

Hands-on 1

Preparing PCs

R

Clam

- calibrating ^{14}C dates
- basic age-depth modeling

Preparing PCs

Software needed:

R, Firefox, OxCal

Mac: development library

Clam (via USB sticks)

unzip to somewhere easy, e.g., C:\

For plain text files (.txt, .dat, .csv, .bacon, .14C):

text editor such as Wordpad (*not* Word or Notepad)

Internet access to download Bchron R-package

R

Stats and graphing software

Many user-provided modules

Free / open-source / under-the-hood

Open R and type:

```
plot(1:10, 11:20) <enter>
```

```
x <- 1:10 ; y <- x^2 ; plot(x, y, type='l')
```

Case sensitive

Previous commands: use up cursor

R

R uses variables, e.g., x

and functions, e.g. plot()

Functions come with constants/settings

e.g., `curve(expr=dnorm(x), from=-4, to=4)`

Shorthand: use order and commas

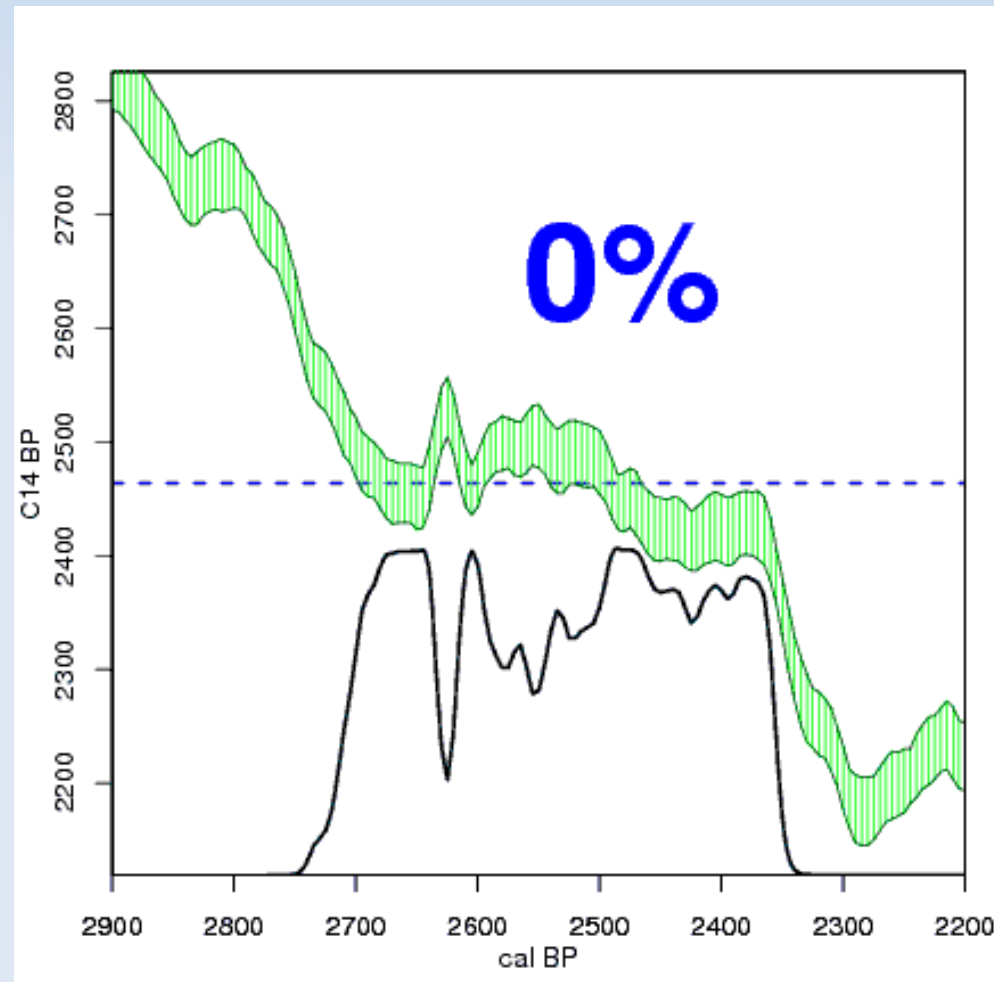
```
curve(dnorm(x),, -4, 4)
```

Check inner parts of functions: remove brackets

1. clam ... R

- We often work with R in specific dirs
 - So that R can find the files it needs
 - No easy ways to search for files automatically, remember where you work(ed)!
 - Work in easy dirs, e.g., C:\clam\
 - Avoid spaces in filenames/dirs
 - File > Change Dir...
 - Or permanently using Desktop Icon (right-click, properties, start in)

^{14}C calibration



Calibrating DIY

- Define years: `yrs <- 1:1000`
- A date: `y <- 230; sdev <- 70`
- Prob. for each yr:
 - `prob <- dnorm(yrs, y, sdev)`
- `plot(yrs, prob)`
- But we should calibrate: `cc <- read.table('IntCal09.14C', header=TRUE)`
- `cc[1:10,]`

Calibrating DIY

- `prob <- dnorm(cc[,2], y, sdev)`
- `plot(cc[,1], prob, type='l', xlim=c(0, 1000))`
- More correct:
- `prob <- dnorm(cc[,2], y, sqrt(sdev^2 + cc[,3]^2))`

(plot this)

Calibrate – clam

- ***clam*** (Blaauw, in press Quat Geochr)
 - Open R (via desktop icon or Start menu)
 - Change working directory to clam dir
 - Type: `source("clam.R")` [enter]

2. clam, calibrating

- Type **calibrate()**
- This calibrated ^{14}C date of 2450 +/- 50 BP
- Type **calibrate(130, 30)**
- Type **calibrate(130, 30, sdev=1)**
- Calibrate other dates, e.g., old, young
- All clam code is *open source*, you can read the code to see/follow what it does

Age-depth modelling

```
clam()
```

```
clam(type=4, dmax=800)
```

```
clam(type=4, outliers=6)
```

```
clam(type=4, hiatus=450)
```

```
clam(type=4, outliers=6, ageofdepth=600)
```

Your own data

- `.../clam/Cores/Example/Example.csv`
 - Open in Excel and in Wordpad
- Your core: store `.csv` in folder `Cores/`
- Read `manual.html!`
- Avoid spaces in names
- Check consistency names and folders