



ggplot Wizardry

Extended Version

My Favorite Tricks and Secrets for Beautiful Plots in R

Dr. Cédric Scherer



Use  slo



MeetUp March 25, 2021

Image: Freepik.com

Scientist by Training



Computational Ecology at the Leibniz
Institute for Zoo and Wildlife Research

DataVizard by Heart



Self-employed Data Visualization
Designer & Workshop Instructor

99% R | 95% ggplot2



2008 – my first time using R

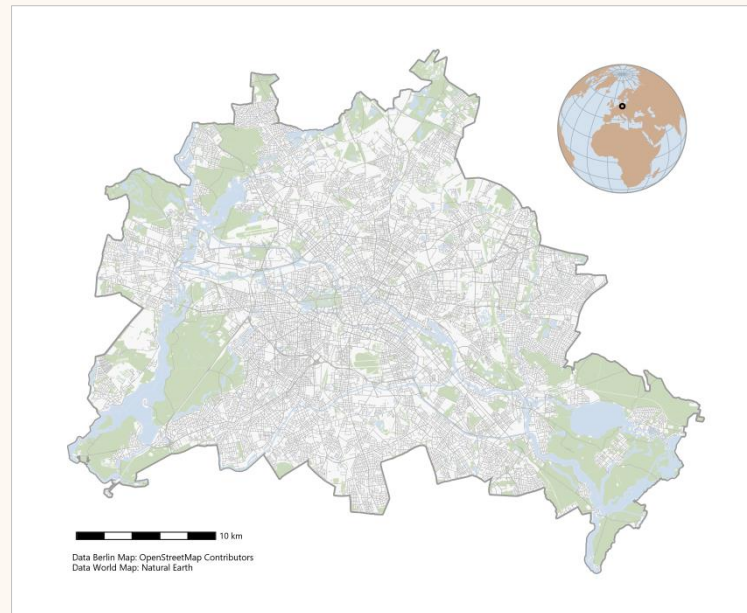
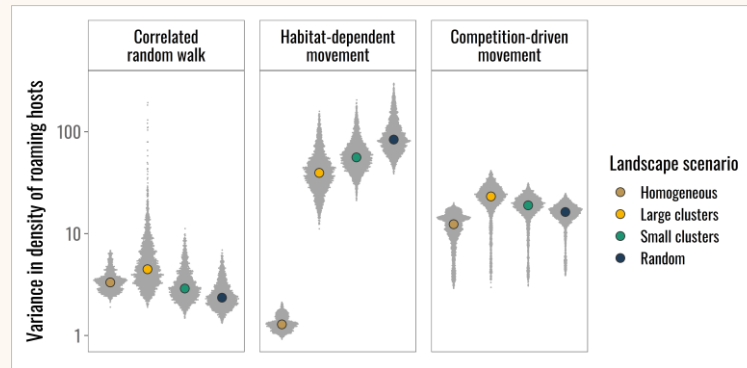
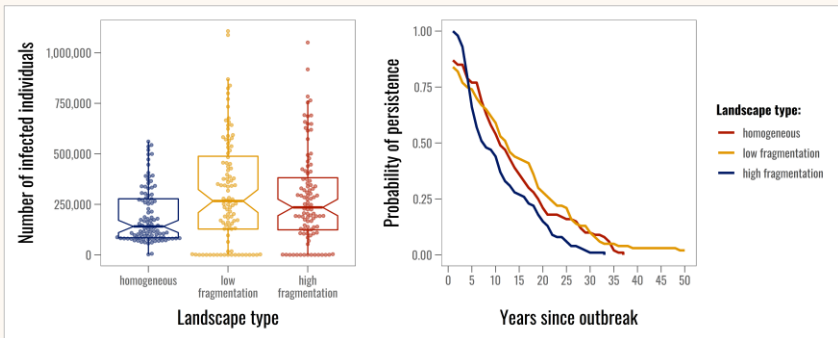
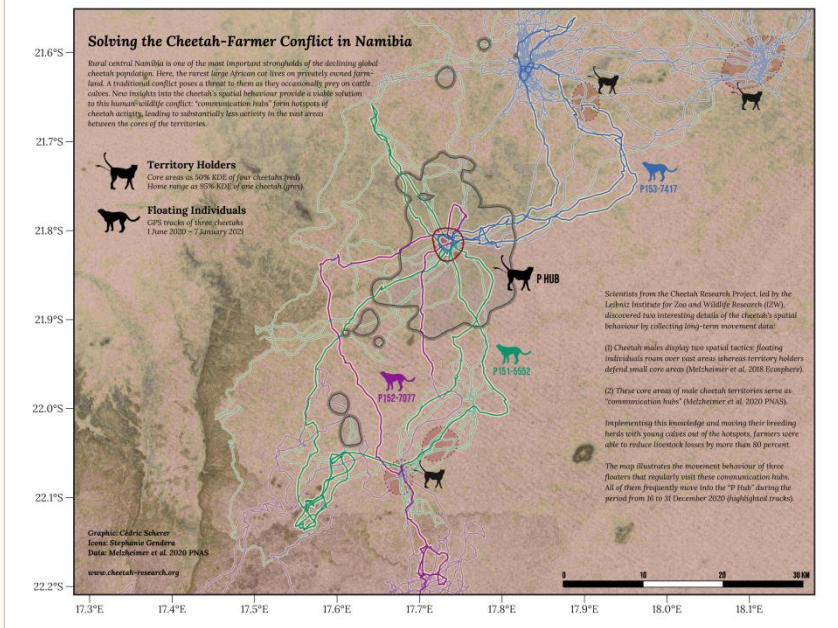
2011 – frequent use of base R

2016 – discovered ggplot2 +
rest of the tidyverse

2019 – using ggplot2 every day

2020 – freelancing with ggplot2
designs + courses





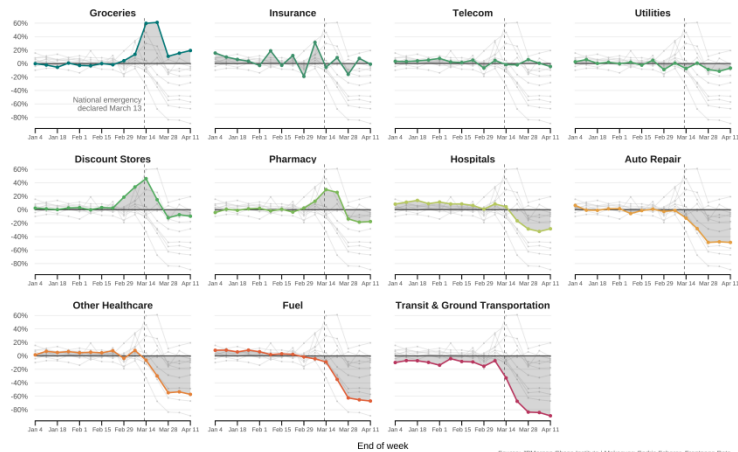
Top left:
[BES MoveMap Contest](#) –
Winner “Pretty Map” and
Runner-Up “Rmap”

Top right:
Scherer, Radchuk, Franz,
Thulke, Lange, Grimm &
Kramer-Schadt (2020)
[Oikos 129 \(5\):651–667](#)
(modified)

Bottom left:
Sciaini, Fritsch, Scherer
& Simpkins (2018)
[Methods in Ecology and
Evolution 9 \(11\):2240–
2248](#) (modified)

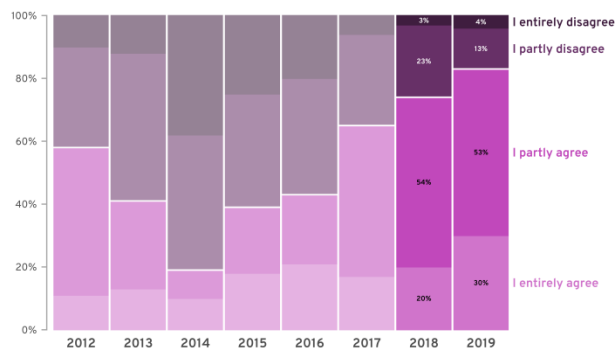
Bottom right:
Package to create
template maps of Berlin

Year-over-year percent change in spending by essential category



Do you agree with the following statement?

"The price of banking services will fall."



Source: Ernst & Young Global Limited | Makeover: Cedric Scherer, Frontpage Data

Upper row:

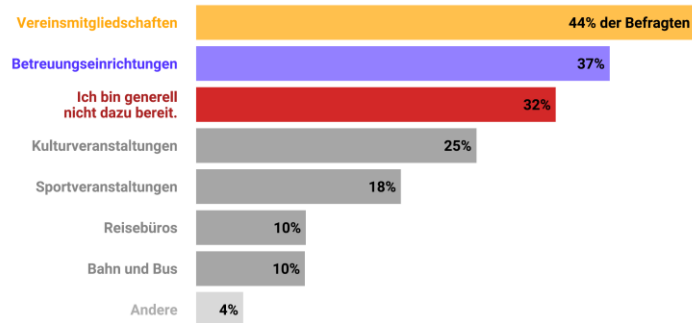
[Makeover examples for FrontPage Data](#)

Lower row:

[Survey on contract termination during the COVID-19 pandemic for kuendigung.org](#)

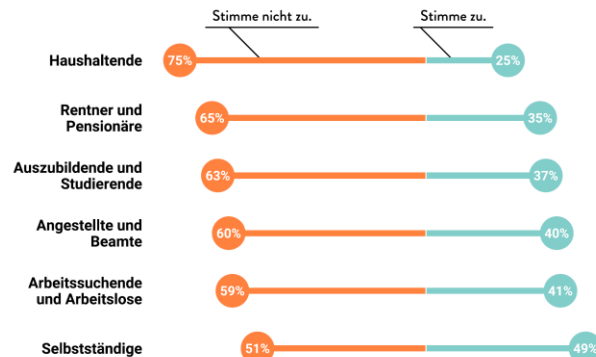
Ich bin bei diesen Betrieben bereit auf eine Rückerstattung zu verzichten.

(Mehrfachauswahl möglich)



Basierend auf 2064 Antworten auf eine Umfrage von KUENDIGUNG.ORG

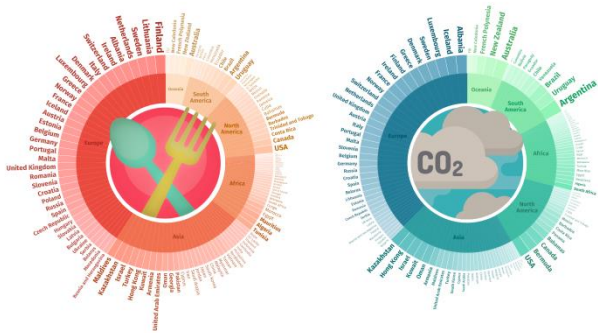
Der Eventim-Chef Klaus-Peter Schulenberg sagt, dass die Pflicht zur Ticketerstattung der Kultur in Deutschland dauerhaft schadet.



Basierend auf 1057 Antworten auf eine Umfrage von KUENDIGUNG.ORG

Food Carbon Footprint Index 2018

Global comparison of different diets in terms of **Average Consumption (kg/person/year)** of both animal and non-animal products as well as **Carbon Emissions (kg CO₂/person/year)** per continent and country. Font size and color intensity indicate each country's estimate with **countries printed in bold** belonging to the upper 50% of consumers and CO₂ -emissioners, respectively.



Visualization by Cédric Scherer • Data by Food and Agriculture Organization of the United Nations (FAO) via nu3 • Icons by Freepik

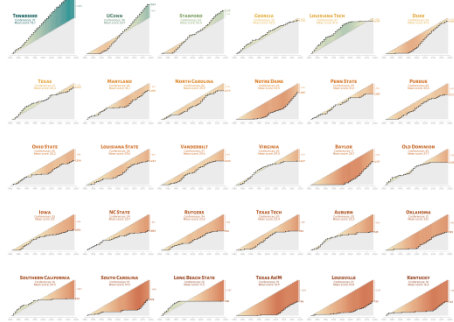
THE WHOLE WORLD IS GETTING WARMER

TEMPERATURE ANOMALIES BY COUNTRY (1980-2019 COMPARED TO 1960-1990 BASELINE)

Trends in US Spendings on Children Public Health Efforts 1997-2016



— THE RISE & FALL OF WOMEN'S COLLEGE BASKETBALL DYNASTIES —

[illegible]

Wind Turbines in Canada

Each vertical stripe contains the same number of wind turbines.



Visualization by Cédric Scherer - Data by Government of Canada

ggplot2

[gee–gee–plot–two]

an R package

is a ~~system~~ for declaratively creating graphics
based on “The Grammar of Graphics”.



cedricscherer.com



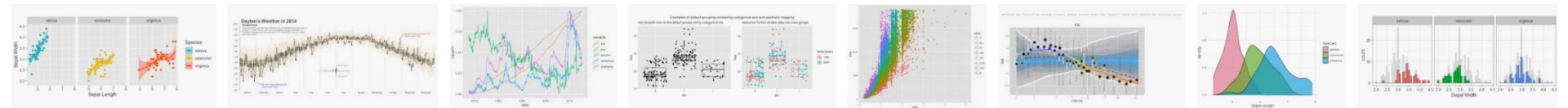
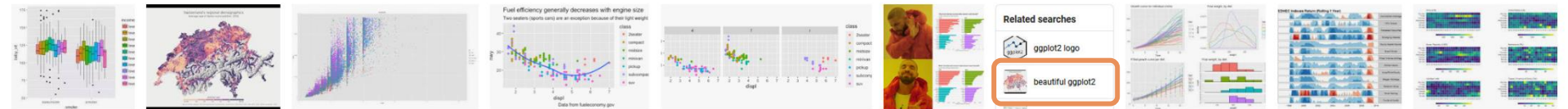
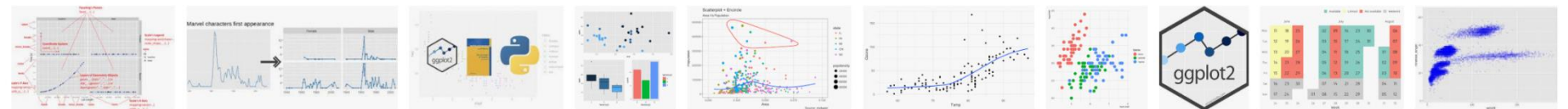
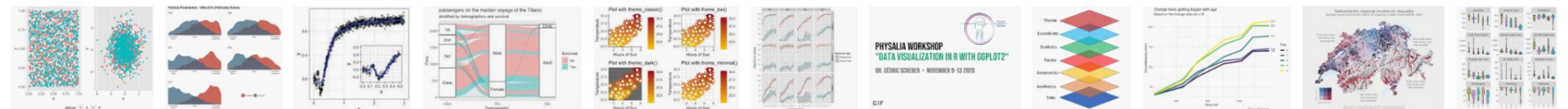
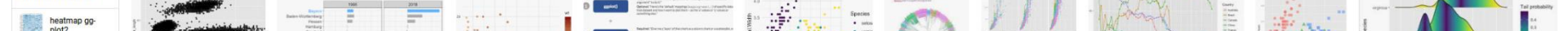
cedricphilippscherer@gmail.com



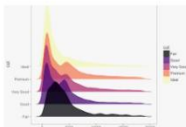
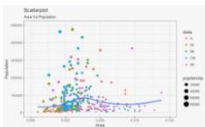
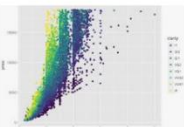
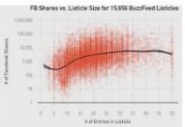
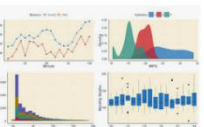
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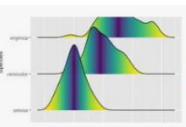
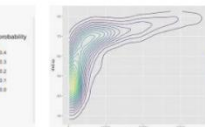
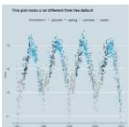
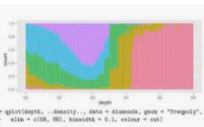
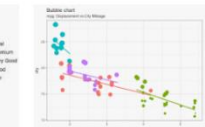
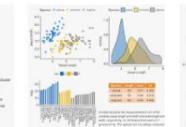
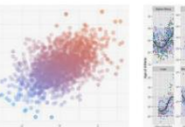


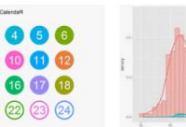
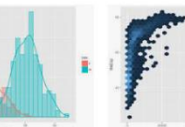
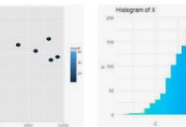
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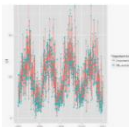
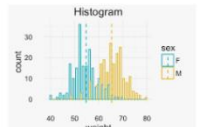
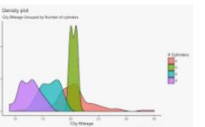
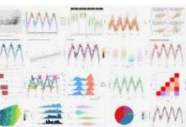
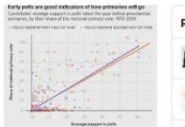
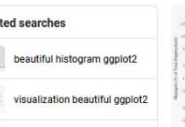
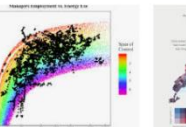
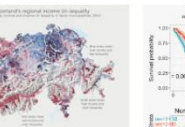
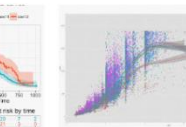
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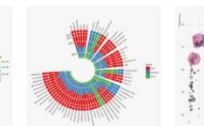
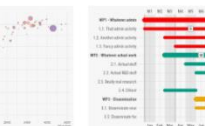
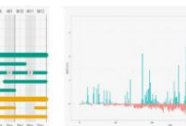
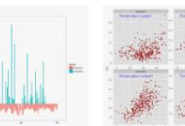
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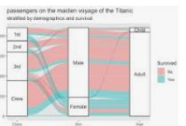
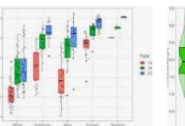
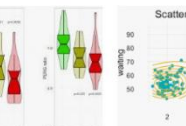
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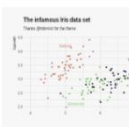
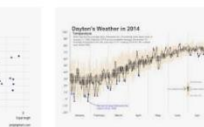
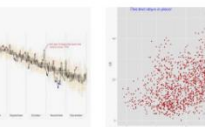
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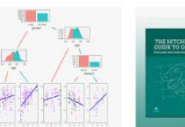
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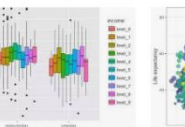
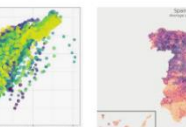
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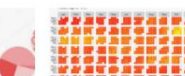
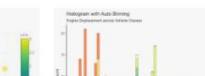
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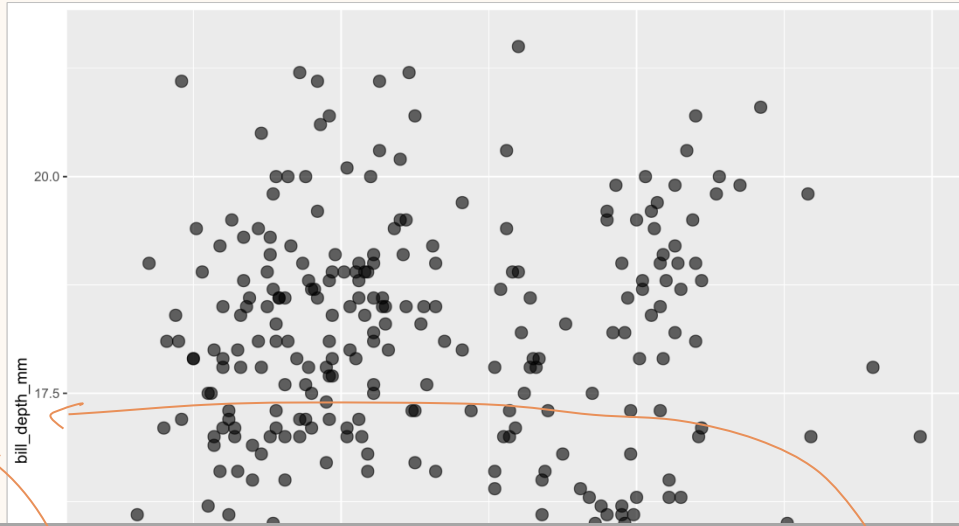
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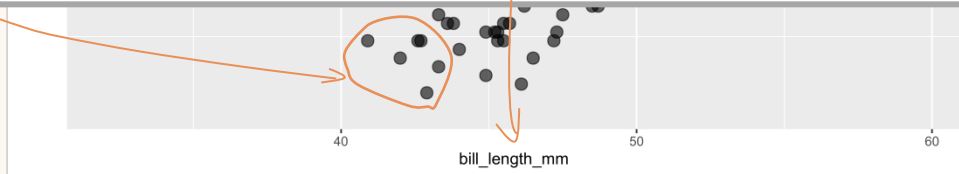
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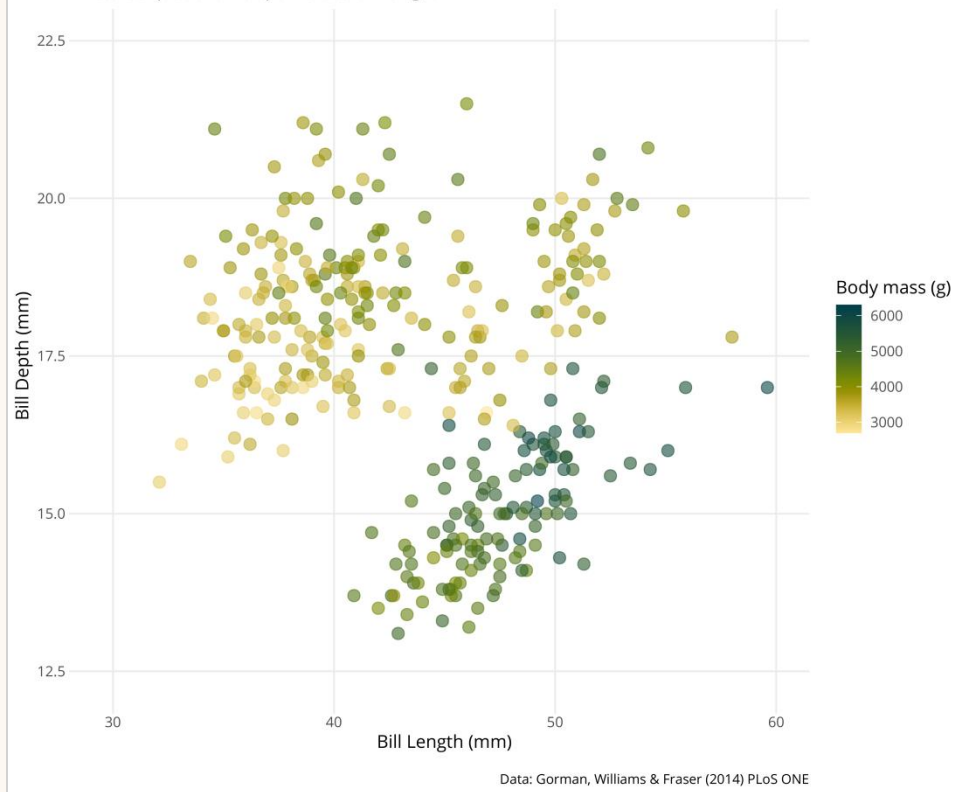
```
ggplot(data = penguins, aes(x = bill_length_mm, y = bill_depth_mm)) +  
  geom_point(alpha = .6)
```



You provide the data, tell ggplot2 how to map variables to aesthetics, what graphical primitives to use, and **it** takes care of the details.

Bill Dimensions of Brush-Tailed Penguins (Pygoscelis)

A scatter plot of bill depth versus bill length.



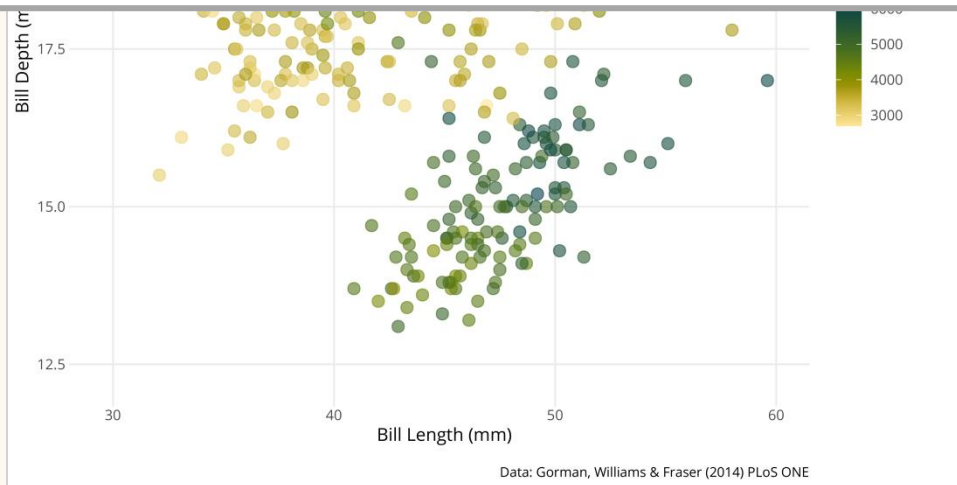
You provide the data, tell ggplot2 how to map variables to aesthetics, what graphical primitives to use, and **it** takes care of the details.

Bill Dimensions of Brush-Tailed Penguins (Pygoscelis)

A scatter plot of bill depth versus bill length.

22.5

```
ggplot(data = penguins, aes(x = bill_length_mm, y = bill_depth_mm)) +  
  geom_point(aes(color = body_mass_g), alpha = .6) +  
  ## custom colors  
  scico::scale_color_scico(palette = "bamako", direction = -1)
```



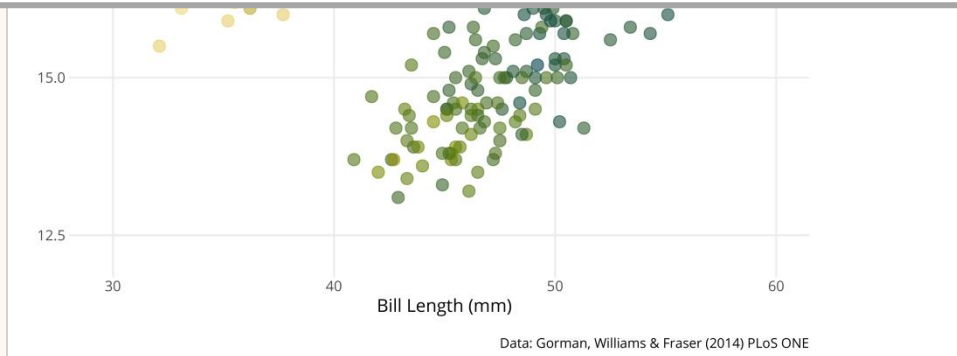
You provide the data, tell ggplot2 how to map variables to aesthetics, what graphical primitives to use, and **it** takes care of the details.

Bill Dimensions of Brush-Tailed Penguins (Pygoscelis)

A scatter plot of bill depth versus bill length.



```
ggplot(data = penguins, aes(x = bill_length_mm, y = bill_depth_mm)) +  
  geom_point(aes(color = body_mass_g), alpha = .6) +  
  ## custom colors  
  scico::scale_color_scico(palette = "bamako", direction = -1) +  
  ## custom axes scaling  
  scale_x_continuous(breaks = 3:6 * 10, limits = c(30, 60)) +  
  scale_y_continuous(breaks = seq(12.5, 22.5, by = 2.5), limits = c(12.5, 22.5))
```



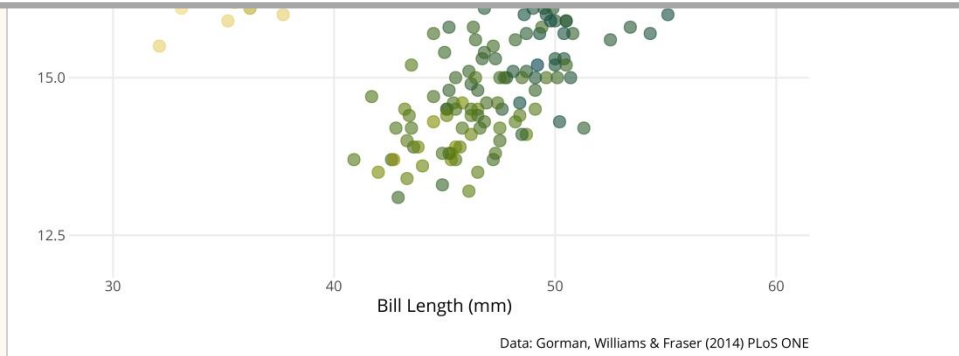
You provide the data, tell ggplot2 how to map variables to aesthetics, what graphical primitives to use, and **it** takes care of the details.

Bill Dimensions of Brush-Tailed Penguins (Pygoscelis)

A scatter plot of bill depth versus bill length.

22.5

```
ggplot(data = penguins, aes(x = bill_length_mm, y = bill_depth_mm)) +  
  geom_point(aes(color = body_mass_g), alpha = .6) +  
  ## custom colors  
  scico::scale_color_scico(palette = "bamako", direction = -1) +  
  ## custom axes scaling  
  scale_x_continuous(breaks = 3:6 * 10, limits = c(30, 60)) +  
  scale_y_continuous(breaks = seq(12.5, 22.5, by = 2.5), limits = c(12.5, 22.5))
```



You provide the data, tell ggplot2 how to map variables to aesthetics, what graphical primitives to use, and it takes care of the details.



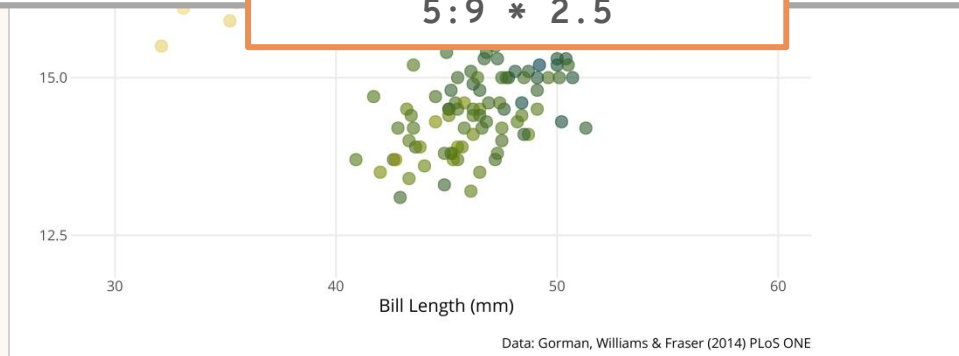
Bill Dimensions of Brush-Tailed Penguins (Pygoscelis)

A scatter plot of bill depth versus bill length.

22.5

```
ggplot(data = penguins, aes(x = bill_length_mm, y = bill_depth_mm)) +  
  geom_point(aes(color = body_mass_g), alpha = .6) +  
  ## custom colors  
  scico::scale_color_scico(palette = "bamako", direction = -1) +  
  ## custom axes scaling  
  scale_x_continuous(breaks = 3:6 * 10, limits = c(30, 60)) +  
  scale_y_continuous(breaks = seq(12.5, 22.5, by = 2.5), limits = c(12.5, 22.5))
```

$5:9 * 2.5$



You provide the data, tell ggplot2 how to map variables to aesthetics, what graphical primitives to use, and it takes care of the details.

Bill Dimensions of Brush-Tailed Penguins (Pygoscelis)

A scatter plot of bill depth versus bill length.

22.5

```
ggplot(data = penguins, aes(x = bill_length_mm, y = bill_depth_mm)) +  
  geom_point(aes(color = body_mass_g), alpha = .6) +  
  ## custom colors  
  scico::scale_color_scico(palette = "bamako", direction = -1) +  
  ## custom axes scaling  
  scale_x_continuous(breaks = 3:6 * 10, limits = c(30, 60)) +  
  scale_y_continuous(breaks = seq(12.5, 22.5, by = 2.5), limits = c(12.5, 22.5)) +  
  ## custom labels  
  labs(  
    title = 'Bill Dimensions of Brush-Tailed Penguins (Pygoscelis)',  
    subtitle = 'A scatter plot of bill depth versus bill length.',  
    caption = 'Data: Gorman, Williams & Fraser (2014) PLoS ONE',  
    x = 'Bill Length (mm)',  
    y = 'Bill Depth (mm)',  
    color = 'Body mass (g)'  
  )
```

You provide the data, tell ggplot2 how to map variables to aesthetics, what graphical primitives to use, and **it** takes care of the details.

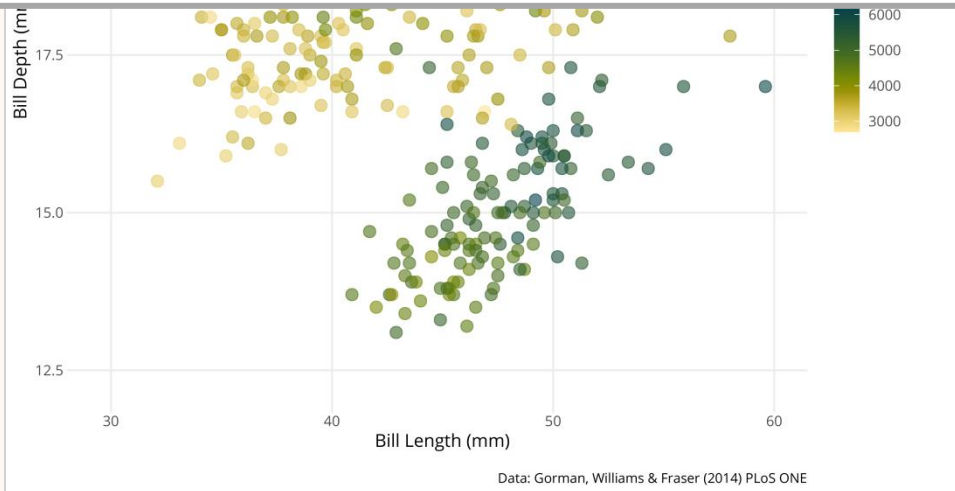
Bill Dimensions of Brush-Tailed Penguins (Pygoscelis)

A scatter plot of bill depth versus bill length.



Run before plotting!
(or add via +)

```
## change global theme settings (for all following plots)
theme_set(theme_minimal(base_size = 12, base_family = "Open Sans"))
```



You provide the data, tell ggplot2 how to map variables to aesthetics, what graphical primitives to use, and **it** takes care of the details.

Bill Dimensions of Brush-Tailed Penguins (Pygoscelis)

A scatter plot of bill depth versus bill length.



Run before plotting!
(or add via +)

```
## change global theme settings (for all following plots)
theme_set(theme_minimal(base_size = 12, base_family = "Open Sans"))

## modify plot elements globally (for all following plots)
theme_update(
  axis.ticks = element_line(color = "grey92"),
  axis.ticks.length = unit(.5, "lines"),
  panel.grid.minor = element_blank(),
  legend.title = element_text(size = 12),
  legend.text = element_text(color = "grey30"),
  plot.title = element_text(size = 18, face = "bold"),
  plot.subtitle = element_text(size = 12, color = "grey30"),
  plot.caption = element_text(size = 9, margin = margin(t = 15))
)
```

You provide the data, tell ggplot2 how to map variables to aesthetics,
what graphical primitives to use, and **it** takes care of the details.

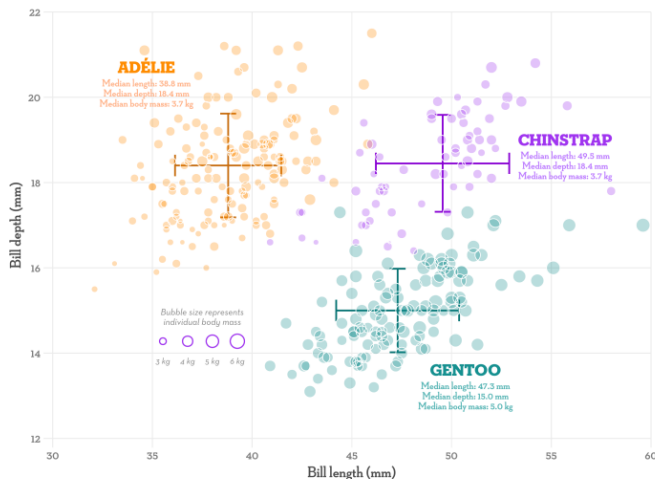
BILL DIMENSIONS OF BRUSH-TAILED PENGUINS

Pygoscelis adeliae (Adélie penguin) • *P. antarctica* (Chinstrap penguin) • *P. papua* (Gentoo penguin)

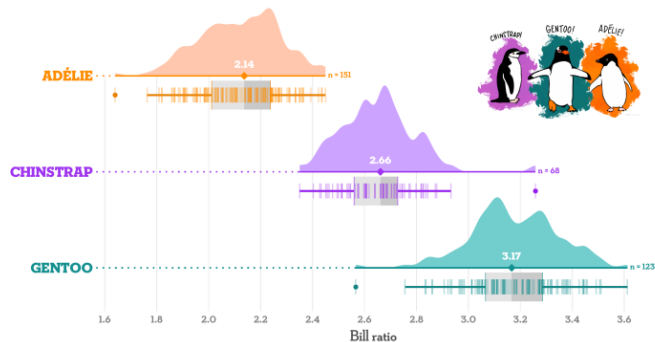


Note: In this size data, bill dimensions are recorded as "culmen length" and "culmen depth". The culmen is the upper ridge along the bill.

A. Scatterplot of bill length versus bill depth (median $\pm$ sd)



B. Distribution of the bill ratio, estimated as bill length divided by bill depth

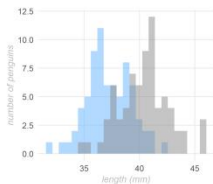


Note: In the original data, bill dimensions are recorded as "culmen length" and "culmen depth". The culmen is the dorsal (upper) ridge of a bird's bill.
Visualization: Cédric Scherer • Data: Gorman, Williams & Fraser (2014) DOI:10.1371/journal.pone.0090081 • Illustrations: Allison Horst

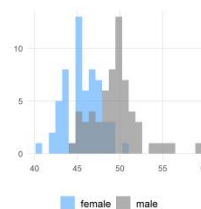
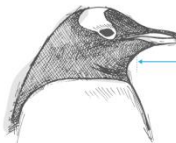
Palmer Penguins Bill Length

Palmer Archipelago is a group of islands off the northwestern coast of the Antarctic Peninsula. The histograms show that females has shorter bills than males in every species.

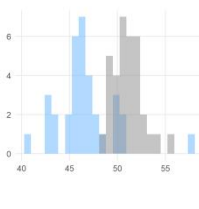
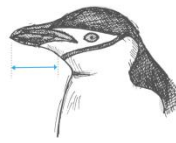
ADELIE



GENTOO



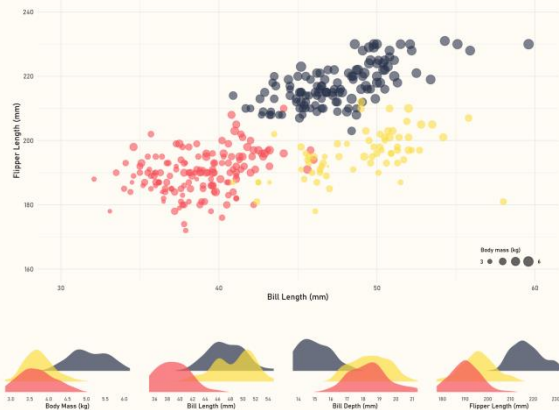
CHINSTRAP



Visualization: Laura Navarro Soler | Data: Gorman, Williams & Fraser (2014)

Measurements of body mass, bill length, bill depth, and flipper length in Adélie, Gentoo, and Chinstrap penguins, collected from 3 islands in the Palmer Archipelago, Antarctica.

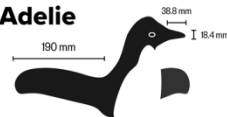
Date: Dr. K. Gorman, Dr. A. Horst, & Dr. A. Hill: allisonhorst@palmerpenguins
Visualization: Joseph Shaw / @JosephShaw



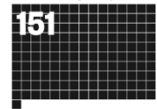
Palmer Penguins

Median length of flipper, length and depth of bill, of 342 penguins recorded between 2007 and 2009

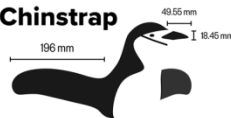
Adelie



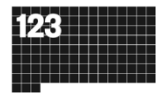
Recorded penguins by species



Chinstrap



Gentoo



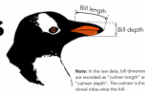
Source: Dr. Kristen Gorman and the Palmer Station, Antarctica LTER; Graphic: Georgios Karamanis

#TidyTuesday Contributions by

- ← myself
- ↖ Laura Navarro
- ↗ Joe Shaw
- ↓ Georgios Karamanis

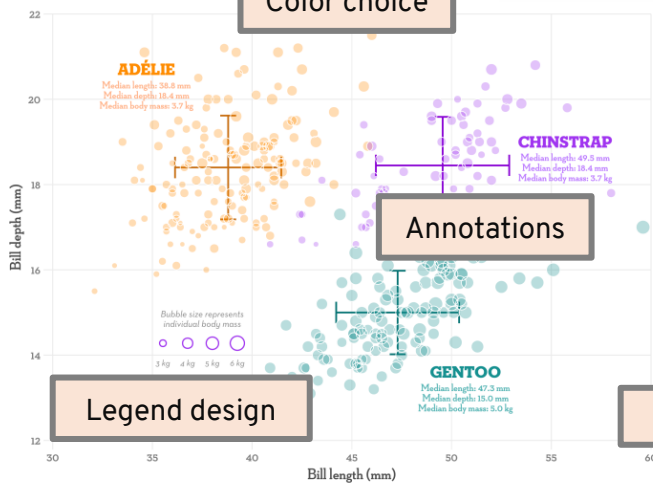
BILL DIMENSIONS OF BRUSH-TAILED PENGUINS

Pygoscelis adeliae (Adélie penguin) • *P. antarctica* (Chinstrap penguin) • *P. papua* (Gentoo penguin)

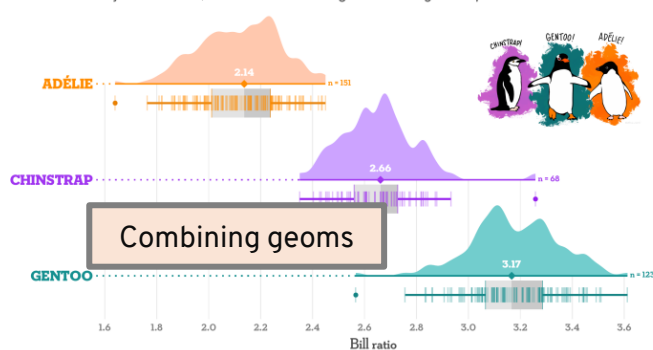


Bill length
Bill depth

A. Scatterplot of bill length versus bill depth



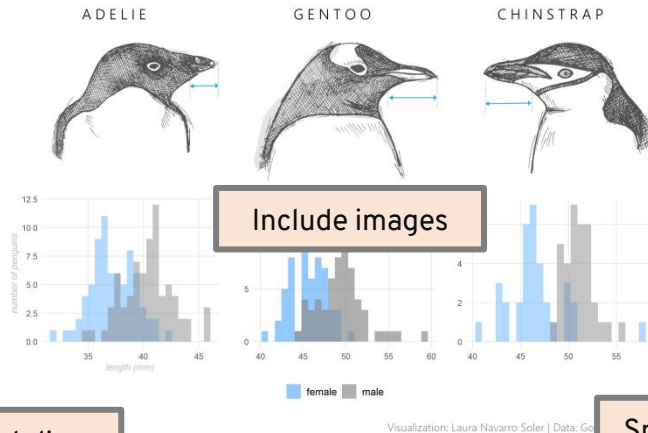
B. Distribution of the bill ratio, estimated as bill length divided by bill depth



Note: In the original data, bill dimensions are recorded as "culmen length" and "culmen depth". The culmen is the dorsal (upper) ridge of a bird's bill.
Visualization: Cedric Scherer • Data: Gorman, Williams & Fraser (2014) DOI:10.1371/journal.pone.0090081 • Illustrations: Allison Horst

Palmer Penguins Bill Length

Palmer Archipelago is a group of islands off the northwestern coast of the Antarctic Peninsula. The histograms show that females has shorter bills than males in every species.

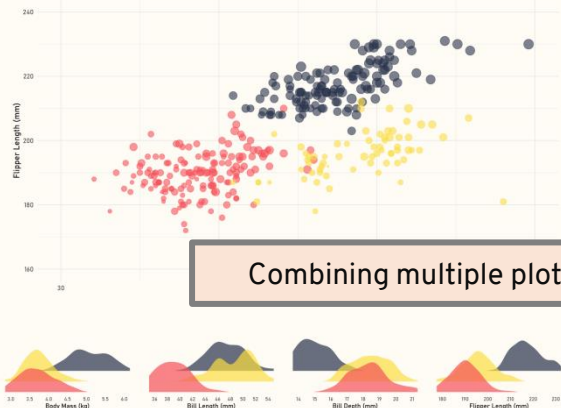


Text styling

Measurements of body mass, bill length, bill depth, and flipper length in **Adélie**, **Gentoo**, and **Chinstrap** penguins, collected from 3 islands in the Palmer Archipelago, Antarctica.

Date: Dr. K. Gorman, Dr. A. Horst, & Dr. A. Hill; allisonhorst@palmer-penguins

Visualization: Joseph Shaw / @JosephShaw



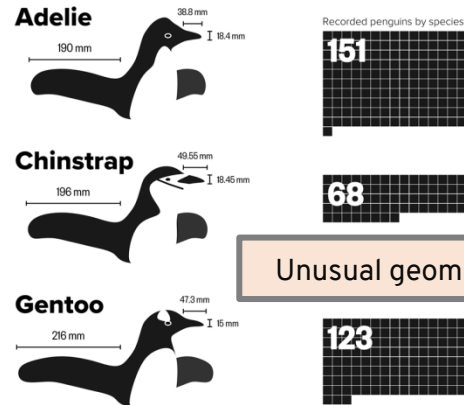
Spacing

#TidyTuesday Contributions by

- ← myself
- ↖ Laura Navarro
- ↗ Joe Shaw
- ↓ Georgios Karamanis

Palmer Penguins

Median length of flipper, length and depth of bill, of 342 penguins recorded between 2007 and 2009



Source: Dr. Kristen Gorman and the Palmer Station, Antarctica LTER | Graphic: Georgios Karamanis

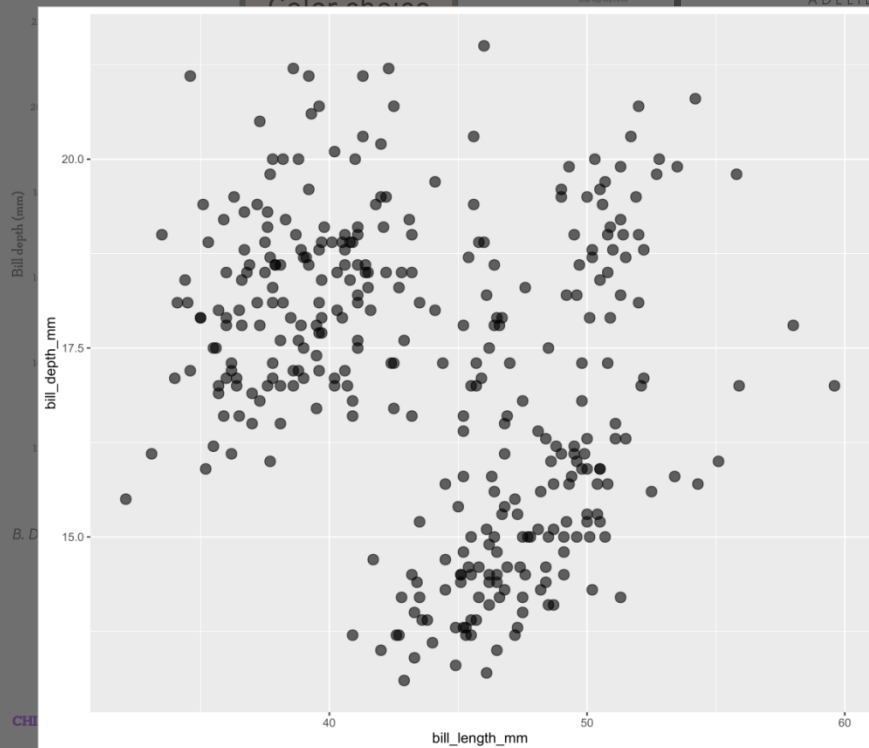
BILL DIMENSIONS OF BRUSH-TAILED PENGUINS

Pygoscelis adeliae (Adelie penguin) • *P. antarctica* (Chinstrap penguin) • *P. papua* (Gentoo penguin)



Note: In the original data, bill dimensions are recorded as "culmen length" and "culmen depth". The culmen is the dorsal (upper) edge of a bird's bill.

A. Scatterplot of bill length versus bill depth



Palmer Penguins Bill Length

Palmer Archipelago is a group of islands off the northwestern coast of the Antarctic Peninsula. The histograms show that females has shorter bills than males in every species.

ADELIE

GENTOO

CHINSTRAP

How to draw an owl

1.



2.



1. Draw some circles

2. Draw the rest of the owl

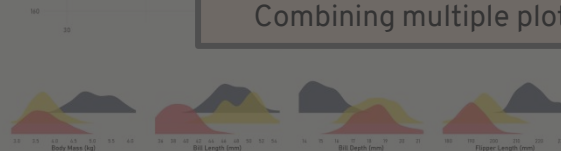
Combining geoms

GENTOO



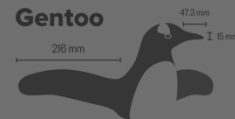
Note: In the original data, bill dimensions are recorded as "culmen length" and "culmen depth". The culmen is the dorsal (upper) edge of a bird's bill.
Visualization: Gabriel Scholer • Data: G. Williams & F. Fraser (2014) DOI: 10.1371/journal.pone.0090086 • Illustration: Adam Hunt

Combining multiple plots



Unusual geoms

Gentoo



123



Image by Sean McGrath

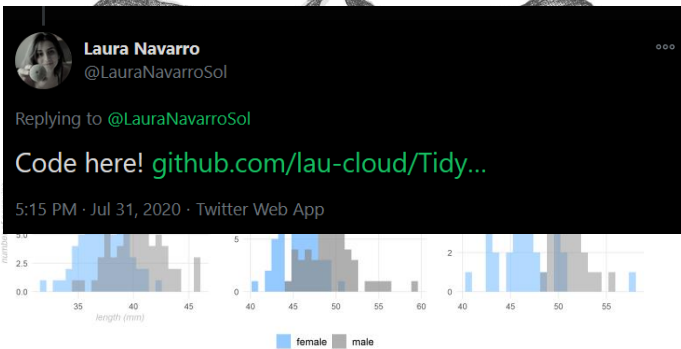
Palmer Penguins Bill Length

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ADELIE

GENTOO

CHINSTRAP

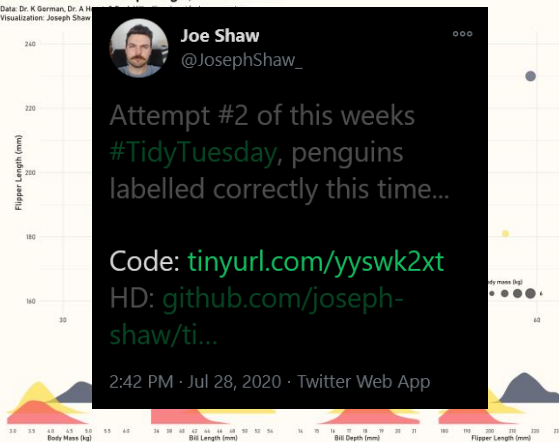


#TidyTuesday Contributions by

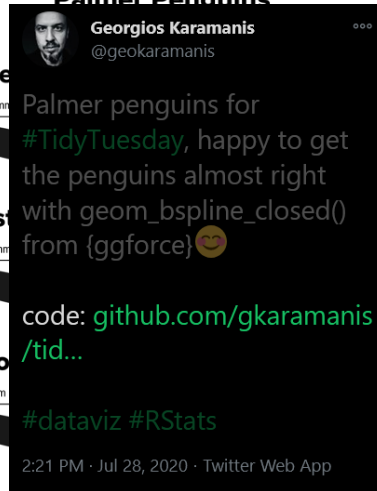
- ← myself
- ↖ Laura Navarro
- ↗ Joe Shaw
- ↓ Georgios Karamanis

Measurements of body mass, bill length, bill depth, and flipper length in **Adelie**, **Gentoo**, and **Chinstrap** penguins, collected from 3 islands in the Palmer Archipelago, Antarctica.

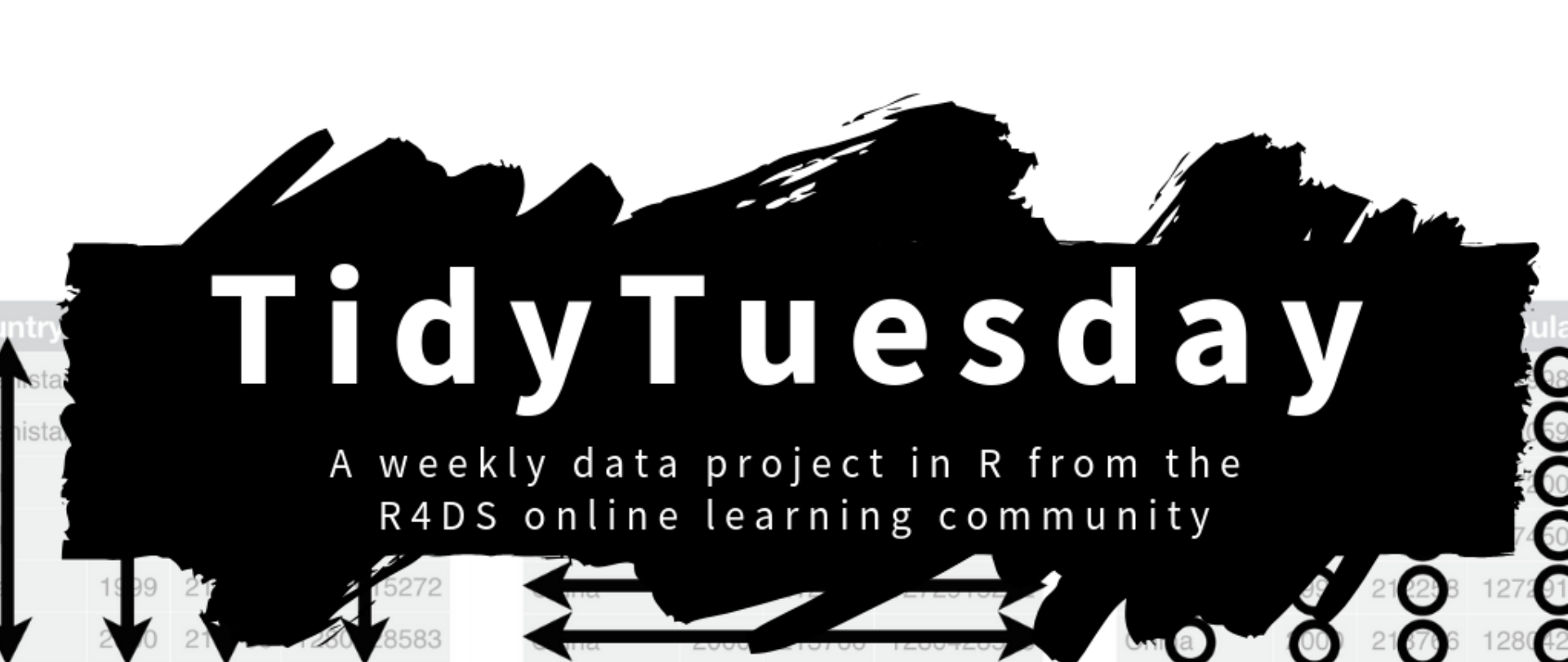
Date: Dr. K. Gorman, Dr. A. H. Williams & Dr. J. Fraser (2014)
Visualization: Joseph Shaw



Palmer Penguins



Source: Dr. K. Gorman and the Palmer Station, Antarctica LTER / Graphs: Georgios Karamanis



TidyTuesday

A weekly data project in R from the
R4DS online learning community

[#TIDYTUESDAY](#) on Twitter • [RFORDATASCIENCE/TIDYTUESDAY](#) on GitHub • [R4DS](#) on Slack



“I’m not looking to necessarily practice my skills as much as I am **to be inspired and know what I can do** based on what other people share.”

P3 in *Proc. ACM Hum.-Comput. Interact.* 37, 4, Article 111

[#TIDYTUESDAY](#) on Twitter • [RFORDATASCIENCE/TIDYTUESDAY](#) on GitHub • [R4DS](#) on Slack



“#TidyTuesday became a ‘choose your own adventure game’, which allowed participants to ‘pursue something really weird’ beyond traditional visualizations.”

I17 and P16 in *Proc. ACM Hum.-Comput. Interact.* 37, 4, Article 111

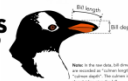
[#TIDYTUESDAY](#) on Twitter • [RFORDATASCIENCE/TIDYTUESDAY](#) on GitHub • [R4DS](#) on Slack



The Showcase

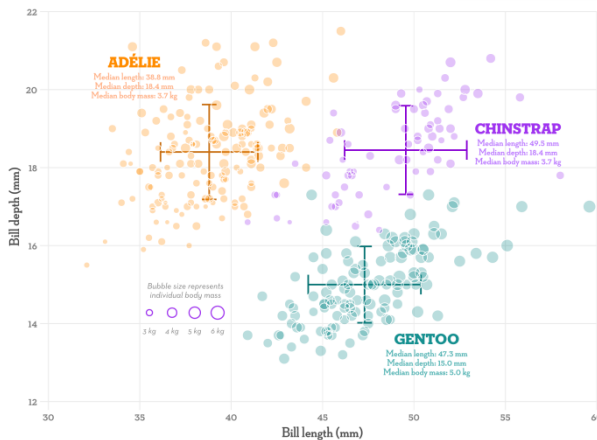
BILL DIMENSIONS OF BRUSH-TAILED PENGUINS

Pygoscelis adeliae (Adélie penguin) • *P. antarctica* (Chinstrap penguin) • *P. papua* (Gentoo penguin)

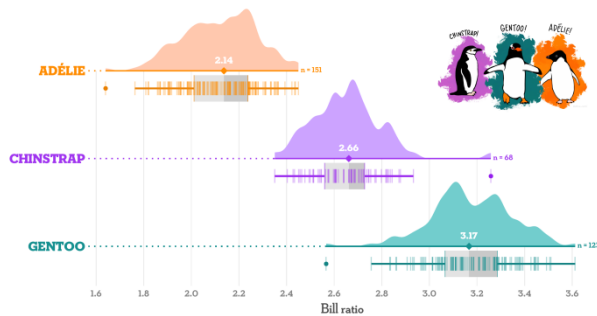


Note: In the main plot, bill dimensions are recorded as "culmen length" and "culmen depth". The culmen is the dorsal ridge along the bill.

A. Scatterplot of bill length versus bill depth (median $\pm$ sd)



B. Distribution of the bill ratio, estimated as bill length divided by bill depth



Note: In the original data, bill dimensions are recorded as "culmen length" and "culmen depth". The culmen is the dorsal (upper) ridge of a bird's bill.
Visualization: Cedric Scherer • Data: Gorman, Williams & Fraser (2014) DOI: 10.1371/journal.pone.0090081 • Illustrations: Allison Horst

with the help of
{ggdist} & {ggtext} & {patchwork}

mjskay.github.io/ggdist

wilkelab.org/ggtext/

patchwork.data-imagist.com

My Contribution to #TidyTuesday 2020/31

Thorsten Sprenger

The Showcase

Treemaps

The Tate Collection's Artists



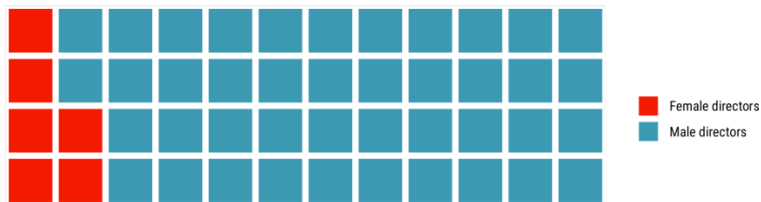
How to read:
Each rectangle represents an artist
The size represents the number of artworks
The color represents the gender of the artist, female or male

Data Source: Tate Art Museum (github.com/tategallery/collection) | Design: Yobanny Samano

The Showcase

Waffle Charts

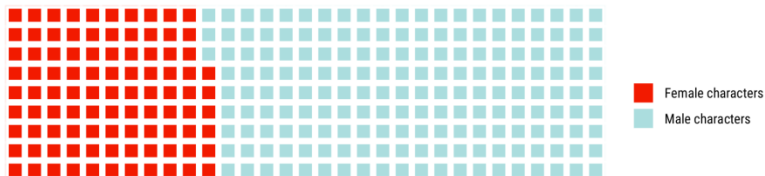
Directors of The Office



Writers of The Office



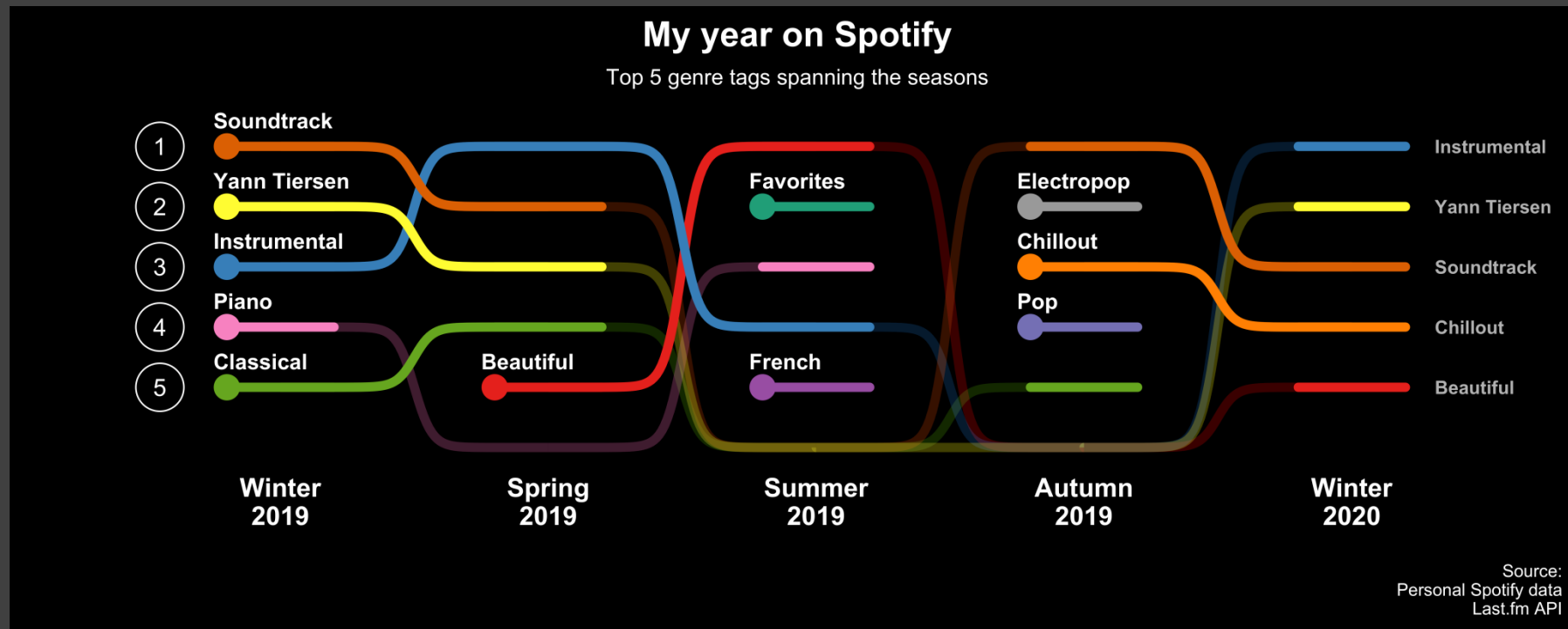
Characters of The Office



One square represents one person • Data by {schrute} • Plot by @AnnaHenschel

The Showcase

Bump Charts



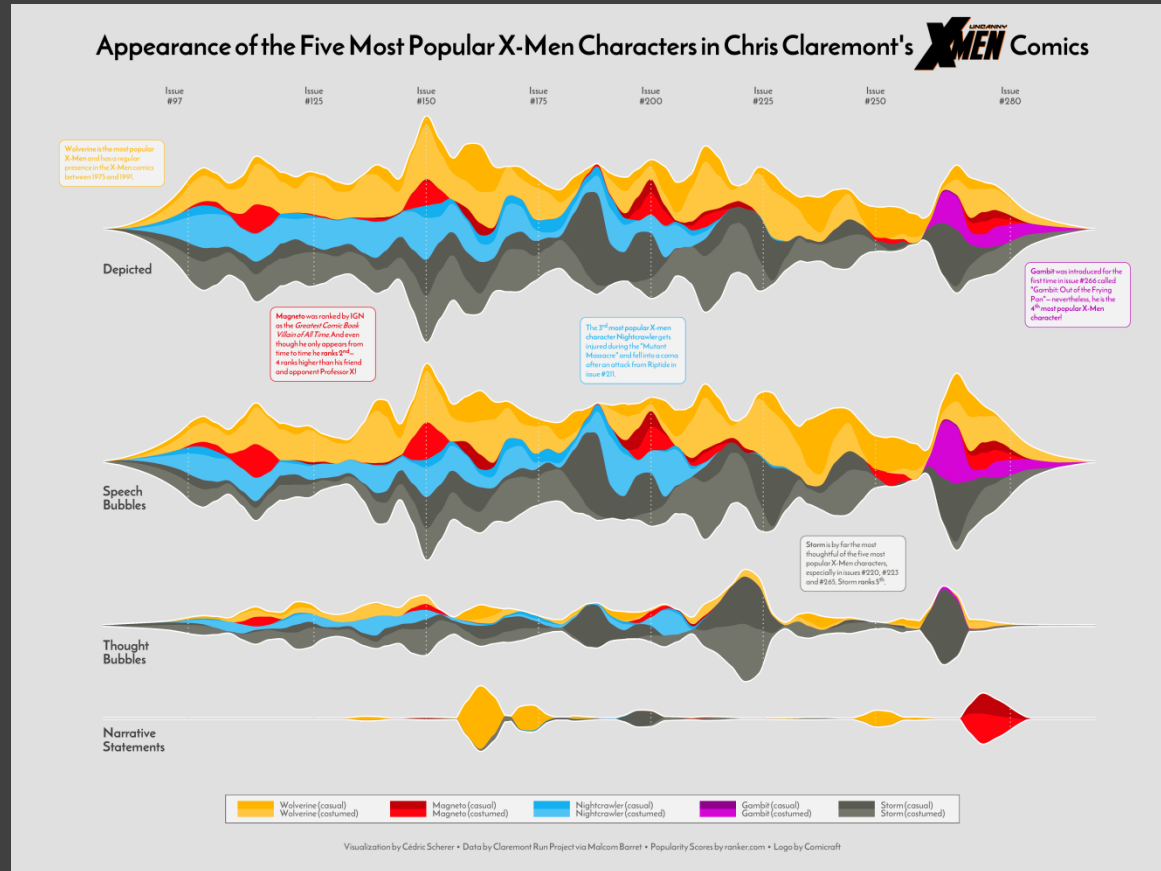
David Sjöberg

with the help of
{ggbumb}

github.com/davidsjoberg/ggbump

The Showcase

Streamgraphs



with the help of
{ggstream}

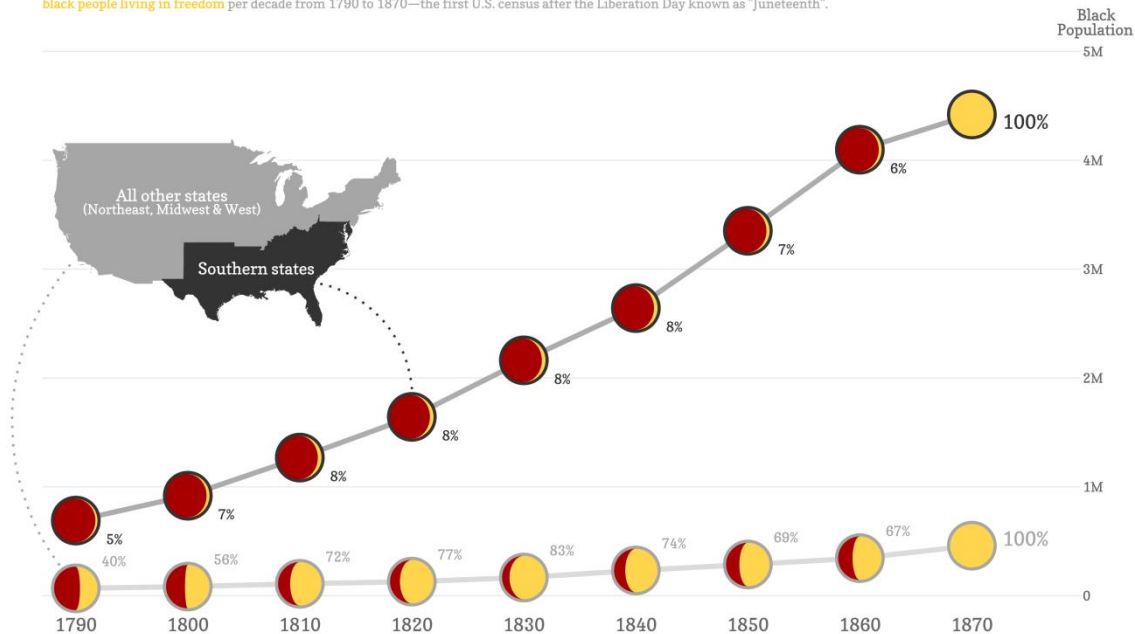
github.com/davidsjoberg/ggstream

My Contribution to #TidyTuesday 2020/27

The Showcase

Streamgraphs

By 1680, property owners in the south of North America began establishing plantation farms for cash crops like tobacco, cotton, and sugar cane—enterprises that required increasing amounts of labor. To meet the need, wealthy planters became slave traders and imported ever more individuals to the colonies, the vast majority from West Africa. While the "Emancipation Proclamation" was made law as of 1863, slave owners in the South, namely Texas, still maintained slavery until June 19th 1865 when Union soldiers were able to enforce the law abolishing slavery in the region. The graphic below shows the share of **black people in slavery**, most of them enslaved in the Southern states, and **black people living in freedom** per decade from 1790 to 1870—the first U.S. census after the Liberation Day known as "Juneteenth".



#JUNETEENTH #BLACKLIVESMATTER

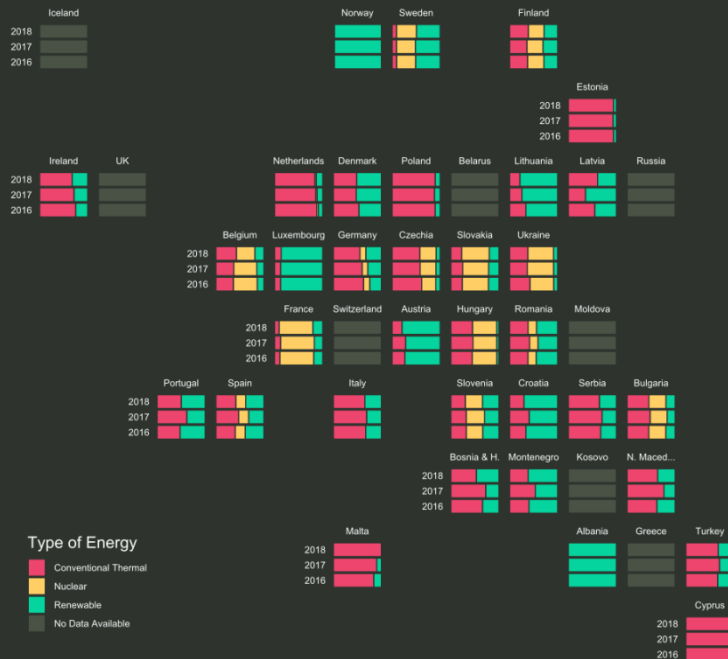
Graphic: Cédric Scherer • Source: U.S. Census Bureau

The Showcase

Geofacets

EUROPEAN ENERGY GENERATION

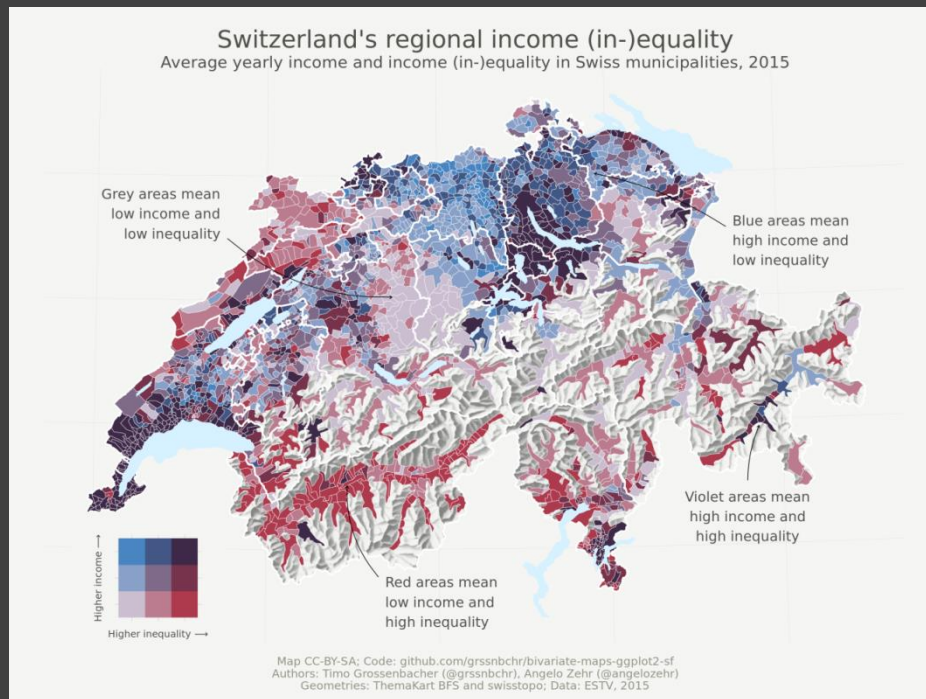
Each bar represents the total energy generation for each country per year.
The colours represent the proportion of energy generated a) using **conventional thermal power plants**, which is to say those that use coal, oil or natural gas, b) using **nuclear power stations**, and c) using other **renewable sources**.



Data from "Electricity generation - statistics - First Results" (ec.europa.eu/eurostat/statistics-explained)
Visualisation by: Jack Davison (@Twitter_gg_JDavison_)
Code found at: github.com/jack-davison

The Showcase

Maps



Timo Grossenbacher
(timogrossenbacher.ch/2019/04/bivariate-maps-with-ggplot2-and-sf)

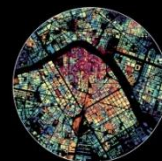
Barcelona



Málaga



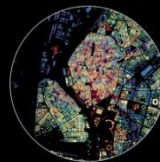
Valencia



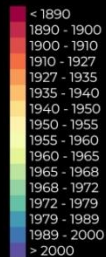
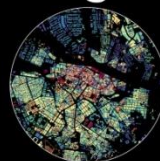
Madrid



Sevilla



Zaragoza



Dominic Royé (@dr_xeo) | Data: Catastro INSPIRE

Dominic Royé
(dominicroye.github.io/en/2019/visualize-urban-growth/)

The Showcase

Cartograms

What do most people die from?

Cardiovascular Diseases



Cancers



Diabetes

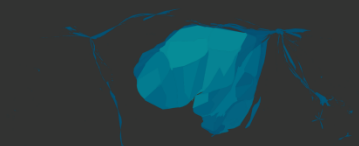


The leading causes of death across the world still vary significantly.
These cartograms show causes of deaths in 2016 that exceeded 20 percent of total deaths in at least 1 country.

HIV Infections & Aids



Malaria Infections



Wars & Conflicts



Share of Deaths



The data refers to the specific cause of death, which is distinguished from risk factors for death, such as air pollution, diet and other lifestyle factors.

Visualization by Cédric Scherer • Data by OurWorldInData.org

with the help of
{cartogram}

github.com/sjewo/cartogram

My Contribution to the #30DayMapChallenge 2019, Topic *Polygons*

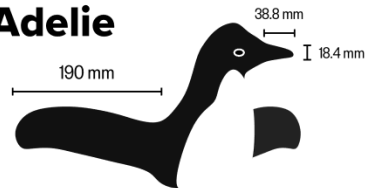
The Showcase

Drawings

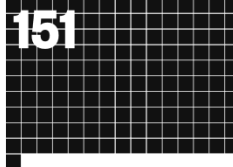
Palmer Penguins

Median length of flipper, length and depth of bill,
of 342 penguins recorded between 2007 and 2009

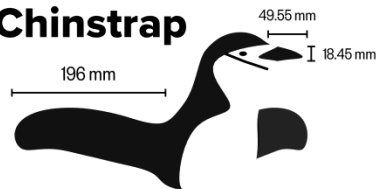
Adelie



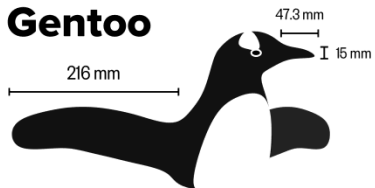
Recorded penguins by species



Chinstrap



Gentoo



Source: Dr. Kristen Gorman and the Palmer Station, Antarctica LTER | Graphic: Georgios Karamanis

Georgios Karamanis

The Showcase

Tables

Tour de France Winners

Source: alastairrushworth.tdf.kaggle.com/jaminliu | Graphic: Georgios Karamanis

YEAR	DISTANCE	WINNER	TEAM	AVERAGE SPEED	TOTAL TIME	YEAR
1903	0	8000 km		0	60 km/h	0
1904	•2428	Maurice Garis (FRA)	La Française			1903
1905		Henri Cornet (FRA)	Corte	25.3	•96.1	1904
1906		André Pottier (FRA)	Peugeot-Malher			1905
1907	•4488	Lucien Petit-Breton (FRA)	Peugeot-Malher			1906
1908		Lucien Petit-Breton (FRA)	Peugeot-Malher			1907
1909		Frédéric Faure (LUX)	Alcyon-Buhalp			1908
1910	•4734	Octave Lapize (FRA)	Alcyon-Buhalp			1909
1911		Octave Lapize (FRA)	Alcyon-Buhalp			1910
1912		Gustaaf Serfontein (BEL)	Alcyon-Buhalp			1911
1913		Gustaaf Serfontein (BEL)	Alcyon-Buhalp	26.7	•197.9	1912
1914	•5287	Philippe Thys (BEL)	Peugeot-Malher			1913
1915		Philippe Thys (BEL)	Peugeot-Malher			1914
1915-1918 Tour suspended because of World War I						
1919		Firmin Lambet (BEL)	La Sportive			1918
1920	•5583	Philippe Thys (BEL)	La Sportive	24.1	•228.4	1919
1921		Jean Scieur (BEL)	La Sportive			1920
1922		Firmin Lambet (BEL)	Peugeot-Malher			1921
1923	•5384	Henri Pélissier (FRA)	Automoto-Hutchinson	24.2	•222.3	1922
1924		Ottavio Bottecchia (ITA)	Automoto			1923
1925		Ottavio Bottecchia (ITA)	Automoto-Hutchinson			1924
1926	•5745	Lucien Boryse (BEL)	Automoto-Hutchinson	24.1	•238.7	1925
1927		Nicolas Frenet (LUX)	Alcyon-Buhalp			1926
1928		Nicolas Frenet (LUX)	Alcyon-Buhalp			1927
1929	•5286	Maurice De Maess (BEL)	Alcyon-Buhalp	28.3	•186.7	1928
1930		André Lehoucq (FRA)	Alcyon-Buhalp			1929
1931		Antoine Magne (FRA)	France			1930
1932	•4479	André Lehoucq (FRA)	France	29	•154.2	1931
1933		Georges Spillacher (FRA)	France			1932
1934		Antoine Magne (FRA)	France			1933
1935	•4338	Romain Maes (BEL)	Belgium	28.7	•143.4	1934
1936		Sylvère Maes (BEL)	Belgium			1935
1937		Roger Laessle (FRA)	France			1936
1938	•4494	Gino Bartali (ITA)	Italy	31.6	•148.5	1937
1939		Sylvère Maes (BEL)	Belgium			1938
1940-1946 Tour suspended because of World War II						
1947		Jean Robic (FRA)	France			1946
1948	•4922	Gino Bartali (ITA)	Italy	31.6	•147.2	1947
1949		Fausto Coppi (ITA)	Italy			1948
1950		Ferdinand Kübler (CHE)	Switzerland			1949
1951	•4490	Hugo Koblet (CHE)	Switzerland	32.9	•142.3	1950
1952		Fausto Coppi (ITA)	Italy			1951
1953		Lucien Robet (FRA)	France			1952
1954	•4856	Lucien Robet (FRA)	France	33.2	•148.1	1953
1955		Lucien Robet (FRA)	France			1954
1956		Roger Rivalland (FRA)	France			1955
1957	•4449	Charles Saut (LUX)	Luxembourg	34.4	•135.7	1956
1958		Jacques Anquetil (FRA)	Spain			1957
1959		Federico Bahamontes (ESP)	Spain			1958
1960	•4373	Jacques Anquetil (FRA)	Italy	39.2	•132.1	1959
1961		Jacques Anquetil (FRA)	France			1960
1962		Jacques Anquetil (FRA)	Saint-Raphaël-Helyett-Hutchinson			1961
1963	•4138	Jacques Anquetil (FRA)	Saint-Raphaël-Litane-B. Geminiani	36.5	•133.5	1962
1964		Jacques Anquetil (FRA)	Saint-Raphaël-Litane-Buhalp			1963
1965		Felice Gimondi (ITA)	Salvatorelli			1964
1966	•4329	Lucien Almer (FRA)	Ford France-Hutchinson	36.8	•137.4	1965
1967		Niger Pignone (FRA)	Peugeot-BP-Ricardo			1966
1968		Jan Janssen (NED)	Pelfort-Savoyage-Lejeune			1967
1969	•4117	Eddy Merckx (BEL)	Faema	35.4	•136.3	1968
1970		Eddy Merckx (BEL)	Faema-Faema			1969
1971		Eddy Merckx (BEL)	Molteni			1970
1972	•3846	Eddy Merckx (BEL)	Molteni	35.5	•188.3	1971
1973		Eddy Merckx (BEL)	Molteni			1972
1974		Eddy Merckx (BEL)	Molteni			1973
1975	•4089	Bernard Hinault (FRA)	Peugeot-BP-Ricardo	34.9	•134.4	1974
1976		Lucien Van Impe (BEL)	Gitane-Campagnolo			1975
1977		Bernard Hinault (FRA)	Peugeot-BP-Ricardo			1976
1978	•3988	Bernard Hinault (FRA)	Renault-Gitane-Campagnolo	36.1	•188.3	1977
1979		Bernard Hinault (FRA)	Renault-Gitane			1978
1980		Jon Zieten (NED)	TI-Baligh-Creda			1979
1981	•3753	Bernard Hinault (FRA)	Renault-ELV-Gitane	39	•96.3	1980
1982		Bernard Hinault (FRA)	Renault-ELV-Gitane			1981
1983		Laurent Fignon (FRA)	Renault-ELV			1982
1984	•4821	Laurent Fignon (FRA)	La Via Claire	35.9	•132.1	1983
1985		Greg LeMond (USA)	La Via Claire			1984
1986	•4231	Greg LeMond (USA)	Carrera Jean-Pignone	36.4	•135.5	1985
1987		Greg LeMond (USA)	Reynolds			1986
1988		Pedro Delgado (ESP)	40 Manning-Bot-Bottechia			1987
1989		Greg LeMond (USA)	Z-Tomasso	38.4	•99.7	1988
1990	•3564	Miguel Indurain (ESP)	Banesto			1989
1991		Miguel Indurain (ESP)	Banesto			1990
1992		Miguel Indurain (ESP)	Banesto			1991
1993	•3734	Miguel Indurain (ESP)	Banesto	38.7	•96	1992
1994		Miguel Indurain (ESP)	Banesto			1993
1995		Miguel Indurain (ESP)	Banesto			1994
1996	•3765	Stanno Risi (DNK)	Team Telekom	39.2	•96	1995
1997		Stanno Risi (DNK)	Team Telekom			1996
1998		Mario Pantani (ITA)	Mercatone Uno-Bianchi			1997
1999	•3487	Lance Armstrong (USA)	U.S. Postal Service	40.3	•91.5	1998
2000		Lance Armstrong (USA)	U.S. Postal Service			1999
2001		Lance Armstrong (USA)	U.S. Postal Service			2000
2002	•3272	Lance Armstrong (USA)	U.S. Postal Service	39.9	•92.1	2001
2003		Lance Armstrong (USA)	U.S. Postal Service			2002
2004		Lance Armstrong (USA)	U.S. Postal Service			2003
2005	•3593	Lance Armstrong (USA)	Discovery Channel	41.7	•84.3	2004
2006		Oscar Pereira (ESP)	Caisse d'Epargne-Illes Balears			2005
2007		Alberto Contador (ESP)	Discovery Channel			2006
2008	•3559	Alberto Contador (ESP)	Team CSC	40.5	•87.9	2007
2009		Alberto Contador (ESP)	Astana			2008
2010		Andy Schleck (LUX)	Team Saxo Bank			2009
2011	•3438	Cadel Evans (AUS)	BMC Racing Team	39.8	•84.2	2010
2012		Bradley Wiggins (GBR)	Team Sky			2011
2013		Crista Froome (GBR)	Team Sky			2012
2014	•3448.5	Vincenzo Nibali (ITA)	Astana	40.7	•90	2013
2015		Crista Froome (GBR)	Team Sky			2014
2016		Crista Froome (GBR)	Team Sky			2015
2017	•3540	Crista Froome (GBR)	Team Sky	41	•84.3	2016
2018		Geraint Thomas (GBR)	Team Sky			2017
2019		Egan Bernal (COL)	Team Ineos			2018

The Showcase

Pixel Art

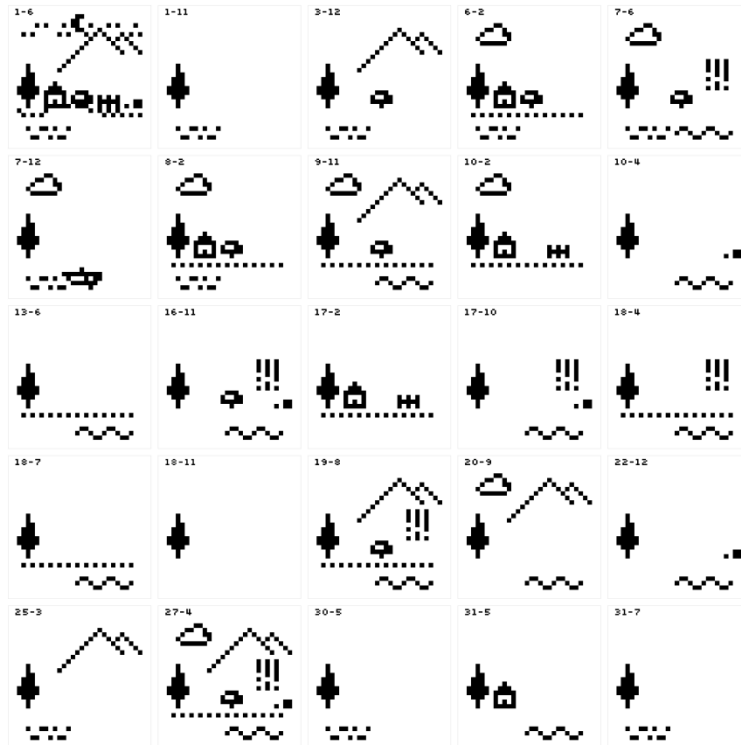
BOB ROSS - PAINTING BY THE ELEMENTS

GRAPHIC REPRESENTATIONS OF BOB ROSS' PAINTINGS WITH ELEMENTS IDENTIFIED IN THEM BY WALT HICKEY (FIVETHIRTYEIGHT). EACH ELEMENT REPRESENTS ONE OR MORE OCCURRENCES IN THE PAINTING. ONLY THE ELEMENTS IN THE LEGEND BELOW ARE DRAWN. TO THE RIGHT THERE ARE 25 RANDOM PAINTINGS THAT BOB PAINTED IN 'THE JOY OF PAINTING', WITH THE SEASON AND EPISODE NUMBER.



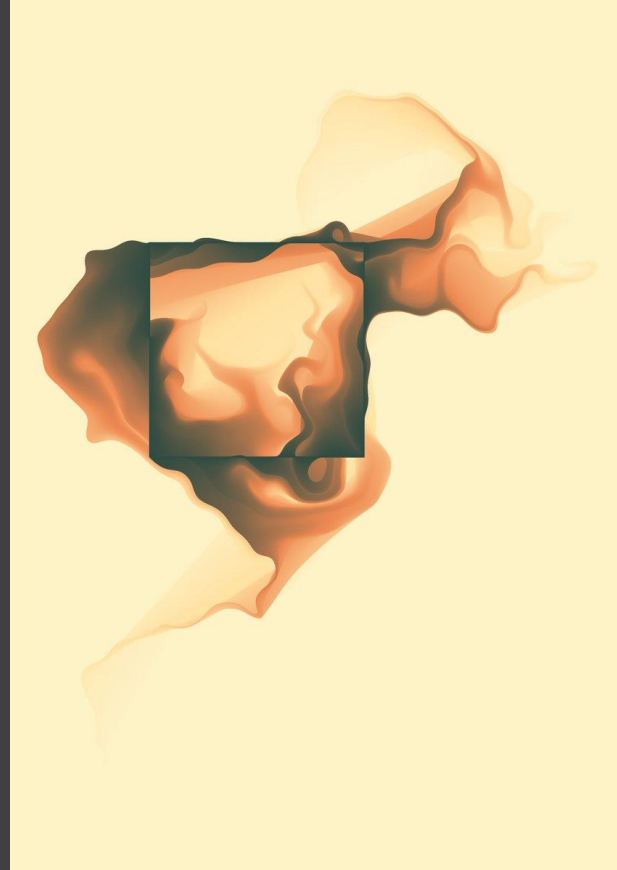
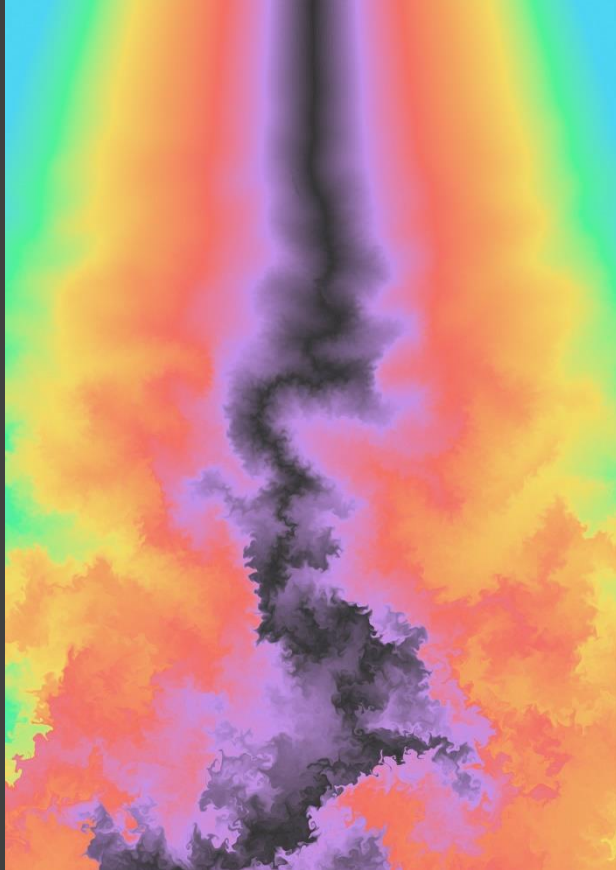
CLOUD (CIRRUS, CUMULUS), MOON, NIGHT, PALM TREE, SUN, MOUNTAIN (HILLS), CACTUS, LIGHTHOUSE, ROCKS, TREE (DECIDUOUS, CONIFER), BEACH, BOAT, CABIN (BARN, BUILDING, FARM), SEA (OCEAN, WAVES), BUSHES, FENCE, GRASS, WATERFALL, LAKE, RIVER

SOURCE: FIVETHIRTYEIGHT | PLOT: GEORGIOS KARAMANIS



The Showcase

Generative Art



with the help of



Thomas Lin Pedersen

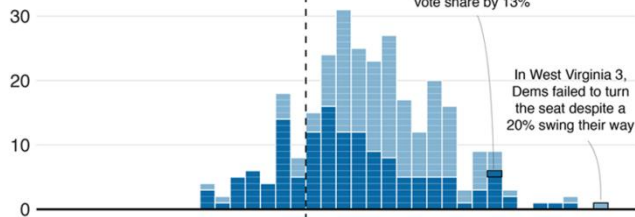
The Showcase

Consistent Theming

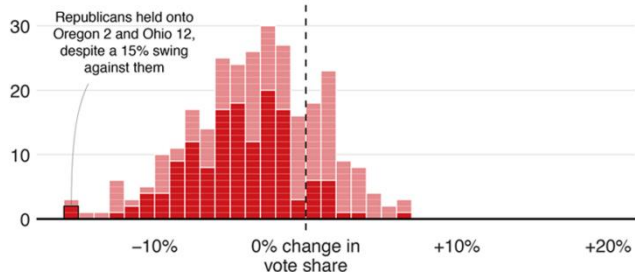
Blue wave

■ Won seat ■ Didn't win

Democrat candidates



Republican candidates

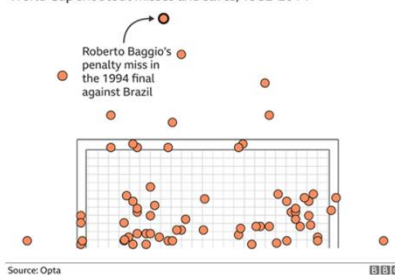


Source: AP, 19:01 ET

BBC

Where penalties are saved

World Cup shootout misses and saves, 1982-2014

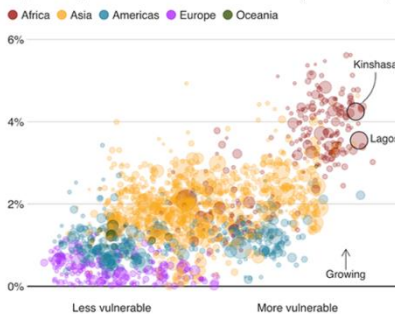


Source: Opta

BBC

Fast-growing cities face worse climate risks

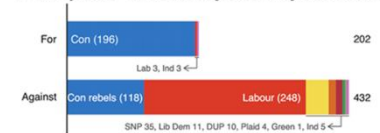
Population growth 2018-2035 over climate change vulnerability



Source: Verisk Maplecroft. Circle size represents current population.

BBC

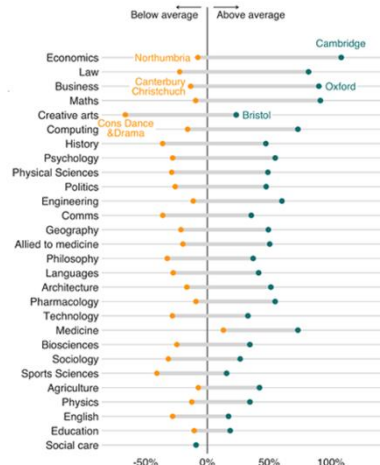
MPs rejected Theresa May's deal by 230 votes



Source: Commons Votes Services. Excludes 'tellers', the Speaker and deputies.

Earnings vary across units even within subjects

Impact on men's earnings relative to the average degree

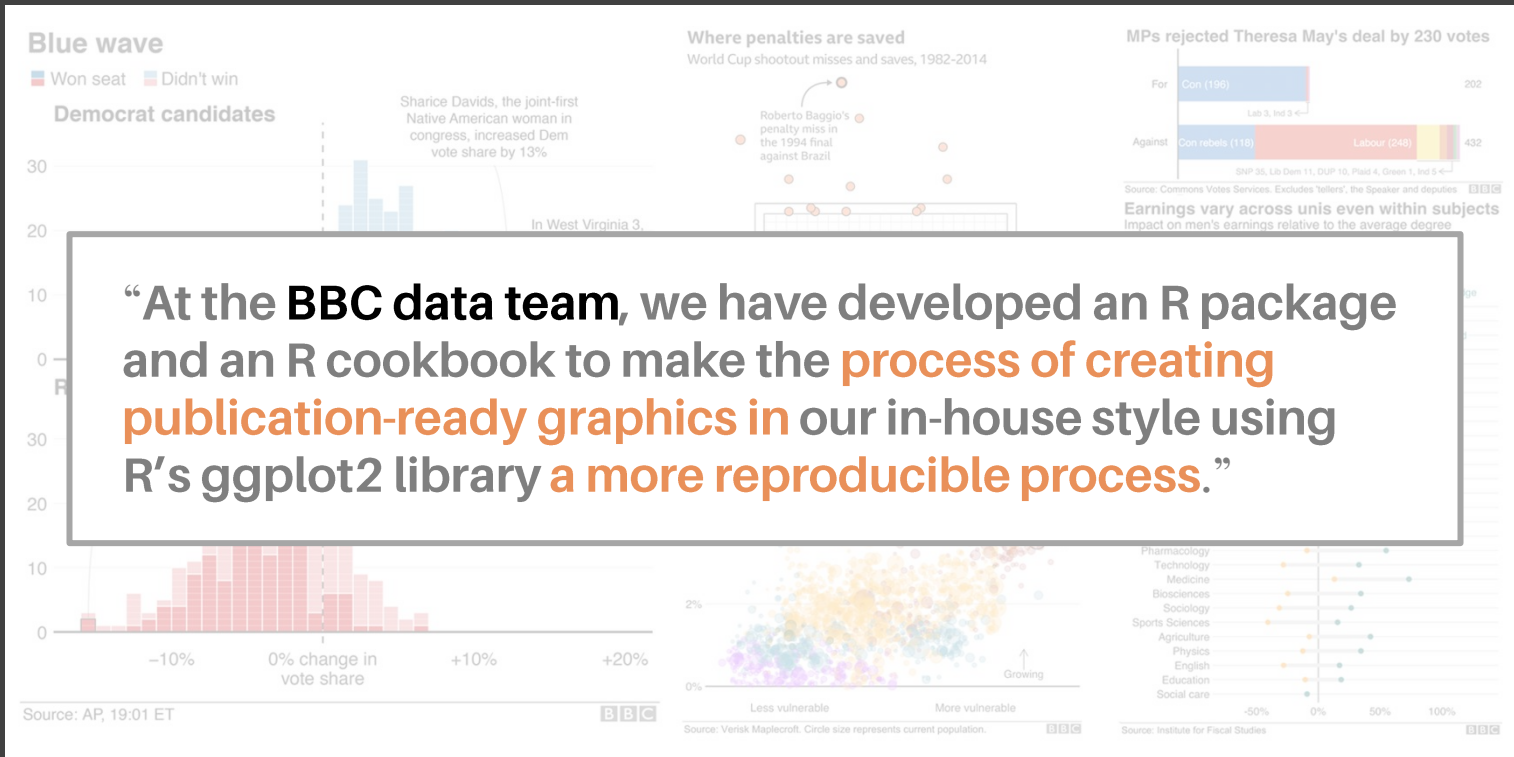


Source: Institute for Fiscal Studies

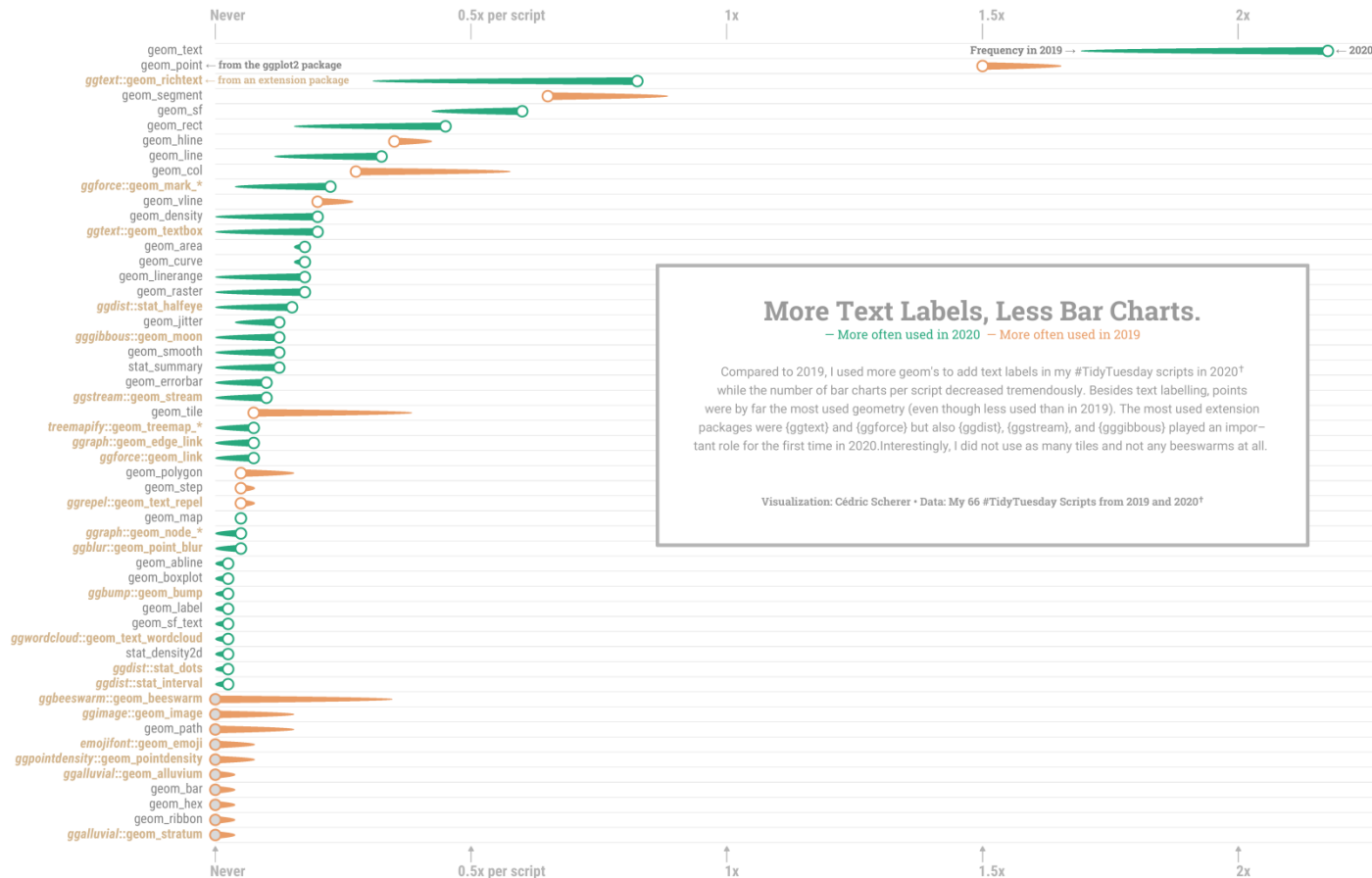
BBC

The Showcase

Consistent Theming + Reproducibility



“At the BBC data team, we have developed an R package and an R cookbook to make the **process of creating publication-ready graphics** in our in-house style using R's ggplot2 library **a more reproducible process.**”



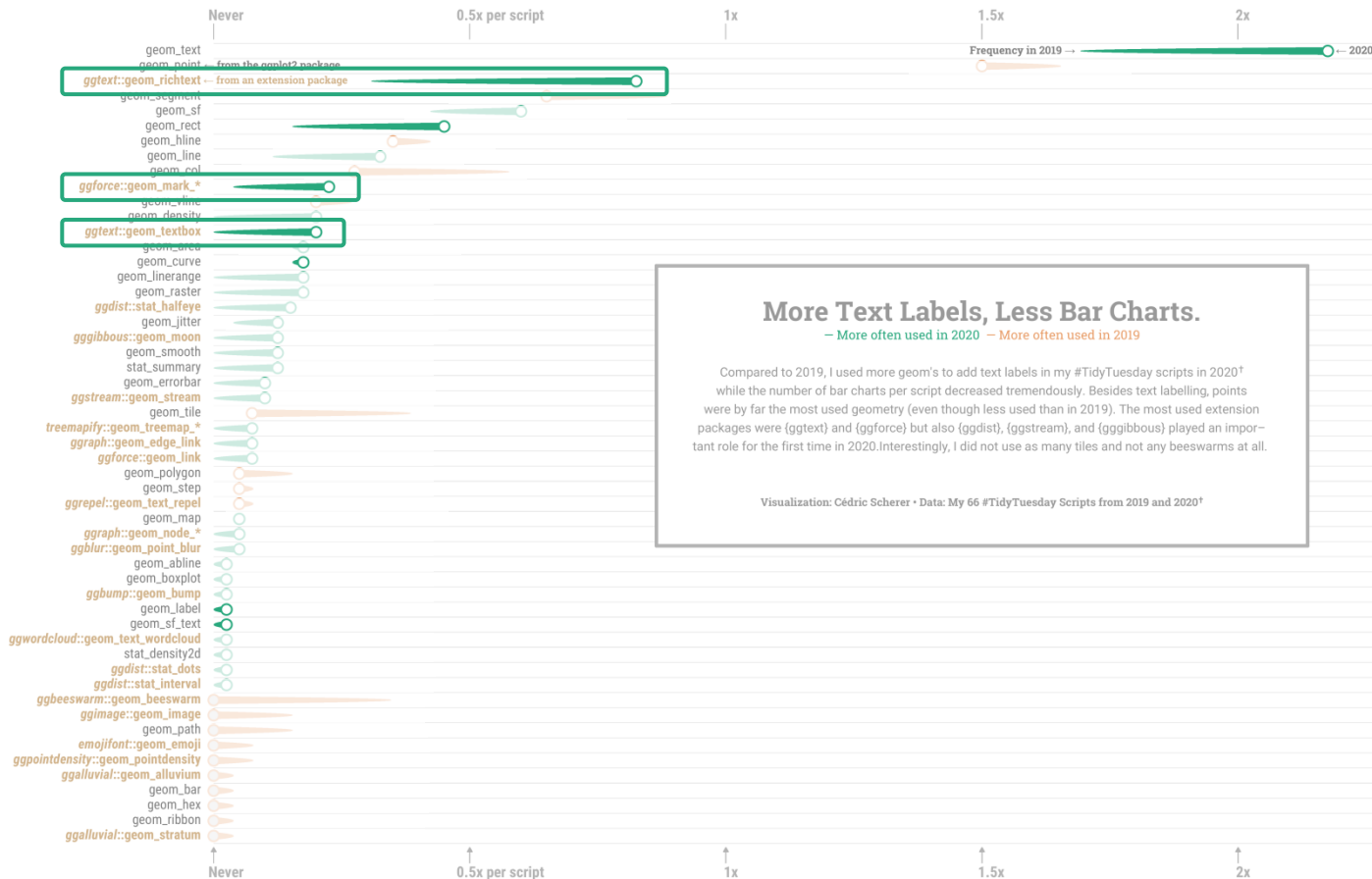
More Text Labels, Less Bar Charts.

— More often used in 2020 — More often used in 2019

Compared to 2019, I used more geom's to add text labels in my #TidyTuesday scripts in 2020[†] while the number of bar charts per script decreased tremendously. Besides text labelling, points were by far the most used geometry (even though less used than in 2019). The most used extension packages were (ggtext) and (ggforce) but also (ggdist), (ggstream), and (gggibbous) played an important role for the first time in 2020. Interestingly, I did not use as many tiles and not any beeswarms at all.

Visualization: Cédric Scherer • Data: My 66 #TidyTuesday Scripts from 2019 and 2020[†]

[†] I extracted all functions starting with `geom` or `stat` from my Rmd files containing the code for all my #TidyTuesday contributions (thanks Georgios for the idea and script). For the contributions from 2019 (n = 26) and 2020 (n = 40) I calculated the frequency of usage per year for each geom/stat as times used divided by the number of contributions. Note that some geom's which usually appear together (e.g. `treemapify::geom_treemap` functions) or behave very similarly (e.g. `ggforce::geommark` functions) were grouped together.



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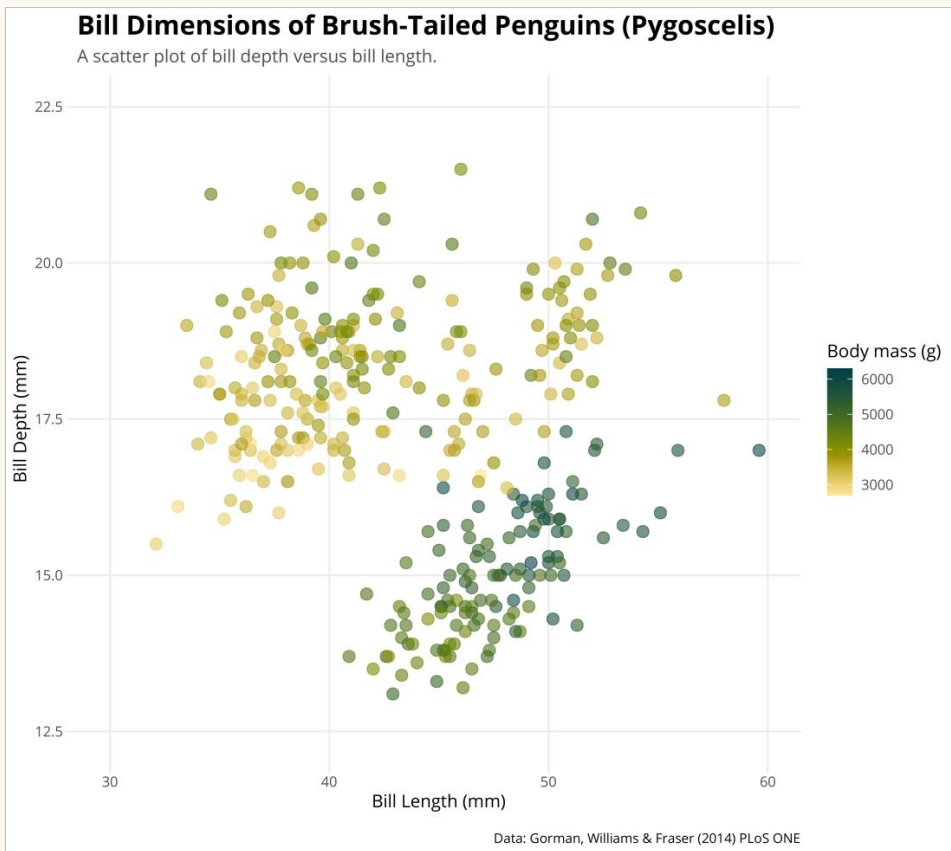
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{ggtext}

Improved Text Rendering Support

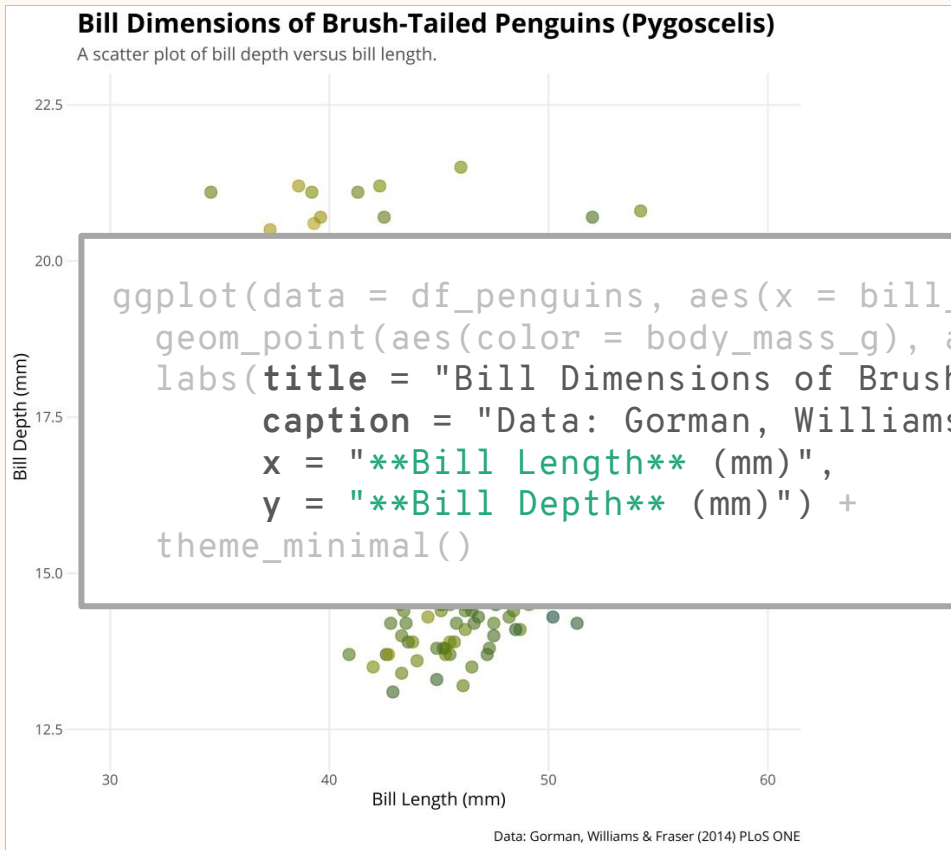
{ggtext} Improved Text Rendering Support



`element_markdown()`

→ formatted text elements,
e.g. titles, caption, axis text, striptext

{ggtext} Improved Text Rendering Support



`element_markdown()`

→ formatted text elements,
e.g. titles, caption, axis text, striptext

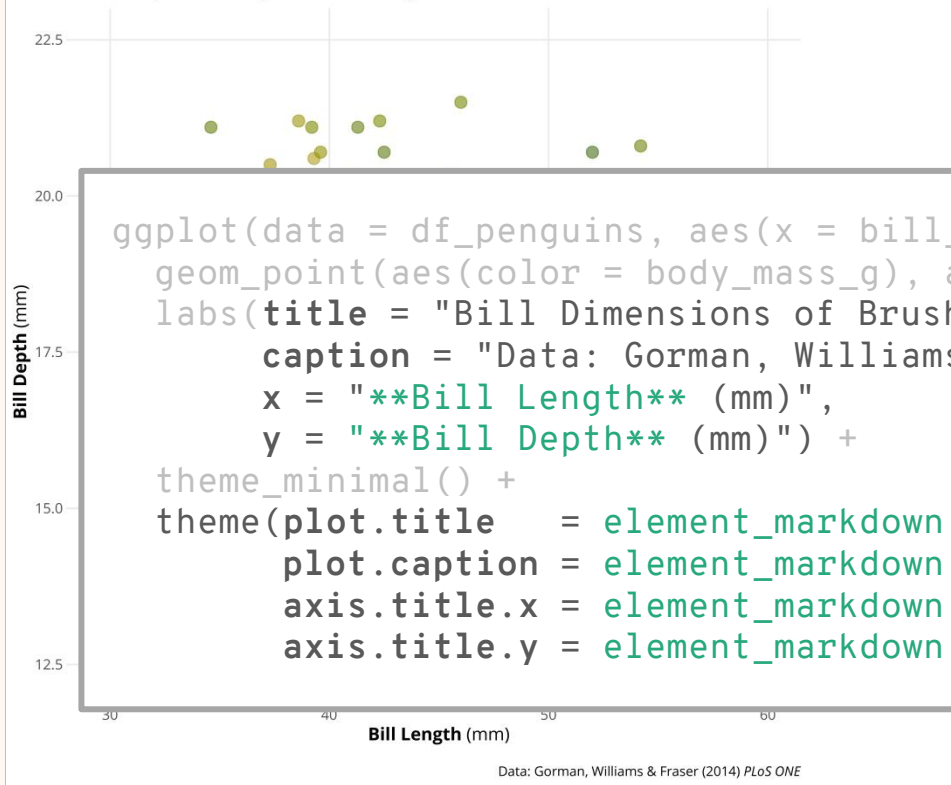
```
ggplot(data = df_penguins, aes(x = bill_length_mm, y = bill_depth_mm)) +  
  geom_point(aes(color = body_mass_g), alpha = .6, size = 3) +  
  labs(title = "Bill Dimensions of Brush-Tailed Penguins *Pygoscelis*",  
        caption = "Data: Gorman, Williams & Fraser (2014) *PLoS ONE*",  
        x = "**Bill Length** (mm)",  
        y = "**Bill Depth** (mm)") +  
  theme_minimal()
```



{ggtext} Improved Text Rendering Support

Bill Dimensions of Brush-Tailed Penguins (*Pygoscelis*)

A scatter plot of bill depth versus bill length.



element_markdown()

→ formatted text elements,
e.g. titles, caption, axis text, striptext

{ggtext} Improved Text Rendering Support

```
<i style='color:#28A87D;'>Pygoscelis</i>
```

Bill Dimensions of Brush-Tailed Penguins *Pygoscelis*

```
<b style='font-size:32pt;font-family:blackword;'>Pygoscelis</b>
```

Bill Dimensions of Brush-Tailed Penguins *Pygoscelis*

```
<img src='https://cedricscherer.com/img/pygoscelis.jpg', width='10' />
```

Bill Dimensions of Brush-Tailed Penguins



Chats about Friends and their Past, Present, and Future Partners

Mentions of the main characters and their most popular partners in dialogues* during the ten seasons of Friends.



Font Color
Font Face

```
<b style='color:#d86b1d;'>Ross & Rachel</b>  
<b style='color:#ba2a22;'>Rachel</b> & Barry
```

* For each of the 67,373 dialogues in 236 episodes it was determined whether the two names occur in the same text. The area and luminance of the squares is mapped to the number of overall mentions of the two names per season.

Visualization by Cédric Scherer • Data by Emil Hvittfeldt via the (friends) R package

Contribution to #TidyTuesday 2020/37

Chats about Friends and their Past, Present, and Future Partners

```
tibble(  
  key = c("Chandler", "Joey", "Monica", "Monica &  
          Chandler", "Phoebe", "Rachel", "Rachel &  
          Joey", "Ross", "Ross & Rachel"),  
  color = c("#48508c", "#55331d", "#a64d64",  
            "#774f78", "#5b7233", "#ba2a22",  
            "#882f20", "#f6ab18", "#d86b1d")  
)
```

Ross & Carol
Ross & Julie
Ross & Bonnie
Ross & Emily
Ross & Elizabeth
Ross & Mona
Ross & Charlie
Ross & Rachel
Rachel & Barry
Rachel & Paolo
Rachel & Tag
Rachel & Joshua
Rachel & Paul
Rachel & Joey
Joey & Kathy
Joey & Janine
Joey & Charlie
Monica & Richard
Monica & Pete
Monica & Chandler
Chandler & Janice
Chandler & Kathy
Phoebe & David
Phoebe & Gary
Phoebe & Mike

Font Color
Font Face

Chats about Friends and their Past, Present, and Future Partners

```
tibble(  
  key = c("Chandler", "Joey", "Monica", "Monica &  
          Chandler", "Phoebe", "Rachel", "Rachel &  
          Joey", "Ross", "Ross & Rachel"),  
  color = c("#48508c", "#55331d", "#a64d64",  
            "#774f78", "#5b7233", "#ba2a22",  
            "#882f20", "#f6ab18", "#d86b1d")  
)
```

key	color
Ross	#f6ab18
Chandler	#48508c
Ross & Rachel	#d86b1d

Ross & Carol
Ross & Julie
Ross & Bonnie
Ross & Emily
Ross & Elizabeth
Ross & Mona
Ross & Charlie
Ross & Rachel
Rachel & Barry
Rachel & Paolo
Rachel & Tag
Rachel & Joshua
Rachel & Paul
Rachel & Joey
Joey & Kathy
Joey & Janine
Joey & Charlie
Monica & Richard
Monica & Pete
Monica & Chandler
Chandler & Janice
Chandler & Kathy
Phoebe & David
Phoebe & Gary
Phoebe & Mike

Font Color
Font Face

Chats about Friends and their Past, Present, and Future Partners

```
tibble(  
  key = c("Chandler", "Joey", "Monica", "Monica &  
    Chandler", "Phoebe", "Rachel", "Rachel &  
    Joey", "Ross", "Ross & Rachel"),  
  color = c("#48508c", "#55331d", "#a64d64",  
    "#774f78", "#5b7233", "#ba2a22",  
    "#882f20", "#f6ab18", "#d86b1d")  
) %>%  
right_join(df_friends, by = "key")
```

key	color	partners	episode
Ross	#f6ab18	Ross & Carol	S01E01
Chandler	#48508c	Chandler & Janice	S01E03
Ross & Rachel	#d86b1d	Ross & Rachel	S01E04

Ross & Carol
Ross & Julie
Ross & Bonnie
Ross & Emily
Ross & Elizabeth
Ross & Mona
Ross & Charlie
Ross & Rachel
Rachel & Barry
Rachel & Paolo
Rachel & Tag
Rachel & Joshua
Rachel & Paul
Rachel & Joey
Joey & Kathy
Joey & Janine
Joey & Charlie
Monica & Richard
Monica & Pete
Monica & Chandler
Chandler & Janice
Chandler & Kathy
Phoebe & David
Phoebe & Gary
Phoebe & Mike

Font Color
Font Face

Chats about Friends and their Past, Present, and Future Partners

```
tibble(  
  key = c("Chandler", "Joey", "Monica", "Monica &  
          Chandler", "Phoebe", "Rachel", "Rachel &  
          Joey", "Ross", "Ross & Rachel"),  
  color = c("#48508c", "#55331d", "#a64d64",  
            "#774f78", "#5b7233", "#ba2a22",  
            "#882f20", "#f6ab18", "#d86b1d")  
) %>%  
right_join(df_friends, by = "key") %>%  
mutate(partners = if_else(  
  key == partners,  
  glue::glue("<b style='color:{color};'>  
              {partners}</b>"),  
  str_replace(partners, key,  
    glue::glue("<b style='color:{color};'>  
              {key}</b>"))  
)
```

Ross & Carol
Ross & Julie
Ross & Bonnie
Ross & Emily
Ross & Elizabeth
Ross & Mona
Ross & Charlie
Ross & Rachel
Rachel & Barry
Rachel & Paolo
Rachel & Tag
Rachel & Joshua
Rachel & Paul
Rachel & Joey
Joey & Kathy
Joey & Janine
Joey & Charlie
Monica & Richard
Monica & Pete
Monica & Chandler
Chandler & Janice
Chandler & Kathy
Phoebe & David
Phoebe & Gary
Phoebe & Mike

Font Color
Font Face

Chats about Friends and their Past, Present, and Future Partners

key	color	partners
Ross	#f6ab18	Ross & Carol
Chandler	#48508c	Chandler & Janice
Ross & Rachel	#d86b1d	Ross & Rachel

```
right_join(df_friends, by = "key") %>%
mutate(partners = if_else(
  key == partners,
  glue::glue("<b style='color:{color};'>
    {partners}</b>"),
  str_replace(partners, key,
    glue::glue("<b style='color:{color};'>
      {key}</b>"))
))
```

Ross & Carol
Ross & Julie
Ross & Bonnie
Ross & Emily
Ross & Elizabeth
Ross & Mona
Ross & Charlie
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Rachel & Barry
Rachel & Paolo
Rachel & Tag
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Rachel & Paul
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Joey & Janine
Joey & Charlie
Monica & Richard
Monica & Pete
Monica & Chandler
Chandler & Janice
Chandler & Kathy
Phoebe & David
Phoebe & Gary
Phoebe & Mike

Font Color
Font Face

Visualization by Cédric Scherer • Data by Emil Hvitfeldt via the *(friends)* R package

Chats about Friends and their Past, Present, and Future Partners

key	color	partners	
Ross	#f6ab18	Ross & Carol	FALSE
Chandler	#48508c	Chandler & Janice	FALSE
Ross & Rachel	#d86b1d	Ross & Rachel	TRUE

```
right_join(df_friends, by = "key") %>%
  mutate(partners = if_else(
    key == partners,
    glue::glue("<b style='color:{color};'>
      {partners}</b>"),
    str_replace(partners, key,
      glue::glue("<b style='color:{color};'>
        {key}</b>"))
  ))
```

Visualization by Cédric Scherer • Data by Emil Hvitfeldt via the *(friends)* R package

Ross & Carol
 Ross & Julie
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 Rachel & Joshua
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 Joey & Janine
 Joey & Charlie
 Monica & Richard
 Monica & Pete
 Monica & Chandler
 Chandler & Janice
 Chandler & Kathy
 Phoebe & David
 Phoebe & Gary
 Phoebe & Mike

Font Color
 Font Face

Chats about Friends and their Past, Present, and Future Partners

key	color	partners
Ross	#f6ab18	Ross & Carol FALSE
Chandler	#48508c	Chandler & Janice FALSE
Ross & Rachel	#d86b1d	<b style='color:#d86b1d;'>Ross & Rachel

```

right_join(df_friends, by = "key") %>%
  mutate(partners = if_else(
    key == partners,
    glue::glue("<b style='color:{color};'>
      {partners}</b>"),
    str_replace(partners, key,
      glue::glue("<b style='color:{color};'>
        {key}</b>"))
  ))

```

Ross & Carol
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 Phoebe & David
 Phoebe & Gary
 Phoebe & Mike

Font Color
Font Face

Visualization by Cédric Scherer • Data by Emil Hvitfeldt via the (friends) R package

Chats about Friends and their Past, Present, and Future Partners

key	color	partners
Ross	#f6ab18	<b style='color:#f6ab18;'>Ross & Carol
Chandler	#48508c	<b style='color:#48508c;'>Chandler & Janice
Ross & Rachel	#d86b1d	<b style='color:#d86b1d;'>Ross & Rachel

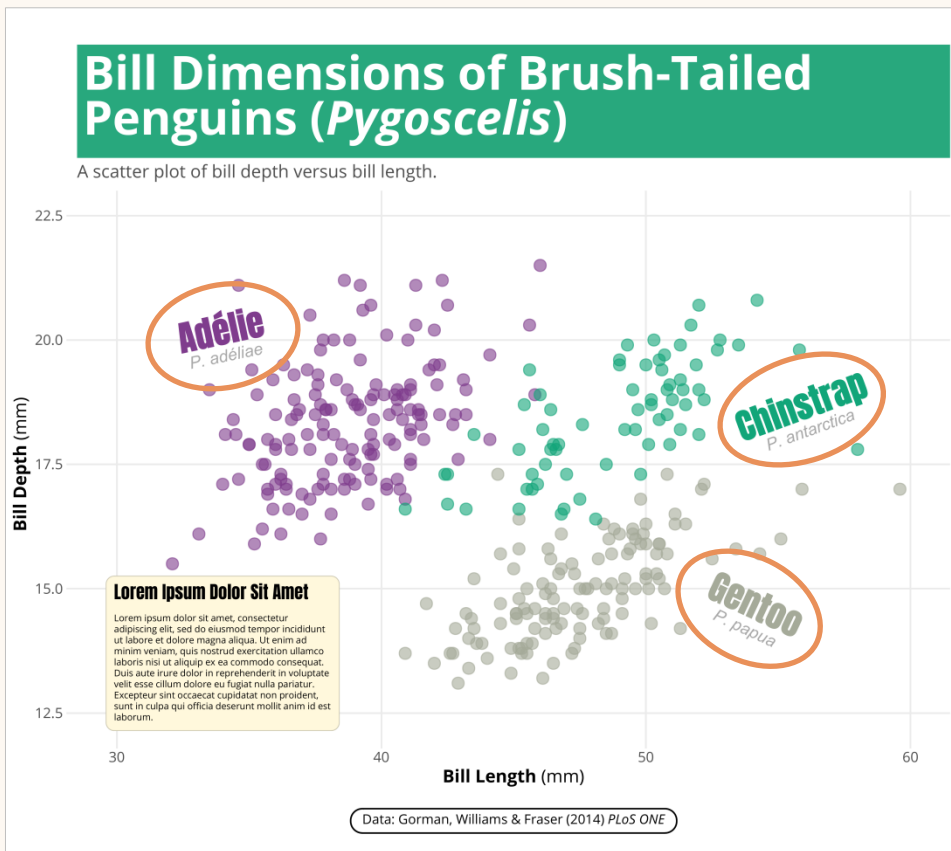
```
right_join(df_friends, by = "key") %>%
mutate(partners = if_else(
  key == partners,
  glue::glue("<b style='color:{color};'>
    {partners}</b>"),
  str_replace(partners, key,
    glue::glue("<b style='color:{color};'>
      {key}</b>"))
))
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Ross & Carol
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 Chandler & Janice
 Chandler & Kathy
 Phoebe & David
 Phoebe & Gary
 Phoebe & Mike

Font Color
 Font Face

Visualization by Cédric Scherer • Data by Emil Hvitfeldt via the (friends) R package

{ggtext} Improved Text Rendering Support



`element_markdown()`

→ formatted text elements,
e.g. titles, caption, axis text, striptext

`geom_richtext()`

→ formatted text labels with 360° rotation

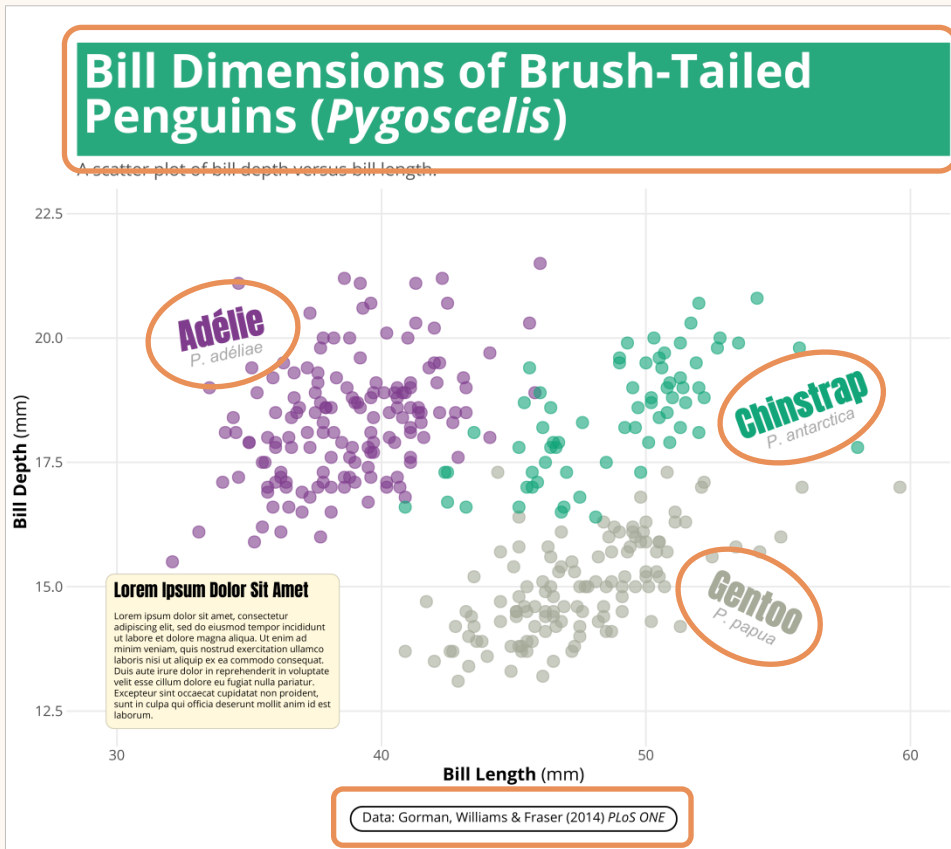
`element_textbox()` and
`element_textbox_simple()`

→ formatted text boxes with word wrapping

`geom_textbox()`

→ formatted text boxes with word wrapping

{ggtext} Improved Text Rendering Support



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→ formatted text elements,
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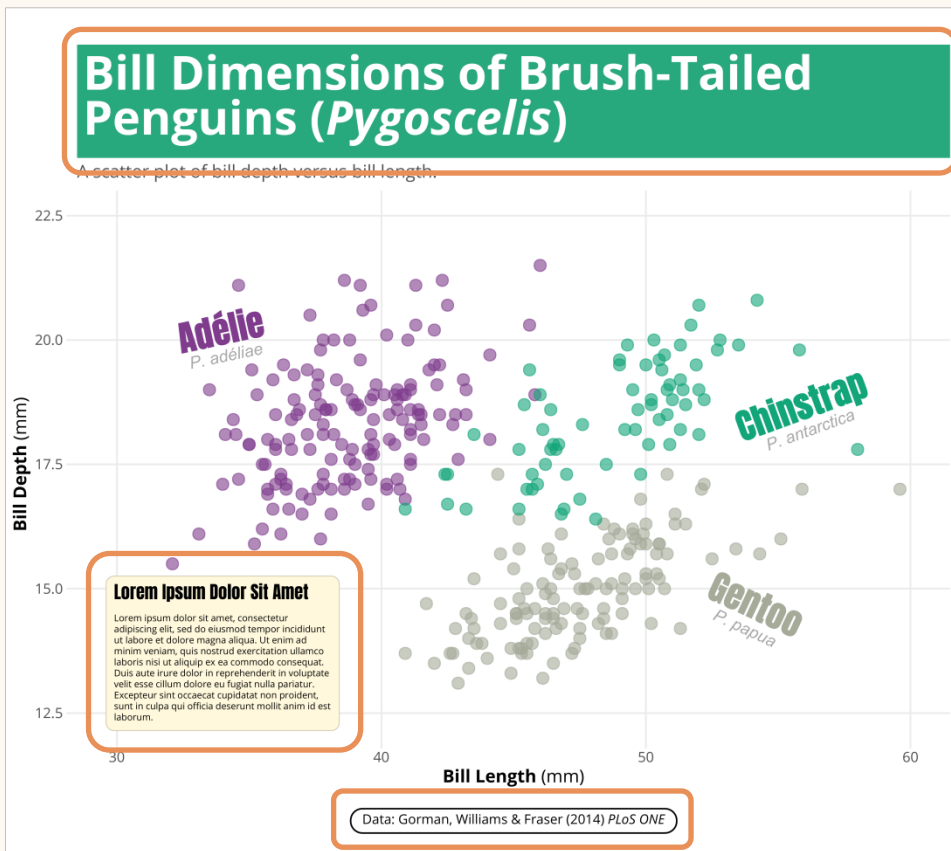
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`element_textbox_simple()`

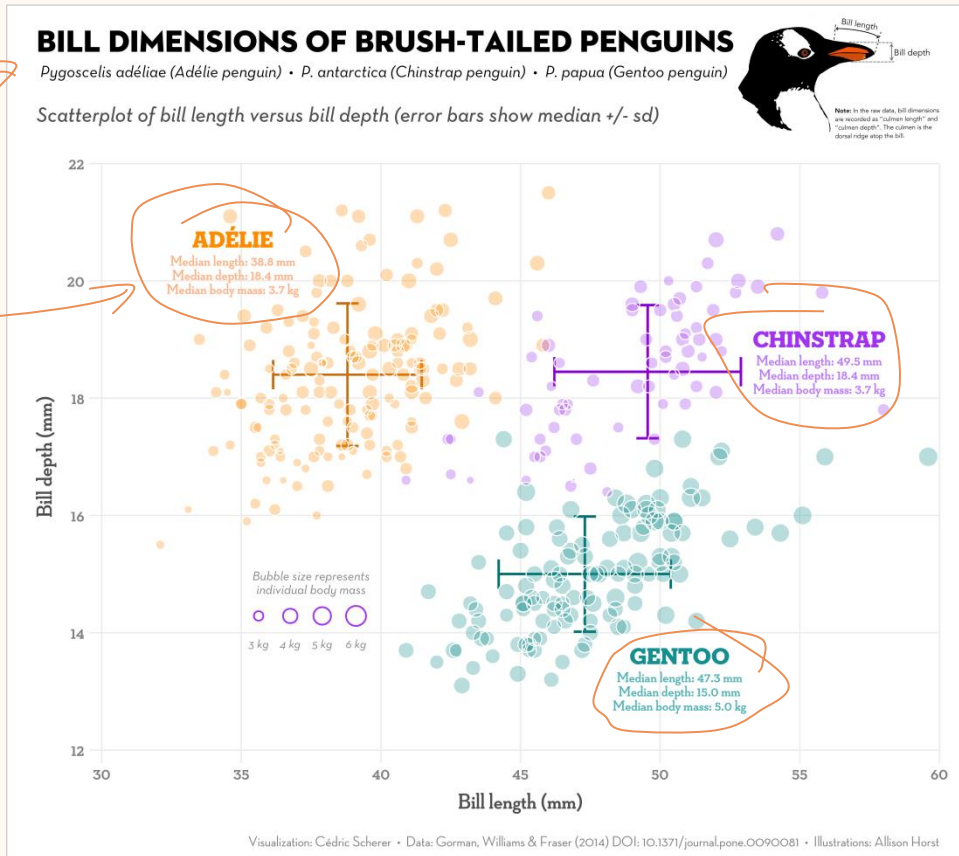
→ formatted text boxes with word wrapping

`geom_textbox()`

→ formatted text boxes with word wrapping

{ggtext} Improved Text Rendering Support

Font Family
Font Size
Font Face
Lineheight



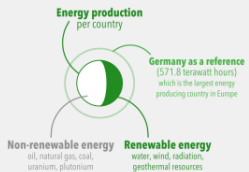
{ggtext} Improved Text Rendering Support

How European countries generated electricity in 2018

Germany is the largest energy producing country in Europe. It generates the most renewable and conventional thermal energy, representing 31% and 56% of its overall production respectively. France is the second largest European producer and by far the largest nuclear energy provider: 71% of its production is based on nuclear fission to generate heat.

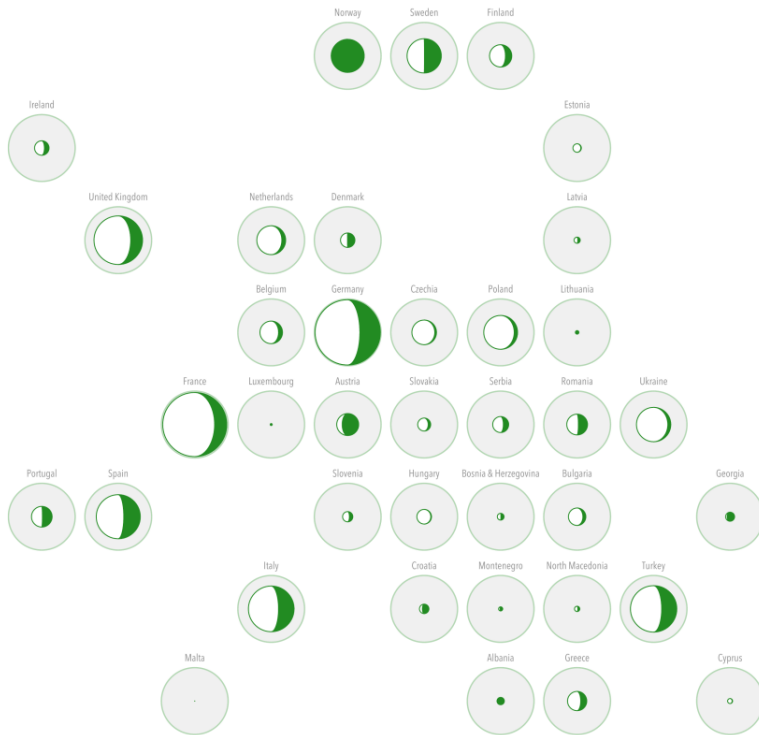
Renewable: Germany	Nuclear: France	Conventional thermal: Germany
179.1 TWh (31% of its production)	393.2 TWh (71% of its production)	320.4 TWh (56% of its production)

Renewable energy is energy that comes from resources that are naturally replenished such as sunlight, wind, water, and geothermal heat. Unlike fossil fuels, such as oil, natural gas and coal, or nuclear power sources such as uranium and plutonium, renewable energy regenerates naturally in a short period of time.

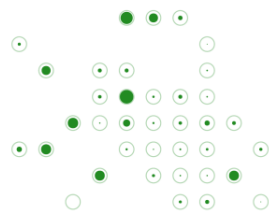


Norway had an electricity production almost entirely made up of renewable energy (98%). This makes Norway the second largest producer of this energy type in Europe. Interestingly, most of the renewable energy is produced by hydro power that take up 95% and only 5% by wind. In contrast, twelve European countries were reported to produce less than 10% of their energy with renewable resources: Malta (0%), Hungary (2%), Estonia (6%), Czechia (7%), Cyprus (6%), Ukraine (9%), Poland (10%), Netherlands (13%), Bulgaria (17%), Belgium (18%), Slovakia (19%), and France (19%).

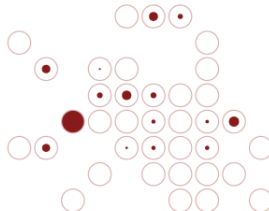
Note: Energy production is mapped to the area of the circles.
Visualization by GdR Scherer • Data by Eurostat



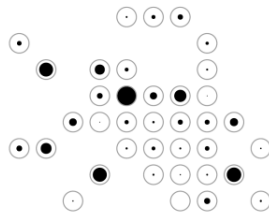
Renewable energy



Nuclear energy



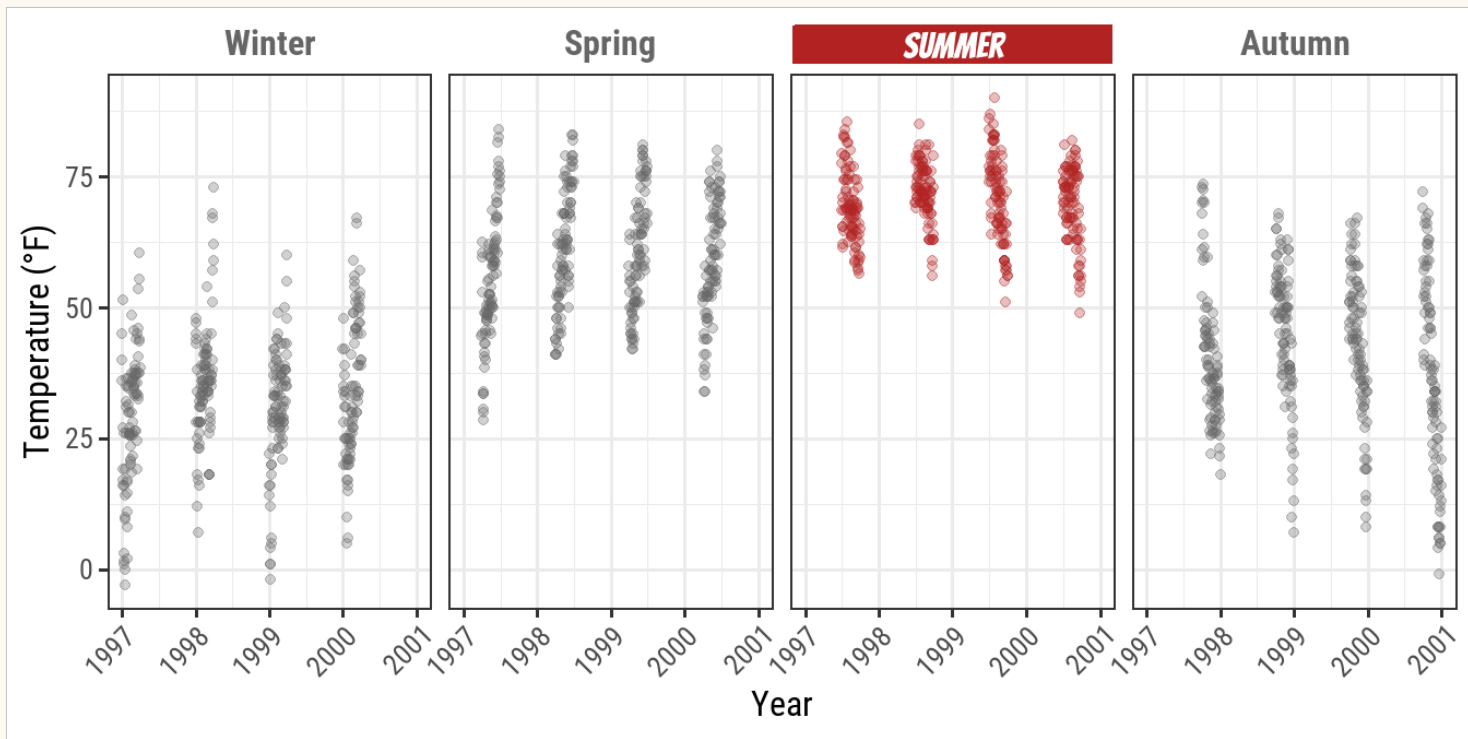
Conventional thermal energy



geom_textbox() +
geom_richtext()

Contribution to #TidyTuesday 2020/32

{ggtext} Improved Text Rendering Support



→ stackoverflow.com/questions/60332202/conditionally-fill-ggtext-text-boxes-in-facet-wrap

→ cedricscherer.com/2019/08/05/a-ggplot2-tutorial-for-beautiful-plotting-in-r/#panels

`custom_element_textbox_highlight()`

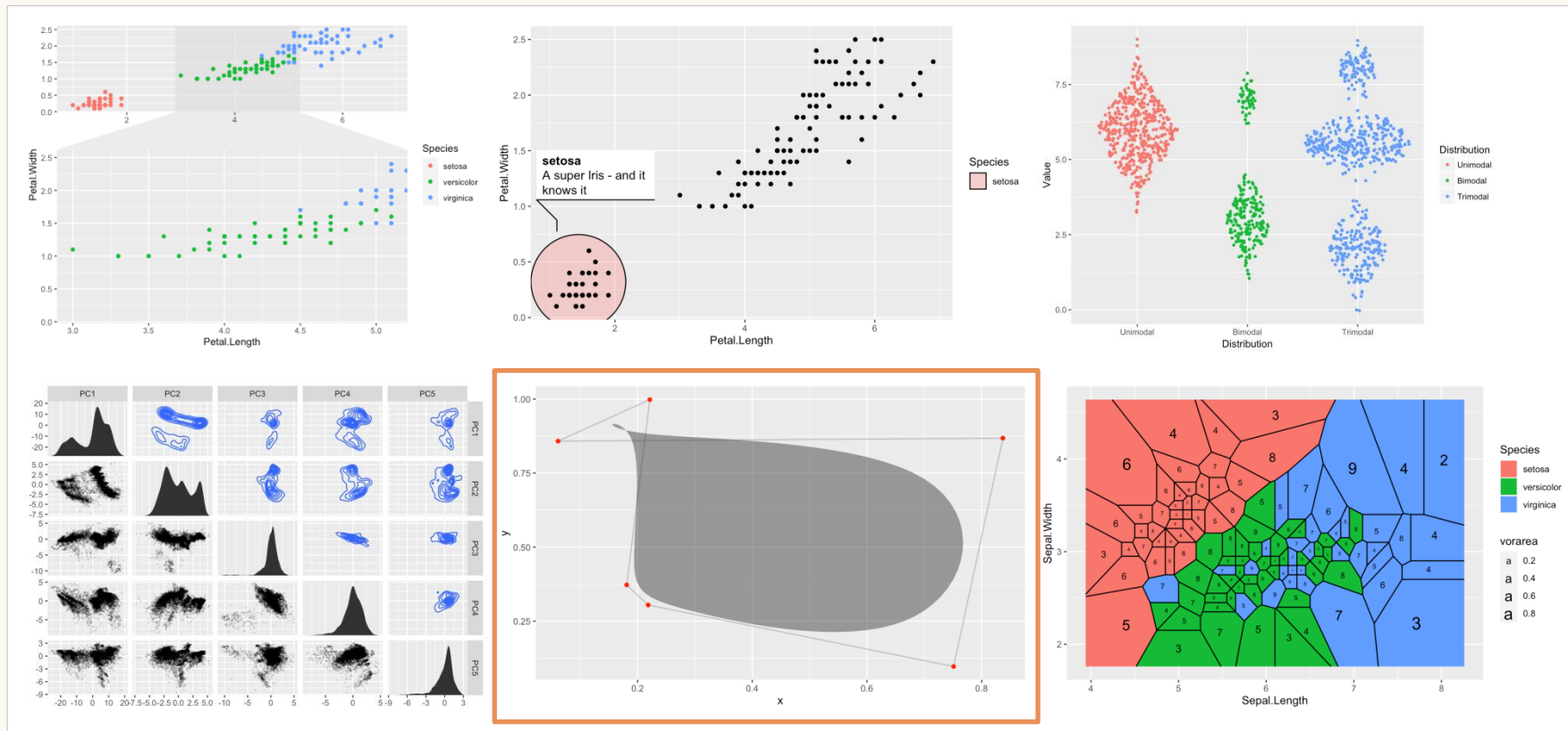
{ggforce}

Providing Missing Functionality to `ggplot2`



ggforce.data-imaginist.com

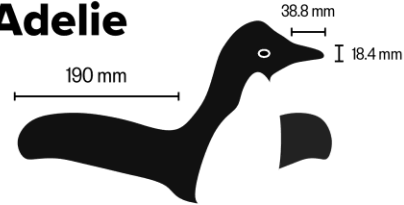
{ggforce} Providing Missing Functionality



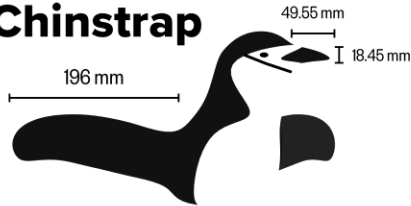
Palmer Penguins

Median length of flipper, length and depth of bill,
of 342 penguins recorded between 2007 and 2009

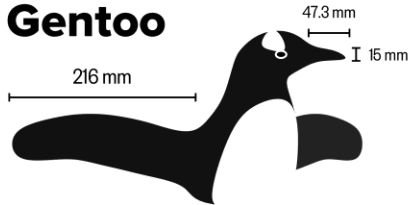
Adelie



Chinstrap

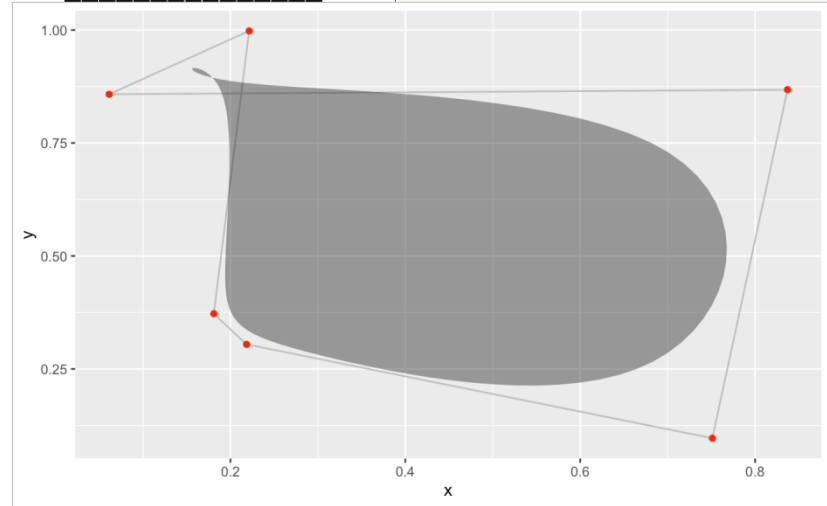


Gentoo



Recorded penguins by species

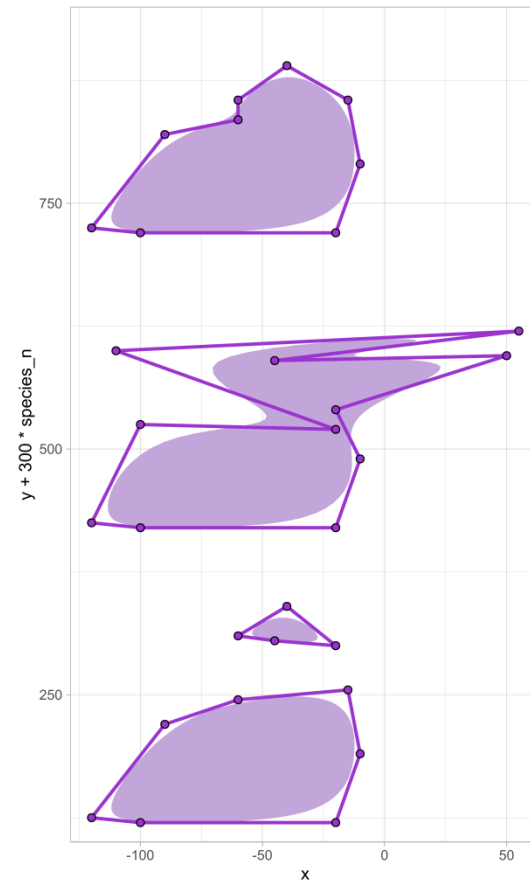
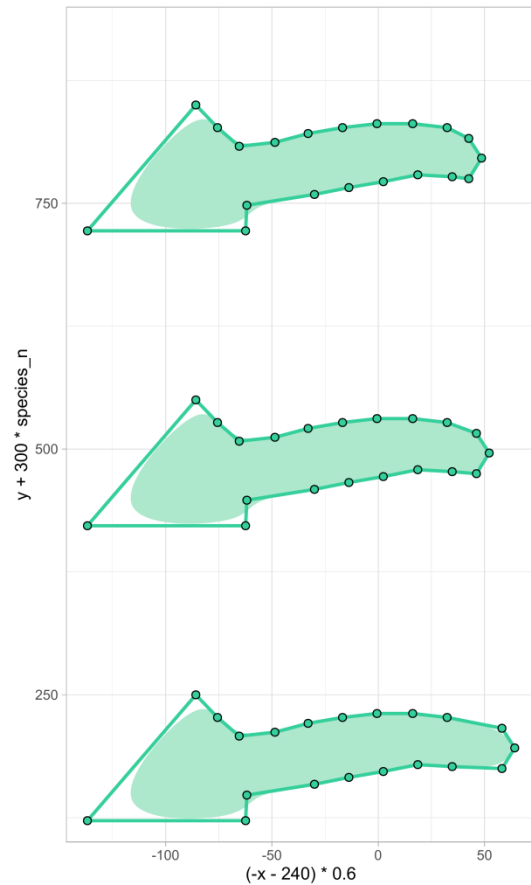
151



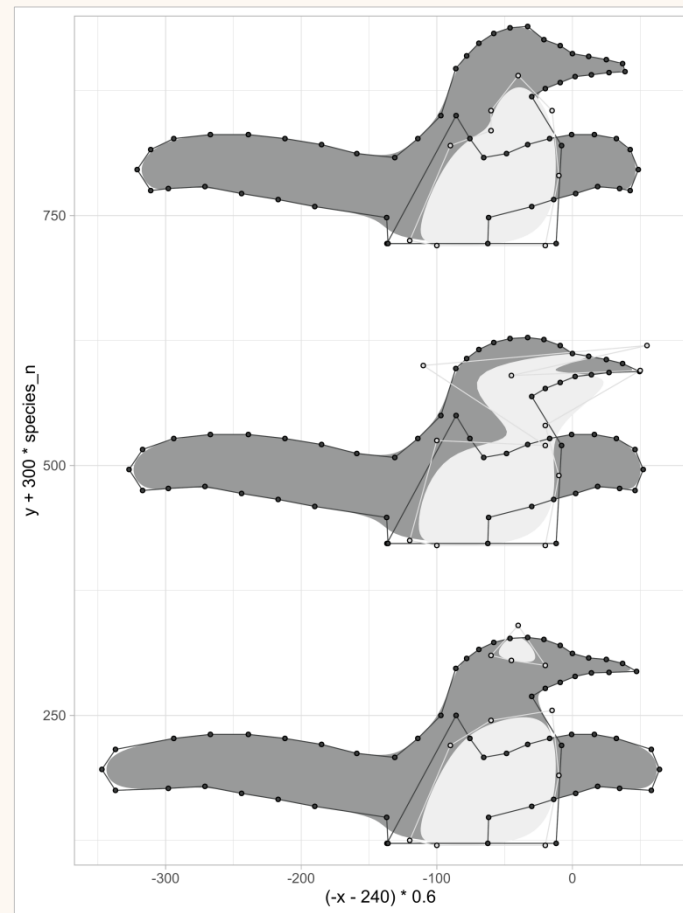
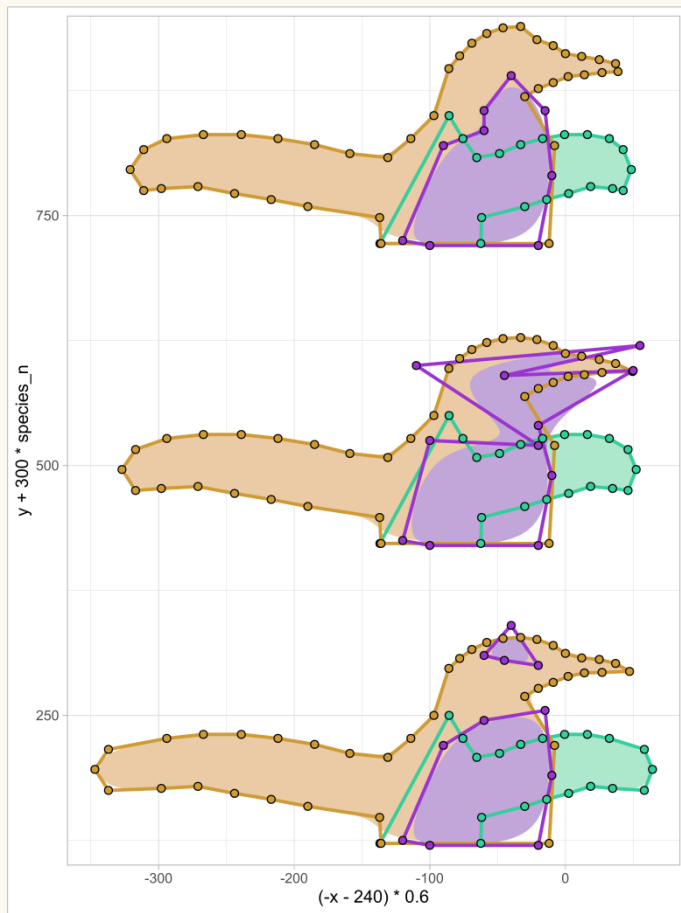
`geom_bspline_closed()`

Source: Dr. Kristen Gorman and the Palmer Station, Antarctica LTER | Graphic: Georgios Karamanis

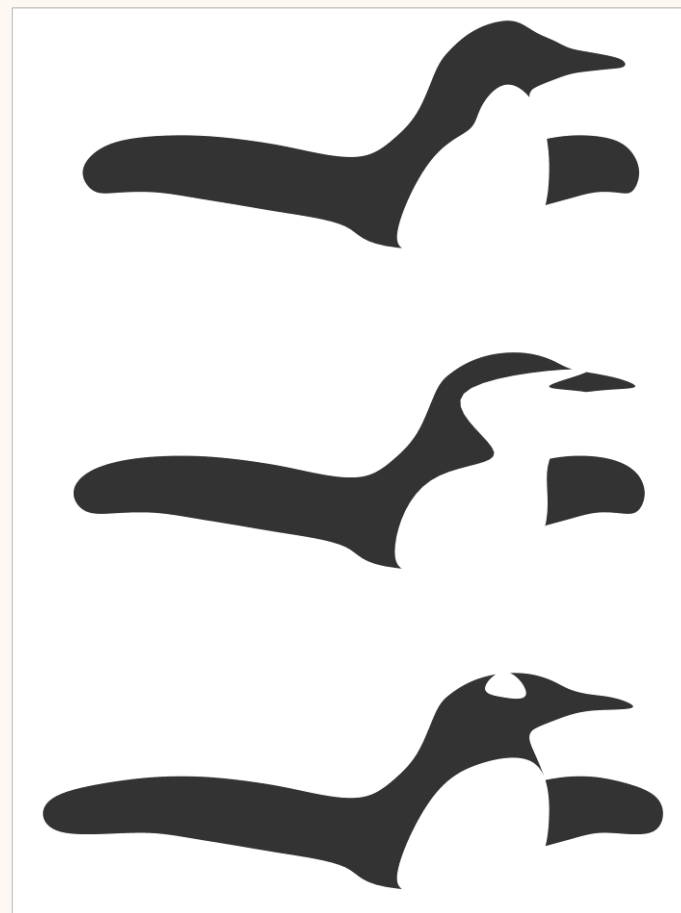
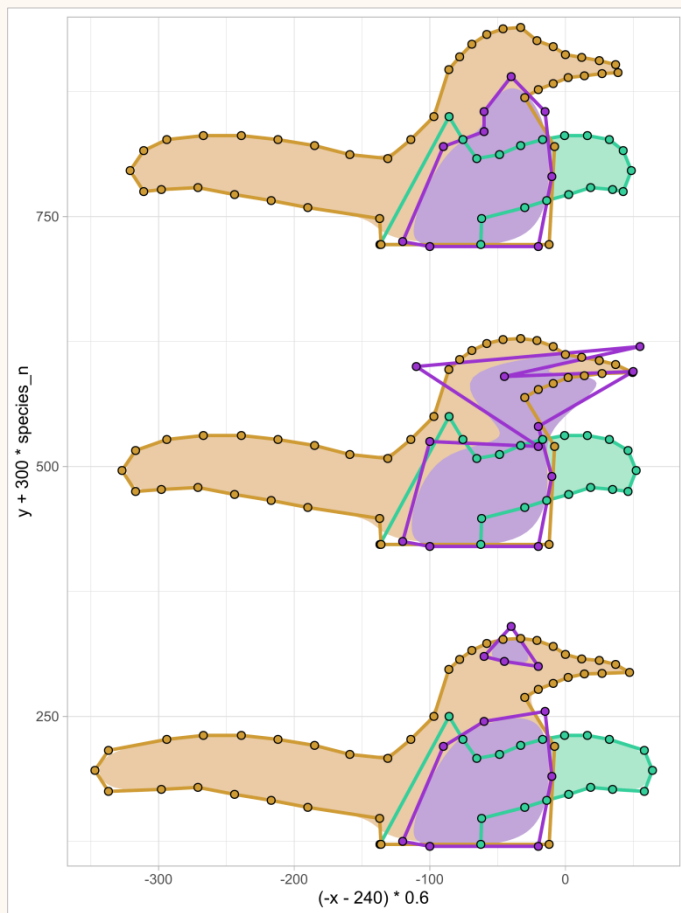
Georgios Karamanis, Contribution to #TidyTuesday 2020/31



Modified from Georgios Karamanis' Contribution to #TidyTuesday 2020/31

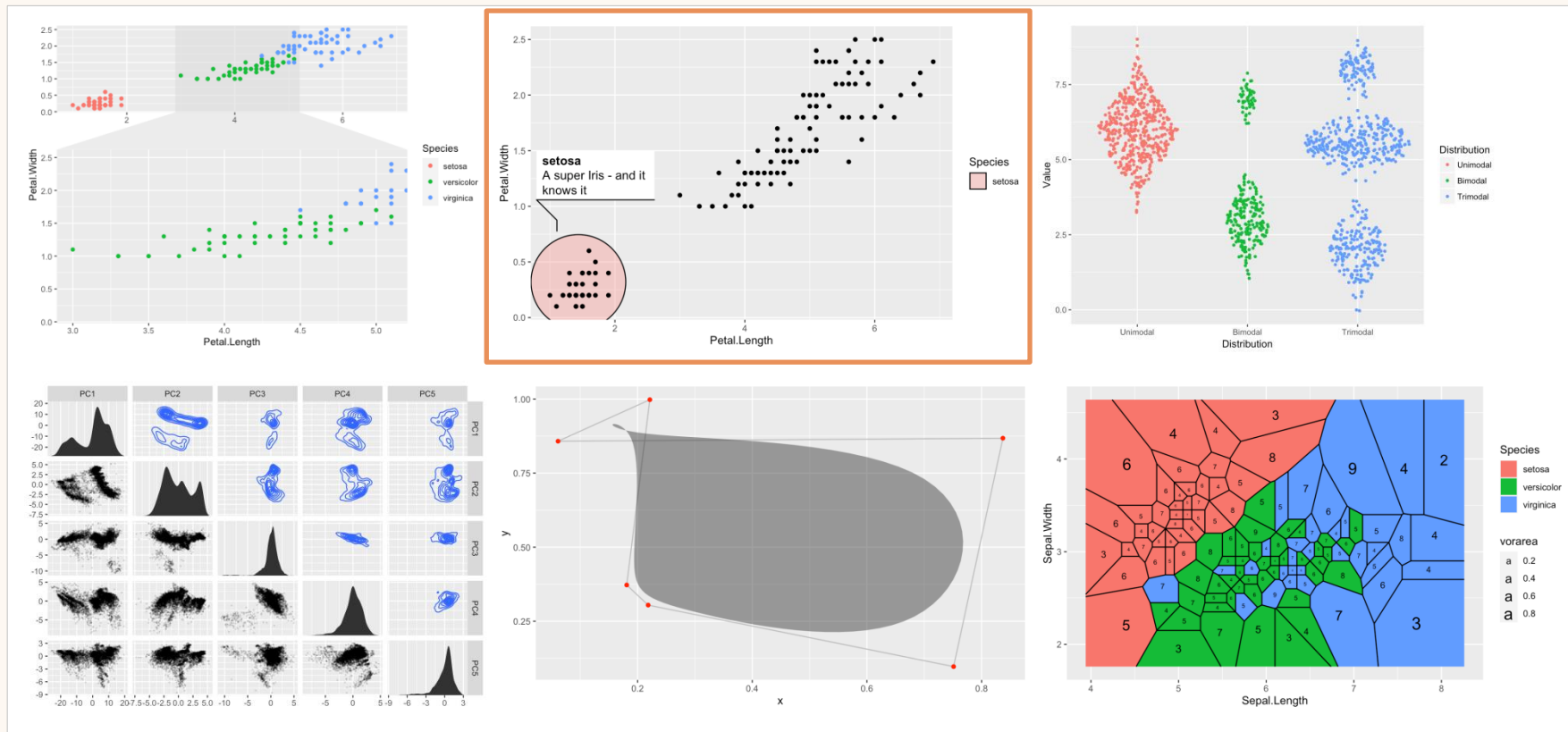


Modified from Georgios Karamanis' Contribution to #TidyTuesday 2020/31

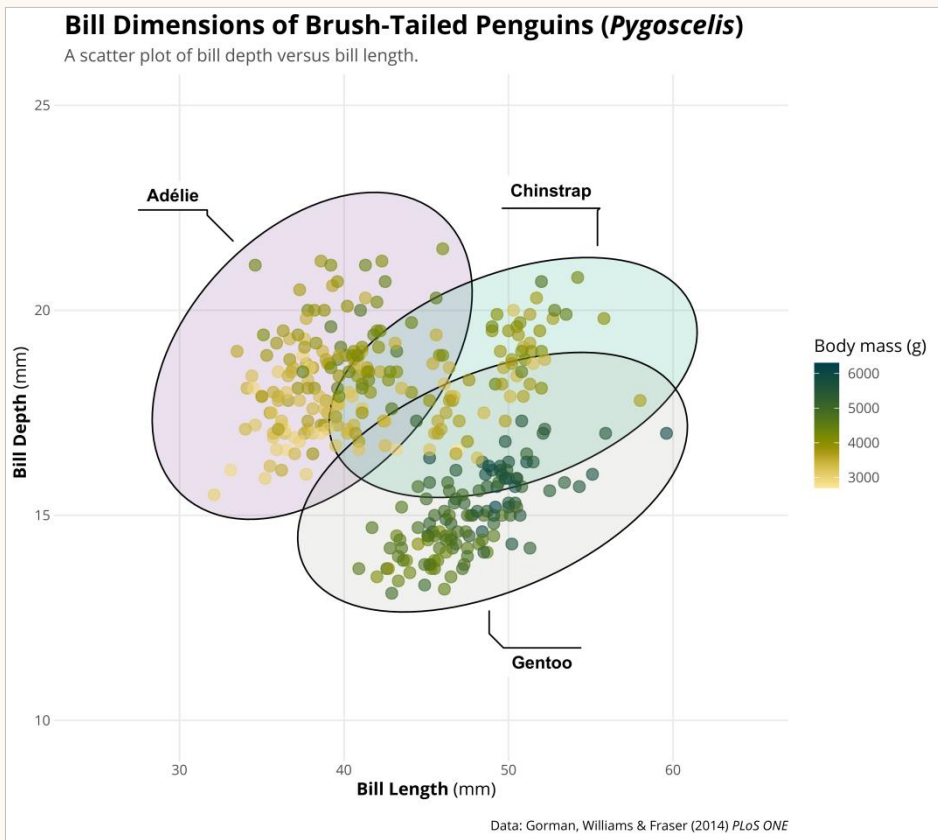


Modified from Georgios Karamanis' Contribution to #TidyTuesday 2020/31

{ggforce} Providing Missing Functionality



{ggforce} Fancy Annotations

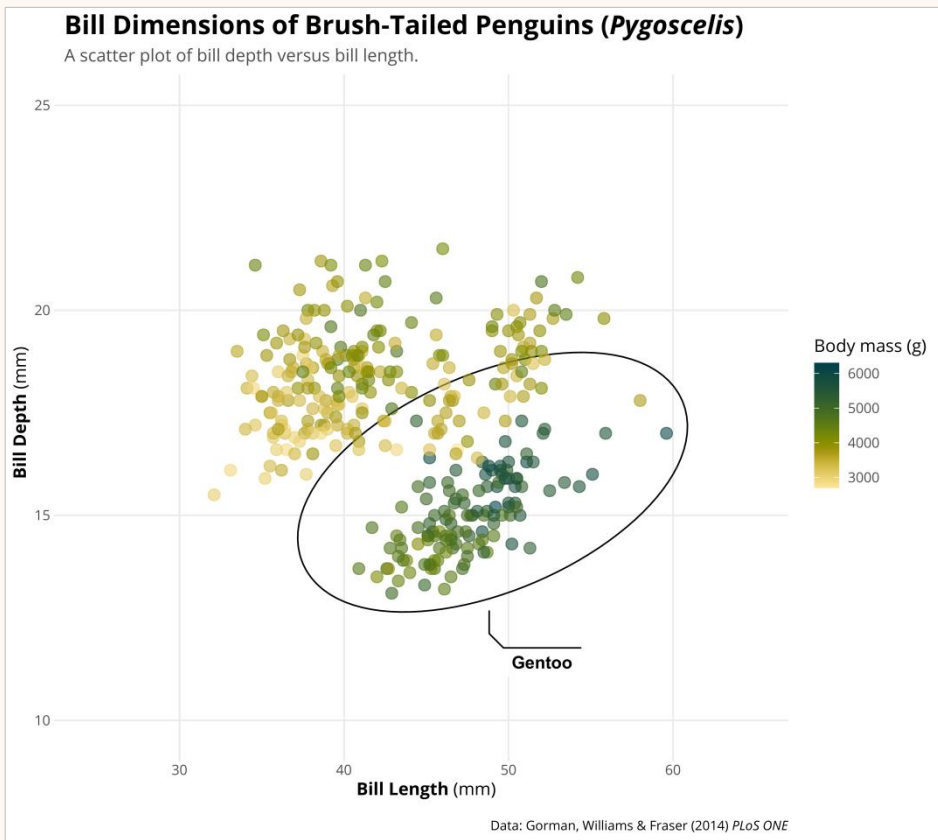


`geom_mark_*()`

→ advanced labels for single or multiple points

`geom_mark_ellipsoid(aes(fill = species, label = species))`

{ggforce} Fancy Annotations

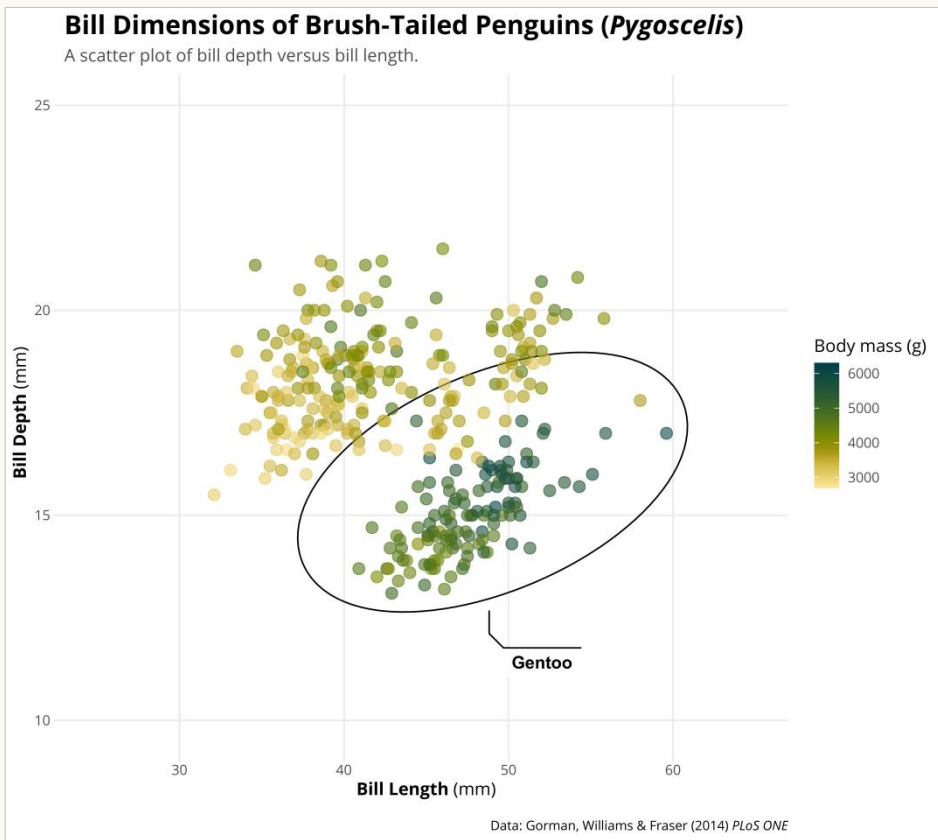


```
geom_mark_ellipsoid(aes(fill = species, label = species,  
  filter = species == 'Gentoo'))
```

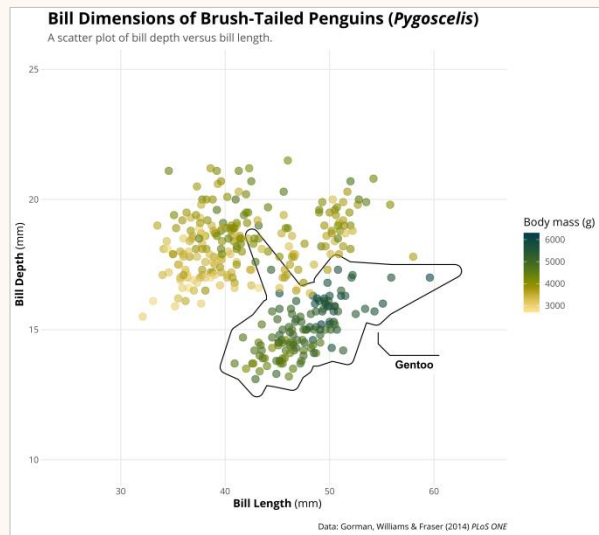
`geom_mark_*()`

- advanced labels for single or multiple points
- show all groups or highlight interesting parts

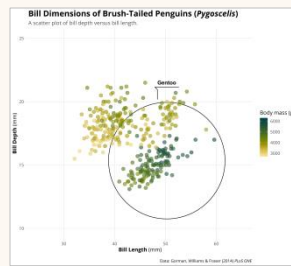
{ggforce} Fancy Annotations



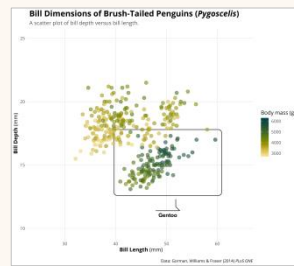
`geom_mark_ellipsoid()`



`geom_mark_hull()`



`geom_mark_circle()`

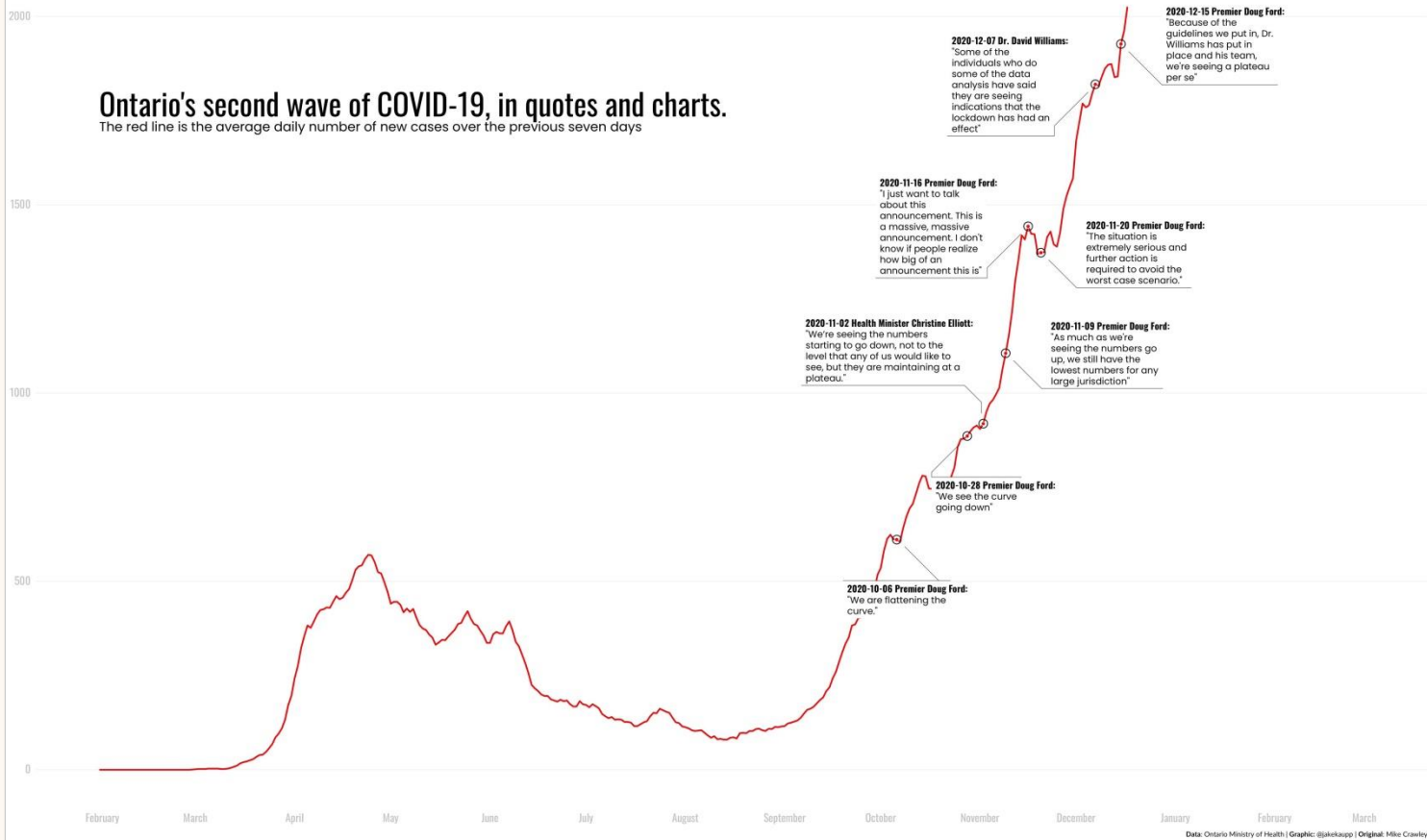


`geom_mark_rect()`

points
ing parts

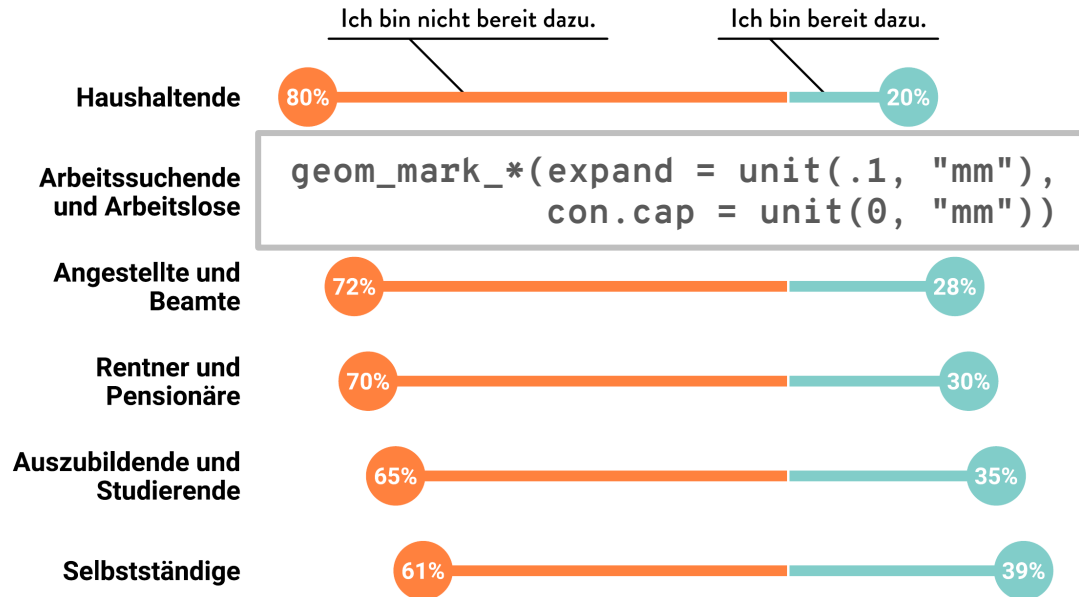
Ontario's second wave of COVID-19, in quotes and charts.

The red line is the average daily number of new cases over the previous seven days



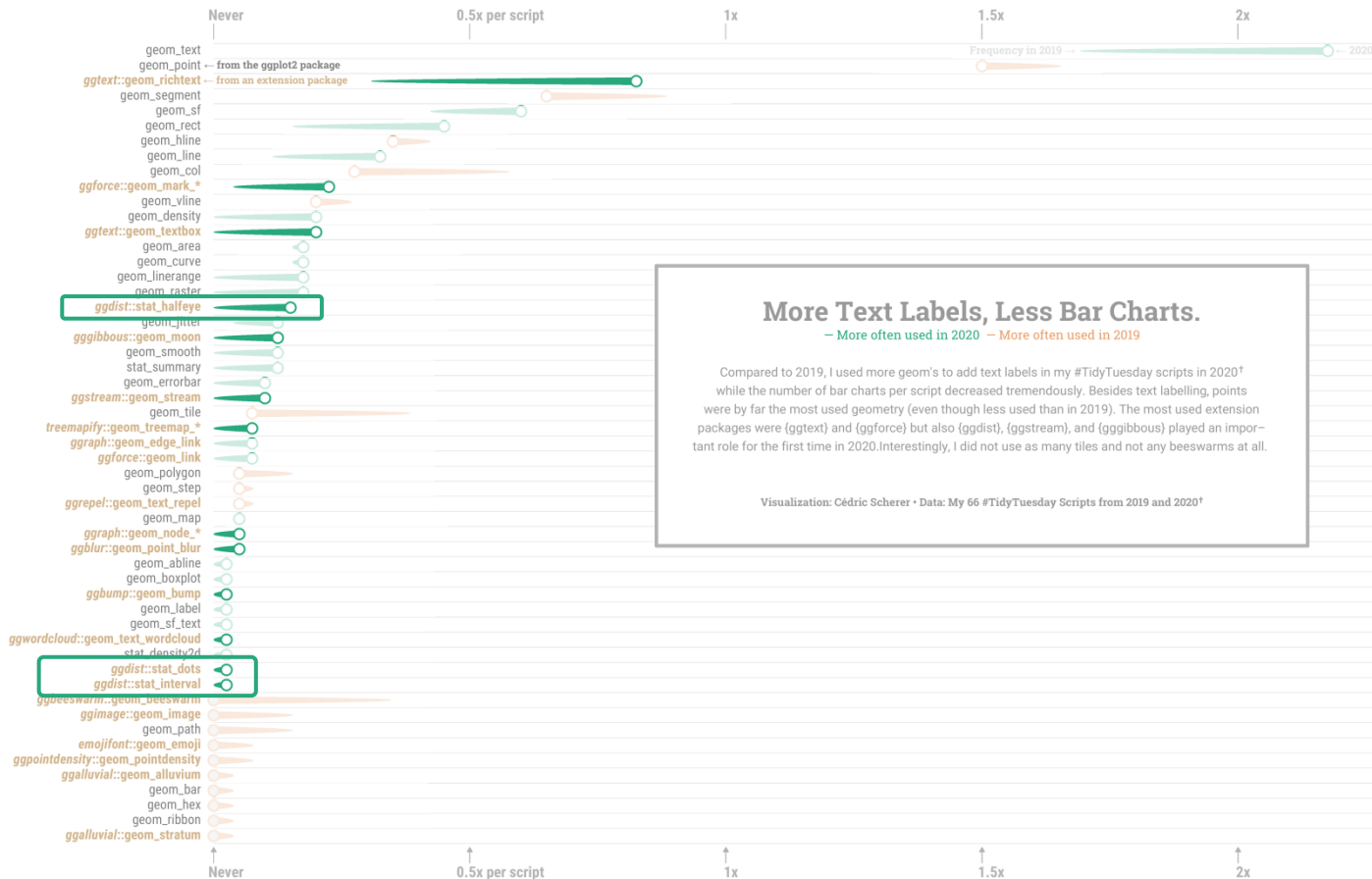
Jake Kaupp

Die Präsidentin der EU Ursula von der Leyen bittet “finanziell nicht notleidende Kunden” ihr Recht auf Rückerstattung aus Solidarität nicht in Anspruch zu nehmen.



Basierend auf 1057 Antworten auf eine Umfrage von KUENDIGUNG.ORG

Customer survey Kuendigung.org
(kuendigung.org/studien/verbraucherumfrage-zur-zukunft-nach-der-krise)



More Text Labels, Less Bar Charts.

— More often used in 2020 — More often used in 2019

Compared to 2019, I used more geom's to add text labels in my #TidyTuesday scripts in 2020[†] while the number of bar charts per script decreased tremendously. Besides text labelling, points were by far the most used geometry (even though less used than in 2019). The most used extension packages were (ggtext) and (ggforce) but also (ggdist), (ggstream), and (gggibbous) played an important role for the first time in 2020. Interestingly, I did not use as many tiles and not any beeswarms at all.

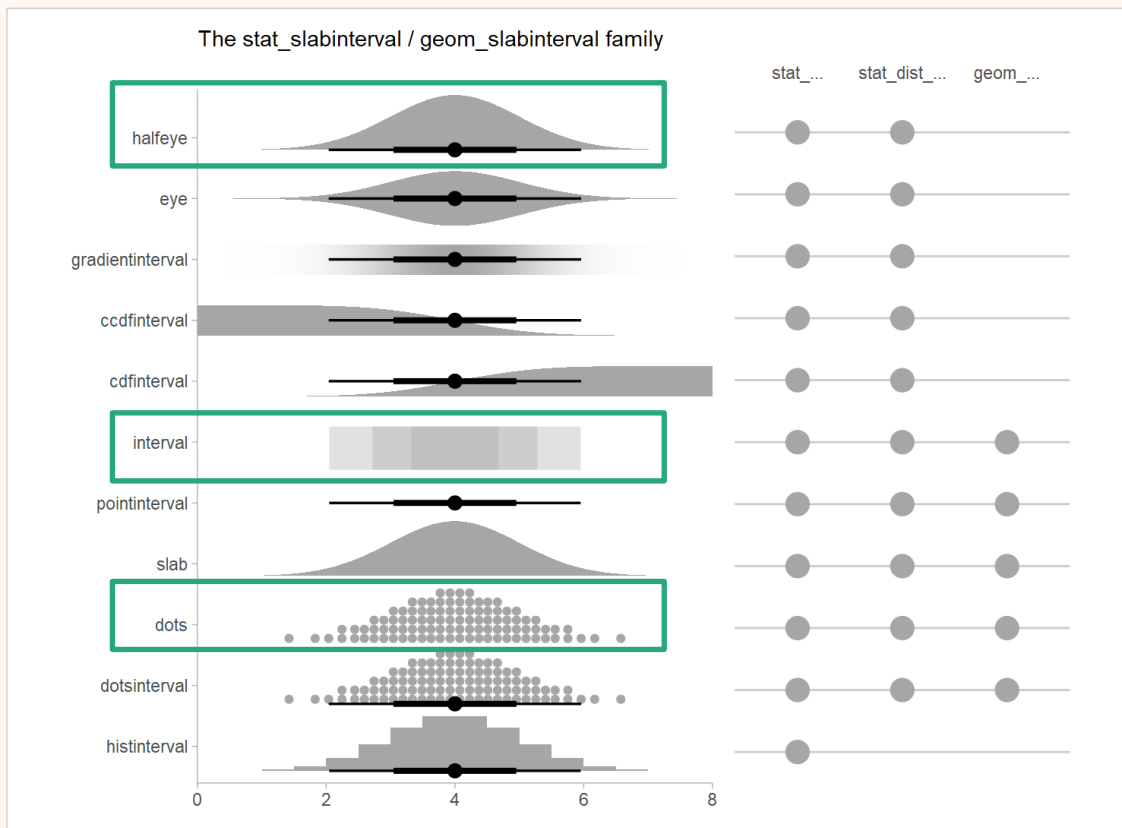
Visualization: Cédric Scherer • Data: My 66 #TidyTuesday Scripts from 2019 and 2020[†]

[†] I extracted all functions starting with `geom` or `stat` from my Rmd files containing the code for all my #TidyTuesday contributions (thanks Georgios for the idea and script). For the contributions from 2019 (n = 26) and 2020 (n = 40) I calculated the frequency of usage per year for each geom/stat as times used divided by the number of contributions. Note that some geom's which usually appear together (e.g. `treemapify::geom_treemap` functions) or behave very similarly (e.g. `ggforce::geommark` functions) were grouped together.

{ggdist}

Visualizations of Distributions and Uncertainty

{ggdist} Visualizations of Distributions and Uncertainty

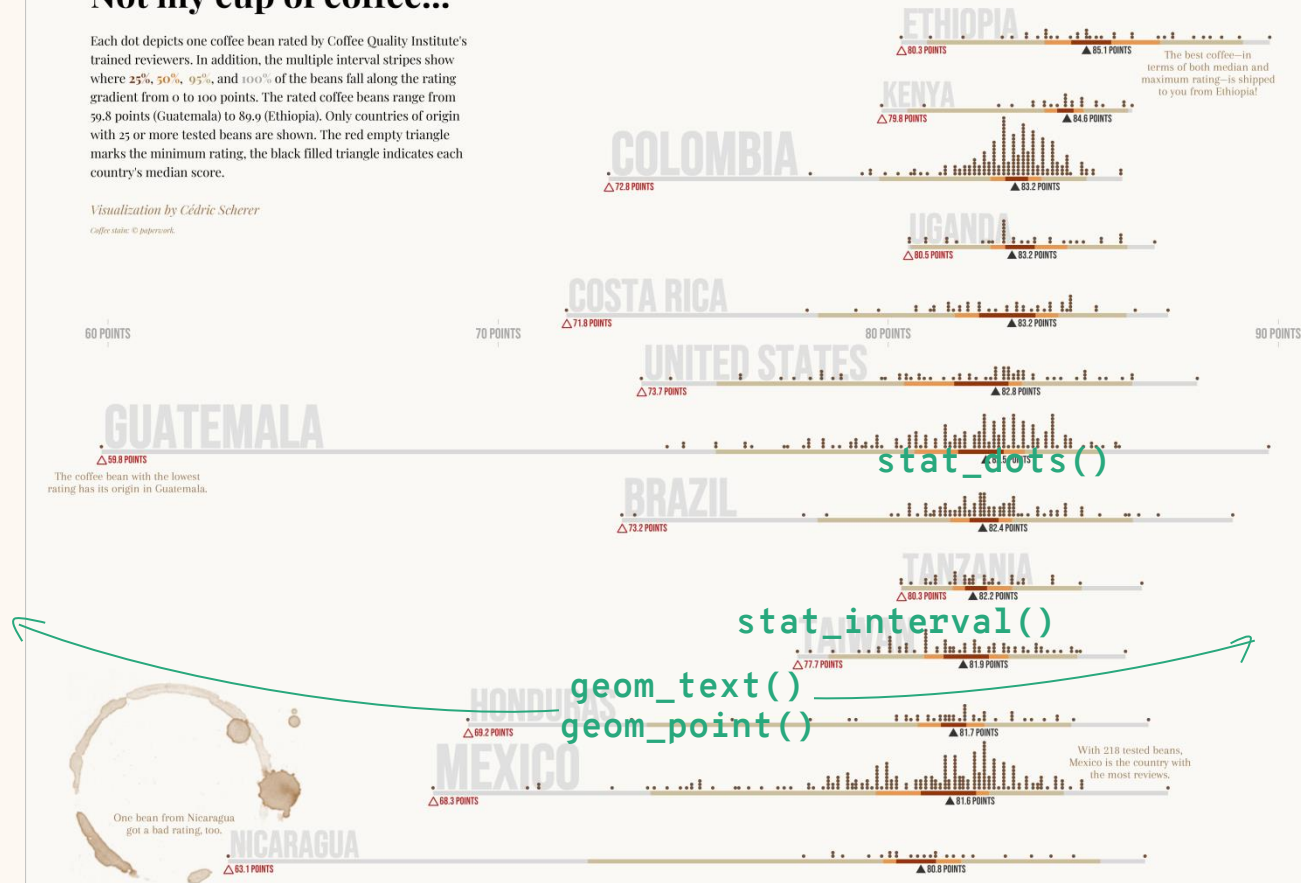


Not my cup of coffee...

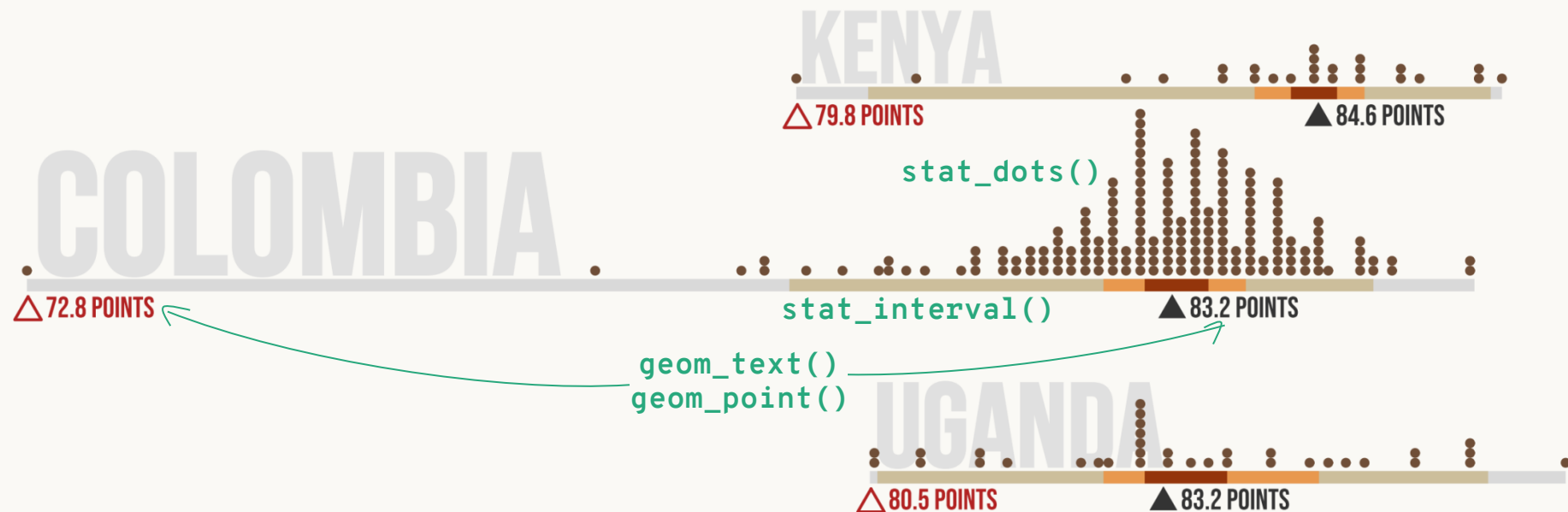
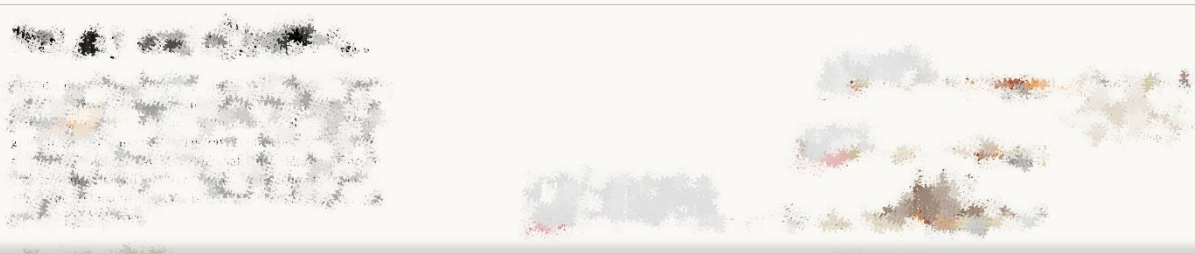
Each dot depicts one coffee bean rated by Coffee Quality Institute's trained reviewers. In addition, the multiple interval stripes show where 25%, 50%, 95%, and 100% of the beans fall along the rating gradient from 0 to 100 points. The rated coffee beans range from 59.8 points (Guatemala) to 89.9 (Ethiopia). Only countries of origin with 25 or more tested beans are shown. The red empty triangle marks the minimum rating, the black filled triangle indicates each country's median score.

Visualization by Cédric Scherer

Coffee state © paperwork



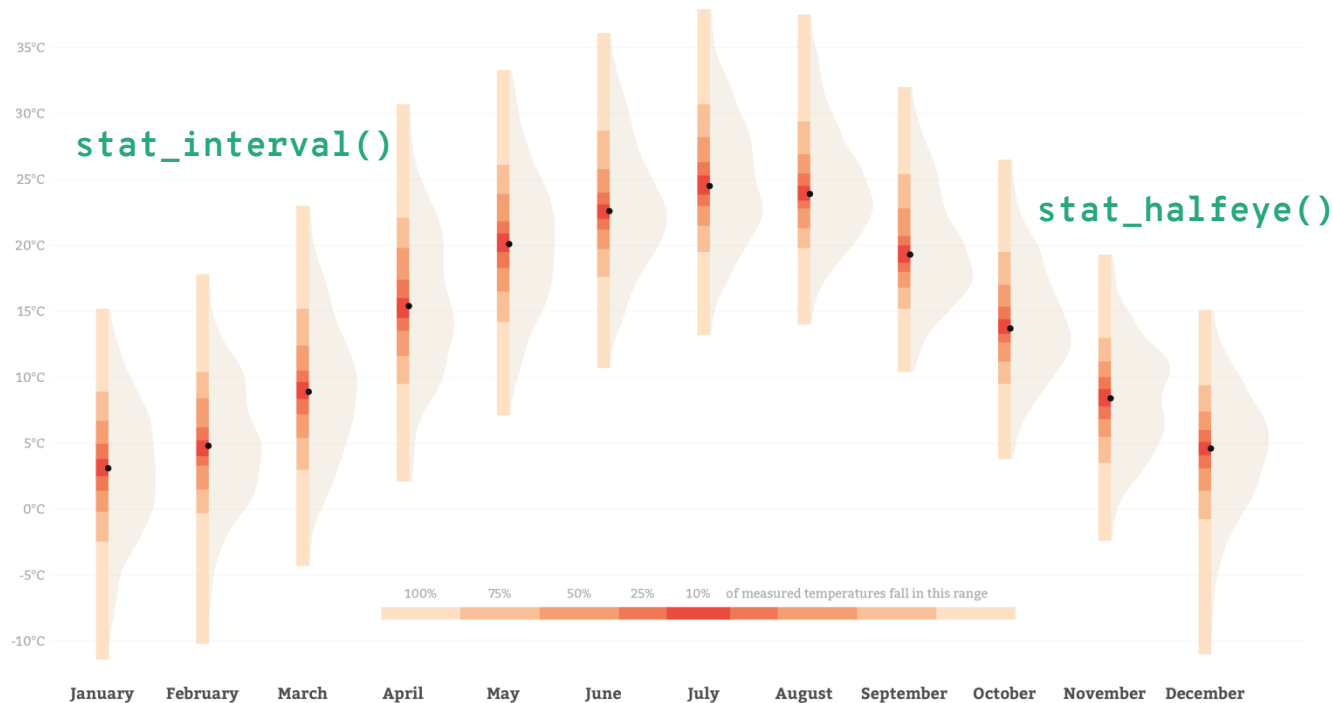
Contribution to #TidyTuesday 2020/28



Contribution to #TidyTuesday 2020/28

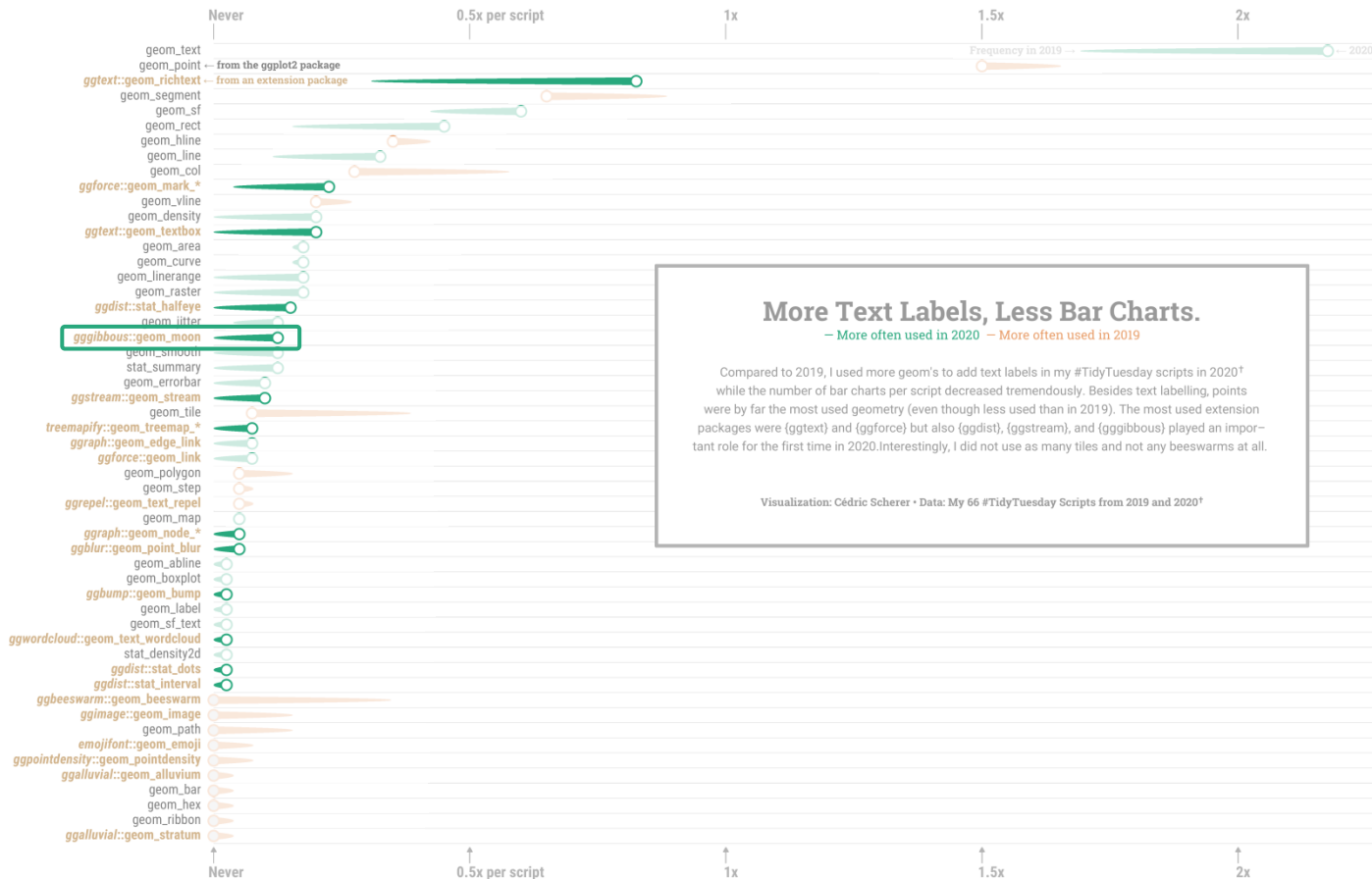
Daily Temperatures in Berlin, Germany

Range and distribution of maximum daily temperatures in Celsius per month from 2000 to 2018 measured in Berlin-Dahlem, Germany



Visualization by Cédric Scherer | Data: DWD (Deutscher Wetterdienst)

Contribution to the SWD Challenge September 2019



More Text Labels, Less Bar Charts.

— More often used in 2020 — More often used in 2019

Compared to 2019, I used more geom's to add text labels in my #TidyTuesday scripts in 2020[†] while the number of bar charts per script decreased tremendously. Besides text labelling, points were by far the most used geometry (even though less used than in 2019). The most used extension packages were (ggtext) and (ggforce) but also (ggdist), (ggstream), and (gggibbous) played an important role for the first time in 2020. Interestingly, I did not use as many tiles and not any beeswarms at all.

Visualization: Cédric Scherer • Data: My 66 #TidyTuesday Scripts from 2019 and 2020[†]

[†] I extracted all functions starting with `geom` or `stat` from my Rmd files containing the code for all my #TidyTuesday contributions (thanks Georgios for the idea and script). For the contributions from 2019 (n = 26) and 2020 (n = 40) I calculated the frequency of usage per year for each geom/stat as times used divided by the number of contributions. Note that some geom's which usually appear together (e.g. `treemapify::geom_treemap` functions) or behave very similarly (e.g. `ggforce::geommark` functions) were grouped together.

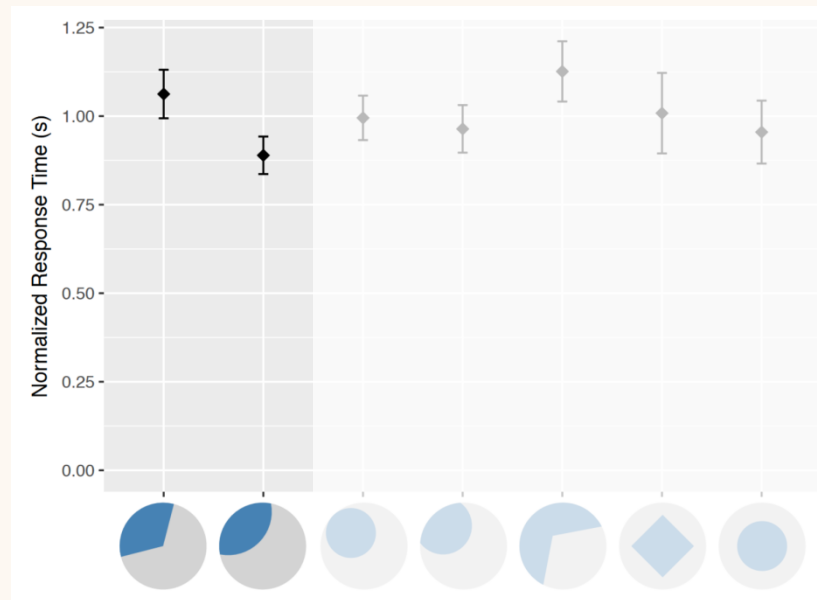
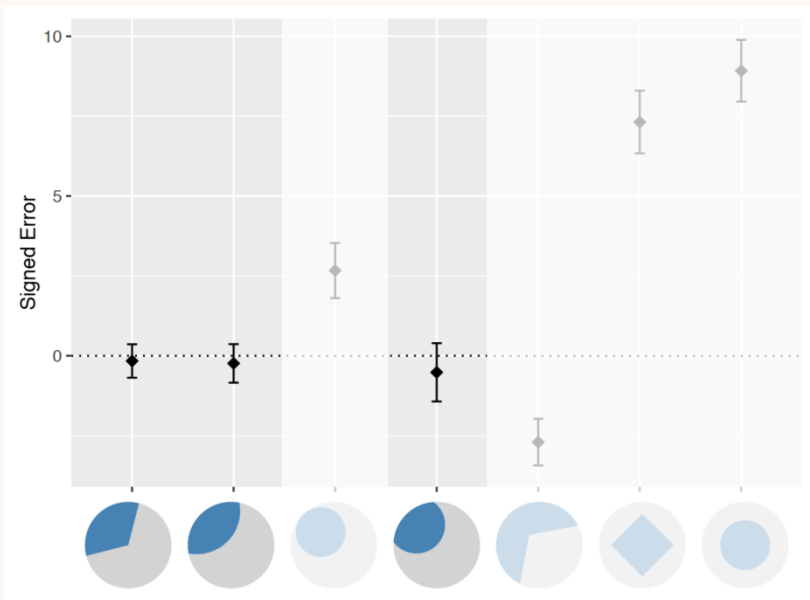
{gggibbous}

Moon charts for `ggplot2`



Circular Part-to-Whole Charts Using the Area Visual Cue

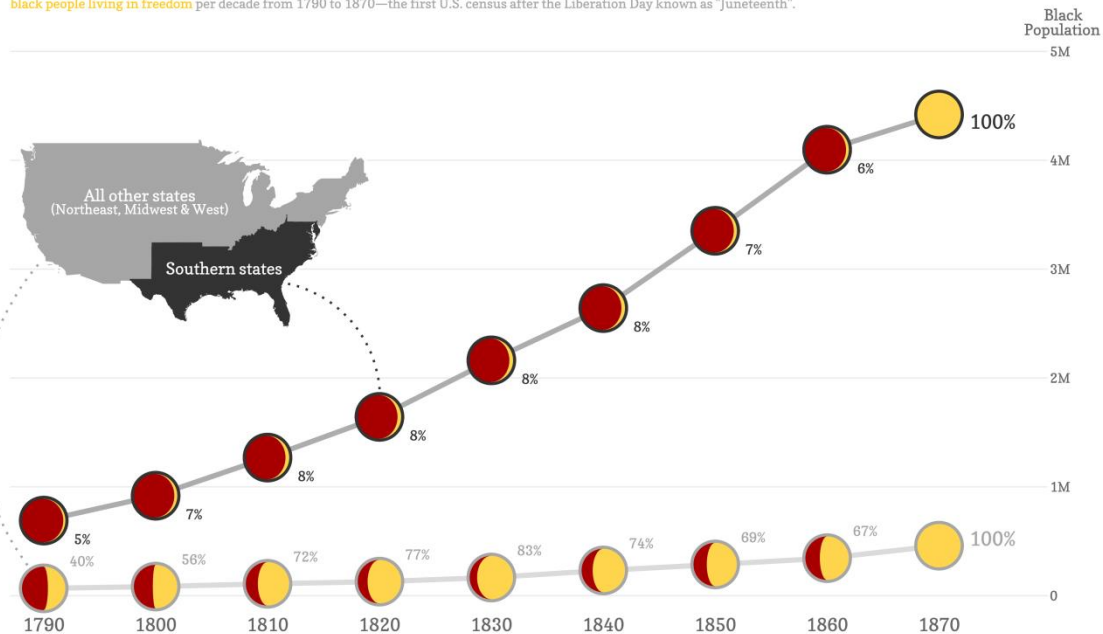
Robert Kosara
Tableau Research



doi.org/10.2312/evs.20191163

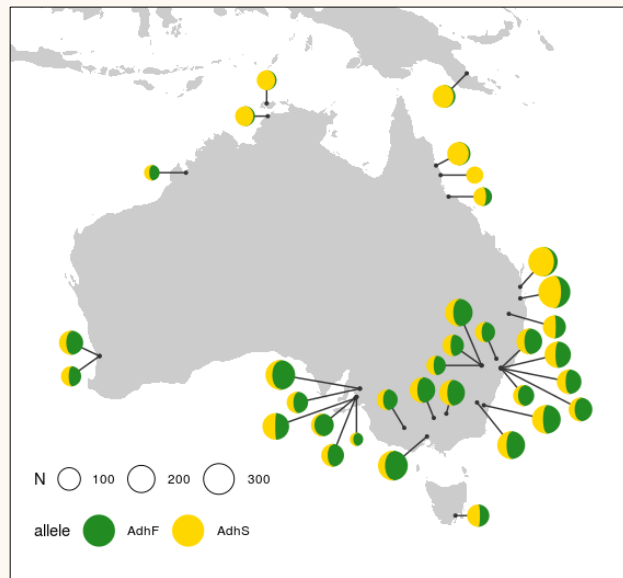
{gggibbous} Moon charts

By 1880, property owners in the south of North America began establishing plantation farms for cash crops like tobacco, cotton, and sugar cane—enterprises that required increasing amounts of labor. To meet the need, wealthy planters became slave traders and imported ever more individuals to the colonies, the vast majority from West Africa. While the "Emancipation Proclamation" was made law as of 1863, slave owners in the South, namely Texas, still maintained slavery until June 19th 1865 when Union soldiers were able to enforce the law abolishing slavery in the region. The graphic below shows the share of **black people in slavery**, most of them enslaved in the Southern states, and **black people living in freedom** per decade from 1790 to 1870—the first U.S. census after the Liberation Day known as "Juneteenth".



#JUNETEENTH #BLACKLIVESMATTER

Graphic: Cédric Scherer • Source: U.S. Census Bureau



Package example
(github.com/mnram/gggibbous)

Contribution to #TidyTuesday 2020/25



More Text Labels, Less Bar Charts.

— More often used in 2020 — More often used in 2019

Compared to 2019, I used more geom's to add text labels in my #TidyTuesday scripts in 2020[†] while the number of bar charts per script decreased tremendously. Besides text labelling, points were by far the most used geometry (even though less used than in 2019). The most used extension packages were (ggtext) and (ggforce) but also (ggdist), (ggstream), and (gggibbous) played an important role for the first time in 2020. Interestingly, I did not use as many tiles and not any beeswarms at all.

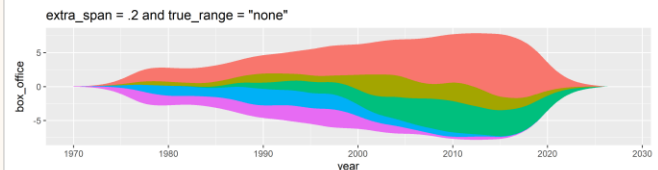
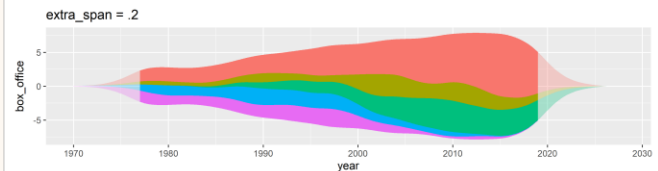
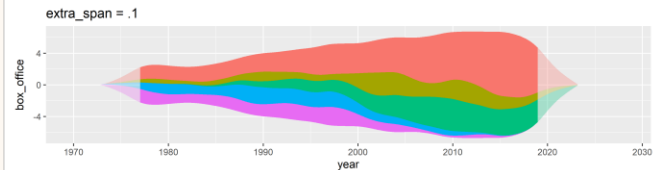
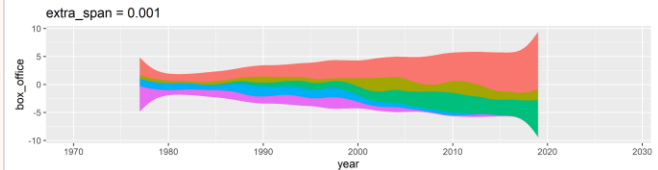
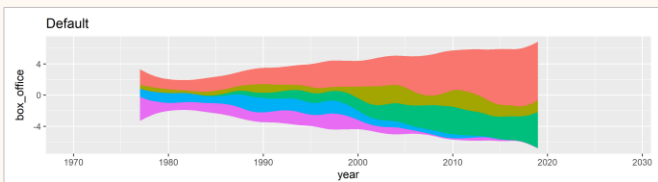
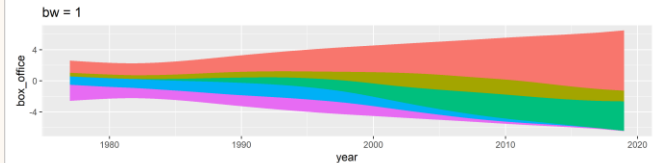
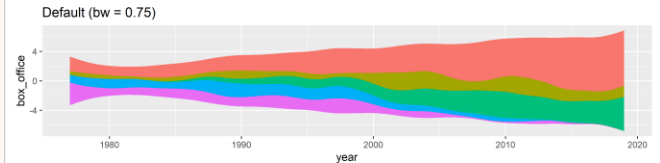
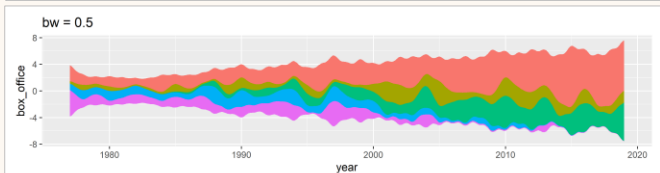
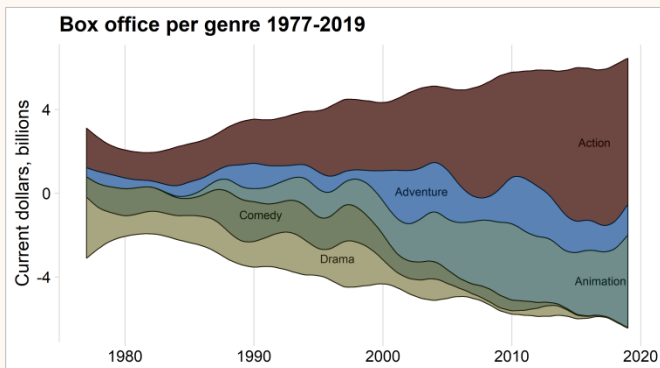
Visualization: Cédric Scherer • Data: My 66 #TidyTuesday Scripts from 2019 and 2020[†]

[†] I extracted all functions starting with `geom` or `stat` from my Rmd files containing the code for all my #TidyTuesday contributions (thanks Georgios for the idea and script). For the contributions from 2019 (n = 26) and 2020 (n = 40) I calculated the frequency of usage per year for each geom/stat as times used divided by the number of contributions. Note that some geom's which usually appear together (e.g. `treemapify::geom_treemap` functions) or behave very similarly (e.g. `ggforce::geommark` functions) were grouped together.

{ggstream}

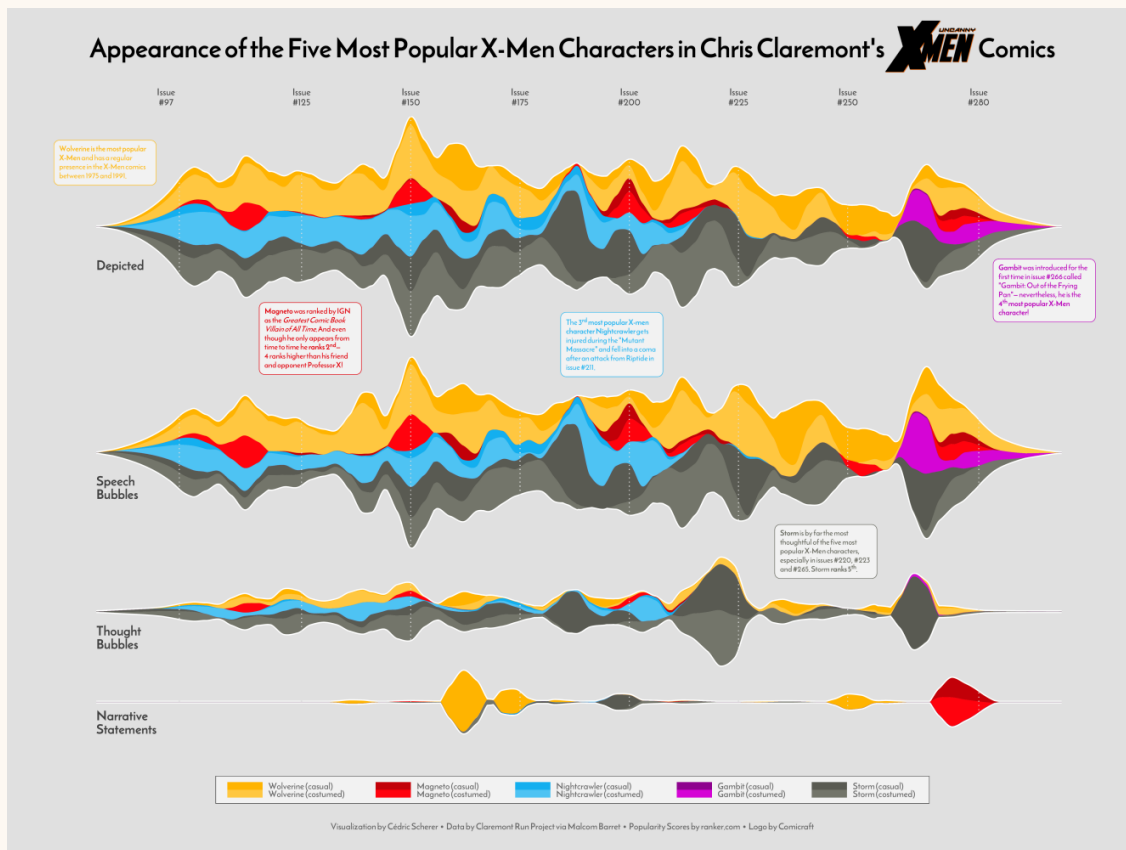
Make streamplots with `ggplot2`

{ggstream} Streamgraphs



Package examples
(github.com/davidsjoberg/ggstream)

{ggstream} Streamgraphs



My Contribution to #TidyTuesday 2020/27

{ggplot2}

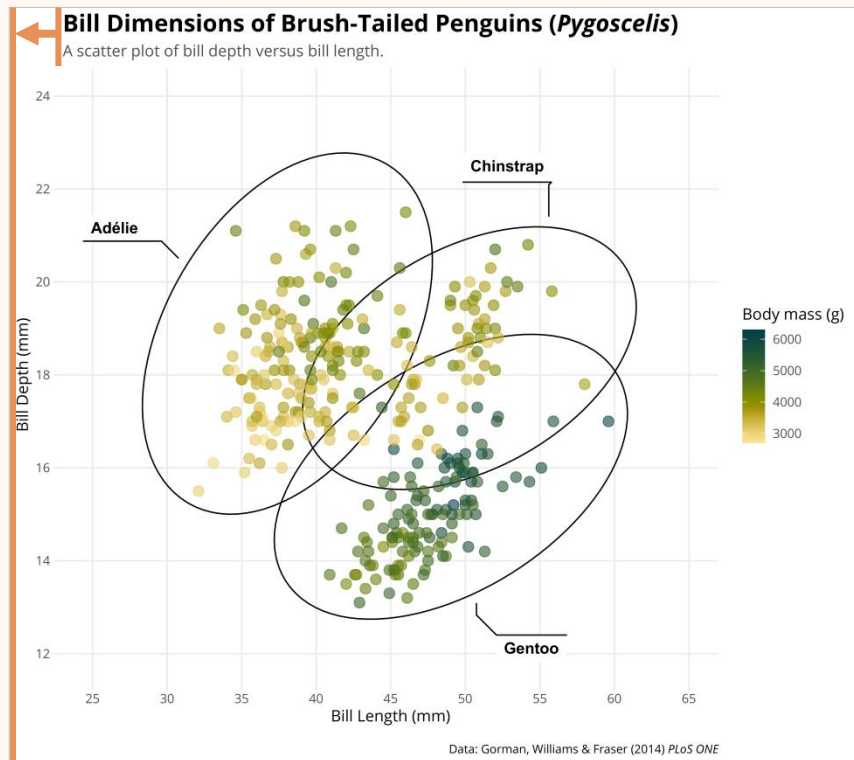
Details You May Not Know Yet
(or have never thought about)



ggplot2.tidyverse.org

Left-Aligned Title?

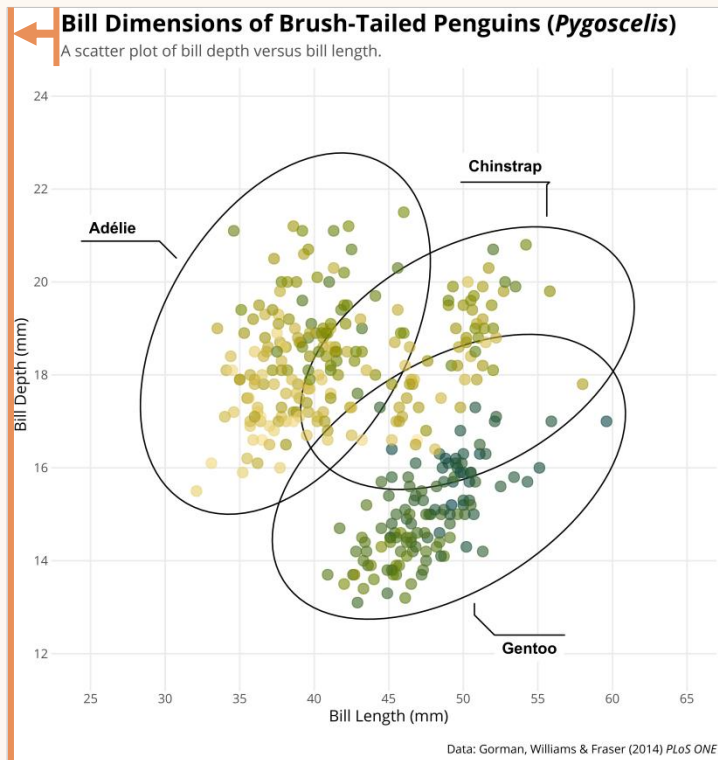
```
theme(plot.title = element_text(hjust = 0))
```



Left-Aligned Title

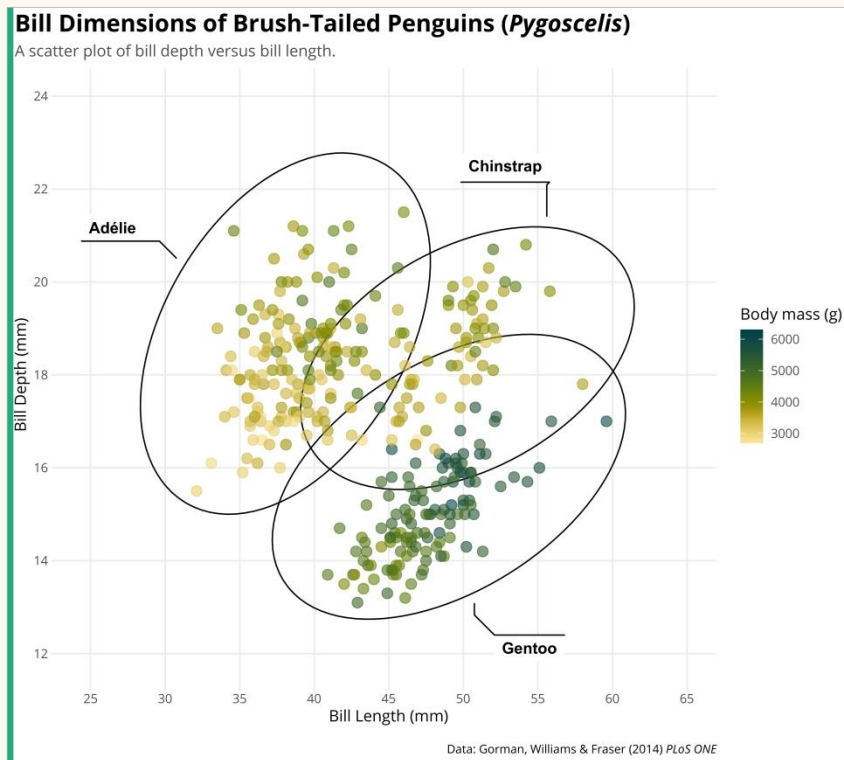
```
theme(plot.title.position = 'panel')
```

Default



Better

```
theme(plot.title.position = 'plot')
```



Right-Aligned Caption

```
theme(plot.caption.position = 'panel')
```

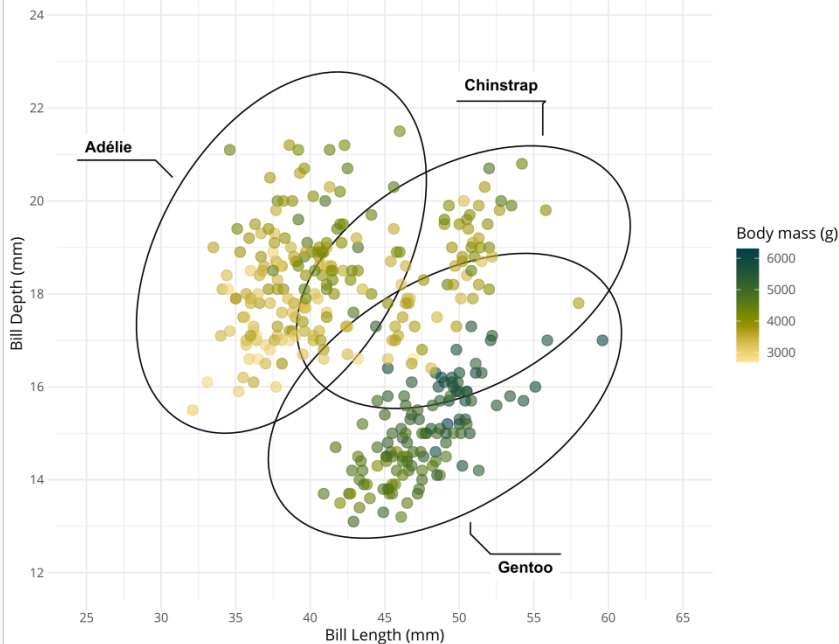
Default

Better (?)

```
theme(plot.caption.position = 'plot')
```

Bill Dimensions of Brush-Tailed Penguins (*Pygoscelis*)

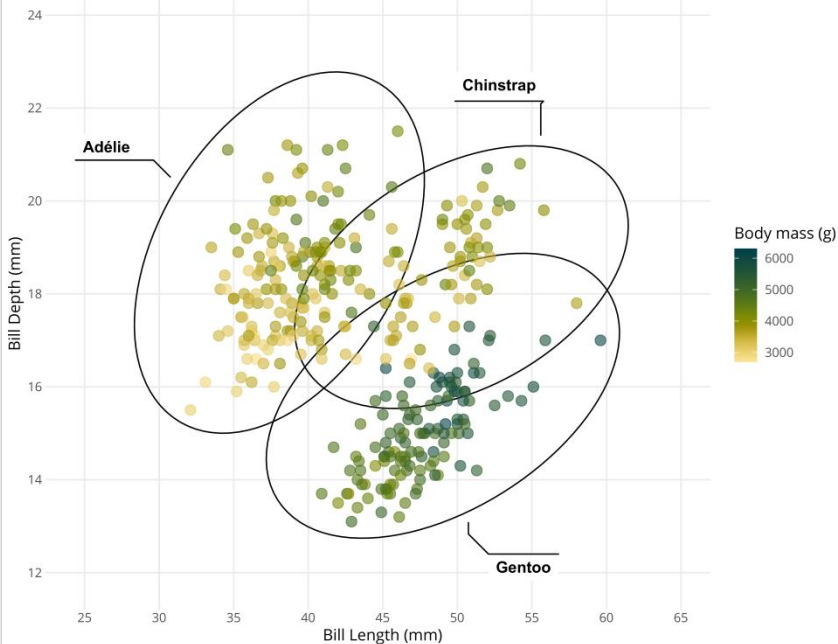
A scatter plot of bill depth versus bill length.



Data: Gorman, Williams & Fraser (2014) *PLoS ONE*

Bill Dimensions of Brush-Tailed Penguins (*Pygoscelis*)

A scatter plot of bill depth versus bill length.



Data: Gorman, Williams & Fraser (2014) *PLoS ONE*

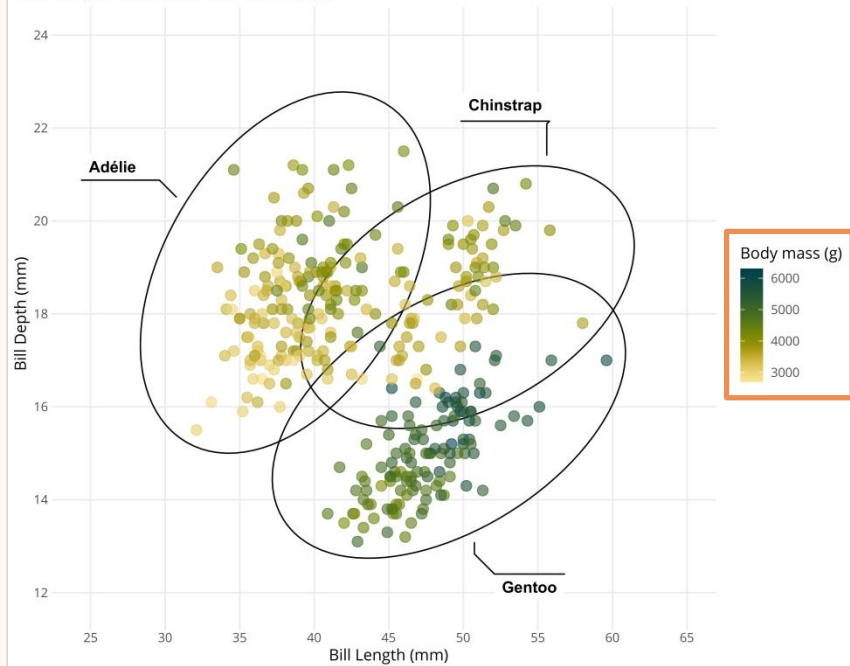
Legend Design

```
theme(legend.position = 'right')
```

Default

Bill Dimensions of Brush-Tailed Penguins (*Pygoscelis*)

A scatter plot of bill depth versus bill length.



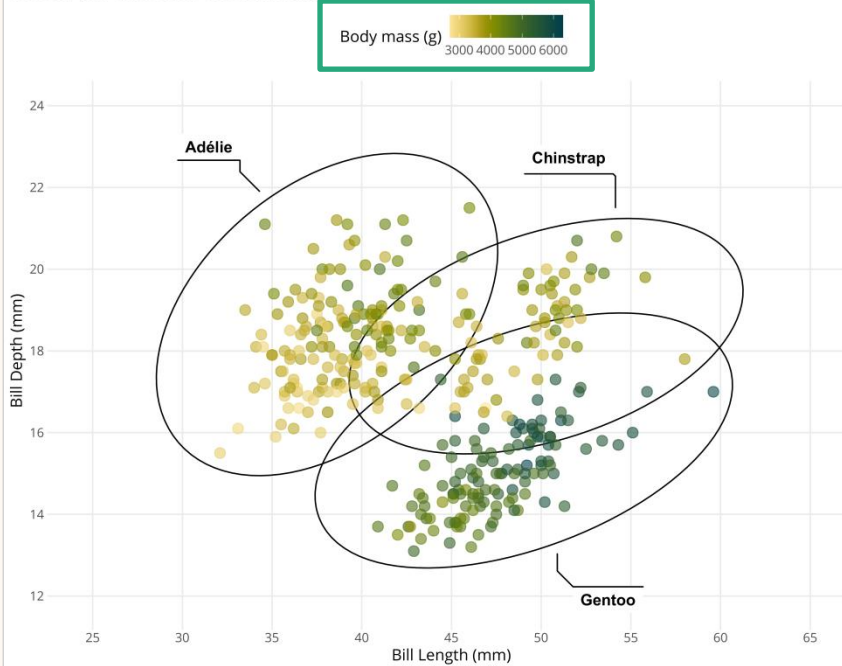
Data: Gorman, Williams & Fraser (2014) PLoS ONE

Well...

```
theme(legend.position = 'top')
```

Bill Dimensions of Brush-Tailed Penguins (*Pygoscelis*)

A scatter plot of bill depth versus bill length.



Data: Gorman, Williams & Fraser (2014) PLoS ONE

Legend Design

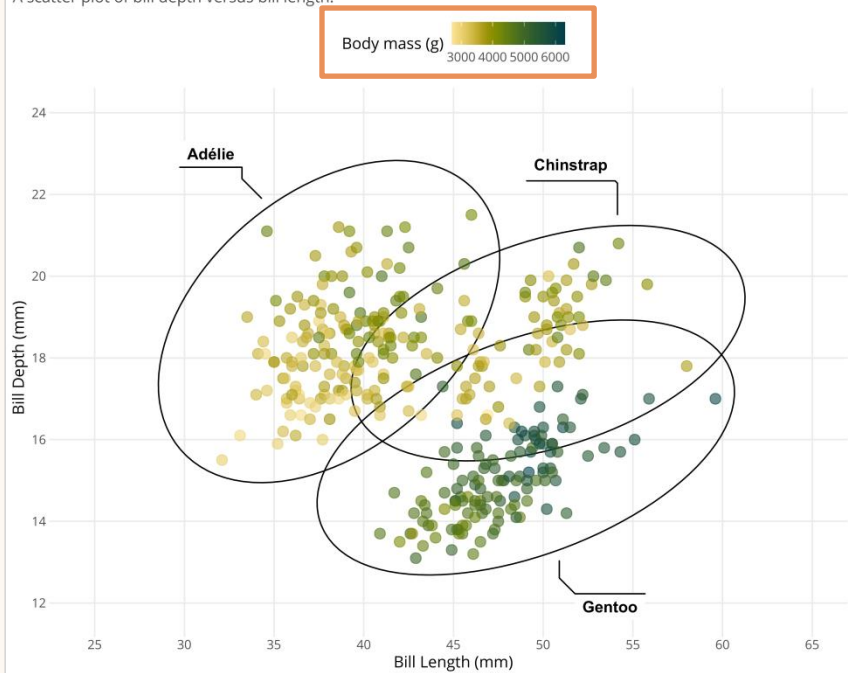
Default

```
guides(color = guide_colorbar(title.position = 'top', title.hjust = .5,  
barwidth = unit(20, 'lines'), barheight = unit(.5, 'lines')))
```

Better!

Bill Dimensions of Brush-Tailed Penguins (*Pygoscelis*)

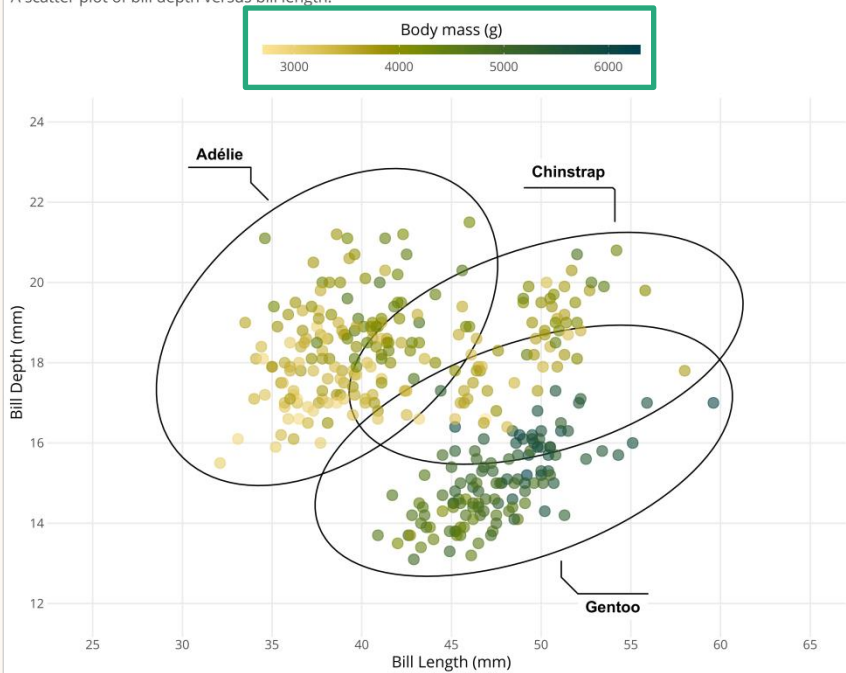
A scatter plot of bill depth versus bill length.



Data: Gorman, Williams & Fraser (2014) PLoS ONE

Bill Dimensions of Brush-Tailed Penguins (*Pygoscelis*)

A scatter plot of bill depth versus bill length.



Data: Gorman, Williams & Fraser (2014) PLoS ONE

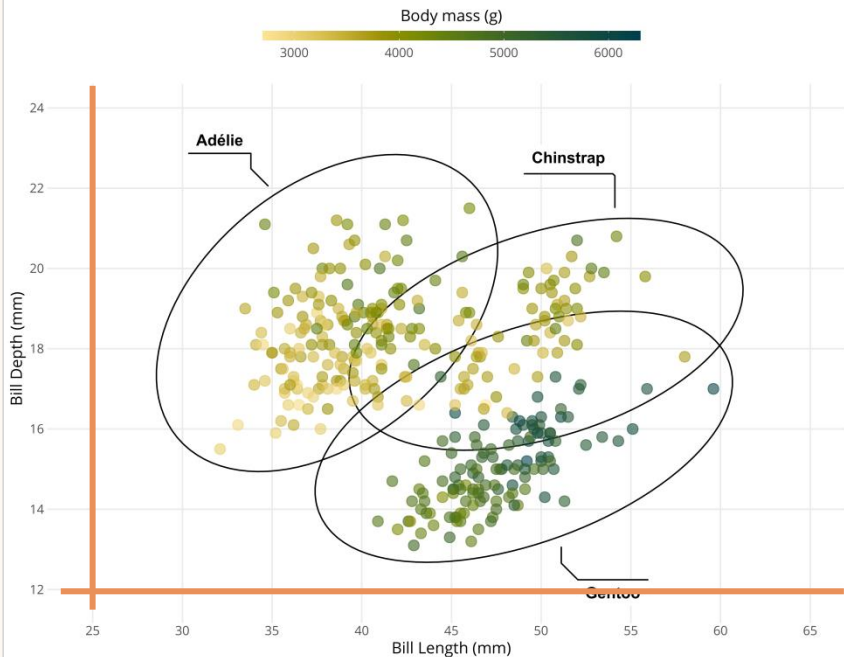
Limit Expansion

```
coord_cartesian(expand = TRUE)
```

Default

Bill Dimensions of Brush-Tailed Penguins (*Pygoscelis*)

A scatter plot of bill depth versus bill length.



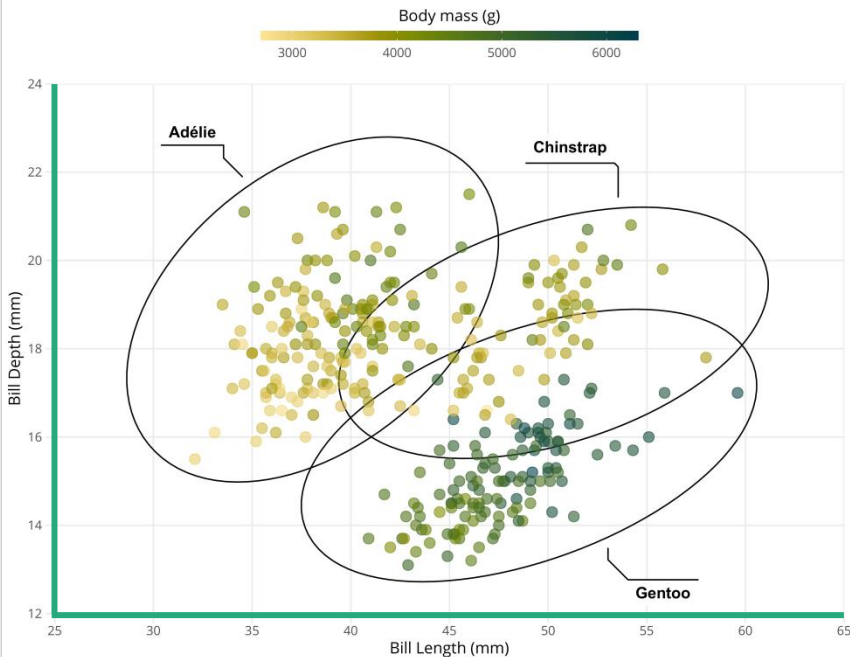
Data: Gorman, Williams & Fraser (2014) PLoS ONE

Without

```
coord_cartesian(expand = FALSE)
```

Bill Dimensions of Brush-Tailed Penguins (*Pygoscelis*)

A scatter plot of bill depth versus bill length.



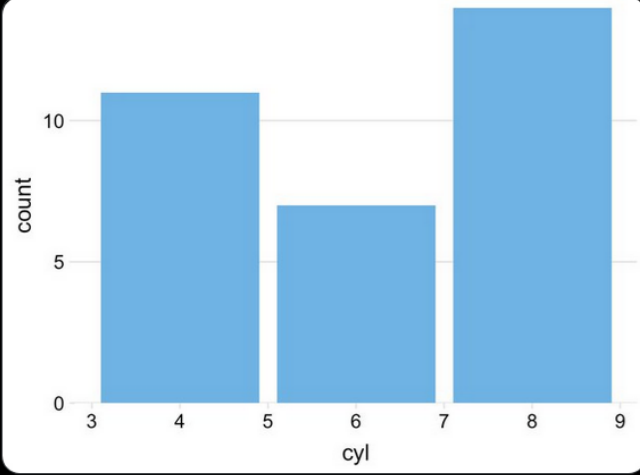
Data: Gorman, Williams & Fraser (2014) PLoS ONE

Geeky Details

Claus Wilke @ClausWilke

Replying to @thomasp85 and @hrbrmstr

This kind of stuff just really gets me. One of the main reasons I was motivated to add clip = "off" is plots like the attached, which look terrible in my opinion.

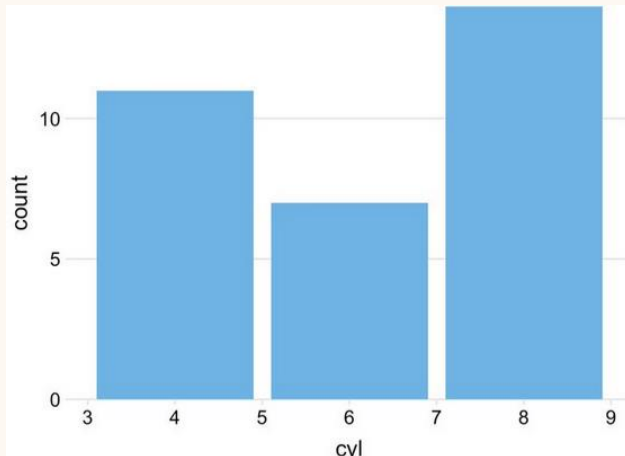


5:10 PM · May 2, 2018 · Twitter Web Client

gvdr @ipnosimmia · May 2, 2018

Replying to @ClausWilke @thomasp85 and @hrbrmstr

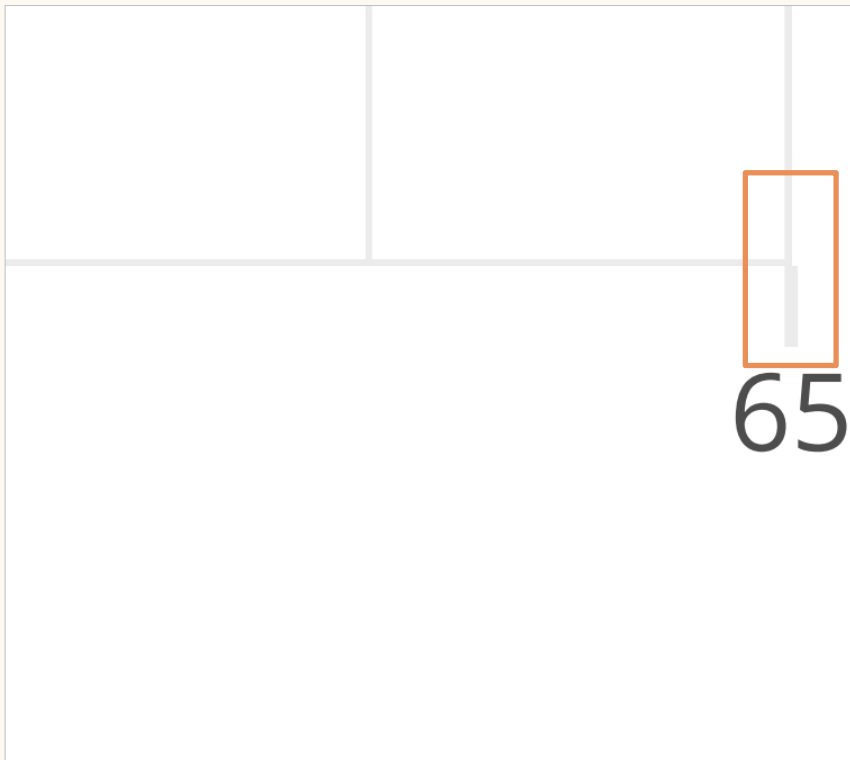
I must admit my limits. I can't see any difference between incorrect and correct. May I ask you to spell it out? (here to learn!)



Geeky Details

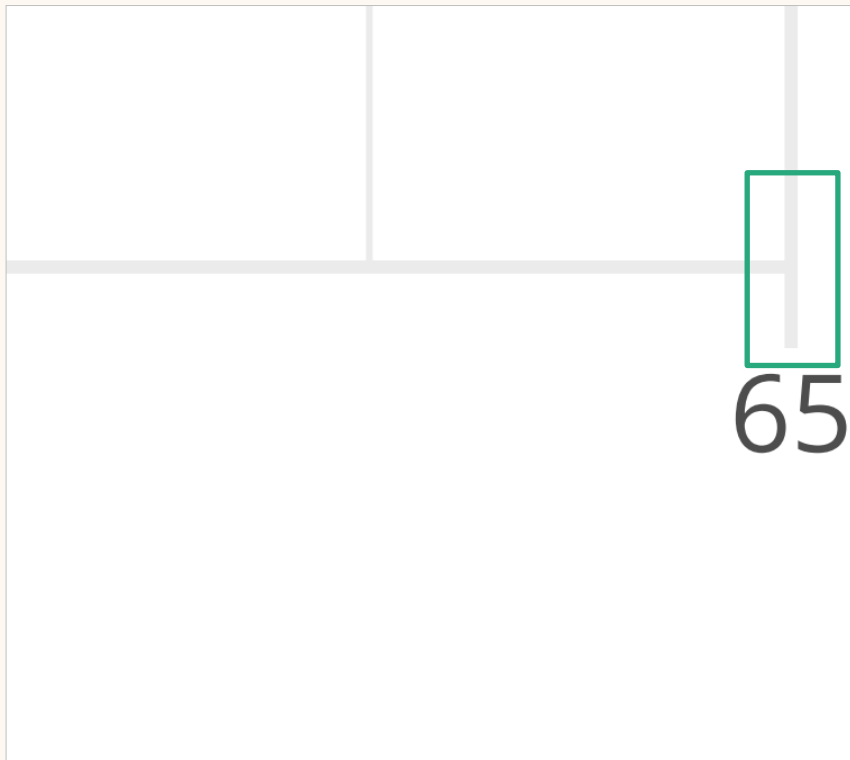
`coord_cartesian(clip = 'on')`

Default



Without

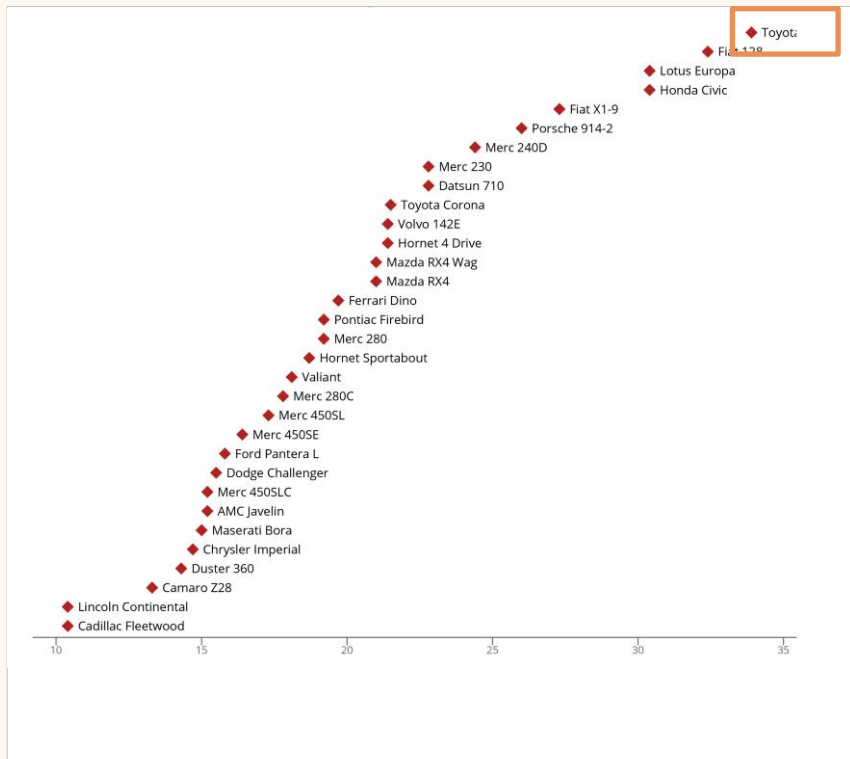
`coord_cartesian(clip = 'off')`



Geeky Details

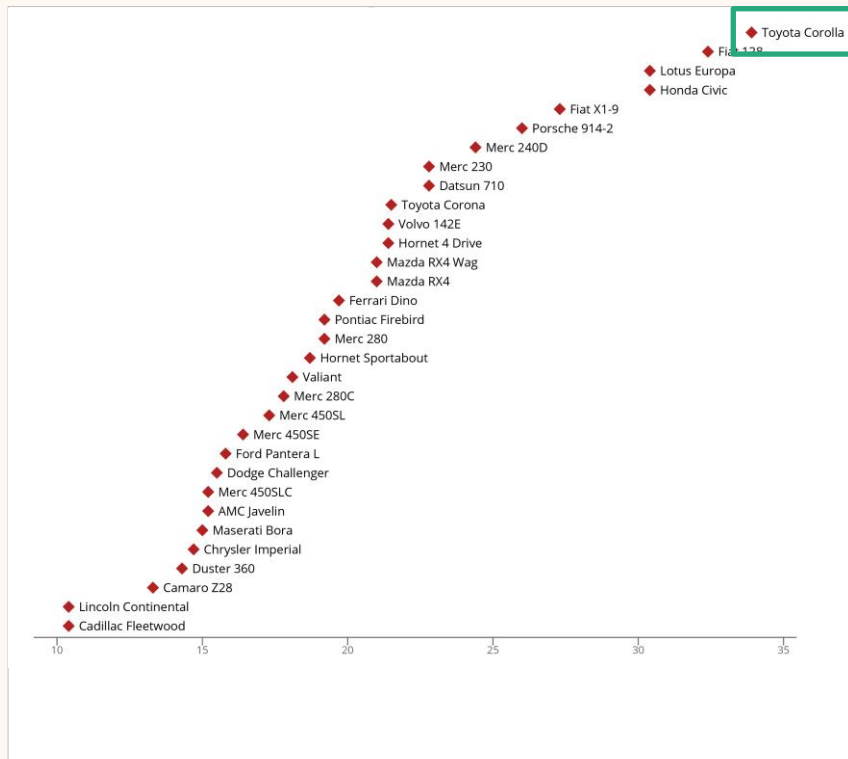
`coord_cartesian(clip = 'on')`

Default



Without

`coord_cartesian(clip = 'off')`



White Space

```
theme(plot.margin = margin(rep(base_size/2, 4)))
```

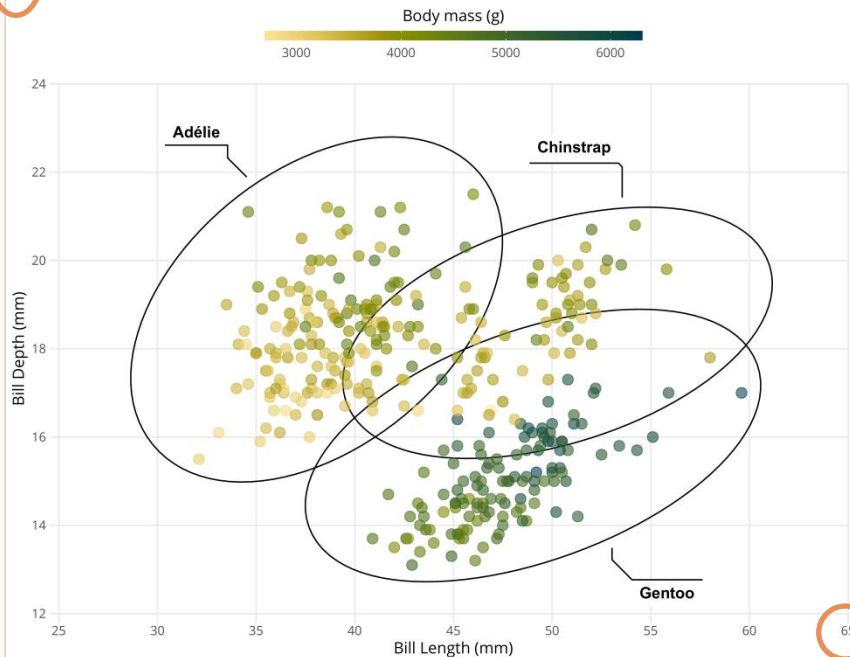
Default

Better

```
theme(plot.margin = margin(25, 25, 10, 25))
```

Bill Dimensions of Brush-Tailed Penguins (*Pygoscelis*)

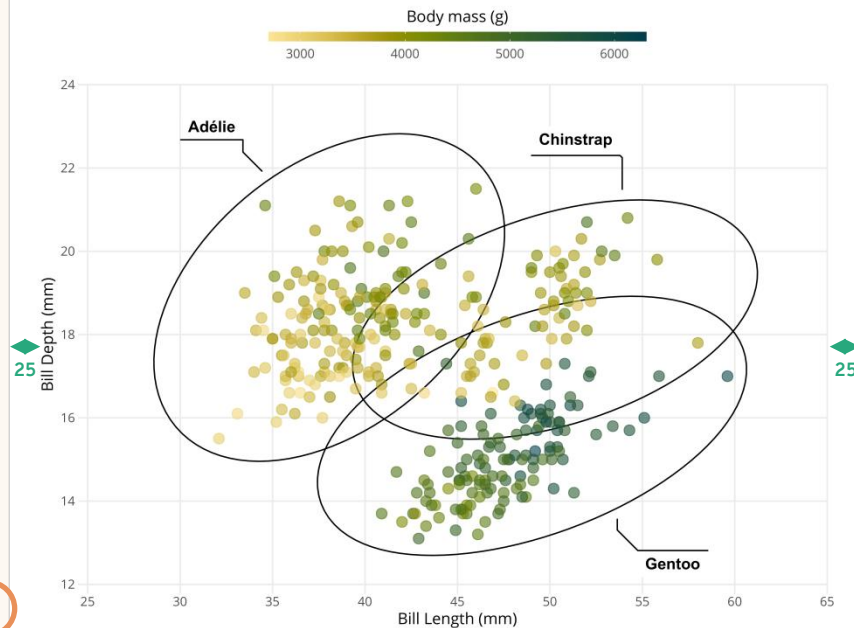
A scatter plot of bill depth versus bill length.



Data: Gorman, Williams & Fraser (2014) PLoS ONE

Bill Dimensions of Brush-Tailed Penguins (*Pygoscelis*)

A scatter plot of bill depth versus bill length.



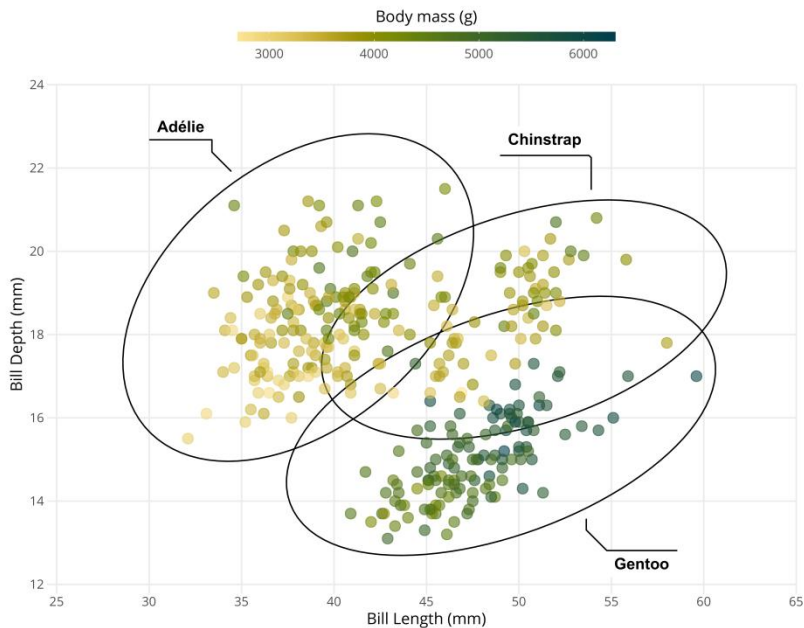
Data: Gorman, Williams & Fraser (2014) PLoS ONE

Adding Images

```
png <- magick::image_read("https://raw.githubusercontent.com/allisonhorst/.../culmen_depth.png")  
img <- grid::rasterGrob(png, interpolate = TRUE)  
annotation_custom(img, ymin = 22, ymax = 31, xmin = 55, xmax = 65.5)
```

Bill Dimensions of Brush-Tailed Penguins (*Pygoscelis*)

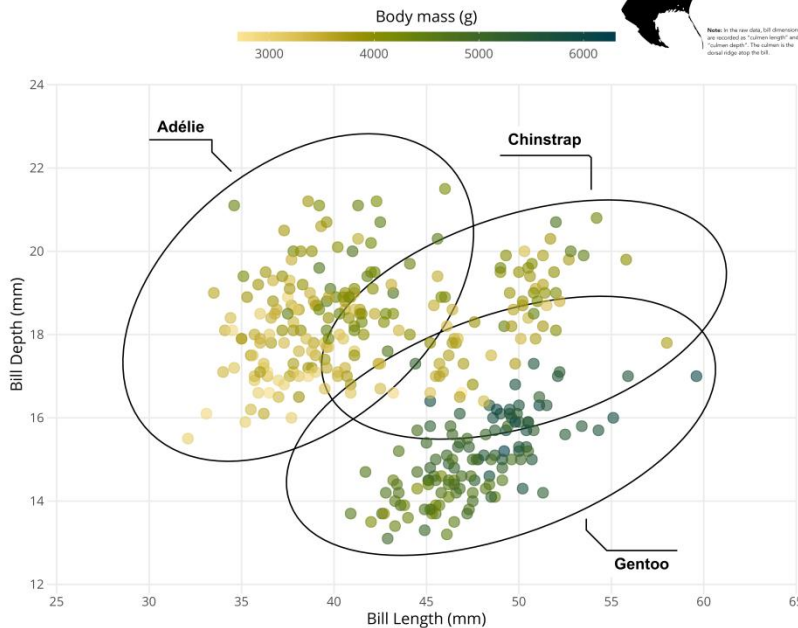
A scatter plot of bill depth versus bill length.



Data: Gorman, Williams & Fraser (2014) *PLoS ONE*

Bill Dimensions of Brush-Tailed Penguins (*Pygoscelis*)

A scatter plot of bill depth versus bill length.



Data: Gorman, Williams & Fraser (2014) *PLoS ONE* • Illustration: Allison Horst

{patchwork}

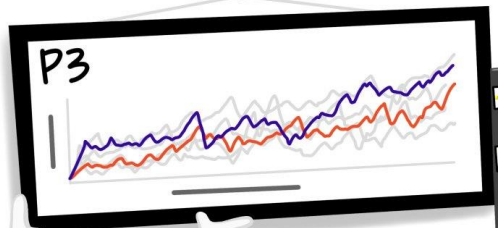
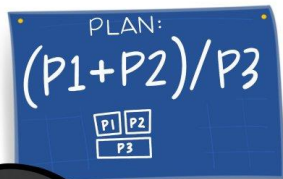
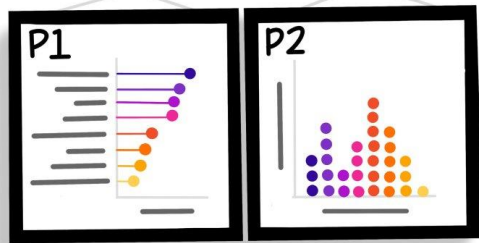
The Composer of ggplots



patchwork.data-imaginist.com

patchwork

Combine + arrange
your ggplots!



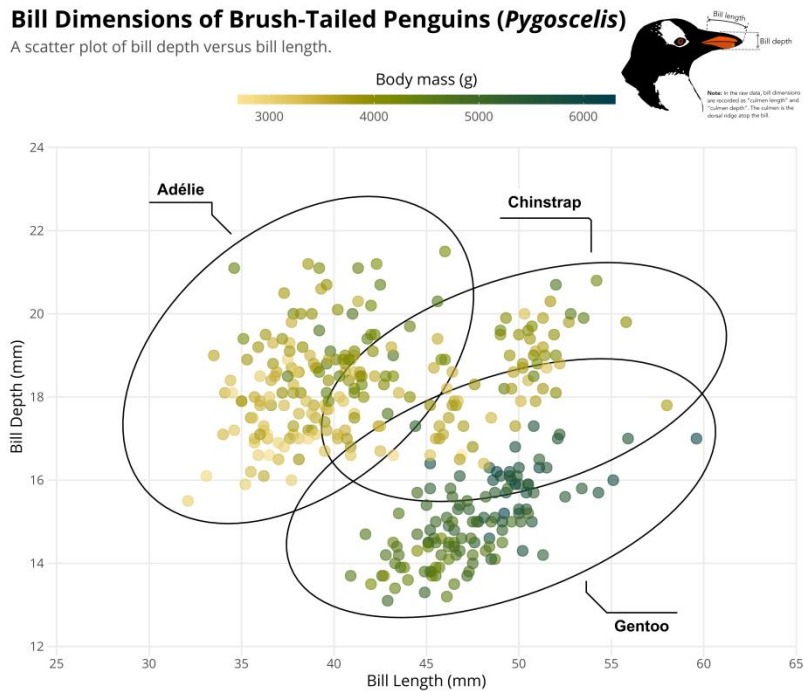
Horst 20

Artwork by Allison Horst

{patchwork} The Composer of ggplots

Bill Dimensions of Brush-Tailed Penguins (*Pygoscelis*)

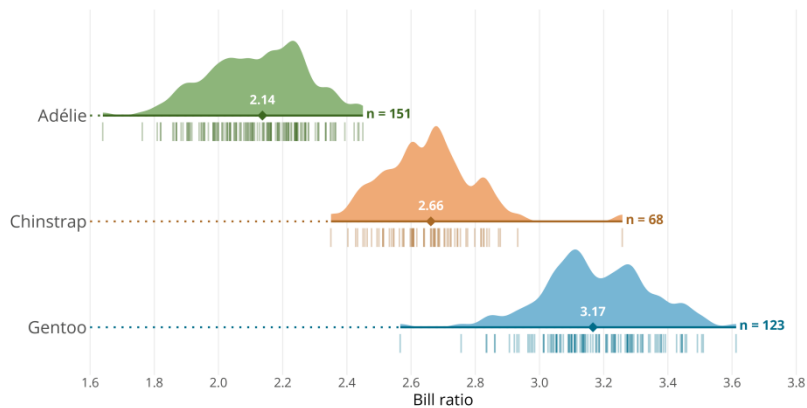
A scatter plot of bill depth versus bill length.



p1

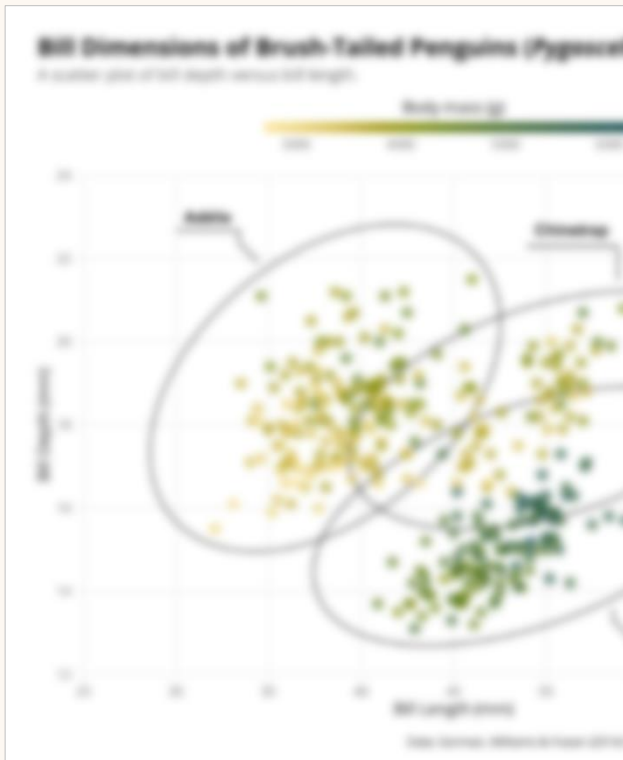
```
(p1 / p2) + plot_layout(heights = c(1, .65))
```

B. Raincloud plot showing the distribution of bill ratios, estimated as bill length divided by bill depth.

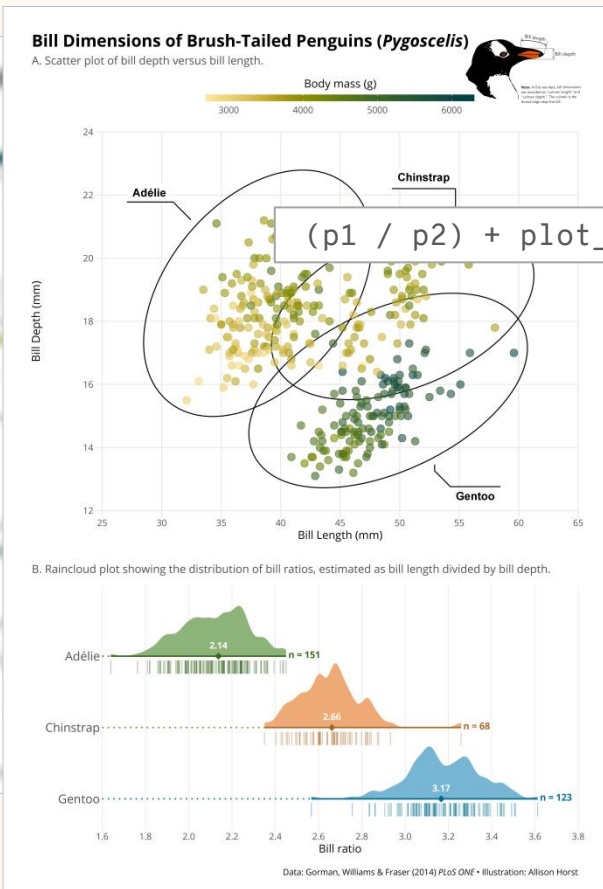


p2

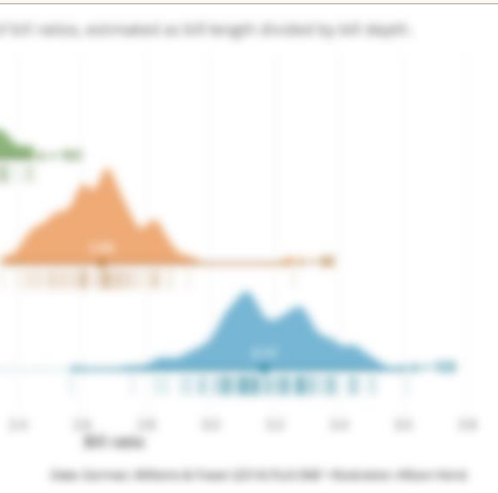
{patchwork} The Composer of ggplots



p1



```
(p1 / p2) + plot_layout(heights = c(1, .65))
```



p2



```
ggtitle('*Pygoscelis*') + theme(plot.title = element_markdown())
```

```
theme(plot.position = 'plot')
```

```
theme(legend.position = 'top') +  
guide(color = guide_colorbar())
```

```
theme(plot.margin = margin(t, r, b, l))
```

```
coord_cartesian(expand = c(0, 0),  
clip = 'off')
```

```
ggdist::stat_halfeye()
```

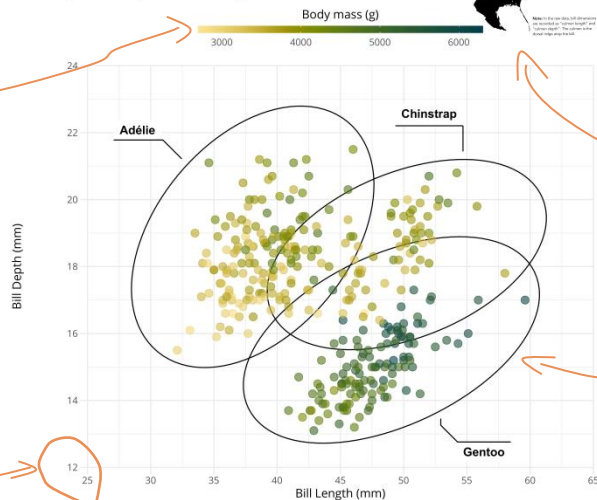
Palmer Penguins

github.com/allisonhorst/palmerpenguins

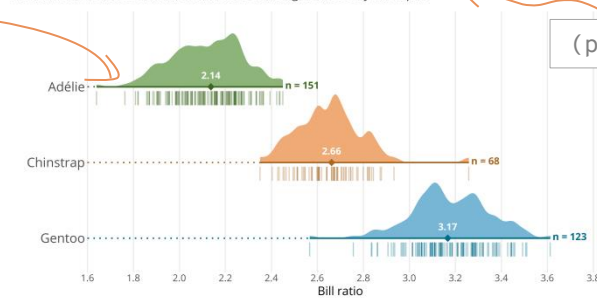


Bill Dimensions of Brush-Tailed Penguins (*Pygoscelis*)

A. Scatter plot of bill depth versus bill length.



B. Distribution of the bill ratio, estimated as bill length divided by bill depth



Data: Gorman, Williams & Fraser (2014) *PLoS ONE* • Illustration: Allison Horst

ggtext

```
annotation_custom(grid::rasterGrob(img))
```

```
ggforce::geom_mark_*()
```

```
(p1 / p2) + plot_layout(heights = c(1, .65))
```



ggplot2

ggplot2.tidyverse.org



cedricscherer.com



cedricphilippscherer@gmail.com



@CedScherer



@Z3tt

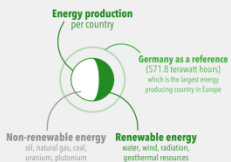
{patchwork} The Composer of ggplots

How European countries generated electricity in 2018

Germany is the largest energy producing country in Europe. It generates the most renewable and conventional thermal energy, representing 31% and 56% of its overall production respectively. France is the second largest energy European producer and by far the largest nuclear energy provider: 71% of its production is based on nuclear fission to generate heat.

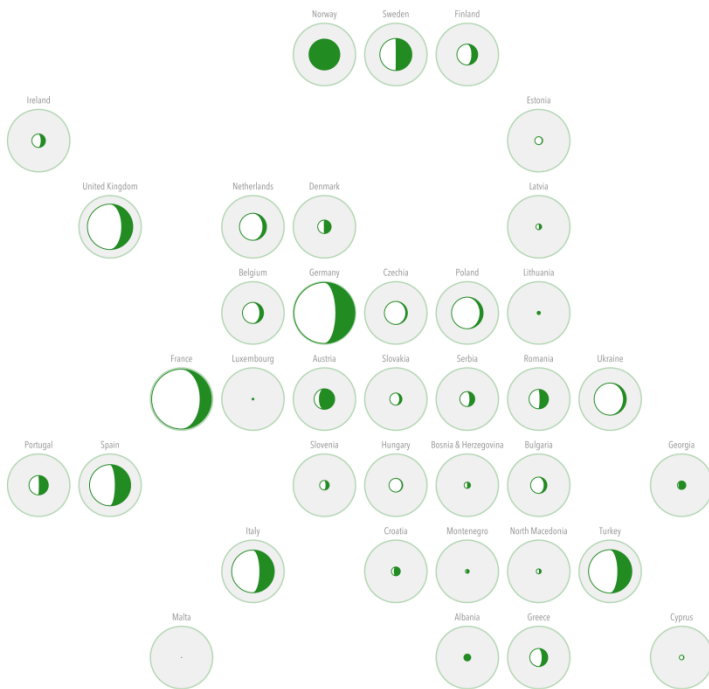


Renewable energy is energy that comes from resources that are naturally replenished such as sunlight, wind, water, and geothermal heat. Unlike fossil fuels, such as oil, natural gas and coal, or nuclear power sources such as uranium and plutonium, renewable energy regenerates naturally in a short period of time.

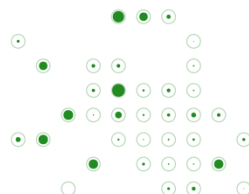


Norway had an electricity production almost entirely made up of renewable energy (98%). This makes Norway the second largest producer of this energy type in Europe. Interestingly, most of the renewable energy is produced by hydro power that take up 95% and only 5% by wind. In contrast, twelve European countries were reported to produce less than 20% of their energy with renewable resources: Malta (0%), Hungary (5%), Estonia (6%), Czechia (5%), Cyprus (6%), Ukraine (9%), Poland (10%), Netherlands (13%), Bulgaria (17%), Belgium (18%), Slovakia (19%), and France (19%).

Note: Energy production is mapped to the area of the circles.
Visualization by Cedric Scherer • Data by Eurostat



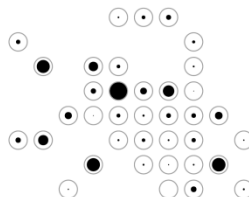
Renewable energy



Nuclear energy

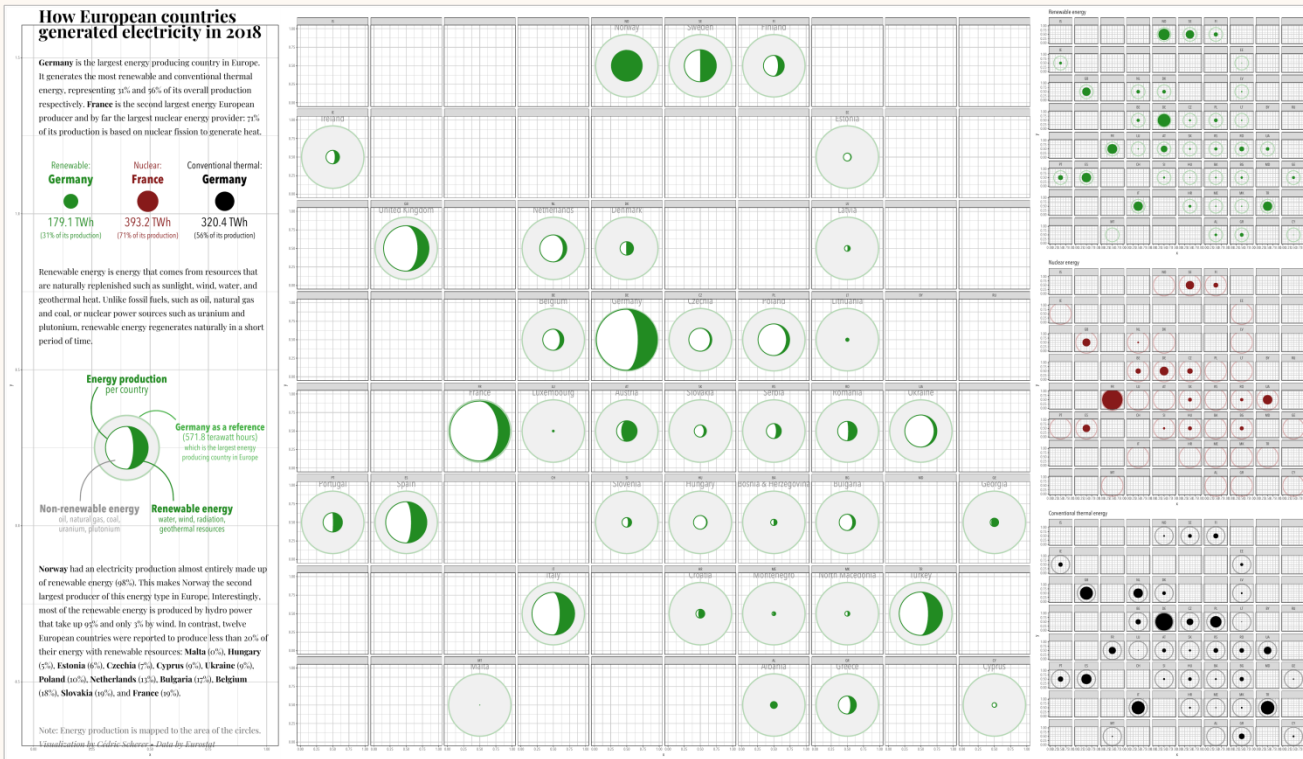


Conventional thermal energy



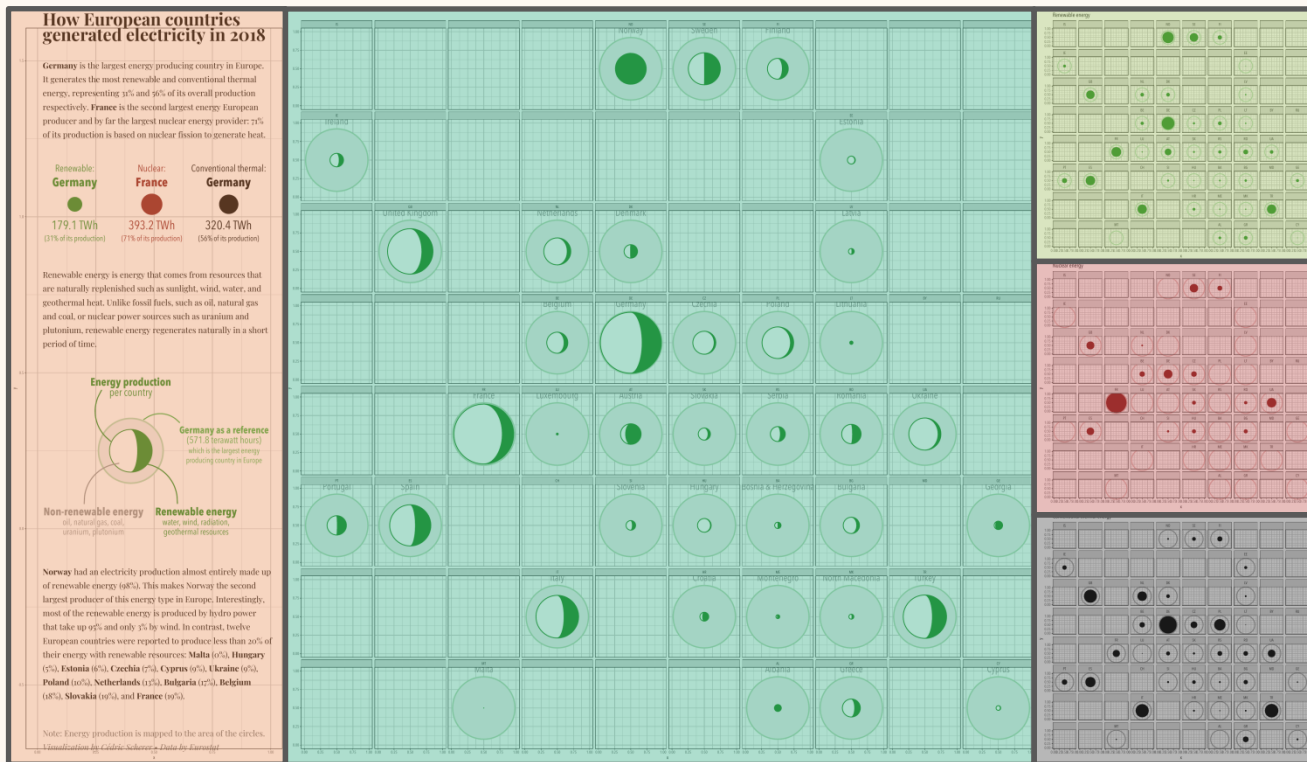
{patchwork} The Composer of ggplots

legend	main	(renewable / nuclear / thermal) + plot_layout(widths = c(.35, 1, .35))
--------	------	--



{patchwork} The Composer of ggplots

```
legend | main | (renewable / nuclear / thermal) + plot_layout(widths = c(.35, 1, .35))
```



Use R!

Hadley Wickham

ggplot2

Elegant Graphics for Data Analysis

Second Edition

[Q](#) [CHART TYPES](#) [QUICK](#) [TOOLS](#) [ALL](#) [D3.JS](#) [PYTHON](#) [DATA TO VIZ](#) [ABOUT](#)

The R Graph Gallery



Welcome the R graph gallery, a collection of charts made with the [R programming language](#). Hundreds of charts are displayed in several sections, always with their reproducible code available. The gallery makes a focus on the tidyverse and [ggplot2](#). Feel free to suggest a chart or report a bug: any feedback is highly welcome. Stay in touch with the gallery by following it on [Twitter](#) or [GitHub](#). If you're new to R, consider following this [course](#).

Distribution



Violin



Density



Histogram



Boxplot



Ridgeline

Correlation



Scatter



Heatmap



Correlogram



Bubble



Connected scatter



Density 2d

Ranking



Barplot



Spider / Radar



Wordcloud



Parallel



Lollipop



Circular Barplot

Part of a whole



CÉDRIC SCHERER

Data Visualization & Computational Ecology

MY PERSONAL DATA VISUALIZATION YEAR 2020

Even though it was a crazy and exhausting year, there was also some good and exiting things happening. Therefore I've decided to take a short break on New Year's Day and look back at some of the positive moments of my personal data visualization journey during 2020.

POSTED BY CÉDRIC FRIDAY, JANUARY 1, 2020

WHAT DO I BINGE NEXT? A DETAILED OVERVIEW OF THE TOP 250 TV SHOWS

My contribution to the RStudio table contests visualizing relevant details of the top 250 TV shows as rated by IMDb users. I focused on displaying all the details I and my friends care about including in-line visualizations of rating trends and average runtime.

POSTED BY CÉDRIC SUNDAY, NOVEMBER 1, 2020

THE WORST DAYS OF THE CORONAVIRUS PANDEMIC SO FAR

Coronavirus SARS-CoV-2, COVID-19 or simply Corona—what started as an epidemic in China has become a global pandemic. I created an animated timeseries of daily deaths relative to each country's worst day so far to visualize the first wave of COVID-19.

POSTED BY CÉDRIC TUESDAY, MARCH 16, 2020

COMPARING THE EXTENT OF THE AUSTRALIAN BUSHFIRES 2019/20

The massive bushfires in Australia are in the news worldwide. The incredible extent of burnt land and plume of smoke is hard to imagine so I have compared the areas to countries in Europe and worldwide.

POSTED BY CÉDRIC THURSDAY, JANUARY 8, 2020

BEST TIDYTUESDAY 2019

Here are my favorite visualizations of the #TidyTuesday challenge in 2019 (from those I've seen and which I remember). I present my personal top 3 in terms of design and storytelling.

POSTED BY CÉDRIC MONDAY, DECEMBER 30, 2019

MERRY (WHITE?) CHRISTMAS!

At the end of the year, I explore the history of snow cover and white Christmas in Berlin. I wish you a merry Christmas and wonderful holidays 2019!

POSTED BY CÉDRIC TUESDAY, DECEMBER 24, 2019

ABOUT ME



Always coding. Passionate about design. Worried about nature. Proud dad.



FEATURED TAGS



FRIENDS

DanVib Society
R4DS Community Correlaid
Will Chase
Georgios Karanakis
Marco Sciaini
Manthias Stahl
Henreka Labs

OLDER POSTS →



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Cédric Scherer

Z3tt

Data Visualization Designer • Computational Ecologist

Edit profile

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cedricphilippscherer@gmail.com
cedricscherer.com
@CedScherrer

Highlights

Arctic Code Vault Contributor
FRO

Organizations



Overview

Repositories 56 Projects 3 Packages



22K / README · 10

Send feedback

Hi, I'm Cédric! 🐼



Data Visualization and Computational Ecology 🐼



Pinned

Customize your pins

TidyTuesday

My contributions to the #TidyTuesday challenge

415 77

RStudioMapChallenge

My contributions to the #RStudioMapChallenge 2019

115 21

RStudioTableContest2020

Table showing an "Overview and Series Trends of the Best TV Shows on IMDb" - My Contribution to the RStudio Table Contest 2020

11 3

OutlierConf2021

Slides and hands-on codes for my talk "Signed Wickedness: My Favorite Ticks and Secrets for Beautiful Plots in R" at the 1st OutlierConf, February 4-7 2021.

133 23

ContestCivibear

A shiny app to explore accidents in Germany as well as bicycle infrastructure and bike accidents in Berlin.

7 7

ChessahMap

Solving the ChessahMap Conflict in Hamburg - My Contribution to the SES Movement "MoveMap" Competition 2021

2,013 contributions in the last year

Contribution settings •

2021



Learn how we count contributions.

Less More

@CedynZw @Cervid @apptrades More

Activity overview

Contributed to Z3tt/Z3tt, Z3tt/TidyTuesday, Z3tt/RangeRanking and 5 other repositories



Contribution activity

March 2021

Created 174 commits in 24 repositories

Created 3 repositories



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Thank you!

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Z3tt/TidyTuesday

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master branch 0 tags

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About

My contributions to the #TidyTuesday challenge

ggplot2 dplyr tidyr tidymodels rstatix

Readme

#TidyTuesday Contributions

Buy me a coffee

My contributions to the #TidyTuesday challenge, a weekly social data project that focuses on understanding how to summarize and arrange data to make meaningful and/or beautiful charts with (ggplot2), (tidyr), (dplyr), and other tools that are part of the (tidyverse) ecosystem. The project was founded in 2018 by Thomas Mock and organized by the R4DS ("R for Data Science") online learning community. The intent is to provide a safe and supportive forum to practice their wrangling and data visualization skills.

DISCLAIMER:

- no Illustrator or Photoshop was harmed during the making of these visualizations.
- certified ggplot quality.

Feedback is very welcome via [Twitter](#) or [mail](#).

Contributions in chronological order (click to expand)

- Challenges 2018
 - 2018/03 Global Mortality
 - 2018/03 Malana
- Challenges 2019
 - 2019/14 Seattle Bike Traffic
 - 2019/16 The Economist's Data Viz Mistakes
 - 2019/17 Anime Data
 - 2019/18 Chicago Bird Collisions
 - 2019/19 Global Student to Teachers Ratios
 - 2019/20 Nobel Prize Winners
 - 2019/21 Global Plastic Waste
 - 2019/22 Wine Ratings
 - 2019/24 Meteorites
 - 2019/25 Christmas Bird Count
 - 2019/27 Media Franchise Revenues
 - 2019/28 FIFA Women's World Cup
 - 2019/33 Roman Emperors
 - 2019/34 Nuclear Explosions
 - 2019/35 Simpsons Guest Stars
 - 2019/36 Moore's Law
 - 2019/38 US National Park Visits
 - 2019/39 US School Diversity
 - 2018/40 NYC Pizza Ratings
 - 2019/42 Big Cars
 - 2019/44 NYC Squirrels
 - 2019/50 Replicating Plots (Rap Edition)
 - 2019/51 Adoptable Dogs
 - 2019/52 Christmas Songs
- Challenges 2020
 - 2020/01 Bring Your Own Data: White Christmas in Berlin
 - 2020/02 Australian Fires
 - 2020/03 Passwords
 - 2020/04 Spotify Songs: The Golden Age of Hip Hop
 - 2020/05 San Francisco Trees
 - 2020/07 Hotel Bookings
 - 2020/08 Foot Carbon Footprint
 - 2020/12 The Office on IMDb
 - 2020/14 Beer Production
 - 2020/15 Tour de France History
 - 2020/16 Best Hip Hop Songs of All Time
 - 2020/18 Broadway Musicals (BTFM Edition)
 - 2020/19 Animal Crossing
 - 2020/20 Volcano Eruptions
 - 2020/21 Beach Volleyball

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main OutlierConf2021 / README.md

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Z3tt updates readme

Latest commit 19/2/21 now History

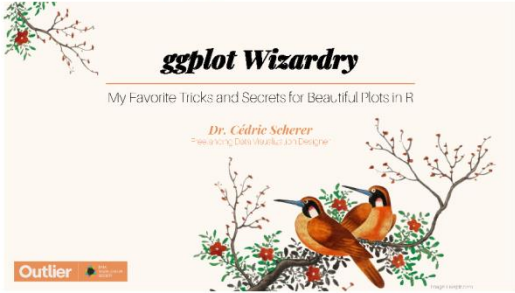
As 1 contributor

17 files (54 lines) 4.9k B

Raw Edit Open in IDE

ggplot Wizardry: My Favorite Tricks and Secrets for Beautiful Plots in R

Slides and hands-on codes for my talk at the 1st OutlierConf, February 4-7 2021.



My Favorite Tricks and Secrets for Beautiful Plots in R

Dr. Cédric Scherer
Senior Data Analyst & Designer

Outlier

Talk Resources:

- Slides
- Recording
- Hands-On Tutorial
- Codes

Bonus: Extended version!

- Slides from the user! Oslo meeting on March 24, 2021

About the talk:

In this talk, I present my favorite tips and tricks with regard to the ggplot2 package, a library for plotting in the programming language R. I will cover functions that are helpful but many may not be aware of as well as a collection of interesting functions from a large range of extension packages.

The talk is intended for people who already know how to code in R and ggplot2. However, I am going to cover a diverse collection of tips so I hope everyone can pick something helpful independent from their level of expertise.



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Thank you!

DATAVIZ TUTORIAL 8 TIDYTUESDAY GGPLOT2

A GGPLOT2 TUTORIAL FOR BEAUTIFUL PLOTTING IN R

POSTED BY CÉDRIC ON MONDAY, AUGUST 5, 2019

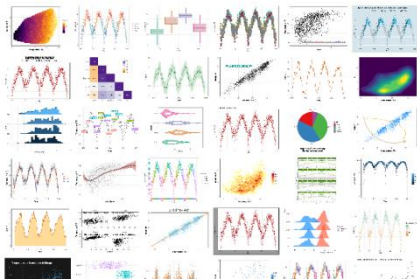
Last update: 2020-12-07

INTRODUCTORY WORDS

I don't care, just show me the content!

Back in 2016, I had to prepare my PhD introductory talk and I started using `(ggplot2)` to visualize my data. I never liked the syntax and style of base plots in R, so I was quickly in love with ggplot. Especially useful was its faceting utility. But because I was short on time, I plotted these figures by trial and error and with the help of lots of googling. The resource I came always back to was a blog entry called [Beautiful plotting in R: A ggplot2 cheatsheet](#) by Zev Ross, updated last in January 2016. After giving the talk which contained some decent plots thanks to the blog post, I decided to go through this tutorial step-by-step. I learned so much from it and directly started modifying the codes and over the time I added additional code snippets, chart types and resources.

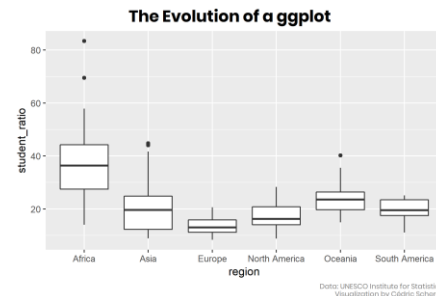
Since the blog entry by Zev Ross was not updated for some years and step by step this became a unique version of a tutorial, I decided to host the updated version on my GitHub. Now it finds its proper place on this homepage! (Plus I added a ton of other updates—just to name a few: The fantastic `(patchwork)`, `(ggtext)` and `(ggforce)` packages. How to deal with custom fonts and colors. A collection of R packages tailored to create interactive charts. And several other chart types including pie charts because everyone loooves pie charts!)



DATAVIZ TUTORIAL 8 GGPLOT2 TIDYTUESDAY

THE EVOLUTION OF A GGPLOT (EP. I)

POSTED BY CÉDRIC ON FRIDAY, MAY 17, 2019

Data: UNESCO Institute for Statistics
Visualization by Cédric Scherer

- [Aim of this Tutorial](#)
- [Data Preparation](#)
- [The Default Boxplot](#)
- [Sort Your Data!](#)
- [Let Your Plot Shine—Get Rid of the Default Settings](#)
- [The Choice of the Chart Type](#)
- [More Geoms, More Fun, More Info!](#)
- [Add Text Boxes to Let The Plot Speak for Itself](#)
- [Bonus: Add a Tile Map as Legend](#)
- [The Final Evolved Visualization](#)
- [Complete Code for Final Plot](#)
- [Post Scriptum: Mean versus Median](#)

AIM OF THIS TUTORIAL

In this series of blog posts, I aim to show you how to turn a default ggplot into a plot that visualizes information in an appealing and easily understandable way. The goal of each blog post is to provide a step-by-step tutorial explaining how my visualization have evolved from a typical basic ggplot. All plots are going to be created with 100% `(ggplot2)` and 0% Inkscape.

In the first episode, I transform a basic boxplot into a colorful and self-explanatory combination of a jittered dot strip plot and a lollipop plot. I am going to use [data provided by the UNESCO on global student to teacher ratios](#) that was selected as data for the #TidyTuesday challenge 19 of 2019.



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Thank you!