Allocating Resources After a Major Weather Event

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The analysis was done based on Storm Data for year 2017. The analysis was done on various parameters including The total damage and Counties.

Background and Scope

Import the Data

```
alldata=importfile("StormEvents_2017_finalProject.csv");
```

```
alldata= alldata(alldata.Begin_Date_Time >= '2017-08-17 00:00:00' & alldata.Begin_Date_Time < '
alldata.Crop_Cost(isnan(alldata.Crop_Cost))=0;
alldata.Property_Cost(isnan(alldata.Property_Cost))=0;
alldata.totalcost= alldata.Property_Cost + alldata.Crop_Cost;

mostevent =groupsummary (alldata,'State','sum',"totalcost");

mostevent = sortrows(mostevent,'sum_totalcost','descend');
mostevent = mostevent(ismember(mostevent.State,{'ARKANSAS','KENTUCKY','LOUISIANA','MISSISSIPPI'
```

Two States Most Impacted by Harvey

Texas and Louisiana

```
Moststate =mostevent.State(1)
```

```
Moststate = categorical
     TEXAS
```

```
secondMost= mostevent.State(2)
```

```
secondMost = categorical
     LOUISIANA
```

Table of Events for Two Most Impacted States

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

```
Twostates = alldata(ismember(alldata.State,{'LOUISIANA','TEXAS'}),:)
```

```
Twostates = 361×25 table
```

...

	EpisodeID	Event_ID	State	Year	Month	Event_Type	CZ_Name
1	119753	723472	TEXAS	2017	August	Tropical Storm	MONTGOMERY

	EpisodeID	Event_ID	State	Year	Month	Event_Type	CZ_Name
2	119753	723473	TEXAS	2017	August	Tropical Storm	FORT BEND
3	119753	723449	TEXAS	2017	August	Tropical Storm	GALVESTON
4	119753	723474	TEXAS	2017	August	Tropical Storm	SAN JACINTO
5	119753	723475	TEXAS	2017	August	Tropical Storm	WALKER
6	119753	723648	TEXAS	2017	August	Tropical Storm	POLK
7	120011	719146	TEXAS	2017	August	Flash Flood	EL PASO
8	120012	719147	TEXAS	2017	August	Thunderstorm Wind	EL PASO
9	120012	719148	TEXAS	2017	August	Flash Flood	EL PASO
10	119746	719493	TEXAS	2017	August	Flash Flood	HARDIN
11	119746	719496	TEXAS	2017	August	Flash Flood	JASPER
12	119746	719497	TEXAS	2017	August	Flash Flood	NEWTON
13	119753	720340	TEXAS	2017	August	Flash Flood	FORT BEND
14	119826	718436	TEXAS	2017	August	Thunderstorm Wind	MIDLAND
15	117836	708282	TEXAS	2017	August	Thunderstorm Wind	BRISCOE
16	119746	719740	TEXAS	2017	August	Thunderstorm Wind	JASPER
17	119746	720010	TEXAS	2017	August	Flood	ORANGE
18	119753	720464	TEXAS	2017	August	Flash Flood	MONTGOMERY
19	119853	718515	TEXAS	2017	August	Thunderstorm Wind	ECTOR
20	119746	719342	TEXAS	2017	August	Flash Flood	JEFFERSON
21	119753	720344	TEXAS	2017	August	Flash Flood	GALVESTON
22	117887	708470	LOUISIANA	2017	August	Heat	CADDO
23	117887	708471	LOUISIANA	2017	August	Heat	BOSSIER
24	117887	708472	LOUISIANA	2017	August	Heat	DE SOTO
25	117887	708473	LOUISIANA	2017	August	Heat	RED RIVER
26	118032	709519	TEXAS	2017	August	Thunderstorm Wind	SWISHER
27	118916	714375	LOUISIANA	2017	August	Tropical Storm	SABINE
28	118330	711050	TEXAS	2017	August	Flash Flood	ANGELINA
29	118330	711054	TEXAS	2017	August	Flash Flood	ANGELINA
30	118330	711059	TEXAS	2017	August	Flash Flood	ANGELINA
31	118330	711060	TEXAS	2017	August	Flash Flood	ANGELINA
32	119753	721087	TEXAS	2017	August	Flash Flood	SAN JACINTO
33	119753	720859	TEXAS	2017	August	Flash Flood	GALVESTON
34	117887	708474	LOUISIANA	2017	August	Heat	BIENVILLE
35	117887	708475	LOUISIANA	2017	August	Heat	WEBSTER

	EpisodeID	Event_ID	State	Year	Month	Event_Type	CZ_Name
36	117887	708477	LOUISIANA	2017	August	Heat	CLAIBORNE
37	117887	708478	LOUISIANA	2017	August	Heat	LINCOLN
38	117887	708479	LOUISIANA	2017	August	Heat	JACKSON
39	118032	709521	TEXAS	2017	August	Thunderstorm Wind	LUBBOCK
40	118916	714376	LOUISIANA	2017	August	Tropical Storm	NATCHITOC...
41	118916	714377	LOUISIANA	2017	August	Tropical Storm	UNION
42	118330	711063	TEXAS	2017	August	Flash Flood	ANGELINA
43	118032	709520	TEXAS	2017	August	Flash Flood	SWISHER
44	118032	709525	TEXAS	2017	August	Thunderstorm Wind	HOCKLEY
45	120132	719823	TEXAS	2017	August	Thunderstorm Wind	CLAY
46	119753	720465	TEXAS	2017	August	Flash Flood	GALVESTON
47	117887	708480	LOUISIANA	2017	August	Heat	UNION
48	117887	708481	LOUISIANA	2017	August	Heat	OUACHITA
49	117887	708482	LOUISIANA	2017	August	Heat	CALDWELL
50	117887	708483	LOUISIANA	2017	August	Heat	WINN
51	117887	708484	LOUISIANA	2017	August	Heat	LA SALLE
52	120318	720930	TEXAS	2017	August	Tropical Storm	KENEDY
53	118032	709522	TEXAS	2017	August	Flash Flood	HOCKLEY
54	118032	709523	TEXAS	2017	August	Thunderstorm Wind	LYNN
55	118032	711899	TEXAS	2017	August	Heavy Rain	HOCKLEY
56	118330	711072	TEXAS	2017	August	Flash Flood	SABINE
57	118330	711078	TEXAS	2017	August	Flash Flood	SAN AUGUS...
58	118330	711079	TEXAS	2017	August	Flash Flood	SABINE
59	118330	711081	TEXAS	2017	August	Flash Flood	SABINE
60	118330	711083	TEXAS	2017	August	Flash Flood	ANGELINA
61	118330	711089	TEXAS	2017	August	Flash Flood	ANGELINA
62	118330	711090	TEXAS	2017	August	Flash Flood	ANGELINA
63	118330	711092	TEXAS	2017	August	Flash Flood	SABINE
64	118330	711405	TEXAS	2017	August	Flash Flood	SABINE
65	118330	711407	TEXAS	2017	August	Flash Flood	SABINE
66	118330	711408	TEXAS	2017	August	Flash Flood	SABINE
67	118330	711409	TEXAS	2017	August	Flash Flood	SABINE
68	118330	711412	TEXAS	2017	August	Flash Flood	ANGELINA
69	119556	717411	TEXAS	2017	August	Hail	SHERMAN

	EpisodeID	Event_ID	State	Year	Month	Event_Type	CZ_Name
70	119753	720858	TEXAS	2017	August	Flash Flood	HARRIS
71	119753	720860	TEXAS	2017	August	Flash Flood	HARRIS
72	117887	708485	LOUISIANA	2017	August	Heat	GRANT
73	117887	708486	LOUISIANA	2017	August	Heat	NATCHITOC...
74	117887	708487	LOUISIANA	2017	August	Heat	SABINE
75	117891	708498	TEXAS	2017	August	Heat	CASS
76	118330	711413	TEXAS	2017	August	Flash Flood	SHELBY
77	118330	711414	TEXAS	2017	August	Flash Flood	SHELBY
78	118330	711415	TEXAS	2017	August	Flash Flood	SABINE
79	118386	711416	LOUISIANA	2017	August	Flash Flood	SABINE
80	118386	711417	LOUISIANA	2017	August	Flash Flood	SABINE
81	118386	711418	LOUISIANA	2017	August	Flash Flood	SABINE
82	118386	711419	LOUISIANA	2017	August	Flash Flood	RED RIVER
83	118386	711420	LOUISIANA	2017	August	Flash Flood	SABINE
84	118386	711421	LOUISIANA	2017	August	Flash Flood	RED RIVER
85	118386	711422	LOUISIANA	2017	August	Flash Flood	SABINE
86	118386	711423	LOUISIANA	2017	August	Flash Flood	NATCHITOC...
87	118386	711424	LOUISIANA	2017	August	Flash Flood	NATCHITOC...
88	119556	717412	TEXAS	2017	August	Hail	HUTCHINSON
89	119556	717413	TEXAS	2017	August	Thunderstorm Wind	RANDALL
90	119565	717436	TEXAS	2017	August	Thunderstorm Wind	HARTLEY
91	119753	721098	TEXAS	2017	August	Flash Flood	AUSTIN
92	117891	708499	TEXAS	2017	August	Heat	MARION
93	117891	708500	TEXAS	2017	August	Heat	HARRISON
94	117891	708501	TEXAS	2017	August	Heat	GREGG
95	117891	708503	TEXAS	2017	August	Heat	RUSK
96	118386	711425	LOUISIANA	2017	August	Flash Flood	SABINE
97	118386	711426	LOUISIANA	2017	August	Flash Flood	SABINE
98	118386	711427	LOUISIANA	2017	August	Flash Flood	NATCHITOC...
99	118386	711428	LOUISIANA	2017	August	Flash Flood	NATCHITOC...
100	118386	711429	LOUISIANA	2017	August	Flash Flood	SABINE

Visualizations

Figure of Event Types

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

```
Twostates.Event_Type = removecats(Twostates.Event_Type,{'Astronomical Low Tide','Avalanche','Bl
histogram(Twostates.Event_Type);

title('Number and types of events occured')
xlabel('Event Type')
ylabel('Occurances')
```

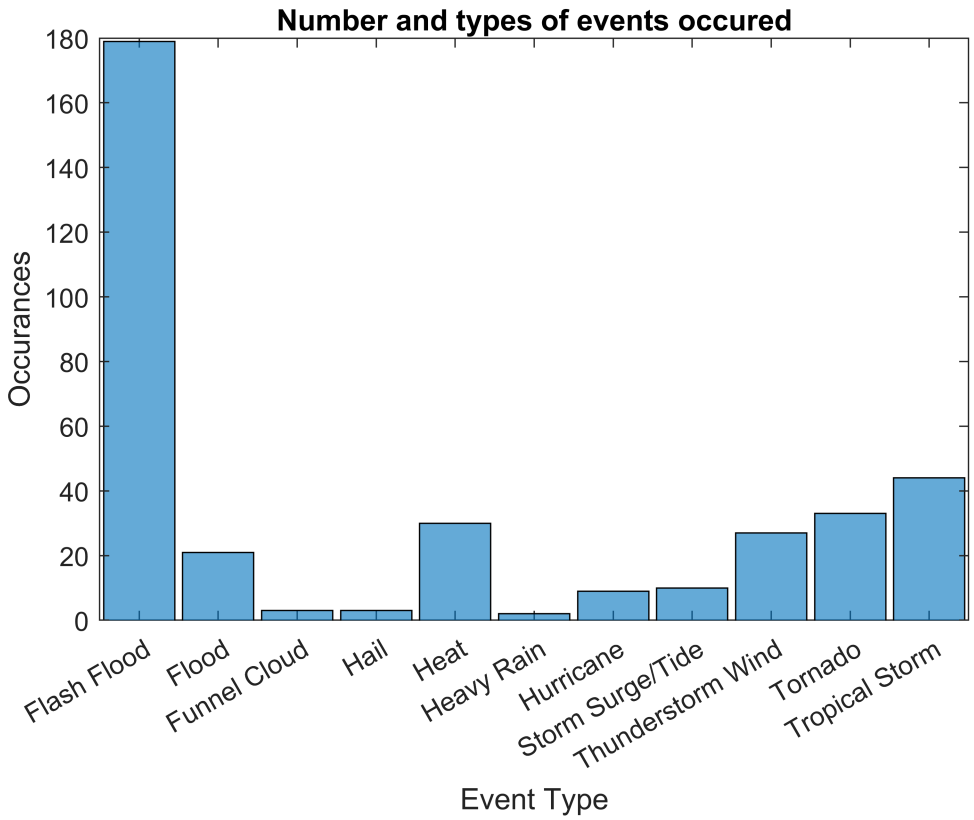


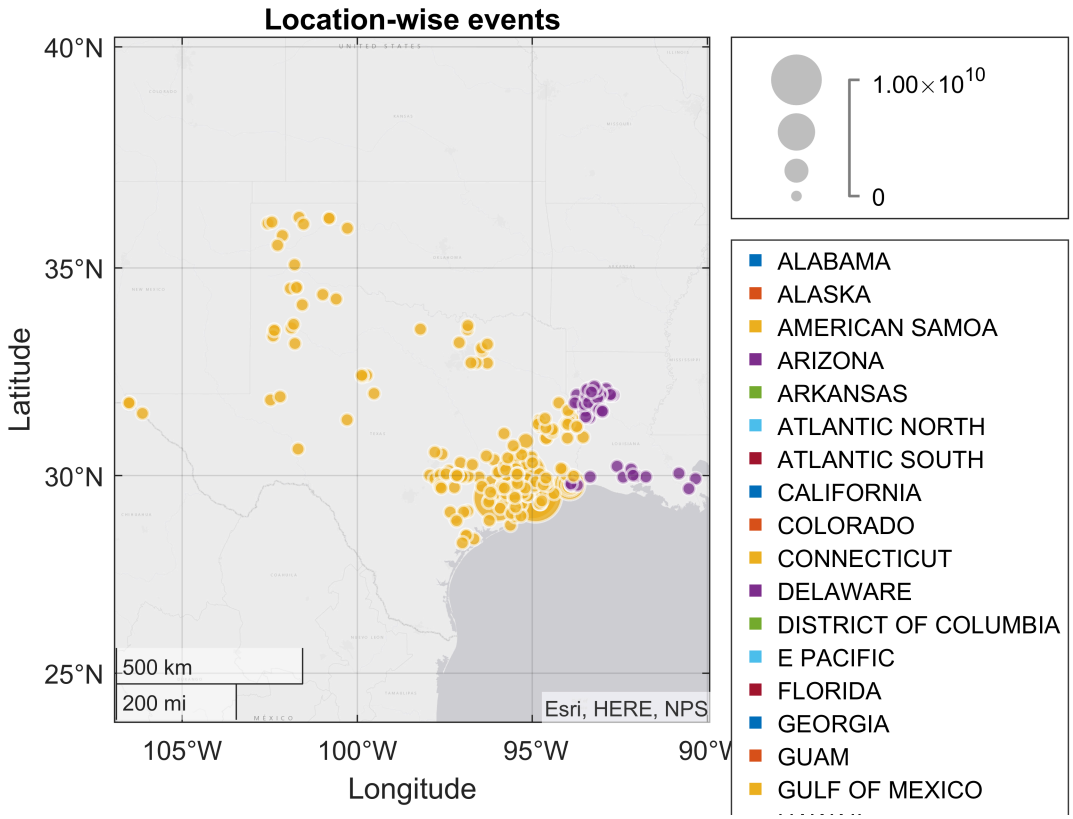
Figure of Event Locations

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

```
MostData = alldata(alldata.State == 'TEXAS'|alldata.State == 'LOUISIANA',:);
geobubble(MostData.Begin_Lat,MostData.Begin_Lon,MostData.totalcost,MostData.State);

legend show

title('Location-wise events')
```



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.

```
State1 = Twostates(Twostates.State == 'TEXAS',:);
State2 = Twostates(Twostates.State == 'LOUISIANA',:);
County1= groupsummary(State1,"CZ_Name");
County1 = sortrows(County1,'GroupCount','descend')
```

County1 = 95×2 table

	CZ_Name	GroupCount
1	HARRIS	21
2	GALVESTON	17
3	FORT BEND	13
4	ANGELINA	12
5	BRAZORIA	12
6	SABINE	12
7	BASTROP	9

	CZ_Name	GroupCount
8	CHAMBERS	8
9	CALDWELL	7
10	MONTGOMERY	6
11	CALHOUN	5
12	JEFFERSON	5
13	MATAGORDA	5
14	WHARTON	5
15	FAYETTE	4
16	LIBERTY	4
17	WALKER	4
18	WALLER	4
19	AUSTIN	3
20	EL PASO	3
21	GRIMES	3
22	HOCKLEY	3
23	JACKSON	3
24	ORANGE	3
25	REFUGIO	3
26	SAN AUGUS...	3
27	SAN JACINTO	3
28	SHELBY	3
29	SWISHER	3
30	TAYLOR	3
31	VICTORIA	3
32	ARANSAS	2
33	BRAZOS	2
34	COLLIN	2
35	DALLAS	2
36	DE WITT	2
37	GONZALES	2
38	GRAYSON	2
39	HAYS	2
40	JASPER	2
41	LEE	2

	CZ_Name	GroupCount
42	LUBBOCK	2
43	MADISON	2
44	NACOGDOCHES	2
45	NUECES	2
46	OCHILTREE	2
47	POLK	2
48	SAN PATRI...	2
49	WASHINGTON	2
50	WILLIAMSON	2
51	BEE	1
52	BEXAR	1
53	BOWIE	1
54	BRISCOE	1
55	BURLESON	1
56	CASS	1
57	CLAY	1
58	COLEMAN	1
59	COLORADO	1
60	COMAL	1
61	CROCKETT	1
62	DALLAM	1
63	DENTON	1
64	ECTOR	1
65	GOLIAD	1
66	GREGG	1
67	GUADALUPE	1
68	HALE	1
69	HARDIN	1
70	HARRISON	1
71	HARTLEY	1
72	HEMPHILL	1
73	HUNT	1
74	HUTCHINSON	1
75	JIM WELLS	1

	CZ_Name	GroupCount
76	KARNES	1
77	KAUFMAN	1
78	KENEDY	1
79	KLEBERG	1
80	LAVACA	1
81	LIVE OAK	1
82	LYNN	1
83	MARION	1
84	MIDLAND	1
85	MOORE	1
86	MOTLEY	1
87	NEWTON	1
88	OLDHAM	1
89	PANOLA	1
90	RANDALL	1
91	RUSK	1
92	SHERMAN	1
93	TOM GREEN	1
94	TYLER	1
95	WILSON	1

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.

```
County2= groupsummary(State2,"CZ_Name");
County2 = sortrows(County2,'GroupCount','descend')
```

County2 = 30×2 table

	CZ_Name	GroupCount
1	NATCHITOC...	21
2	SABINE	15
3	RED RIVER	9
4	WINN	6
5	CAMERON	4

	CZ_Name	GroupCount
6	VERMILION	4
7	DE SOTO	3
8	UNION	2
9	ACADIA	1
10	BEAUREGARD	1
11	BIENVILLE	1
12	BOSSIER	1
13	CADDO	1
14	CALCASIEU	1
15	CALDWELL	1
16	CLAIBORNE	1
17	EAST CAME...	1
18	GRANT	1
19	IBERIA	1
20	JACKSON	1
21	LA SALLE	1
22	LAFAYETTE	1
23	LAFOURCHE	1
24	LINCOLN	1
25	OUACHITA	1
26	ST. CHARLES	1
27	ST. JAMES	1
28	ST. MARY	1
29	WEBSTER	1
30	WEST CAME...	1

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 reported property cost in state 1. *Be sure to include the dollar amount*.

```
CountyWH1= groupsummary(State1,"CZ_Name",'sum',"totalcost");
CountyWH1 = sortrows(CountyWH1,'sum_totalcost','descend')
```

CountyWH1 = 95×3 table

	CZ_Name	GroupCount	sum_totalcost
1	GALVESTON	17	2.0000e+10

	CZ_Name	GroupCount	sum_totalcost
2	FORT BEND	13	1.6004e+10
3	MONTGOMERY	6	1.4000e+10
4	HARRIS	21	1.0001e+10
5	JEFFERSON	5	3.0000e+09
6	BRAZORIA	12	2.0009e+09
7	ARANSAS	2	1.9500e+09
8	ORANGE	3	1.5000e+09
9	NUECES	2	1.3000e+09
10	WALKER	4	1.2000e+09
11	LIBERTY	4	1.0000e+09
12	SAN JACINTO	3	700010000
13	HARDIN	1	600000000
14	POLK	2	600000000
15	REFUGIO	3	520020000
16	SAN PATRI...	2	507000000
17	MATAGORDA	5	500500000
18	JACKSON	3	500200000
19	WALLER	4	350700000
20	CALHOUN	5	301010000
21	WHARTON	5	200350000
22	VICTORIA	3	180000000
23	WASHINGTON	2	150000000
24	JASPER	2	85005000
25	MADISON	2	80000000
26	TYLER	1	60000000
27	FAYETTE	4	50000000
28	GRIMES	3	50000000
29	NEWTON	1	45000000
30	BURLESON	1	20000000
31	BRAZOS	2	15000000
32	CALDWELL	7	12850000
33	DE WITT	2	3100000
34	BASTROP	9	1500000
35	CHAMBERS	8	1000000

	CZ_Name	GroupCount	sum_totalcost
36	COMAL	1	1000000
37	GOLIAD	1	1000000
38	LEE	2	350000
39	AUSTIN	3	150000
40	BEXAR	1	100000
41	GONZALES	2	100000
42	HAYS	2	100000
43	LAVACA	1	100000
44	GUADALUPE	1	50000
45	HOCKLEY	3	42000
46	BEE	1	10000
47	BRISCOE	1	10000
48	KLEBERG	1	10000
49	LIVE OAK	1	10000
50	ECTOR	1	8000
51	JIM WELLS	1	1000
52	LUBBOCK	2	500
53	ANGELINA	12	0
54	BOWIE	1	0
55	CASS	1	0
56	CLAY	1	0
57	COLEMAN	1	0
58	COLLIN	2	0
59	COLORADO	1	0
60	CROCKETT	1	0
61	DALLAM	1	0
62	DALLAS	2	0
63	DENTON	1	0
64	EL PASO	3	0
65	GRAYSON	2	0
66	GREGG	1	0
67	HALE	1	0
68	HARRISON	1	0
69	HARTLEY	1	0

	CZ_Name	GroupCount	sum_totalcost
70	HEMPHILL	1	0
71	HUNT	1	0
72	HUTCHINSON	1	0
73	KARNES	1	0
74	KAUFMAN	1	0
75	KENEDY	1	0
76	LYNN	1	0
77	MARION	1	0
78	MIDLAND	1	0
79	MOORE	1	0
80	MOTLEY	1	0
81	NACOGDOCHES	2	0
82	OCHILTREE	2	0
83	OLDHAM	1	0
84	PANOLA	1	0
85	RANDALL	1	0
86	RUSK	1	0
87	SABINE	12	0
88	SAN AUGUS...	3	0
89	SHELBY	3	0
90	SHERMAN	1	0
91	SWISHER	3	0
92	TAYLOR	3	0
93	TOM GREEN	1	0
94	WILLIAMSON	2	0
95	WILSON	1	0

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 reported property cost in state 2. *Be sure to include the dollar amount*.

```
CountyWH2= groupsummary(State2,"CZ_Name",'sum',"totalcost");
CountyWH2 = sortrows(CountyWH2,'sum_totalcost','descend')
```

```
CountyWH2 = 30×3 table
```

	CZ_Name	GroupCount	sum_totalcost
1	CALCASIEU	1	60000000
2	BEAUREGARD	1	15000000
3	ACADIA	1	200000
4	CAMERON	4	72000
5	VERMILION	4	5000
6	BIENVILLE	1	0
7	BOSSIER	1	0
8	CADDO	1	0
9	CALDWELL	1	0
10	CLAIBORNE	1	0
11	DE SOTO	3	0
12	EAST CAME...	1	0
13	GRANT	1	0
14	IBERIA	1	0
15	JACKSON	1	0
16	LA SALLE	1	0
17	LAFAYETTE	1	0
18	LAFOURCHE	1	0
19	LINCOLN	1	0
20	NATCHITOC...	21	0
21	OUACHITA	1	0
22	RED RIVER	9	0
23	SABINE	15	0
24	ST. CHARLES	1	0
25	ST. JAMES	1	0
26	ST. MARY	1	0
27	UNION	2	0
28	WEBSTER	1	0
29	WEST CAME...	1	0
30	WINN	6	0

Conclusions and Recommendations

The most Affected States are Texas and Louisiana. The most affected counties based on events are Harris, Galveston, Angelina from Texas. Natchitoces, Sabine, Red River from LOUISIANA.The most affected counties

based on Total cost are Galveston, Forest Bend and Montgomery from Texas. Calcasieu, Beauregard, Acadia from LOUISIANA.

These places are needed immidiate attention and should be priotized. The Galveston is the most affected county in Texas in both aspects. Also it constitute most of the cost incurred.