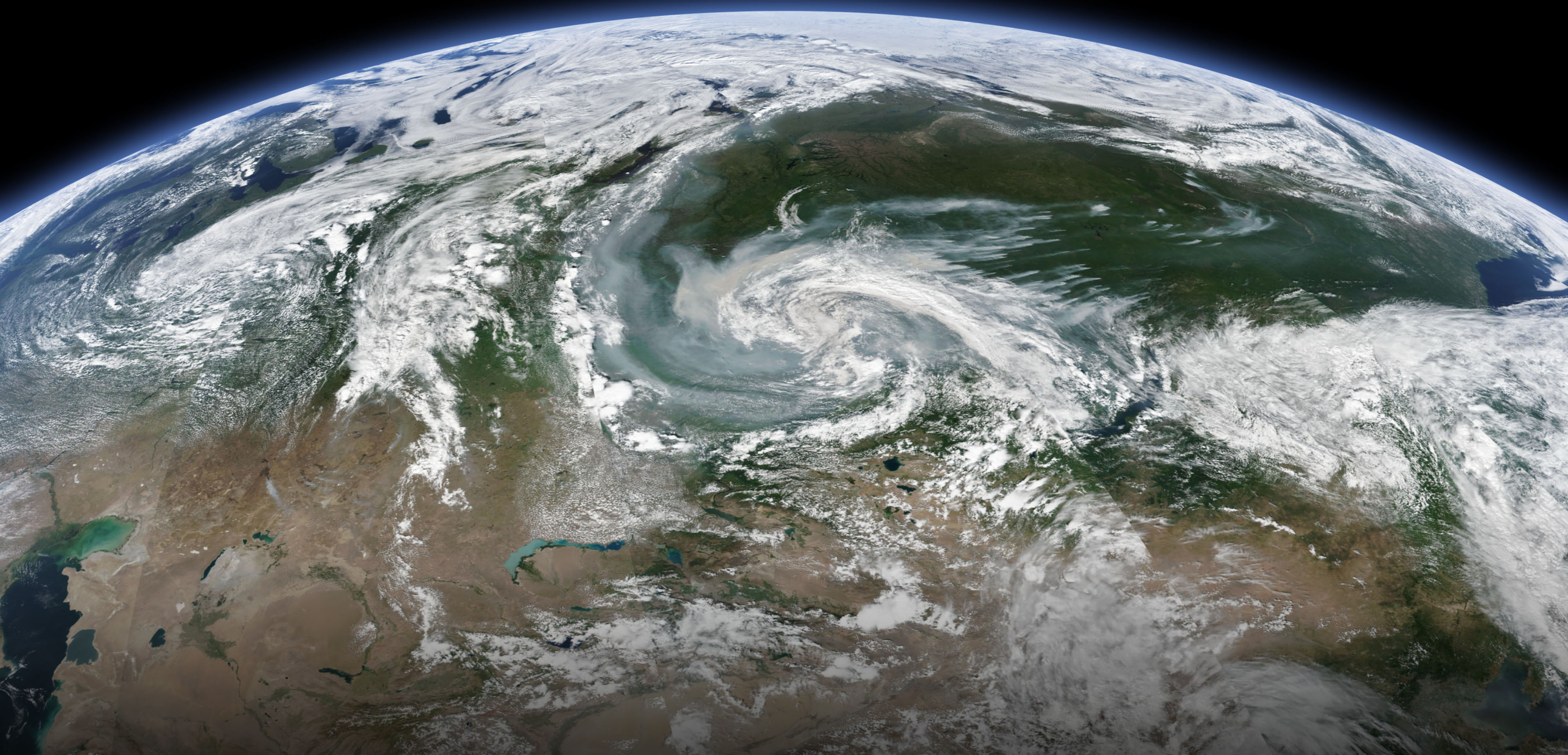
AN EXPLORATORY ANALYSIS

NATURAL EVENTS AND CLIMATE CHANGE

QUESTION?

IS THERE A CORRELATION BETWEEN NATURAL DISASTERS OCCURRENCES AND EMISSIONS OF CO_2?



DATA SOURCES

- EONET API v.2.1 by NASA

- Global carbon Atlas :

http://globalcarbonatlas.org/en/CO2-emissions

DATA WRANGLING

- From the EONET API, we extract all the information about Natural Events from 1980 up today. Overall, clean and organised data, except for unstacked information contained in dictionaries at some fields.

- From Global Carbon Atlas we extract all the information concerning to CO_2 emissions by country and year from 1960 until 2017. Files in format .xlsx.

- Natural events along the years

	id	title	categories	date	closed	date_closed	geometries	year
0	EONET_4488	Wildfires - Riverside County (Hill Fire), Cal...	Wildfires	2019-10-30	False	NaT	{'type': 'Point', 'coordinates': [-117.46421, ...	2019
1	EONET_4487	Wildfires - Ventura County (Easy Fire), Califo...	Wildfires	2019-10-30	False	NaT	{'type': 'Point', 'coordinates': [-118.8304898...	2019
2	EONET_4485	Tropical Cyclone Maha	Severe Storms	2019-10-30	False	NaT	{'type': 'Point', 'coordinates': [74.8, 8.8]}	2019
3	EONET_4484	Tropical Storm Matmo	Severe Storms	2019-10-30	False	NaT	{'type': 'Point', 'coordinates': [111.9, 13.0]}	2019
4	EONET_4486	Subtropical Storm Rebekah	Severe Storms	2019-10-30	False	NaT	{'type': 'Point', 'coordinates': [-40.7, 38.3]}	2019
5	EONET_4482	Wildfires - Port Macquarie (Crestwood Drive Fi...	Wildfires	2019-10-28	False	NaT	{'type': 'Point', 'coordinates': [152.18798676...	2019
6	EONET_4483	Wildfires - La Ligua (La Patagua Fire), Chile	Wildfires	2019-10-28	False	NaT	{'type': 'Point', 'coordinates': [-71.23004, -...	2019

- CO_2 (mt) measurements per country along the years

	Year	Afghanistan	Albania	Algeria	Andorra	Angola	Anguilla	Antigua and Barbuda	Argentina	Armenia	...	Uruguay	Uzbekistan
0	1960	0.41388	2.0225	6.1512	NaN	0.54895	NaN	0.036640	48.7645	2.4936	...	4.3145	47.8515
1	1961	0.49080	2.2790	6.0559	NaN	0.45371	NaN	0.047632	51.1267	2.5714	...	4.1168	49.3462
2	1962	0.68859	2.4622	5.6610	NaN	1.17910	NaN	0.102590	53.6401	2.6987	...	4.0069	51.7895
3	1963	0.70674	2.0812	5.4192	NaN	1.14970	NaN	0.084272	50.0327	2.8942	...	4.3148	55.5408
4	1964	0.83855	2.0152	5.6430	NaN	1.22290	NaN	0.091600	55.6700	3.0780	...	4.5527	59.0674

- Merging data about different CO_2 measurements, global aggregates

	Year	mt_CO2_global	kg_CO2_global	pc_CO2_average
0	1960	11064.131248	3920.0	13.719937
1	1961	11061.885846	3922.0	13.804837
2	1962	11385.687956	3924.0	13.838856
3	1963	11923.171792	3926.0	14.295206
4	1964	12430.081615	3928.0	14.307196
5	1965	12921.535815	3930.0	14.340537
6	1966	13420.870930	3932.0	14.305202
7	1967	13774.912094	3934.0	14.508391
8	1968	14419.554844	3936.0	14.637909
9	1969	15257.565529	3938.0	15.346885

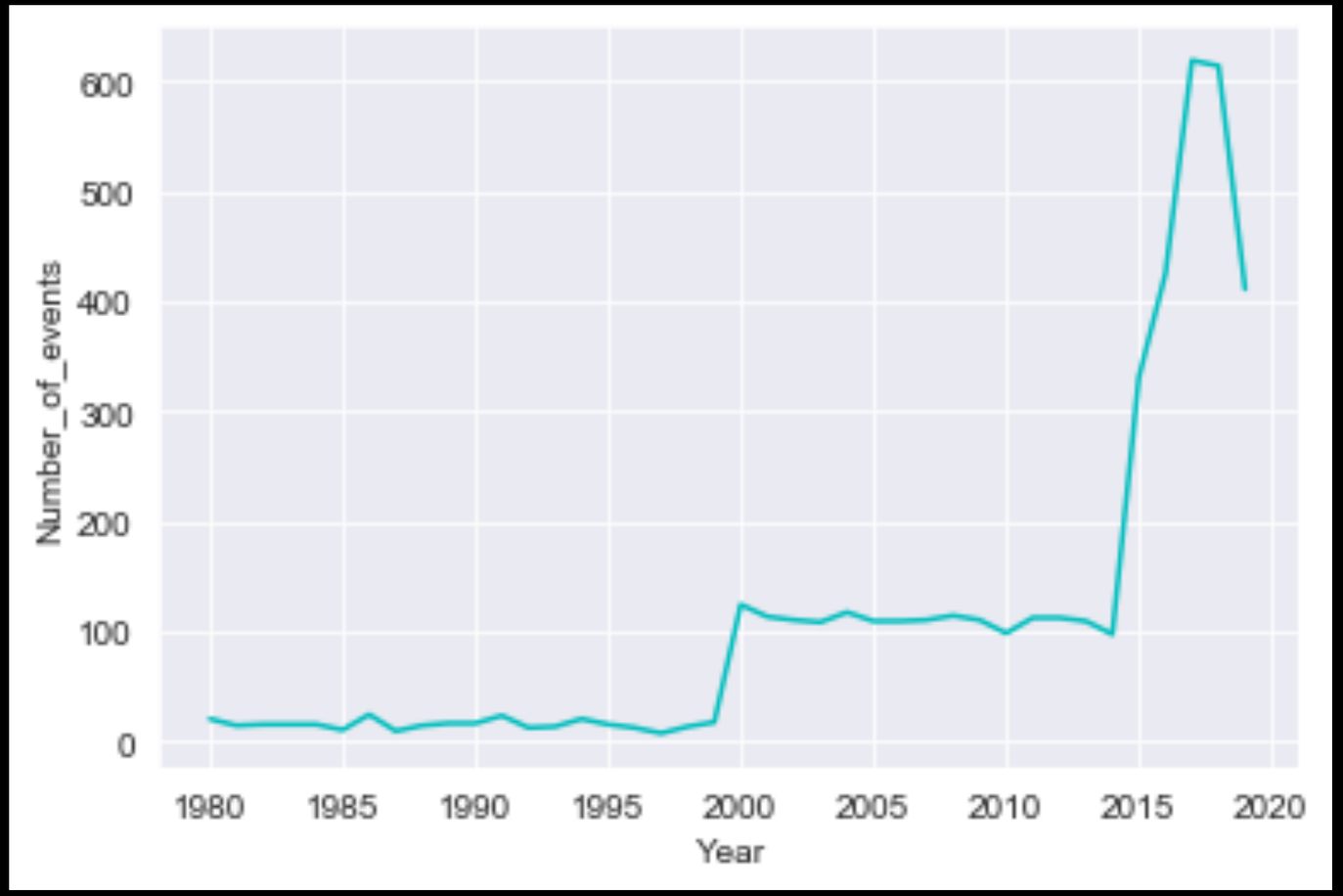
- Combined dataframe

	Year	mt_CO2_global	kg_CO2_global	pc_CO2_average	Number_of_events
0	1980	20928.866204	4054.845970	15.560998	20
1	1981	20439.839034	4053.400998	14.956099	14
2	1982	20341.079622	4056.926502	14.889520	15
3	1983	20530.671032	4050.300670	14.484301	15
4	1984	21080.674356	4062.019382	15.006519	15
5	1985	21768.494488	4068.839102	15.250024	10
6	1986	22035.509136	4054.344036	14.603545	24
7	1987	22739.156532	4056.015335	14.639604	9
8	1988	23536.523416	4057.716957	14.797980	14
9	1989	23866.218532	4062.961496	15.035768	16

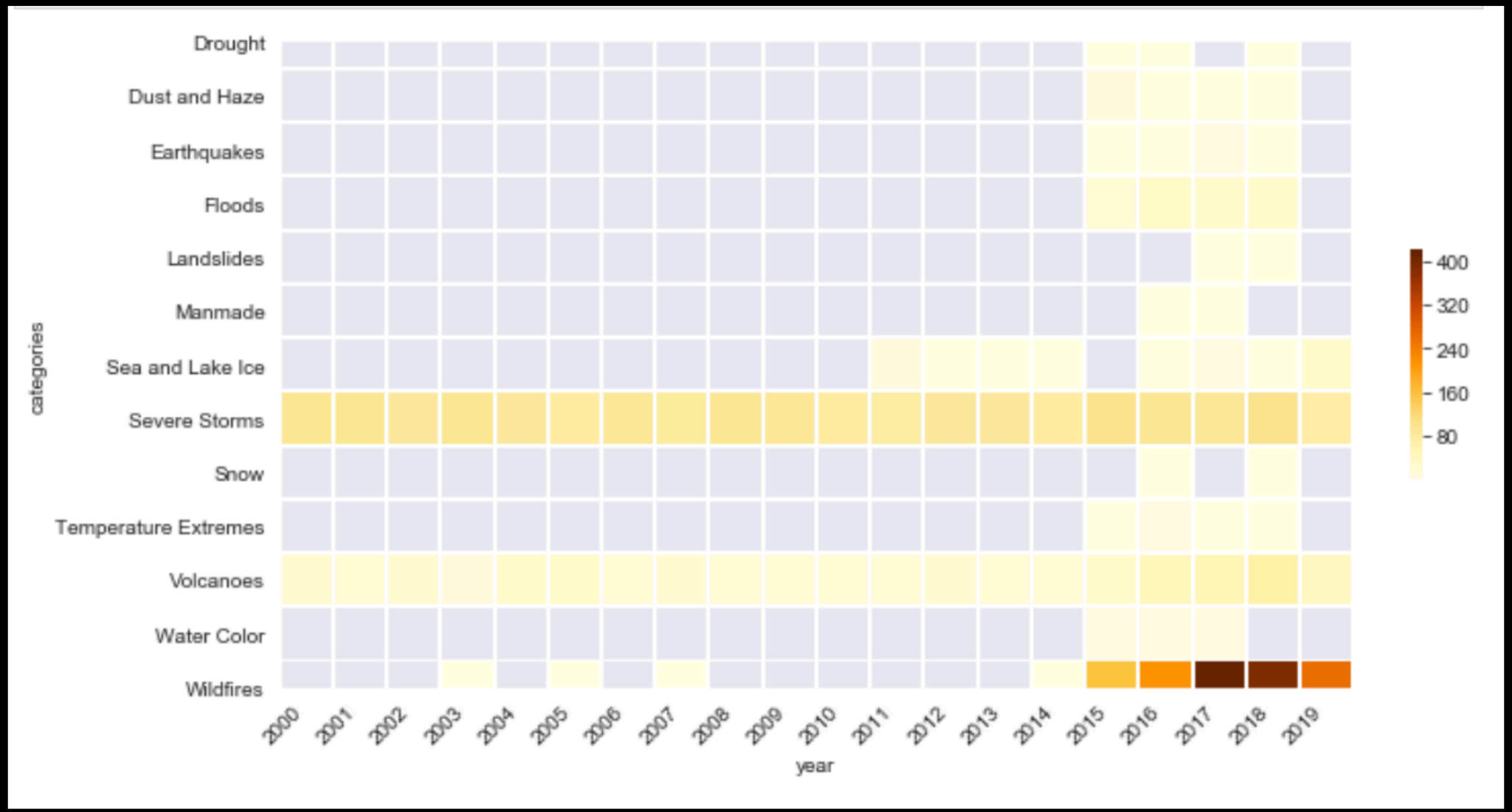
MAIN FINDINGS

1. Frequency of natural events along the years:

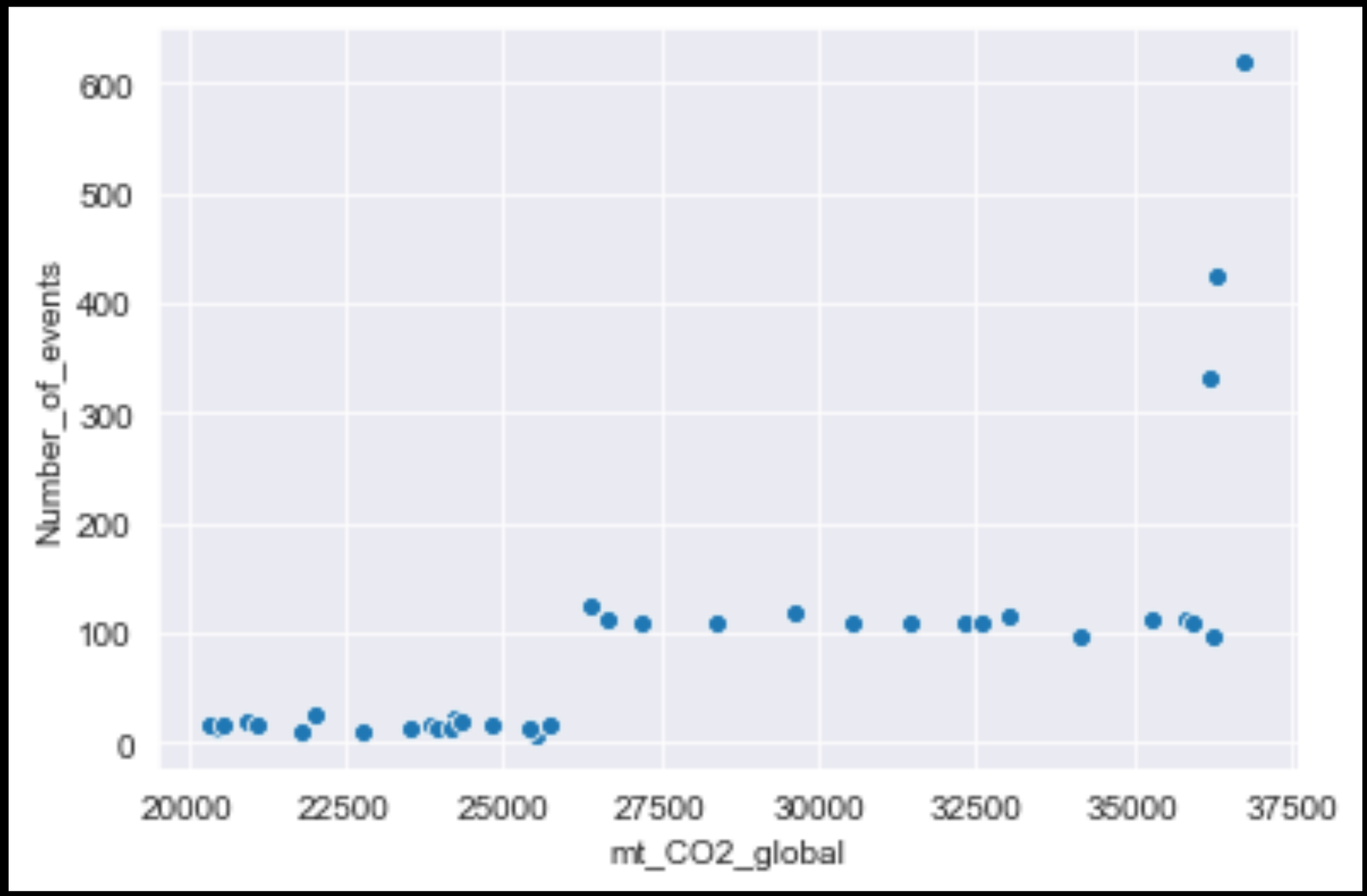
We observe a clear increase of natural events after the year 2000.



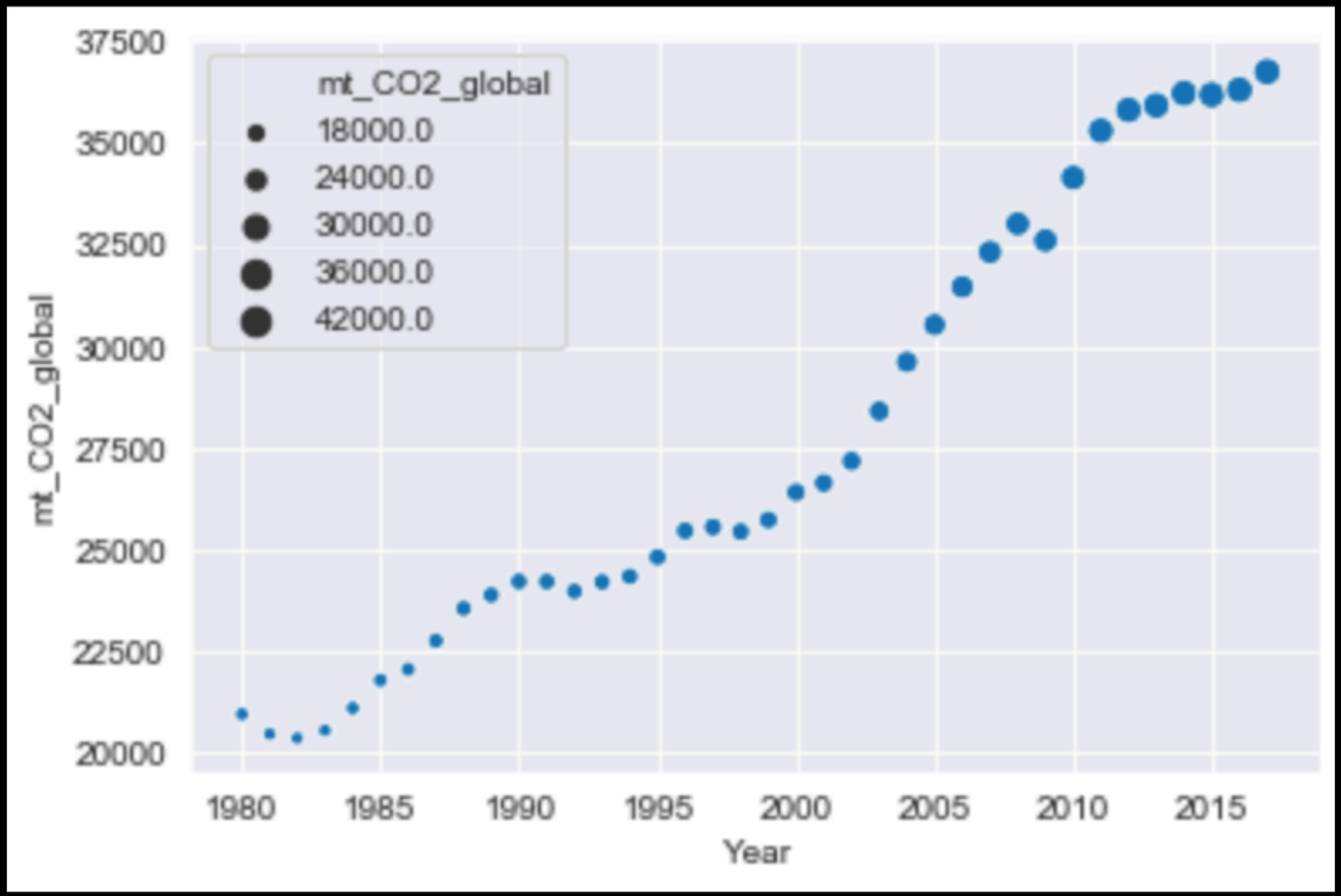
2. The most frequent natural events in the last two decades are the Wildfires. And the risk of Wildfires has been linked to climate change!



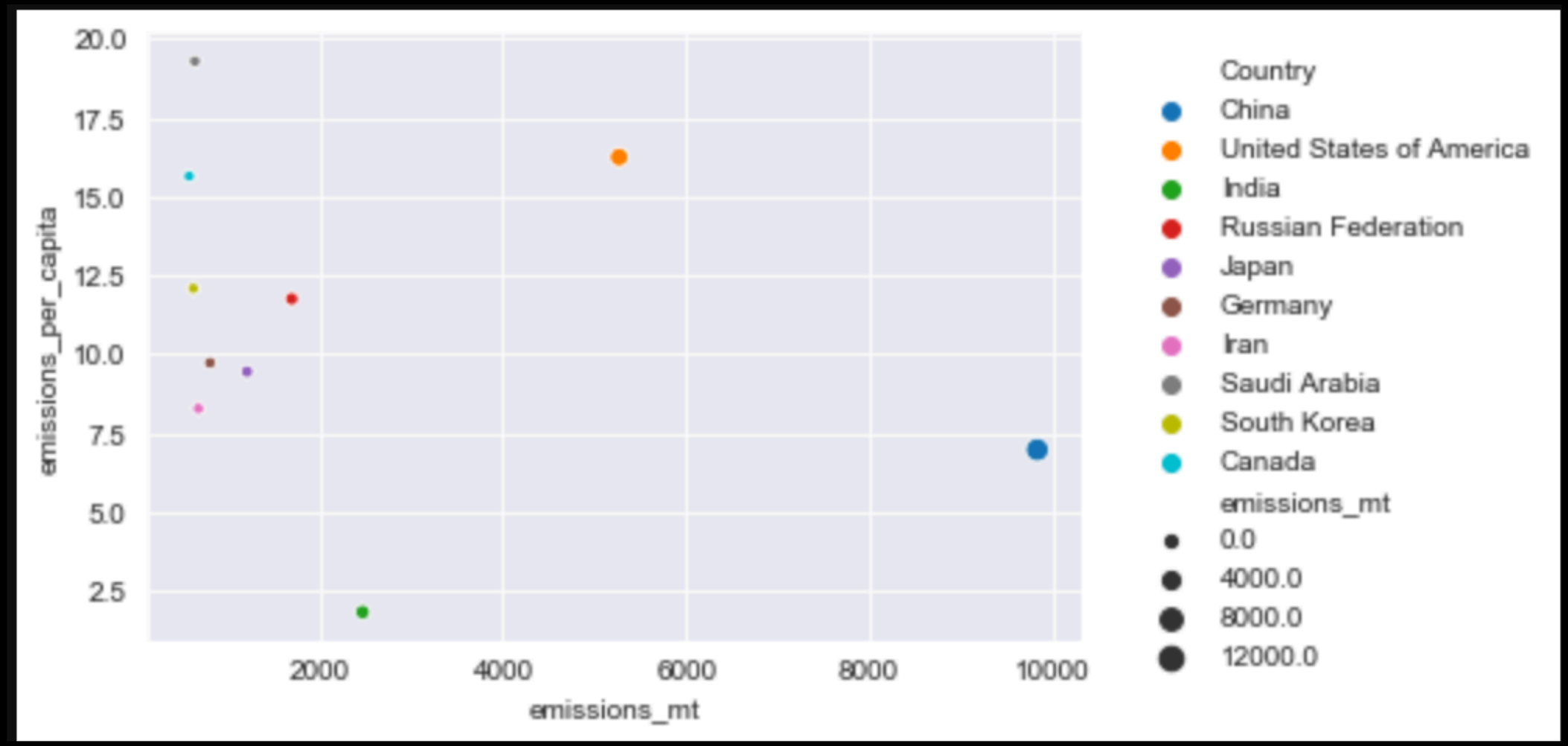
3. We pair the number of natural events with the emissions of CO_2 (mt globally) along the years and we found that they are correlated: The risk of having natural events increases when the emissions of CO_2 rise.



4. Along the years, the global emissions of CO_2 have increased as the number of natural events!



5. Finally, we present the top 10 countries with more CO_2 (mt) on 2017. Here we see that India, have a relatively small ratio concerning CO_2 mt/ CO_2 p.c. emissions, while China and US show high emissions per capita of CO_2 and high territorial emissions in million tons.



REMAINING QUESTIONS

- How are related the CO_2 (consumption) emissions with the occurrence of natural events per Country?
- Do our findings change if we consider CO_2 consumption emissions instead of territorial ones?
- Is there any chance of predict the risk of having natural events from CO_2 measurements?