings.*

---

**Description**

Treatments were assigned at random to the three plots within each of 11 blocks. Each plot was made up of 50 seedlings. Average 5-year height increment was the criterion for evaluating treatments. Initial heights and 5-year increments are part of the data.

**Usage**

```
data(soiltreat)
```

**Format**

Contains the following columns:

**block** Code for the corresponding block used in the experiment.

**treat** Treatment level.

**ini.h** Initial height of the plot, in m.

**inc.h** 5-yr increment in height of the plot, in m.

**Source**

The data come from page 71 of Freese (1967), and were typed by Nayeli Ramirez, a student of Prof Christian Salas-Eljatib.

**References**

Freese F. 1967. Elementary statistical methods for foresters. Agriculture Handbook 317, U.S. Department of Agriculture, Forest Service, Washington DC, USA. 87p.

**Examples**

```
data(soiltreat)
tapply(soiltreat$inc.h,soiltreat$treat,summary)
```

---

soiltreat2

*Tratamiento de suelo en el crecimiento de plantulas de 2-años de edad.*


---

**Description**

Los tratamientos fueron asignados aleatoriamente a tres parcelas dentro de cada uno de los 11 bloques. Cada parcela estaba constituida de 50 plantulas. El incremento promedio en altura de los ultimos 5 años fue el criterio para evaluar los tratamientos. La altura inicial y el incremento son las variables continuas de los datos.

**Usage**

```
data(soiltreat)
```

**Format**

Contiene las siguientes columnas:

**bloque** Codigo del bloque correspondiente del experimento.

**tmo** Tratamiento.

**alt.ini** Altura inicial de la parcela, en m.

**alt.inc** Incremento en altura de los ultimos 5-años de la parcela, en m.



**Source**

Los datos vienen de la pagina 71 de Freese (1967), y fueron digitados por Nayeli Ramirez, una estudiante del Prof Christian Salas-Eljatib.

**References**

Freese F. 1967. Elementary statistical methods for foresters. Agriculture Handbook 317, U.S. Department of Agriculture, Forest Service, Washington DC, USA. 87p.

**Examples**

```
data(soiltreat2)
tapply(soiltreat2$alt.inc,soiltreat2$tmo,summary)
```

---

 spatAustria

---

*Tree locations for several plots of Norway spruce*


---

**Description**

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

**Usage**

```
data(spatAustria)
```

**Format**

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

**plot.code** Plot identificator

**tree.code** Tree identificator

**spp.name** species 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](https://doi.org/10.1038/sdata.2018.77)

**Examples**

```

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

```

---

speciesList

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


---

**Description**

This data set provides names (taxonomy), of plant species. Includes codes and name abbreviations used by the Biometrics research group lead by Dr Christian Salas-Eljatib (Chile).

**Usage**

```
data(speciesList)
```

**Format**

A data frame with 63 observations on 31 variables

**nesp** Unique correlative specie number

**spp.ci.name** Species scientific name

**spp.ci.abb** Species scientific name abbreviation

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

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

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

**common.nameLatex** Species common name formatted for Latex

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

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

**division** Taxonomic rank division or phylum within the Kingdom

**class** Taxonomic rank Class within the Kingdom

**order** Taxonomic rank Order within the Class

**family** Taxonomic rank Family within the Order

**spp.ci.full** Full scientific name including author

**genus** Taxonomic rank Genus within the Family

**epithet** Specific epithet  
**sppAuthor** Species author  
**subSpp** 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 distribución geografica. VII Concurso del Fondo de Investigación 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 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 six 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.  
**pmass** Leaf P content per unit mass.  
**l.lifespan** Leaf life span.  
**l.length** Leaf length.  
**sem** Seed mass.  
**wd** Wood density.  
**max.h** Maximum height.

### Source

The data were provided from DRYAD repository

### References

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

### Examples

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

---

standLleuque

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

---

### Description

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

### Usage

```
data(standLleuque)
```

**Format**

The data frame contains seven variables as follows:

**rodal** number of stand

**plot.id** code of plot

**nha** Density of plot

**gha** Basal area of plot

**qmd** Quadratic mean diameter of plot

**toph** Dominant height of plot

**structure** Forest structure level: open, secondary adult, pure

**Source**

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

**References**

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

**Examples**

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

---

standLleuque2	<i>Datos con variables a nivel de parcela de bosques de Prumnopitys andina</i>
---------------	--

---

**Description**

Se proporciona información de densidad, área basal, diametro medio cuadratico y otras variables de 24 parcelas para Lleuque.

**Usage**

```
data(standLleuque2)
```

**Format**

Variables se describen a continuacion::

**rodal** Numero de rodal

**plot.id** Codigo de parcela

**nha** Densidad de parcela

**gha** Área basal de parcela

**qmd** Diametro medio cuadratico

**toph** Altura dominante

**estructura** Estructura del bosque. Abiero, secundario adulto o puro

**Source**

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

**References**

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

**Examples**

```
data(standLleuque2)
head(standLleuque2)
```

---

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 six variables, as follows:

- reference** Number of observation od datasets.
- placement** Type of "placement" placed in each station (random or trail).
- season** Season where were made the samplings.
- station** Station where were collected the data.
- specie** Name of specie medium to large terrestrial mammals.
- date.time** The date and time of each photographic event is also given.

**Source**

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

**References**

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

**Examples**

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

---

traits

*Functional traits of vegetative species in Chile.*

---

**Description**

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

**Usage**

```
data(traits)
```

**Format**

- esp** species codified name
- shadeTolerance** indicates the species tolerance to 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).

**References**

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

---

traits2

*Rasgos funcionales para algunas especies vegetales de Chile.*

---

**Description**

Rasgos funcionales para algunas especies vegetales de Chile.

**Usage**

data(traits2)

**Format**

**especie** Código alfanumérico para especie.

**tolerancia.sombra** Tolerancia a la sombra de la especie.

**nombre.cient** Nombre científico.

**nom.cient.abre** Nombre científico abreviado.

**den.madera** Densidad de la madera en kg/m<sup>3</sup>.

**Source**

Parte de la información sobre tolerancia a la sombra se encuentra en Soto et al 2010

**References**

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

---

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

---

**Description**

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

**Usage**

```
data(treegrowth)
```

**Format**

Contains seven column, as follows:

**tree.id** Tree number identifier. An unique number to each sample tree.

**forest** Forest type.

**habitat** Forest habitat type.

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

**age** Age, in yr

**dbh** Diameter at breast-height, in cm.

**htot** Total height, in m.

**Source**

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

**References**

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

**Examples**

```
head(treegrowth)
unique(treegrowth$tree.code)
```

---

`treegrowth2`*Crecimiento en diámetro y altura de árboles muestras de Grand-fir.*

---

### Description

Crecimiento en diámetro y altura de 66 árboles de Grand-fir. Los datos fueron derivados a partir de árboles muestras de analisis fustal colectados por el Dr Albert Stage (US Forest Service, Moscow, ID, USA.)

### Usage

```
data(treegrowth2)
```

### Format

Contiene las siguientes siete columnas:

**num.arb** Numero identificador del árbol. Unico para cada árbol muestra.

**bosque** Tipo forestal.

**habitat** Clasificación de tipo de habitat.

**cod.arb** Un codigo que combina a las siguientes columnas: num.arb-bosque-habitat

**edad** Edad, en años.

**dap** diámetro a la altura del pecho, en cm. Note que los decimales es debido a que esta variable originalmente fue medida en pulgadas.

**htot** Altura total, in m. Note que los decimales es debido a que esta variable fue originalmente medida en pies.

### Source

Originalmente los datos fueron cedidos por el Dr Albert Stage (Q.E.P.D) al Profesor Andrew Robinson (University of Idaho, USA), quien los usaba para explicar el ajuste de modelos estadísticos. El Dr Christian Salas-Eljatib fue un estudiante de postgrado en estadística del Prof. Robinson en la Univ. of Idaho.

### References

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

### Examples

```
head(treegrowth2)
unique(treegrowth2$cod.arb)
```

---

treelistinve

*Tree-list data from a forest inventory.*

---

### Description

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

### Usage

```
data(treelistinve)
```

### Format

Contains tree-level variables, as follows:

**plot** Plot number.

**plot.size** Plot size, in m2.

**tree** Tree identifier

**species** species common name as follows: Olivillo= *Aextocicon punctatum*, Tapa= *Laureliopsis philippiana*, Lingue= *Persea lingue*, Coigue= *Nothofagus dombeyi*, Roble= *Nothofagus obliqua*, Other= Other

**dbh** Diameter at breast-height, in cm

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

### Source

The data are provided courtesy of Prof. Christian Salas-Eljatib (Chile). Further details can be found in Salas (2001, 2002).

### References

- Salas C. 2001. Caracterización básica del relicto de Biodiversidad Rucamanque. Bosque Nativo, 29:3-9. [https://eljatib.com/publication/2001-06-01\\_caracterizacion\\_basi/](https://eljatib.com/publication/2001-06-01_caracterizacion_basi/)
- Salas C. 2002. Ajuste y validación de ecuaciones de volumen para un relicto del bosque de Roble-Laurel-Lingue. Bosque 23(2): 81-92. [doi:10.4067/S071792002002000200009](https://doi.org/10.4067/S071792002002000200009)

### Examples

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

---

`treelistinve2`*Lista de árboles provenientes de un inventario forestal.*

---

**Description**

Variables a nivel de árbol medidos en tres unidades de muestreo establecidas en un inventario forestal. Note que las parcelas no tienen la misma superficie. Las parcelas fueron establecidas en un bosque secundario de *Nothofagus obliqua* en las cercanías de Temuco.

**Usage**

```
data(treelistinve2)
```

**Format**

Contiene variables a nivel de árbol dentro de parcelas.

**parcela** Numero de la parcela de muestreo.

**sup.parce** Superficie de la parcela, en m<sup>2</sup>.

**arbol** Numero identificador del árbol.

**especie** Nombre comun de especies como sigue: Olivillo= *Aextocicon punctatum*, Tapa= *Laureliopsis philippiana*, Lingue= *Persea lingue*, Coigue= *Nothofagus dombeyi*, Roble= *Nothofagus obliqua*, Other= Otra

**dap** Diametro a la altura del pecho, en cm

**htot** Altura total, en m. Solo medida en algunas árboles muestra.

**Source**

Los datos son cortesía del Prof. Christian Salas-Eljatib (Chile). Mayores detalles pueden encontrarse en Salas (2001, 2002).

**References**

- Salas C. 2001. Caracterización básica del relicto de Biodiversidad Rucamanque. *Bosque Nativo*, 29:3-9. [https://eljatib.com/publication/2001-06-01\\_caracterizacion\\_basi/](https://eljatib.com/publication/2001-06-01_caracterizacion_basi/)

- Salas C. 2002. Ajuste y validación de ecuaciones de volumen para un relicto del bosque de Roble-Laurel-Lingue. *Bosque* 23(2): 81-92. doi:10.4067/S071792002002000200009.

**Examples**

```
data(treelistinve2)
unique(treelistinve2$parcela)
table(treelistinve2$parcela, treelistinve2$sup.parce)
```

---

 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. It is a slight modification of the dataframe 'trees' of 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 m<sup>3</sup>

**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 data frame")
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)
```

---

 treevol2

*Volumen, altura, y diámetro para árboles de Black Cherry*


---

**Description**

Estos datos provienen de mediciones de volumen, altura y diámetro en 31 árboles volteados de black cherry (*Prunus serotina*). Son una modificación de la data frame 'trees' del paquete 'datasets' de R.

**Usage**

```
data(treevol2)
```

**Format**

Datos con 31 observaciones y tres variables

**dap** Diametro a la altura del pecho, en cm

**atot** Altural total, en m

**vtot** Volumen total, en m<sup>3</sup>

**Source**

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

**Examples**

```
pairs(treevol2, panel = panel.smooth, main = "data frame treevol2")
plot(vtot ~ dap, data = treevol2, log = "xy")
coplot(log(vtot) ~ log(dap) | atot, data = treevol2,
       panel = panel.smooth)
summary(m1 <- lm(log(vtot) ~ log(dap), data = treevol2))
summary(m2 <- update(m1, ~ . + log(atot), data = treevol2))
anova(m1,m2)
```

---

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 data frame "treevolruca", but only having observations for the species roble (*Nothofagus obliqua*).

**Usage**

```
data(treevolroble)
```

**Format**

Contains tree-level variables, as follows:

**tree.no** Tree number.

**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-Eljatib (Chile).

## References

- Salas C. 2002. Ajuste y validación de ecuaciones de volumen para un relicto del bosque de Roble-Laurel-Lingue. *Bosque* 23(2): 81-92. doi:10.4067/S071792002002000200009

## Examples

```
data(treevolroble)
head(treevolroble)
plot(vtot~dbh, data=treevolroble)
```

---

treevolroble2	<i>Variables alométricas a nivel de árbol para roble (Nothofagus obliqua) en el bosque de Rucamanque, cerca de Temuco, Chile.</i>
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---

## 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 data frame "treevolruca", but only having observations for the species roble (*Nothofagus obliqua*).

## Usage

```
data(treevolroble2)
```

## Format

Las siguientes columnas son parte de la data frame:

**arbol** Numero del árbol.

**especie** Especie.

**dap** Diámetro a la altura del pecho, en cm.

**htot** Altura total, en m.

**d6** Diámetro fustal a los 6 m, en cm.

**vtot** Volumen bruto total, en m<sup>3</sup> with bark.

## Source

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

## References

- Salas C. 2002. Ajuste y validación de ecuaciones de volumen para un relicto del bosque de Roble-Laurel-Lingue. *Bosque* 23(2): 81-92. doi:10.4067/S071792002002000200009



### Examples

```
data(treevolroble2)
head(treevolroble2)
plot(vtot~dap, data=treevolroble2)
```

---

treevolruca	<i>Contains tree-level variables of several species from 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 were provided courtesy of Dr Christian Salas-Eljatib (Chile).

### References

- Salas C. 2002. Ajuste y validación de ecuaciones de volumen para un relicto del bosque de Roble-Laurel-Lingue. *Bosque* 23(2): 81-92. doi:[10.4067/S071792002002000200009](https://doi.org/10.4067/S071792002002000200009)

### Examples

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

---

`treevolruca2`*Variables alométricas a nivel de árbol para varias especies del bosque de Rucamanque, cerca de Temuco, Chile.*

---

### Description

Volumen, altura y diámetro, entre otras para árboles muestra en el bosque de Rucamanque, cerca de Temuco, en la región de la Araucanía, en el sur de Chile. Las siguientes especies son parte de los datos: laurel (*laurelia sempervirens*), lingue (*Persea lingue*), olivillo (*Aextocicon punctatum*), roble (*Nothofagus obliqua*), tepa (*Laurelissis philippiana*), y tinea (*Weinmannia trichosperma*).

### Usage

```
data(treevolruca2)
```

### Format

Las siguientes columnas son parte de la data frame:

**arbol** Numero del árbol.

**especie** Especie.

**dap** Diametro a la altura del pecho, en cm.

**htot** Altura total, en m.

**d6** Diametro fustal a los 6 m, en cm.

**vtot** Volumen bruto total, en m<sup>3</sup> with bark.

### Source

Los datos fueron cedidos por el Dr Christian Salas-Eljatib (Chile).

### References

- Salas C. 2002. Ajuste y validación de ecuaciones de volumen para un relicto del bosque de Roble-Laurel-Lingue. *Bosque* 23(2): 81-92. [doi:10.4067/S0717920020020000200009](https://doi.org/10.4067/S0717920020020000200009)

### Examples

```
data(treevolruca2)
head(treevolruca2)
```

---

valesta

*A function that computes validation statistics.*

---

### Description

This function computes validation statistics, as the RMSD, AD and AAD of any response vector 'y.pred' using as real values the vector 'y.obs'. The computed statistics are: root mean square differences (RMSD); aggregated difference (AD); and aggregated of the absolute value differences (AAD). Be sure that both predicted and observed values are expressed in the same measurement unit. Thus, be careful if the model uses a transformation of the response variable.

### Usage

```
valesta(y.obs = y.obs, y.pred = y.pred)
```

### Arguments

y.obs	Observed values of the variable of interest.
y.pred	Predicted values of the variable of interest.

### Value

This function returns the following statistics as a vector: (RMSD,RMSD.p,AD,AD.p,AAD,AAD.p); where RMSD.p stands for RMSD expressed as a percentage, and the same applied to AD.p and AAD.p.

### Note

Check the reference for further details.

### Author(s)

Christian Salas-Eljatib.

### References

Salas C, Ene L, Gregoire TG, Nasset E, Gobakken T. 2010. Modelling tree diameter from airborne laser scanning derived variables: a comparison of spatial statistical models. Remote Sensing of Environment 114(6):1277-1285. doi:10.1016/j.rse.2010.01.020

### Examples

```
#creating a fake dataframe
set.seed(1234)
df <- as.data.frame(cbind(Y=rnorm(30, 30,9), X=rnorm(30, 450,133)))
df
#fitting a candidate model
```

```
mod1 <- lm(Y~X, data=df)
#using the function
valesta(y.obs=df$Y,y.pred=fitted(mod1))
```

---

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

---

**Description**

This function creates a scatter-plot with boxplots for the Y-axis variable.

**Usage**

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

**Arguments**

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

**Value**

Result of calculation

**Examples**

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

---

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

---

**Description**

It creates a scatter-plot with histograms in both axes.

**Usage**

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

**Arguments**

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

**Value**

Result of calculation

**Examples**

```
library(datana)  
data(treevolroble)  
df <- treevolroble  
head(df)  
xyHist(x=df$dbh, y=df$hgtot)
```

```
xyHist(x=df$dbh,y=df$htot, xlab="Variable X", ylab="Variable Y")  
xyHist(x=df$dbh,y=df$htot, xlab="Variable X", ylab="Variable Y",  
       col.x = "gray",col.y="white")
```

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