EVR 628- Intro to Environmental Data Science

Assignment 3: Visualizing your data

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The big picture

Remember that the final goal is to have a GitHub repository where you can showcase your work. Assignment 1 was to create the repository. Assignment two required you to develop one R script to clean some data in that same repository. **For this third assignment, you will visualize the data you cleaned last week.** Your fourth assignment will require you to work with spatial data. Your final project will leverage the data and visualizations you'll produce to wrap it all together.

This assignment

Task: Develop one data visualization script that reads the clean data you exported last week, visualizes them, and exports 1-2 figures in `.png` format.

Your visualization should meet the following criteria (50% of your grade):

- ☐ (10%) You must use at lest two different `geoms` to show *different* visualizations[1].
- ☐ (10%) You must modify labels as appropriate, and make sure to include units when relevant. Use the `caption` argument to attribute the source of your data.
- ☐ (10%) All text appears in `Sentence case`, as relevant.
- ☐ (10%) You must use any theme other than the default theme.
- ☐ (10%) At least one of your figures should have panels, produced either with `facet_*()` or by combining multiple plots with `cowplot::plot_grid()` or the `patchwork` package.

Additionally, your script should have the following (50% of your grade):

- ☐ (10%) Be called `data_visualization.R` and be saved inside the `scripts/03_content/` folder
- ☐ (10%) Contain code documentation using comments `#`

[1] *e.g.* Don't produce the same plot simply switching `geom_line()` to `geom_point()`

- ☐ (10%) Clearly indicate all packages and data loaded at the top of the script[2]
- ☐ (10%) Uses **relative** paths to read data and write figures. Figure(s) are exported to the `results/img` folder.
- ☐ (10%) I can reproduce your figure without needing to modify any code.

Turning in your assignment

- Please share the link to your github repo via Canvas
- The deadline for this assignment is Nov 2 by 23:59

Resources

Class material

- Intro to ggplot slides
- More on ggplot slides
- ggplot live coding session

R4DS

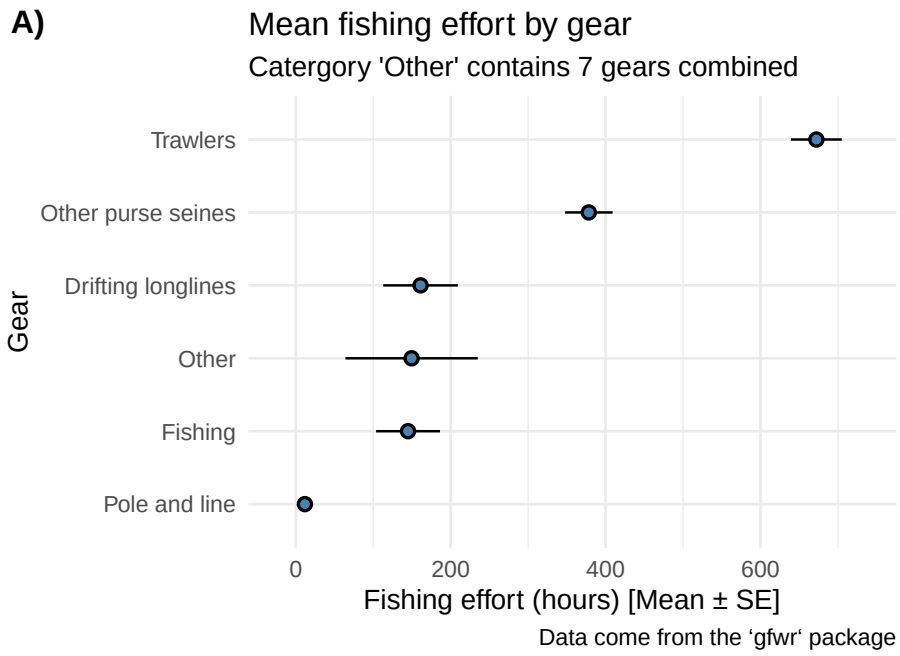
- Visualization (Look at section 1.6 for saving your plot)
- Layers

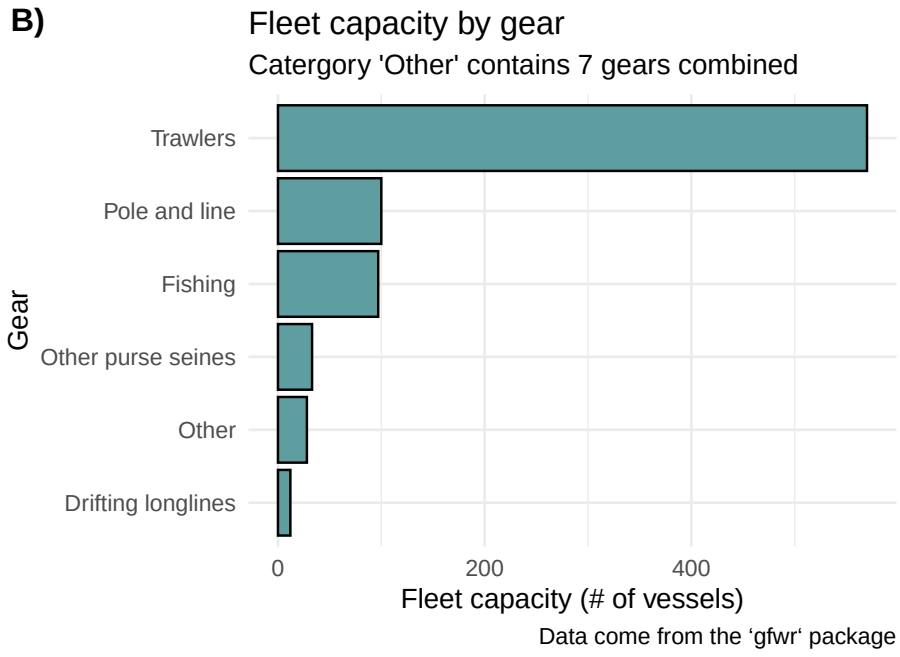
Example of a figure that would get 100%

```
## SET UP ##############################################################################
# Load packages
library(EVR628tools)
library(tidyverse)
library(cowplot)

# Load data
data("data_geartypes") # In your case you will load them from your data/processed folder

## PROCESSING ##########################################################################

# My data are already clean, but I need to make some final touches for visualization
data_vis <- data_geartypes |>
  mutate(
    geartype = str_replace_all(geartype, "_", " "), # swap the underscores for spaces
    geartype = str_to_sentence(geartype), # Make them into sentence case
    geartype = fct_lump_n(geartype, 5), # Lump them (5 categories + others)
    geartype = fct_reorder(geartype, effort_hours, .fun = mean))  # Order them based on mean
```

[2] I recommend you use my snippets

```r
## VISUALIZE ##################################################################

# Build a figure
p1 <- ggplot(data = data_vis,
             mapping = aes(x = effort_hours, y = geartype)) +
  stat_summary(geom = "pointrange",
               fun.data = mean_se,
               pch = 21,
               color = "black",
               fill = "steelblue") +
  labs(title = "Mean fishing effort by gear",
       subtitle = "Catergory 'Other' contains 7 gears combined",
       x = "Fishing effort (hours) [Mean ± SE]",
       y = "Gear",
       caption = "Data come from the `gfwr` package") +
  theme_minimal(base_size = 12) +
  scale_x_continuous(expand = c(0.1, 1))

# Build my second figure
p2 <- data_vis |>
  group_by(geartype) |>
  summarize(n_vessels = n_distinct(vessel_id)) |>
  ggplot(mapping = aes(x = n_vessels, y = fct_reorder(geartype, n_vessels))) +
  geom_col(fill = "cadetblue", color = "black") +
  labs(title = "Fleet capacity by gear",
       subtitle = "Catergory 'Other' contains 7 gears combined",
       x = "Fleet capacity (# of vessels)",
       y = "Gear",
       caption = "Data come from the `gfwr` package") +
  theme_minimal(base_size = 12)


my_plot <- plot_grid(p1, p2,
                     ncol = 1,
                     labels = c("A)", "B)"))

## EXPORT #####################################################################
ggsave(plot = my_plot,
       filename = "results/img/effort_and_capacity.png", # Export my file as png
       width = 8,
       height = 8)
```


A)
Mean fishing effort by gear
Catergory 'Other' contains 7 gears combined
Trawlers
Other purse seines
Drifting longlines
Other
Fishing
Pole and line
Gear
0
200
400
600
Fishing effort (hours) [Mean ± SE]
Data come from the ‘gfwr‘ package


B)
Fleet capacity by gear
Catergory 'Other' contains 7 gears combined
Trawlers
Pole and line
Fishing
Other purse seines
Other
Drifting longlines
Gear
0
200
400
Fleet capacity (# of vessels)
Data come from the ‘gfwr‘ package