Package 'IntCal'

September 25, 2020

Type Package

Title Radiocarbon Calibration Curves

Version 0.1.3

Date 2020-09-04

Description The IntCal20 radiocarbon calibration curves (Reimer et al. 2020 <doi:10.1017/RDC.2020.68>) are provided here in a single data package, together with previous IntCal curves (IntCal13, IntCal09, IntCal04, IntCal98) and postbomb curves.

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RoxygenNote 7.1.1

Encoding UTF-8

NeedsCompilation no

Language en-GB

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Repository CRAN

Date/Publication 2020-09-25 09:20:12 UTC

R topics documented:

age.pMC *Calculate pMC values from C14 ages*

Description

Calculate pMC values from radiocarbon ages

Usage

```
age.pMC(mn, sdev, ratio = 100, decimals = 3)
```

Arguments

mn	Reported mean of the 14C age.
sdev	Reported error of the 14C age.
ratio	Most modern-date values are reported against 100. If it is against 1 instead, use 1 here.
decimals	Amount of decimals required for the pMC value.

Details

Post-bomb dates are often reported as pMC or percent modern carbon. Since Bacon expects radiocarbon ages, this function can be used to calculate pMC values from radiocarbon ages. The reverse function of pMC.age.

Value

pMC values from C14 ages.

Examples

```
age.pMC(-2000, 20)
age.pMC(-2000, 20, 1)
```

copyCalibrationCurve *Copy a calibration curve.*

Description

Copy one of the the calibration curves into memory.

Usage

```
copyCalibrationCurve(cc = 1, postbomb = FALSE)
```

Arguments

cc	Calibration curve for 14C dates: cc=1 for IntCal20 (northern hemisphere terrestrial), cc=2 for Marine20 (marine), cc=3 for SHCal20 (southern hemisphere terrestrial).
postbomb	Use postbomb=TRUE to get a postbomb calibration curve (default postbbomb=FALSE).

Details

Copy the radiocarbon calibration curve defined by cc into memory.

Value

The calibration curve (invisible).

Examples

```
intcal20 <- copyCalibrationCurve(1)
```

IntCal *IntCal*

Description

The international IntCal research group publishes ratified radiocarbon calibration curves such as IntCal20, Marine20 and SHCal20 (Reimer et al. 2020). This data package provides the files of these curves, for use by other R package (reducing the need for replication and the size of other packages that use IntCal). It also comes with a limited number of relevant functions, to read in calibration curves, translate pMC ages to 14C ages (et vice versa), etc.

Author(s)

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mix.curves *Build a custom-made, mixed calibration curve.*

Description

If two curves need to be 'mixed' to calibrate, e.g. for dates of mixed terrestrial and marine carbon sources, then this function can be used.

Usage

```
mix.curves(
  proportion = 0.5,
  cc1 = "3Col_intcal20.14C",
  cc2 = "3Col_marine20.14C",
  name = "mixed.14C",
  dirname = ".",
  offset = c(0, 0),
  sep = "\t"
)
```

Arguments

proportion	Proportion of the first calibration curve required. e.g., change to proportion=0.7 if cc1 should contribute 70% (and cc2 30%) to the mixed curve.
cc1	The first calibration curve to be mixed. Defaults to the northern hemisphere terrestrial curve IntCal20.
cc2	The second calibration curve to be mixed. Defaults to the marine curve IntCal20.
name	Name of the new calibration curve.
dirname	Directory where the file will be written. If using the default dirname=".", the new curve will be saved in current working directory.
offset	Any offset and error to be applied to cc2 (default 0 +- 0).
sep	Separator between fields (tab by default, "\t")

Details

The proportional contribution of each of both calibration curves has to be set.

Value

A file containing the custom-made calibration curve, based on calibration curves cc1 and cc2.

Examples

```
mix.curves(, dirname=tempdir())
```

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pMC.age *Calculate C14 ages from pMC values.*

Description

Calculate C14 ages from pMC values of radiocarbon dates.

Usage

```
pMC.age(mn, sdev, ratio = 100, decimals = 0)
```

Arguments

mn	Reported mean of the pMC.
sdev	Reported error of the pMC.
ratio	Most modern-date values are reported against 100. If it is against 1 instead, use 1 here.
decimals	Amount of decimals required for the radiocarbon age.

Details

Post-bomb dates are often reported as pMC or percent modern carbon. Since Bacon expects radiocarbon ages, this function can be used to calculate radiocarbon ages from pMC values. The reverse function is age.pMC.

Value

Radiocarbon ages from pMC values. If pMC values are above 100%, the resulting radiocarbon ages will be negative.

See Also

http://www.qub.ac.uk/chrono/blaauw/manualBacon_2.3.pdf

Examples

```
pMC.age(110, 0.5) # a postbomb date, so with a negative 14C age
pMC.age(80, 0.5) # prebomb dates can also be calculated
pMC.age(.8, 0.005, 1) # pMC expressed against 1 (not against 100\%)
```

Index