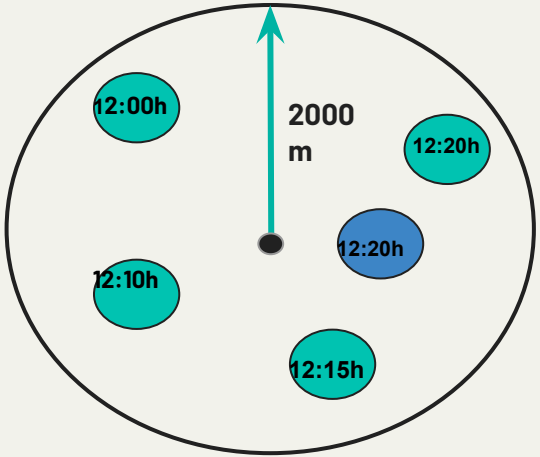
Twitter Pluviometer

Student: Vitor Yuichi Hossaki
Supervisor: Prof. Dr. Leonardo Bacelar Lima Santos
Collaborator: Prof. Dr. Rogério Galante Negri

Introduction

- Relate data from tweets and rain gauges
- Spatial/temporal Radius
- Data processing with Python



Legend

- Radius
- Posts
- Flooding spots
- Rain gauge

Spatial Radius: 2000 m
Temporal window:
01/03/2019 to 12/03/2019

Cemaden
Centro Nacional de Monitoramento e Alertas de Desastres Naturais

Phases

1. Filtering tweets and flood data
2. Select tweets that contain the context linked to the floods
3. Tweet and flood frequence calculation
4. Fidelity/strength
5. Plots

- Importing tweets archive
- First Temporal Window
  - Adjusting and filtering the date
  - Filtering for the word list associate to flood (HIDRO/METEO)
  - Importing the flood data and adjusting the date for the first temporal window
  - Strength and Fidelity tweets
    - Fidelity
    - Strength
  - Dispersion plots, Frequency of flood x Frequency of tweets
    - Strength Dispersion
    - Fidelity Dispersion
  - Duration of flood x frequency of tweets
    - Fidelity Dispersion
  - **Words Fidelity Frequence**

Cemaden
Centro Nacional de Monitoramento e Alertas de Desastres Naturais

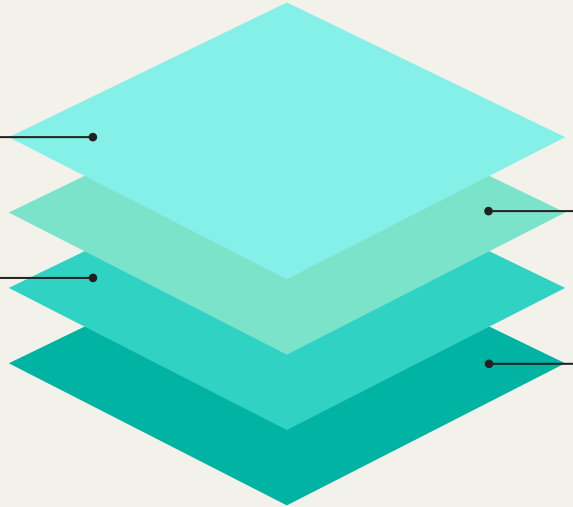
Some information

Temporal Window

01/03/2019 to 12/03/2019

Spatial Radius

2000 meters from the rain gauge



Time interval

4:00pm to 8:00pm

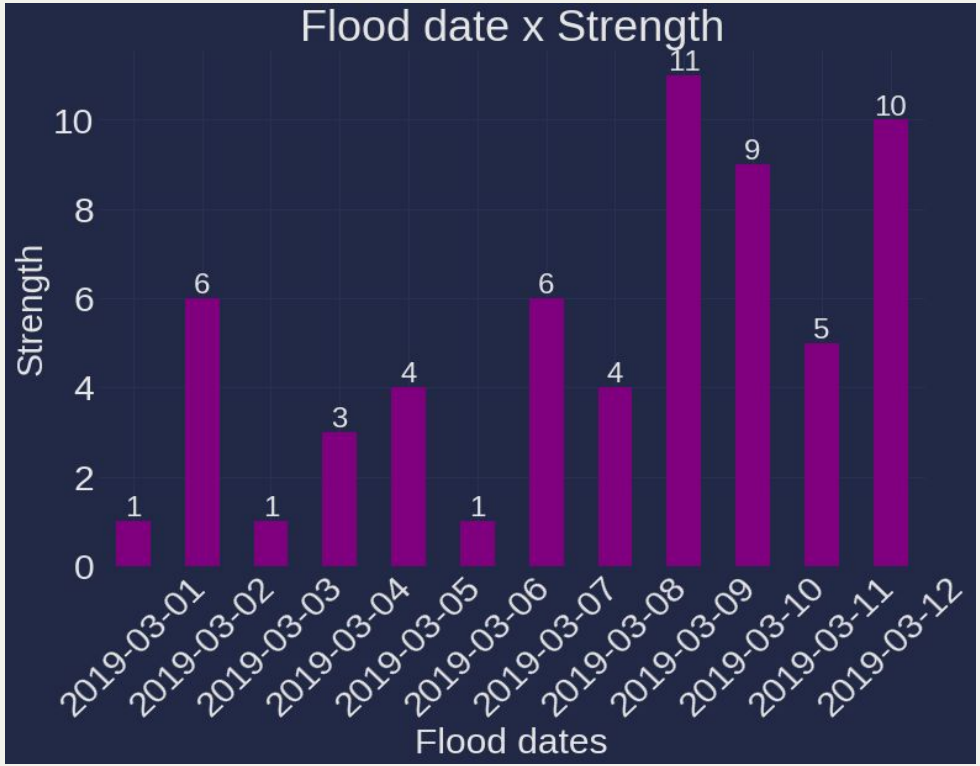
Plots with Python

Scatter and vertical bars plots

Cemaden
Centro Nacional de Monitoramento e Alertas de Desastres Naturais

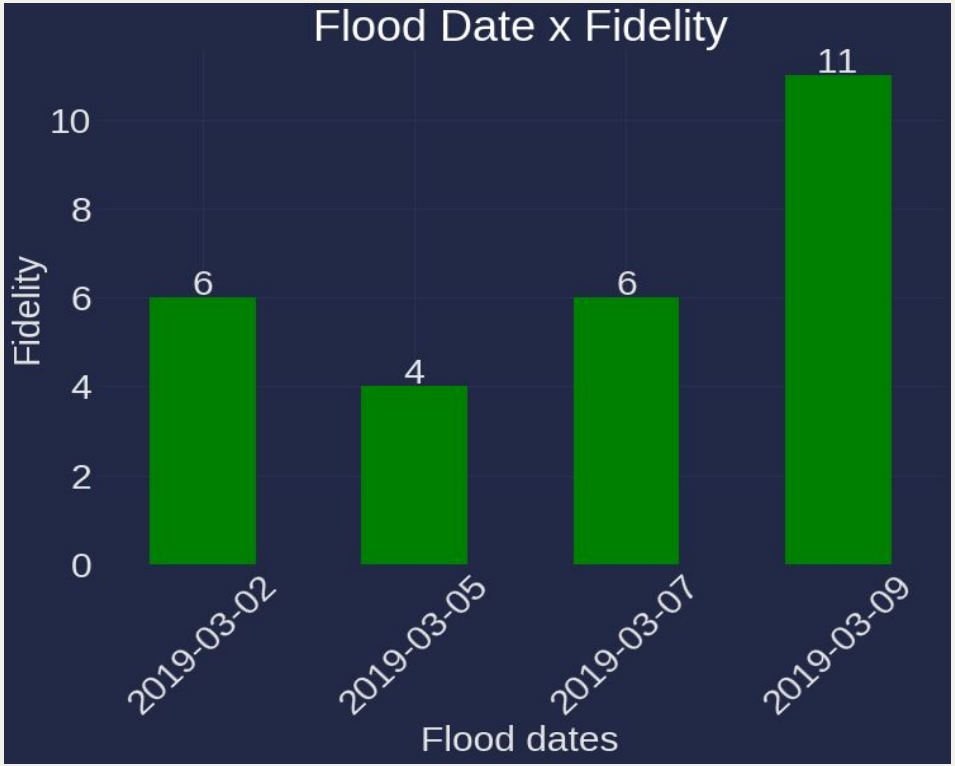
Plot Strength

- Tweets on no flood-day
- These days it may possibly have rained
- Metaphorically used words



Plot Fidelity

- There were tweets on flooding days
- Considerable amount of tweets



Cemaden
Centro Nacional de Monitoramento e Alertas de Desastres Naturais

Words

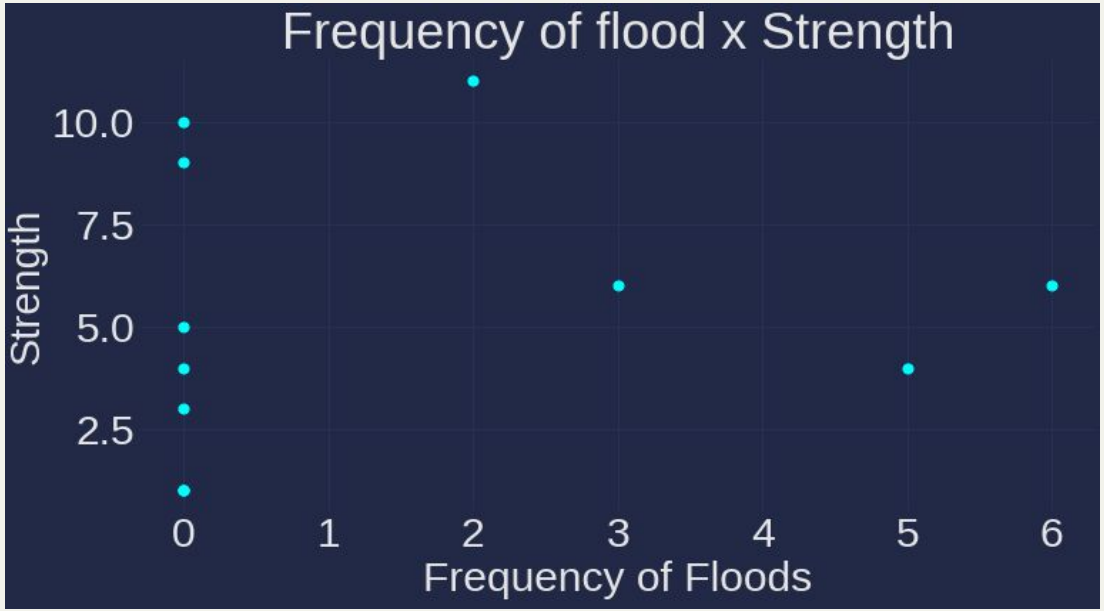
- List of words associate with flood
- How users type the words associated to flood
- Prevalence of Metereological class words
- Potential to research

	Words	Frequence_x	F
0	chuva	13	
1	#chuva	3	
2	#rain	2	
3	CHUVA	1	
4	#train	1	
5	chuva.	1	
6	lightning!	1	
7	Chuvaaaa	1	
8	rain...	1	
9	chuva!	1	
10	tempestade	1	
11	#Lightning…	1	
12	chuva).	1	
13	#dianublado…	1	
14	#rainy	1	
15	chuva!!😂😂😂	1	
16	rain	1	
17	chuva😋😋😋☂	1	
18	Chuva	1	

Cemaden
Centro Nacional de Monitoramento e Alertas de Desastres Naturais

Scatter plot, Strength

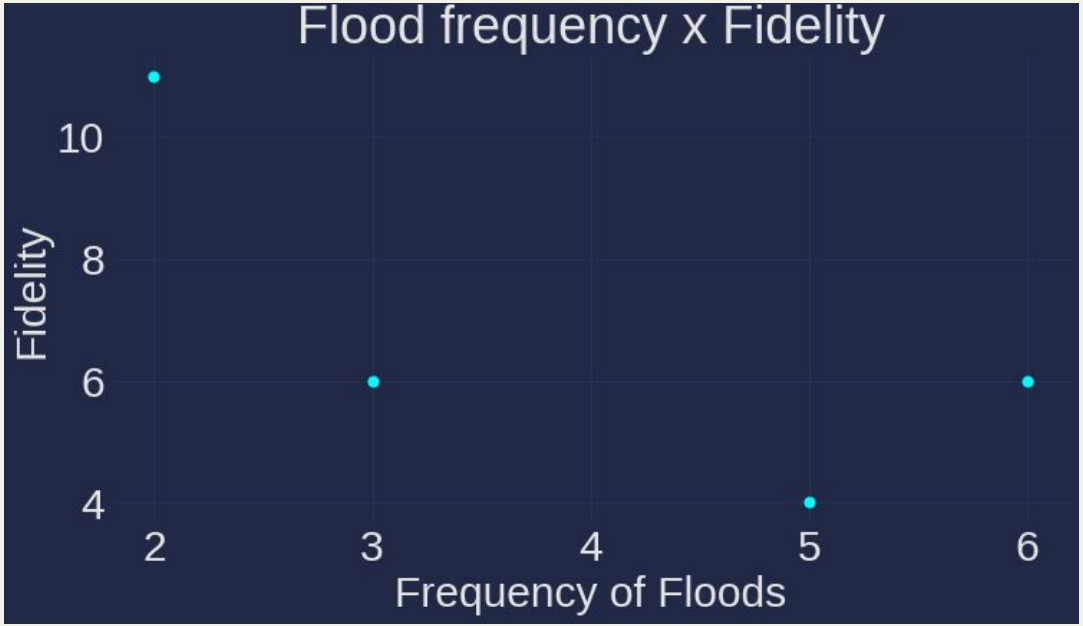
- Tweets on no flood-days
- Considerable amount of tweets for zero floods
- it is not possible to look for patterns



Cemaden
Centro Nacional de Monitoramento e Alertas de Desastres Naturais

Scatter plot, Fidelity

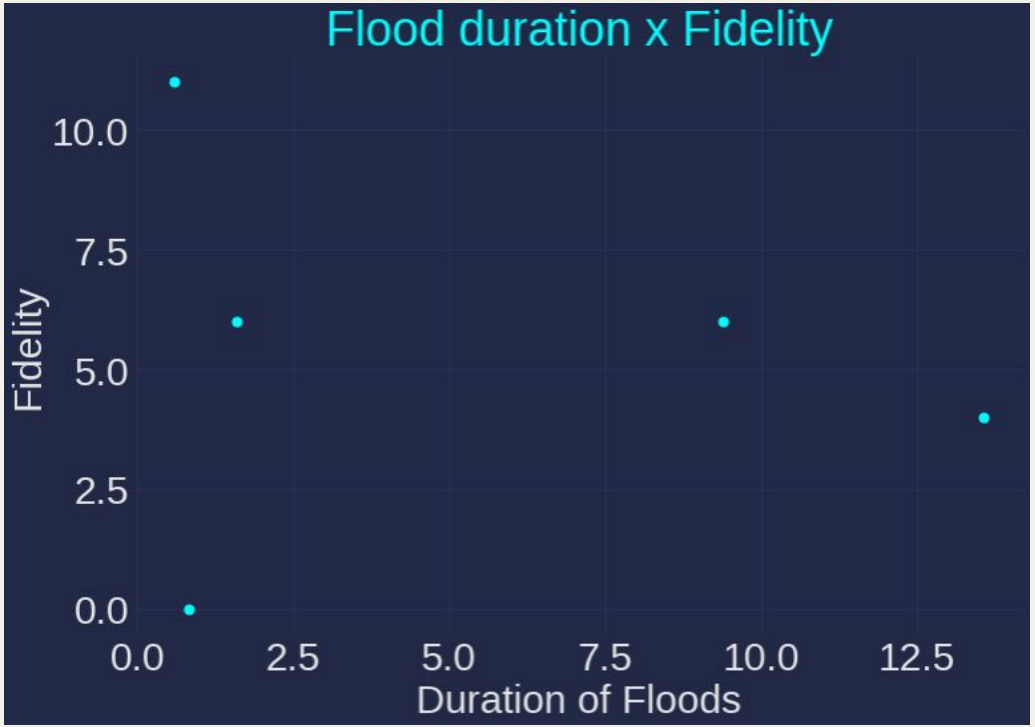
- Lowest frequence of flood
- Higher number of tweets
- Linked to others parameters



Cemaden
Centro Nacional de Monitoramento e Alertas de Desastres Naturais

Scatter plot, flood duration

- Implicit relation between flood and tweet
- One of the shortest floods had a higher frequency of tweets
- The impact of flooding
- The duration is expressed by the time the road was closed



Cemaden
Centro Nacional de Monitoramento e Alertas de Desastres Naturais

General considerations

- The time window is short, more data is needed for reliable inferences and patterns in scatter and bars plots.
- Spatial radius cut
- Analyze in the future, how many tweets per millimeter of rain is needed to cause a possible flooding

What I've learned

- Better understanding of programming
- Python libraries (matplotlib/pandas)
- Excel
- QGIS
- Special thanks to:
  - Wilson Ceron
  - Jeferson F. Mendes
  - Lívia Tomás

Contact

Email: vitor.yuichi@unesp.br

Cemaden
Centro Nacional de Monitoramento e Alertas de Desastres Naturais