

Package: folio (via r-universe)

October 31, 2024

Title Datasets for Teaching Archaeology and Paleontology

Version 1.5.0

Maintainer Nicolas Frerebeau

<nicolas.frerebeau@u-bordeaux-montaigne.fr>

Description Datasets for teaching quantitative approaches and modeling in archaeology and paleontology. This package provides several types of data related to broad topics (cultural evolution, radiocarbon dating, paleoenvironments, etc.), which can be used to illustrate statistical methods in the classroom (multivariate data analysis, compositional data analysis, diversity measurement, etc.).

License GPL (>= 3)

URL <https://packages.tesselle.org/folio/>,
<https://github.com/tesselle/folio>

BugReports <https://github.com/tesselle/folio/issues>

Depends R (>= 2.10)

Encoding UTF-8

LazyData true

Roxygen list(markdown = TRUE)

RoxygenNote 7.3.2

Repository <https://tesselle.r-universe.dev>

RemoteUrl <https://github.com/tesselle/folio>

RemoteRef v1.5.0

RemoteSha c2b163787dac31daeb2aa504c633155c58005246

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arnold1949

Arnold and Libby's Curve of Knowns

Description

"The agreement between prediction and observation is seen to be satisfactory."

Usage

arnold1949

Format

A data.frame with 6 observations and 8 variables:

sample **character**: sample name.

age_expected **integer**: Expected age (year BP).

age_expected_error **integer**: Error on age_expected (year BP).

- age_found** *integer*: Measured age (year BP).
- age_found_error** *integer*: Error on age_found (year BP).
- activity_expected** *numeric*: Expected specific activity (cpm/g of carbon).
- activity_found** *numeric*: Measured specific activity (cpm/g of carbon).
- activity_found_error** *numeric*: Error on activity_found (cpm/g of carbon).

Source

Arnold, J. R. and Libby, W. F. (1949). Age Determinations by Radiocarbon Content: Checks with Samples of Known Age. *Science*, 110(2869), 678-80. doi:[10.1126/science.110.2869.678](https://doi.org/10.1126/science.110.2869.678)

See Also

Other radiocarbon dating: [intcal09](#), [intcal13](#), [intcal20](#)

birds

European Birds

Description

A dataset of birds species abundance in remote European woodlands.

Usage

birds

Format

A data.frame with 35 observations (species) and 3 variables (woodlands).

Source

Magurran, A. E. (1988). *Ecological Diversity and its Measurement*. Princeton, NJ: Princeton University Press. doi:[10.1007/9789401573580](https://doi.org/10.1007/9789401573580).

See Also

Other count data: [boves](#), [chevelon](#), [compiegne](#), [loire](#), [merzbach](#), [mississippi](#), [zuni](#)

boves

Boves Ceramics

Description

A dataset containing the ceramic counts from the castle site of Boves (Somme, France). The data are grouped into eight periods ranging from the 10th to the 18th century and thirteen ceramic types.

Usage

boves

Format

A data.frame with 8 observations (periods) and 13 variables (ceramic types).

Source

Racinet P. (2002). Le site castral et prioral de Boves du Xe au XVIIe siècle. Bilan des recherches 1996-2000. *Revue archéologique de Picardie*. Numéro spécial 20, 123 p.

See Also

Other count data: [birds](#), [chevelon](#), [compiègne](#), [loire](#), [merzbach](#), [mississippi](#), [zuni](#)

bronze

Chinese Ritual Bronzes

Description

Chemical analysis of 369 Chinese ritual bronzes. The major elements (Cu, Sn and Pb) were measured using atomic absorption spectroscopy and the trace elements using neutron activation analysis.

Usage

bronze

Format

A data.frame with 88 observations and 22 variables (chemical elements):

reference [integer](#): catalog number.

chronology [integer](#): chronology (typology).

dynasty ordered [factor](#): dynasty name.

Cu [numeric](#): Cu content (ppm).

Sn numeric: Sn content (ppm).

Pb numeric: Pb content (ppm).

Zn numeric: Zn content (ppm).

Au numeric: Au content (ppm).

Ag numeric: Ag content (ppm).

As numeric: As content (ppm).

Sb numeric: Sb content (ppm).

Source

Wood, J. R. & Liu, Y. (2023). A Multivariate Approach to Investigate Metallurgical Technology: The Case of the Chinese Ritual Bronzes. *Journal of Archaeological Method and Theory*, 30: 707-756. doi:10.1007/s10816022095728.

References

Bagley, R. W. (1987). *Shang ritual bronzes in the Arthur M. Sackler collections*. New York: The Arthur M. Sackler Foundation.

Rawson, J. (1990). *Western Zhou ritual bronzes from the Arthur M. Sackler collections*. New York: The Arthur M. Sackler Foundation.

So, J. (1995). *Eastern Zhou ritual bronzes from the Arthur M. Sackler Collections*. New York: The Arthur M. Sackler Foundation.

See Also

Other chemical data: [kommos](#), [verre](#)

chevelon

Chevelon Ground Stone

Description

A dataset of ground stone artifact counts from the Cholla project (USA).

Usage

chevelon

Format

A data frame with 12 observations (sites) and 10 variables (ground stone types):

BMe *integer*: basin metate.

SMe *integer*: slab metate.

TMe *integer*: Trough metate.

IMe *integer*: indeterminate metate.

UMa *integer*: unifacial mano.

BMa *integer*: bifacial mano.

MUHa *integer*: modified unifacial handstone.

MBHa *integer*: modified bifacial handstone.

UUHa *integer*: unmodified unifacial handstone.

UBHa *integer*: unmodified bifacial handstone.

Source

Reid, J. J. (ed.) (1982). *Cholla Project Archaeology*. Vol. 2. Archaeological Series 161. Tucson: University of Arizona. doi:10.6067/XCV8435710

See Also

Other count data: [birds](#), [boves](#), [compiegne](#), [loire](#), [merzbach](#), [mississippi](#), [zuni](#)

cities

Roman cities

Description

A dataset of population, area, and infrastructural measures for Roman cities of the Imperial period.

Usage

cities

Format

A data frame with 125 observations (Roman cities) and 8 variables:

name *character*: site Name.

area *integer*: site area, in hectares.

population *integer*: population estimate, following the methodology in Hanson and Ortman (2017).

forum_area *integer*: total area of all fora/agorae in the site, in square meters.

street_area *integer*: total area of streets in the site, in square meters.

street_length *integer*: total length of streets in the site, in meters.

street_width *integer*: average width of streets, in square meters.

block_area *integer*: average area of a block, in square meters.

Source

Hanson, J. & Ortman, S. (2019). Population, area, and infrastructural measures for Roman cities of the Imperial period. *tDAR*. doi:10.6067/XCV8448563.

References

Hanson J. W. & Ortman S. G. (2017). A systematic method for estimating the populations of Greek and Roman settlements. *Journal of Roman Archaeology*, 30:301-324. doi:10.1017/S1047759400074134.

Hanson J. W., Ortman S. G., Bettencourt L. M. A. & Mazur L. C. (2019). Urban form, infrastructure and spatial organisation in the Roman Empire. *Antiquity*, 93(369):702-718. doi:10.15184/aqy.2018.192.

See Also

Other geographical data: [inrap](#)

compiègne

Compiègne Ceramics

Description

A dataset containing the ceramic counts from the Place des Hallettes in Compiègne (Oise, France). The data are grouped into five periods of about a century, ranging from the 9th to the 14th century, and sixteen ceramic types.

Usage

compiègne

Format

A data frame with 5 observations (periods) and 16 variables (ceramic types):

- A** *integer*: red to white ceramics with fine sized inclusions.
- B** *integer*: red to white ceramics with medium sized inclusions.
- C** *integer*: dark ceramics with fine sized inclusions.
- D** *integer*: dark ceramics with medium sized inclusions.
- E** *integer*: ceramics close to those of groups B or D, with similarities to group F.
- F** *integer*: black, red or beige ceramics with coarse inclusions.
- G** *integer*: red polished ceramics with fine to medium sized inclusions.
- H** *integer*: black polished ceramics with fine sized inclusions.
- I** *integer*: black polished ceramics with medium sized inclusions.
- J** *integer*: polished and painted ceramics with fine to medium sized inclusions.
- K** *integer*: painted ceramics, similar to those of group A.

L integer: painted ceramics, similar to those of group B.

M integer: painted ceramics with coarse inclusions.

N integer: glazed ceramics.

O integer: stamped ceramics.

P integer: coated ceramics.

Chronological periods are numbered from the oldest to the most recent (from 1 to 5).

Source

Lacroix, M. C. (1997). La céramique médiévale du site des Hallettes à Compiègne (Oise). *Revue archéologique de Picardie*. Numéro spécial, 13(1), 135-168. doi:10.3406/pica.1997.1945

See Also

Other count data: [birds](#), [boves](#), [chevelon](#), [loire](#), [merzbach](#), [mississippi](#), [zuni](#)

epica2008

EPICA Dome C

Description

EPICA Dome C 800-ka composite CO_2 data.

Usage

epica2008

Format

A data frame with 1096 observations and 2 variables:

age integer: year BP.

CO2 numeric: CO_2 (ppmv).

Source

<https://www.ncei.noaa.gov/access/paleo-search/study/6091>

References

Lüthi, D., Le Floch, M., Bereiter, B., Blunier, T., Barnola, J.-M., Siegenthaler, U., Raynaud, D., Jouzel, J., Fischer, H., Kawamura, K. and Stocker, T. F. (2008). High-resolution carbon dioxide concentration record 650,000-800,000 years before present. *Nature*, 453, 379-382. doi:10.1038/nature06949

Monnin, E., Indermuhle, A., Dallenbach, A., Fluckiger, J., Stauffer, B., Stocker, T. F., Raynaud, D. and Barnola, J.-M. (2001). Atmospheric CO₂ concentrations over the last glacial termination. *Science*, 291, 112-114. doi:10.1126/science.291.5501.112

Petit, J. R., Jouzel, J., Raynaud, D., Barkov, N. I., Barnola, J.-M., Basile, I., Benders, M., Chappellaz, J., Davis, M., Delayque, G., Delmotte, M., Kotlyakov, V. M., Legrand, M., Lipenkov, V. Y., Lorius, C., Pepin, L., Ritz, C., Saltzman, E. and Stievenard, M. (1999). Climate and atmospheric history of the past 420,000 years from the Vostok ice core, Antarctica. *Nature*, 399, 429-436. doi:10.1038/20859

Siegenthaler, U., Stocker, T. F., Monnin, E., Lüthi, D., Schwander, J., Stauffer, B., Raynaud, D., Barnola, J.-M., Fischer, H., Masson-Delmotte, V., Jouzel, J. (2005). Stable Carbon Cycle-Climate Relationship During the Late Pleistocene. *Science*, 310, 1313-1317. doi:10.1126/science.1120130

See Also

Other palaeoenvironment data: [law2006](#), [lisiecki2005](#), [ngrip2004](#), [ngrip2010](#), [spratt2016](#)

Examples

```
plot(
  x = epica2008$age / 1000,
  y = epica2008$CO2,
  type = "l",
  xlim = c(800, 0),
  xlab = "kilo year BP",
  ylab = expression("CO"[2]~"(ppmv)"))
)
```

inrap

Location of Inrap Archaeological Sites

Description

A dataset of geographical locations of archaeological sites in France.

Usage

inrap

Format

A data frame with 625 observations (archaeological sites) and 11 variables:

X numeric: longitude (RGF93 v1 / Lambert-93).

Y numeric: latitude (RGF93 v1 / Lambert-93).

region character: French region.

departement character: French departement.

commune character: French city.

site character: name of the site.

start Date: excavation start date.

end Date: excavation end date.

period list: chronology periods.

theme list: themes.

type character.

Details

This dataset presents the geographical locations of a selection of preventive archaeological excavations carried out in France by the Institut national de recherches archéologiques préventives (Inrap).

Source

<https://www.data.gouv.fr/fr/datasets/r/b098d16a-ae19-48e4-8c58-e659e0603acd> (last update: 2024-06-03)

See Also

Other geographical data: [cities](#)

Examples

```
# library(sf)
# coord <- st_as_sf(inrap, coords = c("X", "Y"), crs = st_crs(2154))
# plot(coord["region"])
```

intcal09

IntCal09

Description

The IntCal series of radiocarbon calibration curves.

Usage

```
intcal09
```

Format

A data.frame with 3522 observations and 5 variables:

calBP *integer*: calendar (calibrated) age (year BP).

age *integer*: radiocarbon age (year BP).

error *integer*: radiocarbon error (year BP).

delta *numeric*: isotopic ratio $\Delta^{14}C$ (per mil).

sigma *numeric*: error on delta (per mil).

Source

Reimer, P. J., Baillie, M. G. L., Bard, E., Bayliss, A., Beck, J. W., Blackwell, P. G., Bronk Ramsey, C. *et al.* (2009). IntCal09 and Marine09 Radiocarbon age Calibration Curves, 0-50,000 Years Cal BP. *Radiocarbon*, 51(4): 1111-50. doi:10.1017/S0033822200034202.

See Also

Other radiocarbon dating: [arnold1949](#), [intcal13](#), [intcal20](#)

intcal13

IntCal13

Description

The IntCal series of radiocarbon calibration curves.

Usage

intcal13

Format

A data.frame with 5141 observations and 5 variables:

calBP *integer*: calendar (calibrated) age (year BP).

age *integer*: radiocarbon age (year BP).

error *integer*: radiocarbon error (year BP).

delta *numeric*: isotopic ratio $\Delta^{14}C$ (per mil).

sigma *numeric*: error on delta (per mil).

Source

Reimer, P. J., Bard, E., Bayliss, A., Beck, J. W., Blackwell, P. G., Bronk Ramsey, C., Buck, C. E. *et al.* (2013). IntCal13 and Marine13 Radiocarbon age Calibration Curves 0-50,000 Years cal BP. *Radiocarbon*, 55(4): 1869-87. doi:10.2458/azu_js_rc.55.16947.

See Also

Other radiocarbon dating: [arnold1949](#), [intcal09](#), [intcal20](#)

intcal20

IntCal20

Description

The IntCal series of radiocarbon calibration curves.

Usage

intcal20

Format

A data frame with 9501 observations and 5 variables:

calBP *integer*: calendar (calibrated) age (year BP).

age *integer*: radiocarbon age (year BP).

error *integer*: radiocarbon error (year BP).

delta *numeric*: isotopic ratio $\Delta^{14}C$ (per mil).

sigma *numeric*: error on delta (per mil).

Source

Reimer, P. J., Austin, W. E. N., Bard, E., Bayliss, A., Blackwell, P. G., Bronk Ramsey, C., Butzin, M. *et al.* (2020). The IntCal20 Northern Hemisphere Radiocarbon Age Calibration Curve (0-55 Cal KBP). *Radiocarbon*, 62(4), 725-757. doi:10.1017/RDC.2020.41.

See Also

Other radiocarbon dating: [arnold1949](#), [intcal09](#), [intcal13](#)

kommos

Transport Jars from Kommos (Crete)

Description

Chemical analysis (neutron activation analysis) of 88 Late Bronze Age transport jars found in excavations at Kommos, Crete.

Usage

kommos

Format

A data.frame with 88 observations and 22 variables (chemical elements):

type *factor*: CJ (Canaanite jar), EJ (Egyptian jar); TSJ (transport stirrup jar), SNA (short-necked amphora).

date *character*: chronology (period).

Sm *numeric*: Sm content (ppm).

Lu *numeric*: Lu content (ppm).

U *numeric*: U content (ppm).

Yb *numeric*: Yb content (ppm).

As *numeric*: As content (ppm).

Sb *numeric*: Sb content (ppm).

Ca *numeric*: Ca content (ppm).

Na *numeric*: Na content (ppm).

La *numeric*: La content (ppm).

Ce *numeric*: Ce content (ppm).

Th *numeric*: Th content (ppm).

Cr *numeric*: Cr content (ppm).

Hf *numeric*: Hf content (ppm).

Cs *numeric*: Cs content (ppm).

Sc *numeric*: Sc content (ppm).

Rb *numeric*: Rb content (ppm).

Fe *numeric*: Fe content (ppm).

Ta *numeric*: Ta content (ppm).

Co *numeric*: Co content (ppm).

Eu *numeric*: Eu content (ppm).

References

Day, P. M., Quinn, P. S., Rutter, J. B. & Kilikoglou, V. (2011). A World of Goods: Transport Jars and Commodity Exchange at the Late Bronze Age Harbor of Kommos, Crete. *Hesperia*, 80, 511-558. doi:10.2972/hesperia.80.4.0511

See Also

Other chemical data: [bronze](#), [verre](#)

law2006

Law Dome Ice Core

Description

Law Dome Ice Core 2000-year CH_4 , CO_2 and N_2O data.

Usage

law2006

Format

A data.frame with 2004 observations and 8 variables:

year *integer*: year AD.

NOAA04 *numeric*: NOAA04 CH_4 scale.

CH4_spl *numeric*: CH_4 spline (ppb).

CH4_grw *numeric*: CH_4 growth Rate (ppb/yr).

CO2_spl *numeric*: CO_2 spline (ppb).

CO2_grw *numeric*: CO_2 growth Rate (ppb/yr).

N2O_spl *numeric*: N_2O spline (ppb).

N2O_grw *numeric*: N_2O growth Rate (ppb/yr).

Source

<https://www.ncei.noaa.gov/access/paleo-search/study/9959>

References

MacFarling Meure, C., Etheridge, D., Trudinger, C., Steele, P., Langenfelds, R., van Ommen, T., Smith, A. and Elkins, J. (2006). The Law Dome CO_2 , CH_4 and N_2O Ice Core Records Extended to 2000 years BP. *Geophysical Research Letters*, 33(14), L14810. doi:10.1029/2006GL026152.

See Also

Other palaeoenvironment data: [epica2008](#), [lisiECKi2005](#), [ngrip2004](#), [ngrip2010](#), [spratt2016](#)

Examples

```
plot(  
  x = law2006$year,  
  y = law2006$CO2_spl,  
  type = "l",  
  xlab = "Year AD",  
  ylab = expression("CO"[2]~"(ppm)")  
)
```

lisiecki2005

Global Benthic $\delta^{18}O$ Stack

Description

A global Pliocene-Pleistocene benthic $\delta^{18}O$ stack.

Usage

```
lisiecki2005
```

Format

A data.frame with 2115 observations and 3 variables:

age *numeric*: calendar age (kilo year cal BP).

delta *numeric*: benthic $\delta^{18}O$ (per mil).

error *numeric*: standard error (per mil).

Details

The LR04 stack spans 5.3 Myr and is an average of 57 globally distributed benthic $\delta^{18}O$ records (which measure global ice volume and deep ocean temperature) collected from the scientific literature.

Source

<https://www.ncei.noaa.gov/access/paleo-search/study/5847>

References

Lisiecki, L. E. and Raymo, M. E. (2005). A Pliocene-Pleistocene stack of 57 globally distributed benthic $\delta^{18}O$ records. *Paleoceanography*, 20, PA1003. doi:10.1029/2004PA001071

See Also

Other palaeoenvironment data: [epica2008](#), [law2006](#), [ngrip2004](#), [ngrip2010](#), [spratt2016](#)

Other isotopic data: [ngrip2004](#), [ngrip2010](#), [nydal1996](#), [spratt2016](#), [vegetation](#)

Examples

```
plot(  
  x = lisiiecki2005$age,  
  y = lisiiecki2005$delta,  
  type = "l",  
  xlim = c(500, 0),  
  xlab = "kilo year BP",  
  ylab = expression(delta^{18}*"0")  
)
```

loire

Medieval Ceramics from the Loire Basin

Description

A dataset containing the ceramic counts from the Loire Basin (France).

Usage

loire

Format

A data.frame with 332 observations (assemblages) and 331 variables (ceramic types). The first five columns provide background information, the next columns give the MNI of each ceramic types:

site *character*: name of the archaeological site.

city *character*: city.

area *character*: geographical area.

lower *integer*: lower bound of the temporal range (year AD).

upper *integer*: upper bound of the temporal range (year AD).

Source

<https://ceramedvaldeloire.huma-num.fr/editions/suppl79racf2022/accueil>

References

Husi, P. (dir.). (2022). *La céramique médiévale et moderne du bassin de la Loire moyenne, chronotypologie et transformation des aires culturelles dans la longue durée (6e-19e s.)*. Suppléments à la revue Archéologique du Centre de la France, 79.

See Also

Other count data: [birds](#), [boves](#), [chevelon](#), [compiegne](#), [merzbach](#), [mississippi](#), [zuni](#)

merzbach

Merzbach Ceramics

Description

A dataset containing the ceramic counts from the Merzbach assemblage (Germany). The data are grouped into eight phases.

Usage

merzbach

Format

A data.frame with 8 observations (chronological phases) and 36 variables (pottery motifs).

Source

Crema, E. R. (2016). Sample codes and data for "Revealing patterns of cultural transmission from frequency data: equilibrium and non-equilibrium assumptions". *Zenodo*, v1.0. [doi:10.5281/zenodo.187558](https://doi.org/10.5281/zenodo.187558).

References

Crema, E. R., Kandler, A. & Shennan, S. (2016). Revealing Patterns of Cultural Transmission from Frequency Data: Equilibrium and Non-Equilibrium Assumptions. *Scientific Reports*, 6(1). [doi:10.1038/srep39122](https://doi.org/10.1038/srep39122).

See Also

Other count data: [birds](#), [boves](#), [chevelon](#), [compiegne](#), [loire](#), [mississippi](#), [zuni](#)

mississippi

Mississippi Ceramics

Description

A dataset containing ceramic counts from the Mississippi region.

Usage

mississippi

Format

A data frame with 20 observations and 10 variables (ceramic types):

ParkinPunctate *integer*.

BartonKentMPI *integer*.

Painted *integer*.

FortuneNoded *integer*.

RanchIncised *integer*.

WallsEngraved *integer*.

WallaceIncised *integer*.

RhodesIncised *integer*.

VernonPaulApplique *integer*.

HullEngraved *integer*.

Source

Lipo, C. P., Madsen, M. E. & Dunnell, R. C. (2015). A Theoretically-Sufficient and Computationally-Practical Technique for Deterministic Frequency Seriation. *PLOS ONE*, 10(4), e0124942. doi:10.1371/journal.pone.0124942.

See Also

Other count data: [birds](#), [boves](#), [chevelon](#), [compiegne](#), [loire](#), [merzbach](#), [zuni](#)

munsingen

Münsingen Cemetery

Description

A dataset of data set of artifact presence/absence for the Celtic Münsingen-Rain cemetery (Switzerland).

Usage

munsingen

Format

A data frame with 59 observations (graves) and 70 variables (artefact types).

References

Hodson, F. R. (1968). *The La Tene Cemetery at Münsingen-Rain*. Stämpfli, Bern.

Kendall, D. G. (1971). Seriation from abundance matrices. In Hodson, F. R., Kendall, D. G. and Tautu, P. (eds), *Mathematics in the Archaeological and Historical Sciences*. Edinburgh University Press, Edinburgh, 215-232.

See Also

Other artefact data: [shipwrecks](#)

Examples

```
heatmap(  
  x = as.matrix(munsingen),  
  Rowv = NA,  
  Colv = NA,  
  scale = "none",  
  col = c("white", "black")  
)
```

ngrip2004

NGRIP 50-year Average

Description

50-year averaged oxygen isotope data from the North Greenland Ice Core Project (ss09sea time scale).

Usage

```
ngrip2004
```

Format

A data.frame with 4918 observations and 2 variables:

age *integer*: calendar age (years before 2000 AD), ss09sea time scale.

delta *numeric*: $\delta^{18}O$ (per mil).

Source

<https://www.ncei.noaa.gov/access/paleo-search/study/2481>

References

North Greenland Ice Core Project members (2004). High-resolution record of Northern Hemisphere climate extending into the last interglacial period. *Nature*, 431(7005), 147-151. doi:10.1038/nature02805

See Also

Other palaeoenvironment data: [epica2008](#), [law2006](#), [lisiecki2005](#), [ngrip2010](#), [spratt2016](#)

Other isotopic data: [lisiecki2005](#), [ngrip2010](#), [nydal1996](#), [spratt2016](#), [vegetation](#)

Examples

```
plot(
  x = ngrip2004$age / 1000,
  y = ngrip2004$delta,
  type = "l",
  xlim = c(120, 0),
  xlab = "ss09sea (ka b2k)",
  ylab = expression(delta^{18}*O)
)
```

ngrip2010

NGRIP 20-year Average

Description

20-year averaged oxygen isotope data from the North Greenland Ice Core Project (GICC05 time scale).

Usage

```
ngrip2010
```

Format

A data.frame with 6114 observations and 4 variables:

age *integer*: calendar age (years before 2000 AD), GICC05 time scale (or GICC05modelext when going beyond 60 ka b2k).

depth *numeric*: depth (meters).

delta *numeric*: $\delta^{18}O$ (per mil).

MCE *numeric*: maximum counting error (years).

Note

Use the labels GICC05 (or GICC05modelext when going beyond 60 ka b2k) on graphs.

Source

<https://www.iceandclimate.nbi.ku.dk/data/>

References

- Vinther, B. M., Clausen, H. B., Johnsen, S. J., Rasmussen, S. O., Andersen, K. K., Buchardt, S. L., Dahl-Jensen, D., Seierstad, I. K., Siggaard-Andersen, M.-L., Steffensen, J. P., Svensson, A. M., Olsen, J. & Heinemeier, J. (2006). A synchronized dating of three Greenland ice cores throughout the Holocene. *Journal of Geophysical Research*, 111, D13102. doi:10.1029/2005JD006921.
- Rasmussen, S. O., Andersen, K. K., Svensson, A. M., Steffensen, J. P., Vinther, B. M., Clausen, H. B., Siggaard-Andersen, M.-L., Johnsen, S. J., Larsen, L. B., Dahl-Jensen, D., Bigler, M., Röthlisberger, R., Fischer, H., Goto-Azuma, K., Hansson, M. E. & Ruth, U. (2006). A new Greenland ice core chronology for the last glacial termination. *Journal of Geophysical Research*, 111, D06102. doi:10.1029/2005JD006079.
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See Also

Other palaeoenvironment data: [epica2008](#), [law2006](#), [lisiecki2005](#), [ngrip2004](#), [spratt2016](#)
 Other isotopic data: [lisiecki2005](#), [ngrip2004](#), [nydal1996](#), [spratt2016](#), [vegetation](#)

Examples

```
plot(
  x = ngrip2010$age / 1000,
  y = ngrip2010$delta,
  type = "l",
  xlim = c(120, 0),
  xlab = "GICC05",
  ylab = expression(delta^{18}*10^0)
)
```

 nydal1996

 $\delta^{14}\text{C}$ Measurements in Atmospheric CO₂

Description

Corrected ^{14}C measurements from air samples collected at five Norwegian sites from 1962-1993.

Usage

nydal1996

Format

A data.frame with 620 observations and 5 variables:

site *character*: sampling station.

start *Date*: beginning date of the sampling period.

end *Date*: ending date of the sampling period.

delta *numeric*: isotopic ratio $\Delta^{14}C$ (per mil).

sigma *numeric*: error on delta (per mil).

Source

Nydal, R. and Lövseth, K. (1996). *Carbon-14 Measurements in Atmospheric CO₂ from Northern and Southern Hemisphere Sites, 1962-1993*. ORNL/CDIAC-93; NDP-057. Washington, DC: USDOE Office of Energy Research. [doi:10.2172/461185](https://doi.org/10.2172/461185)

See Also

Other isotopic data: [lisiiecki2005](#), [ngrip2004](#), [ngrip2010](#), [spratt2016](#), [vegetation](#)

Examples

```
plot(  
  x = nydal1996$start,  
  y = nydal1996$delta,  
  type = "p",  
  xlab = "Date",  
  ylab = expression(Delta^{14}*"C")  
)
```

shipwrecks

Mediterranean Shipwrecks

Description

A dataset of Mediterranean shipwrecks.

Usage

shipwrecks

Format

A data frame with 1784 observations (wrecks) and 13 variables:

- name** *character*: wreck name.
- sea** *character*: region of the sea where the wreck was discovered.
- country** *character*: country where the wreck was discovered.
- region** *character*: region where the wreck was discovered.
- depth_min** *integer*: minimum depth of the wreck (m).
- depth_max** *integer*: maximum depth of the wreck (m).
- depth** *character*: depth of the wreck (m).
- period** *character*: chronology (period).
- dating** *character*: chronology (dating).
- date_early** *integer*: earliest date.
- date_late** *integer*: latest date.
- origin** *character*: place of origin.
- destination** *character*: place of destination.

Note

This dataset contains typos and needs to be normalized.

Source

Strauss, J. (2013). *Shipwrecks Database*. Version 1.0. Accessed 2022-08-13. URL: http://oxrep.classics.ox.ac.uk/databases/shipwrecks_database/

References

- Parker, A. J. (1992). *Ancient Shipwrecks of the Mediterranean and the Roman Provinces*. British Archaeological Reports International Series 580. Oxford.
- Strauss, E. J. (2007). *Roman Cargoes: Underwater Evidence from the Eastern Mediterranean*. Doctoral thesis, University College London. URL: <https://discovery.ucl.ac.uk/id/eprint/1349806>.

See Also

Other artefact data: [munsingen](#)

spratt2016

Late Pleistocene Sea Level Stack

Description

A Late Pleistocene sea level stack based on marine sediment core data (foraminiferal carbonate $\delta^{18}O$).

Usage

spratt2016

Format

A data.frame with 799 observations and 9 variables:

age_calkaBP *integer*: age (calendar kilo year BP).

SeaLev_shortPC1 *numeric*: sea Level (meters above present day), climate reconstructions (scaled first principal component of seven sea level reconstructions (0-430 ka)).

SeaLev_shortPC1_err_sig *numeric*: sea Level standard deviation from bootstrap (meters), climate reconstructions (scaled first principal component of seven sea level reconstructions (0-430 ka)).

SeaLev_shortPC1_err_lo *numeric*: sea Level 95% confidence interval lower bound (meters), climate reconstructions (scaled first principal component of seven sea level reconstructions (0-430 ka)).

SeaLev_shortPC1_err_up *numeric*: sea Level 95% confidence interval upper bound (meters), climate reconstructions (scaled first principal component of seven sea level reconstructions (0-430 ka)).

SeaLev_longPC1 *numeric*: sea Level (meters above present day), climate reconstructions (scaled first principal component of five sea level reconstructions (0-798 ka)).

SeaLev_longPC1_err_sig *numeric*: sea Level standard deviation from bootstrap (meters), climate reconstructions (scaled first principal component of five sea level reconstructions (0-798 ka)).

SeaLev_longPC1_err_lo *numeric*: sea Level 95% confidence interval lower bound (meters), climate reconstructions (scaled first principal component of five sea level reconstructions (0-798 ka)).

SeaLev_longPC1_err_up *numeric*: sea Level 95% confidence interval upper bound (meters), climate reconstructions (scaled first principal component of five sea level reconstructions (0-798 ka)).

Source

<https://www.ncei.noaa.gov/access/paleo-search/study/19982>

References

Spratt, R. M. and Lisiecki, L. E. (2016). A Late Pleistocene sea level stack. *Climate of the Past*, 12, 1079-1092. doi:10.5194/cp1210792016

See Also

Other palaeoenvironment data: [epica2008](#), [law2006](#), [lisiecki2005](#), [ngrip2004](#), [ngrip2010](#)

Other isotopic data: [lisiecki2005](#), [ngrip2004](#), [ngrip2010](#), [nydal1996](#), [vegetation](#)

Examples

```
plot(
  x = spratt2016$age_calkaBP,
  y = spratt2016$SeaLev_longPC1,
  type = "l",
  xlim = c(500, 0),
  xlab = "kilo year BP",
  ylab = "Sea level (meters above present)"
)
```

 stratigraphy

Chronostratigraphic Chart

Description

The ICS international chronostratigraphic chart (v2022/2).

Usage

```
stratigraphy
```

Format

A data.frame with 176 observations and 5 variables:

type **character**: unit type ("eon", "era", "period", "series" or "stage"). Precambrian and Hadean are informal units.

name **character**: unit name.

age **numeric**: numerical age (Ma).

error **numeric**: error on numerical age (Ma).

parent **character**: parent unit.

Source

<https://stratigraphy.org/ICSchart/ChronostratChart2022-02.pdf>

References

Cohen, K. M., Finney, S. C., Gibbard, P. L. and Fan, J.-X. (2013). The ICS International Chronostratigraphic Chart. *Episodes*, 36(3): 199-204. doi:[10.18814/epiiugs/2013/v36i3/002](https://doi.org/10.18814/epiiugs/2013/v36i3/002)

vegetation	$\delta^{13}C$ Values for Vegetation
------------	--------------------------------------

Description

$\delta^{13}C$ Values for Vegetation

Usage

vegetation

Format

A data frame with 155 observations and 5 variables:

family character: plant family.

species character: plant species.

type character: C3 or C4 plant.

delta numeric: isotopic ratio $\delta^{13}C$ (per mil).

country character: country.

Source

Cerling, T. E. and Harris, J. M. (1999). Carbon isotope fractionation between diet and bioapatite in ungulate mammals and implications for ecological and paleoecological studies. *Oecologia*, 120, 347-363. doi:[10.1007/s004420050868](https://doi.org/10.1007/s004420050868)

See Also

Other isotopic data: [lisiiecki2005](#), [ngrip2004](#), [ngrip2010](#), [nydal1996](#), [spratt2016](#)

Examples

```
hist(
  x = vegetation$delta,
  breaks = 20,
  main = "C3 and C4 plants",
  xlab = expression(delta^{13}*C"),
  xlim = c(-40, 0)
)

boxplot(
  delta ~ type,
```

```

data = vegetation,
horizontal = TRUE,
xlab = expression(delta^{13}*"C"),
ylab = "Plant",
ylim = c(-40, 0)
)

```

verre

*French Medieval Glass Composition***Description**

Chemical analysis (electron probe X-ray micro analysis) of 398 medieval glass vessels found in France.

Usage

verre

Format

A data.frame with 398 observations and 17 variables:

Site factor: CNL (Cour Napoléon, Louvre), ORL (Orléans), POI (Poitiers), ANG (Angers), OMO (Omonville, Seine Maritime), ROU (Rouen), MEA (Meaux), CHL (Châlons-sur-Marne), PAI (Pairu, Argonne, Ardennes), BER (Bercettes, Argonne, Ardennes), BIN (Binois, Argonne, Ardennes), CHE (Chevrie, Argonne, Ardennes), MIT (Mitte, Argonne, Ardennes), MET (Metz), CHM (Chambaran).

Sample character: sample code.

Type character: typology.

Age character: century.

Periode factor: I (9th-12th century), II (13th-first half of the 15th century), III (end of the 15th to end of the 16th century), IV (end of 16th to end of the 17th century).

Tint factor: ? (unknown), B (blue), CL (colourless), CLg (colourless – greyish tint), PB (pale blue; PGE: pale greenish), PGE-B (pale green-blue or blue-green), PGY-B (pale grey-blue), R (opaque red), W (opaque white), *av (added aventurine spots), *bl (added thread blue or blue spots), *r (added thread opaque red or opaque red spots), *w (added thread opaque white).

Na2O numeric: Na2O content (percent).

CaO numeric: CaO content (percent).

K2O numeric: K2O content (percent).

MgO numeric: MgO content (percent).

P2O5 numeric: P2O5 content (percent).

SiO2 numeric: SiO2 content (percent).

Al2O3 numeric: Al2O3 content (percent).

FeO *numeric*: FeO content (percent).

MnO *numeric*: MnO content (percent).

Cl *numeric*: Cl content (percent).

Reference *character*: site reference.

References

Barrera J., Velde B. (1989). A study of french medieval glass composition. *Archéologie médiévale*, 19, 81-130. doi:[10.3406/arcme.1989.953](https://doi.org/10.3406/arcme.1989.953).

See Also

Other chemical data: [bronze](#), [kommos](#)

Examples

```
plot(
  x = verre$Na20,
  y = verre$Ca0 / (verre$Ca0 + verre$K20),
  type = "p",
  xlab = expression("Na"[2]*"0 (%)"),
  ylab = expression("Ca0"/"(Ca0"+"K"[2]*"0)"),
)
```

zuni

Zuni Ceramics

Description

A dataset containing ceramic counts from the Zuni region of the American Southwest.

Usage

```
zuni
```

Format

A data.frame with 420 observations (assemblages) and 18 variables (ceramic types):

LINO *integer*: Lino Gray (575-875).

KIAT *integer*: Kiatuthlanna Black-on-white (850-910).

RED *integer*: Red Mesa Black-on-white (900-1030).

GALL *integer*: Gallup Black-on-white (1025-1150).

ESC *integer*: Escavada Black-on-white (1050-1150).

PUBW *integer*: Puerco Black-on-white (1050-1200).

RES *integer*: Reserve Black-on-white (1071-1115).

TULA *integer*: Tularosa Black-on-white (1175-1300).
PINE *integer*: Pinedale Black-on-white (1275-1325).
PUBR *integer*: Puerco Black-on-red (1050-1200).
WING *integer*: Wingate Black-on-red (1070-1200).
WIPO *integer*: Wingate Polychrome (1150-1250).
SJ *integer*: St. Johns Black-on-red/Polychrome (1200-1300).
LSJ *integer*: St. Johns glaze, Techado Polychrome (1275-1300).
SPR *integer*: Springerville Polychrome (1250-1300).
PINER *integer*: Pinedale Black-on-red/Polychrome (1275-1325).
HESH *integer*: Heshotauthla Polychrome (1285-1400).
KWAK *integer*: Kwakina Polychrome (1285-1400).

The numbers in brackets correspond to the date range of each type (in AD years).

Source

Peebles, M. A., & Schachner, G. (2012). Refining correspondence analysis-based ceramic seriation of regional data sets. *Journal of Archaeological Science*, 39(8), 2818-2827. doi:10.1016/j.jas.2012.04.040.

See Also

Other count data: [birds](#), [boves](#), [chevelon](#), [compiegne](#), [loire](#), [merzbach](#), [mississippi](#)

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