

Visualization Project Proposal

What

The topic of this project is about the occurrences of severe weather, specifically tornadoes, in the United States over the past years. The goal of the project is to find the patterns and correlations that relate to the occurrence of the tornadoes. The patterns and correlations may be from the commonly expected factors, such as wind or temperature, and it may also come from factors that don't necessarily have a reasonable explanation, for instance population per state.

Why

Tornadoes are not like typical storms like hurricanes or cyclones are. The United States is one of the countries that have a rather high rate of occurrence for this weather event and it would be intriguing to explore the factors that affect its happenings and whether unusual patterns may appear for which have no scientific reasoning.

How

To achieve the goal of this project, data sets from a variety of sources will be used. Patterns will be observed from the main tornado data sets first (data sets relating to tornadoes specifically), and then more patterns will be explored using the additional data sets (data sets that don't necessarily give information about tornadoes), such as relating to temperature, wind, state population, etc. MATLAB will be the main software used for visualizing the data sets.

Data

Through online research, several data sources have been collected:

- National Centers for Environmental Information – National Oceanic and Atmospheric Administration: <https://www.ncdc.noaa.gov/stormevents/> (Figure 1)
- United States Drought Monitor: <https://droughtmonitor.unl.edu/Data/DataDownload.aspx> (Figure 2)
- United States Census Bureau: <https://www.census.gov/data/datasets/time-series/demo/popest/2010s-state-total.html> (Figure 3)

Figure 1 (U.S. Tornadoes):

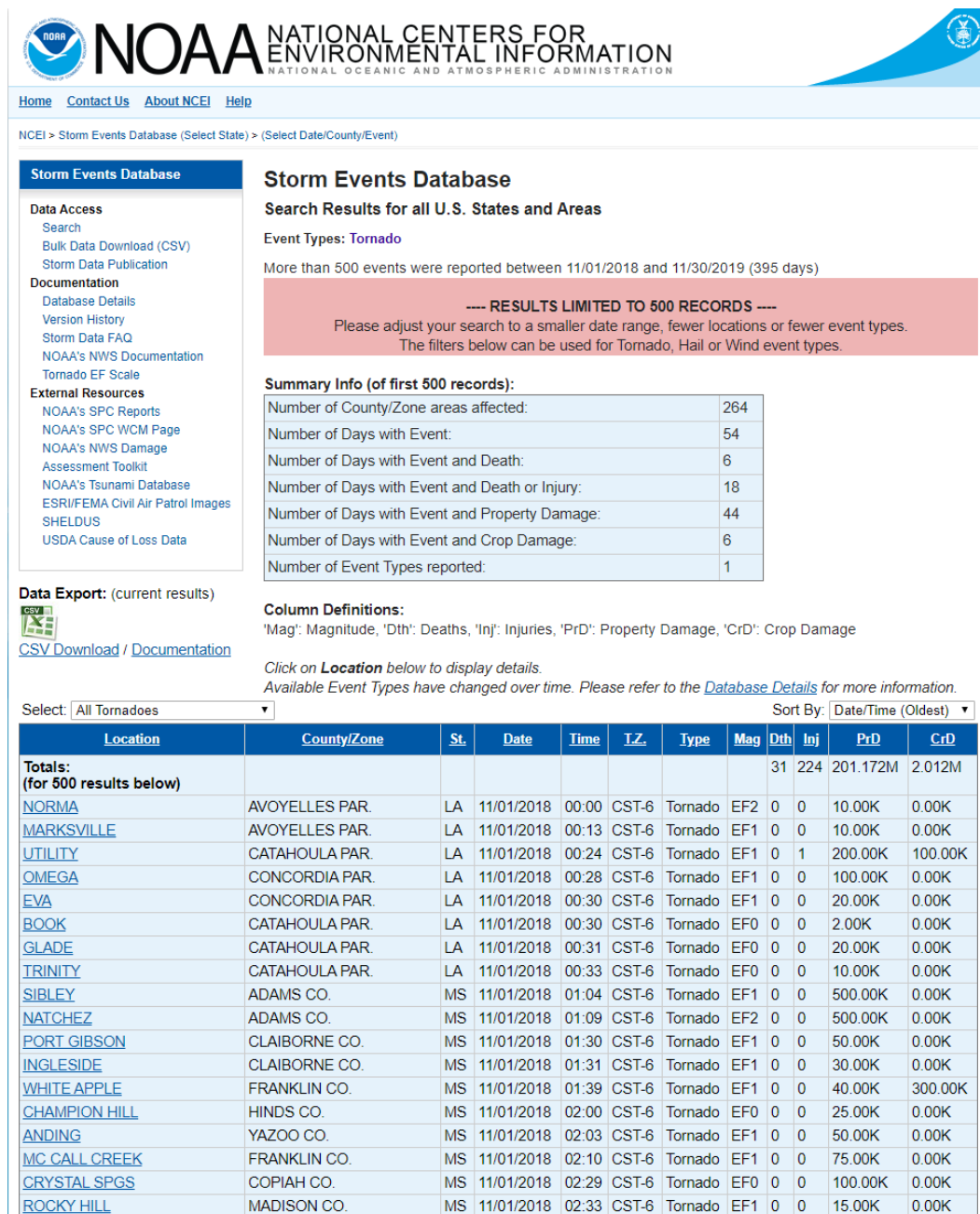


Figure 2 (Drought Levels):

	A	B	C	D	E	F	G	H	I	J	K	
1	MapDate	StateAbbreviation	None	D0	D1	D2	D3	D4	ValidStart	ValidEnd	StatisticFormatID	
2	20191231	AK	542,876.38	34,868.60	4,836.49	0	0	0	12/31/2019	1/6/2020	2	
3	20191224	AK	542,876.38	34,868.60	4,836.49	0	0	0	12/24/2019	12/30/2019	2	
4	20191217	AK	542,876.38	34,868.60	4,836.49	0	0	0	12/17/2019	12/23/2019	2	
5	20191210	AK	538,762.66	38,982.32	4,836.49	0	0	0	12/10/2019	12/16/2019	2	
6	20191203	AK	538,762.66	38,982.32	4,836.49	0	0	0	12/3/2019	12/9/2019	2	
7	20191126	AK	531,161.80	46,583.18	4,836.49	0	0	0	11/26/2019	12/2/2019	2	
8	20191119	AK	531,161.80	46,583.18	4,836.49	0	0	0	11/19/2019	11/25/2019	2	
9	20191112	AK	526,039.56	33,474.37	23,067.55	0	0	0	11/12/2019	11/18/2019	2	
10	20191105	AK	526,039.56	33,474.37	23,067.55	0	0	0	11/5/2019	11/11/2019	2	
11	20191029	AK	526,039.56	33,474.37	11,403.17	11,664.38	0	0	10/29/2019	11/4/2019	2	
12	20191022	AK	520,131.75	34,536.45	16,248.90	11,664.38	0	0	10/22/2019	10/28/2019	2	
13	20191015	AK	520,131.75	34,536.45	16,248.90	11,664.38	0	0	10/15/2019	10/21/2019	2	
14	20191008	AK	516,396.68	36,906.96	17,613.45	6,563.22	5,101.16	0	10/8/2019	10/14/2019	2	
15	20191001	AK	516,396.68	36,906.96	17,613.45	6,563.22	5,101.16	0	10/1/2019	10/7/2019	2	
16	20190924	AK	479,134.69	43,109.52	44,924.26	10,311.84	5,101.16	0	9/24/2019	9/30/2019	2	
17	20190917	AK	443,823.87	69,516.77	35,048.31	25,445.27	8,747.25	0	9/17/2019	9/23/2019	2	
18	20190910	AK	413,374.73	65,250.38	64,537.01	30,672.11	8,747.25	0	9/10/2019	9/16/2019	2	
19	20190903	AK	402,551.51	76,073.60	64,537.01	30,672.11	8,747.25	0	9/3/2019	9/9/2019	2	
20	20190827	AK	388,413.49	90,211.62	64,537.01	30,672.11	8,747.25	0	8/27/2019	9/2/2019	2	
21	20190820	AK	388,413.49	128,950.14	38,509.95	19,027.34	7,680.55	0	8/20/2019	8/26/2019	2	
22	20190813	AK	404,160.77	122,337.76	34,138.30	16,843.48	5,101.16	0	8/13/2019	8/19/2019	2	
23	20190806	AK	296,295.86	218,455.74	56,165.49	6,563.22	5,101.16	0	8/6/2019	8/12/2019	2	
24	20190730	AK	176,941.52	263,079.15	108,830.47	28,629.18	5,101.16	0	7/30/2019	8/5/2019	2	
25	20190723	AK	176,941.52	263,079.15	108,830.47	28,629.18	5,101.16	0	7/23/2019	7/29/2019	2	
26	20190716	AK	178,779.89	263,403.42	128,733.79	6,563.22	5,101.16	0	7/16/2019	7/22/2019	2	
27	20190709	AK	219,361.75	332,667.74	20,951.14	4,499.68	5,101.16	0	7/9/2019	7/15/2019	2	
28	20190702	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	7/2/2019	7/8/2019	2	
29	20190625	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	6/25/2019	7/1/2019	2	
30	20190618	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	6/18/2019	6/24/2019	2	
31	20190611	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	6/11/2019	6/17/2019	2	
32	20190604	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	6/4/2019	6/10/2019	2	
33	20190528	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	5/28/2019	6/3/2019	2	
34	20190521	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	5/21/2019	5/27/2019	2	
35	20190514	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	5/14/2019	5/20/2019	2	
36	20190507	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	5/7/2019	5/13/2019	2	
37	20190430	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	4/30/2019	5/6/2019	2	
38	20190423	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	4/23/2019	4/29/2019	2	
39	20190416	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	4/16/2019	4/22/2019	2	
40	20190409	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	4/9/2019	4/15/2019	2	
41	20190402	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	4/2/2019	4/8/2019	2	
42	20190326	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	3/26/2019	4/1/2019	2	
43	20190319	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	3/19/2019	3/25/2019	2	
44	20190312	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	3/12/2019	3/18/2019	2	
45	20190305	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	3/5/2019	3/11/2019	2	
46	20190228	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	2/28/2019	3/5/2019	2	
47	20190221	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	2/21/2019	2/27/2019	2	
48	20190214	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	2/14/2019	2/20/2019	2	
49	20190207	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	2/7/2019	2/13/2019	2	
50	20190131	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	1/31/2019	2/6/2019	2	
51	20190124	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	1/24/2019	1/30/2019	2	
52	20190117	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	1/17/2019	1/23/2019	2	
53	20190110	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	1/10/2019	1/16/2019	2	
54	20190103	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	1/3/2019	1/9/2019	2	
55	20181227	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	12/27/2018	1/2/2019	2	
56	20181220	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	12/20/2018	12/26/2018	2	
57	20181213	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	12/13/2018	12/19/2018	2	
58	20181206	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	12/6/2018	12/12/2018	2	
59	20181129	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	11/29/2018	12/5/2018	2	
60	20181122	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	11/22/2018	11/28/2018	2	
61	20181115	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	11/15/2018	11/21/2018	2	
62	20181108	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	11/8/2018	11/14/2018	2	
63	20181101	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	11/1/2018	11/7/2018	2	
64	20181025	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	10/25/2018	10/31/2018	2	
65	20181018	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	10/18/2018	10/24/2018	2	
66	20181011	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	10/11/2018	10/17/2018	2	
67	20181004	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	10/4/2018	10/10/2018	2	
68	20180927	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	9/27/2018	10/3/2018	2	
69	20180920	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	9/20/2018	9/26/2018	2	
70	20180913	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	9/13/2018	9/19/2018	2	
71	20180906	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	9/6/2018	9/12/2018	2	
72	20180830	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	8/30/2018	9/5/2018	2	
73	20180823	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	8/23/2018	8/29/2018	2	
74	20180816	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	8/16/2018	8/22/2018	2	
75	20180809	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	8/9/2018	8/15/2018	2	
76	20180802	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	8/2/2018	8/8/2018	2	
77	20180726	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	7/26/2018	8/1/2018	2	
78	20180719	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	7/19/2018	7/25/2018	2	
79	20180712	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	7/12/2018	7/18/2018	2	
80	20180705	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	7/5/2018	7/11/2018	2	
81	20180628	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	6/28/2018	7/4/2018	2	
82	20180621	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	6/21/2018	6/27/2018	2	
83	20180614	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	6/14/2018	6/20/2018	2	
84	20180607	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	6/7/2018	6/13/2018	2	
85	20180531	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	5/31/2018	6/6/2018	2	
86	20180524	AK	510,602.43	55,792.30	6,585.91	4,499.68	5,101.16	0	5/24/2018	5/30/2018	2	