**Process Book**

1. **Introduction**
   1. Information about why we’re visualizing climate change, specifically its manifestations in temperature changes and climate disasters, and their effects on human wellbeing represented by national economic indicators such as GDP and life expectancy. Introduction to highlight which countries have historically contributed the most and least, and see if they are the ones dealing most with the repercussions
2. **Climate Indicators**
   1. Time series of temperature and disaster frequency change: Start with the basics
   2. Relationship between historical emissions and historical temperatures
      1. Assuming every country will see a similar increase in average temperatures, so those who have historically high temperatures will be impacted most by climate change
   3. GDP and Temperature
      1. Highest emitters tend to be those who also have the highest emissions, given higher emissions means more industrial activity and higher national domestic product. Showing the relationship between GDP and temperature highlights a similar relationship from a different perspective, and having both graphs back to back ties economic wellbeing, climate health and emissions together
3. **Climate Disasters**
   1. Time series of frequency of disasters and its effects
      1. Temperature and disaster graph from above shows positive relationship between the two, now we’re showing the indirect impacts of rising temperatures via higher climate disasters
   2. Per year bar plot for top countries effects by disasters
      1. Diving deeper into which countries are effected in select number of years, selecting recent years with the least null values) to uncover if they are high, medium or low emitters
   3. Temperature Map
      1. Look at the historical average temperatures of countries on a world map and add clickable portion that shows total number of deaths from disasters. Helps see which regions/countries will be more effected by climate change now that we’ve established its negative effects through higher deaths from higher number of disasters
4. GHG Emissions
   1. CO2 emitters map
      1. Top and bottom 10 CO2 emitters map pointing to specific countries. Right below the temperature graph to see the relationship, and represent the previous emissions and temperature scatter plot in a geospatial manner. Didn’t put these points on top of the temperature map due to possible information overload when that occurs
   2. Carbon dioxide Emissions from 2010 till 2015
      1. Focusing specially on the top emitters now to see the differences between top emitters and also provide the primary focus on these countries by not including any other variable
5. Country Wellbeing Plots
   1. Economic and Population Wellbeing and CO2 Emissions
      1. We’ve previously indirectly tied emissions to economic and population wellbeing, so directly tying them together after looking directly at top emitters helps direct the user to what countries’ populations are doing the best, and at what cost with regards to climate impacts per country to the whole world and also the benefits of emissions such as higher life expectancy
   2. GDP per capita worldwide
      1. Visualizing GDP per capita on a map allows the user to see the regions that are doing the best with regards to the most commonly used wellbeing indicator that is gdp per capita
   3. Rural and urban populations map
      1. Urbanization is also another indicator of wellbeing and also climate adaptation; urban population emit less carbon per capita. This map allows us to see after the GDP per capita graph the relationship between the two and preparedness for higher climate disasters per region.
   4. Arable land and CO2 emissions
      1. Arable land is an indicator of historical ability to produce food to their citizens and also export, thus economic wellbeing. Putting this after rural and urban population map allows us to tie the relationship between rural economic forces impact on a countries industrial wellbeing represented by emissions
   5. Arable Land and Percentage of Forested Land
      1. Having more arable land means more economic wellbeing however less ecological wellbeing as it likely leads to deforestation. Inspired by the Amazon forests destruction, we wanted to see how much human development is related with the wellbeing of nature in a given country

A whiteboard with writing on it

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