10/03/2023, CASABLANCA

FINAL LAB : VISUALIZING FRANCE 2022 WEATHER

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WEST FRANCE NEWSPAPER EDITORS PITCH

I. Dataset presentation and understanding

The dataset *weather2022.geojson* is about meteorologic conditions of different cities in France in 2022 (Metropolitan and overseas' regions). We can observe the pressure at sea level, the temperature, the wind direction, and the wind speed. The dataset gives us the information about every day of the year with the different hour range. We can also see exactly where the cities are thanks to their latitude and longitude. It is organized in a tabular form with 7 columns and 173710 rows and has a memory usage of 19.6MB.

Here is an extract of the data frame:

	date	pmer	t	dd	ff	libgeo	geometry
0	2022-12-14 03:00:00+00:00	100540.0	279.55	240.0	15.6	NaN	POINT (51.85667 -46.43250)
1	2022-12-14 06:00:00+00:00	99800.0	282.35	220.0	5.9	Poitiers	POINT (0.31433 46.59383)
2	2022-12-14 06:00:00+00:00	100060.0	284.35	210.0	3.2	Mérignac	POINT (-0.69133 44.83067)
3	2022-12-14 09:00:00+00:00	100030.0	274.65	80.0	4.9	Saint-Jacques-de-la-Lande	POINT (-1.73400 48.06883)
4	2022-12-14 09:00:00+00:00	101200.0	302.65	80.0	4.4	NaN	POINT (47.28967 -11.58267)

II. Data analysis/exploration

We first used the map that we coded in the previews lesson to see which cities were in the regions of Brittany and Pays de la Loire. We found Perros-Guirex, Guipavas, Saint-Jacques-de-la-Lande and Bangor in Brittany and Saint-Aignan-Grandlieu in Pays de la Loire.

We used pandas library to get the data that interested us about Saint-Aignan-Grandlieu, a city in Loire Atlantique and Perros-Guirec, a city in Brittany. Thanks to this code we extracted the meteorologic conditions from the 14th to the 19th of July 2022. We changed the datatype of the column "date" from *datetime64* to *date* to get the dates without the time for the extraction.

```
city_df = gdf.loc[gdf["libgeo"]== "Perros-Guirec"]
mask = (city_df['date'] > '2022-07-13') & (city_df['date'] <= '2022-07-19')
gdf_july = city_df.loc[mask]
gdf_july

gdf_july['date'] = pd.to_datetime(gdf_july['date']).dt.date

display(gdf_july)
```

We converted the temperatures in degree to better understand them and we exported the data into excel files that we opened in tableau to do both of our graphs.

```
df = pd.DataFrame(gdf_july)
df.to_excel(r'C:\Users\nousa\Desktop\export_dataframe.xlsx')
```

We had a problem with our macs with the exportation because the computers were not able to read the exported excel files. After many trials and help, we finally opened them them sending them to the tablet.

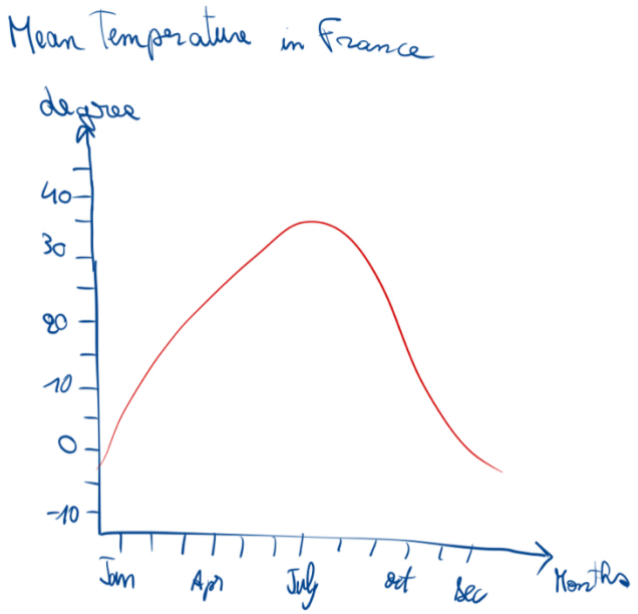
III. Inspiration sources

We used some external sources to better understand the context and the characteristics of the temperature.

Capital: https://www.capital.fr/economie-politique/canicule-juillet-2022-est-le-second-mois-le-plus-sec-jamais-enregistre-1443062

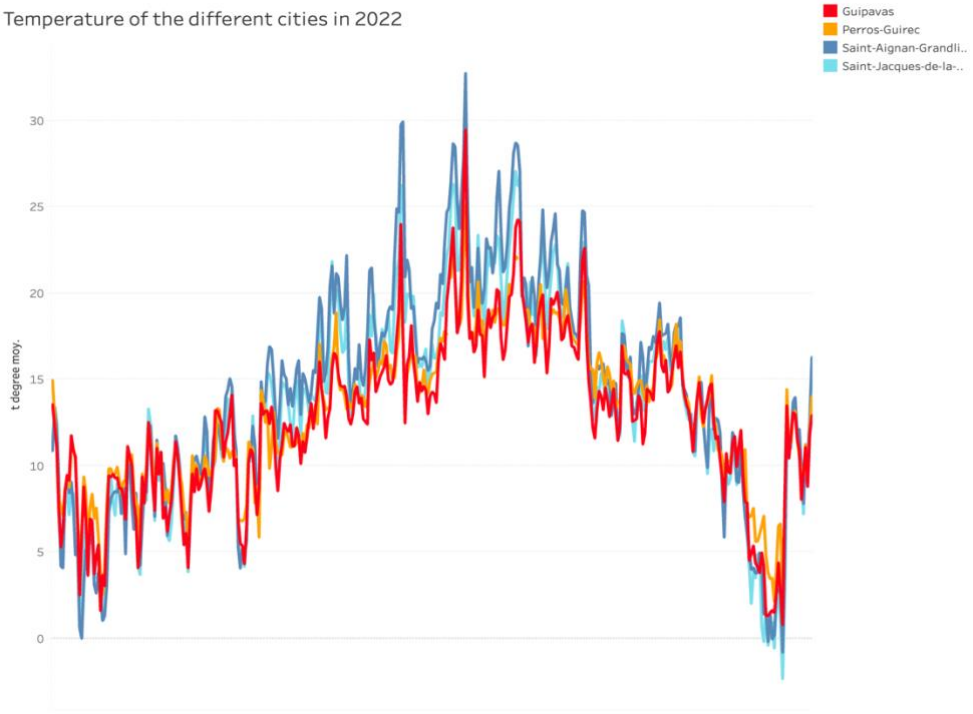
Meteo France: https://meteofrance.com/actualites-et-dossiers/actualites/canicule-intense-et-durable-de-juillet-2022-que-faut-il-retenir

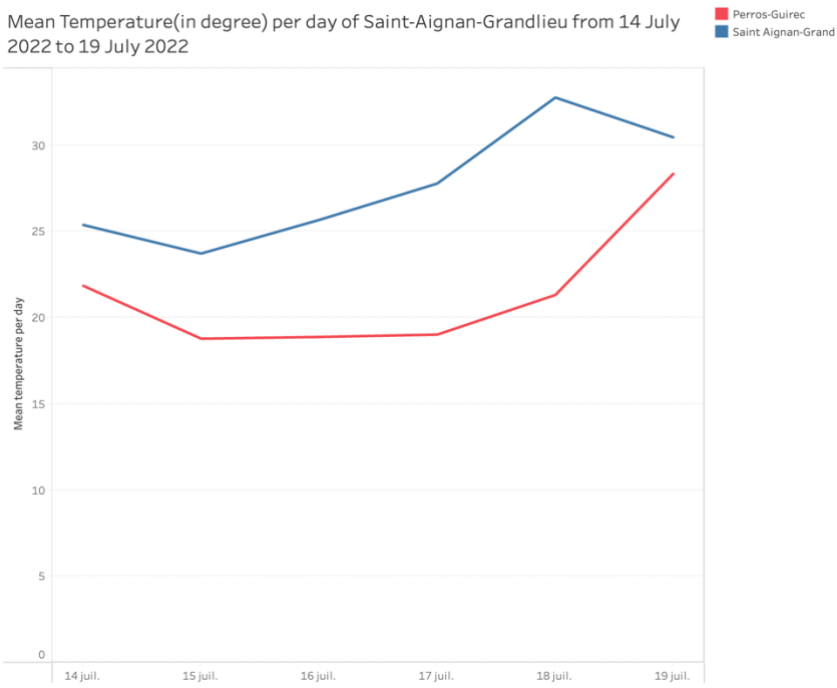
IV. Draft versions



This is a hand-draw that we made to try to represent the mean temperature all over in France in 2022.

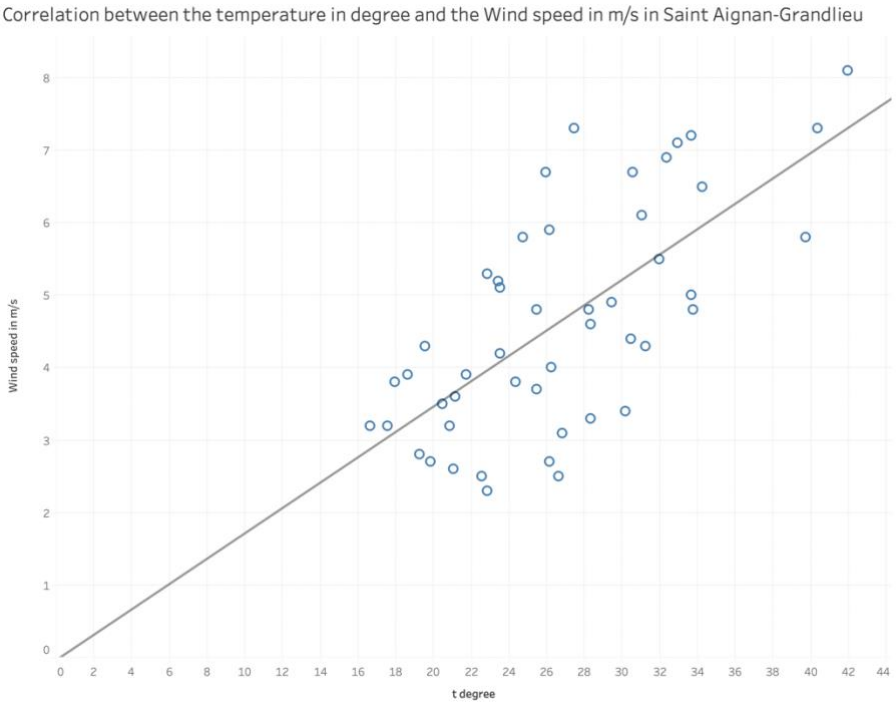
This linear graph represents the different mean temperatures in the year 2022 of some cities in Britany and Pays de la Loire. The results are quite the same so that's we why we did not choose to keep this graph. Moreover, the colors can be improved.





This is a linear graph that shows the mean temperature of two cities that we choose: Perros-Guirec and Saint-Aignan-Grandlieu. It shows us the difference between both. It is clear but we find it not interesting enough for the exercise because it only shows that Saint-Aignan-Grandlieu gets hotter than the other city.

This is a graph that shows the correlation between the temperature and the wind speed in a city chosen: Saint-Aignan-Grandlieu. We find that there is a correlation between the two parameters. That is interesting but we found another way to show the correlation so that's why we did not choose this graph.

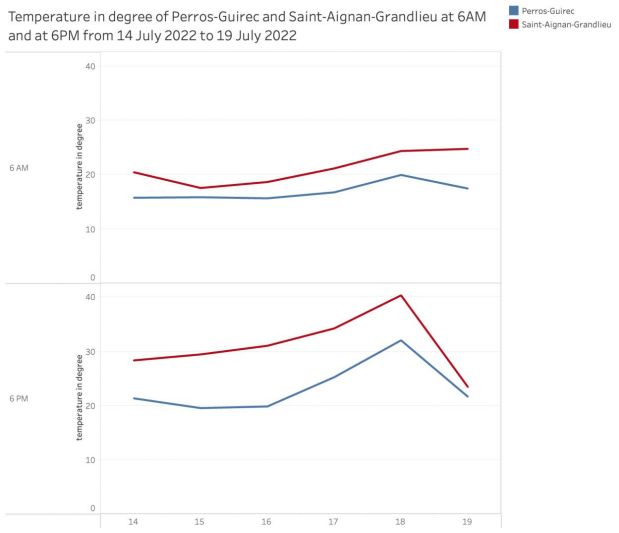


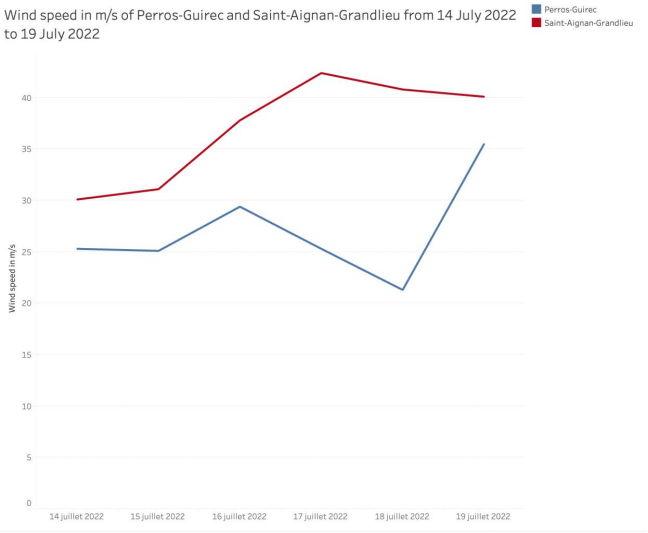
V. Storyboard

The summer started one month ago, and people are feeling more heat than usual. July 2022 is "the second driest month in all months" in Metropolitan France since the beginning of the measurements in 1958-1959, with an aggregate precipitation of 9.7 millimetres. This represents a precipitation deficit of 84% compared to normal for the previous periods 1991-2020.

Pays de la Loire and Brittany suffered a lot from the heat wave: serious and even fatal accidents, such as dehydration or heatstroke for the weaker of us. That's why we wanted to compare two cities from these regions, Perros-Guirec in Brittany, and Saint-Aignan-Grandlieu in Pays de la Loire.

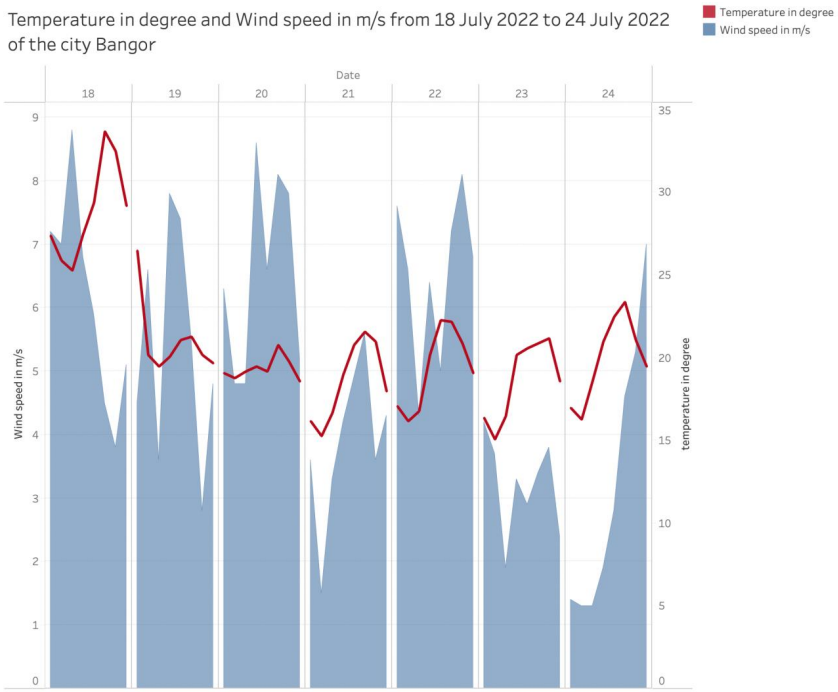
We analyzed the temperatures from 14th July to 19th July 2022 in both cities. The temperatures are much higher in Saint-Aignan-Grandlieu than in Perros-Guirec. Moreover, temperatures change during the day, they are higher in the afternoon but keep the keep the same difference. To explain that we decided to add the wind parameter. Indeed, as Perros-Guirec is right next to the sea, the wind is higher than in Saint-Aignan-Grandlieu which explains the temperature difference between these two cities.





After heat waves, the temperature tends to dimmish fast during the days after. On 18th July 2022, the heat wave was intense in the cities of Britany and Pays de la Loire. Temperature even reached 41ºC in Saint-Aignan-Grandlieu. At the end of the heat wave, the wind speed increased compared to other days and reached 8.8 in Bangor in Britany. That created a drop in the temperature in Bangor. It was at 33.65ºC with 3.8m/s and 20.75ºC 8.1m/s at 6PM each day with a two-day

difference. We can deduce that most of the time, when the wind speed increases, the temperature decreases.



VI. Building steps

After getting the data from Python, we used Tableau software to make the analysis. We first imported the files in Tableau: the exported file about *Perros-Guirec*, the exported file about *Saint-Aignan-Grandlieu* and the file *weather2022.geojson*. That allowed us to have all the important data that we needed.

A. Heatwave between 14 and 19 July on Brittany dand Pays de la Loire

To focus on the date range that was wanted, between 14th July 2022 to 19th July 2022, we selected the parameter date to which we changed its filter to be able to be positioned on those dates. We then chose our parameter that we wanted to figure on the linear graph. We changed the color.

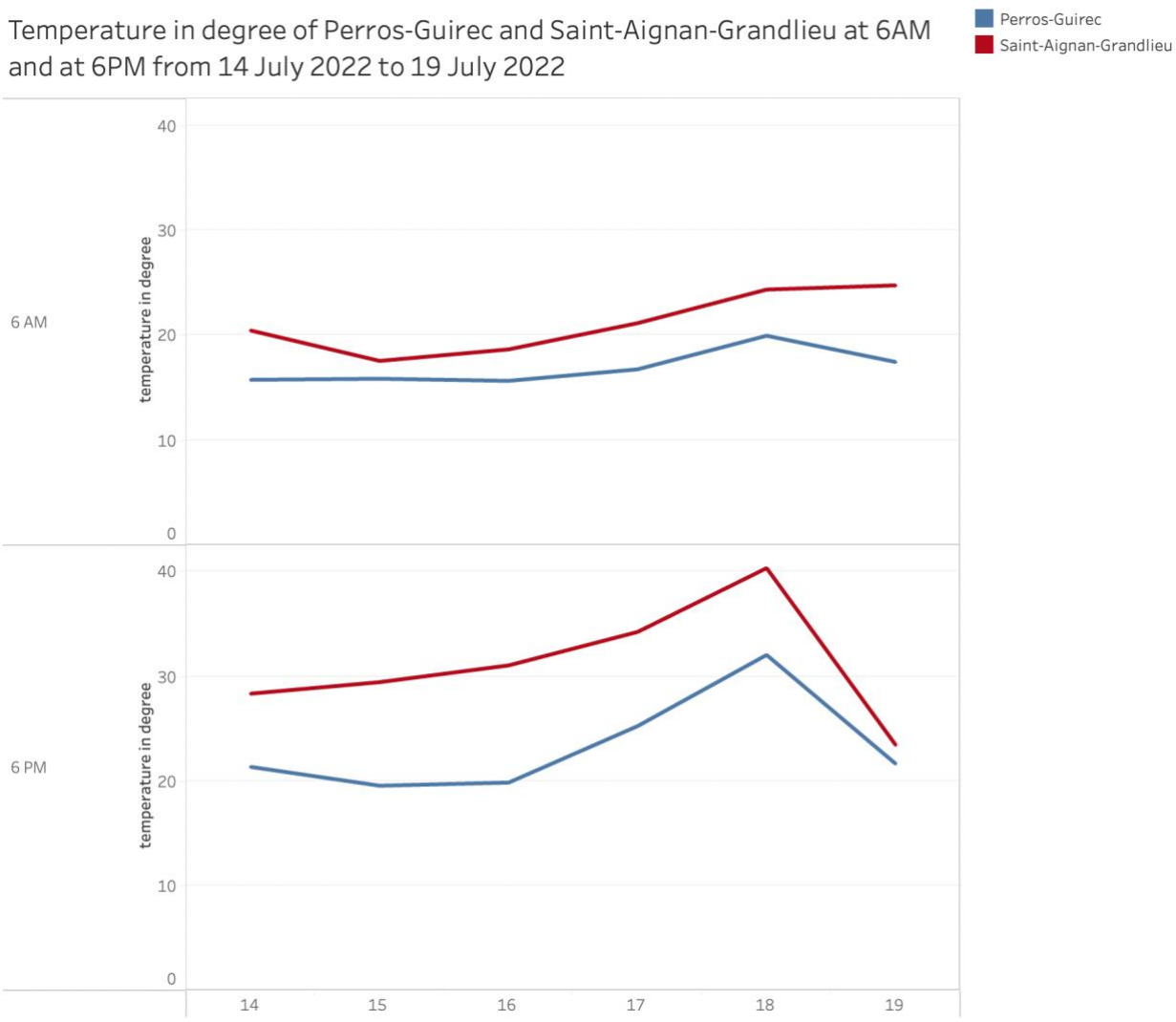
B. Correlation between the temperature and the wind speed

We took the parameters that we needed for each graph. As we wanted to compare the wind speed and the temperature, we put both in a graph. The temperature is represented by a line and the wind speed by an area graph. Like that, we can clearly see the difference or correlation between both with a dual axis graph. Moreover, we wanted a temporal representation spread on a weak focusing on the dates where the heat wave occurred. That's why we filtered the date from July 18th to July 24th.

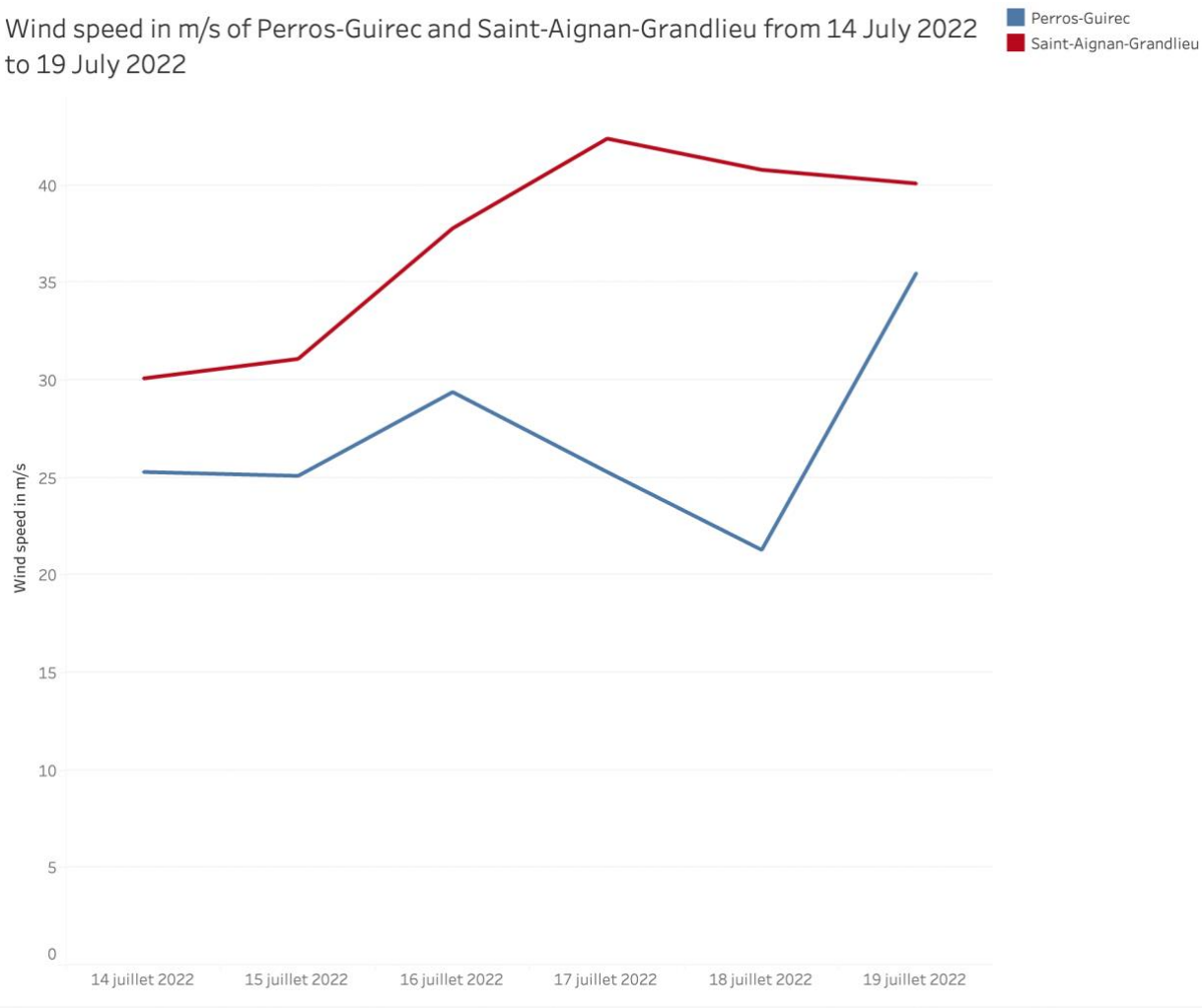
We decided to choose the colors blue and red because in this case, we can afford to do it as there are just two categories and that makes its clear for everyone. For the font, we chose a readable and simple font from the Tableau Software.

VII. Visuals

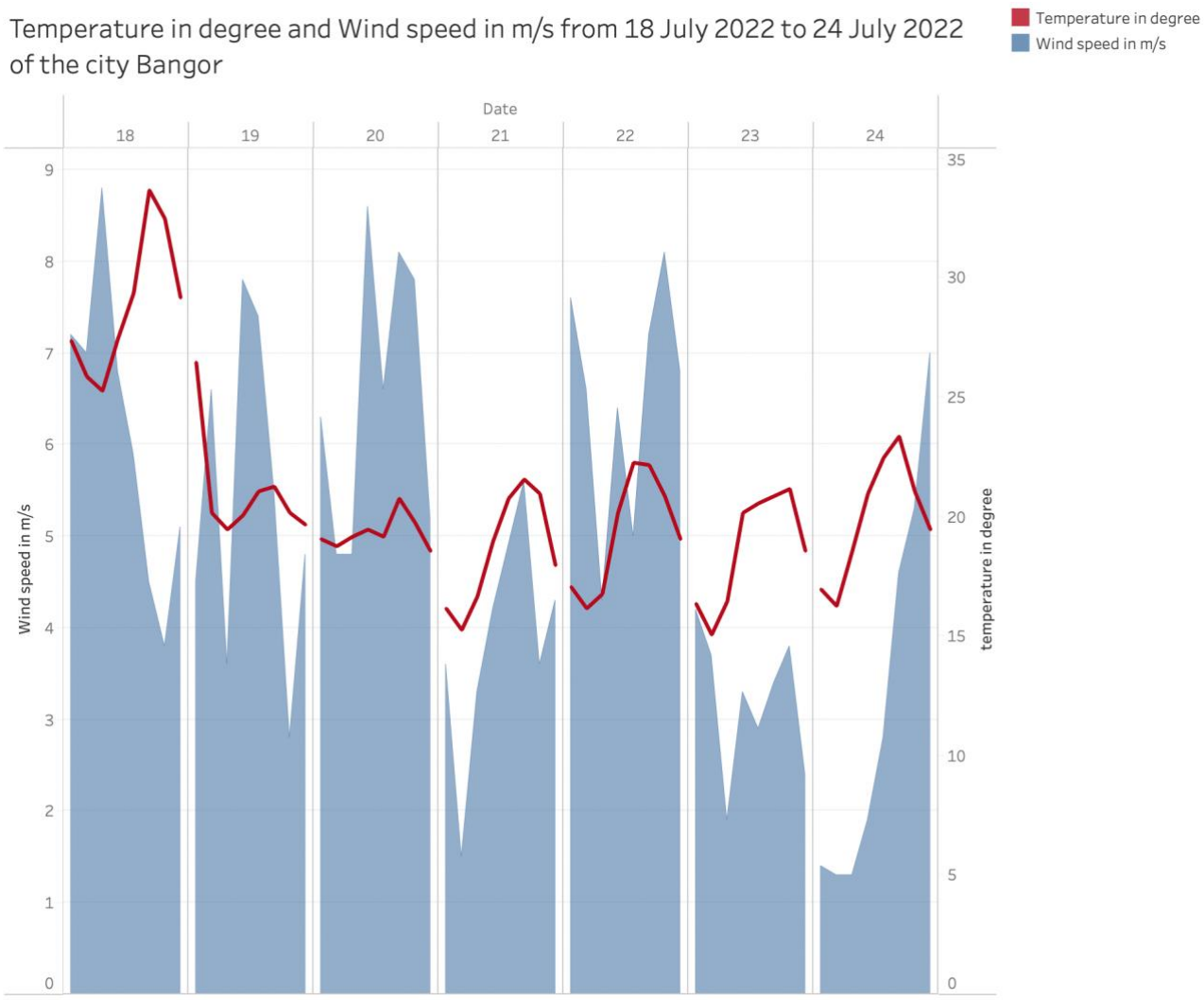
a.1



a.2


Wind speed in m/s of Perros-Guirec and Saint-Aignan-Grandlieu from 14 July 2022 to 19 July 2022
Perros-Guirec
Saint-Aignan-Grandlieu
Wind speed in m/s
40
35
30
25
20
15
10
5
0
14 juillet 2022
15 juillet 2022
16 juillet 2022
17 juillet 2022
18 juillet 2022
19 juillet 2022

b.


Temperature in degree and Wind speed in m/s from 18 July 2022 to 24 July 2022 of the city Bangor
Temperature in degree
Wind speed in m/s
Date
18
19
20
21
22
23
24
Wind speed in m/s
temperature in degree
0
1
2
3
4
5
6
7
8
9
0
5
10
15
20
25
30
35