

Meeting Notes

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Using base plot and saving graphics device

The first step involves opening a device, creating the canvas to draw the plot, with the call `png()` `pdf()` or `svg()` as the different devices. Whereafter the call `plot()` can be used to plot R objects on the previously opened graphics device.

Using ggplot and saving with ggsave

The benefits of ggplot are that dimensions and positions can be better fixed. The ggplot is build layer by layer with a dedicated call for the data sources (as a dataframe) and variable selection (`ggplot`), the visual representation of data (`geom_point()`, `geom_line()` ...) and formatting of the former layer (`theme()`), and, so give a good overview of the different layers added to a plot. After finalising the plot, you can save it with the call `ggsave`.

Example

For the example we use the following two packages.

```
library(ggplot2)
library(dplyr)
```

We create a dummy y-x data frame with a label for subsetting. By mutating the label with `bquote`, we can introduce mathematical expressions in the facet and legend labels later on.

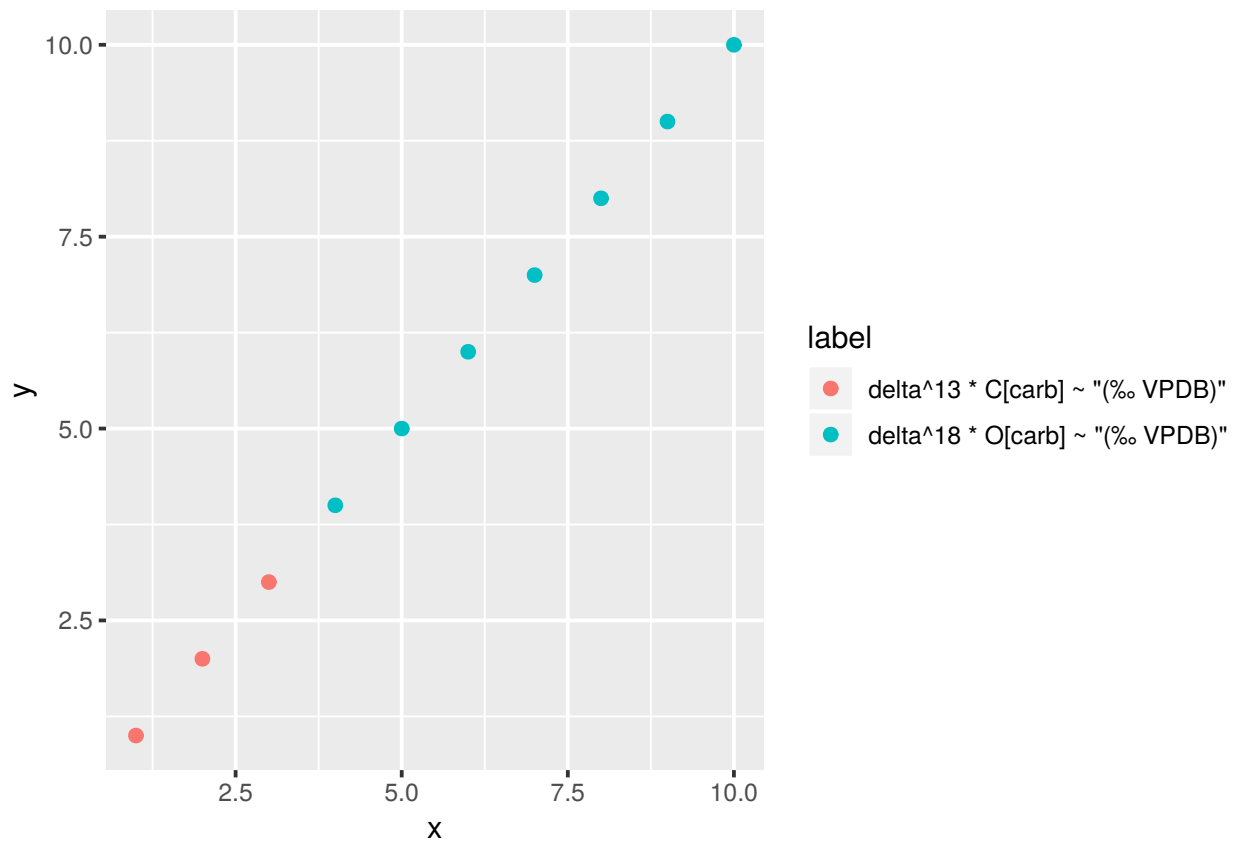
```
df <- data.frame(x=c(1:10),y=c(1:10), label=c(rep("A",3),rep("B",7)))

df <- df %>% mutate(label=factor(label, levels = c("A","B"), c(bquote(delta^13*C[carb]~"(\u2030 VPDB)"))
```

Here, we create a ggplot with variables as points. We include `df$label` in the aesthetics (`aes`) to subset the variable according to the label by creating different colors (`colour`) for the datapoints.

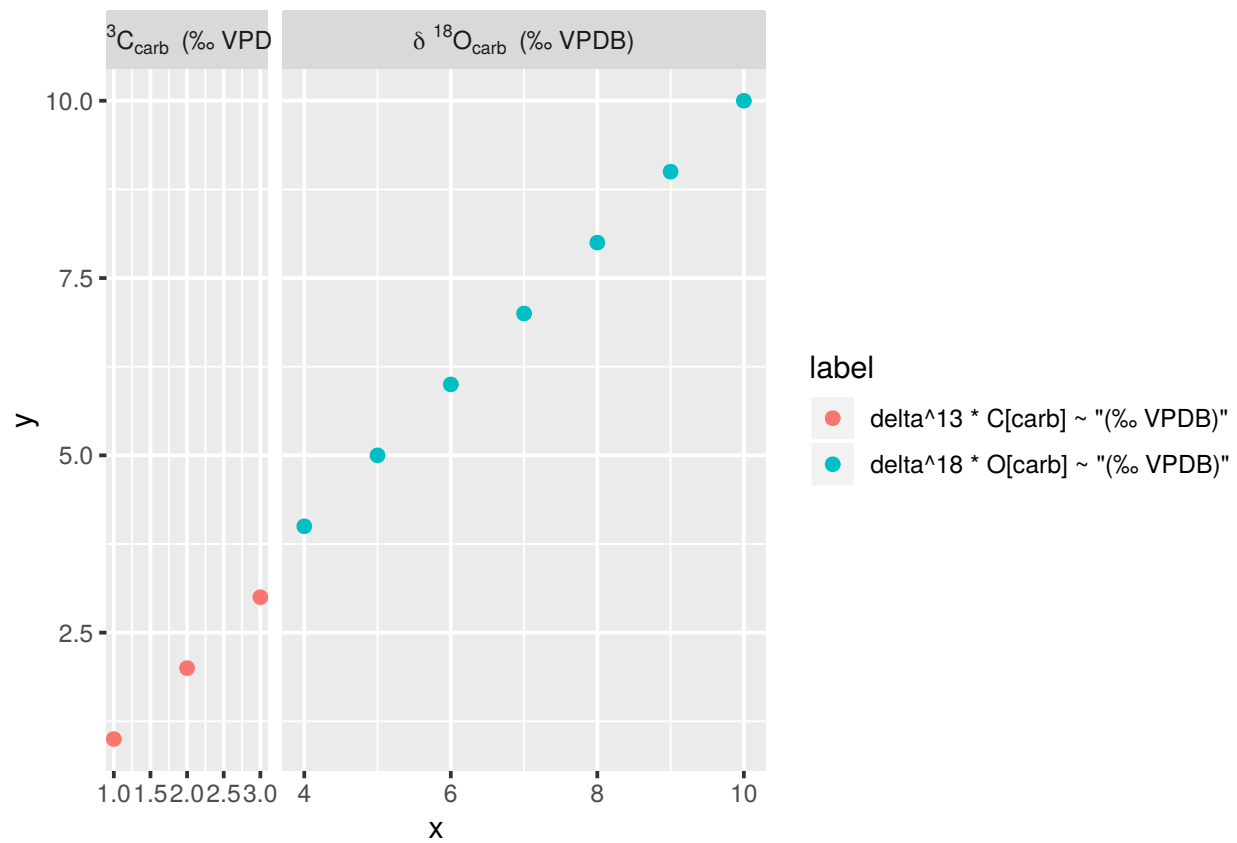
```
p <- ggplot(df, aes(x,y, colour = label))+
  geom_point()
```

p



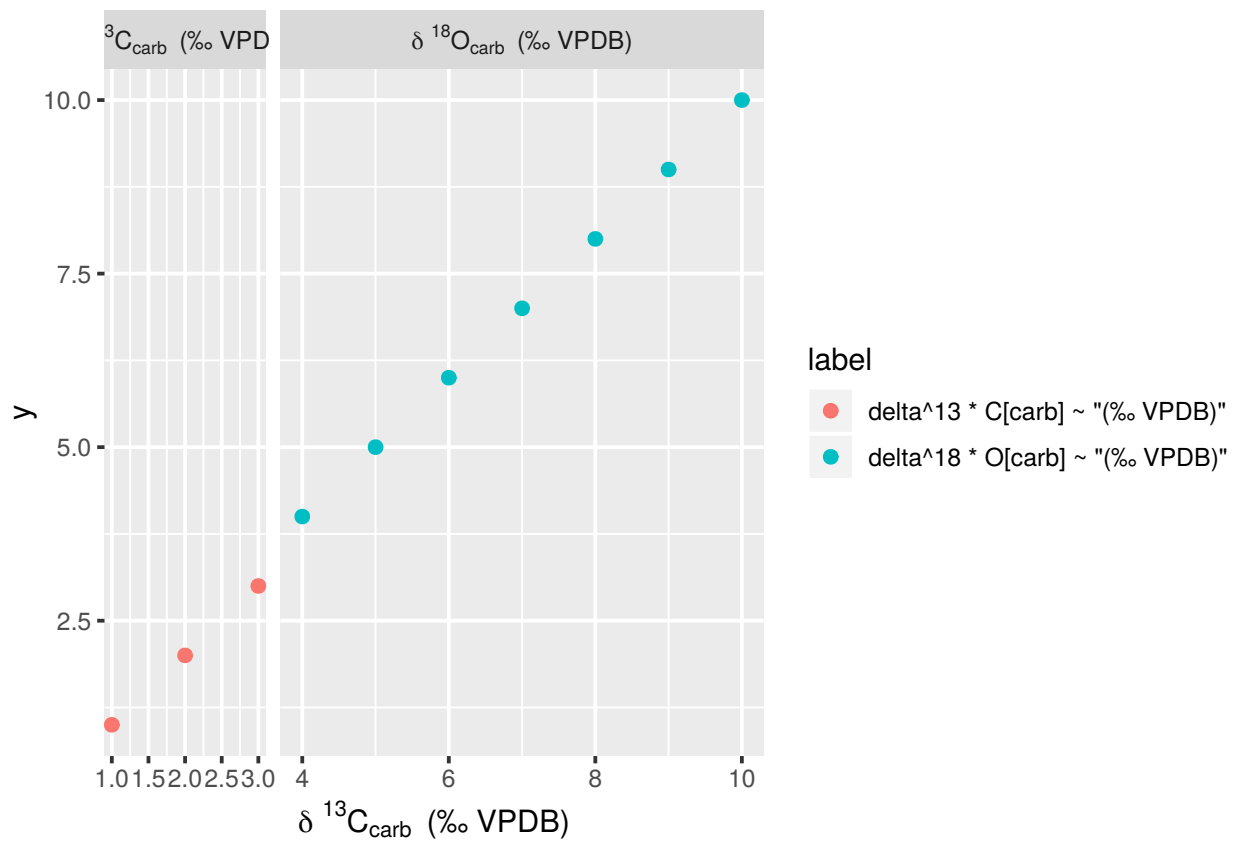
We can make multiple plot panels based on the `label (df$label)` variable in the dataframe `df`. By setting argument `labeller` to `label_parsed`, we generate the previous defined mathematical expressions. So, let's say when you want to plot stable carbon and oxygen isotope data in delta notation as two different panels.

```
p <- p + facet_grid(cols= vars(label), scales = "free", space = "free", labeller=label_parsed)
p
```



It is also possible to include mathematical expression in the axis title by using `expression`.

```
p <- p + xlab(expression(delta^{13}*C[carb]~"(\u2030 VPDB)"))
p
```

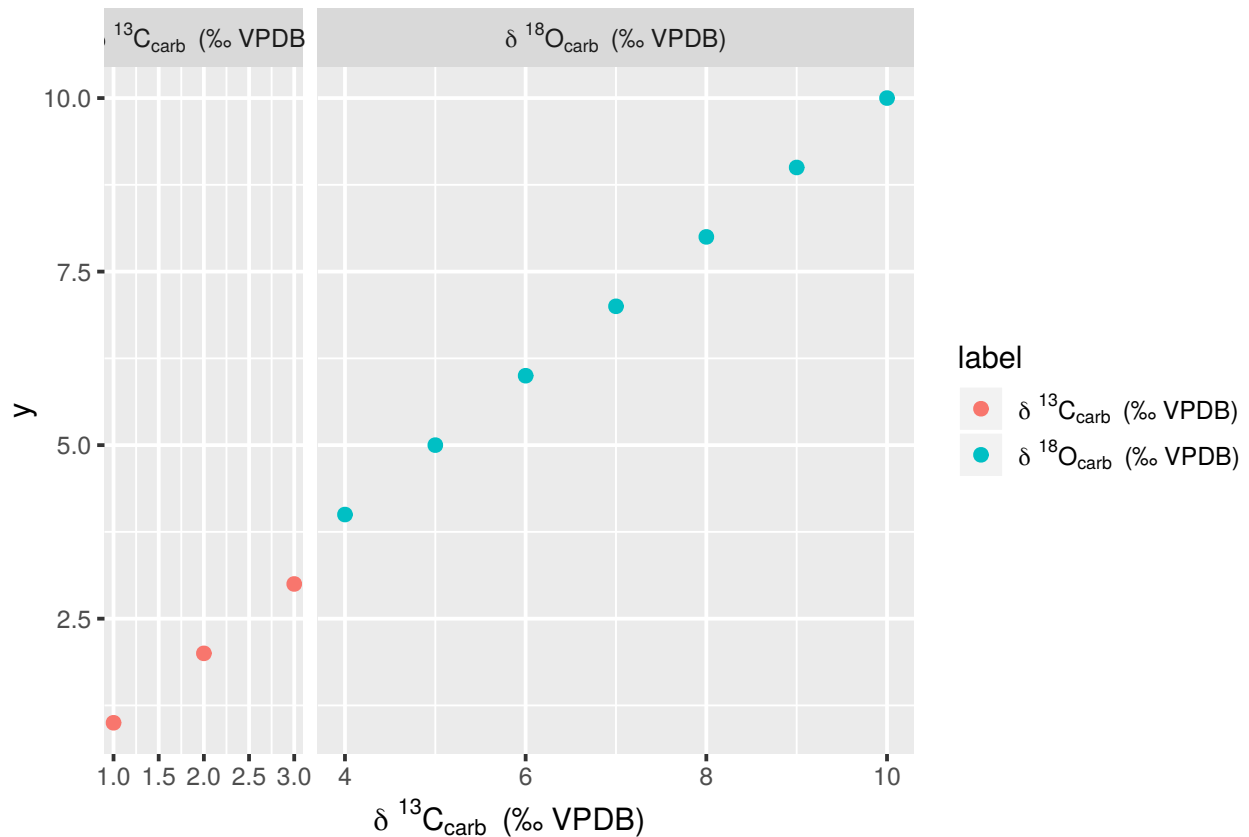


Parsing the same expression for the legend text seems more tricky and involves changing two arguments of `scale_colour` and the additional package `scales`.

```
library(scales)

p <- p + scale_colour_discrete(guide = guide_legend(parse = TRUE), labels = parse_format())

p
```



Some links discussed during the meeting

Data visualization course: https://www.datacamp.com/courses/data-visualization-with-ggplot2-1?tap_a=5644-dce66f&tap_s=93618-a68c98

Data wrangling course: <https://www.datacamp.com/courses/dplyr-data-manipulation-r-tutorial>

Spatial data in R: <http://mazamascience.com/WorkingWithData/?p=1277>

Some packages discussed during the meeting

```
lapply(list("swirl", "ggplot2", "dplyr"), citation)
```

```
## [[1]]
##
## To cite package 'swirl' in publications use:
##
##   Sean Kross, Nick Carchedi, Bill Bauer and Gina Grdina (2017).
##   swirl: Learn R, in R. R package version 2.4.3.
##   https://CRAN.R-project.org/package=swirl
##
## A BibTeX entry for LaTeX users is
##
##   @Manual{,
##     title = {swirl: Learn R, in R},
##     author = {Sean Kross and Nick Carchedi and Bill Bauer and Gina Grdina},
```

```

##   year = {2017},
##   note = {R package version 2.4.3},
##   url = {https://CRAN.R-project.org/package=swirl},
## }
##
##
## [[2]]
##
## To cite ggplot2 in publications, please use:
##
##   H. Wickham. ggplot2: Elegant Graphics for Data Analysis.
##   Springer-Verlag New York, 2016.
##
## A BibTeX entry for LaTeX users is
##
##   @Book{,
##     author = {Hadley Wickham},
##     title = {ggplot2: Elegant Graphics for Data Analysis},
##     publisher = {Springer-Verlag New York},
##     year = {2016},
##     isbn = {978-3-319-24277-4},
##     url = {http://ggplot2.org},
##   }
##
##
## [[3]]
##
## To cite package 'dplyr' in publications use:
##
##   Hadley Wickham, Romain François, Lionel Henry and Kirill Müller
##   (2018). dplyr: A Grammar of Data Manipulation. R package version
##   0.7.8. https://CRAN.R-project.org/package=dplyr
##
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##
##   @Manual{,
##     title = {dplyr: A Grammar of Data Manipulation},
##     author = {Hadley Wickham and Romain François and Lionel Henry and Kirill Müller},
##     year = {2018},
##     note = {R package version 0.7.8},
##     url = {https://CRAN.R-project.org/package=dplyr},
##   }

```