TidyTuesday: Colour palettes and volcanoes

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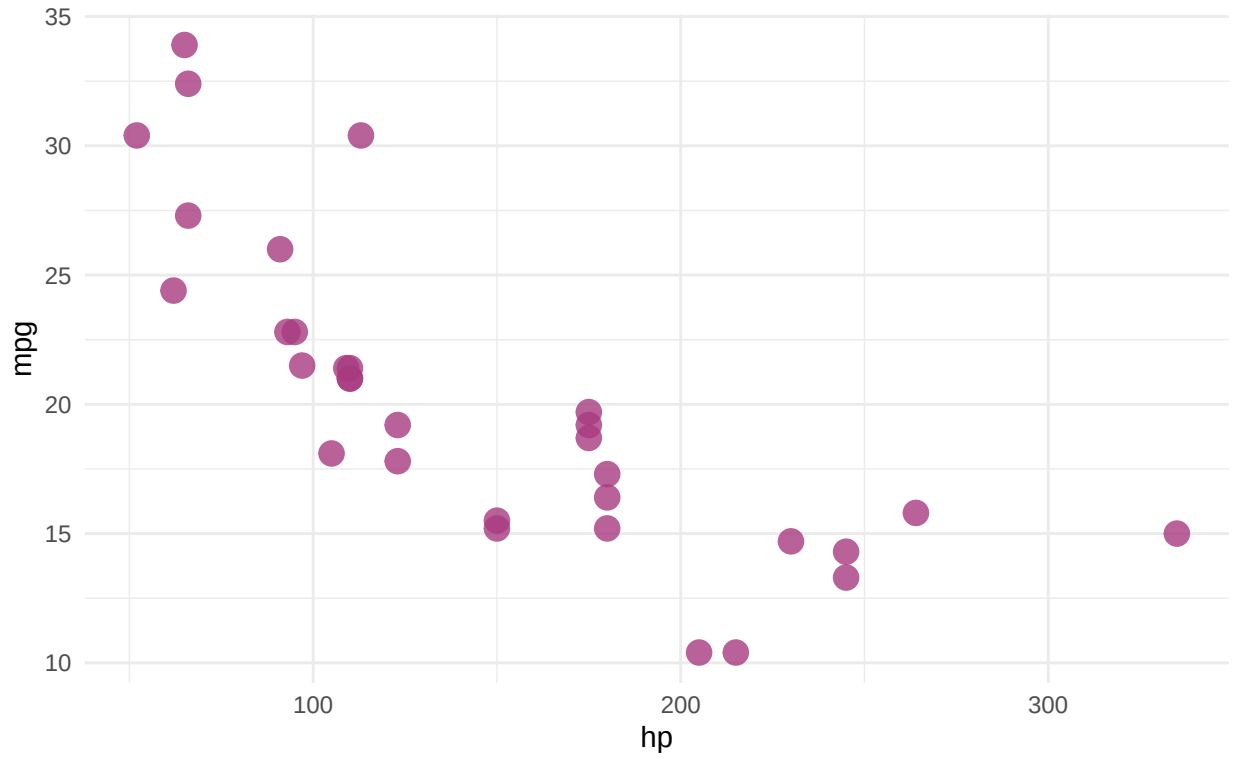
- This session will be recorded and put up on Past events
- Click the stacked lines at the top left of this panel to open a helfpul navigation pane
- The slides from the mini-tutorial are available here: https://www.dataembassy.co.nz/ggplot-colour-palettes

Code for custom colour palettes

You can see this in action at https://www.dataembassy.co.nz/ggplot-colour-palettes#48

```
library(ggplot2)
# Set up the colours you want
my_colours <- c(
  `turquoise`  = "#30E6C9",
  `khaki`      = "#D7EA85",
  `slate`      = "#355E78",
  `old-rose`   = "#A83B80",
  `cadet-blue` = "#77A5BF",
  `light grey` = "#cccccc", # added extra neutrals
  `dark grey`  = "#8c8c8c")

#Function that converts names to hexcodes
get_spiderverse_col <- function(...) {
  cols <- c(...)

  if (is.null(cols)) return (my_colours)

  my_colours[cols]
}

# You could just use this function:
ggplot(mtcars, aes(hp, mpg)) +
    geom_point(color = get_spiderverse_col("old-rose"),
               size = 4, alpha = .8) +
  theme_minimal()
```



] .pull-right[
]

Setting up your own palette: Group colours into palettes

```
spiderverse_palettes <- list(
  `main`  = get_spiderverse_col("turquoise", "khaki", "old-rose"),

  `blues`  = get_spiderverse_col("cadet-blue", "slate"),

  `full` = get_spiderverse_col("turquoise", "khaki", "slate", "old-rose", "cadet-blue"),

  `neutral`  = get_spiderverse_col("slate", "light grey", "cadet-blue", "dark grey")
)

# Helpful function for retrieving the palettes you just names
spiderverse_pal <- function(palette = "main", reverse = FALSE, ...) {
  pal <- spiderverse_palettes[[palette]]
  if (reverse) pal <- rev(pal)
  colorRampPalette(pal, ...)
}
```

Setting up your own palette: Set up scales for ggplot

```
# Colour scale - good for scatter plots
scale_color_spiderverse <- function(palette = "main", discrete = TRUE, reverse = FALSE, ...) {
  pal <- spiderverse_pal(palette = palette, reverse = reverse)
```

```
  if (discrete) {
    discrete_scale("colour", paste0("spiderverse_", palette), palette = pal, ...)
  } else {
    scale_color_gradientn(colours = pal(256), ...)
  }
}

# Fill scale - good for barplots
scale_fill_spiderverse <- function(palette = "main", discrete = TRUE, reverse = FALSE, ...) {
  pal <- spiderverse_pal(palette = palette, reverse = reverse)

  if (discrete) {
    discrete_scale("fill", paste0("spiderverse_", palette), palette = pal, ...)
  } else {
    scale_fill_gradientn(colours = pal(256), ...)
  }
}
```

TidyTuesday

Set up packages

- I always love using `tidyverse` (which includes `ggplot`, `dplyr` and several other helpful packages).
- The `devtools` (developer tools) package lets me download packages that aren't on CRAN.
- `emo` makes it easy to use emoji

```
list.of.packages <- c("tidyverse", "devtools", "leaflet",
                      "emo", "yarrr", "ggthemes")
new.packages <- list.of.packages[!(list.of.packages %in% installed.packages()[,"Package"])]
if(length(new.packages)) install.packages(new.packages, repos = "http://cran.us.r-project.org")

rm("list.of.packages", "new.packages")

library(tidyverse)
```

```
## -- Attaching packages ---------------------------------------------------------------- tidyverse 1.3.0

## v tibble  3.0.1     v dplyr   0.8.5
## v tidyr   1.0.0     v stringr 1.4.0
## v readr   1.3.1     v forcats 0.5.0
## v purrr   0.3.4

## -- Conflicts ------------------------------------------------------------------- tidyverse_conflicts()
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```

```
library(leaflet)
library(ggthemes)
# devtools::install_github("ropenscilabs/ochRe")
```

```
library(ochRe)
# devtools::install_github("ropenscilabs/icon")
library(icon)
```

Load the data

At the top of every tidy Tuesday there are a range of ways you can get the data. Last week I just copied the links that use `readr::read_csv()` to read the files from their URLs. This week I'm using the `tidytuesdayR` package.

```
############################################################
# NOTE: install this to use tidytuesdayR functions
# devtools::install_github("thebioengineer/tidytuesdayR")
############################################################

tuesdata <- tidytuesdayR::tt_load('2020-05-12')
```

```
## --- Downloading #TidyTuesday Information for 2020-05-12 ----

## --- Identified 5 files available for download ----

## --- Downloading files ---

## --- Download complete ---
```

```
tuesdata
```

```
## Available datasets:
##  volcano
##  eruptions
##  events
##  tree_rings
##  sulfur
##
```

```
# The below would do the same thing
# tuesdata <- tidytuesdayR::tt_load(2020, week = 20)

volcano <- tuesdata$volcano
```

Let's explore

```
table(volcano$primary_volcano_type)
```

```
##
##             Caldera          Caldera(s)             Complex         Complex(es)
##                  65                   9                  46                   1
##            Compound         Crater rows     Fissure vent(s)           Lava cone
```

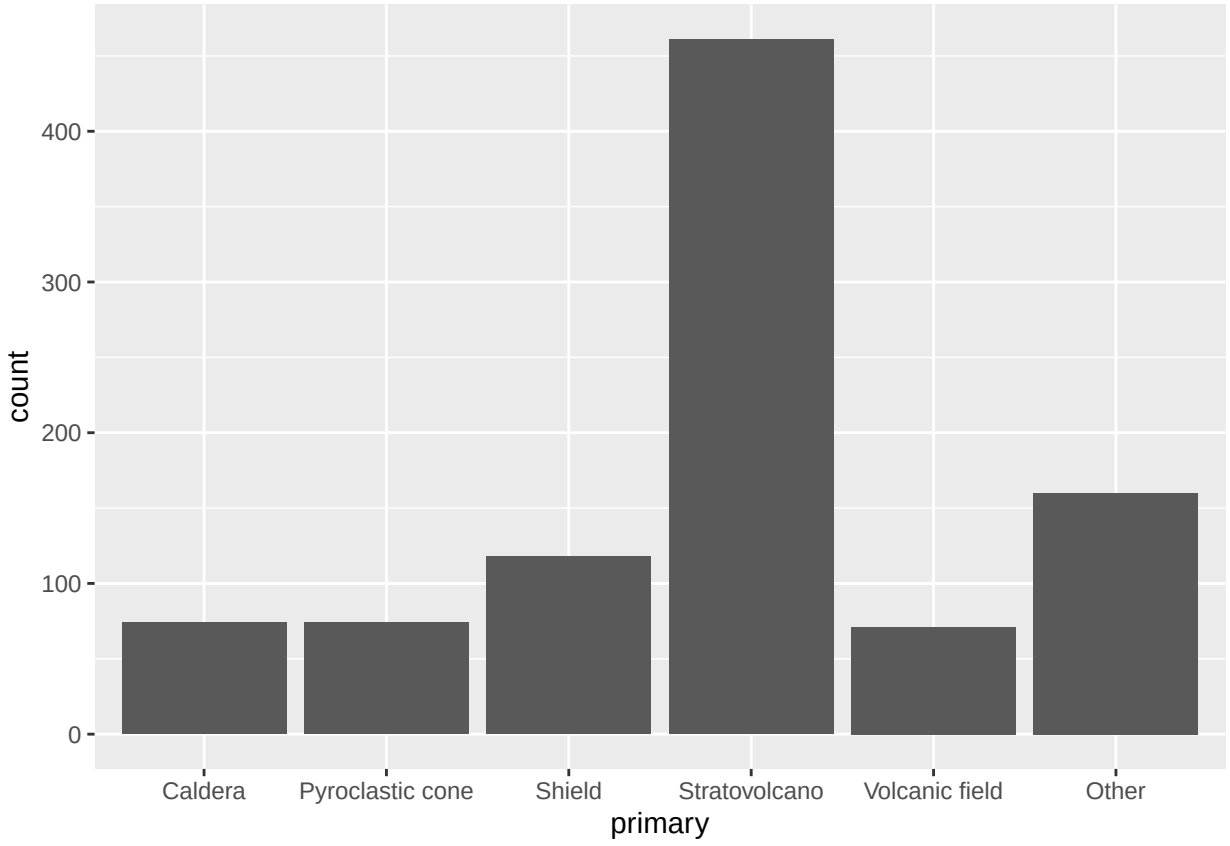
```
##                   9                   5                  12                   1
##       Lava cone(es)        Lava cone(s)           Lava dome        Lava dome(s)
##                   1                   1                   3                  26
##             Maar(s)    Pyroclastic cone Pyroclastic cone(s)  Pyroclastic shield
##                   8                   4                  70                   7
##              Shield           Shield(s)       Stratovolcano      Stratovolcano?
##                  85                  33                 353                   1
##   Stratovolcano(es)          Subglacial           Submarine           Tuff cone
##                 107                   5                  27                   1
##        Tuff cone(s)      Volcanic field
##                   7                  71
```

I want to get rid the (s) and (es).

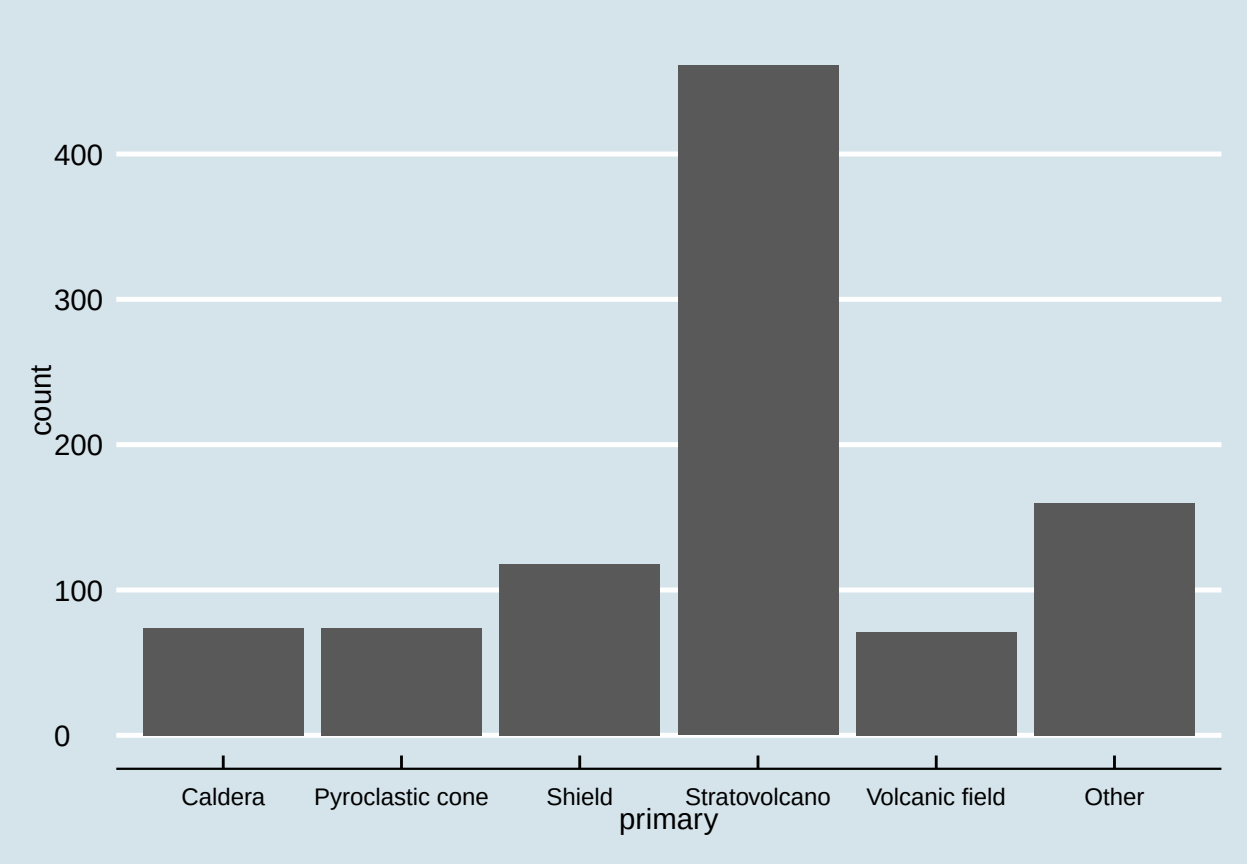
```
volcano_edit <- volcano %>%
  mutate(last_eruption_year = parse_number(last_eruption_year)) %>%
  mutate(primary = gsub("\\s*\\([^\\)]+\\)", "", primary_volcano_type)) %>%
  mutate(primary = gsub("\\?", "", primary)) %>%
  mutate(primary = fct_lump_n(primary, 5))
```

```
## Warning: 301 parsing failures.
## row col expected  actual
##   2  -- a number Unknown
##   7  -- a number Unknown
##   8  -- a number Unknown
##  10  -- a number Unknown
##  17  -- a number Unknown
## ... ... ........ .......
## See problems(...) for more details.
```

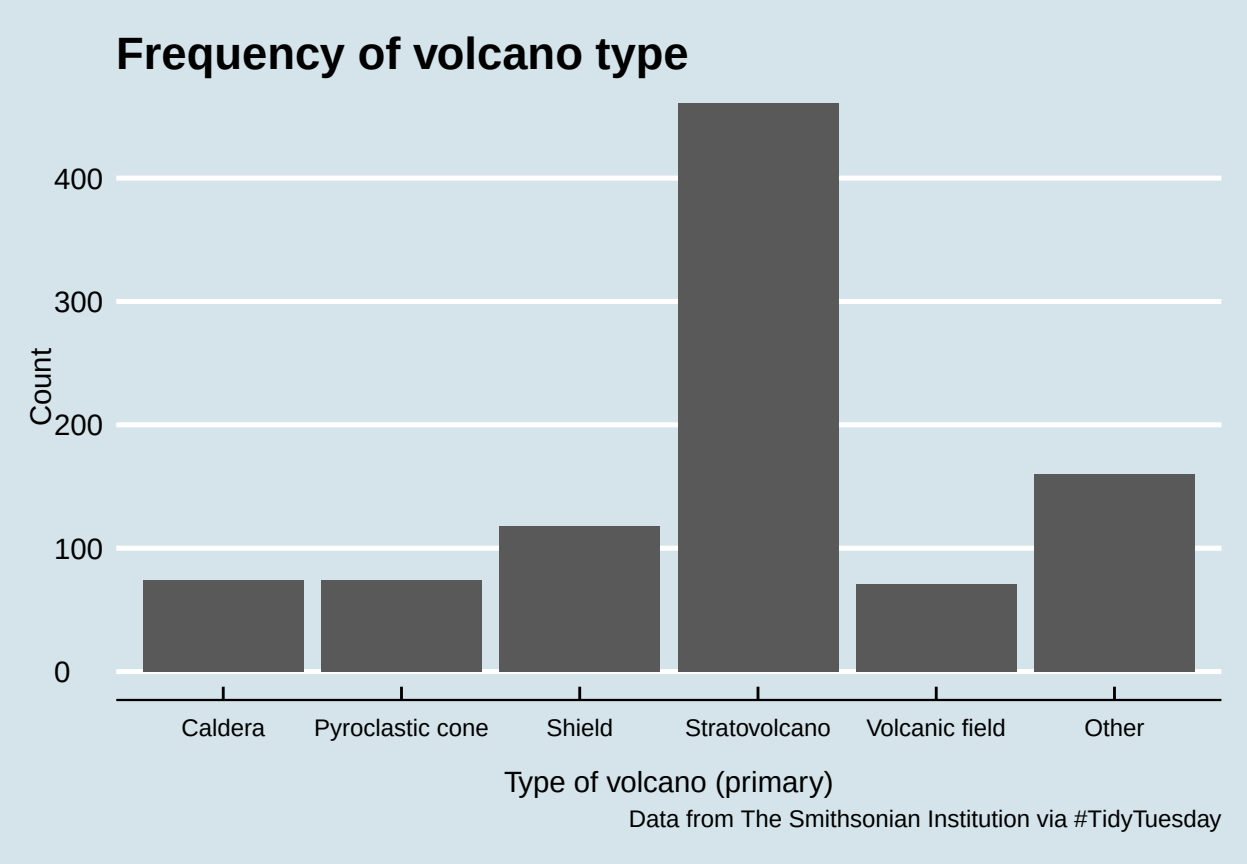
```
primary <- volcano_edit %>%
  ggplot(aes(x = primary)) +
  geom_bar()

primary
```



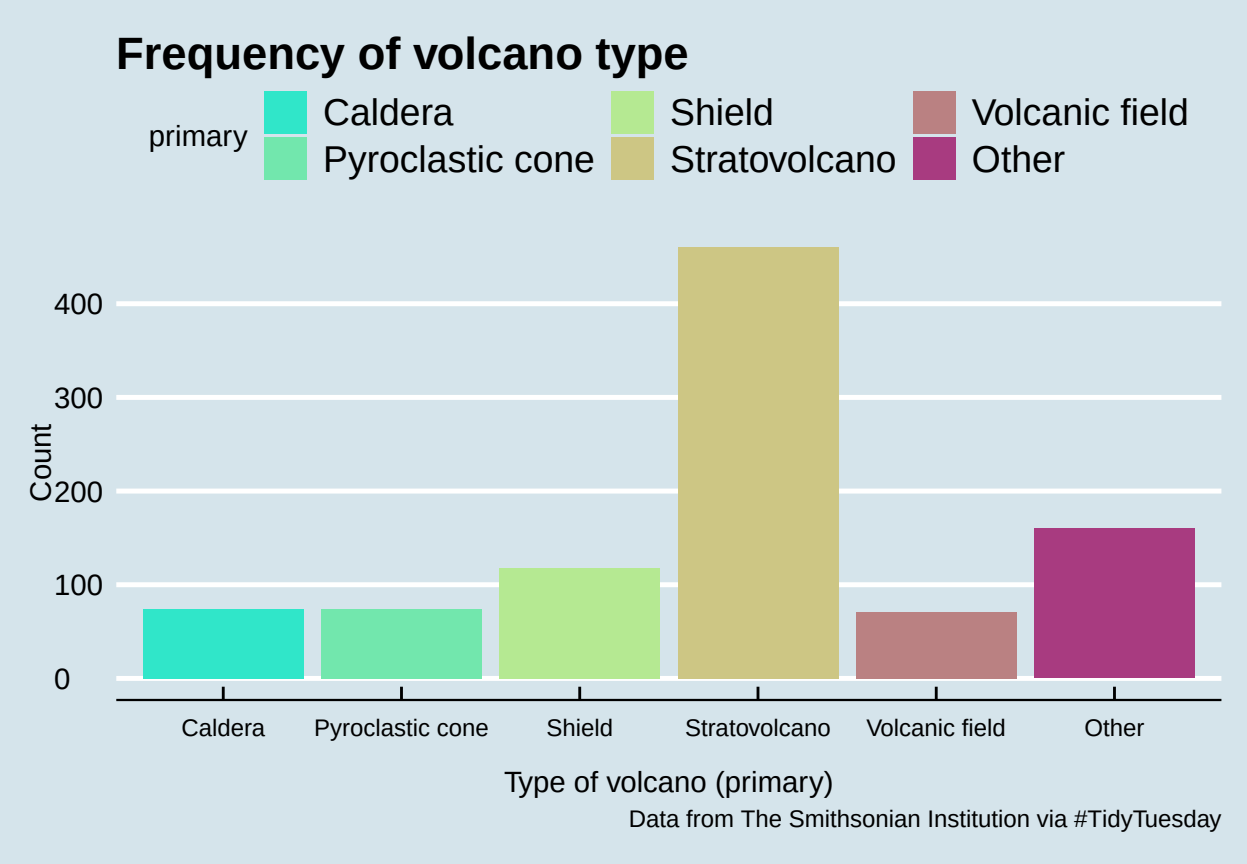

```
primary <- primary +
  theme_economist() +
  theme(axis.text.x = element_text(size = 9))

primary
```




```
primary <- primary +
  xlab("\nType of volcano (primary)") +
  ylab("Count") +
  labs(title = "Frequency of volcano type",
       caption = "Data from The Smithsonian Institution via #TidyTuesday")

primary
```



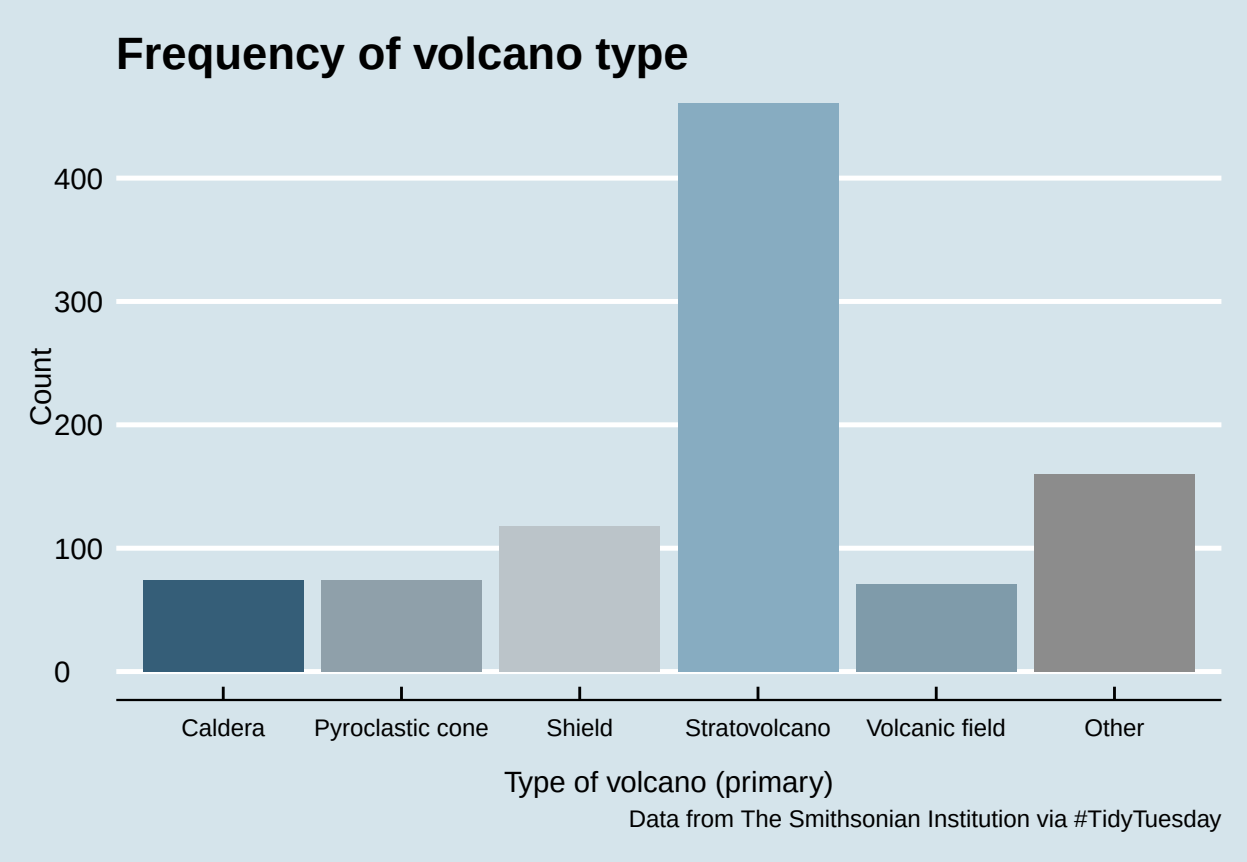

```
primary <- primary +
  geom_bar(aes(fill=primary)) +
  scale_fill_spiderverse("main")

primary
```




```
primary <- primary +
  geom_bar(aes(fill=primary)) +
  scale_fill_spiderverse("neutral") +
  theme(legend.position = "none")
```

```
## Scale for 'fill' is already present. Adding another scale for 'fill', which
## will replace the existing scale.
```

```
primary
```

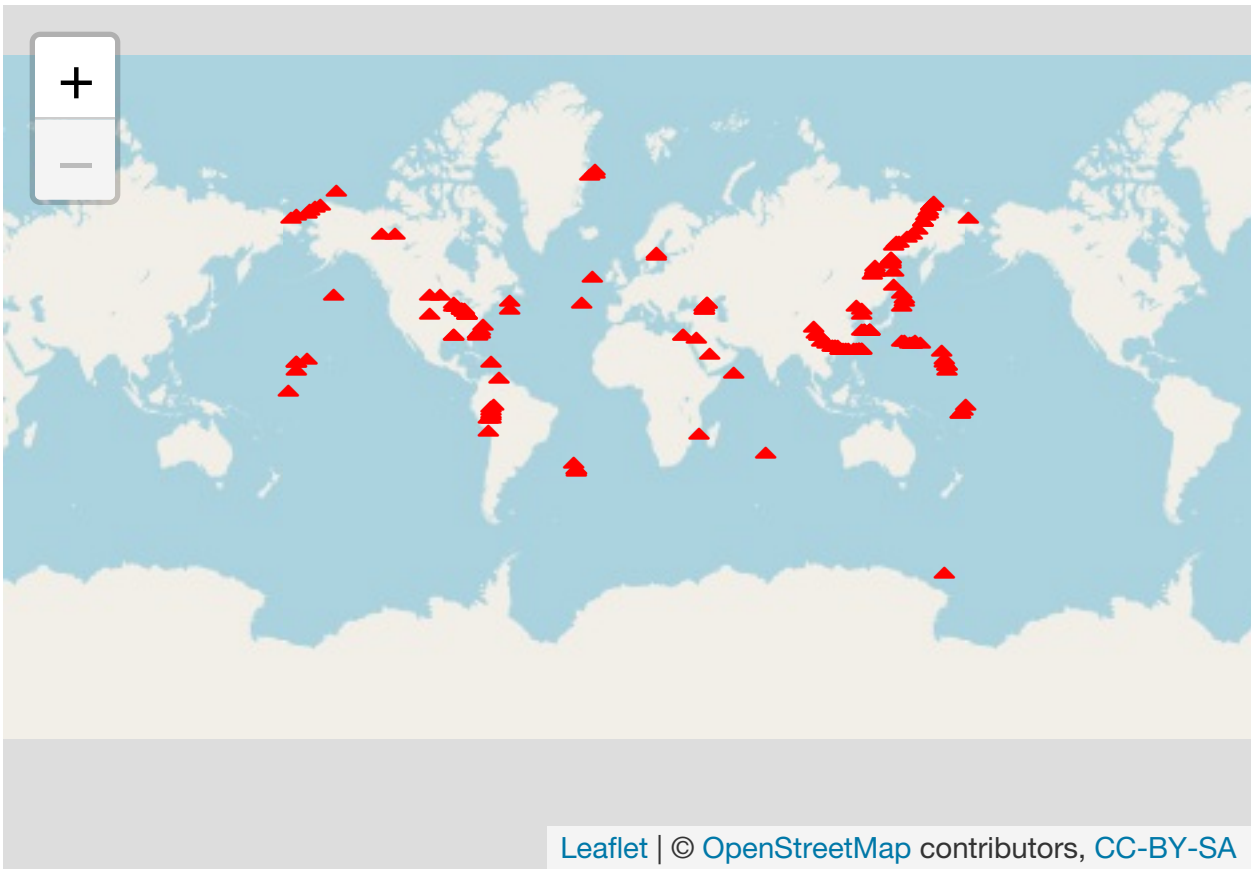


Leaflet plot: interactive maps

Leaflet is "an open-source JavaScript library for mobile-friendly interactive maps" https://leafletjs.com/.

There is more information on leaflet for R here https://rstudio.github.io/leaflet/. "Leaflet is one of the most popular open-source JavaScript libraries for interactive maps. It's used by websites ranging from The New York Times and The Washington Post to GitHub and Flickr, as well as GIS specialists like OpenStreetMap, Mapbox, and CartoDB."

```
volcano_edit %>%
  # Let's focus on the last 20 years
  filter(last_eruption_year > 2000) %>%
  leaflet() %>%
  # A nice minimal map
  addTiles() %>%
  addAwesomeMarkers(
    lat = ~latitude,
    lng = ~longitude,
    #volcano shaped markers
    icon = awesomeIcons(
      library = "fa",
      icon = "caret-up",
      iconColor = "red",
      markerColor = "orange"),
    label = ~paste0(volcano_name, ", ", last_eruption_year))
```


+
−
Leaflet | © OpenStreetMap contributors, CC-BY-SA