

Final Project First Course

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Harvey became a hurricane August 24th, made landfall on the 25th, and was downgraded to a tropical storm on August 26th.

The impact of Harvey was felt over much more than just 3 days. In the 2017 storm events data set, Harvey related events are reported beginning August 17th and end September 3rd as the system moved north and east across the United States. Flooding, thunderstorms, hail, and tornadoes are just a few of the weather events related to Harvey.

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Background and Scope

Import the Data

Use only the first time to generate the function

```
%uiimport("StormEvents_2017_finalProject.csv")
%pause
```

Use in anytime later of using uiimport command

```
clc
clear
ev=importfile1("StormEvents_2017_finalProject.csv");
ev.Property_Cost(ismissing(ev.Property_Cost))=0;
head(ev,10)
```

```
ans = 10x24 table
```

...

	EpisodeID	Event_ID	State	Year	Month	Event_Type	CZ_Name
1	113355	678791	NEW JERSEY	2017	April	Thunderstorm Wind	GLOUCESTER
2	113459	679228	FLORIDA	2017	April	Tornado	LEE
3	113448	679268	OHIO	2017	April	Thunderstorm Wind	GREENE
4	113697	682042	OHIO	2017	April	Flood	CLERMONT
5	113683	682062	NEBRASKA	2017	April	Hail	CASS
6	114718	688082	INDIANA	2017	April	Flash Flood	SWITZERLAND
7	114834	688895	VIRGINIA	2017	April	Thunderstorm Wind	WESTMOREL...
8	121068	724772	GULF OF ...	2017	October	Marine Thunders...	ATCHAFALA...
9	114489	686560	OHIO	2017	April	Flash Flood	CLERMONT
10	113683	682156	NEBRASKA	2017	April	Thunderstorm Wind	BURT

Two States Most Impacted by Harvey

Clearly state the two states in order

```
hb=datetime("2017-08-17 00:00:00");
he=datetime("2017-09-03 11:59:59");
hb1=day(hb,"dayofyear");
he1=day(he,"dayofyear");
ev1=ev;
ev1=ev1(day(ev1.Begin_Date_Time,"dayofyear")>= hb1 & day(ev1.End_Date_Time,"dayofyear") <= he1,
ev2=groupsummary(ev1,"State","Sum","Property_Cost");
ev2 = sortrows(ev2,'sum_Property_Cost','descend')
```

ev2 = 57x3 table

	State	GroupCount	sum_Property_Cost
1	TEXAS	272	7.7427e+10
2	LOUISIANA	85	75277000
3	NORTH CA...	59	12338500
4	WASHINGTON	2	4000000
5	FLORIDA	68	2237000
6	MINNESOTA	24	1375000
7	NEBRASKA	62	1054000
8	MISSISSI...	39	915000
9	NEW YORK	109	641000
10	TENNESSEE	46	504000
11	PENNSYLV...	203	491630
12	KENTUCKY	20	435000
13	CALIFORNIA	74	329000

	State	GroupCount	sum_Property_Cost
14	IOWA	54	321000
15	INDIANA	6	300000
16	NORTH DA...	17	141000
17	OHIO	48	112500
18	IDAHO	11	111000
19	MASSACHU...	17	92700
20	VERMONT	9	67000
21	ARKANSAS	52	61000
22	SOUTH CA...	42	54000
23	MISSOURI	78	49000
24	MICHIGAN	5	45000
25	GEORGIA	34	36000
26	ARIZONA	12	26000
27	VIRGINIA	64	23000
28	WEST VIR...	9	20100
29	SOUTH DA...	89	12000
30	HAWAII	28	10000
31	LAKE SUP...	1	10000
32	ALABAMA	16	5000
33	NEVADA	11	5000
34	OKLAHOMA	34	2000
35	NEW MEXICO	15	800
36	AMERICAN...	1	0
37	ATLANTIC...	62	0
38	ATLANTIC...	32	0
39	COLORADO	7	0
40	DELAWARE	4	0
41	DISTRICT...	4	0
42	E PACIFIC	1	0
43	GULF OF ...	64	0
44	ILLINOIS	30	0
45	KANSAS	64	0
46	LAKE ERIE	5	0
47	LAKE MIC...	5	0

	State	GroupCount	sum_Property_Cost
48	LAKE ONT...	1	0
49	MAINE	3	0
50	MARYLAND	64	0
51	MONTANA	6	0
52	NEW HAMP...	21	0
53	NEW JERSEY	27	0
54	OREGON	3	0
55	PUERTO R...	33	0
56	UTAH	2	0
57	WISCONSIN	6	0

```
heatmap(ev2,"State","sum_Property_Cost")
```

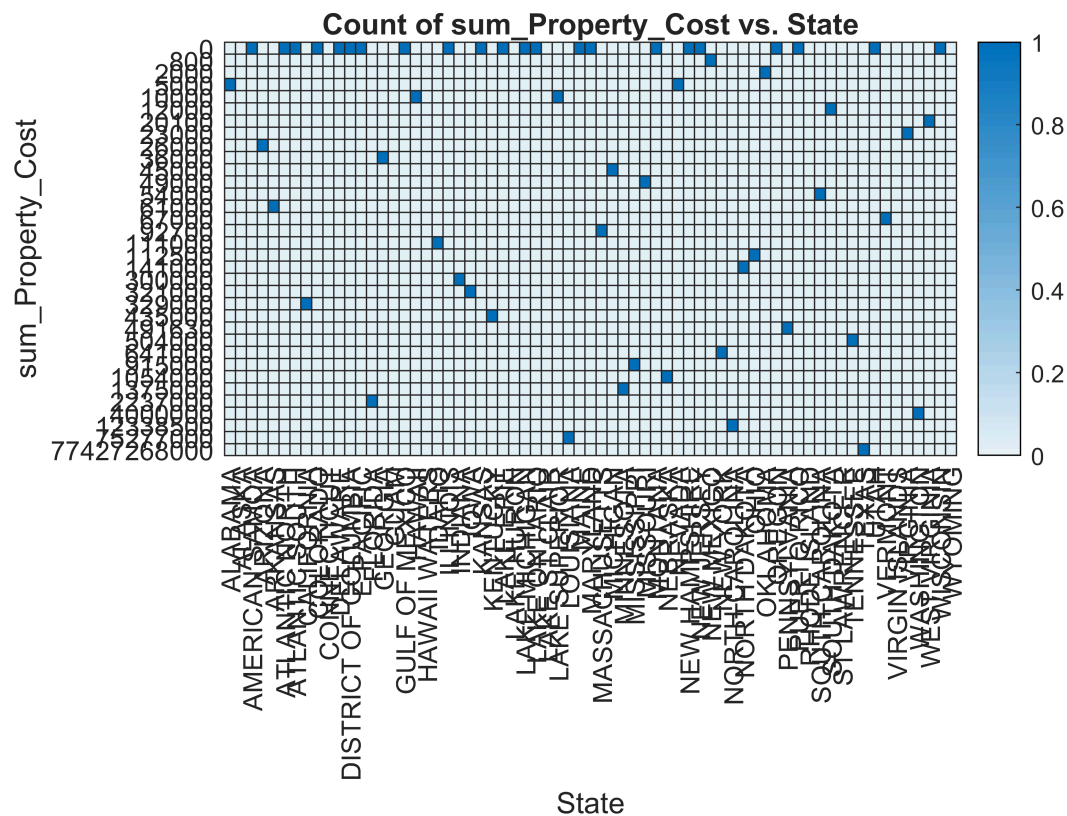


Table of Events for Two Most Impacted States

Create and display a few rows of events that include only the two most affected states

```
ev3=ev1;
ev4=ev1;
ev3=ev3(ev3.State=="TEXAS",:);
ev31=groupsummary(ev3,"Event_Type");
```

```
ev31 = sortrows(ev31, 'GroupCount', 'descend')
```

```
ev31 = 11x2 table
```

	Event_Type	GroupCount
1	Flash Flood	126
2	Tropical Storm	41
3	Thunderstorm Wind	27
4	Tornado	26
5	Flood	16
6	Heat	13
7	Hurricane	9
8	Storm Surge/Tide	6
9	Funnel Cloud	3
10	Hail	3
11	Heavy Rain	2

```
ev4=ev4(ev4.State=="LOUISIANA",:);
ev41=groupsummary(ev4,"Event_Type");
ev41 = sortrows(ev41, 'GroupCount', 'descend')
```

```
ev41 = 6x2 table
```

	Event_Type	GroupCount
1	Flash Flood	53
2	Heat	17
3	Tornado	7
4	Storm Surge/Tide	4
5	Tropical Storm	3
6	Flood	1

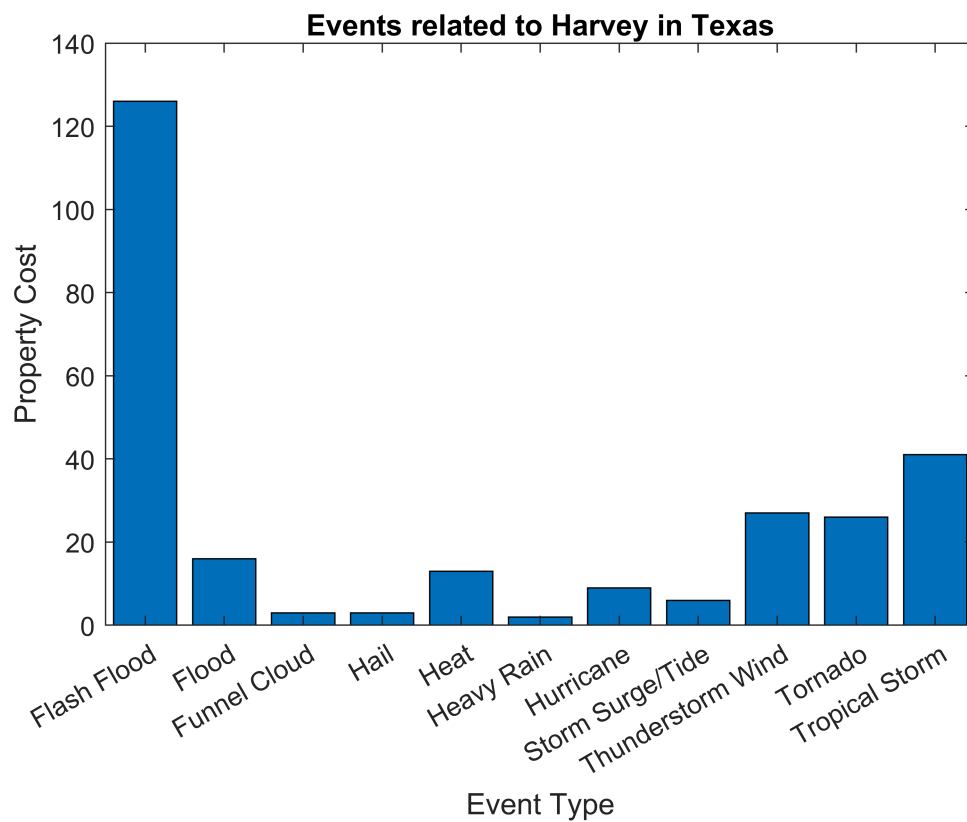
Visualizations

Figure of Event Types

Create a figure showing the type and number of occurrences for events related to Harvey in the two states

```
ev31.Event_Type=removecats(ev31.Event_Type);
bar(ev31.Event_Type,ev31.GroupCount)
title("Events related to Harvey in Texas")
```

```
xlabel("Event Type")
ylabel("Property Cost")
```



```
ev41.Event_Type=removecats(ev41.Event_Type);
bar(ev41.Event_Type,ev41.GroupCount)
title("Events related to Harvey in Louisiana")
xlabel("Event Type")
ylabel("Property Cost")
```

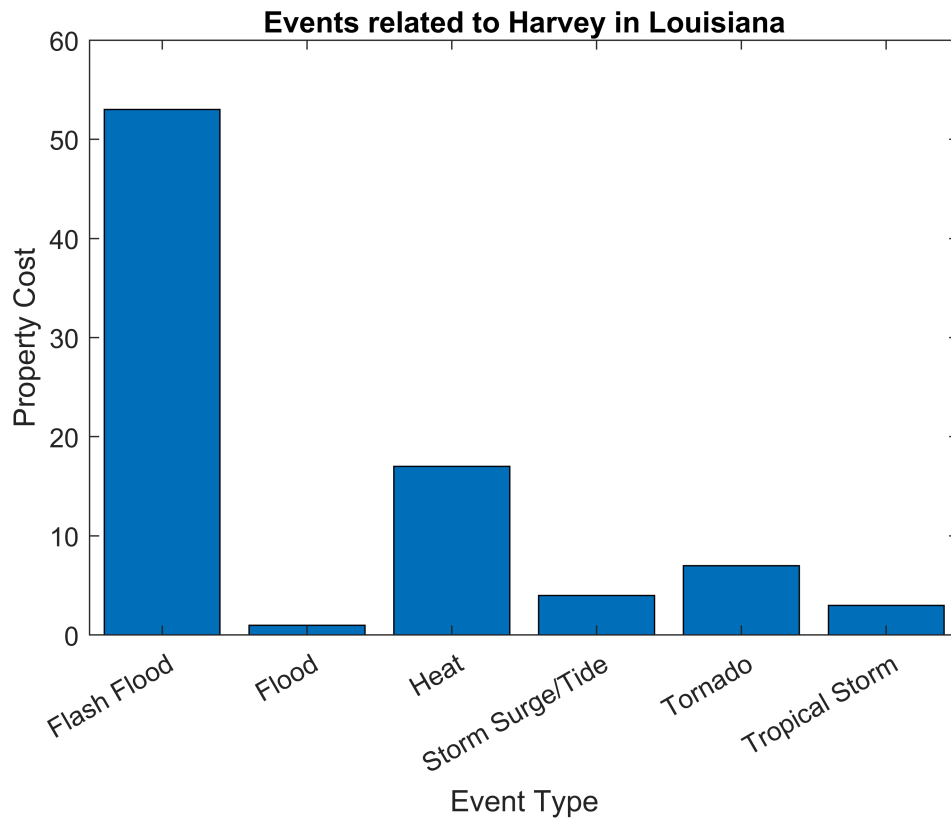
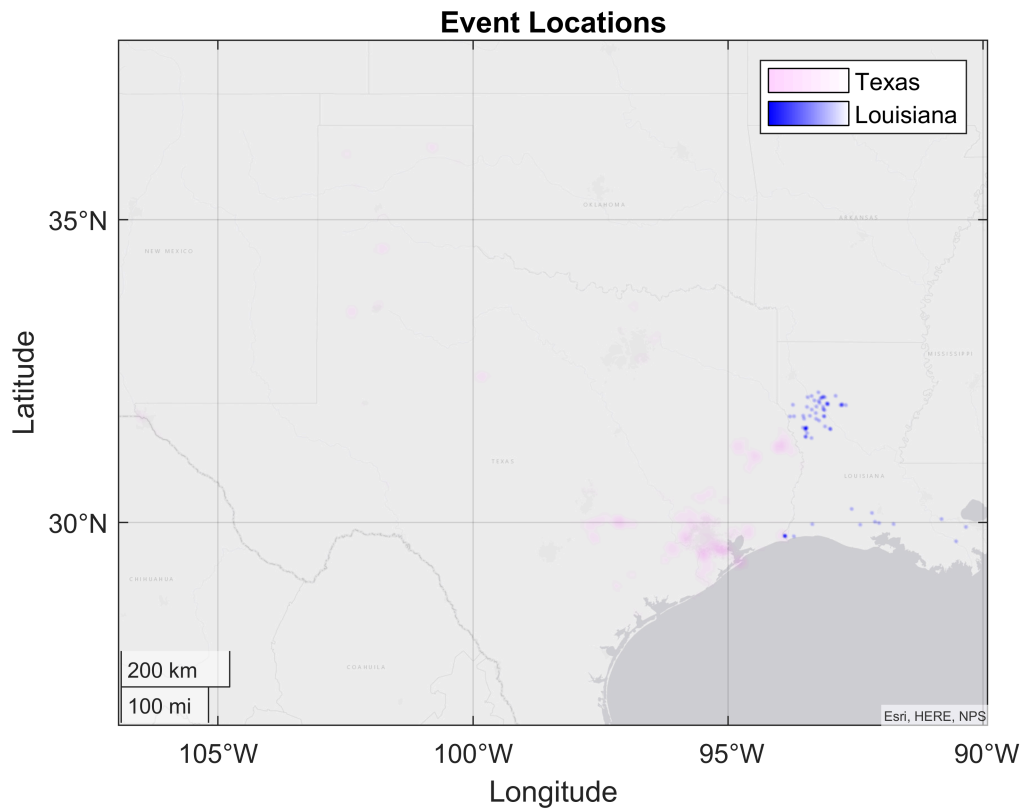


Figure of Event Locations

Show the location of events in the two states. Be sure to use different markers for the two states

```
geodensityplot(ev3.Begin_Lat, ev3.Begin_Lon, 'FaceColor', 'm');  
hold on  
geodensityplot(ev4.Begin_Lat, ev4.Begin_Lon, 'FaceColor', 'b');  
title("Event Locations")  
legend("Texas", "Louisiana")  
geolimits("auto")  
hold off
```



Analysis

Three Counties with Most Events in State 1

Either type out, show in a table, or show in a clear visualization the three counties with the most events in state 1.

```
ev32=groupsummary(ev3,"CZ_Name");
ev32 = sortrows(ev32,'GroupCount','descend');
head(ev32,3)
```

ans = 3x2 table

	CZ_Name	GroupCount
1	HARRIS	21
2	GALVESTON	17
3	FORT BEND	13

Three Counties with Most Events in State 2

Either type out, show in a table, or show in a clear visualization the three counties with the most events in state 2.

```
ev42=groupsummary(ev4,"CZ_Name");
ev42 = sortrows(ev42,'GroupCount','descend');
```



```
head(ev42,3)
```

```
ans = 3x2 table
```

	CZ_Name	GroupCount
1	NATCHITOCHES	21
2	SABINE	15
3	RED RIVER	9

Three Counties with Highest Property Cost in State 1

Either type out, show in a table, or show in a clear visualization the three counties with the highest property damage in state 1. *Be sure to include the dollar amount.*

```
ev33=groupsummary(ev3,"CZ_Name","Sum","Property_Cost");  
ev33 = sortrows(ev33,'sum_Property_Cost','descend');  
head(ev33,3)
```

```
ans = 3x3 table
```

	CZ_Name	GroupCount	sum_Property_Cost
1	GALVESTON	17	2.0000e+10
2	FORT BEND	13	1.6004e+10
3	MONTGOMERY	6	1.4000e+10

Three Counties with Highest Property Cost in State 2

Either type out, show in a table, or show in a clear visualization the three counties with the highest property damage in state 2. *Be sure to include the dollar amount.*

```
ev43=groupsummary(ev4,"CZ_Name","Sum","Property_Cost");  
ev43 = sortrows(ev43,'sum_Property_Cost','descend');  
head(ev43,3)
```

```
ans = 3x3 table
```

	CZ_Name	GroupCount	sum_Property_Cost
1	CALCASIEU	1	60000000
2	BEAUREGARD	1	15000000
3	ACADIA	1	200000

Conclusions and Recommendations

Summarize your analysis. Make a recommendation supported by the data.

According to the results the two most impacted states are Texas and Louisiana, different type events presents like flash flood, tornados, tropical storm, heat etc.

In Texas the three most impacted counties are dfferent to the three counties with the most property damage, in fact we have Galvestone, Fort Bend and Montgomery respectively

In Louisiana something similar occurs, the three counties with the most property damage are Calcasieu, Beauregard and Acadia respectively

These counties mentioned before require the most possible attention