

Hurricane Hurvey in 2017

Table of Contents

BACKGROUND AND SCOPE.....	1
Import Using Function:.....	1
Two States Most Impacted by Harvey:.....	2
VISUALIZATIONS:.....	4
Figure of Event Types.....	4
Figure of Event Locations.....	7
Analysis.....	8
Three Counties with Most Events in State 1.....	8
Three Counties with Most Events in State 2.....	9
Three Counties with Highest Property Cost in State 1.....	10
Three Counties with Highest Property Cost in State 2.....	11
Conclusion and Recommendations:.....	13

BACKGROUND AND SCOPE

Import Using Function:

we have created an import function in order to import data from the csv file.

```
stormevents=importfile("StormEvents_2017_finalProject.csv")
```

```
stormevents = 57006x13 table
```

...

	State	Month	Event_Type	CZ_Name	Begin_Date_Time	End_Date_Time
1	State	Month	Event_Type	CZ_Name	NaT	NaT
2	NEW JER...	April	Thunderstorm Wind	GLOUCESTER	2017-04-06 15:09...	2017-04-06 15:...
3	FLORIDA	April	Tornado	LEE	2017-04-06 09:30...	2017-04-06 09:...
4	OHIO	April	Thunderstorm Wind	GREENE	2017-04-05 17:49...	2017-04-05 17:...
5	OHIO	April	Flood	CLERMONT	2017-04-16 17:59...	2017-04-16 19:...
6	NEBRASKA	April	Hail	CASS	2017-04-15 15:50...	2017-04-15 15:...
7	INDIANA	April	Flash Flood	SWITZERLAND	2017-04-29 09:15...	2017-04-29 11:...
8	VIRGINIA	April	Thunderstorm Wind	WESTMOREL...	2017-04-21 19:15...	2017-04-21 19:...
9	GULF OF...	October	Marine Thunders...	ATCHAFALA...	2017-10-22 10:15...	2017-10-22 10:...
10	OHIO	April	Flash Flood	CLERMONT	2017-04-29 09:45...	2017-04-29 11:...
11	NEBRASKA	April	Thunderstorm Wind	BURT	2017-04-15 18:55...	2017-04-15 18:...
12	ARKANSAS	April	Hail	FRANKLIN	2017-04-26 07:57...	2017-04-26 07:...
13	OKLAHOMA	October	Hail	KIOWA	2017-10-21 15:20...	2017-10-21 15:...
14	ATLANTI...	October	Marine Strong W...	DE BAY WA...	2017-10-24 02:24...	2017-10-24 02:...

⋮

```
stormevents.TotalCost=stormevents.Property_Cost+stormevents.Crop_Cost
```

```
stormevents = 57006x14 table
```

...

	State	Month	Event_Type	CZ_Name	Begin_Date_Time	End_Date_Time
1	State	Month	Event_Type	CZ_Name	NaT	NaT
2	NEW JER...	April	Thunderstorm Wind	GLOUCESTER	2017-04-06 15:09...	2017-04-06 15:...
3	FLORIDA	April	Tornado	LEE	2017-04-06 09:30...	2017-04-06 09:...
4	OHIO	April	Thunderstorm Wind	GREENE	2017-04-05 17:49...	2017-04-05 17:...
5	OHIO	April	Flood	CLERMONT	2017-04-16 17:59...	2017-04-16 19:...
6	NEBRASKA	April	Hail	CASS	2017-04-15 15:50...	2017-04-15 15:...
7	INDIANA	April	Flash Flood	SWITZERLAND	2017-04-29 09:15...	2017-04-29 11:...
8	VIRGINIA	April	Thunderstorm Wind	WESTMOREL...	2017-04-21 19:15...	2017-04-21 19:...
9	GULF OF...	October	Marine Thunders...	ATCHAFALA...	2017-10-22 10:15...	2017-10-22 10:...
10	OHIO	April	Flash Flood	CLERMONT	2017-04-29 09:45...	2017-04-29 11:...
11	NEBRASKA	April	Thunderstorm Wind	BURT	2017-04-15 18:55...	2017-04-15 18:...
12	ARKANSAS	April	Hail	FRANKLIN	2017-04-26 07:57...	2017-04-26 07:...
13	OKLAHOMA	October	Hail	KIOWA	2017-10-21 15:20...	2017-10-21 15:...
14	ATLANTI...	October	Marine Strong W...	DE BAY WA...	2017-10-24 02:24...	2017-10-24 02:...

⋮

```
stormevents = movevars(stormevents, 'TotalCost', 'Before', 'Begin_Lat');
```

Two States Most Impacted by Harvey:

In this subsection , I created another table to display the two states without changing the main table's content.

```
hurricanesummary=groupsummary(stormevents,"State","sum","TotalCost")
```

```
hurricanesummary = 68x3 table
```

	State	GroupCount	sum_TotalCost
1	ALABAMA	1300	31582600
2	ALASKA	231	6525000
3	AMERICA...	13	107000
4	ARIZONA	498	11445300
5	ARKANSAS	1212	61096500
6	ATLANTI...	707	5020
7	ATLANTI...	498	500
8	CALIFOR...	1889	815823710

	State	GroupCount	sum_TotalCost
9	COLORADO	1095	24871300
10	CONNECT...	201	1337500
11	DELAWARE	152	60
12	DISTRIC...	46	0
13	E PACIFIC	12	10
14	FLORIDA	1155	3.7042e+09
⋮			

```
hurricanesummary = sortrows(hurricanesummary, 'sum_TotalCost', 'descend')
```

```
hurricanesummary = 68×3 table
```

	State	GroupCount	sum_TotalCost
1	TEXAS	3628	4.6265e+10
2	PUERTO ...	222	1.9028e+10
3	FLORIDA	1155	3.7042e+09
4	CALIFOR...	1889	815823710
5	SOUTH C...	912	755496810
6	MICHIGAN	628	742021000
7	GEORGIA	1679	312589360
8	IDAHO	520	171094200
9	MISSOURI	2289	156203000
10	WISCONSIN	1346	123900100
11	OKLAHOMA	1933	121881000
12	LOUISIANA	821	107641100
13	OREGON	398	101098000
14	WASHING...	521	81766000
⋮			

```
display("So"+" " + "State "+string(hurricanesummary.State(1)) + " faced maximum damage. And State PUERTO RICO faced second most damage.")
```

"So State TEXAS faced maximum damage. And State PUERTO RICO faced second most damage."

```
Two_state=hurricanesummary(hurricanesummary.State == hurricanesummary.State(1) | hurricanesummary.State == hurricanesummary.State(2))
```

```
Two_state = 2×3 table
```

	State	GroupCount	sum_TotalCost
1	TEXAS	3628	4.6265e+10
2	PUERTO ...	222	1.9028e+10

VISUALIZATIONS:

Please enter the name of two states in order to visualise data of the two states .

Figure of Event Types

```
state1 = "TEXAS"
```

```
state1 =  
"TEXAS"
```

```
state2 = "PUERTO RICO"
```

```
state2 =  
"PUERTO RICO"
```

```
stateOne=stormevents(stormevents.State == state1,:)
```

```
stateOne = 3628x14 table
```

...

	State	Month	Event_Type	CZ_Name	Begin_Date_Time	End_Date_Time
1	TEXAS	May	Hail	HENDERSON	2017-05-03 14:06...	2017-05-03 14:...
2	TEXAS	January	Tornado	BOSQUE	2017-01-15 18:17...	2017-01-15 18:...
3	TEXAS	January	Thunderstorm Wind	DALLAS	2017-01-02 05:50...	2017-01-02 05:...
4	TEXAS	January	Thunderstorm Wind	LEON	2017-01-02 05:58...	2017-01-02 05:...
5	TEXAS	January	Thunderstorm Wind	ELLIS	2017-01-02 05:10...	2017-01-02 05:...
6	TEXAS	January	Thunderstorm Wind	LEON	2017-01-02 06:04...	2017-01-02 06:...
7	TEXAS	January	Thunderstorm Wind	RAINS	2017-01-02 06:30...	2017-01-02 06:...
8	TEXAS	January	Hail	JOHNSON	2017-01-15 20:06...	2017-01-15 20:...
9	TEXAS	January	Hail	TARRANT	2017-01-15 20:24...	2017-01-15 20:...
10	TEXAS	January	Thunderstorm Wind	TARRANT	2017-01-15 20:30...	2017-01-15 20:...
11	TEXAS	January	Flash Flood	JOHNSON	2017-01-15 20:30...	2017-01-15 20:...
12	TEXAS	January	Thunderstorm Wind	TARRANT	2017-01-15 20:55...	2017-01-15 20:...
13	TEXAS	January	Thunderstorm Wind	COLLIN	2017-01-15 21:30...	2017-01-15 21:...
14	TEXAS	January	Thunderstorm Wind	DALLAS	2017-01-15 21:39...	2017-01-15 21:...

⋮

```
stateTwo=stormevents(stormevents.State == state2,:)
```

```
stateTwo = 222x14 table
```

...

	State	Month	Event_Type	CZ_Name	Begin_Date_Time	End_Date_Time
1	PUERTO ...	September	Hurricane	EASTERN I...	2017-09-20 11:00...	2017-09-20 23:...

	State	Month	Event_Type	CZ_Name	Begin_Date_Time	End_Date_Time
2	PUERTO ...	September	Hurricane	EASTERN I...	2017-09-20 11:00...	2017-09-20 23:...
3	PUERTO ...	September	Flash Flood	COAMO	2017-09-20 06:02...	2017-09-21 15:...
4	PUERTO ...	September	Flash Flood	COROZAL	2017-09-20 06:29...	2017-09-21 15:...
5	PUERTO ...	September	Hurricane	CENTRAL I...	2017-09-20 11:00...	2017-09-20 23:...
6	PUERTO ...	September	Flash Flood	AGUAS BUE...	2017-09-20 05:12...	2017-09-21 15:...
7	PUERTO ...	September	Flash Flood	TOA BAJA	2017-09-20 06:00...	2017-09-21 15:...
8	PUERTO ...	September	Flash Flood	VEGA ALTA	2017-09-20 06:00...	2017-09-21 15:...
9	PUERTO ...	September	Hurricane	CENTRAL I...	2017-09-20 11:00...	2017-09-20 23:...
10	PUERTO ...	September	Hurricane	CENTRAL I...	2017-09-20 11:00...	2017-09-20 23:...
11	PUERTO ...	September	Hurricane	CENTRAL I...	2017-09-20 11:00...	2017-09-20 23:...
12	PUERTO ...	September	Hurricane	CENTRAL I...	2017-09-20 11:00...	2017-09-20 23:...
13	PUERTO ...	September	Hurricane	CENTRAL I...	2017-09-20 11:00...	2017-09-20 23:...
14	PUERTO ...	September	Flash Flood	GUAYAMA	2017-09-20 03:00...	2017-09-21 15:...

⋮

```
summary1=groupsummary( stateOne, "Event_Type" )
```

```
summary1 = 31x2 table
```

	Event_Type	GroupCount
1	Astronomical Lo...	2
2	Blizzard	3
3	Coastal Flood	7
4	Cold/Wind Chill	3
5	Debris Flow	1
6	Drought	106
7	Dust Storm	1
8	Excessive Heat	12
9	Extreme Cold/Wi...	1
10	Flash Flood	365
11	Flood	59
12	Frost/Freeze	49
13	Funnel Cloud	15
14	Hail	1290

⋮

```
summary2=groupsummary(stateTwo,"Event_Type")
```

```
summary2 = 12x2 table
```

	Event_Type	GroupCount
1	Coastal Flood	3
2	Flash Flood	130
3	Flood	35
4	Funnel Cloud	7
5	Hail	2
6	Heavy Rain	20
7	High Surf	1
8	Hurricane	11
9	Lightning	1
10	Rip Current	4
11	Thunderstorm Wind	7
12	Tornado	1

```
bar(summary2.Event_Type,summary2.GroupCount)
title("Bar Plot Of the state "+string(state2))
```

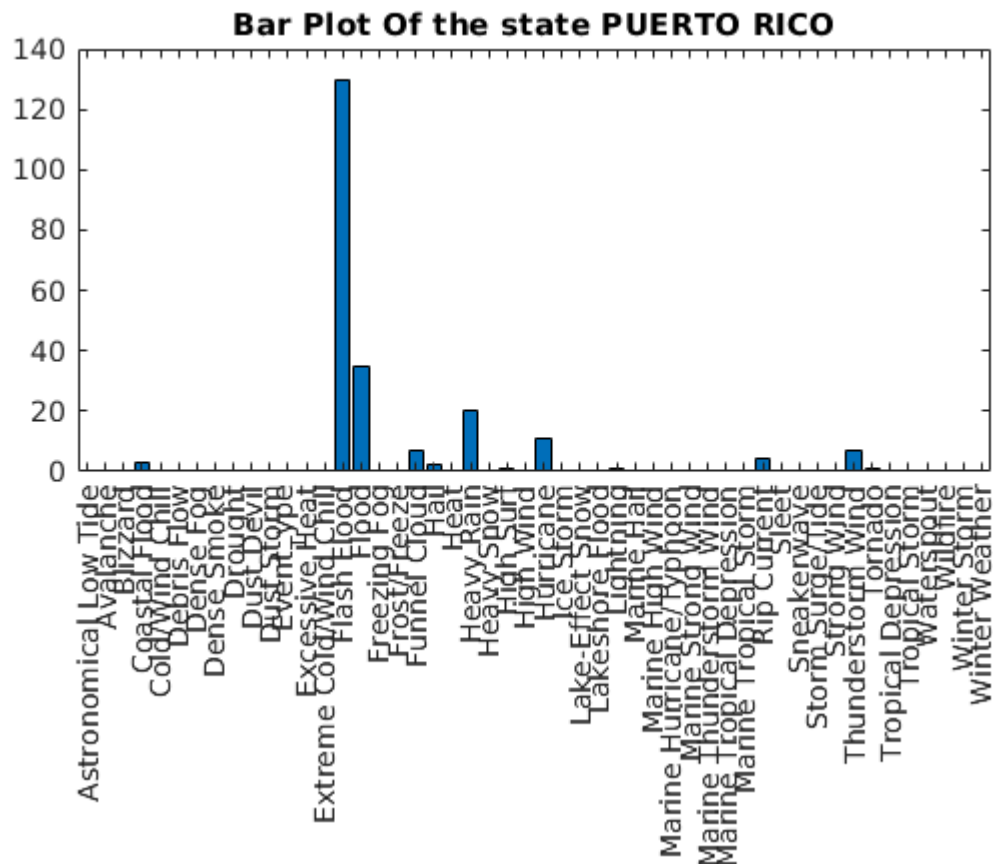
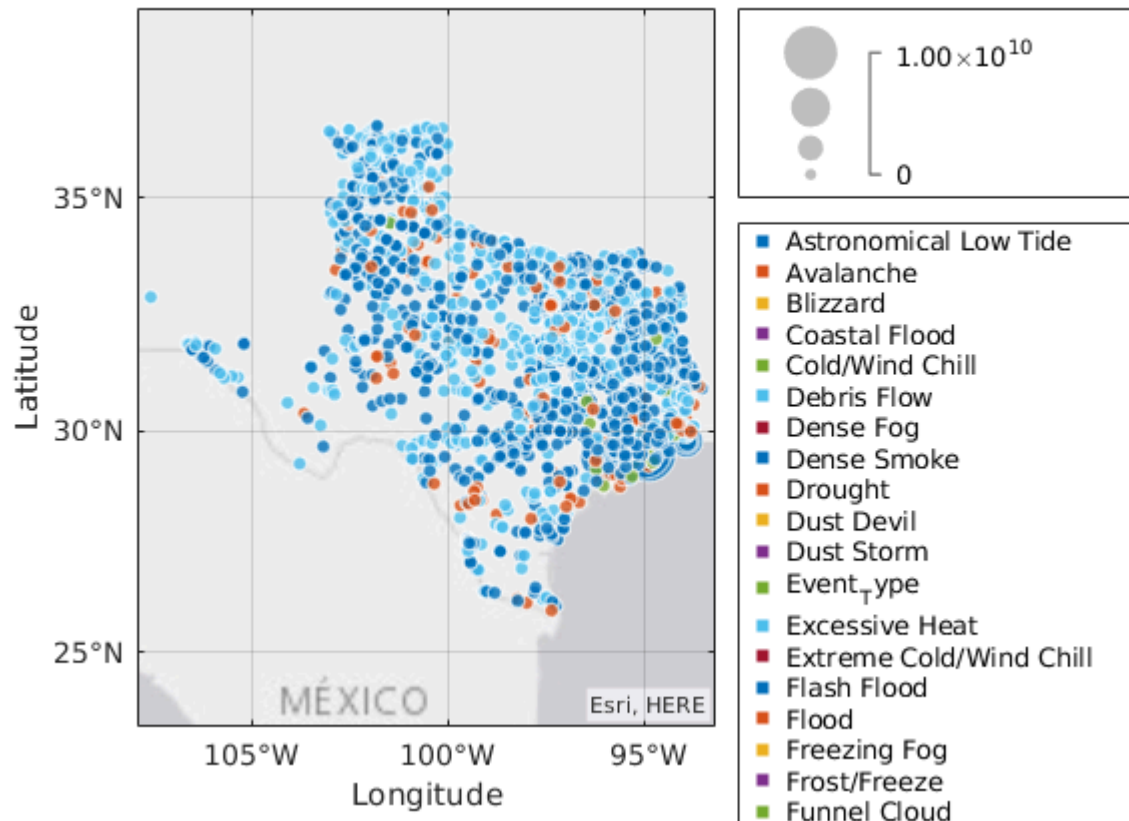


Figure of Event Locations

```
geobubble(stateOne.Begin_Lat,stateOne.Begin_Lon,stateOne.Property_Cost,stateOne.Event_Type)
```

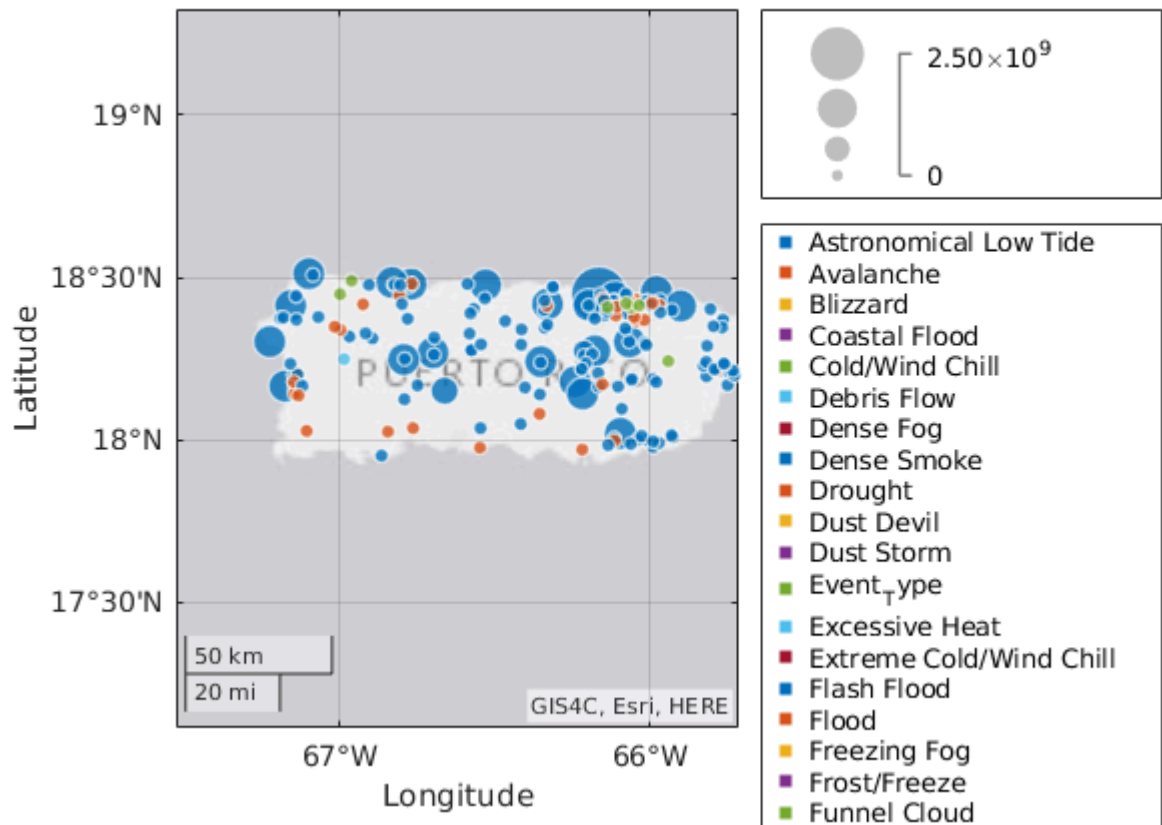
```
legend show
```



```
geobubble(stateTwo.Begin_Lat,stateTwo.Begin_Lon,stateTwo.TotalCost,stateTwo.Event_Type)
```

```
legend show
```

```
geolimits([17.11 19.32],[-67.53-65.71])
```



Analysis

Three Counties with Most Events in State 1

```

table1 = groupsummary(stateOne,"CZ_Name","mode","Event_Type");

table1 = sortrows(table1,'GroupCount','descend')

```

table1 = 268x3 table

	CZ_Name	GroupCount	mode_Event_Type
1	COLLIN	64	Hail
2	HARRIS	64	Flash Flood
3	TARRANT	63	Thunderstorm Wind
4	MIDLAND	61	Hail
5	DENTON	59	Hail
6	GUADALUPE...	59	High Wind
7	POTTER	49	Hail

	CZ_Name	GroupCount	mode_Event_Type
8	ECTOR	46	Hail
9	RANDALL	46	Thunderstorm Wind
10	ANGELINA	41	Hail
11	SMITH	41	Hail
12	HUTCHINSON	40	Hail
13	DALLAS	39	Hail
14	TOM GREEN	39	Thunderstorm Wind

⋮

```
disp("The three Counties are 1."+string(table1.CZ_Name(1)))
```

The three Counties are 1.COLLIN

```
disp("2."+string(table1.CZ_Name(2)))
```

2.HARRIS

```
disp("3."+string(table1.CZ_Name(3)))
```

3.TARRANT

Three Counties with Most Events in State 2

```
table2 = groupsummary(stateTwo,"CZ_Name","mode","Event_Type");
```

```
table2 = sortrows(table2,'GroupCount','descend')
```

table2 = 68x3 table

	CZ_Name	GroupCount	mode_Event_Type
1	MAYAGUEZ	14	Flash Flood
2	SAN JUAN	13	Flood
3	GUAYNABO	12	Flash Flood
4	NAGUABO	12	Flash Flood
5	CAROLINA	9	Flash Flood
6	HATILLO	8	Flash Flood
7	CENTRAL I...	7	Hurricane
8	PATILLAS	7	Flash Flood
9	COMERIO	5	Flash Flood
10	EASTERN I...	5	Hurricane
11	RIO GRANDE	5	Flash Flood
12	AGUADA	4	Flash Flood

	CZ_Name	GroupCount	mode_Event_Type
13	BAYAMON	4	Flash Flood
14	CAGUAS	4	Flash Flood

⋮

```
disp("The three Counties are 1."+string(table2.CZ_Name(1)))
```

The three Counties are 1.MAYAGUEZ

```
disp("2."+string(table2.CZ_Name(2)))
```

2.SAN JUAN

```
disp("3."+string(table2.CZ_Name(3)))
```

3.GUAYNABO

Three Counties with Highest Property Cost in State 1

```
table3 = groupsummary(stateOne,"CZ_Name","sum","TotalCost")
```

table3 = 268×3 table

	CZ_Name	GroupCount	sum_TotalCost
1	ANDERSON	7	6000
2	ANDREWS	5	0
3	ANGELINA	41	100000
4	ARANSAS	13	387000
5	ARCHER	9	8000
6	ARMSTRONG	15	0
7	ATASCOSA	3	0
8	AUSTIN	5	150000
9	BAILEY	7	1420000
10	BANDERA	11	0
11	BASTROP	20	1505000
12	BAYLOR	8	0
13	BEE	10	6150000
14	BELL	21	131000

⋮

```
table3 = sortrows(table3,'sum_TotalCost','descend')
```

```
table3 = 268x3 table
```

	CZ_Name	GroupCount	sum_TotalCost
1	HARRIS	64	1.0002e+10
2	GALVESTON	34	1.0000e+10
3	FORT BEND	31	8.0040e+09
4	MONTGOMERY	12	7.0000e+09
5	JEFFERSON	29	3.0000e+09
6	BRAZORIA	25	2.0013e+09
7	ORANGE	9	1.5000e+09
8	NUECES	32	1.0016e+09
9	WALKER	12	600033000
10	HARDIN	8	600002000
11	REFUGIO	6	520030000
12	SAN PATRI...	11	506205000
13	SAN JACINTO	6	350010000
14	POLK	7	300040000

```
⋮
```

```
disp("The Three Counties are: 1."+string(table3.CZ_Name(1)))
```

```
The Three Counties are: 1.HARRIS
```

```
disp(" 2."+string(table3.CZ_Name(2)))
```

```
2.GALVESTON
```

```
disp("3."+string(table3.CZ_Name(3)))
```

```
3.FORT BEND
```

Three Counties with Highest Property Cost in State 2

```
table4 = groupsummary(stateTwo,"CZ_Name","sum","TotalCost")
```

```
table4 = 68x3 table
```

	CZ_Name	GroupCount	sum_TotalCost
1	ADJUNTAS	3	750760000
2	AGUADA	4	750000000
3	AGUADILLA	2	750005000
4	AGUAS BUE...	2	750177000

	CZ_Name	GroupCount	sum_TotalCost
5	AIBONITO	1	750000000
6	ANASCO	1	750000000
7	ARECIBO	2	750250000
8	ARROYO	2	750000000
9	BARCELONETA	2	750250000
10	BARRANQUI...	2	750250000
11	BAYAMON	4	750251000
12	CABO ROJO	1	750000000
13	CAGUAS	4	750350000
14	CAMUY	2	750250000

⋮

```
table4 = sortrows(table4, 'sum_TotalCost', 'descend')
```

table4 = 68x3 table

	CZ_Name	GroupCount	sum_TotalCost
1	TOA BAJA	1	2.5000e+09
2	ADJUNTAS	3	750760000
3	CANOVANAS	2	750500000
4	CAGUAS	4	750350000
5	BAYAMON	4	750251000
6	ARECIBO	2	750250000
7	BARCELONETA	2	750250000
8	BARRANQUI...	2	750250000
9	CAMUY	2	750250000
10	CAROLINA	9	750250000
11	CATANO	4	750250000
12	CEIBA	3	750250000
13	UTUADO	3	750200000
14	AGUAS BUE...	2	750177000

⋮

```
disp("The Three Counties are: 1."+string(table4.CZ_Name(1)))
```

The Three Counties are: 1.TOA BAJA

```
disp(" 2."+string(table4.CZ_Name(2)))
```

```
disp("3."+string(table4.CZ_Name(3)))
```

Conclusion and Recommendations:

From the above data ,at first we got to know about the most damaged two states . Then we determined most damaged three counties of each as well as three counties where maximum event_type (disasters) occurs .So from the above data, I recommend the two most affected states ,1>TEXAS and 2>PUERTO RICO . Besides ,we should give priorities of those counties which are mostly affected .

From State 1, We got to know that, "Harris" is both in maximum event_type and total_property_cost ,so we should give priority first .

From state 2,"Toa Baja" faced maximum damaged cost .So we should give prioritise it .

Again, we got an idea about maximum event_type from the table 1 and table 2 , it will be helpful to predict about which county should we give priority in future .Because several clमितies occur most in several season.

Thank You !!