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INFO 4310 Final Report

Fishy Business

The Cost of Your Filet from Plate to Sea

https://fishy-business.onrender.com/

I. Project Goals and Motivation

The goal of our project is to visualize and contextualize the environmental cost and sourcing of fish for the consumer. With all foods, especially meat and fish, most consumers only see a nicely cooked fish at a restaurant or a cleaned filet in plastic packaging at the grocery store. Our project is a general guide to the sourcing and consequences of three popular seafoods. After browsing our website, our hope is to incite curiosity of where our purchases come from and our participation in sustainability. We were motivated by our own experiences learning about the sourcing of our foods for the first time and our interest in sustainability.

II. Intended Audience and Use Cases

Our intended audience is the average consumer. A data article like this would not be in a scientific journal but a general news source. This article is intended to be an interesting and interactive way to provide an overview of the environmental costs of the fish we consume.

III. Related Materials (Inspiration or Direct Connections)

- Fish and Overfishing (2021) by Hannah Ritchie and Max Roser (*Our World in Data*)
    - breadth of research area regarding fisheries
- College Majors Visualization by Cuthbert Chow
    - dynamic scrolling and animations
- Free Willy and Flipper by the Numbers by Amber Thomas (*The Pudding*)
    - using real images and narrative
- Personal: One of our group members, Eva, learned a little bit about the paradox that aquaculture poses for the fishing industry. This project provided an opportunity to learn more about the fishing industry as a whole as well.

IV. Data Source

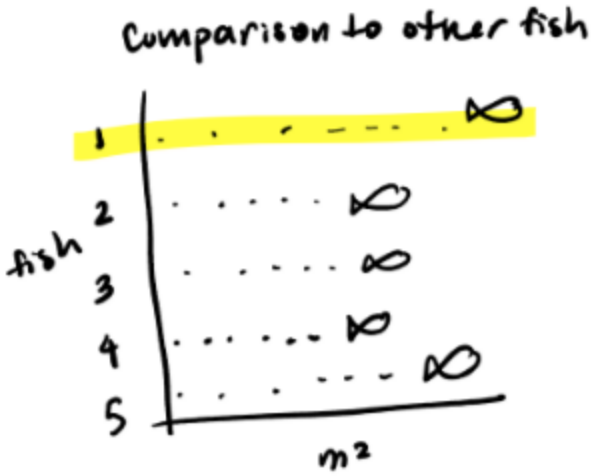
- The data we used was generally simple and didn't require much cleaning. We had to modify some country names in the dataset to match our JSON file and only used 13 observations from each of the CSV files we used for the 13 unique line charts we made using the Kaggle dataset. Some observations in the CSV files needed to be reordered so that they would animate properly on the line graph animation.
- Fish and Overfishing by Kaggle User (likely collected from somewhere else but could not verify)
    - used for line chart

    - specifically “aquaculture-farmed-fish-production.csv” and “capture-fishery-production.csv”
- *Our World in Data* tables
    - used for bar chart and infographics
    - Freshwater use per kilogram of seafood production (farmed)
    - Land use per kilogram of seafood (farmed)
    - Nitrogen emissions per tonne of seafood (farmed)
        - Aqua-Calc to convert to fl. oz.
    - Phosphorous emissions per tonne of seafood (farmed)
        - Aqua-Calc to convert to fl. oz.
- Top Exporters of Salmon
    - used for choropleth/interactive map
- Top Exporters of Shrimp
    - used for choropleth/interactive map
- Top Exporters of Tilapia
    - used for choropleth/interactive map
- Link to World TopoJson
    - used for choropleth/interactive map

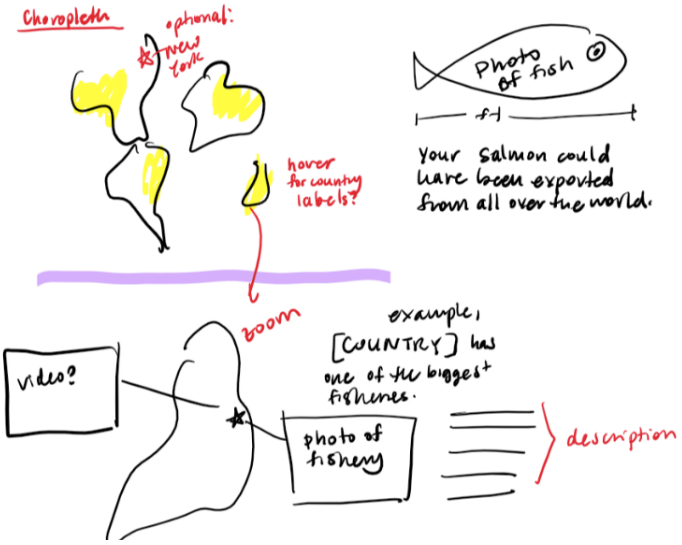
V. Previous Designs and Iterations

For the most part, the sketches we submitted in Milestone 2 and presented on demo day are consistent with our final visualization, but there are many things that we could not implement and had to settle for something else. We were much more ambitious with our sketches and underestimated how long it would take to understand dynamic scrolling.

- Because of how the scrolling worked in Cuthbert Chow’s code and tutorial for building a scroller (which we referenced), we even had trouble with elements like our original plan for the title being at the top of the page because of how the scroller worked. In general, we were pretty constrained by what content could not be outside of the two columns that exist in our visualization.



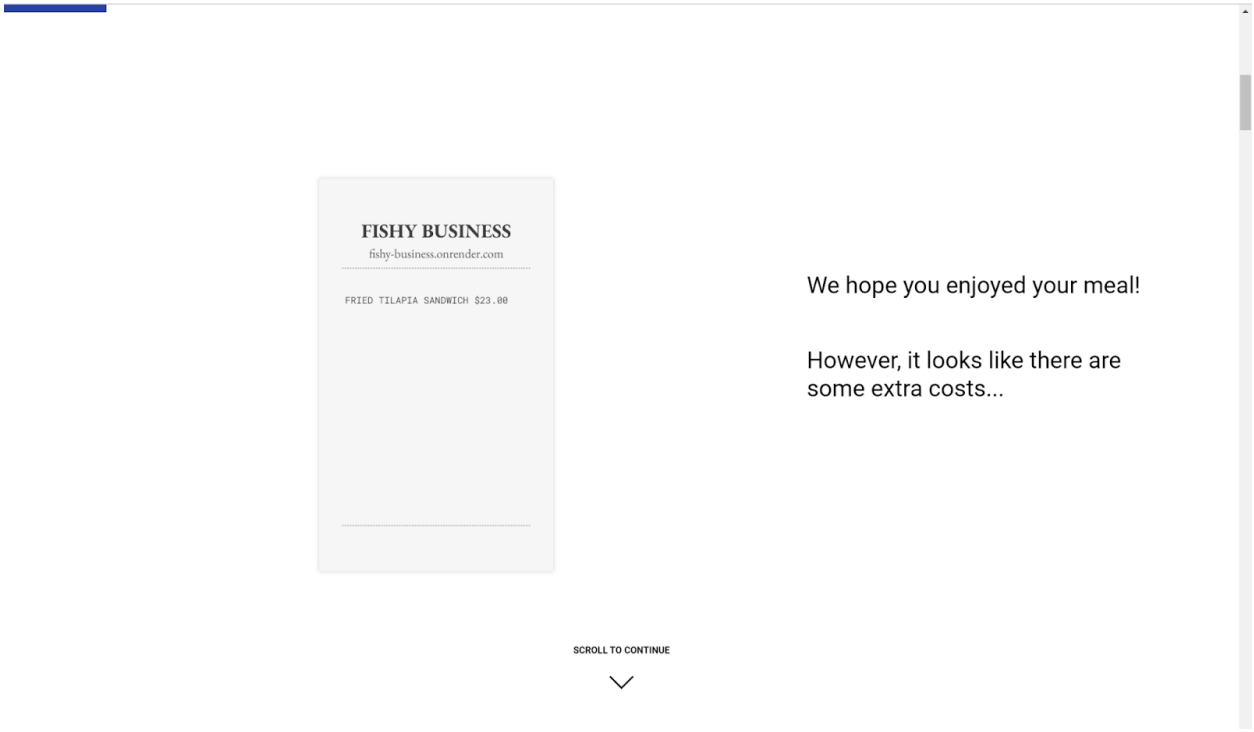
- We had originally planned for the bar chart to look like fish swimming because we wanted for the tone to be more playful in the beginning, and gradually change the tone by using more serious looking charts. We ended up going with a traditional chart because we thought that adding a pattern to the bar chart would be too visually overwhelming next to the image heavy infographic next to it and make the visualization tone too playful.



- Rather than to click on countries to get more information about specific fisheries and information about the real people and communities that supply our fish, our original storyboard design was to click on a country to zoom on a particular country (like this NYT article) .

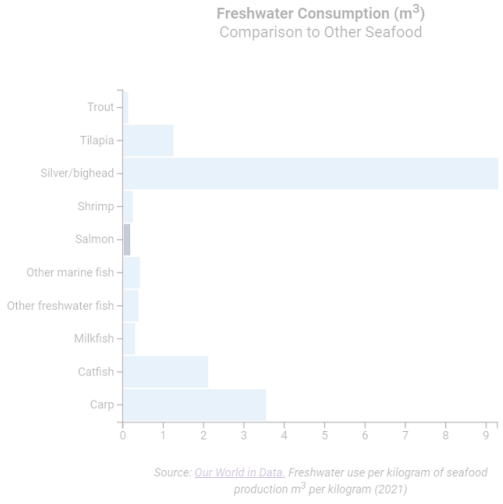
VI. Final Design

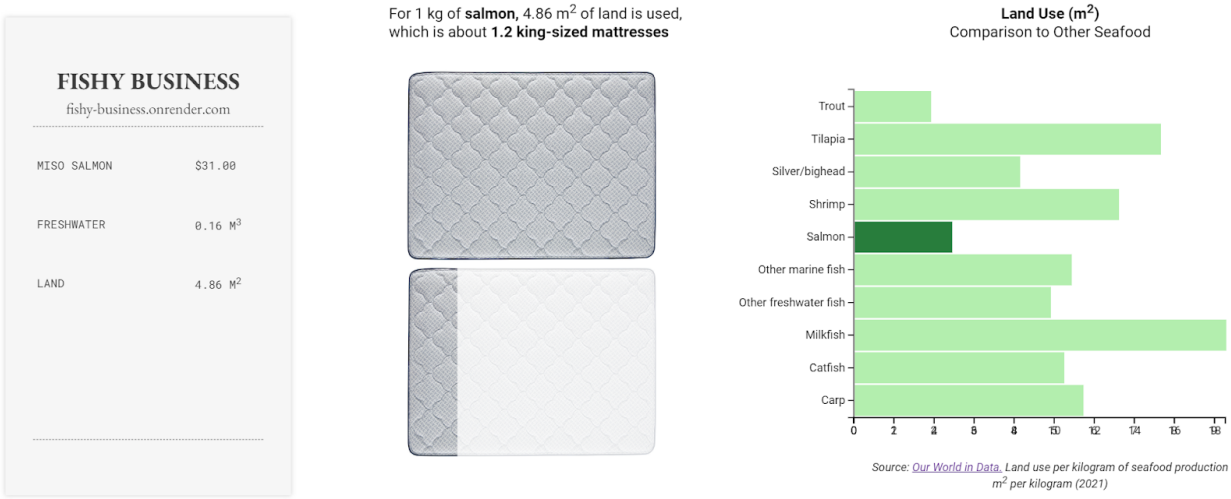
Scrolling Feedback



- We received critique that it's difficult to know when to keep scrolling. To fix this, we implemented a progress bar that is in a fixed position at the top of the screen. We also have a fixed “scroll to continue” arrow that constantly animates up and down (except at the end, in which you don’t scroll anymore).

Scrolling Animations

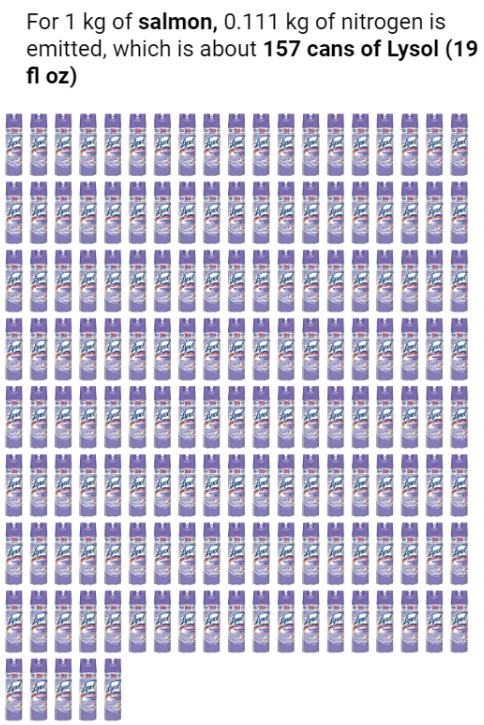




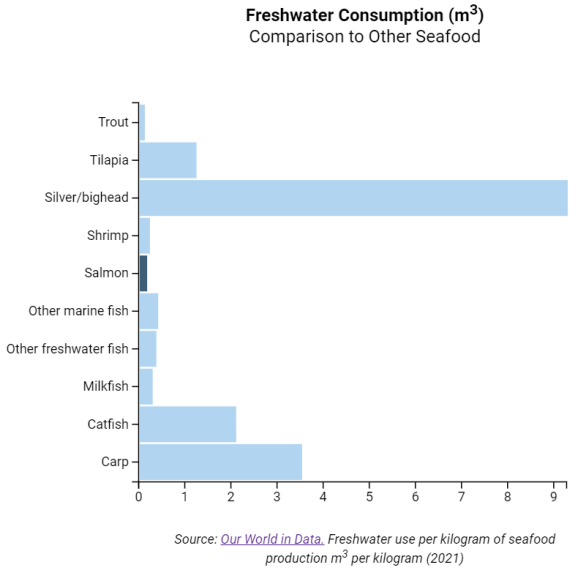
- We received critique that it was confusing to differentiate between visualizations and the commentary/analysis/instructions that we wrote to guide users along the article and provide context. To fix this, we gave certain visualizations, such as the receipt and menu distinct looks and fonts from the font of our article content.
- We use transparency to communicate progress and stages of the scroll. Most text fades in and out as you scroll forward and backward. For the infographic and bar chart, which are displayed side-by-side, we chose to animate/update the two separately. This allows the user to focus on one visualization at a time and also spend more time looking at it since there is more scrolling required.
    - We ran into an issue with the bar chart and infographic not displaying the same data at the same time because we went with this choice. To fix this, we temporarily lower the opacity of the bar chart because the data does not correspond with the current infographic. For example, in the picture above, the receipt and the infographic are on “land” but the user has not scrolled far enough to see the bar chart update to “land.” The bar chart is transparent, but becomes opaque again when the data matches.

Infographic

- infographic animates on scroll to update with new “costs” on the receipt

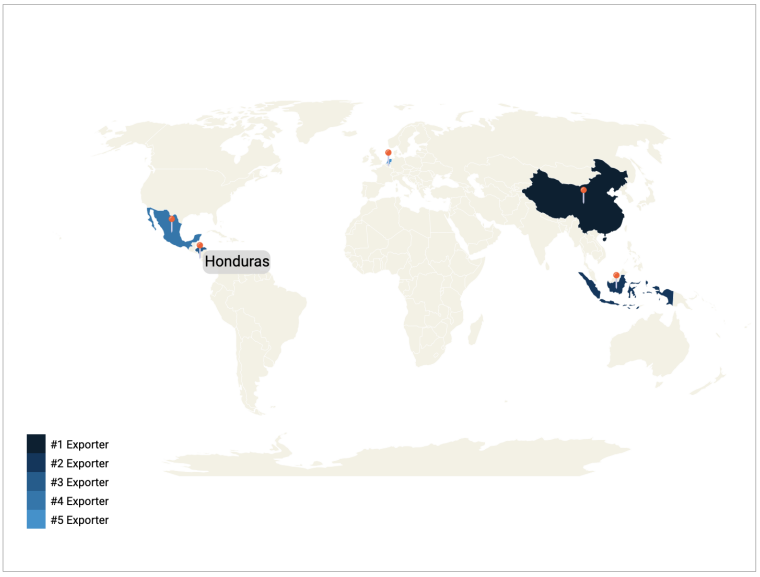


Animating Bar Chart

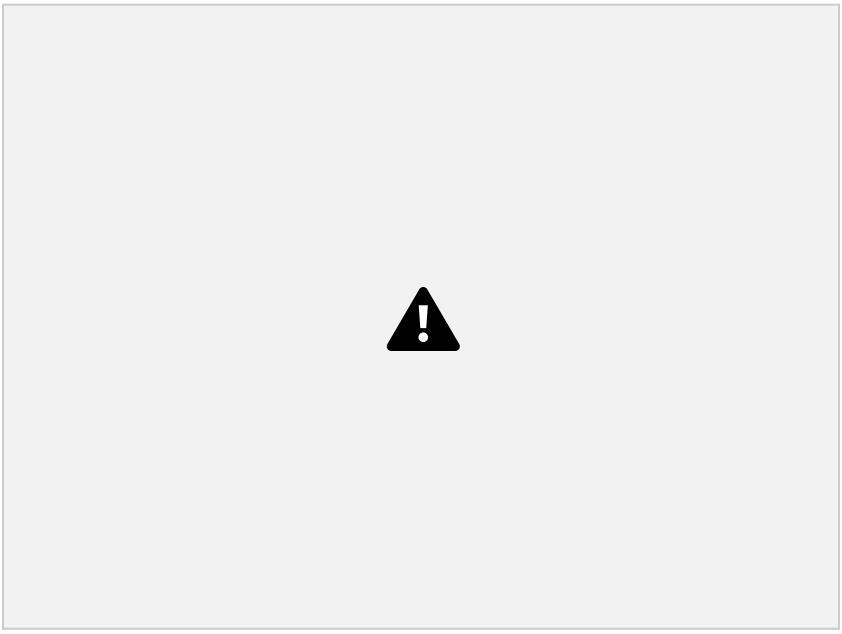


- marks: bars representing environmental costs for various fish
- channels: light/darkness: the selected fish, hue: environmental cost on the receipt, horizontal aligned position, vertical aligned position, length of bars to represent how much environmental costs
- interactions: none; the bar chart animates on scroll

Choropleth Map



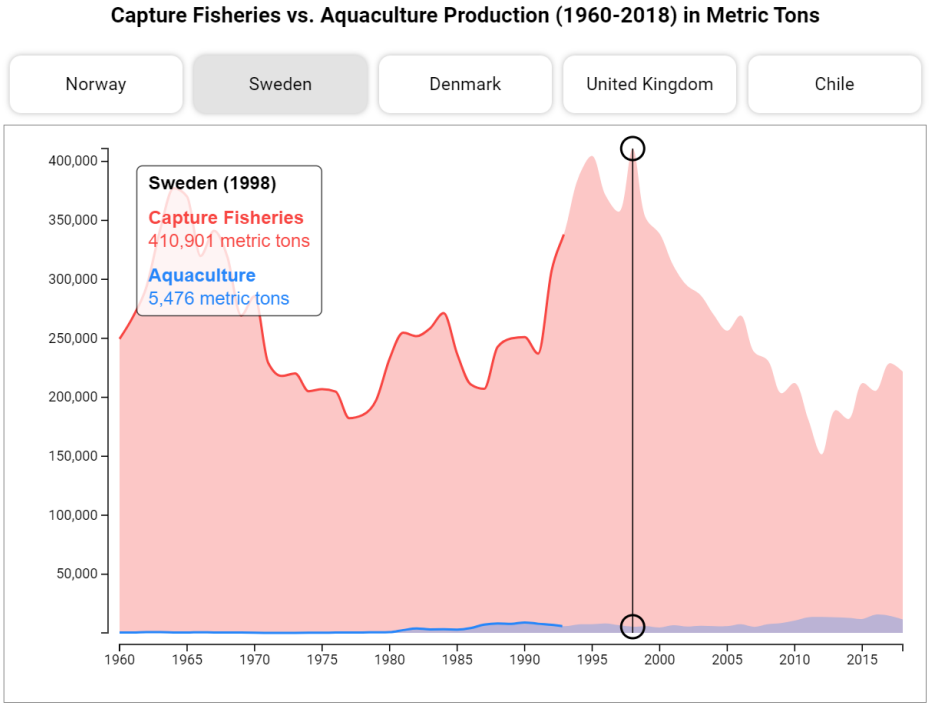
- marks: polygons representing countries
- channels: hue for rank of countries who are exporters
- interactions: mouseover tooltip on pin with country name, click on pin to expand the country and display image of fishing industry and information about specific country, reset map button to get back to world view



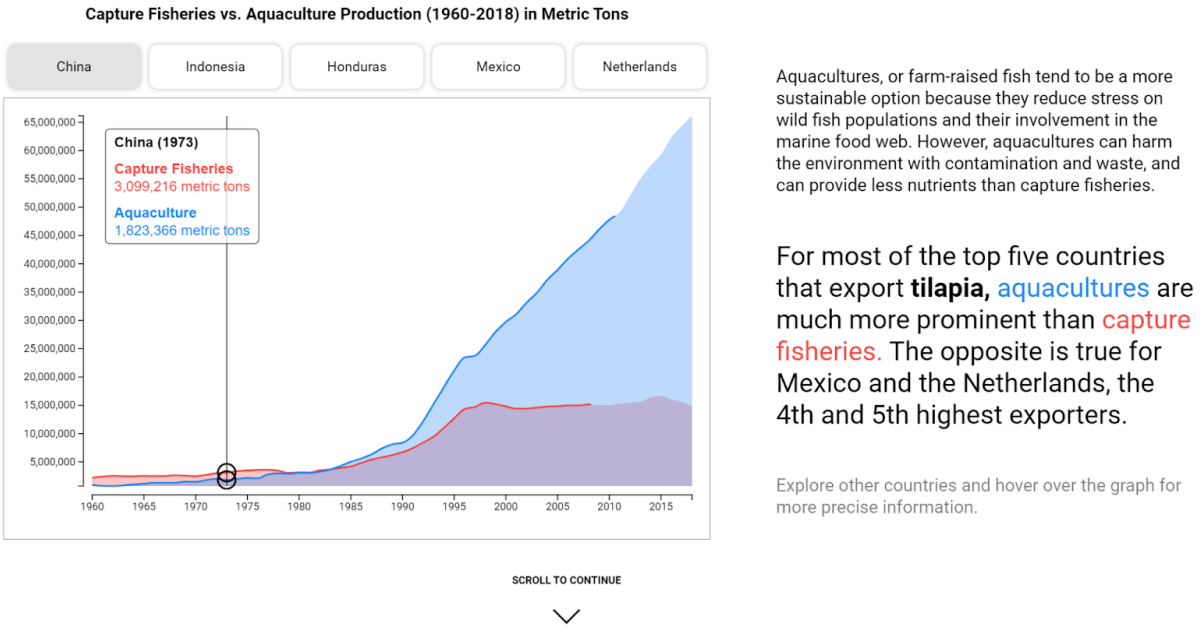
- trade-offs:
    - One trade-off we made here was to choose to redraw a larger version of the country rather than enabling zoom on the map. Our original idea was to be able to

pan/zoom on the map because the countries the map are quite small and can be hard to see. However, because of the dynamic scrolling, the pan/zoom scrolling caused competing issues that we were too limited on time to figure out. To work around this, we considered doing a zoom on click to a bounding box on the particular country, where the surrounding countries would be changed to a neutral color and the clicked country would be colored. However, since we also wanted to add text and images, we decided that it would be cleaner visually to have just the one country on one side and an image/text on the other side.

Line Chart



- marks: lines and polygons representing metric tons of fish
- channels: hue for aquaculture or capture fisheries, horizontal aligned position, vertical aligned position
- interactions: mouseover with tooltip, filter buttons that correspond to the countries on the map



Identifying Interactions

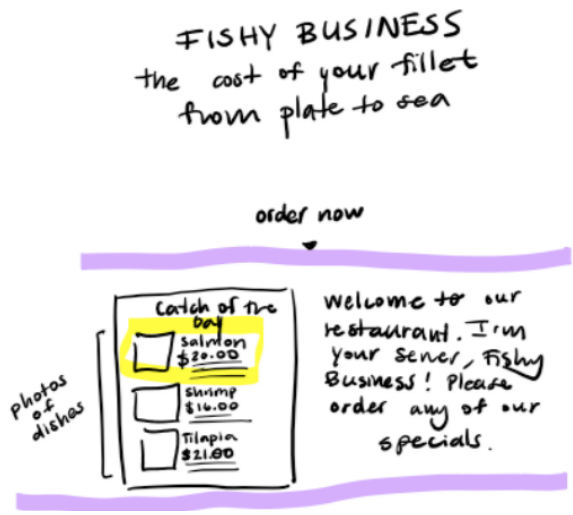
- We were concerned about how to inform users of interactions because the majority of the visualization is spent scrolling, which animates the visualization. For our first interaction, we disabled scrolling so that the user cannot move on until they select an item from the menu. Upon hover, the clickable items will underline. The visualizations and interactions also gradually get more complex as you scroll down the website. We saved our visualizations with clicking and hovering for the last two sections of the visualization because by this point of the article the pace of content has gotten more complex and the user will have hopefully slowed down.

- We also have text that fades in and out to instruct what things are interact-able.
    - “Explore other countries….” fades in and out to inform users of the mouseover/tooltip and to click the filter buttons

Implementation

- We struggled a lot with scrolling animations, and depended on Cuthbert Chow’s code and tutorial for building a scroller.
- We referenced Prof. Rzeszotarski’s code from INFO 3300 for the updating bar chart, the choropleth map, and the mouseover for the line chart.
- Other interesting coding decisions we made:
    - Part of Cuthbert Chow’s scrolling code is that the computer window screen is broken up into positions that a user scrolls through. These positions are then used to index a list called activationFunctions, which holds the names of different

functions in our file. Our code uses this by calling different functions that update both the infographics and the bar charts.



- Additionally due to Cuthbert Chow's scrolling code, we had to get creative with the code for the bar charts. Since the left side of our visualization was one div that we continued to update, the right side of the visualization technically needed to be separate distinct sections. These needed to be sections to allow users to scroll down the page in the first place. However, we also wanted the right side of the screen to give the appearance of the same element updating on scroll. To get around this, we made empty sections for the right side and then put a floating div over these sections and gave it a fixed position. We used this same solution for the infographic images that are next to the bar chart. Therefore, both the infographics and the bar chart divs are layed on top of the right side of the visualization the entire time, we are just changing the opacity between 0 and 1.
- We also wanted to prevent scrolling for users until they have "ordered" something (by clicking on the menu). We originally tried to set all of the sections after the menu to display: none, however, this made the rest of the scrolling inoperable since scroll function needs to calculate the size of all the sections when the page first loads. We got around this by setting height:0, overflow:hidden, and opacity 0. This allowed us to not allow scrolling until a menu item has been clicked/ "ordered".

VII. Team Member Contributions

- a lot of hours spent in brainstorming and work session meetings
- **Estelle:** infographic, menu, receipt, scrolling, write-up
- **Eva:** bar chart, line chart, scrolling, focus on selected country, progress bar, write-up
- **Gaby:** choropleth map, focus on selected country, 13 countries research/photos, write-up