

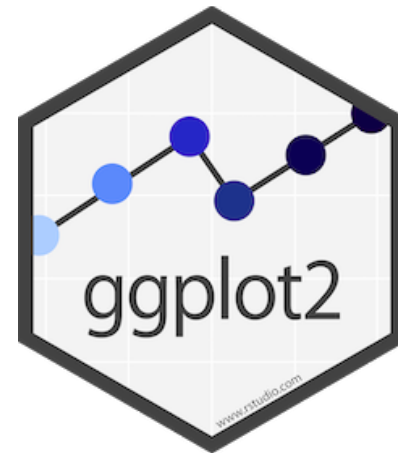
Ateliers R³



MBB

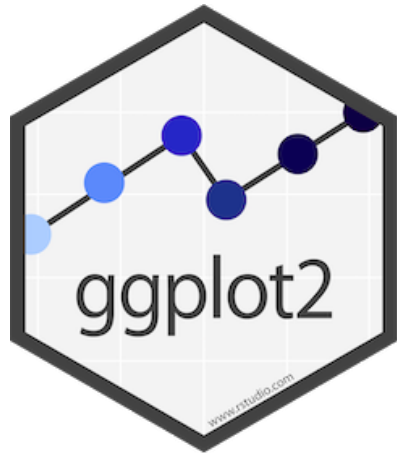
ISEM
Institut des Sciences de l'Evolution-Montpellier

Session 4 - Faire des graphiques avec ggplot2



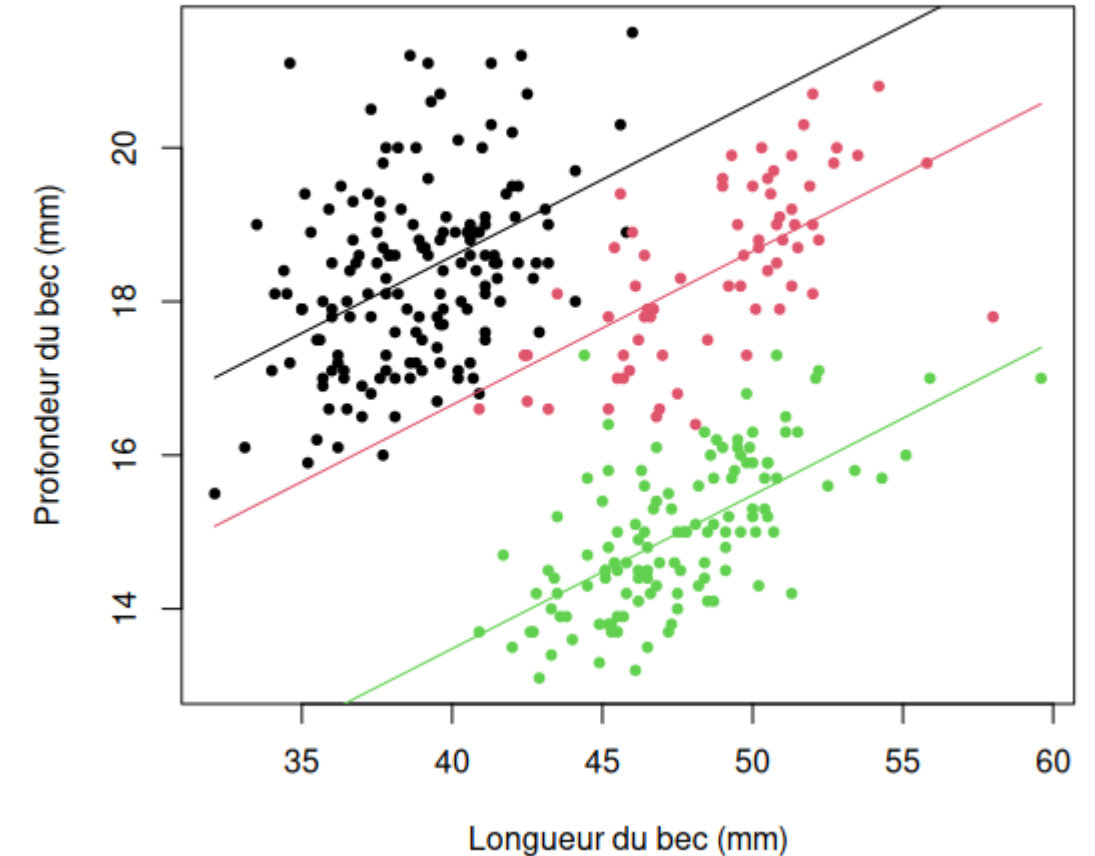
depuis 2007

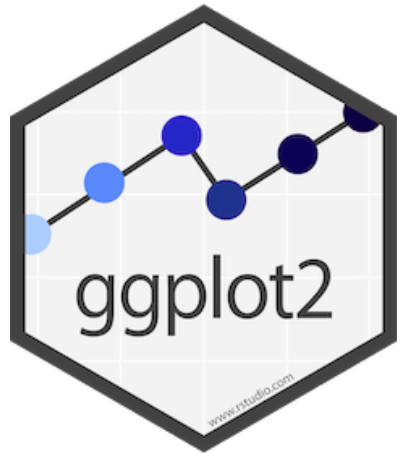
1.5M téléchargements/mois



Pourquoi utiliser ggplot2 ? Faire plus avec moins

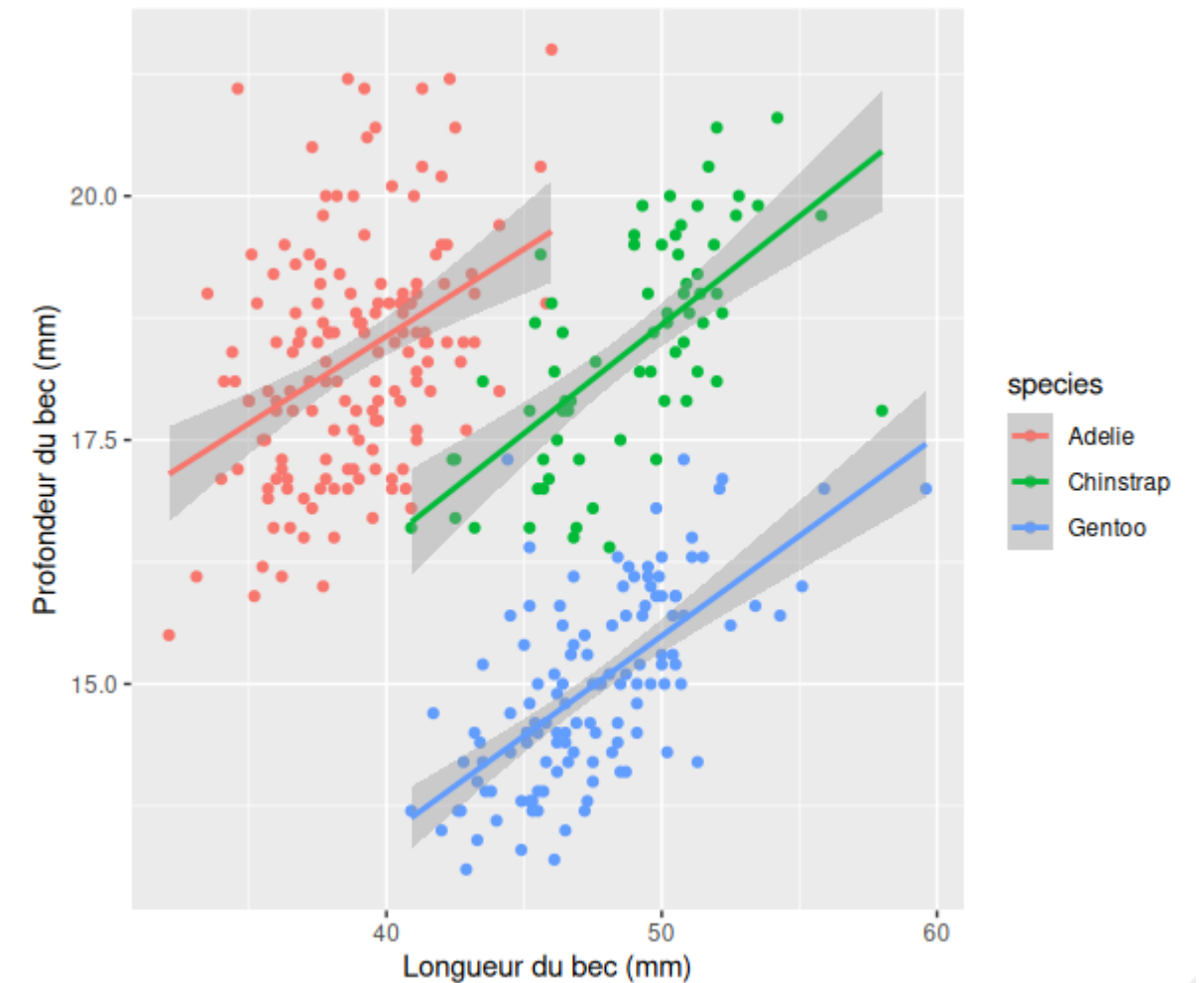
```
cols <- c(Adelie = 1, Chinstrap = 2, Gentoo = 3)
with(penguins,
      plot(bill_length_mm, bill_depth_mm, xlab = "Longueur du bec (mm)",
           ylab = "Profondeur du bec (mm)",
           pch = 20, col = cols[species]))
mod <- lm(bill_depth_mm ~ bill_length_mm + species,
          data = penguins)
xrange <- range(penguins[, "bill_length_mm"], na.rm = TRUE)
mod_pred <- expand.grid(species = unique(penguins$species),
                       bill_length_mm = seq(xrange[1], xrange[2], l = 12))
mod_pred <- data.frame(mod_pred,
                      bill_depth_mm = predict(mod, newdata = mod_pred))
for ( sp in names(cols) ) {
  with(subset(mod_pred, species == sp),
        lines(bill_length_mm, bill_depth_mm, col = cols[species]))
}
```



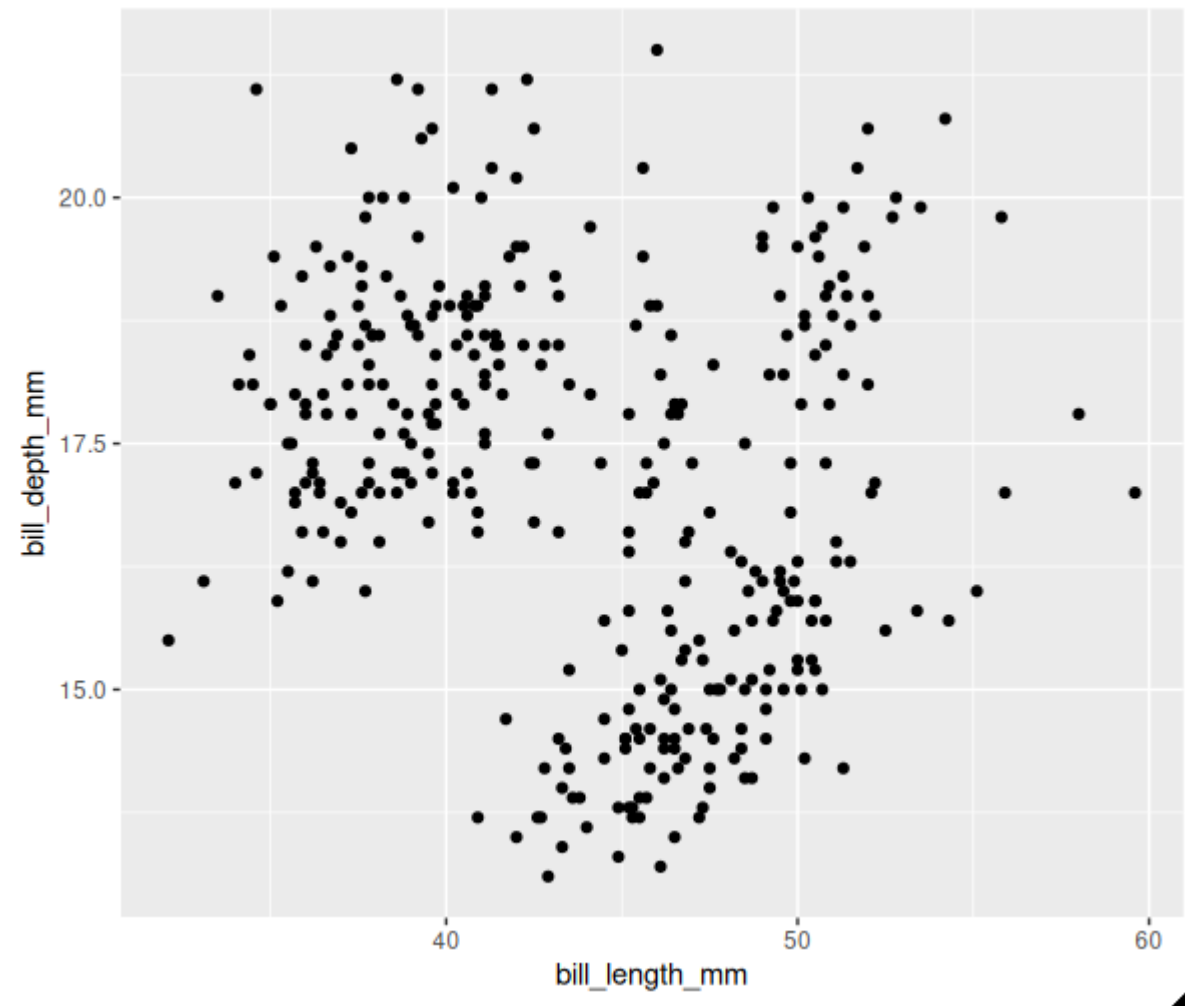


Pourquoi utiliser ggplot2 ? Faire plus avec moins

```
library(ggplot2)
ggplot(penguins, aes(x = bill_length_mm, y = bill_depth_mm)) +
  geom_point(aes(color = species)) +
  geom_smooth(aes(color = species), method = lm) +
  labs(x = "Longueur du bec (mm)",
       y = "Profondeur du bec (mm)")
```

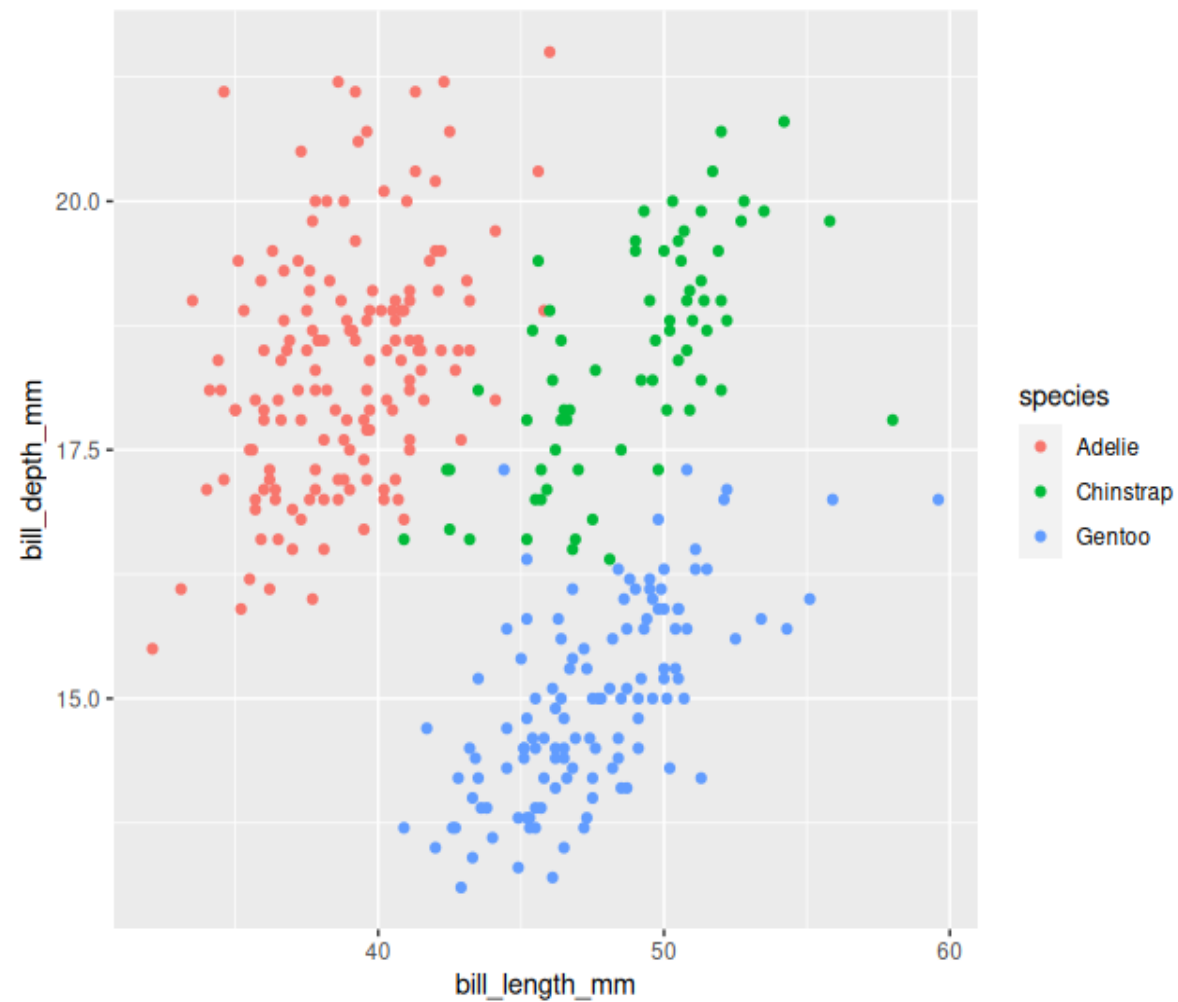


Un système modulaire



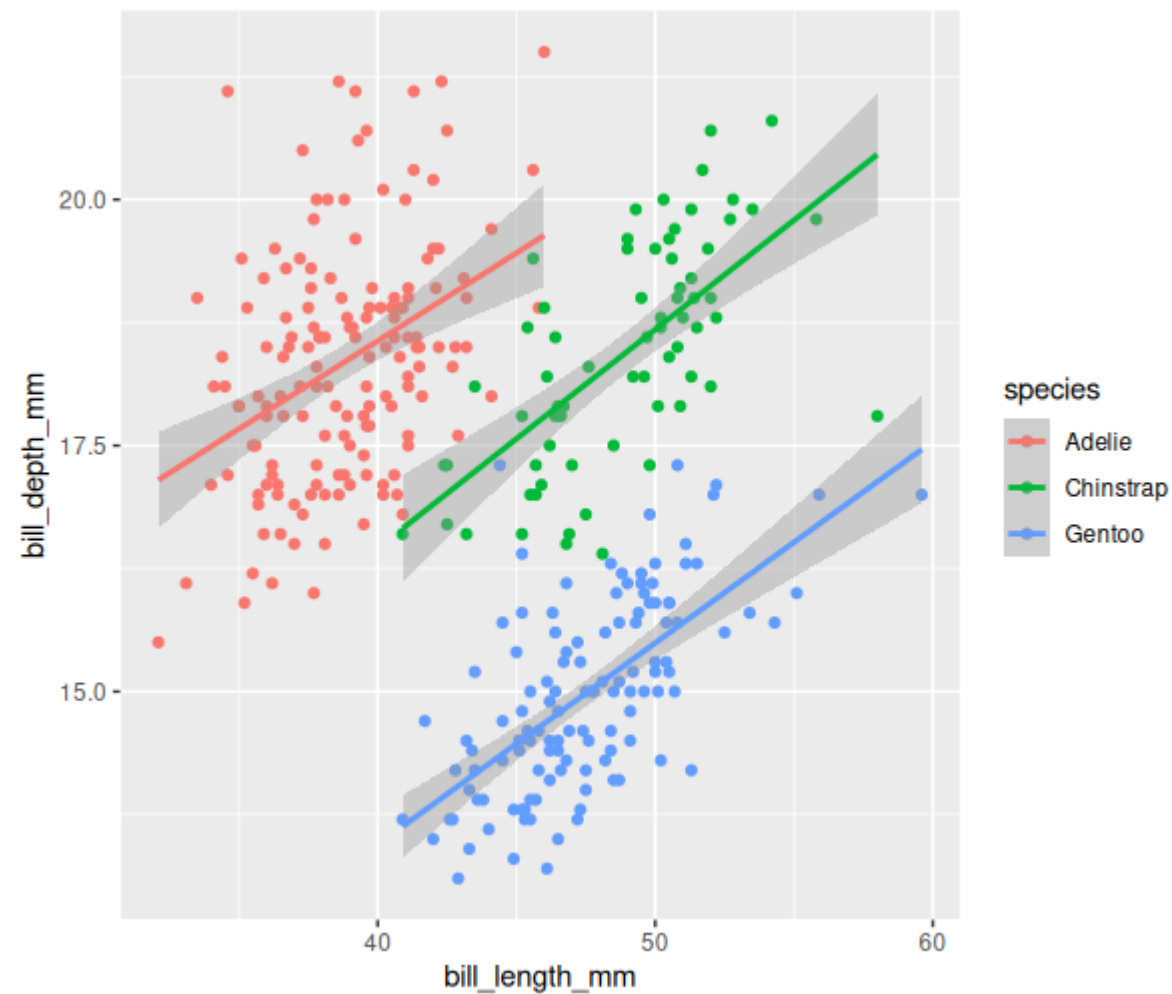
```
library(ggplot2)
ggplot(penguins, aes(x = bill_length_mm,
                    y = bill_depth_mm)) +
  geom_point()
```

Un système modulaire



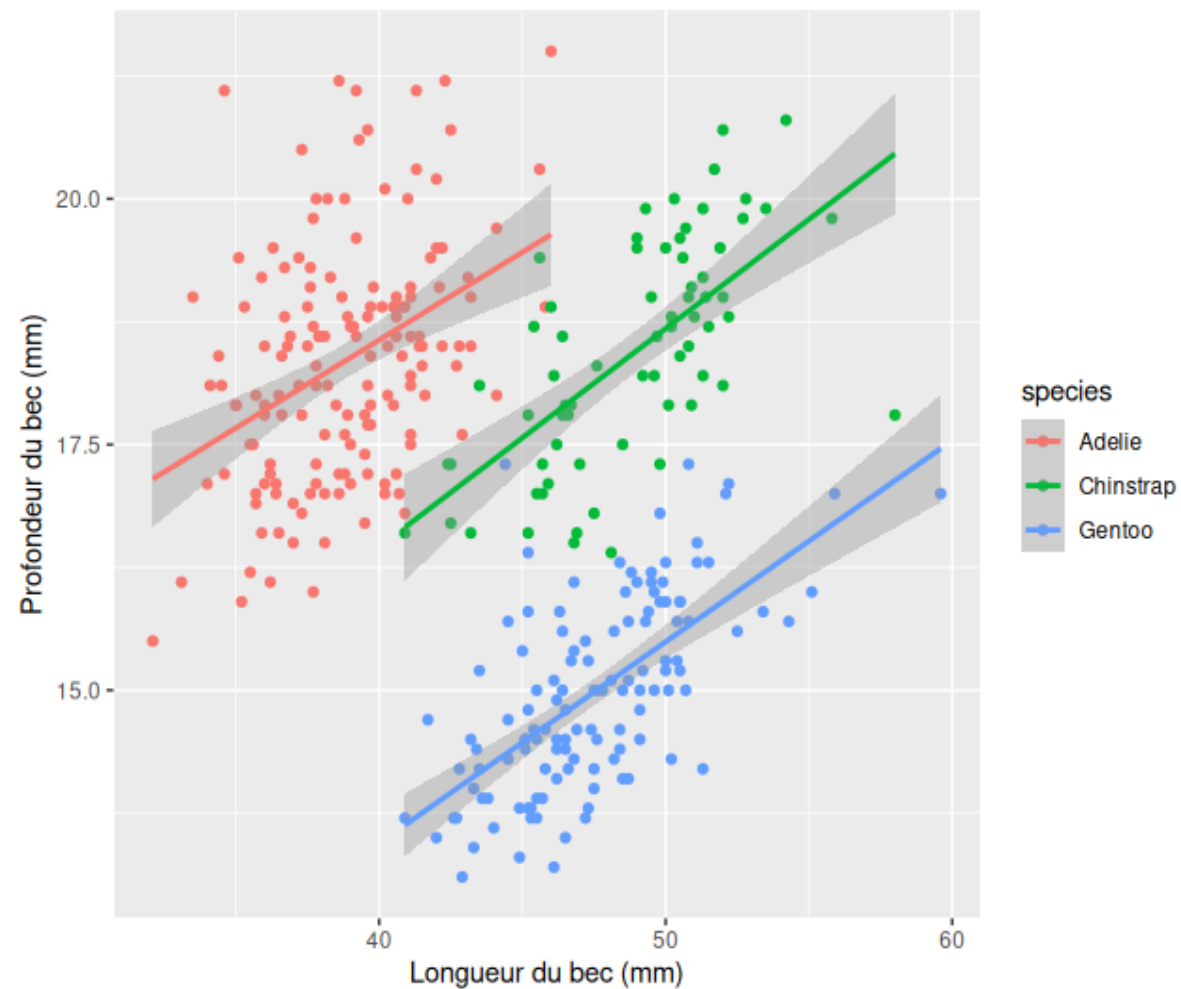
```
library(ggplot2)
ggplot(penguins, aes(x = bill_length_mm,
                    y = bill_depth_mm)) +
  geom_point(aes(color = species))
  geom_smooth(aes(color = species), method = lm)
```

Un système modulaire



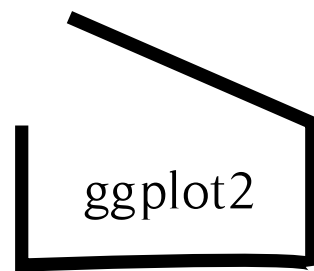
```
library(ggplot2)
ggplot(penguins, aes(x = bill_length_mm,
                    y = bill_depth_mm)) +
  geom_point(aes(color = species))
  geom_smooth(aes(color = species), method = lm)
```

Un système modulaire



```
library(ggplot2)
ggplot(penguins, aes(x = bill_length_mm,
                    y = bill_depth_mm)) +
  geom_point(aes(color = species))
  geom_smooth(aes(color = species), method = lm) +
  labs(x = "Longueur du bec (mm)",
       y = "Profondeur du bec (mm)") +
```


Un système modulaire



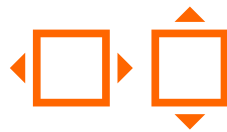
+



Ajouter des représentations des données

"geom_*"

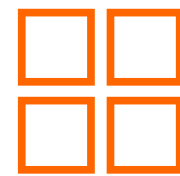
+



Changer les échelles de la représentation

"scale_*"

+



Éclater le graphe en "sous-graphes" (facets)

"facet_*"

+

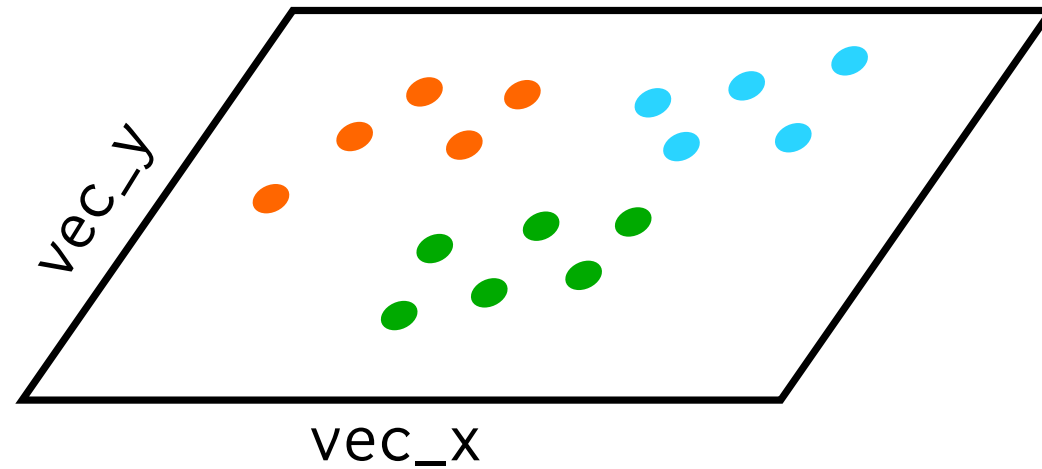


Changer des aspects cosmétiques

"theme_*"

Geoms

`ggplot(mesdonnees) +`



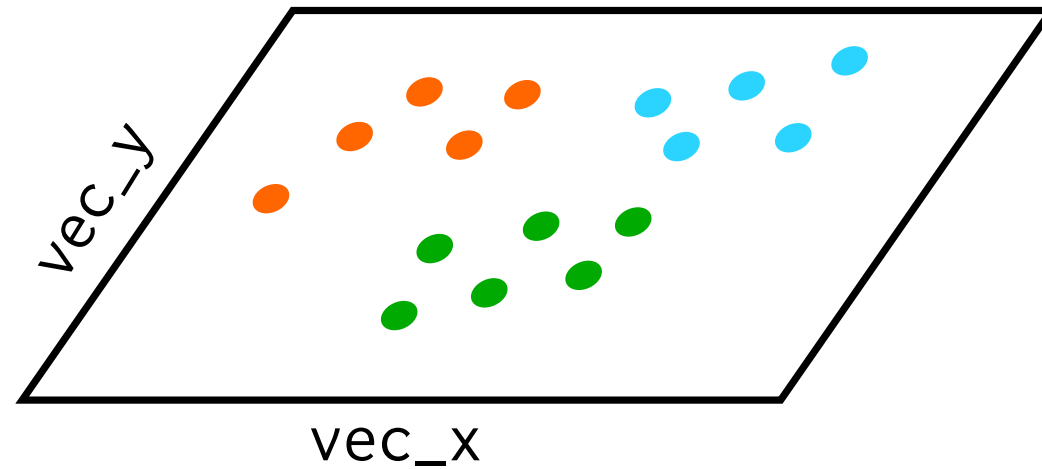
```
geom_point(aes(x = vec_x,  
               y = vec_y,  
               color = groups))
```

mesdonnees

vec_x	vec_y	groups
0.5	2.5	"a"
1.2	3.6	"b"
2.8	6.8	"c"

Geoms

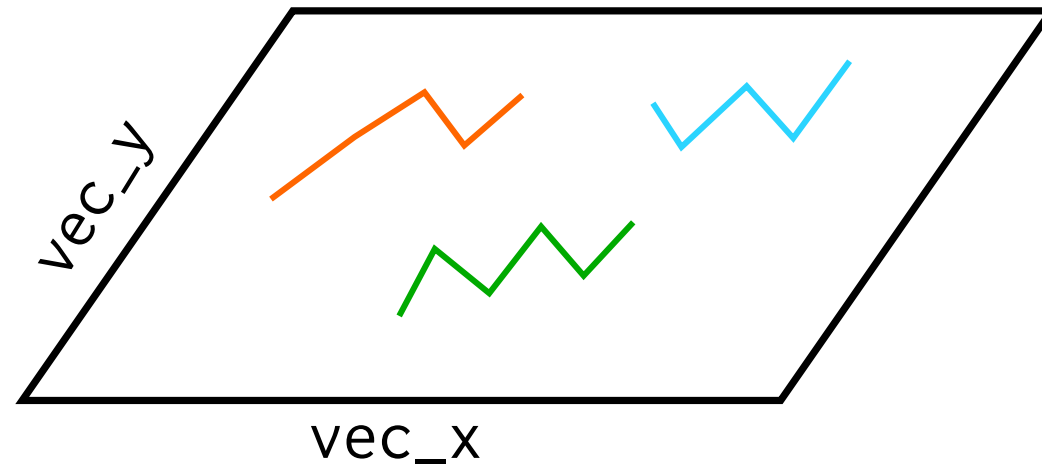
ggplot(mesdonnees) +



```
geom_point(aes(x = vec_x,  
               y = vec_y,  
               color = groups))
```

mesdonnees

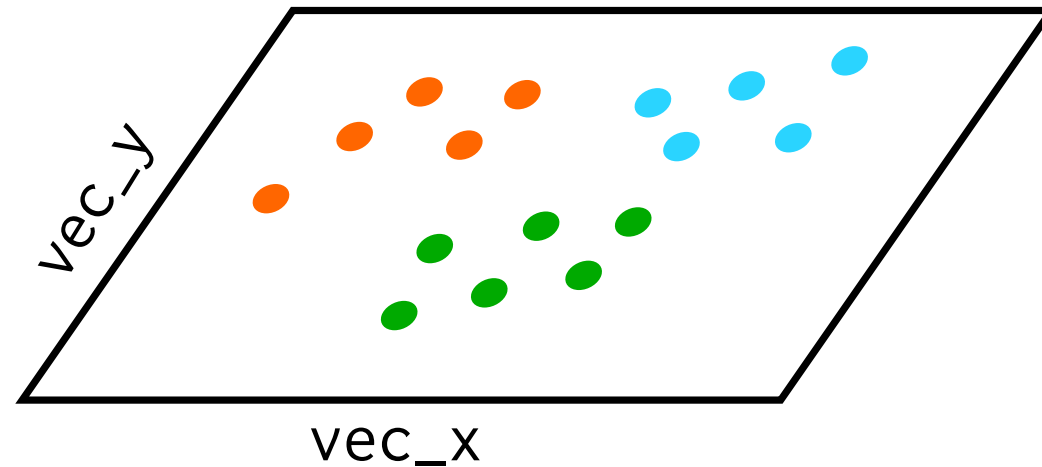
vec_x	vec_y	groups
0.5	2.5	"a"
1.2	3.6	"b"
2.8	6.8	"c"



```
geom_line(aes(x = vec_x,  
              y = vec_y,  
              color = groups))
```

Geoms

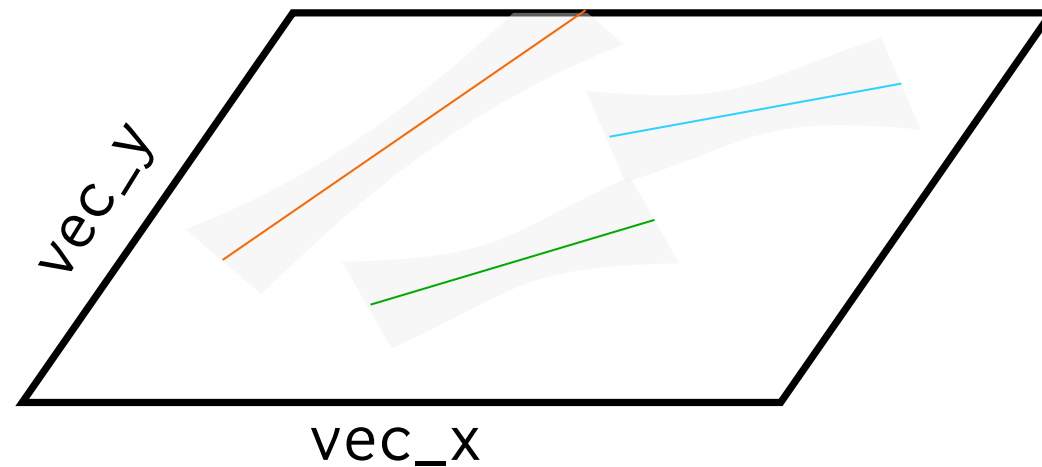
`ggplot(mesdonnees) +`



```
geom_point(aes(x = vec_x,  
               y = vec_y,  
               color = groups))
```

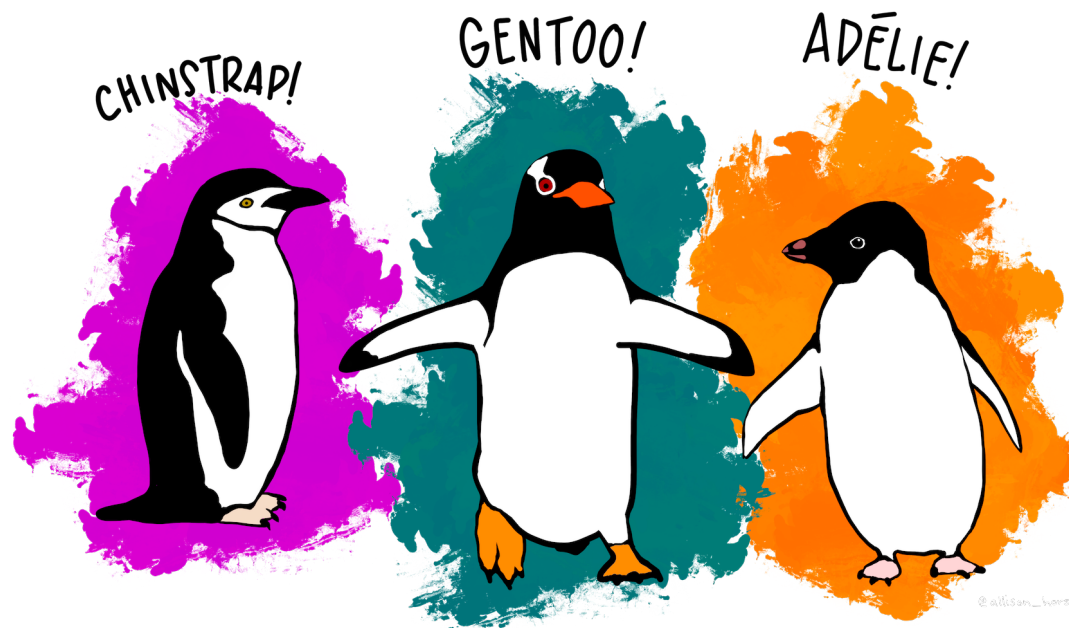
mesdonnees

vec_x	vec_y	groups
0.5	2.5	"a"
1.2	3.6	"b"
2.8	6.8	"c"

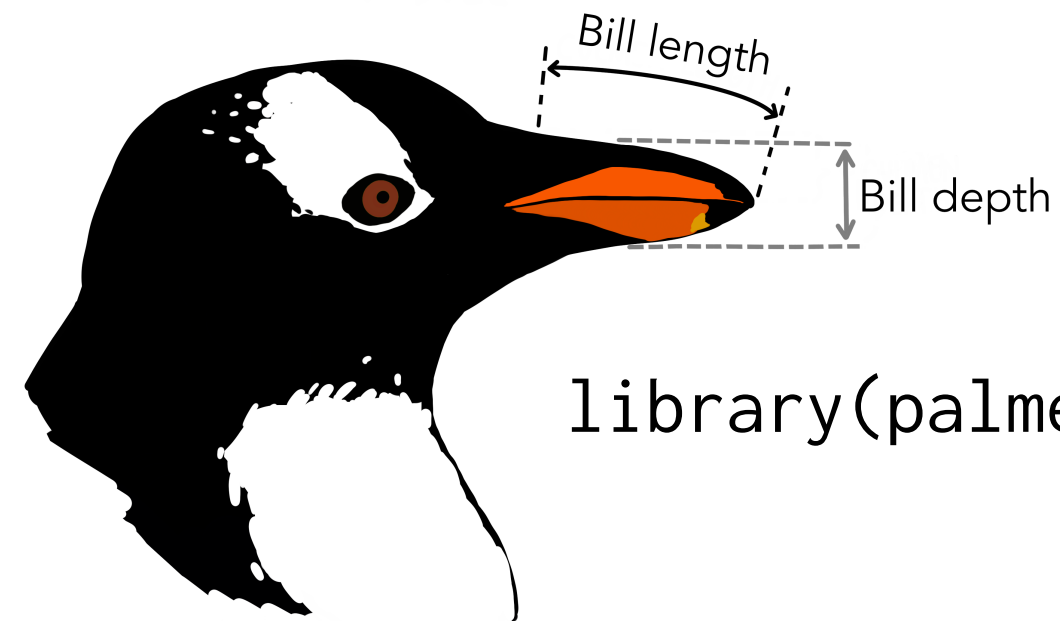


```
geom_smooth(aes(x = vec_x,  
               y = vec_y,  
               color = groups),  
           method = "lm")
```

Geoms: en pratique



Relation entre longueur et profondeur du bec



library(palmerpenguins)


```
#> Horst AM, Hill AP, Gorman KB (2020). palmerpenguins: Palmer  
#> Archipelago (Antarctica) penguin data. R package version 0.1.0.  
#> https://allisonhorst.github.io/palmerpenguins/. doi:  
#> 10.5281/zenodo.3960218.
```

<https://github.com/allisonhorst/palmerpenguins>


Scales: en pratique

Pour les axes d'un graphique:

Valeurs continues

ou y  `scale_x_continuous(name = "Titre de l'axe",
breaks = <breaks>,
labels = <labels>)`

Valeurs discrètes

ou y  `scale_x_discrete(name = "Titre de l'axe",
breaks = <breaks>,
labels = <labels>)`

Scales: en pratique

Pour les couleurs sur un graphique:

Valeurs continues

Valeurs discrètes

Deux couleurs, faire un dégradé

ou fill →
`scale_color_gradient()`

Trois couleurs, faire un dégradé

ou fill →
`scale_color_gradient()`

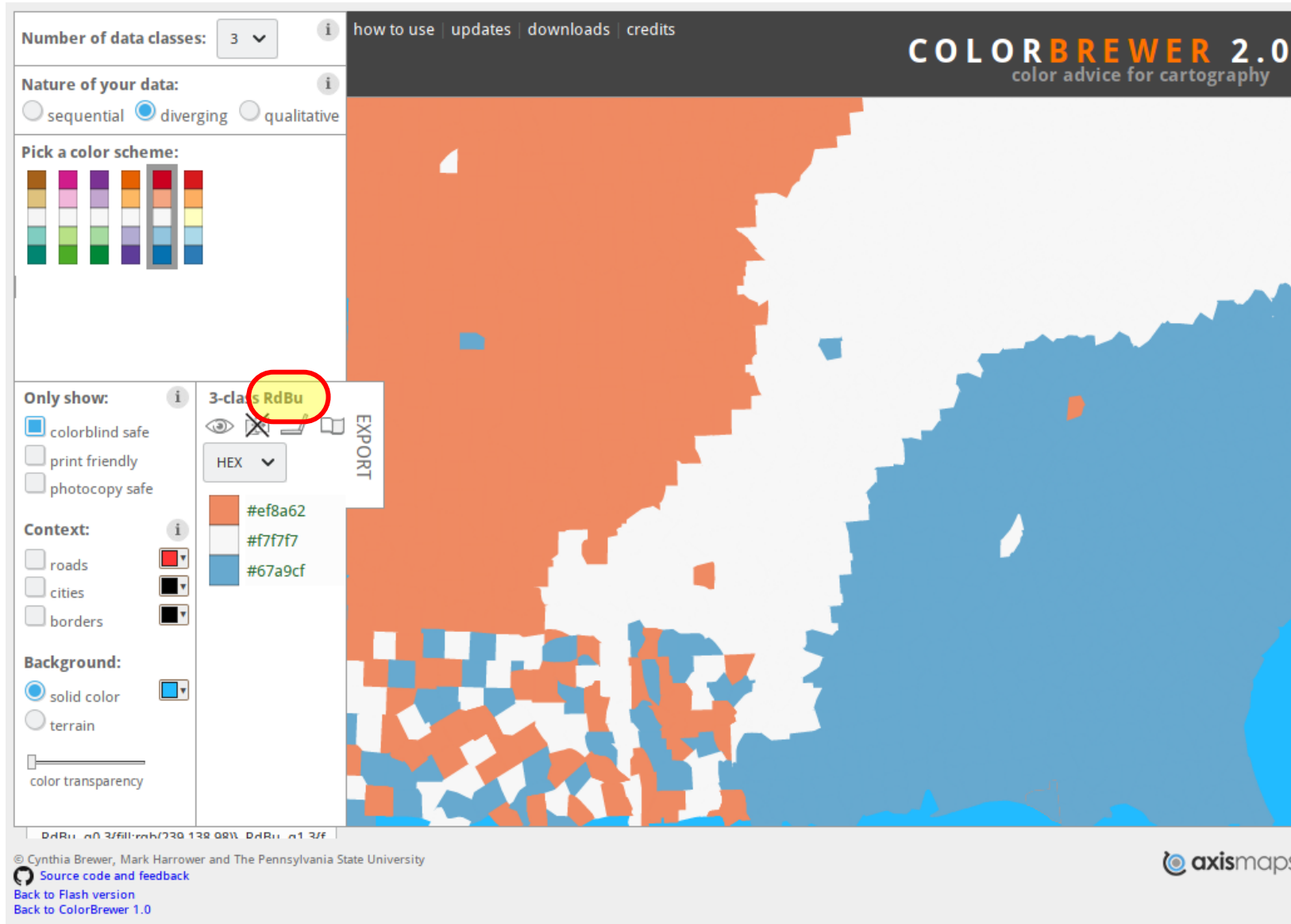
A partir d'une palette

ou fill →
`scale_color_distiller()`

ou fill →
`scale_color_brewer()`

ou fill →
`scale_color_continuous()`

ou fill →
`scale_color_discrete()`



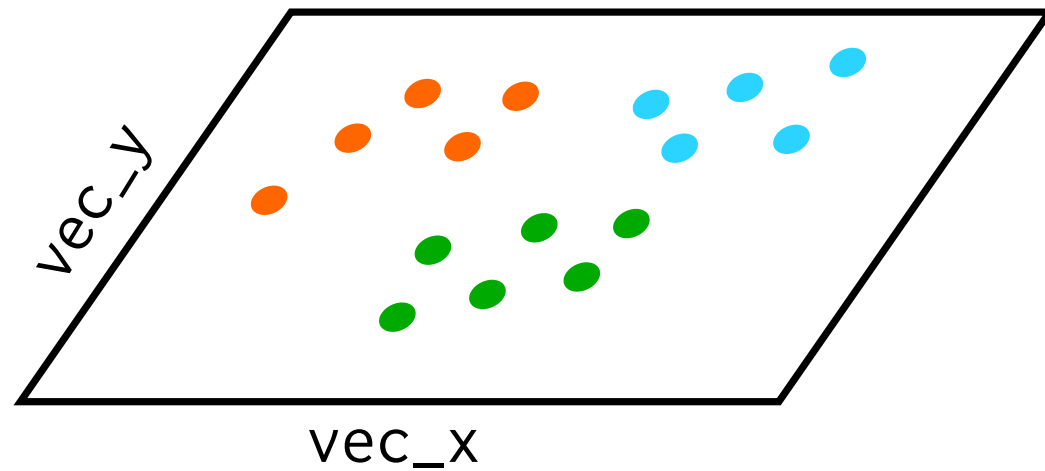
Valeurs continues

```
scale_color_distiller(palette = "RdBu")
```

Valeurs discrètes

```
scale_color_brewer(palette = "RdBu")
```


Facets: des "sous-graphes"



```
ggplot(mesdonnees) +
```

```
  geom_point(aes(x = vec_x,  
                 y = vec_y,  
                 color = groups))
```

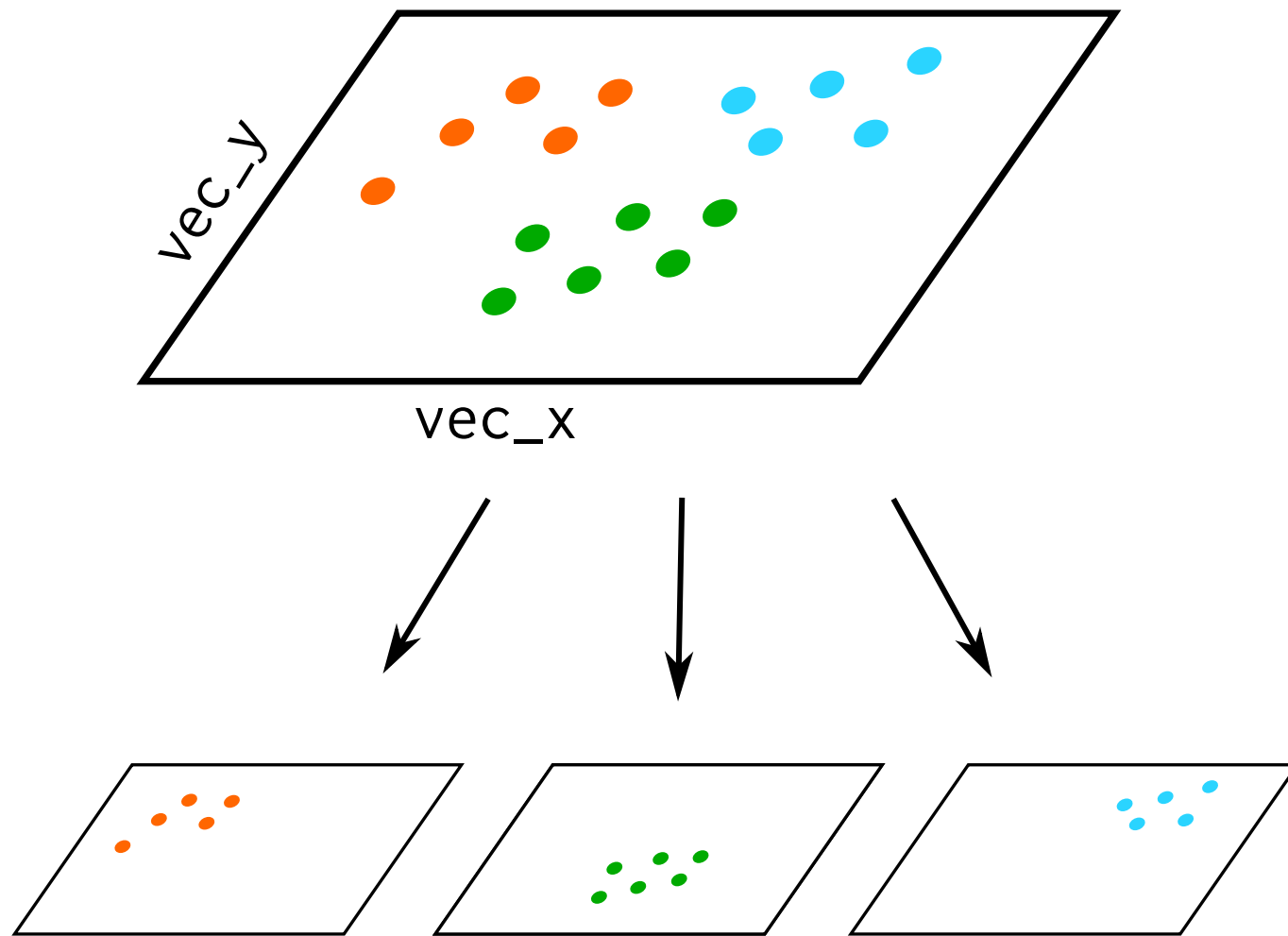
Facets: des "sous-graphes"

`ggplot(mesdonnees) +`

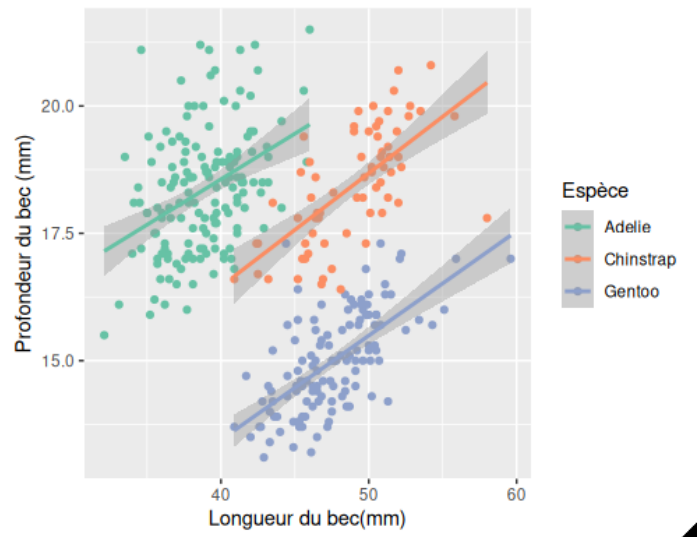
```
geom_point(aes(x = vec_x,  
               y = vec_y,  
               color = groups)) +
```

```
facet_wrap( ~ groups )
```

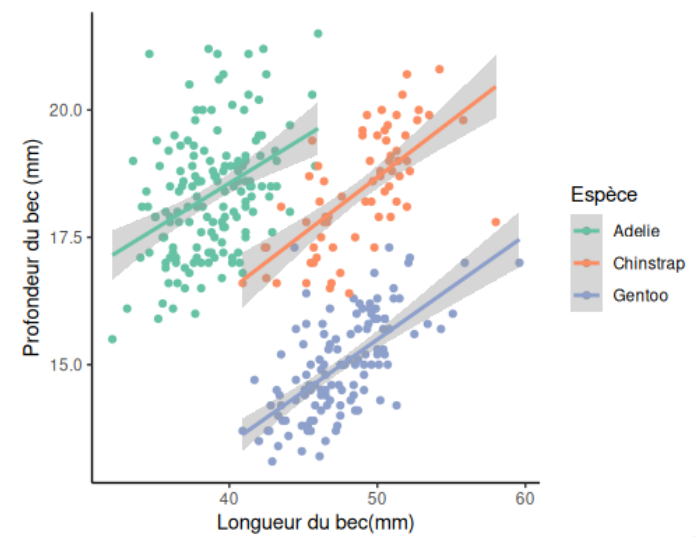
```
facet_grid( group_var1 ~ group_var2 )
```



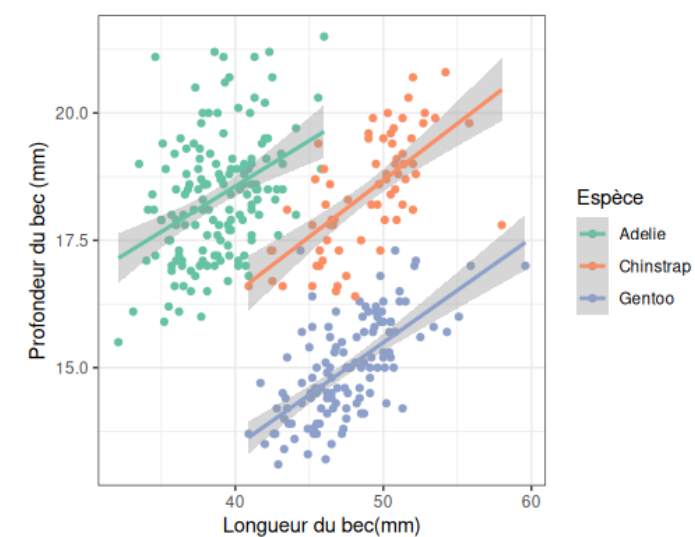
Thèmes



(par défaut)



+ theme_classic()



+ theme_bw()

+ theme_minimal()



A l'aide !

<https://www.r-graph-gallery.com/>



Q CHART TYPES QUICK TOOLS ALL D3.JS PYTHON DATA TO VIZ ABOUT

Distribution



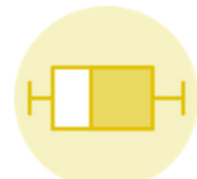
Violin



Density



Histogram



Boxplot



Ridgeline

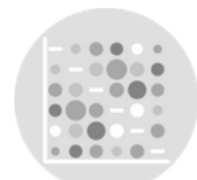
Correlation



Scatter



Heatmap



Correlogram



Bubble



Connected scatter



Density 2d

Ranking

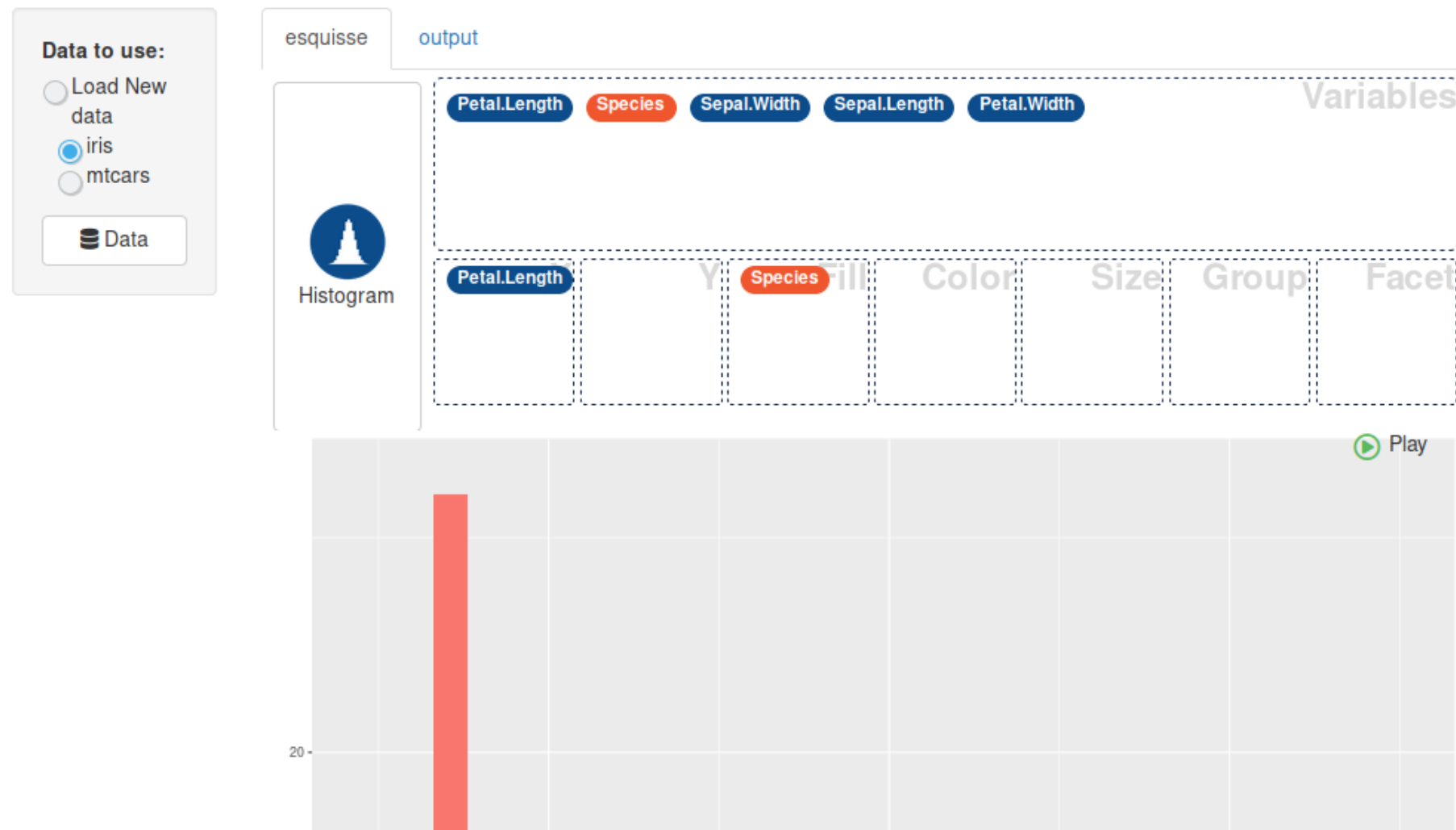


A l'aide !

Paquet *esquisse* : <https://dreamrs.github.io/esquisse/index.html>

<https://shiny.mbb.univ-montp2.fr/ggplothelper/>

ggplot helper with *esquisse* package as a Shiny module



Recap:

- **ggplot2: geoms, scales, facets, themes**
- **comment chercher de l'aide**

Atelier: jeudi 5 novembre, 14h !

Tous les exercices et infos sur <https://rrr.mbb.cnrs.fr>