

## Doing an exploration on recent disaster tweets for a disaster category

```
In [1]: import pandas as pd
import pickle

import spacy
from spacy import displacy
import matplotlib.pyplot as plt
import seaborn as sns
import altair as alt
import networkx as nx
import nx_altair as nxa
from collections import Counter
import warnings

from tools import extract_assign_location, disaster_title, topNlocations, top_locations, \
    sampleNtweets, top_locations_tweets, show_top_locations, get_top_locations_flatten,
    get_location_graph_data, build_network, get_layout, plot_disaster_mentions, is_inter
    show_tweets_locations, top_location_pairs

warnings.filterwarnings('ignore')
pd.set_option('display.max_colwidth', 280)
```

## Define any upstream dependencies

```
In [2]: upstream = [
    'vectorizer',
    'category_classification_models',
    'recent_tweets_wildfire',
    'recent_tweets_earthquake',
    'recent_tweets_flood',
    'recent_tweets_hurricane'
]
random_seed = None
disaster_kind = None
```

```

In [3]: # Parameters
random_seed = 42
disaster_kind = "recent_tweets_hurricane"
upstream = {
    "recent_tweets_earthquake": {
        "nb": "/Users/mboussarov/_umsi/Capstone/umads_697_data_medics/pipeline/output/recent_tweets_eart
        "file": "/Users/mboussarov/_umsi/Capstone/umads_697_data_medics/pipeline/output/recent_tweets_ea
    },
    "vectorizer": {
        "nb": "/Users/mboussarov/_umsi/Capstone/umads_697_data_medics/pipeline/output/vectorizer.ipynb",
        "vectorizer": "/Users/mboussarov/_umsi/Capstone/umads_697_data_medics/pipeline/output/vectorizer
        "vocab": "/Users/mboussarov/_umsi/Capstone/umads_697_data_medics/pipeline/output/vocab.pkl",
    },
    "recent_tweets_wildfire": {
        "nb": "/Users/mboussarov/_umsi/Capstone/umads_697_data_medics/pipeline/output/recent_tweets_wild
        "file": "/Users/mboussarov/_umsi/Capstone/umads_697_data_medics/pipeline/output/recent_tweets_wi
    },
    "recent_tweets_flood": {
        "nb": "/Users/mboussarov/_umsi/Capstone/umads_697_data_medics/pipeline/output/recent_tweets_flood
        "file": "/Users/mboussarov/_umsi/Capstone/umads_697_data_medics/pipeline/output/recent_tweets_fl
    },
    "category_classification_models": {
        "nb": "/Users/mboussarov/_umsi/Capstone/umads_697_data_medics/pipeline/output/category_classific
        "model_lr": "/Users/mboussarov/_umsi/Capstone/umads_697_data_medics/pipeline/output/model_lr.pkl
        "model_rf": "/Users/mboussarov/_umsi/Capstone/umads_697_data_medics/pipeline/output/model_rf.pkl
        "model_nb": "/Users/mboussarov/_umsi/Capstone/umads_697_data_medics/pipeline/output/model_nb.csv
        "model_votingc": "/Users/mboussarov/_umsi/Capstone/umads_697_data_medics/pipeline/output/model_v
    },
    "recent_tweets_hurricane": {
        "nb": "/Users/mboussarov/_umsi/Capstone/umads_697_data_medics/pipeline/output/recent_tweets_hurr
        "file": "/Users/mboussarov/_umsi/Capstone/umads_697_data_medics/pipeline/output/recent_tweets_hu
    },
}
product = {
    "nb": "/Users/mboussarov/_umsi/Capstone/umads_697_data_medics/pipeline/output/tweets_timeline_hurricane
}

```

```
In [4]: print('Disaster kind: ', disaster_title(disaster_kind))
```

Disaster kind: Hurricane

## Load the sample of recent tweets

```
In [5]: df_tweets = pd.read_csv(upstream[disaster_kind]['file'])
df_tweets.sample(5)
```

Out[5]:

	author_id	tweet_text	created_at	hashtags	users
18550	1310354499987542016	Angelina Jolie Is Noticed By Fans In Tennessee State Evacuation after Hurricane.	2022-08-04 17:17:08+00:00	[]	[]
20768	1364585717536591873	RT @mgrenlle: Hurricane season in the North Atlantic starts in June. It is now August and not a single cyclone yet and only a couple in the...	2022-08-04 11:36:16+00:00	[]	['mgrenlle']
54161	590266004	@BrittaniPittm17 Great question! Here is a link with details on preparing for hurricane season: <a href="https://t.co/035pai3lkB">https://t.co/035pai3lkB</a> \n\nSome important things are knowing your evacuation zone, assembling an emergency kit, developing a plan to evacuate, & knowing where to receive infor...	2022-08-04 16:10:59+00:00	[]	['BrittaniPittm17']
6480	236402256	We live on an island with poor drainage systems, failing infrastructure, and limited capacity to help those who would be most affected in a significant storm and di bredda aggo ask "Wahm to di hurricane dem?"	2022-08-05 03:55:38+00:00	[]	[]
89037	4122881613	RT @sachikoko: 🎉🎉🎉 RESCUED! 10YO BLACK & WHITE KITTY "FUZZ" IS SAFE! 🎉🎉🎉 \n▶️ <a href="https://t.co/5l9ccVqF8H">https://t.co/5l9ccVqF8H</a> \n🐱🐾 PULLED BY Hurricane Pets Rescue Inc. (HP...	2022-07-31 17:21:51+00:00	[]	['sachikoko']

## Extract the locations from the tweet sample

```
In [6]: %%time
df_tweets, df_locs_most_common = extract_assign_location(df_tweets, number_most_common=10)

df_tweets.sample(5)
```

105761it [12:27, 141.46it/s]

CPU times: user 12min 27s, sys: 15 s, total: 12min 42s

Wall time: 13min 10s

Out[6]:

	author_id	tweet_text	created_at	hashtags	users	location
<b>39261</b>	949699751942897664	Think through — and walk through — evacuation routes from each room in your house, even before hurricane winds start howling. And practice them with your family. <a href="https://t.co/z9PFylhdz4">https://t.co/z9PFylhdz4</a>	2022-08-02 16:00:43+00:00			
<b>74031</b>	2914346570	RT @kerberos007: ICYMI:\n\nfrom Tuesday 7/12:\nthe calm before the storm (or hurricane)\n\nCPI (huge beat on the wrong direction 🤔)\n&\nBank earni...	2022-08-02 10:36:45+00:00		['kerberos007']	
<b>63902</b>	1200835889062174720	This storm to fight should've been called a mini hurricane or something. Not only did it flood BUT I couldn't even drive down my normal street to go home because a tree fell in the middle of the road, and tore down a bunch of power lines in the process! Thankful to have power...	2022-08-03 02:28:03+00:00			
<b>20059</b>	296321384	RT @FLSERT: 🌀 Hurricane categories are a useful tool in determining potential damage to your home or business when a storm threatens your c...	2022-08-05 23:21:43+00:00		['FLSERT']	
<b>77303</b>	214976391	RT @nycemergencymgt: It's hurricane season! Do you #knowyourzone? Knowing your hurricane evacuation zone is the first step towards being pr...	2022-08-01 15:30:55+00:00	['knowyourzone']	['nycemergencymgt']	

```
In [7]: df_locs_most_common
```

```
Out[7]:
```

	location	count
0	Atlantic	7688
1	Gulf increases	2505
2	Florida	2212
3	California	1706
4	US	1387
5	Africa	1339
6	Gulf of Mexico	1247
7	Texas	1215
8	North Atlantic...Caribbean Sea	1164
9	Louisiana	1154

## Predict the class labels

```
In [8]: # Get the vectorizer
with open(upstream["vectorizer"]["vectorizer"], 'rb') as f:
    vectorizer = pickle.load(f)
```

```
In [9]: # Get the classification model
with open(upstream["category_classification_models"]["model_lr"], 'rb') as f:
    classifier = pickle.load(f)
```

```
In [10]: %%time
# Predict the class labels
class_label = classifier.predict(vectorizer.transform(df_tweets['tweet_text']))
df_tweets['class_label'] = class_label

df_tweets.sample(5)
```

CPU times: user 57.5 s, sys: 288 ms, total: 57.8 s  
Wall time: 57.8 s

Out[10]:

	author_id	tweet_text	created_at	hashtags	users	location	class_label
51373	1518021919819321353	RT @OutcomeOptimist: @GeneralAmarah @RBot42 I live in Hawaii. That was on the Big Island of Hawaii because the hurricane/tropical storm pas...	2022-08-01 21:51:39+00:00	[]	['OutcomeOptimist', 'GeneralAmarah', 'RBot42']	[Hawaii, Big Island, Hawaii]	other_relevant_information
91526	1529421373	RT @NHC_TAFB: Jul 31st, 12 ET: Hurricane #Frank and Tropical Storm #Georgette continue to impact the eastern North Pacific high seas. Fra...	2022-08-02 16:25:23+00:00	['Frank', 'Georgette']	['NHC_TAFB']	[North Pacific]	caution_and_advice
55987	1143974270017495040	Ooooh! Something new and fun for California!\n\nThe cold waters of the Pacific Ocean may not support strengthening of a hurricane as it moves north, but maybe the storm could bring unwanted lightning to the state. \n\nSomething to watch this week.\n\nPlease no earthquakes.\n\n...	2022-07-31 13:39:37+00:00	['CAwx']	[]	[Pacific Ocean]	other_relevant_information

	author_id	tweet_text	created_at	hashtags	users	location	class_label
53027	817798591	RT @JimCantore: (2/2) Saildrones along w/ Ocean Gliders, &Area-I Altius drones launched from P3 aircraft provide an incredible chance to ga...	2022-08-02 18:39:10+00:00	[]	['JimCantore']	[Saildrones, Ocean Gliders]	other_relevant_information
36975	920623954053738496	@waryas_carol @WWorld2019 @tedcruz All everyone needs to know about Ted Cruz is THIS: He voted AGAINST Federal aid for NY & NJ after Hurricane Sandy caused BILLIONS in damage. \nThis is the SAME Ted Cruz that has HIS hands out after Texas gets pounded by natural disasters...	2022-08-03 13:03:04+00:00	[]	['waryas_carol', 'WWorld2019', 'tedcruz']	[NY, Texas]	not_humanitarian

**Plot the intensity for each catagory, and for a particular location**

**Prepare the time series grouped by disaster class label**

```
In [11]: df_tweets['created_at'] = pd.to_datetime(df_tweets['created_at'], errors='coerce')
df_plot = df_tweets.copy()

df_plot['created_at'] = df_plot['created_at'].dt.floor('8H') # Round to 8 hours
df_plot['count'] = 1
df_group_plot = df_plot[['created_at', 'class_label', 'count']].groupby(['created_at', 'class_label']).count()
df_group_plot['created_at'] = pd.to_datetime(df_group_plot['created_at'])
df_group_plot.head()
```

Out[11]:

	created_at	class_label	count
0	2022-07-31 08:00:00+00:00	caution_and_advice	1168
1	2022-07-31 08:00:00+00:00	displaced_people_and_evacuations	361
2	2022-07-31 08:00:00+00:00	infrastructure_and_utility_damage	223
3	2022-07-31 08:00:00+00:00	not_humanitarian	407
4	2022-07-31 08:00:00+00:00	other_relevant_information	1251

**Prepare the time series grouped by location label**



```
In [12]: df_explode = df_tweets.copy()

most_common10 = df_locs_most_common.head(10)['location'].tolist()

df_explode = df_explode.explode('location').reset_index(drop=True)
df_explode.dropna(inplace=True)
df_explode['created_at'] = df_explode['created_at'].dt.floor('8H') # Round to 8 hours
df_explode['count'] = 1
df_group_explode = df_explode[['created_at', 'location', 'count']].groupby(
    ['created_at', 'location']
).count().reset_index()
df_group_explode = df_group_explode[df_group_explode['location'].isin(most_common10)]
df_group_explode.head()
```

Out[12]:

	created_at	location	count
0	2022-07-31 08:00:00+00:00	Africa	44
1	2022-07-31 08:00:00+00:00	Atlantic	152
3	2022-07-31 08:00:00+00:00	California	322
5	2022-07-31 08:00:00+00:00	Florida	44
6	2022-07-31 08:00:00+00:00	Gulf of Mexico	44

## Find the top 10 locations in the tweets sample

```
In [13]: top10_locs = list(df_group_explode['location'].unique())
top10_locs
```

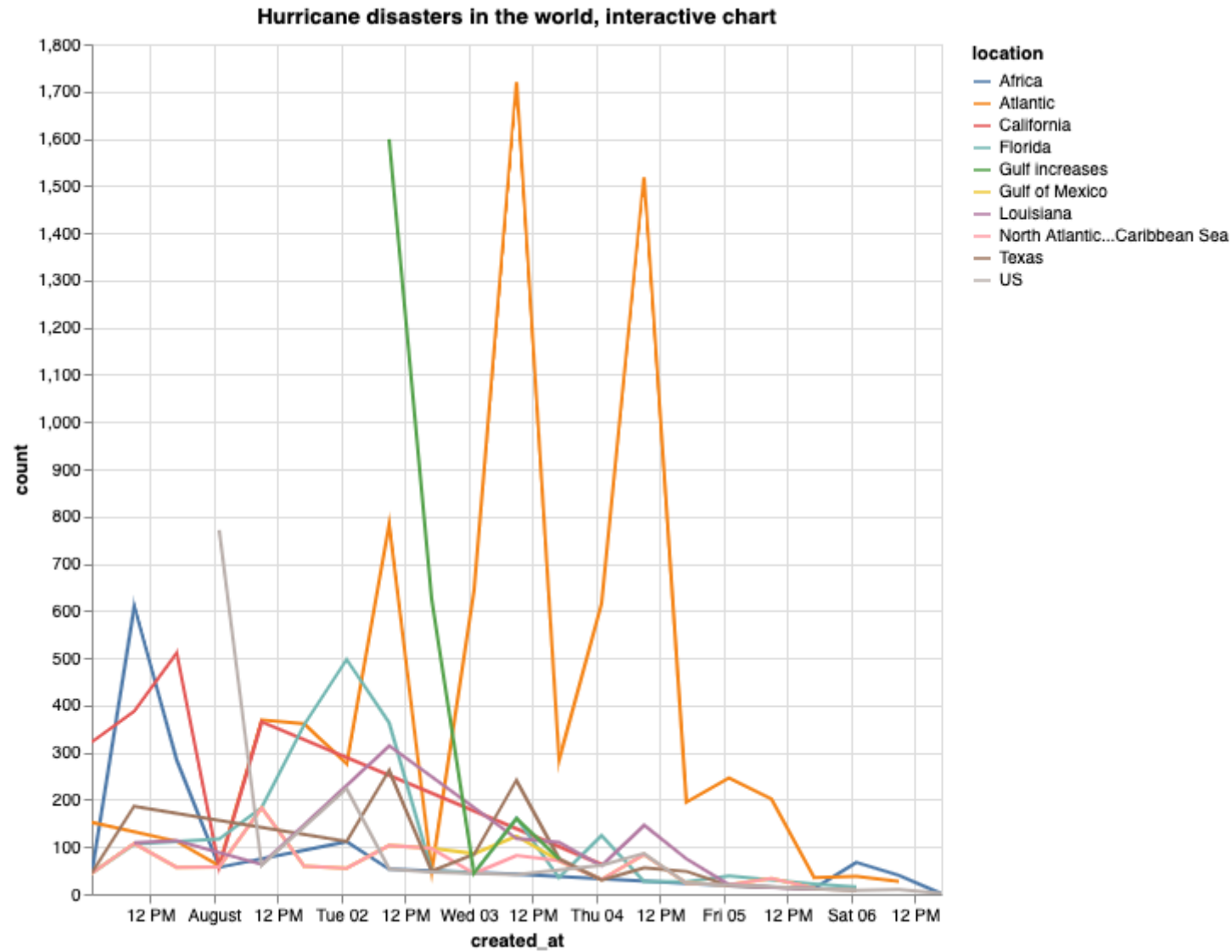
Out[13]:

```
['Africa',
 'Atlantic',
 'California',
 'Florida',
 'Gulf of Mexico',
 'North Atlantic...Caribbean Sea',
 'Texas',
 'Louisiana',
 'US',
 'Gulf increases']
```

```
In [14]: chart = alt.Chart(df_group_explode[df_group_explode['location'].isin(top10_locs)]).mark_line(size=2).encode(
    x='created_at:T',
    y='count:Q',
    color='location:N',
    tooltip=['location', 'count']
)

chart.properties(
    width=500,
    height=500
).properties(
    title=disaster_title(disaster_kind) + ' disasters in the world, interactive chart'
).interactive()
```

Out[14]:



**Combine the most important locations per category**

```
In [15]: df_top_locations = top_locations(df_tweets, top10_locs)
df_top_locations.sample(5)
```

Out[15]:

	created_at	class_label	locations	count
83	2022-08-03 16:00:00+00:00	infrastructure_and_utility_damage	[Atlantic, Texas, US]	125
39	2022-08-01 22:00:00+00:00	caution_and_advice	[Gulf of Mexico, North Atlantic...Caribbean Sea]	124
166	2022-08-07 00:00:00+00:00	other_relevant_information	[US]	2
116	2022-08-04 14:00:00+00:00	other_relevant_information	[Atlantic, California, Florida]	454
46	2022-08-02 02:00:00+00:00	rescue_volunteering_or_donation_effort	[Florida]	121

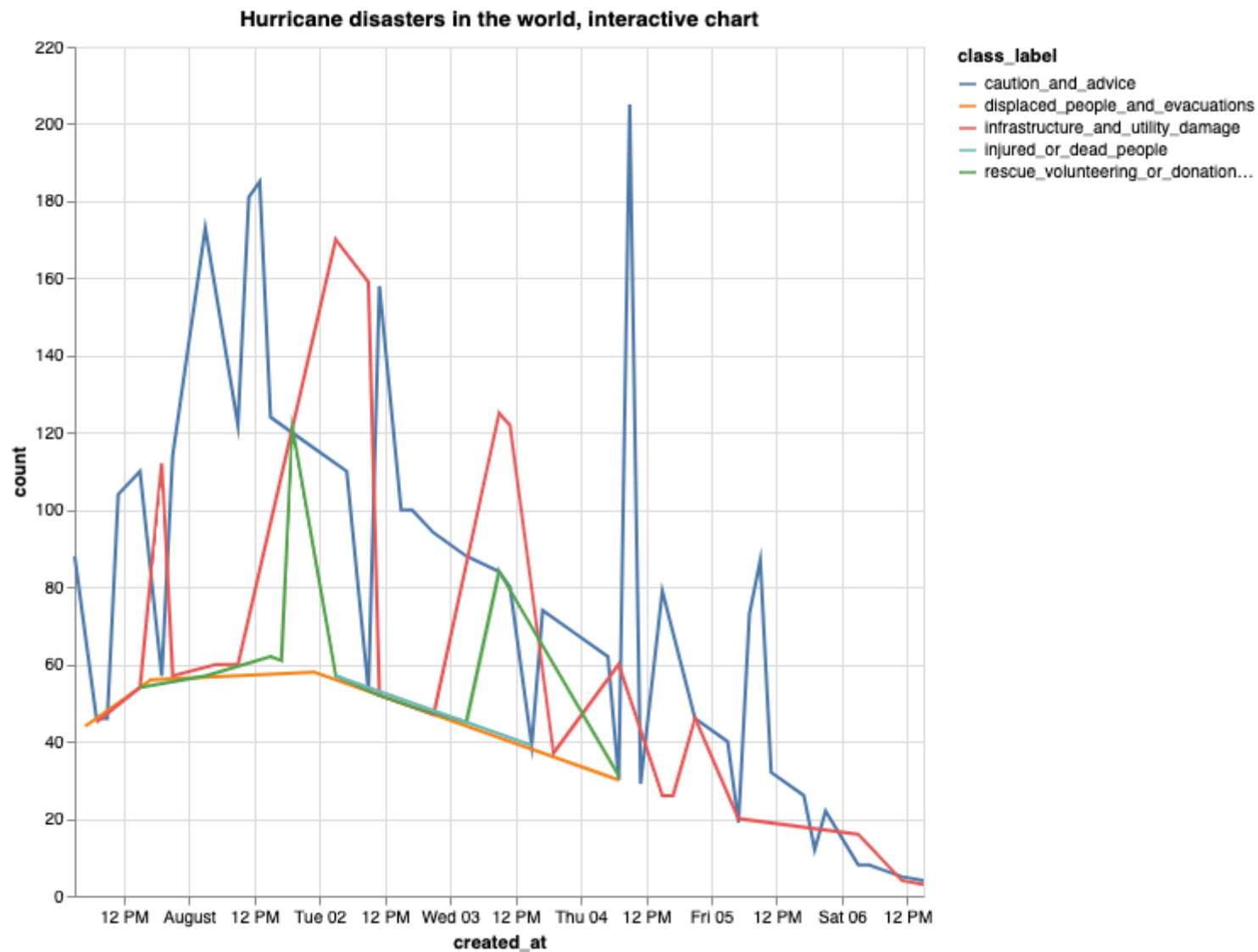
## Define the class labels we are interested in

```
In [16]: class_labels = [
    'displaced_people_and_evacuations',
    'injured_or_dead_people',
    'rescue_volunteering_or_donation_effort',
    'requests_or_urgent_needs',
    'sympathy_and_support',
    'infrastructure_and_utility_damage',
    'caution_and_advice'
]
```

```
In [17]: chart = alt.Chart(df_top_locations[df_top_locations['class_label'].isin(class_labels)]).mark_line(size=2,
    x='created_at:T',
    y='count:Q',
    color='class_label:N',
    tooltip=['class_label:N', 'locations', 'count']
)

chart.properties(
    width=500,
    height=500
).properties(
    title=disaster_title(disaster_kind) + ' disasters in the world, interactive chart'
)
```

Out[17]:



**Show sample tweets per most important locations above**

```
In [18]: df_top_location_tweets = top_locations_tweets(df_tweets, top10_locs)
df_top_location_tweets.sample(5)
```

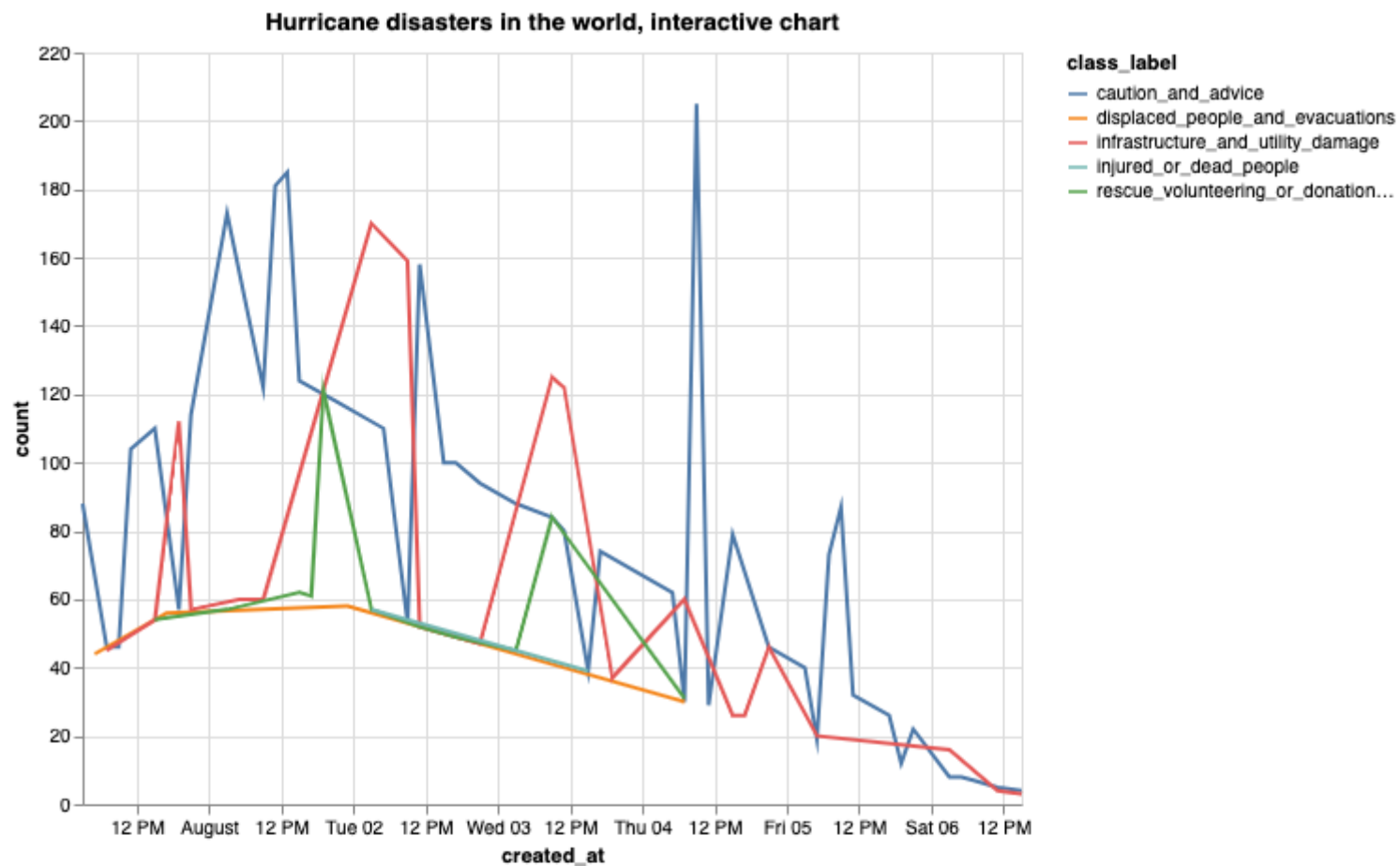
Out[18]:

	created_at	class_label	tweet_text	locations	count
11	2022-07-31 20:00:00+00:00	other_relevant_information	[RT @shamnis9182: @Faithwisdom_ I remember when Matt Walsh had started a crowdfund for AOC's Grandma because her house had sustained heavy d..., @washingtonpost The Kentucky flooding is horrific but it's not worse than flooding during Hurricane Harvey.\n\nFACTS MATTER and Washi...	[Africa, Florida]	107
46	2022-08-02 02:00:00+00:00	rescue_volunteering_or_donation_effort	[The 2005 Hurricane Katrina disaster, launch the Community Tree Recovery campaign. The campaign has since planted more than 120,000 new trees to residents impacted by the storm.\n\n@uk_ofc \n#PlantwithFGRF \n@FGRForg https://t.co/DIPjMIP5kJ, RT @MAndersen66: @Acyn Radical soci...	[Florida]	121
89	2022-08-03 18:00:00+00:00	other_relevant_information	[@SvechNCoochie IM JIM CANTORE LIVE FROM THE EYEWALL OF HURRICANE TONY ITS WINDY AS HELL AND THE STORM IS ROLLING US, #合肥 A storm turns into a hurricane when the wind speed goes over a hundred nineteen kilometers an hour. https://t.co/zUKTvucZeJ, RT @GoMiamiDade: In preparati...	[Atlantic, Gulf increases, Gulf of Mexico]	362
47	2022-08-02 04:00:00+00:00	caution_and_advice	[NHC Atlantic Outlook\nhttps://t.co/DHXo72Wd2y\n\nZCZC MIATWOAT ALL\nTTAA00 KNHC DDHHMM\n\nTropical Weather Outlook\nNWS National Hurricane Center Miami FL\n200 AM EDT Tue Aug 2 2022\n\nFor the North Atlantic...Caribbean Sea and the Gulf of Mexico:\n\nTropical cyclone formati...	[Gulf of Mexico, North Atlantic...Caribbean Sea]	118
95	2022-08-03 22:00:00+00:00	other_relevant_information	[RT @weather_history: August 3, 1970:\n\nHurricane Celia made landfall as a high-end Category 3 near Aransas Pass, Texas. Storm surge reached..., We've had just over 3 'named storm days' this hurricane season so far... WELL below the average of 9.1 named storm days through toda...	[Atlantic, Florida, Texas]	193

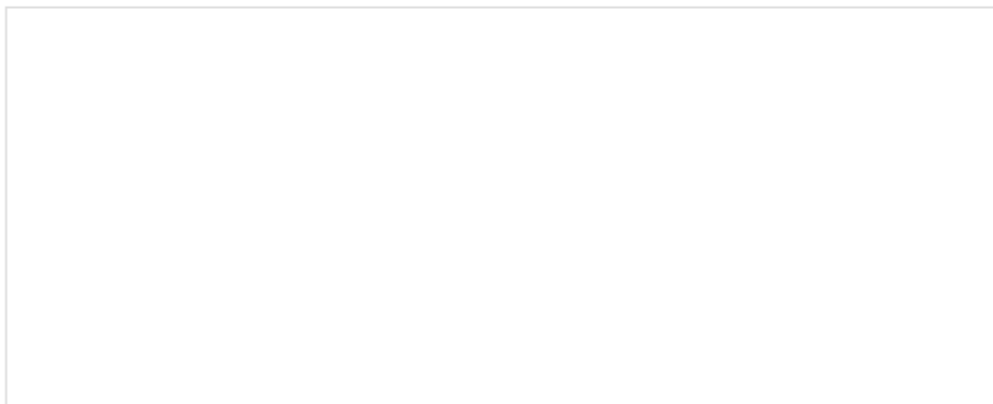
```
In [19]: show_top_locations(df_top_location_tweets, class_labels, disaster_kind)
```

```
Out[19]:
```





### Tweets from the selected time period



## Visualize the locations and relationship between them as a network

### Select the top 20 locations for this disaster

```
In [20]: loc20 = get_top_locations_flatten(df_tweets, 20)
loc20
```

```
Out[20]: ['Atlantic',
          'Gulf increases',
          'Florida',
          'California',
          'US',
          'Africa',
          'Gulf of Mexico',
          'Texas',
          'North Atlantic...Caribbean Sea',
          'Louisiana',
          'Gambia',
          'Independence Stadi...',
          'New Orleans',
          'St',
          'Petersburg',
          'Gulf Coast',
          'Ocean Isle Beach',
          'National Hurricane Center',
          'Kentucky',
          'North Pacific']
```

### Get the tweets for just the top 20 locations

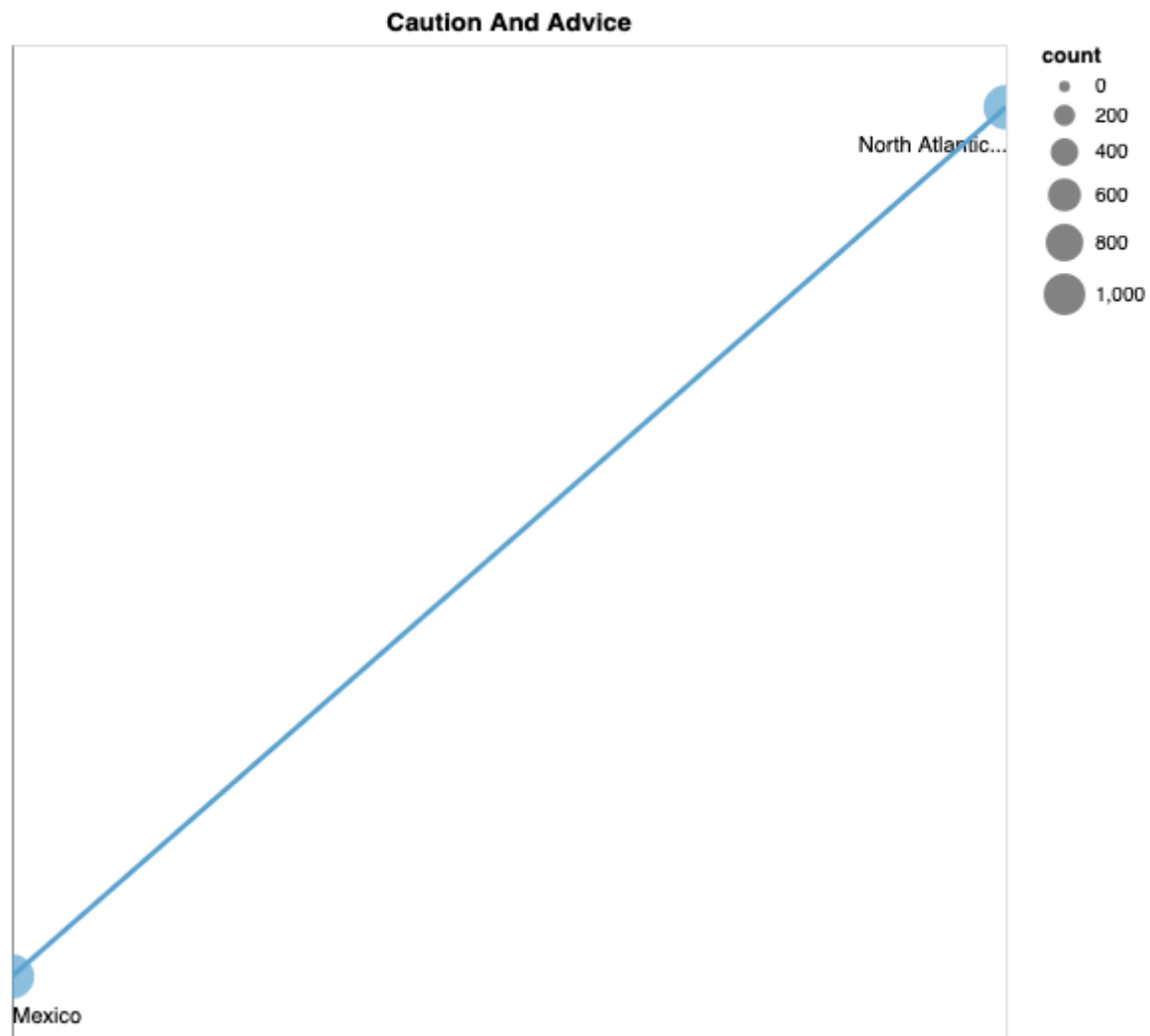
```
In [21]: df_loc_graph = get_location_graph_data(df_tweets, loc20)
df_loc_graph.sample(10)
```

Out[21]:

	class_label	location_x	location_y	count
16	other_relevant_information	Texas	Gulf increases	52
13	other_relevant_information	St	Atlantic	818
20	other_relevant_information	US	Gulf Coast	53
3	infrastructure_and_utility_damage	US	Ocean Isle Beach	41
9	other_relevant_information	National Hurricane Center	Atlantic	73
21	other_relevant_information	US	New Orleans	53
4	infrastructure_and_utility_damage	US	Texas	88
17	other_relevant_information	Texas	Gulf of Mexico	42
0	caution_and_advice	North Atlantic...Caribbean Sea	Gulf of Mexico	1164
1	displaced_people_and_evacuations	New Orleans	Louisiana	56

```
In [22]: plot_disaster_mentions(df_loc_graph, 'caution_and_advice', 'Caution And Advice')
```

Out[22]:



### Get the most frequent location pair

```
In [23]: loc_pairs = top_location_pairs(df_loc_graph, 'caution_and_advice', top_pairs_count=1)
loc_pairs
```

```
Out[23]: [['North Atlantic...Caribbean Sea', 'Gulf of Mexico']]
```

### Show a sample for this location pair

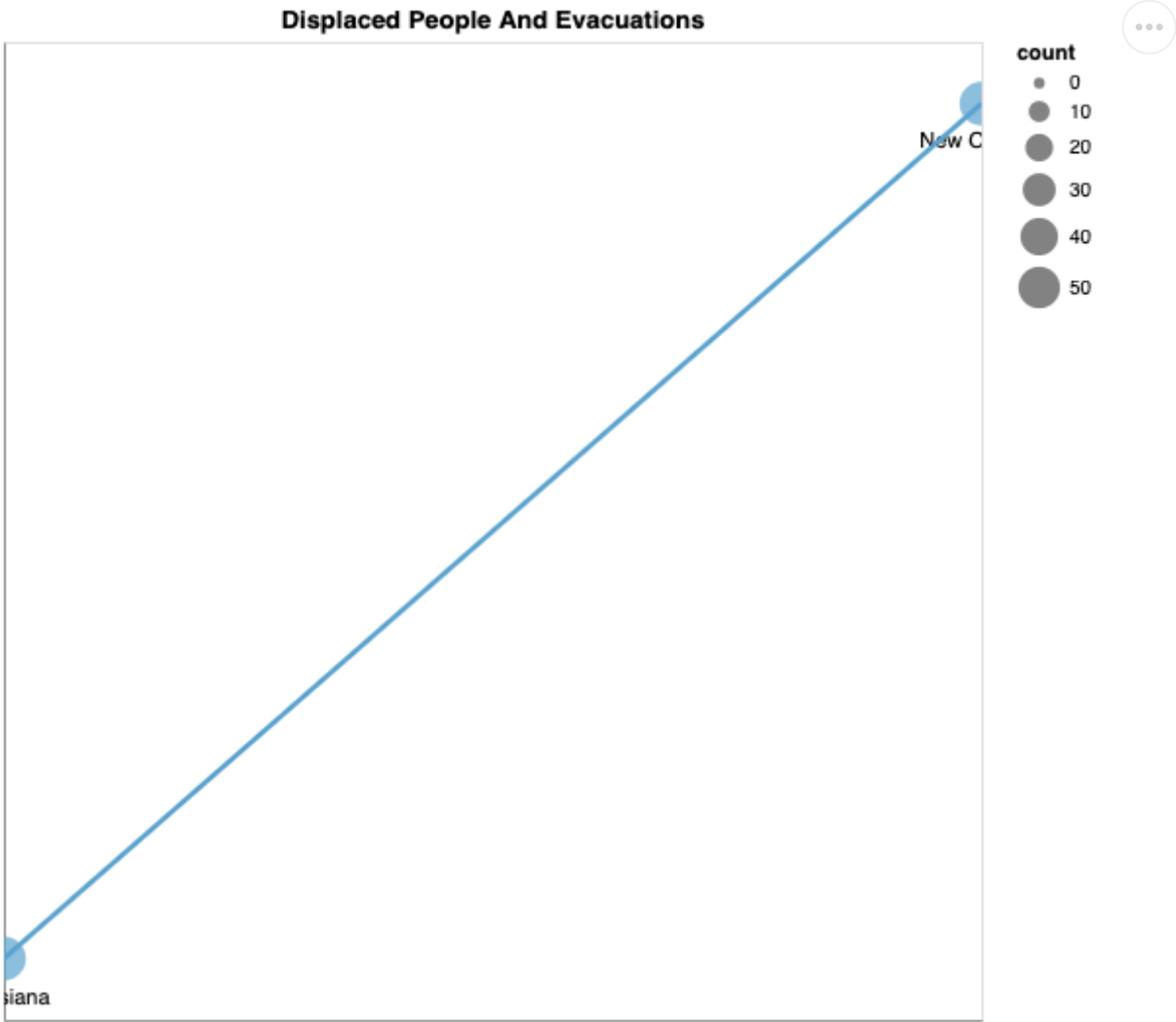
```
In [24]: show_tweets_locations(df_tweets, class_label='caution_and_advice' , locations=loc_pairs[0], sample=5)
```

```
Out[24]:
```

		tweet_text	location
0	NHC Atlantic Outlook\nhttps://t.co/DHXo73dOr8\n\nZCZC MIATWOAT ALL\nTTAA00 KNHC DDHHMM\n\nTropical Weather Outlook\nNWS National Hurricane Center Miami FL\n800 AM EDT Mon Aug 1 2022\n\nFor the North Atlantic...Caribbean Sea and the Gulf of Mexico:\n\nTropical cyclone formatio...	Atlantic...Caribbean Sea, Gulf of Mexico	[North Atlantic...Caribbean Sea, Gulf of Mexico]
1	NHC Atlantic Outlook\nhttps://t.co/DHXo73dOr8\n\nZCZC MIATWOAT ALL\nTTAA00 KNHC DDHHMM\n\nTropical Weather Outlook\nNWS National Hurricane Center Miami FL\n200 PM EDT Sun Jul 31 2022\n\nFor the North Atlantic...Caribbean Sea and the Gulf of Mexico:\n\nTropical cyclone formatio...	Atlantic...Caribbean Sea, Gulf of Mexico	[North Atlantic...Caribbean Sea, Gulf of Mexico]
2	NHC Atlantic Outlook\nhttps://t.co/DHXo73dOr8\n\nZCZC MIATWOAT ALL\nTTAA00 KNHC DDHHMM\n\nTropical Weather Outlook\nNWS National Hurricane Center Miami FL\n800 PM EDT Mon Aug 1 2022\n\nFor the North Atlantic...Caribbean Sea and the Gulf of Mexico:\n\nTropical cyclone formatio...	Atlantic...Caribbean Sea, Gulf of Mexico	[North Atlantic...Caribbean Sea, Gulf of Mexico]
3	NHC Atlantic Outlook\nhttps://t.co/DHXo73dOr8\n\nZCZC MIATWOAT ALL\nTTAA00 KNHC DDHHMM\n\nTropical Weather Outlook\nNWS National Hurricane Center Miami FL\n200 AM EDT Mon Aug 1 2022\n\nFor the North Atlantic...Caribbean Sea and the Gulf of Mexico:\n\nTropical cyclone formatio...	Atlantic...Caribbean Sea, Gulf of Mexico	[North Atlantic...Caribbean Sea, Gulf of Mexico]
4	NHC Atlantic Outlook\nhttps://t.co/DHXo73dOr8\n\nZCZC MIATWOAT ALL\nTTAA00 KNHC DDHHMM\n\nTropical Weather Outlook\nNWS National Hurricane Center Miami FL\n200 PM EDT Sun Jul 31 2022\n\nFor the North Atlantic...Caribbean Sea and the Gulf of Mexico:\n\nTropical cyclone formatio...	Atlantic...Caribbean Sea, Gulf of Mexico	[North Atlantic...Caribbean Sea, Gulf of Mexico]

```
In [25]: plot_disaster_mentions(df_loc_graph, 'displaced_people_and_evacuations', 'Displaced People And Evacuatio
```

Out[25]:



## Get the most frequent location pair

```
In [26]: loc_pairs = top_location_pairs(df_loc_graph, 'displaced_people_and_evacuations', top_pairs_count=1)
loc_pairs
```

```
Out[26]: [['New Orleans', 'Louisiana']]
```

## Show a sample for this location pair

```
In [27]: show_tweets_locations(df_tweets, class_label='displaced_people_and_evacuations' , locations=loc_pairs[0])
```

```
Out[27]:
```

	tweet_text	location
0	We're also partnering with @Kalshi in New Orleans.\n\nIn recent years, as the climate emergency has accelerated, Louisiana has borne the brunt of hurricane season year after year. Kalshi can help in the event of a last-minute evacuation on a tight budget.\nhttps://t.co/oMUWLr...	[New Orleans, Louisiana]
1	We're also partnering with @Kalshi in New Orleans.\n\nIn recent years, as the climate emergency has accelerated, Louisiana has borne the brunt of hurricane season year after year. Kalshi can help in the event of a last-minute evacuation on a tight budget.\nhttps://t.co/oMUWLr...	[New Orleans, Louisiana]
2	We're also partnering with @Kalshi in New Orleans.\n\nIn recent years, as the climate emergency has accelerated, Louisiana has borne the brunt of hurricane season year after year. Kalshi can help in the event of a last-minute evacuation on a tight budget.\nhttps://t.co/oMUWLr...	[New Orleans, Louisiana]
3	We're also partnering with @Kalshi in New Orleans.\n\nIn recent years, as the climate emergency has accelerated, Louisiana has borne the brunt of hurricane season year after year. Kalshi can help in the event of a last-minute evacuation on a tight budget.\nhttps://t.co/oMUWLr...	[New Orleans, Louisiana]
4	We're also partnering with @Kalshi in New Orleans.\n\nIn recent years, as the climate emergency has accelerated, Louisiana has borne the brunt of hurricane season year after year. Kalshi can help in the event of a last-minute evacuation on a tight budget.\nhttps://t.co/oMUWLr...	[New Orleans, Louisiana]

```
In [28]: plot_disaster_mentions(df_loc_graph, 'injured_or_dead_people', 'Injured Or Dead People')
```

```
Out[28]: 'No records found for class injured_or_dead_people'
```



## Get the most frequent location pair

```
In [29]: loc_pairs = top_location_pairs(df_loc_graph, 'injured_or_dead_people', top_pairs_count=1)
loc_pairs
```

```
Out[29]: [[]]
```

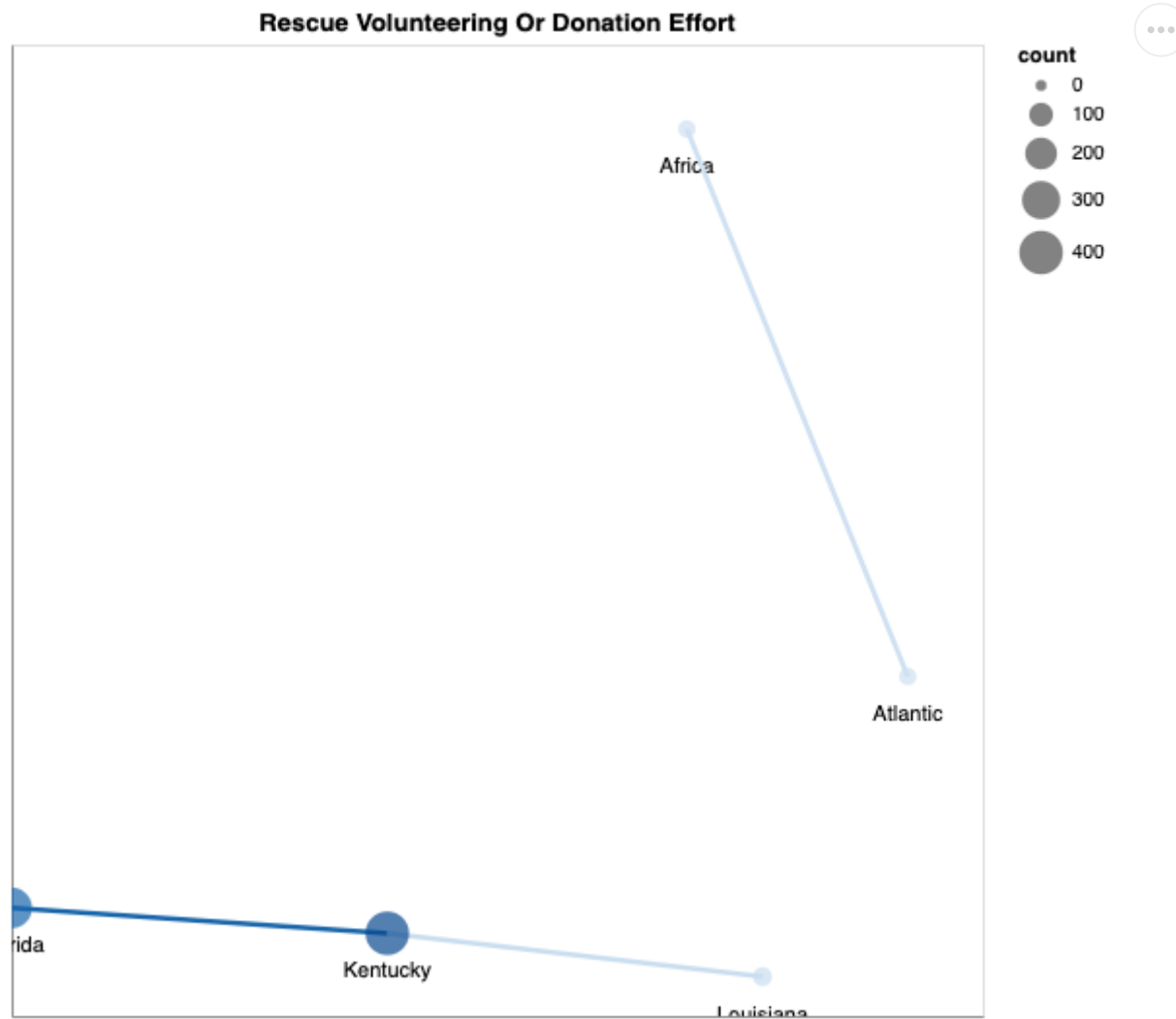
## Show a sample for this location pair

```
In [30]: show_tweets_locations(df_tweets, class_label='injured_or_dead_people' , locations=loc_pairs[0], sample=5)
```

```
Out[30]: 'No location pairs provided'
```

```
In [31]: plot_disaster_mentions(df_loc_graph, 'rescue_volunteering_or_donation_effort',  
                                'Rescue Volunteering Or Donation Effort')
```

Out[31]:



### Get the most frequent location pair

```
In [32]: loc_pairs = top_location_pairs(df_loc_graph, 'rescue_volunteering_or_donation_effort', top_pairs_count=1)
loc_pairs
```

```
Out[32]: [['Kentucky', 'Florida']]
```

### Show a sample for this location pair

```
In [33]: show_tweets_locations(df_tweets, class_label='rescue_volunteering_or_donation_effort',
                                locations=loc_pairs[0], sample=5)
```

Out[33]:

	tweet_text	location
0	RT @MAndersen66: @Acyn Radical social agenda:\n\nHelping flood victims in Kentucky.\n\nHelping hurricane victims in Florida.\n\nHelping storm vic...	[Kentucky, Florida]
1	RT @MAndersen66: @Acyn Radical social agenda:\n\nHelping flood victims in Kentucky.\n\nHelping hurricane victims in Florida.\n\nHelping storm vic...	[Kentucky, Florida]
2	@Acyn Radical social agenda:\n\nHelping flood victims in Kentucky.\n\nHelping hurricane victims in Florida.\n\nHelping storm victims in Nebraska.\n\nHelping landslide victims in Alaska.\n\nThat radical social agenda, Marsha?\n\nWhy don't YOU want to help people?	[Kentucky, Florida, Nebraska., Alaska]
3	@Acyn Radical social agenda:\n\nHelping flood victims in Kentucky.\n\nHelping hurricane victims in Florida.\n\nHelping storm victims in Nebraska.\n\nHelping landslide victims in Alaska.\n\nThat radical social agenda, Marsha?\n\nWhy don't YOU want to help people?	[Kentucky, Florida, Nebraska., Alaska]
4	RT @MAndersen66: @Acyn Radical social agenda:\n\nHelping flood victims in Kentucky.\n\nHelping hurricane victims in Florida.\n\nHelping storm vic...	[Kentucky, Florida]

```
In [34]: plot_disaster_mentions(df_loc_graph, 'requests_or_urgent_needs',
                                'requests_or_urgent_needs')
```

Out[34]: 'No records found for class requests\_or\_urgent\_needs'

## Get the most frequent location pair

```
In [35]: loc_pairs = top_location_pairs(df_loc_graph, 'requests_or_urgent_needs', top_pairs_count=1)
loc_pairs
```

Out[35]: [[]]

## Show a sample for this location pair

```
In [36]: show_tweets_locations(df_tweets, class_label='requests_or_urgent_needs',  
                             locations=loc_pairs[0], sample=5)
```

```
Out[36]: 'No location pairs provided'
```

```
In [37]: plot_disaster_mentions(df_loc_graph, 'sympathy_and_support',  
                                'sympathy_and_support')
```

```
Out[37]: 'No records found for class sympathy_and_support'
```

### Get the most frequent location pair

```
In [38]: loc_pairs = top_location_pairs(df_loc_graph, 'sympathy_and_support', top_pairs_count=1)  
loc_pairs
```

```
Out[38]: [[]]
```

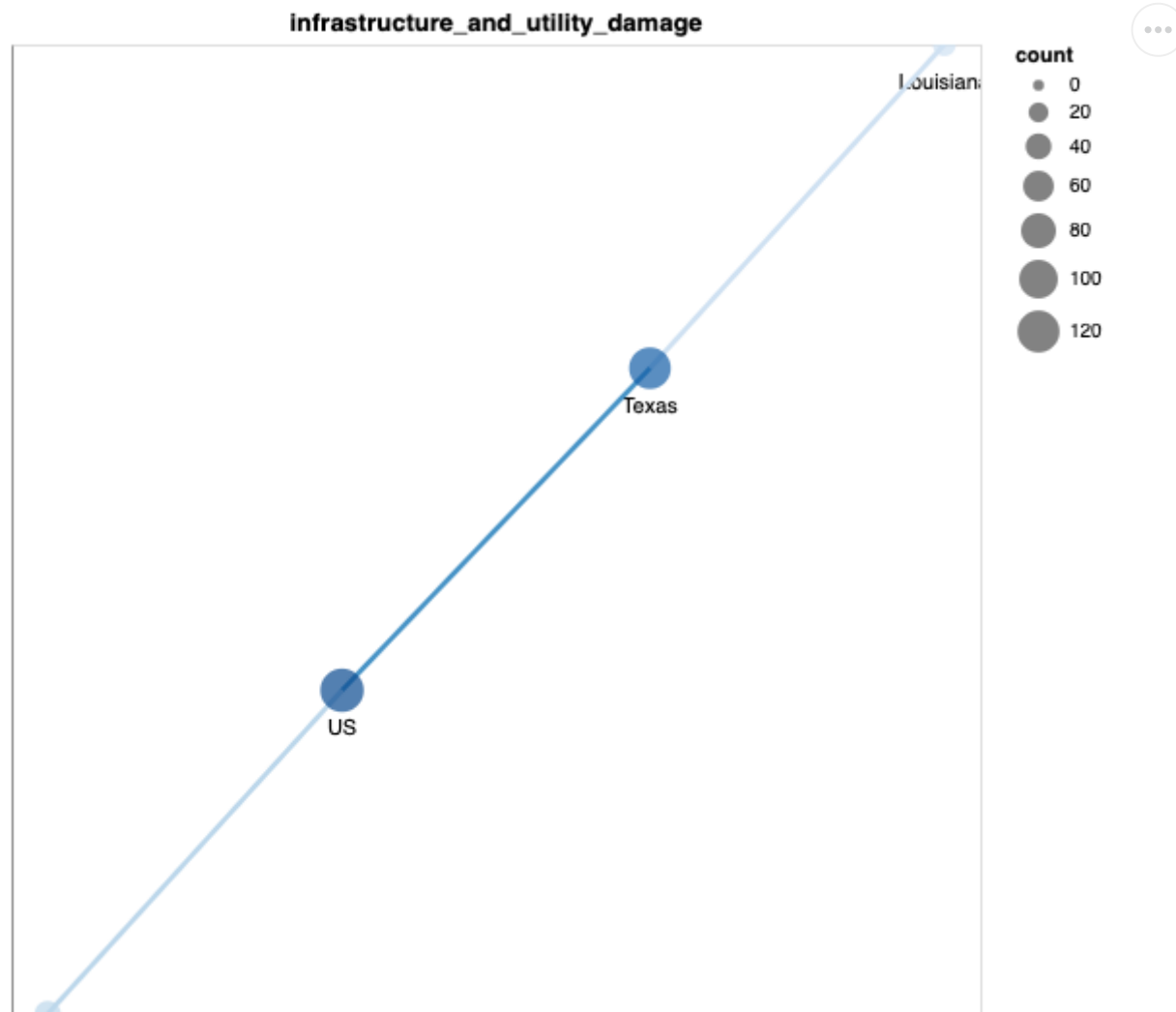
### Show a sample for this location pair

```
In [39]: show_tweets_locations(df_tweets, class_label='sympathy_and_support',  
                             locations=loc_pairs[0], sample=5)
```

```
Out[39]: 'No location pairs provided'
```

```
In [40]: plot_disaster_mentions(df_loc_graph, 'infrastructure_and_utility_damage',  
                                'infrastructure_and_utility_damage')
```

Out[40]:



## Get the most frequent location pair

```
In [41]: loc_pairs = top_location_pairs(df_loc_graph, 'infrastructure_and_utility_damage', top_pairs_count=1)
loc_pairs
```

```
Out[41]: [['US', 'Texas']]
```

## Show a sample for this location pair

```
In [42]: show_tweets_locations(df_tweets, class_label='infrastructure_and_utility_damage',
                               locations=loc_pairs[0], sample=5)
```

```
Out[42]:
```

	tweet_text	location
0	@tedcruz @SenTedCruz demanded aid for Texas after the Texas Power Grid Collapse, but attacked giving aid to New England after Superstorm Sandy,\nwhich did 65BILLIONindamage/killed285AMERICAN Sor Puerto RicoafterHurricane Mariadid90 BILLION in damage/killed 4,645 of...	[Texas, New England, Puerto Rico, US]
1	@SenJoniErnst @SenTedCruz demanded aid for Texas after the Texas Power Grid Collapse, but attacked giving aid to New England after Superstorm Sandy,\nwhich did 65BILLIONindamage/killed285AMERICAN Sor Puerto RicoafterHurricane Mariadid90 BILLION in damage/killed 4,6...	[Texas, New England, Puerto Rico, US]
2	@SenJoniErnst @SenTedCruz demanded aid for Texas after the Texas Power Grid Collapse, but attacked giving aid to New England after Superstorm Sandy,\nwhich did 65BILLIONindamage/killed285AMERICAN Sor Puerto RicoafterHurricane Mariadid90 BILLION in damage/killed 4,6...	[Texas, New England, Puerto Rico, US]
3	@tedcruz @SenTedCruz demanded aid for Texas after the Texas Power Grid Collapse, but attacked giving aid to New England after Superstorm Sandy,\nwhich did 65BILLIONindamage/killed285AMERICAN Sor Puerto RicoafterHurricane Mariadid90 BILLION in damage/killed 4,645 of...	[Texas, New England, Puerto Rico, US]
4	@SenJoniErnst @SenTedCruz demanded aid for Texas after the Texas Power Grid Collapse, but attacked giving aid to New England after Superstorm Sandy,\nwhich did 65BILLIONindamage/killed285AMERICAN Sor Puerto RicoafterHurricane Mariadid90 BILLION in damage/killed 4,6...	[Texas, New England, Puerto Rico, US]

In [ ]: