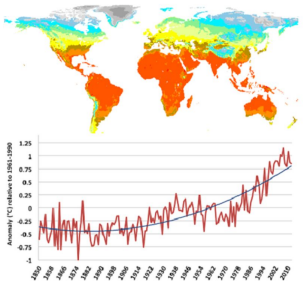
Milestone2 - group ZALDA

The structure of the website can be found here. There will be 8 sections (currently separated with a grey line), in which 4 sections will present data and each contains interactive visualizations in the data story. Besides, we will also introduce in each of these 4 sections some domain knowledge, which serves also for linking the factors and shows the relevance to global warming. Each group of visualizations is explained in the following subsections.

We also show the extra ideas that could be dropped out if we encounter some difficulties in *italic*.

World Average Temperature

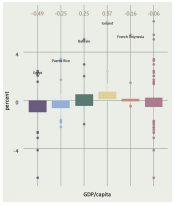


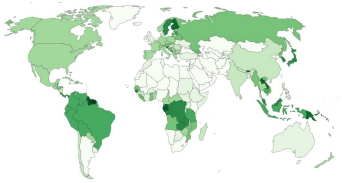
The top figure dynamically shows the geological view of the annual regional average temperature year by year.

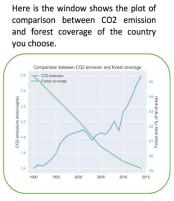
Meanwhile, the bottom one draws the average annual global temperatures of the corresponding year and the regression curve.

In this way, we could visually show the fact that global warming is not a “bullshit”. Besides, we could visually show the increase of temperature in each region of the world. The domain knowledge is to help our audiences to better understand why global warming is indeed a challenge to lives.

CO2 and Deforestation

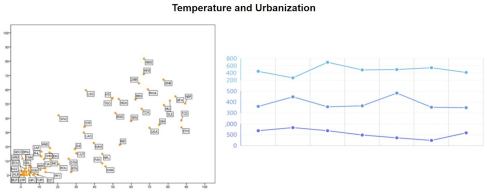






The greenhouse gas such as CO2 is the key factor related to the global temperature, so we want to visualize the relationship between CO2 emission and deforestation in this section. The world map dynamically shows the forest coverage rate of each country year by year. The left box plot shows the annual growth rate in forest areas by countries grouped by GDP/capita. The right window shows the plot of two lines indicating the CO2 emission (tons/capita) and forest coverage rate respectively of the country you click on the world map from 1990 to 2014. We can thus have a global perspective of deforestation and its relationship with CO2 emission.

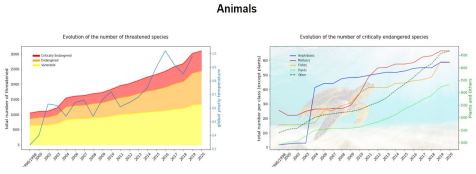
Temperature and Urbanization



The left scatter plot shows the data with 4 dimensions: the evolution of urbanization level and the annual temperature on the x and y-axis, the forest coverage rate of each country with the size of the dots, versus time, i.e. the dots would move dynamically in the figure year by year.

In addition to the trend visualization, every dot is Interactive. Clicking a dot (country/region) would draw a 3 line chart on the right: temperature, urbanization, forest coverage rate v.s. time, so that users could directly see the numerical relations between them. *As long as time is sufficient, we would implement a fisheye distortion to the scatter plot so that users could have a better view of clustered dots.*

Animals



The left figure shows the evolution of the number of different degrees of danger for threatened species through time with an animation of plotting from left to right, together with the evolution of the global temperature.

When clicking on the colored area, it generates a new right figure that shows the data for the chosen degree of danger. *We might add buttons that allow the user to look at the information about each class of animals instead of a graph with several lines together as shown in the sketch.*

Other general extra ideas:

We currently have a page that could be scrolled up and down, but we could split each section to "pages" with an arrow at the bottom, and when clicking on the arrow, the page will be scrolled automatically to the next "page".

For each graph that contains information that evolves with time, we currently design it to draw themselves automatically like a video, but we could add a control bar to let the graph stop, and by dragging the bar, the graph can show the information at any moment we chose.

We have encountered some problems with the design of section food and agriculture*. If we have time, we will add this section just before the section* animals *to our project.*

Tools

During the design of visualization and interaction, we leveraged many ideas from previous lectures. At the beginning of the project, we planned to visualize what led to global warming and what could be the results. But as introduced in the lecture, we need to think about what the audiences already know and what they don't know; more importantly, what they want to know. Global warming is a hot topic since 2000 and most people know what could be the reasons. Therefore, we made the decision to focus more on visualizing the level of influence between global warming and the chosen factors.

The interaction samples in the lectures also help us a lot. As global warming is itself a geography/ global phenomenon, we always converged to world maps and color maps when we designed the visualization. Lecture 5 showed us many other views, inspiring us that as long as pieces of information are linked and highlighted well, we could drop the world map completely. Then we came up with the dynamic scatter plotter in the section "Temperature and Urbanization". Besides, learning many marker channels from the lecture 6, we chose the size of scatters to represent the area of forest coverage of each country/region and the color to show the economic status of the country/region. In this way, the figure is informative and well organized.

Currently, we mainly rely on d3.js for visualization. Some d3.js based packages, such as WorldMap.js, will be used for world map visualization and interactions. We would also try some other packages like amCharts as they provide better visualization experience in some cases.

Implementation

Currently, there are 4 interactive sections as explained above. Each of them demonstrates different factors related to global warming and their interactions are different. So, each section could be implemented independently. In the first stage, we would like to start by implementing each part individually as a function. Each part has its own variables, classes, and styles. In this stage, our target is to have the website interactive.

In the second stage, since these sections are not fully independent as they make up the whole project. We will work together to share features and classes so that the codes could be well structured and have good readability with as few as possible redundant. For example, the functionality of the automatic animation of plotting will be shared by all visualization that has a time evolution.