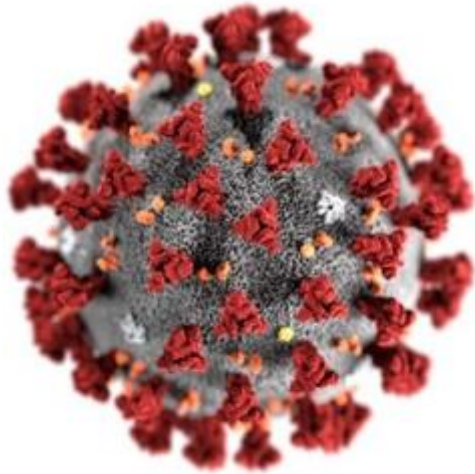


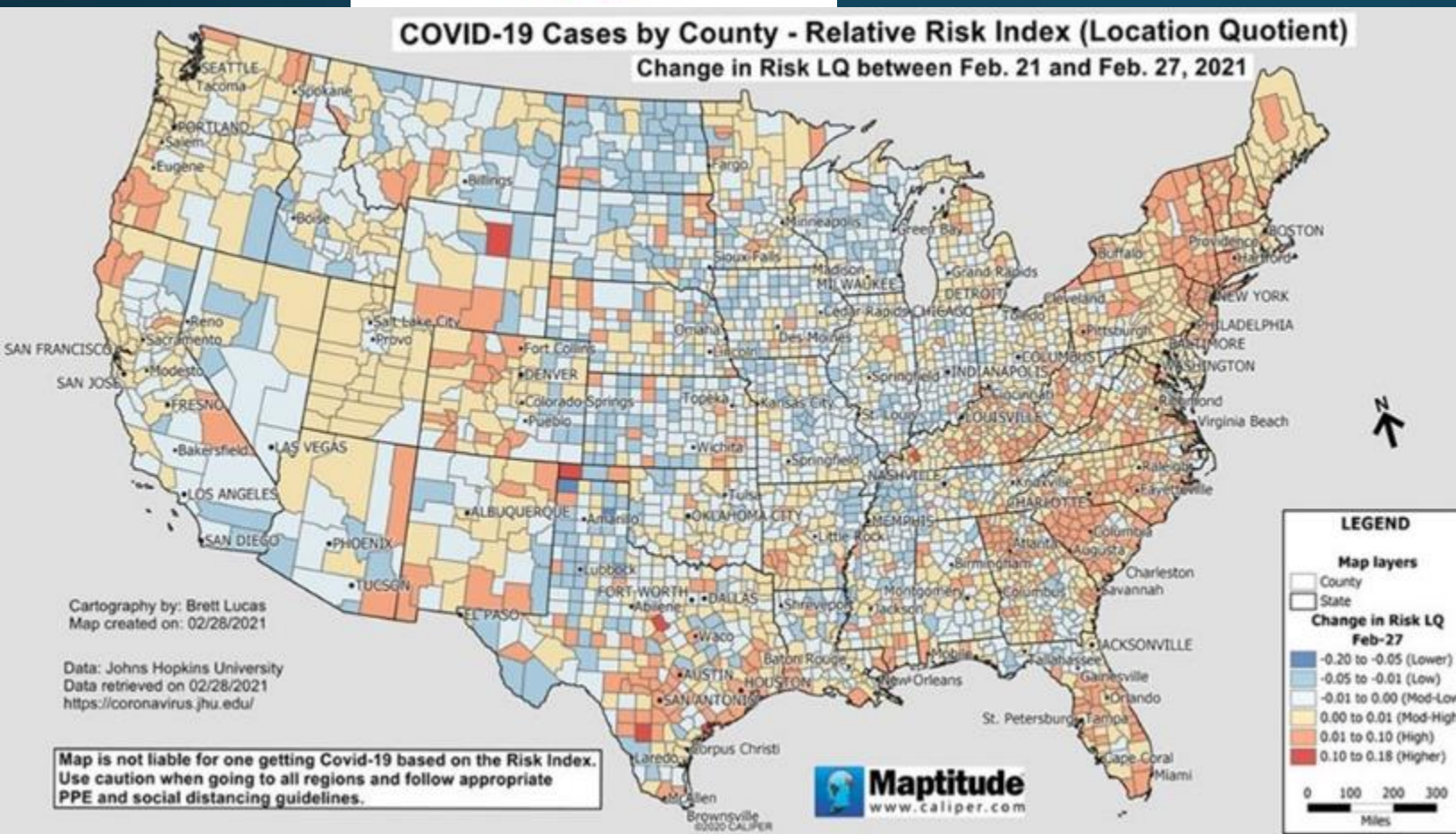
How to Map Covid-19 Data for the United States



A GIS Application in Medical/Health Geography

*Troy University
April 6, 2021*

Brett Lucas – Spokane, WA



Purpose of Presentation

- Introduce the student to the Maptitude GIS software package
- Use some of the tools in Maptitude to map Covid-19
- Mapping Covid-19 at the National level based on County level data
 - The importance of having strong “Excel” skills in data cleanup and data manipulation in preparation for GIS mapping
 - The use of use of heat maps and thematic maps to show the spread of Covid-19 on a weekly basis
 - What are the limitations with the maps I have created?
- What are some other opportunities in GIS for mapping Covid-19?

Johns Hopkins University – Covid-19 data

<https://github.com/CSSEGISandData/COVID-19>

CSSEGISandData Merge pull request #3737 from CSSEGISandData/patch-ri-deaths-2... d57ec7a 1 hour ago 2,761 commits

archived_data	archived_0325	11 months ago
csse_covid_19_data	Update readme for RI	1 hour ago
who_covid_19_situation_reports	update who readme	6 months ago
.gitignore	update	13 months ago
README.md	Update README.md	13 days ago

CSSEGISandData Update readme for RI 16c3c5d 1 hour ago History

..

csse_covid_19_daily_reports	Distribute RI deaths from 2020-03-27 to 2021-02-26	1 hour ago
csse_covid_19_daily_reports_us	Distribute RI deaths from 2020-03-27 to 2021-02-26	1 hour ago
csse_covid_19_time_series	Distribute RI deaths from 2020-03-27 to 2021-02-26	1 hour ago
README.md	Update readme for RI	1 hour ago
UID_ISO_FIPS_LookUp_Table.csv	Update UID_ISO_FIPS_LookUp_Table.csv	5 days ago

Johns Hopkins University – Covid-19 data

<https://github.com/CSSEGISandData/COVID-19>

02-27-2020.csv	Patch Thailand data from 2020-01-22 to 2021-01-10	2 months ago
02-27-2021.csv	Automated update	11 hours ago
02-28-2020.csv	Patch Lithuania data from 2020-02-28 to 2021-02-01	26 days ago

3982 lines (3982 sloc) | 556 KB

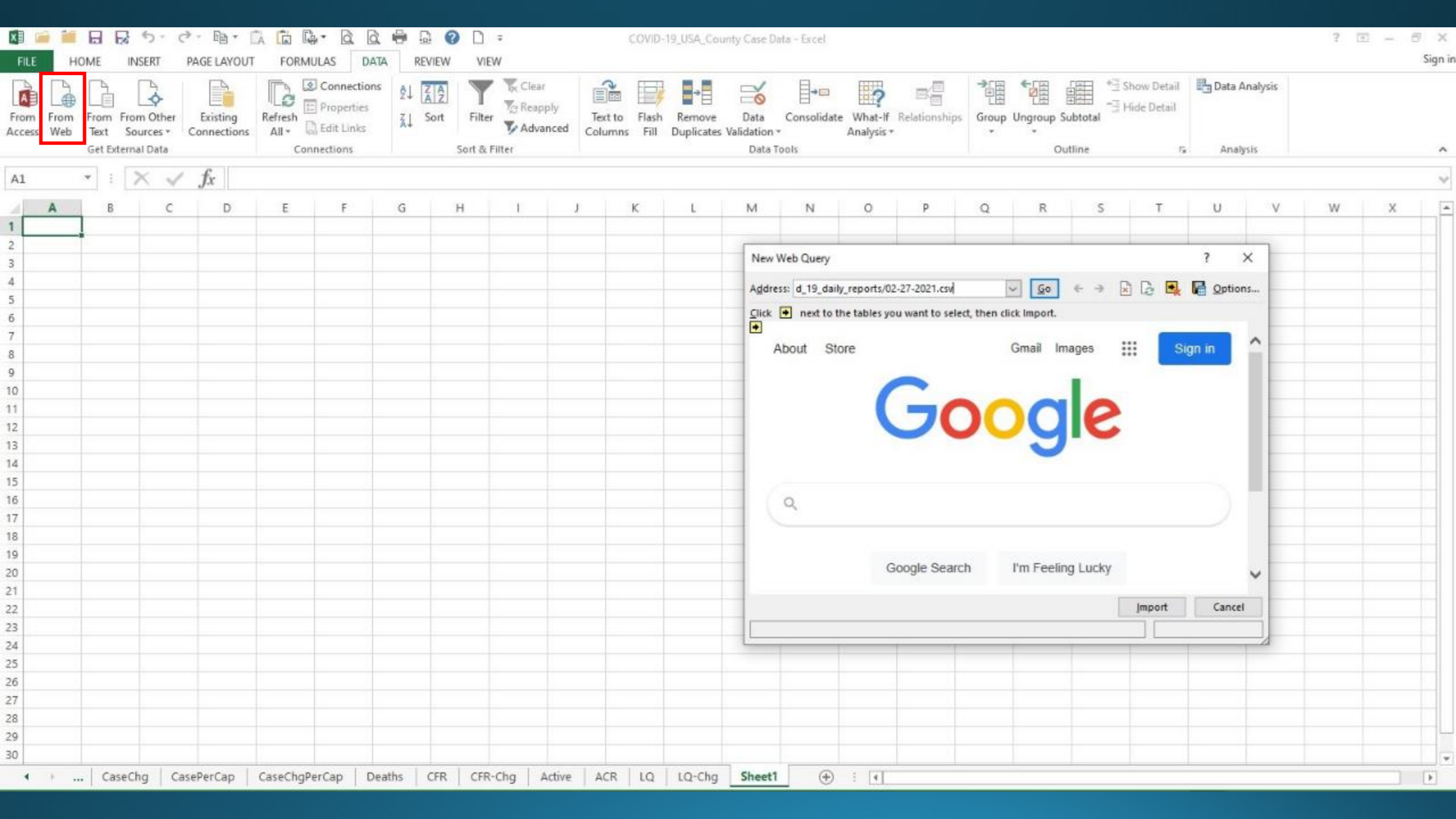
Raw

Blame



We can't make this file beautiful and searchable because it's too large.

```
1 FIPS,Admin2,Province_State,Country_Region,Last_Update,Lat,Long_,Confirmed,Deaths,Recovered,Active,Combined_Key,Incident_Rate,Case_Fatality_Ratio
2 ,,,Afghanistan,2021-02-28 05:22:20,33.93911,67.709953,55707,2443,49288,3976,Afghanistan,143.10139751396034,4.385445276177141
3 ,,,Albania,2021-02-28 05:22:20,41.1533,20.1683,106215,1775,68969,35471,Albania,3690.8402251720063,1.6711387280515935
4 ,,,Algeria,2021-02-28 05:22:20,28.0339,1.6596,112960,2979,77976,32005,Algeria,257.5993460406404,2.6372167138810196
5 ,,,Andorra,2021-02-28 05:22:20,42.5063,1.5218,10849,110,10429,310,Andorra,14041.286481589335,1.0139183334869573
6 ,,,Angola,2021-02-28 05:22:20,-11.2027,17.8739,20782,506,19315,961,Angola,63.232004315184184,2.434799345587528
7 ,,,Antigua and Barbuda,2021-02-28 05:22:20,17.0608,-61.7964,726,14,291,421,Antigua and Barbuda,741.3609999183074,1.9283746556473829
8 ,,,Argentina,2021-02-28 05:22:20,-38.4161,-63.6167,2104197,51946,1899087,153164,Argentina,4655.738079245767,2.4686852039043874
9 ,,,Armenia,2021-02-28 05:22:20,40.0691,45.0382,171793,3190,163309,5294,Armenia,5797.483425203679,1.8568859033837235
10 ,,Australian Capital Territory,Australia,2021-02-28 05:22:20,-35.4735,149.0124,118,3,115,0,"Australian Capital Territory, Australia",27.563653352020555,2.54237288135
11 ,,New South Wales,Australia,2021-02-28 05:22:20,-33.8688,151.2093,5177,54,0,5123,"New South Wales, Australia",63.77186499137719,1.0430751400424956
12 ,,Northern Territory,Australia,2021-02-28 05:22:20,-12.4634,130.8456,105,0,103,2,"Northern Territory, Australia",42.75244299674267,0.0
13 ,,Queensland,Australia,2021-02-28 05:22:20,-27.4698,153.0251,1329,6,1311,12,"Queensland, Australia",25.979865115824452,0.45146726862302483
14 ,,South Australia,Australia,2021-02-28 05:22:20,-34.9285,138.6007,613,4,606,3,"South Australia, Australia",34.89894676914318,0.6525285481239804
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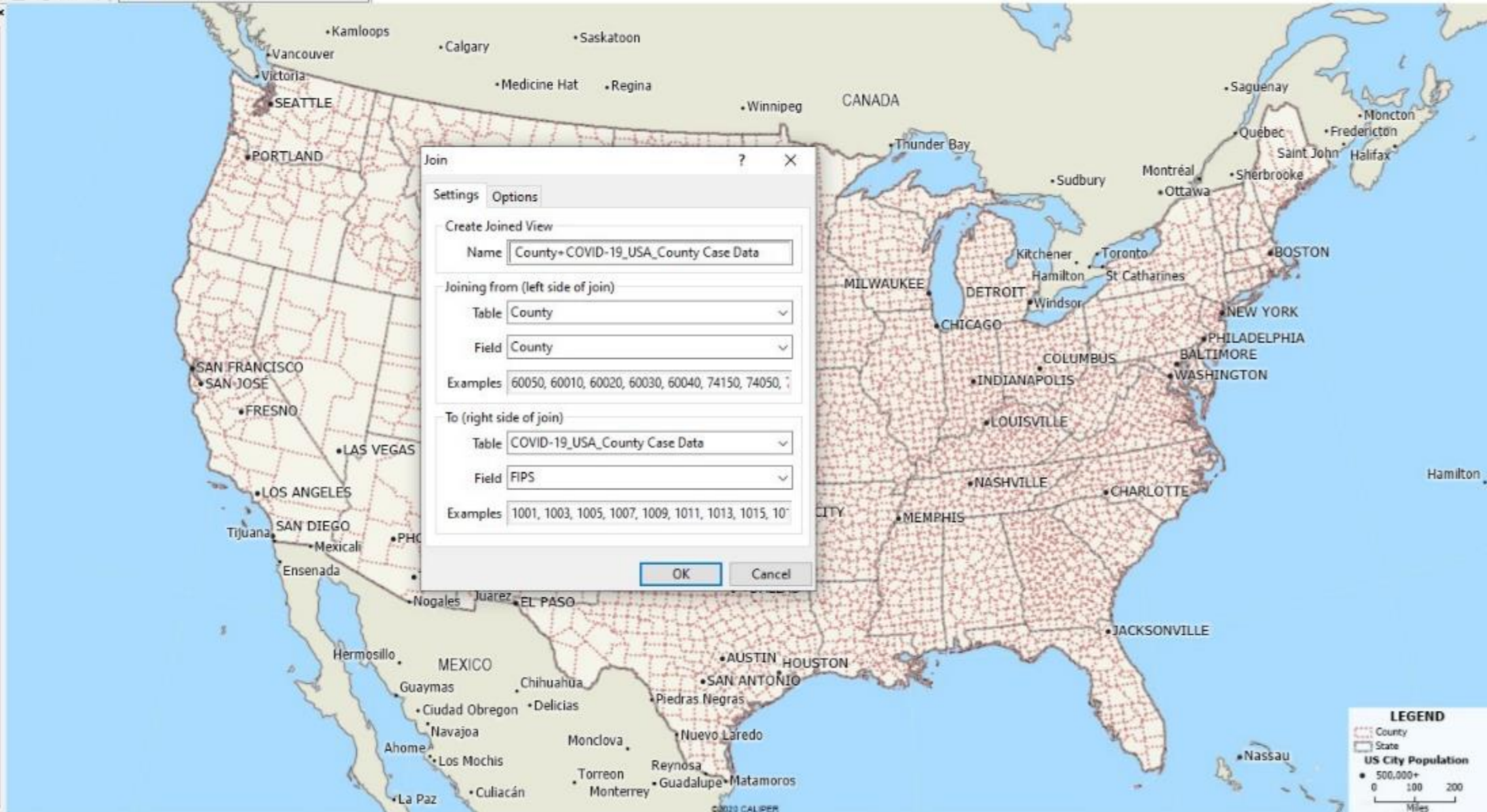
Microsoft Excel interface showing a spreadsheet with columns A through F. The spreadsheet contains data for various FIPS codes and their corresponding counts for Confirmed, Deaths, and Active cases. The FIPS codes range from 1001 to 1057, and the data is organized by Province/State (Alabama).

FIPS	Admin2	Province_State	Confirmed	Deaths	Active
1001	Autauga	Alabama	6248	91	6157
1003	Baldwin	Alabama	19714	283	19431
1005	Barbour	Alabama	2113	51	2062
1007	Bibb	Alabama	2449	60	2389
1009	Blount	Alabama	6095	127	5968
1011	Bullock	Alabama	1167	36	1131
1013	Butler	Alabama	1956	66	1890
1015	Calhoun	Alabama	13232	286	12946
1017	Chambers	Alabama	3406	110	3296
1019	Cherokee	Alabama	1768	38	1730
1021	Chilton	Alabama	3868	100	3768
1023	Choctaw	Alabama	550	23	527
1025	Clarke	Alabama	3436	50	3386
1027	Clay	Alabama	1438	54	1384
1029	Cleburne	Alabama	1373	39	1334
1031	Coffee	Alabama	5238	102	5136
1033	Colbert	Alabama	6000	118	5882
1035	Conecuh	Alabama	1067	24	1043
1037	Coosa	Alabama	888	23	865
1039	Covington	Alabama	3953	106	3847
1041	Crenshaw	Alabama	1443	54	1389
1043	Cullman	Alabama	8891	181	8710
1045	Dale	Alabama	4637	107	4530
1047	Dallas	Alabama	3401	141	3260
1049	DeKalb	Alabama	8441	175	8266
1051	Elmore	Alabama	9371	185	9186
1053	Escambia	Alabama	3772	72	3700
1055	Etowah	Alabama	13163	319	12844
1057	Fayette	Alabama	2002	56	1946

Microsoft Excel interface showing a spreadsheet with columns A through F. The spreadsheet contains data for various FIPS codes and their corresponding counts for Confirmed, Deaths, and Active cases. The FIPS codes range from 48487 to 50023, and the data is organized by Province/State (Texas and Vermont). A red box highlights a range of rows, and the word "Problem?" is written in red above it. The word "FIPS" is written in large red letters across the highlighted area.

FIPS	Admin2	Province_State	Confirmed	Deaths	Active
48487	Wilbarger	Texas	1868	51	1817
48489	Willacy	Texas	2429	78	2351
48491	Williamson	Texas	39586	398	39188
48493	Wilson	Texas	4117	55	4062
48495	Winkler	Texas	710	20	690
48497	Wise	Texas	6916	110	6806
48499	Wood	Texas	3239	116	3123
48501	Yoakum	Texas	862	26	836
48503	Young	Texas	2111	40	2071
48505	Zapata	Texas	1725	25	1700
48507	Zavala	Texas	1809	37	1772
49011	Davis	Utah	34644	140	34504
49035	Salt Lake	Utah	138506	761	137745
49037	San Juan	Utah	1811	36	1775
49043	Summit	Utah	4989	8	4981
49045	Tooele	Utah	6536	35	6501
49049	Utah	Utah	89981	332	89649
49051	Wasatch	Utah	4324	20	4304
50001	Addison	Vermont	741	8	733
50003	Bennington	Vermont	1437	9	1428
50005	Caledonia	Vermont	418	5	413
50007	Chittenden	Vermont	4848	88	4760
50009	Essex	Vermont	163	1	162
50011	Franklin	Vermont	1237	35	1202
50013	Grand Isle	Vermont	111	0	111
50015	Lamoille	Vermont	465	2	463
50017	Orange	Vermont	508	3	505
50019	Orleans	Vermont	441	6	435
50021	Rutland	Vermont	1291	11	1280
50023	Washington	Vermont	1432	13	1419

- Display Manager
- 10 Degree Grid Area
 - World Country
 - World Province
 - Census Place
 - Landmark Area
 - Water Area
 - Census Tract
 - 5-Digit ZIP Code
 - 3-Digit ZIP Code
 - County Subdivision
 - County**
 - State**
 - MSA
 - Building Footprint
 - River/Brook/Stream
 - Street
 - Highway/Freeway
 - Railroad
 - Time Zone
 - 5-Digit ZIP Point
 - Landmark
 - World City
 - City/Town



LEGEND

- County
- State
- US City Population**
- 500,000+
- 100
- 200

Miles

	A	B	C	D	E	F	G
2777	48505	Zapata TX	TX	1725	25	1700	
2778	48507	Zavala TX	TX	1809	37	1772	
2779	49001	Beaver UT	UT	0	0	0	
2780	49003	Box Elder UT	UT	0	0	0	
2781	49005	Cache UT	UT	0	0	0	
2782	49007	Carbon UT	UT	0	0	0	
2783	49009	Daggett UT	UT	0	0	0	
2784	49011	Davis UT	UT	34644	140	34504	
2785	49013	Duchesne UT	UT	0	0	0	
2786	49015	Emery UT	UT	0	0	0	
2787	49017	Garfield UT	UT	0	0	0	
2788	49019	Grand UT	UT	0	0	0	
2789	49021	Iron UT	UT	0	0	0	
2790	49023	Juab UT	UT	0	0	0	
2791	49025	Kane UT	UT	0	0	0	
2792	49027	Millard UT	UT	0	0	0	
2793	49029	Morgan UT	UT	0	0	0	
2794	49031	Piute UT	UT	0	0	0	
2795	49033	Rich UT	UT	0	0	0	
2796	49035	Salt Lake UT	UT	138506	761	137745	
2797	49037	San Juan UT	UT	1811	36	1775	
2798	49039	Sanpete UT	UT	0	0	0	
2799	49041	Sevier UT	UT	0	0	0	
2800	49043	Summit UT	UT	4989	8	4981	
2801	49045	Tooele UT	UT	6536	35	6501	
2802	49047	Uintah UT	UT	0	0	0	
2803	49049	Utah UT	UT	89981	332	89649	
2804	49051	Wasatch UT	UT	4324	20	4304	
2805	49053	Washington UT	UT	0	0	0	
2806	49055	Wayne UT	UT	0	0	0	

Once the “Data Join” is completed in Maptitude, export the table with the data join back out as an Excel Spreadsheet

Remove any extemporaneous rows

The new spreadsheet now shows a “zero” for counties without cases

Next we will bring in the requisite columns into our master spreadsheet, and do some map to get the data ready for mapping

Raw case data

Table with columns: FIPS, County Name, and dates from 1-Mar to 27-Feb. Includes a large red box highlighting the 'Cases' column in the bottom row.



Change in cases between Feb 20 and Feb 27

	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD
1	29-Aug	5-Sep	12-Sep	19-Sep	26-Sep	3-Oct	10-Oct	17-Oct	24-Oct	31-Oct	7-Nov	14-Nov	21-Nov	28-Nov	5-Dec	12-Dec	19-Dec	26-Dec	2-Jan	9-Jan	16-Jan	23-Jan	30-Jan	Feb-6	13-Feb	Feb-20	Feb-20	Feb-27	Feb-27		
2	45	62	61	258	83	45	80	85	62	111	108	168	162	138	244	279	440	301	269	579	305	204	238	260	146	90	6092	6248	=SUM(BA2-AZ2)		
3	270	235	210	309	465	522	142	160	285	303	248	408	535	602	893	1039	1057	986	1247	1247	965	952	794	746	383	341	19392	19714	SUM(number1, [number2], ...)		
4	-2	-8	4	215	50	36	21	35	54	29	32	31	34	16	46	50	61	68	130	120	74	82	126	71	38	27	2067	2113			
5	20	27	26	56	24	22	48	49	52	45	51	54	58	143	104	134	184	138	124	175	107	79	61	50	59	21	2414	2449			
6	73	58	52	437	66	38	49	103	116	149	212	232	217	187	359	463	447	255	283	318	239	170	193	253	49	83	6040	6095			
7	8	9	8	35	19	7	10	11	14	5	10	12	13	8	17	12	27	73	67	58	37	46	42	46	18	10	1149	1167			
8	25	26	12	44	4	11	28	38	17	15	24	29	57	33	60	81	87	53	84	95	56	47	69	63	35	40	1938	1956			
9	182	231	181	610	196	126	163	243	499	294	292	317	454	377	726	733	834	604	494	761	593	418	422	450	261	286	12915	13232			
10	-2	-14	10	267	38	36	38	24	83	39	94	73	113	99	133	96	119	87	183	234	192	216	140	85	59	46	3364	3406			
11	11	23	28	173	47	27	27	47	20	50	53	62	81	43	68	97	91	90	67	88	71	51	37	41	13	11	1753	1768			
12	113	114	84	251	103	52	73	66	89	69	63	67	76	90	138	155	149	136	207	218	105	90	88	78	109	59	3777	3868			
13	12	8	4	17	6	10	14	11	4	5	12	3	6	6	16	15	20	13	6	8	10	7	11	10	3	3	546	550			
14	32	13	8	114	51	43	73	43	83	51	41	60	52	37	76	373	141	109	155	181	170	184	202	145	57	34	3418	3436			
15	26	50	29	121	45	21	33	56	44	31	40	33	38	36	37	42	54	51	55	65	28	36	26	31	36	26	1416	1438			
16	24	32	37	54	59	42	43	48	40	27	39	37	81	32	47	59	65	50	53	71	49	43	51	52	16	17	1351	1373			
17	49	22	68	239	82	93	69	94	146	102	105	185	126	173	183	249	269	239	284	428	261	226	250	214	77	50	5198	5238			
18	81	56	33	99	60	56	82	79	117	146	299	257	216	196	397	290	284	311	329	324	232	188	224	157	60	38	5965	6000			
19	14	0	9	80	13	4	7	7	7	16	27	35	29	16	51	41	29	21	39	40	35	36	23	30	19	14	1064	1067			
20	-3	0	5	50	8	7	8	9	7	19	13	32	37	40	49	37	24	23	46	55	21	29	40	72	90	22	858	888			
21	-8	6	23	471	94	74	64	99	100	146	55	81	94	73	169	159	182	93	156	197	99	116	147	200	90	74	3896	3953			
22	22	11	18	106	17	6	16	21	23	14	21	30	29	11	30	30	58	70	64	156	59	51	56	58	39	31	1421	1443			
23	63	30	52	339	62	39	90	176	227	341	359	511	414	329	591	648	608	484	517	424	306	258	247	219	65	34	8822	8891			
24	48	22	63	243	62	112	38	62	147	155	121	130	85	84	184	238	242	172	242	283	239	153	165	134	114	78	4587	4637			
25	10	27	34	275	43	15	23	16	20	41	75	74	133	74	116	109	107	91	142	89	60	101	66	73	10	50	3328	3401			
26	68	60	38	213	77	129	242	292	290	270	199	318	402	278	427	503	575	350	294	348	284	200	218	171	83	56	8399	8441			
27	83	103	93	361	124	144	128	129	125	109	129	186	261	183	378	463	563	469	684	709	433	400	351	335	219	140	9228	9371			
28	40	36	43	274	49	39	34	18	21	41	57	46	71	43	113	162	121	140	194	240	200	184	147	135	76	37	3740	3772			
29	165	103	108	500	166	148	100	182	312	247	341	437	510	476	892	751	904	796	646	793	567	383	354	356	156	106	13042	13163			
30	19	27	30	80	41	14	21	39	37	34	50	69	91	98	129	115	134	87	75	105	105	107	70	68	23	43	1982	2002			

County Population

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
	FIPS	State	County Name	Population	21-Mar	28-Mar	4-Apr	11-Apr	18-Apr	25-Apr	2-May	9-May	16-May	23-May	30-May	6-Jun	13-Jun	20-Jun	27-Jun	4-Jul	11-Jul	18-Jul	25-Jul	1-Aug	8-Aug	15-Aug	22-Aug
2	01001	AL	Autauga	55200	0	10.9	21.7	34.4	45.3	65.2	81.5	123.2	199.3	280.8	391.3	469.2	599.6	769.9	891.3	1056.2	1224.6	1467.4	1630.4	1789.9	1967.4	2184.8	2289.9
3	01003	AL	Baldwin	208107	1	4.8	13.9	31.7	52.4	70.6	87	103.8	122.1	131.2	136	146.1	173.5	194.6	259	406.5	580	863	1259	1487.2	1682.8	1844.7	1939.9
4	01005	AL	Barbour	25782	0	0	7.8	34.9	69.8	124.1	166.8	225	306.4	407.3	581.8	736.9	876.6	1051.1	1217.9	1345.9	1528.2	1803.6	2001.4	2148.8	2222.5	2319.4	2428.9
5	01007	AL	Bibb	22527	0	0	17.8	57.7	115.4	150.9	186.4	199.8	222	257.5	319.6	341.8	443.9	546	701.4	830.1	981	1154.2	1385	1598.1	1891.1	2081.9	2232.9
6	01009	AL	Blount	57645	0	8.7	17.3	20.8	34.7	53.8	69.4	76.3	78.1	85	105.8	121.4	176.9	242.9	320.9	399	513.5	730.3	987.1	1221.3	1367	1481.5	1615.9
7	01011	AL	Bullock	10352	0	29	19.3	38.6	86.9	115.9	135.2	212.5	338.1	1014.3	1961	2173.5	2666.2	3129.8	3419.6	3554.9	3641.8	3786.7	3941.3	4211.7	4472.6	4781.7	5090.8
8	01013	AL	Butler	20025	0	5	5	30	64.9	104.9	459.4	888.9	1353.3	1672.9	2007.5	2207.2	2581.8	2846.4	2981.3	3116.1	3250.9	3350.8	3545.6	3710.4	3785.3	3935.1	4009.9
9	01015	AL	Calhoun	115098	0.9	2.6	18.2	49.5	57.3	77.3	85.1	107.7	112.9	119.9	133.8	151.2	165.1	176.4	205.9	288.4	425.7	629	894	1249.4	1530	1653.4	1854.9
10	01017	AL	Chambers	33826	5.9	50.3	257.2	535.1	709.5	833.7	869.2	928.3	969.7	975.6	1043.6	1102.7	1294.9	1484.1	1617.1	1844.7	1992.6	2158.1	2267.5	2385.7	2483.3	2524.7	2569.9
11	01019	AL	Cherokee	25853	0	3.9	23.2	27.1	46.4	46.4	58	85.1	104.4	127.6	143.1	154.7	181.8	216.6	255.3	328.8	475.8	611.1	742.7	858.7	1044.4	1156.5	1276.9
12	01021	AL	Chilton	43930	0	15.9	34.1	68.3	88.8	111.5	122.9	145.7	175.3	195.8	227.6	245.8	291.4	355.1	439.3	544	735.3	972	1297.5	1532	1793.8	1950.8	2101.9
13	01023	AL	Choctaw	13075	0	7.6	30.6	61.2	107.1	191.2	374.8	466.5	642.4	1063.1	1154.9	1185.5	1277.2	1414.9	1437.9	1491.4	1621.4	1797.3	1957.9	2072.7	2149.1	2233.3	2329.9
14	01025	AL	Clarke	24387	0	0	24.6	61.5	98.4	98.4	155.8	213.2	303.4	397.8	582.3	619.2	734	873.4	1049.7	1119.4	1279.4	1541.8	1767.3	1964.2	2714.6	3424	3616.9
15	01027	AL	Clay	13378	0	14.9	59.8	89.7	127.1	142	157	194.3	201.8	201.8	201.8	216.8	224.2	231.7	261.6	478.4	635.4	807.3	1106.3	1495	1883.7	2212.6	2362.9
16	01029	AL	Cleburne	14938	0	26.8	46.9	80.3	80.3	80.3	80.3	87	87	87	93.7	100.4	133.9	147.3	167.4	241	281.2	482	636	749.8	843.5	883.7	1178.9
17	01031	AL	Coffee	51288	0	0	13.6	33.1	107.2	169.6	230.1	284.7	319.8	382.2	446.5	475.7	534.2	606.4	661	727.3	826.7	1011.9	1205	1355.1	1474	1569.6	1752.9
18	01033	AL	Colbert	54495	0	1.8	9.2	14.7	27.5	42.2	67.9	117.4	159.6	229.4	326.6	378	456.9	541.3	625.7	717.5	908.3	1288.2	1589.1	1926.8	2148.8	2321.3	2453.9
19	01035	AL	Conecuh	12514	0	0	16	24	79.9	71.9	71.9	103.9	143.8	199.8	311.7	351.6	663.3	1078.8	1302.5	1630.2	1837.9	2229.5	2629.1	2900.8	3100.5	3212.4	3356.9
20	01037	AL	Coosa	10855	0	18.4	55.3	101.3	202.7	267.2	276.4	285.6	313.2	304	350.1	368.5	414.6	460.6	506.7	534.3	598.8	635.7	746.2	819.9	930.4	976.5	1031.9
21	01039	AL	Covington	37351	0	5.4	10.7	29.5	56.2	83	115.1	133.9	152.6	168.7	206.2	224.9	310.6	586.3	784.5	947.8	1108.4	1392.2	1673.3	1831.3	1965.1	2064.2	2187.9
22	01041	AL	Crenshaw	13865	0	7.2	14.4	14.4	43.3	72.1	151.5	274.1	382.3	418.3	548.1	598.6	771.7	815	872.7	901.6	916	1089.1	1608.4	2012.3	2264.7	2502.7	2639.9
23	01043	AL	Cullman	82313	1.2	8.5	18.2	37.7	51	57.1	69.2	76.5	83.8	89.9	153.1	218.7	303.7	365.7	451.9	533.3	693.7	940.3	1132.3	1324.2	1482.1	1528.3	1653.9
24	01045	AL	Dale	49255	0	0	4.1	12.2	34.5	46.7	56.8	87.3	121.8	162.4	223.3	266	347.2	410.1	467	572.5	793.8	1021.2	1364.3	1549.1	1679	1768.3	1936.9
25	01047	AL	Dallas	40029	0	5	17.5	25	55	79.9	122.4	254.8	362.2	477.2	649.5	754.5	1116.7	1548.9	1858.7	2195.9	2488.2	2750.5	2957.9	3160.2	3292.6	3405	3502.9
26	01049	AL	Dekalb	71200	0	5.6	18.3	29.5	56.2	85.7	108.1	199.4	269.7	300.6	341.3	376.4	436.8	560.4	741.6	993	1321.6	1785.1	2063.2	2317.4	2525.3	2658.7	2775.9
27	01051	AL	Elmore	81212	6.2	14.8	23.4	36.9	71.4	91.1	114.5	166.2	231.5	312.8	417.4	493.8	618.1	800.4	949.4	1111.9	1267.1	1504.7	1760.8	1923.4	2111.8	2216.4	2350.9
28	01053	AL	Escambia	37328	0	2.7	5.4	24.1	32.1	58.9	80.4	96.4	104.5	107.2	152.7	219.7	265.2	385.8	576	902.8	1285.9	1591.3	2170	2550.4	2879.9	2957.6	3131.9
29	01055	AL	Etowah	102939	0	5.8	25.3	71.9	90.3	117.5	137	165.1	196.2	221.5	240.9	262.3	292.4	376	531.4	706.2	923.8	1227.9	1568.9	1830.2	2043.9	2164.4	2408.9
30	01057	AL	Fayette	16585	0	0	6	18.1	24.1	24.1	36.2	42.2	54.3	66.3	90.4	102.5	223.1	349.7	391.9	410	494.4	705.5	808	1006.9	1230	1429	1597.9

Round the data to keep the math simple

Clipboard, Font, Alignment, Number, Styles toolbars

BD2 =ROUND(BC2,1)

Excel spreadsheet table with dates from 10-Oct to Feb-27 and numerical data across columns AH to BH. Cell BD2 is highlighted.

Function Arguments dialog box for the ROUND function. Shows Number: BC2, Num_digits: 1. Result: 11318.8

Change in Cases per capita between Feb 20 and Feb 27

Excel ribbon with Font, Alignment, Number, and Styles tabs.

BA2 =SUM(BB2-BA2)

	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE
	12-Sep	19-Sep	26-Sep	3-Oct	10-Oct	17-Oct	24-Oct	31-Oct	7-Nov	14-Nov	21-Nov	28-Nov	5-Dec	12-Dec	19-Dec	26-Dec	2-Jan	9-Jan	16-Jan	23-Jan	30-Jan	Feb-6	Feb-13	Feb-20	Feb-20	Feb-27	Feb-27		
2	110.5	467.4	150.4	81.5	144.9	154	117.7	201.1	195.7	304.3	293.5	250	442	505.5	797.1	545.3	487.3	1048.9	556.2	369.5	431.2	471	264.5	163	11036.2	=SUM(BB2-BA2)			
3	100.9	148.5	223.5	250.8	68.2	76.9	137.9	145.6	119.2	196	257.1	289.3	429.1	499.3	507.9	473.8	599.2	599.2	468	457.5	381.5	358.5	184	163.9	9318.3	=SUM(number1, [number2], ...)			
4	15.5	833.9	193.9	139.7	81.4	135.8	209.4	112.5	124.1	120.3	131.8	62.1	178.4	193.9	236.6	263.8	504.2	465.5	290.9	318	488.7	275.4	147.4	104.7	8017.2	8195.6			
5	115.4	248.6	106.6	97.6	213.1	217.5	235.3	199.7	226.4	239.8	257.4	634.8	461.7	594.8	816.8	612.6	550.5	776.8	470.6	350.7	270.7	222	261.9	93.2	10716	10871.4			
6	90.2	758.1	114.5	65.9	85	178.7	204.7	258.5	367.8	402.4	376.5	324.4	622.7	803.2	775.5	442.3	491	551.6	425	294.9	334.8	438.9	85	144	10477.9	10573.3			
7	77.3	338.1	183.5	67.7	96.6	106.2	135.3	48.3	96.6	115.9	125.6	77.2	164.3	115.9	260.8	705.2	647.2	560.3	357.4	444.3	405.8	444.3	173.9	96.6	11099.3	11273.2			
8	59.9	219.7	20	54.9	139.9	189.7	84.9	74.9	119.9	144.8	284.6	164.8	299.7	404.4	434.5	264.7	419.4	474.5	294.6	234.7	344.6	314.6	174.8	199.7	9677.9	9767.8			
9	157.3	529.9	170.3	109.5	141.6	211.1	435.3	255.5	253.7	275.4	394.4	327.6	630.7	636.9	724.6	524.8	429.2	661.1	543	363.2	366.7	390.9	226.8	248.5	11220.9	11496.3			
10	29.6	789.3	112.4	106.4	112.3	71	248.3	115.3	277.9	215.8	334.1	292.6	393.2	283.8	351.8	257.2	541	691.8	585.4	638.5	413.9	251.3	174.4	136	9945	10069.2			
11	108.3	669.1	181.8	104.5	104.4	181.8	77.4	193.4	205	239.8	313.3	166.3	263	375.2	352	348.2	259.1	340.4	297.8	197.3	143.1	158.6	50.3	42.5	6780.6	6838.7			
12	191.2	571.4	234.4	118.4	166.2	150.2	204.9	157.1	143.4	152.5	173	204.9	314.1	352.8	339.2	309.6	471.2	496.2	264.1	204.9	200.3	177.5	248.2	134.3	8597.8	8804.9			
13	30.6	130	45.9	76.5	107.1	84.1	30.6	38.2	91.8	23	45.8	45.9	122.4	114.7	153	99.4	45.9	61.2	91.8	53.5	84.1	76.5	23	22.9	4175.9	4206.5			
14	32.8	467.5	209.1	176.3	299.4	176.3	344.4	209.2	168.1	246	213.2	151.8	311.6	1529.5	578.2	446.9	635.6	742.2	725.8	754.5	828.3	594.6	233.7	139.5	14015.7	14089.5			
15	216.8	904.4	336.4	157	246.6	418.6	328.9	231.8	299	246.6	284.1	269.1	276.6	313.9	403.7	381.2	411.1	485.9	284	269.1	194.4	231.7	269.1	194.3	10584.5	10749			
16	247.7	361.5	394.9	281.2	287.9	321.3	274.5	180.7	261.1	247.7	542.2	214.2	314.7	394.9	435.2	334.7	354.8	475.3	368.2	287.8	341.4	348.1	107.1	113.8	9044	9191.3			
17	132.6	466	159.8	181.4	134.5	183.3	288.6	198.8	204.8	360.7	245.6	337.3	356.9	485.4	524.5	466	553.8	834.5	536.2	440.6	487.5	417.2	150.1	97.5	10134.9	10212.9			
18	60.6	181.7	110.1	102.7	150.5	145	223.8	268	548.6	471.6	396.4	359.7	728.5	532.1	521.2	570.7	603.7	594.5	447.8	345	411	288.1	110.1	69.8	10946	11010.2			
19	71.9	639.3	103.9	32	55.9	55.9	56	127.8	215.8	279.7	231.7	127.9	407.5	327.7	231.7	167.8	311.7	319.6	295.7	287.6	183.8	239.8	151.8	111.9	8502.5	8526.5			
20	46.1	460.6	73.7	64.5	73.7	82.9	64.5	175	119.8	294.8	340.9	368.4	451.5	340.8	221.1	211.9	423.8	506.6	248.8	267.1	368.5	663.3	829.1	202.7	7904.2	8180.6			
21	61.6	1261	251.7	198.1	171.3	265.1	267.7	390.9	147.2	216.9	251.7	195.4	452.5	425.7	487.2	249	417.7	527.4	332	310.6	393.5	535.5	241	198.1	10430.8	10583.4			
22	129.9	764.5	122.6	43.3	115.4	151.4	165.9	101	151.5	216.3	209.2	79.3	216.4	216.4	418.3	504.9	461.5	1125.2	483.2	367.8	403.9	418.4	281.2	223.6	10248.8	10407.5			
23	63.2	411.8	75.4	47.3	109.4	213.8	277	414.3	436.1	620.8	503	399.7	718	787.2	738.6	588	628.1	515.1	404.6	313.4	300.1	266.1	78.9	41.3	10717.6	10801.5			
24	127.9	493.3	125.9	227.4	77.1	125.9	298.5	314.7	245.6	264	172.5	170.6	373.5	483.2	491.3	349.3	491.3	574.5	519.8	310.6	335	272.1	231.4	158.4	9312.8	9414.3			
25	84.9	687	107.5	37.4	57.5	40	49.9	102.4	187.4	184.9	332.2	184.9	289.8	272.3	267.3	227.3	354.8	222.3	279.8	252.3	164.9	182.4	25	124.9	8314	8496.3			
26	53.3	299.2	108.1	181.2	339.9	410.1	411.5	379.2	279.5	446.7	564.6	390.4	599.7	706.5	807.6	491.6	412.9	488.7	448.1	280.9	306.2	240.1	116.6	78.6	11796.3	11855.3			
27	114.5	444.5	152.7	177.3	157.6	158.9	155.1	134.2	158.9	229	321.4	225.3	465.5	570.1	693.2	577.5	842.3	873	552.9	492.5	432.2	412.5	269.7	172.4	11362.9	11538.9			
28	115.2	734	131.3	104.5	91.1	48.2	61.6	109.8	152.7	123.3	190.2	115.2	302.7	434	324.1	375.1	519.7	643	557.2	492.9	393.8	361.7	203.6	99.1	10019.3	10105			
29	104.9	485.7	161.3	143.7	97.2	176.8	305	240	331.2	424.6	495.4	462.4	866.5	729.6	878.2	773.3	627.5	770.4	611	372.1	343.9	345.8	151.6	102.9	12669.6	12787.2			
30	180.9	482.3	247.2	84.5	126.6	235.1	229.2	205	301.4	416.1	548.7	590.9	777.8	693.4	807.9	524.6	452.2	633.1	663.3	645.1	422.1	410	138.7	259.3	11950.6	12071.1			

“Base map” - Use “County Centroid”

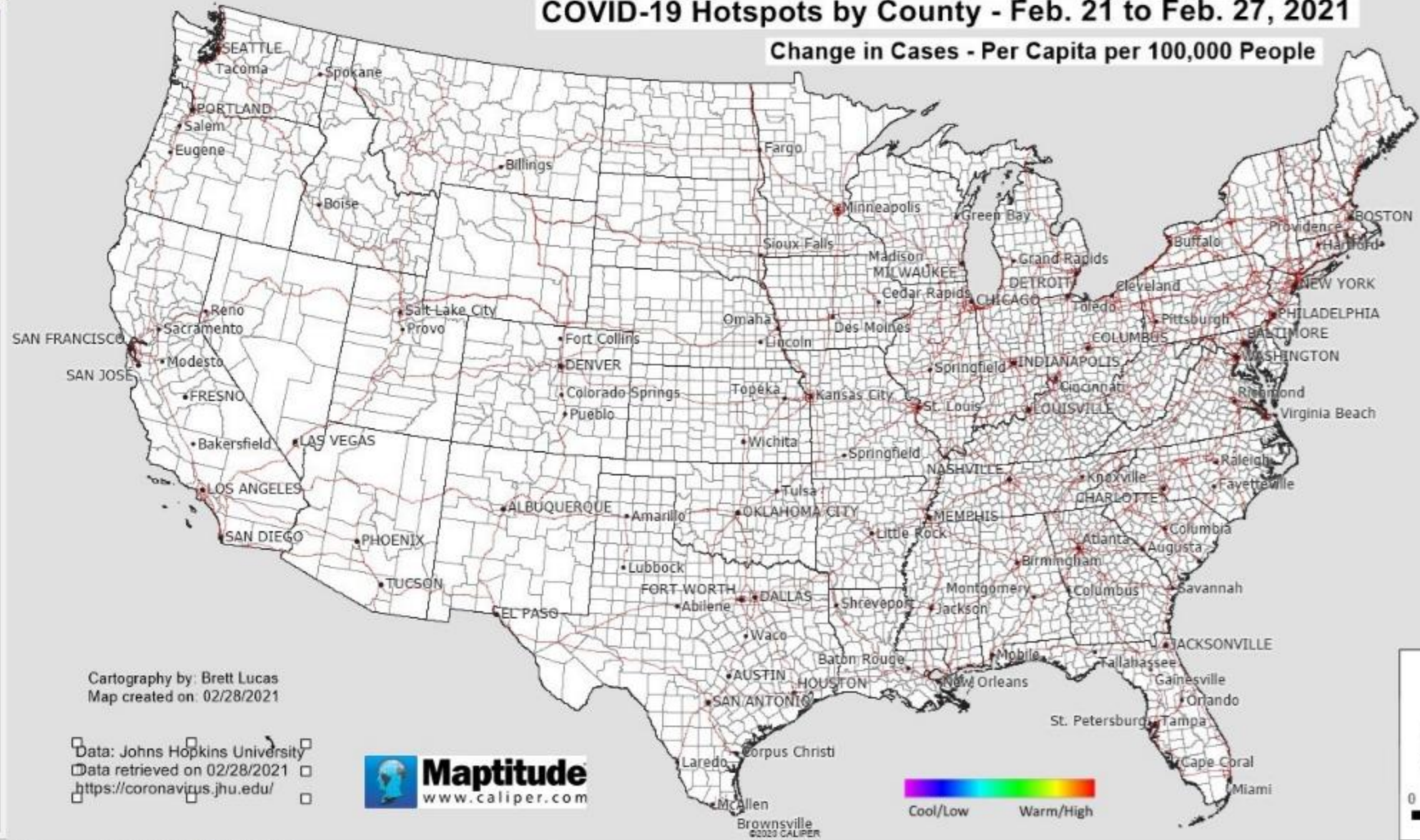


Display Manager

- 10 Degree Grid Area
- World Country
- World Province
- Census Place
- Landmark Area
- Water Area
- Census Tract
- 5-Digit ZIP Code
- 3-Digit ZIP Code
- County Subdivision
- County
- State
- MSA & Micropolitan
- CBSA Micropolitan
- Building Footprint
- River/Brook/Stream
- Street
- Highway/Freeway
- Railroad
- Density
- Time Zone
- 5-Digit ZIP Centroid
- Landmark
- World City
- County-Cent
- Interstate
- Density 02-20-21
- Populated Place

COVID-19 Hotspots by County - Feb. 21 to Feb. 27, 2021

Change in Cases - Per Capita per 100,000 People



Cartography by: Brett Lucas
Map created on: 02/28/2021

Data: Johns Hopkins University
Data retrieved on 02/28/2021
<https://coronavirus.jhu.edu/>



LEGEND

Map layers

- Interstate
- County
- State

0 100 200 300
Miles

“County” – current layer
“Join” – spreadsheet data

File Edit Map Dativew Selection Tools Window Help

New Dativew

Fields Selection (0)

Formula Fields... Ctrl+M

Tools

Statistics

Table

Display Manager

- 10 Dec
- World
- World
- Censu
- Landr
- Water Area
- Census Tract
- 5-Digit ZIP Code
- 3-Digit ZIP Code
- County Subdivision
- County
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New...

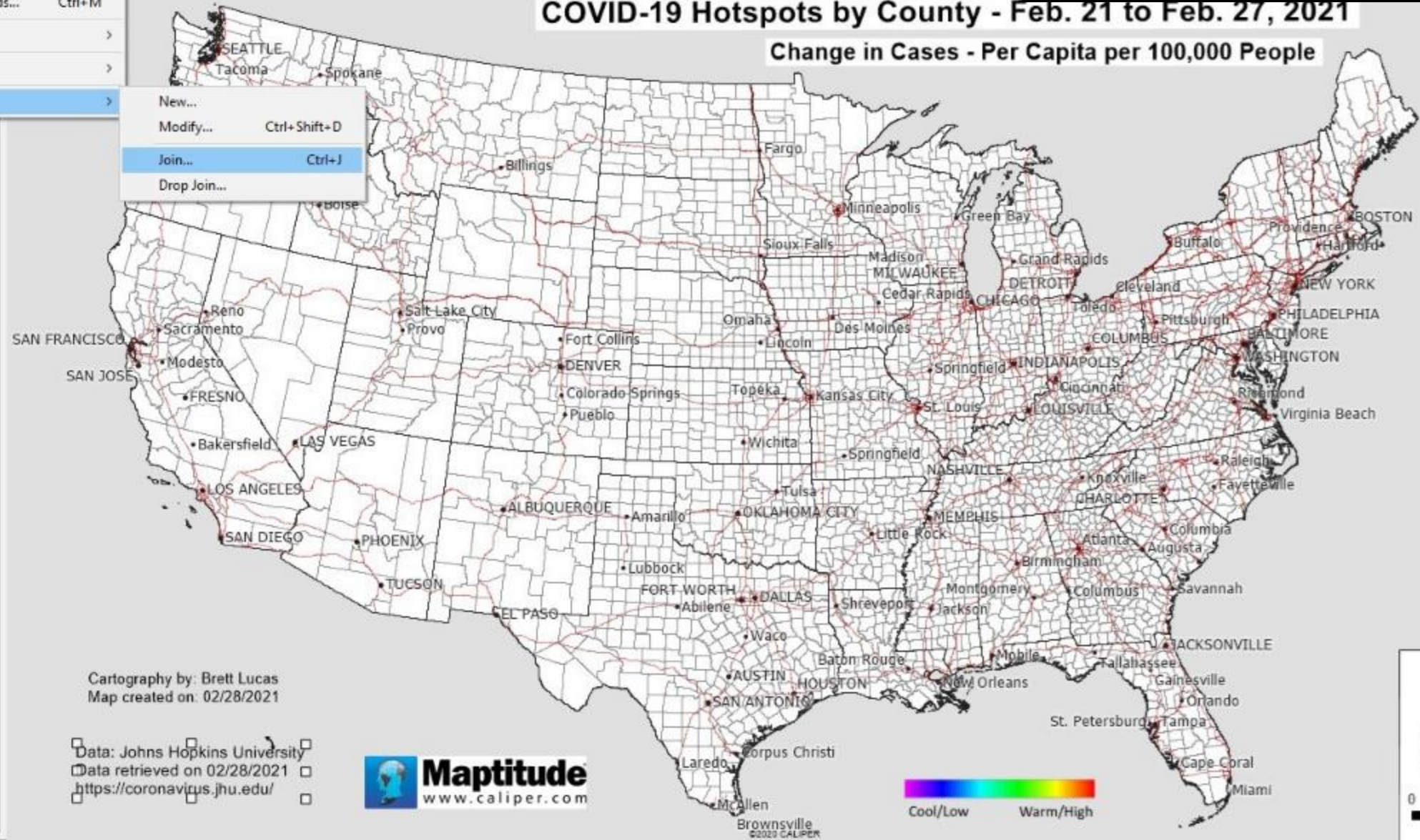
Modify... Ctrl+Shift+D

Join... Ctrl+J

Drop Join...

COVID-19 Hotspots by County - Feb. 21 to Feb. 27, 2021

Change in Cases - Per Capita per 100,000 People



Cartography by: Brett Lucas
Map created on: 02/28/2021

Data: Johns Hopkins University
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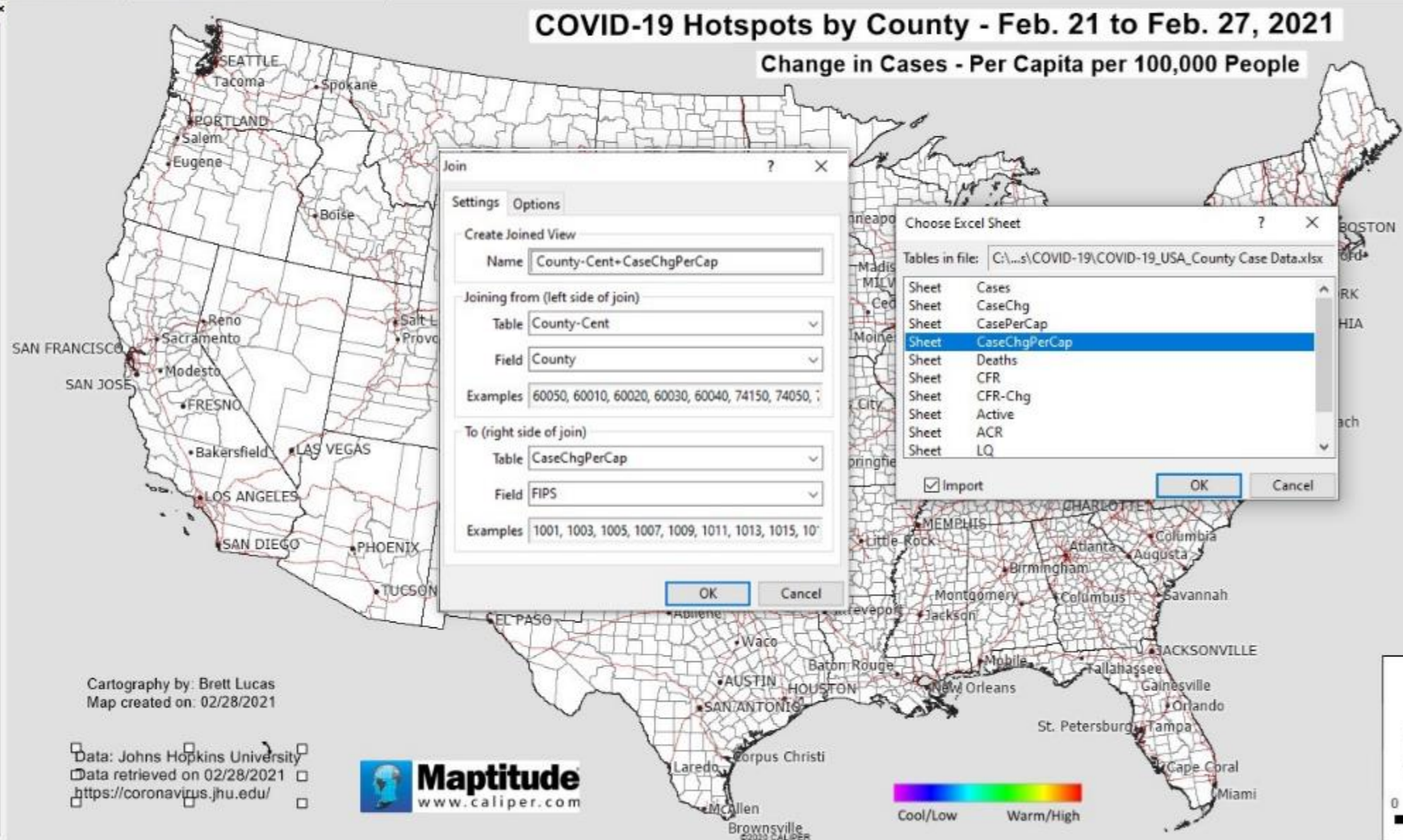
LEGEND

Map layers

- Interstate
- County
- State

0 100 200 300
Miles

- 10 Degree Grid Area
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COVID-19 Hotspots by County - Feb. 21 to Feb. 27, 2021

Change in Cases - Per Capita per 100,000 People

Join

Settings Options

Create Joined View

Name:

Joining from (left side of join)

Table:

Field:

Examples: 60050, 60010, 60020, 60030, 60040, 74150, 74050, ;

To (right side of join)

Table:

Field:

Examples: 1001, 1003, 1005, 1007, 1009, 1011, 1013, 1015, 1017, ;

Choose Excel Sheet

Tables in file: C:\...s\COVID-19\COVID-19_USA_County Case Data.xlsx

Sheet	Cases
Sheet	CaseChg
Sheet	CasePerCap
Sheet	CaseChgPerCap
Sheet	Deaths
Sheet	CFR
Sheet	CFR-Chg
Sheet	Active
Sheet	ACR
Sheet	LQ

Import

Cartography by: Brett Lucas
Map created on: 02/28/2021

Data: Johns Hopkins University
Data retrieved on 02/28/2021
<https://coronavirus.jhu.edu/>



LEGEND

Map layers

- Interstate
- County
- State

0 100 200 300
Miles

Table showing attached data



Display Manager

Dataview1 - County-Cent+ CaseChgPerCap

26-Dec 2-Jan 9-Jan 16-Jan 23-Jan 30-Jan Feb-6 Feb-13 Feb-20 Feb-27

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7.00	8.50	12.60	21.00	7.00	2.80	1.40	0.00	1.40	4.20
89.00	114.30	152.50	136.70	102.90	111.30	87.10	58.10	35.70	125.90
35.40	31.40	37.90	37.50	25.80	19.20	18.20	12.70	8.60	6.60
66.70	67.60	90.30	76.00	54.30	54.00	44.20	28.60	20.80	18.60
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
278.30	347.80	330.50	365.20	834.80	504.30	660.90	643.40	1634.80	1147.90
0.00	-29.20	0.00	29.20	905.10	437.90	5080.30	2627.80	175.20	175.10
60.50	90.70	40.30	110.80	110.80	40.40	40.30	70.50	20.10	40.30
231.80	1780.90	1012.40	658.70	1232.10	500.10	402.50	353.80	121.90	134.20
504.40	2062.10	1319.30	903.50	1153.00	986.70	532.20	482.20	160.80	166.30
142.20	77.60	956.80	478.40	543.10	155.20	38.70	51.80	116.30	25.90
0.00	218.20	218.10	0.00	509.10	0.00	-145.40	872.70	-218.20	0.00

Dataview1 - County-Cent+ CaseChgPerCap

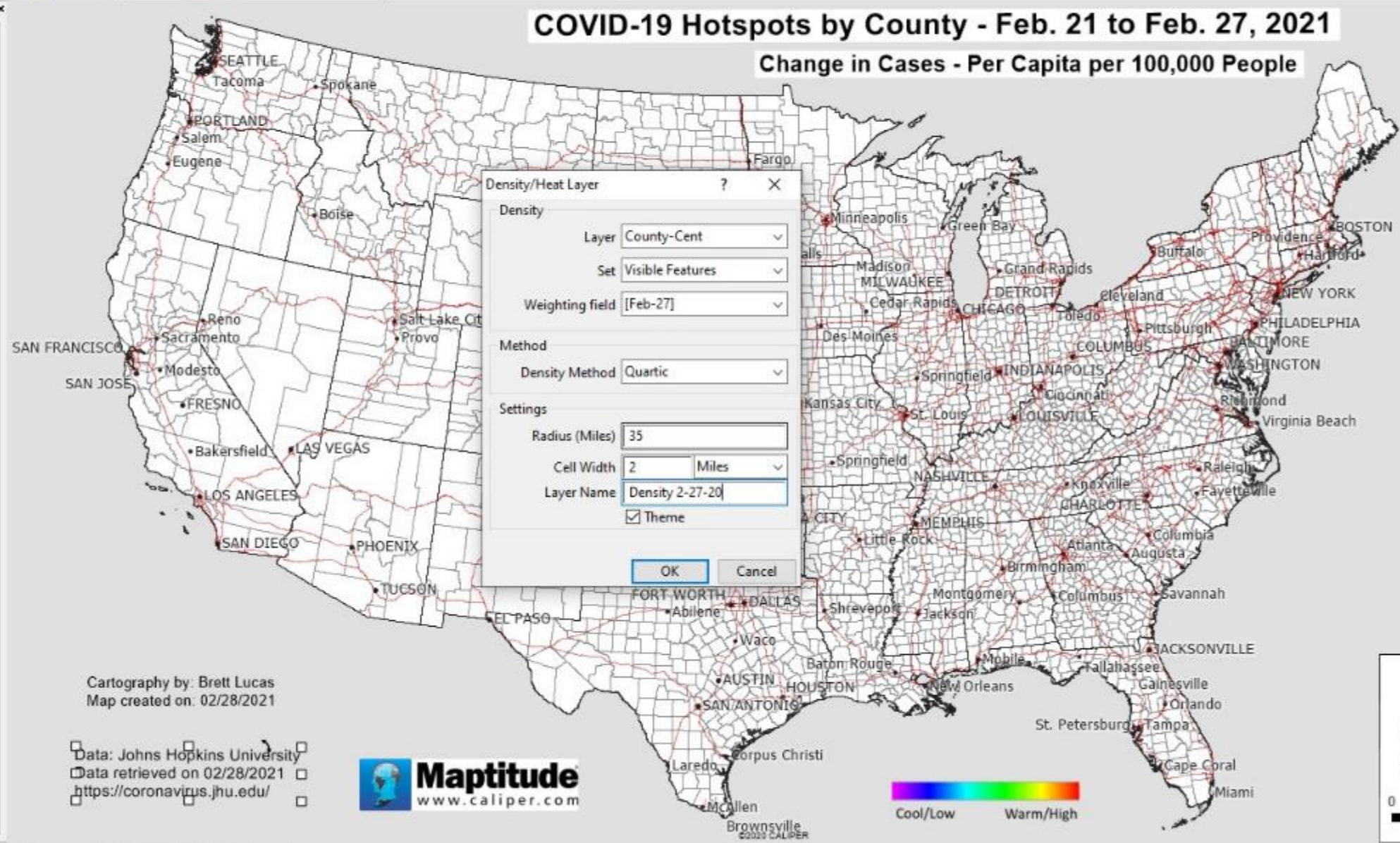
	26-Dec	2-Jan	9-Jan	16-Jan	23-Jan	30-Jan	Feb-6	Feb-13	Feb-20	Feb-27
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7.00	8.50	12.60	21.00	7.00	2.80	1.40	0.00	1.40	4.20	
89.00	114.30	152.50	136.70	102.90	111.30	87.10	58.10	35.70	125.90	
35.40	31.40	37.90	37.50	25.80	19.20	18.20	12.70	8.60	6.60	
66.70	67.60	90.30	76.00	54.30	54.00	44.20	28.60	20.80	18.60	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
278.30	347.80	330.50	365.20	834.80	504.30	660.90	643.40	1634.80	1147.90	
0.00	-29.20	0.00	29.20	905.10	437.90	5080.30	2627.80	175.20	175.10	
60.50	90.70	40.30	110.80	110.80	40.40	40.30	70.50	20.10	40.30	
231.80	1780.90	1012.40	658.70	1232.10	500.10	402.50	353.80	121.90	134.20	
504.40	2062.10	1319.30	903.50	1153.00	986.70	532.20	482.20	160.80	166.30	
142.20	77.60	956.80	478.40	543.10	155.20	38.70	51.80	116.30	25.90	
0.00	218.20	218.10	0.00	509.10	0.00	-145.40	872.70	-218.20	0.00	



Create a "density grid"



- Display Manager
- 10 Degree Grid Area
 - World Country
 - World Province
 - Census Place
 - Landmark Area
 - Water Area
 - Census Tract
 - 5-Digit ZIP Code
 - 3-Digit ZIP Code
 - County Subdivision
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 - Time Zone
 - 5-Digit ZIP Centroid
 - Landmark
 - World City
 - County-Cent
 - Interstate
 - Density 02-20-21
 - Populated Place



Cartography by: Brett Lucas
Map created on: 02/28/2021

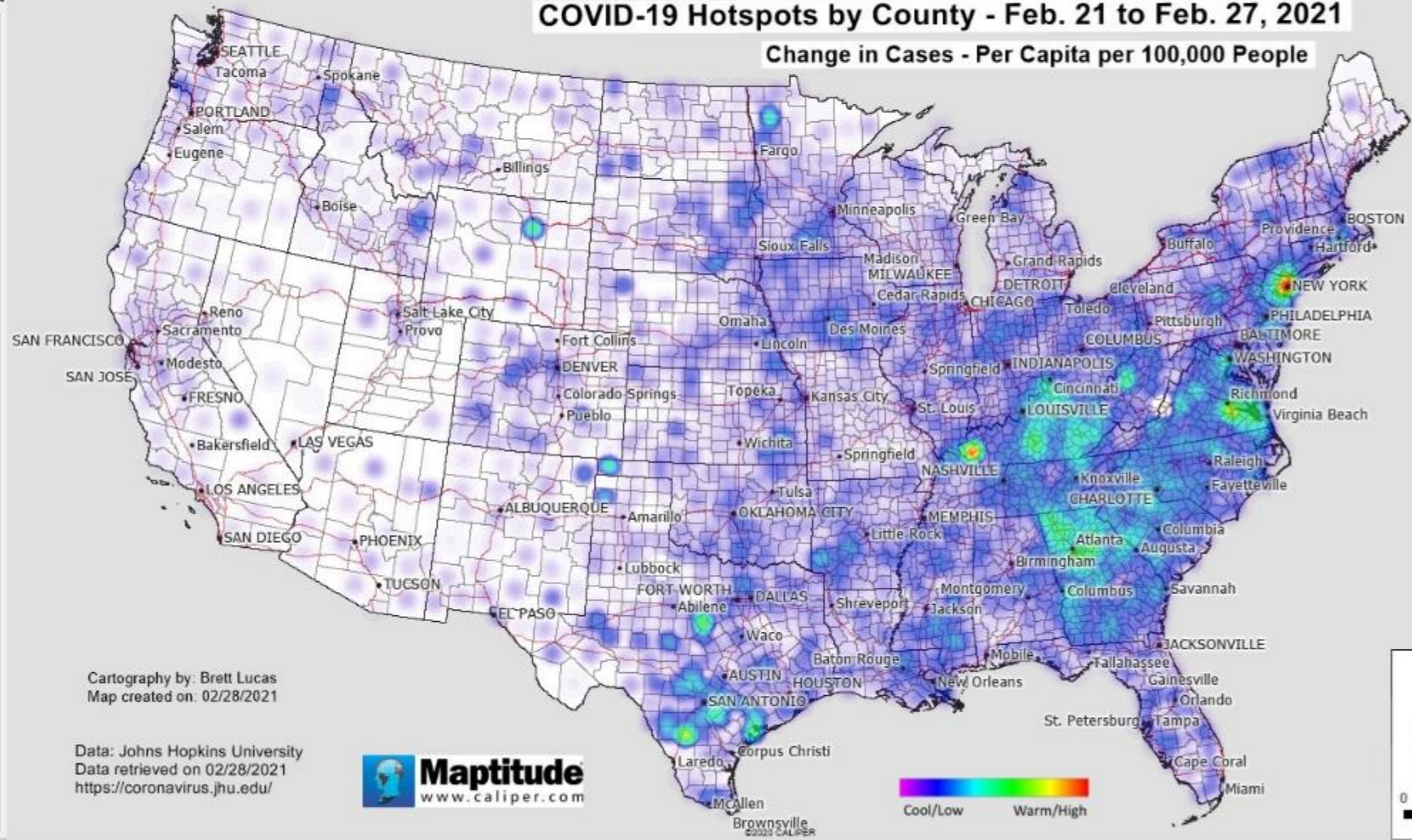
Data: Johns Hopkins University
Data retrieved on 02/28/2021
<https://coronavirus.jhu.edu/>



- 10 Degree Grid Area
- World Country
- World Province
- Census Place
- Landmark Area
- Water Area
- Census Tract
- 5-Digit ZIP Code
- 3-Digit ZIP Code
- County Subdivision
- County
- State
- MSA & Micropolitan
- CBSA Micropolitan
- Building Footprint
- River/Brook/Stream
- Street
- Highway/Freeway
- Railroad
- Density
- Time Zone
- 5-Digit ZIP Centroid
- Landmark
- World City
- County-Cent**
- Interstate
- Density 2-27-21
- Density 02-20-21
- Populated Place

COVID-19 Hotspots by County - Feb. 21 to Feb. 27, 2021

Change in Cases - Per Capita per 100,000 People



Cartography by: Brett Lucas
Map created on: 02/28/2021

Data: Johns Hopkins University
Data retrieved on 02/28/2021
<https://coronavirus.jhu.edu/>



LEGEND

Map layers

- Interstate
- County
- State

0 100 200 300
Miles

Location Quotient
Ratio of ratios

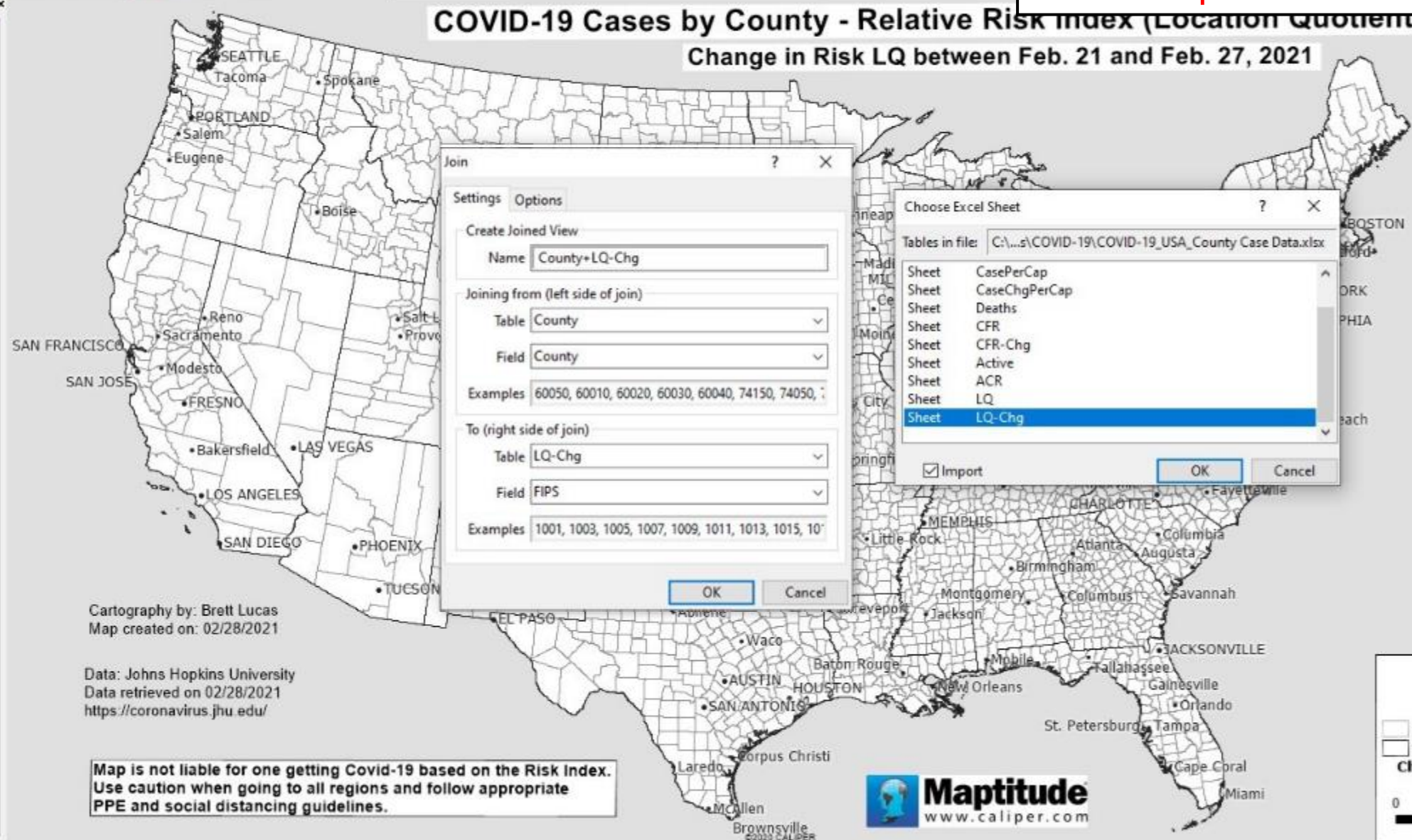
			Population	1-Mar	2-Mar	3-Mar	4-Mar	5-Mar	6-Mar	7-Mar	8-Mar	9-Mar	10-Mar	11-Mar	12-Mar	13-Mar	14-Mar	15-Mar	16-Mar	17-Mar	18-Mar	19-Mar	20-Mar	21-Mar	22-Mar	23-Mar	24-Mar	25-Mar	26-Mar	27-Mar	28-Mar	29-Mar	30-Mar	31-Mar	1-Apr	2-Apr	3-Apr	4-Apr	5-Apr	6-Apr	7-Apr	8-Apr	9-Apr	10-Apr	11-Apr	12-Apr	13-Apr	14-Apr	15-Apr	16-Apr	17-Apr	18-Apr	19-Apr	20-Apr	21-Apr	22-Apr	23-Apr	24-Apr	25-Apr	26-Apr	27-Apr	28-Apr	29-Apr	30-Apr	1-May	2-May	3-May	4-May	5-May	6-May	7-May	8-May	9-May	10-May	11-May	12-May	13-May	14-May	15-May	16-May	17-May	18-May	19-May	20-May	21-May	22-May	23-May	24-May	25-May	26-May	27-May	28-May	29-May	30-May	31-May	1-Jun	2-Jun	3-Jun	4-Jun	5-Jun	6-Jun	7-Jun	8-Jun	9-Jun	10-Jun	11-Jun	12-Jun	13-Jun	14-Jun	15-Jun	16-Jun	17-Jun	18-Jun	19-Jun	20-Jun	21-Jun	22-Jun	23-Jun	24-Jun	25-Jun	26-Jun	27-Jun	28-Jun	29-Jun	30-Jun	1-Jul	2-Jul	3-Jul	4-Jul	5-Jul	6-Jul	7-Jul	8-Jul	9-Jul	10-Jul	11-Jul	12-Jul	13-Jul	14-Jul	15-Jul	16-Jul	17-Jul	18-Jul	19-Jul	20-Jul	21-Jul	22-Jul	23-Jul	24-Jul	25-Jul	26-Jul	27-Jul	28-Jul	29-Jul	30-Jul	31-Jul	1-Aug	2-Aug	3-Aug	4-Aug	5-Aug	6-Aug	7-Aug	8-Aug	9-Aug	10-Aug	11-Aug	12-Aug	13-Aug	14-Aug	15-Aug	16-Aug	17-Aug	18-Aug	19-Aug	20-Aug	21-Aug	22-Aug	23-Aug	24-Aug	25-Aug	26-Aug	27-Aug	28-Aug	29-Aug	30-Aug	31-Aug	1-Sep	2-Sep	3-Sep	4-Sep	5-Sep	6-Sep	7-Sep	8-Sep	9-Sep	10-Sep	11-Sep	12-Sep	13-Sep	14-Sep	15-Sep	16-Sep	17-Sep	18-Sep	19-Sep	20-Sep	21-Sep	22-Sep	23-Sep	24-Sep	25-Sep	26-Sep	27-Sep	28-Sep	29-Sep	30-Sep	31-Sep	1-Oct	2-Oct	3-Oct	4-Oct	5-Oct	6-Oct	7-Oct	8-Oct	9-Oct	10-Oct	11-Oct	12-Oct	13-Oct	14-Oct	15-Oct	16-Oct	17-Oct	18-Oct	19-Oct	20-Oct	21-Oct	22-Oct	23-Oct	24-Oct	25-Oct	26-Oct	27-Oct	28-Oct	29-Oct	30-Oct	31-Oct	1-Nov	2-Nov	3-Nov	4-Nov	5-Nov	6-Nov	7-Nov	8-Nov	9-Nov	10-Nov	11-Nov	12-Nov	13-Nov	14-Nov	15-Nov	16-Nov	17-Nov	18-Nov	19-Nov	20-Nov	21-Nov	22-Nov	23-Nov	24-Nov	25-Nov	26-Nov	27-Nov	28-Nov	29-Nov	30-Nov	1-Dec	2-Dec	3-Dec	4-Dec	5-Dec	6-Dec	7-Dec	8-Dec	9-Dec	10-Dec	11-Dec	12-Dec	13-Dec	14-Dec	15-Dec	16-Dec	17-Dec	18-Dec	19-Dec	20-Dec	21-Dec	22-Dec	23-Dec	24-Dec	25-Dec	26-Dec	27-Dec	28-Dec	29-Dec	30-Dec	31-Dec	1-Jan	2-Jan	3-Jan	4-Jan	5-Jan	6-Jan	7-Jan	8-Jan	9-Jan	10-Jan	11-Jan	12-Jan	13-Jan	14-Jan	15-Jan	16-Jan	17-Jan	18-Jan	19-Jan	20-Jan	21-Jan	22-Jan	23-Jan	24-Jan	25-Jan	26-Jan	27-Jan	28-Jan	29-Jan	30-Jan	31-Jan	1-Feb	2-Feb	3-Feb	4-Feb	5-Feb	6-Feb	7-Feb	8-Feb	9-Feb	10-Feb	11-Feb	12-Feb	13-Feb	14-Feb	15-Feb	16-Feb	17-Feb	18-Feb	19-Feb	20-Feb	21-Feb	22-Feb	23-Feb	24-Feb	25-Feb	26-Feb	27-Feb	28-Feb	29-Feb	30-Feb	31-Feb		
1	FIPS Stat	County Name	Population	1-Mar	2-Mar	3-Mar	4-Mar	5-Mar	6-Mar	7-Mar	8-Mar	9-Mar	10-Mar	11-Mar	12-Mar	13-Mar	14-Mar	15-Mar	16-Mar	17-Mar	18-Mar	19-Mar	20-Mar	21-Mar	22-Mar	23-Mar	24-Mar	25-Mar	26-Mar	27-Mar	28-Mar	29-Mar	30-Mar	31-Mar	1-Apr	2-Apr	3-Apr	4-Apr	5-Apr	6-Apr	7-Apr	8-Apr	9-Apr	10-Apr	11-Apr	12-Apr	13-Apr	14-Apr	15-Apr	16-Apr	17-Apr	18-Apr	19-Apr	20-Apr	21-Apr	22-Apr	23-Apr	24-Apr	25-Apr	26-Apr	27-Apr	28-Apr	29-Apr	30-Apr	31-Apr	1-May	2-May	3-May	4-May	5-May	6-May	7-May	8-May	9-May	10-May	11-May	12-May	13-May	14-May	15-May	16-May	17-May	18-May	19-May	20-May	21-May	22-May	23-May	24-May	25-May	26-May	27-May	28-May	29-May	30-May	31-May	1-Jun	2-Jun	3-Jun	4-Jun	5-Jun	6-Jun	7-Jun	8-Jun	9-Jun	10-Jun	11-Jun	12-Jun	13-Jun	14-Jun	15-Jun	16-Jun	17-Jun	18-Jun	19-Jun	20-Jun	21-Jun	22-Jun	23-Jun	24-Jun	25-Jun	26-Jun	27-Jun	28-Jun	29-Jun	30-Jun	31-Jun	1-Jul	2-Jul	3-Jul	4-Jul	5-Jul	6-Jul	7-Jul	8-Jul	9-Jul	10-Jul	11-Jul	12-Jul	13-Jul	14-Jul	15-Jul	16-Jul	17-Jul	18-Jul	19-Jul	20-Jul	21-Jul	22-Jul	23-Jul	24-Jul	25-Jul	26-Jul	27-Jul	28-Jul	29-Jul	30-Jul	31-Jul	1-Aug	2-Aug	3-Aug	4-Aug	5-Aug	6-Aug	7-Aug	8-Aug	9-Aug	10-Aug	11-Aug	12-Aug	13-Aug	14-Aug	15-Aug	16-Aug	17-Aug	18-Aug	19-Aug	20-Aug	21-Aug	22-Aug	23-Aug	24-Aug	25-Aug	26-Aug	27-Aug	28-Aug	29-Aug	30-Aug	31-Aug	1-Sep	2-Sep	3-Sep	4-Sep	5-Sep	6-Sep	7-Sep	8-Sep	9-Sep	10-Sep	11-Sep	12-Sep	13-Sep	14-Sep	15-Sep	16-Sep	17-Sep	18-Sep	19-Sep	20-Sep	21-Sep	22-Sep	23-Sep	24-Sep	25-Sep	26-Sep	27-Sep	28-Sep	29-Sep	30-Sep	31-Sep	1-Oct	2-Oct	3-Oct	4-Oct	5-Oct	6-Oct	7-Oct	8-Oct	9-Oct	10-Oct	11-Oct	12-Oct	13-Oct	14-Oct	15-Oct	16-Oct	17-Oct	18-Oct	19-Oct	20-Oct	21-Oct	22-Oct	23-Oct	24-Oct	25-Oct	26-Oct	27-Oct	28-Oct	29-Oct	30-Oct	31-Oct	1-Nov	2-Nov	3-Nov	4-Nov	5-Nov	6-Nov	7-Nov	8-Nov	9-Nov	10-Nov	11-Nov	12-Nov	13-Nov	14-Nov	15-Nov	16-Nov	17-Nov	18-Nov	19-Nov	20-Nov	21-Nov	22-Nov	23-Nov	24-Nov	25-Nov	26-Nov	27-Nov	28-Nov	29-Nov	30-Nov	1-Dec	2-Dec	3-Dec	4-Dec	5-Dec	6-Dec	7-Dec	8-Dec	9-Dec	10-Dec	11-Dec	12-Dec	13-Dec	14-Dec	15-Dec	16-Dec	17-Dec	18-Dec	19-Dec	20-Dec	21-Dec	22-Dec	23-Dec	24-Dec	25-Dec	26-Dec	27-Dec	28-Dec	29-Dec	30-Dec	31-Dec	1-Jan	2-Jan	3-Jan	4-Jan	5-Jan	6-Jan	7-Jan	8-Jan	9-Jan	10-Jan	11-Jan	12-Jan	13-Jan	14-Jan	15-Jan	16-Jan	17-Jan	18-Jan	19-Jan	20-Jan	21-Jan	22-Jan	23-Jan	24-Jan	25-Jan	26-Jan	27-Jan	28-Jan	29-Jan	30-Jan	31-Jan	1-Feb	2-Feb	3-Feb	4-Feb	5-Feb	6-Feb	7-Feb	8-Feb	9-Feb	10-Feb	11-Feb	12-Feb	13-Feb	14-Feb	15-Feb	16-Feb	17-Feb	18-Feb	19-Feb	20-Feb	21-Feb	22-Feb	23-Feb	24-Feb	25-Feb	26-Feb	27-Feb	28-Feb	29-Feb	30-Feb	31-Feb

Cases CaseChg CasePerCap CaseChgPerCap Deaths CFR CFR-Chg Active ACR LQ LQ-Chg



“County” – current layer
“Join” – spreadsheet data

- Display Manager
- 10 Degree Grid Area
 - World Country
 - World Province
 - Census Place
 - Landmark Area
 - Water Area
 - Census Tract
 - 5-Digit ZIP Code
 - 3-Digit ZIP Code
 - County Subdivision
 - County**
 - State
 - MSA & Micropolitan
 - CBSA Micropolitan
 - Building Footprint
 - River/Brook/Stream
 - Street
 - Highway/Freeway
 - Railroad
 - Density
 - Time Zone
 - 5-Digit ZIP Centroid
 - Landmark
 - World City
 - Interstate
 - Populated Place
 - County-Cent



Join

Settings Options

Create Joined View
Name: County+LQ-Chg

Joining from (left side of join)
Table: County
Field: County
Examples: 60050, 60010, 60020, 60030, 60040, 74150, 74050

To (right side of join)
Table: LQ-Chg
Field: FIPS
Examples: 1001, 1003, 1005, 1007, 1009, 1011, 1013, 1015, 1017

OK Cancel

Choose Excel Sheet

Tables in file: C:\...s\COVID-19\COVID-19_USA_County Case Data.xlsx

Sheet	CasePerCap
Sheet	CaseChgPerCap
Sheet	Deaths
Sheet	CFR
Sheet	CFR-Chg
Sheet	Active
Sheet	ACR
Sheet	LQ
Sheet	LQ-Chg

Import

OK Cancel

Cartography by: Brett Lucas
Map created on: 02/28/2021

Data: Johns Hopkins University
Data retrieved on 02/28/2021
<https://coronavirus.jhu.edu/>

Map is not liable for one getting Covid-19 based on the Risk Index.
Use caution when going to all regions and follow appropriate PPE and social distancing guidelines.



LEGEND

Map layers

- County
- State

Change in Risk LQ

Use "Equal Size" intervals

County

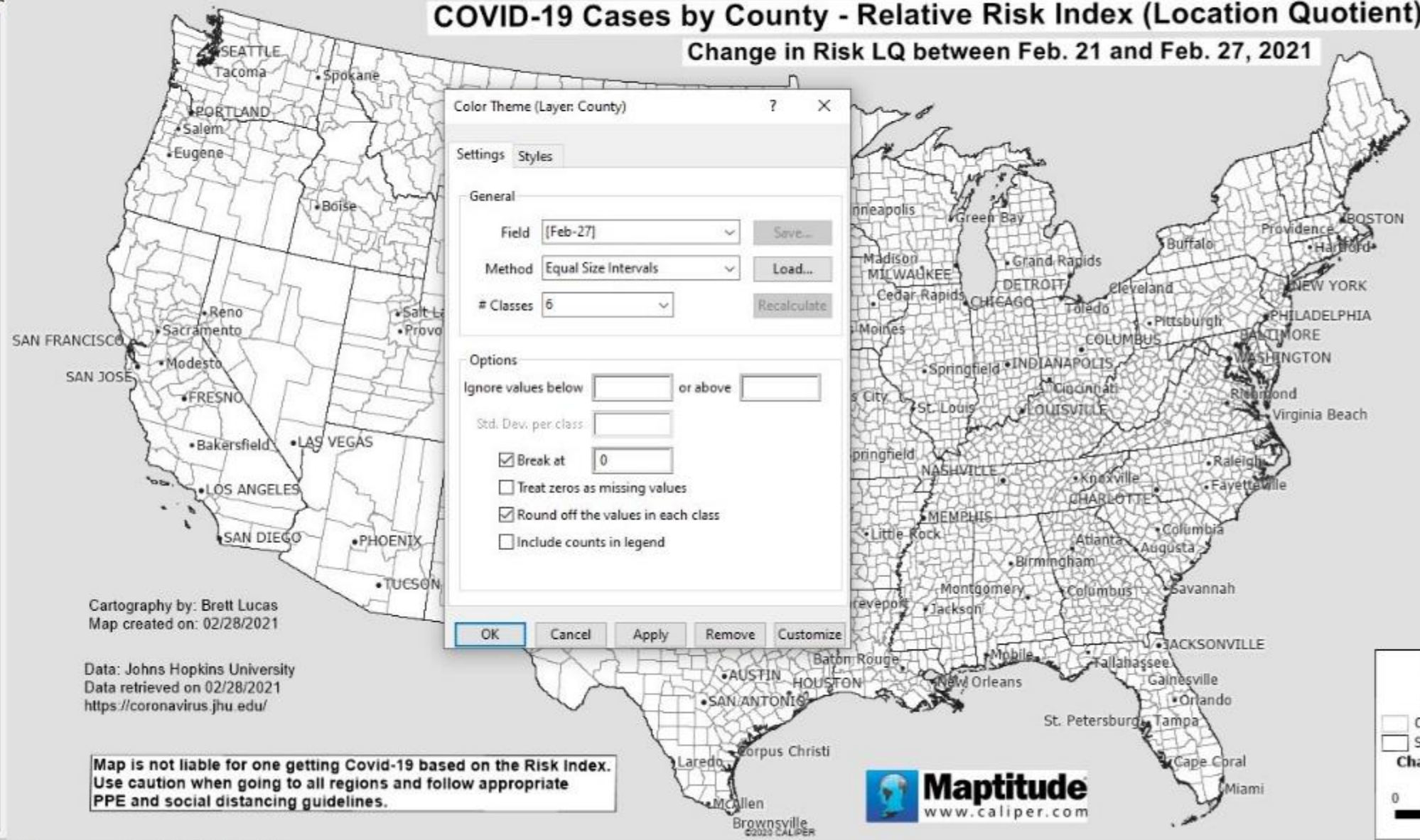
Selection (0)

Display Manager

- 10 Degree Grid Area
- World Country
- World Province
- Census Place
- Landmark Area
- Water Area
- Census Tract
- 5-Digit ZIP Code
- 3-Digit ZIP Code
- County Subdivision
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- Highway/Freeway
- Railroad
- Density
- Time Zone
- 5-Digit ZIP Centroid
- Landmark
- World City
- Interstate
- Populated Place
- County-Cent

COVID-19 Cases by County - Relative Risk Index (Location Quotient)

Change in Risk LQ between Feb. 21 and Feb. 27, 2021



Color Theme (Layer: County)

Settings Styles

General

Field: [Feb-27] Save...

Method: Equal Size Intervals Load...

Classes: 6 Recalculate

Options

Ignore values below: [] or above: []

Std. Dev. per class: []

Break at: [0]

Treat zeros as missing values

Round off the values in each class

Include counts in legend

OK Cancel Apply Remove Customize

Cartography by: Brett Lucas
Map created on: 02/28/2021

Data: Johns Hopkins University
Data retrieved on 02/28/2021
<https://coronavirus.jhu.edu/>

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LEGEND

Map layers

- County
- State

Change in Risk LQ

0 100 200 300

Miles

This is how the data initially comes into the map

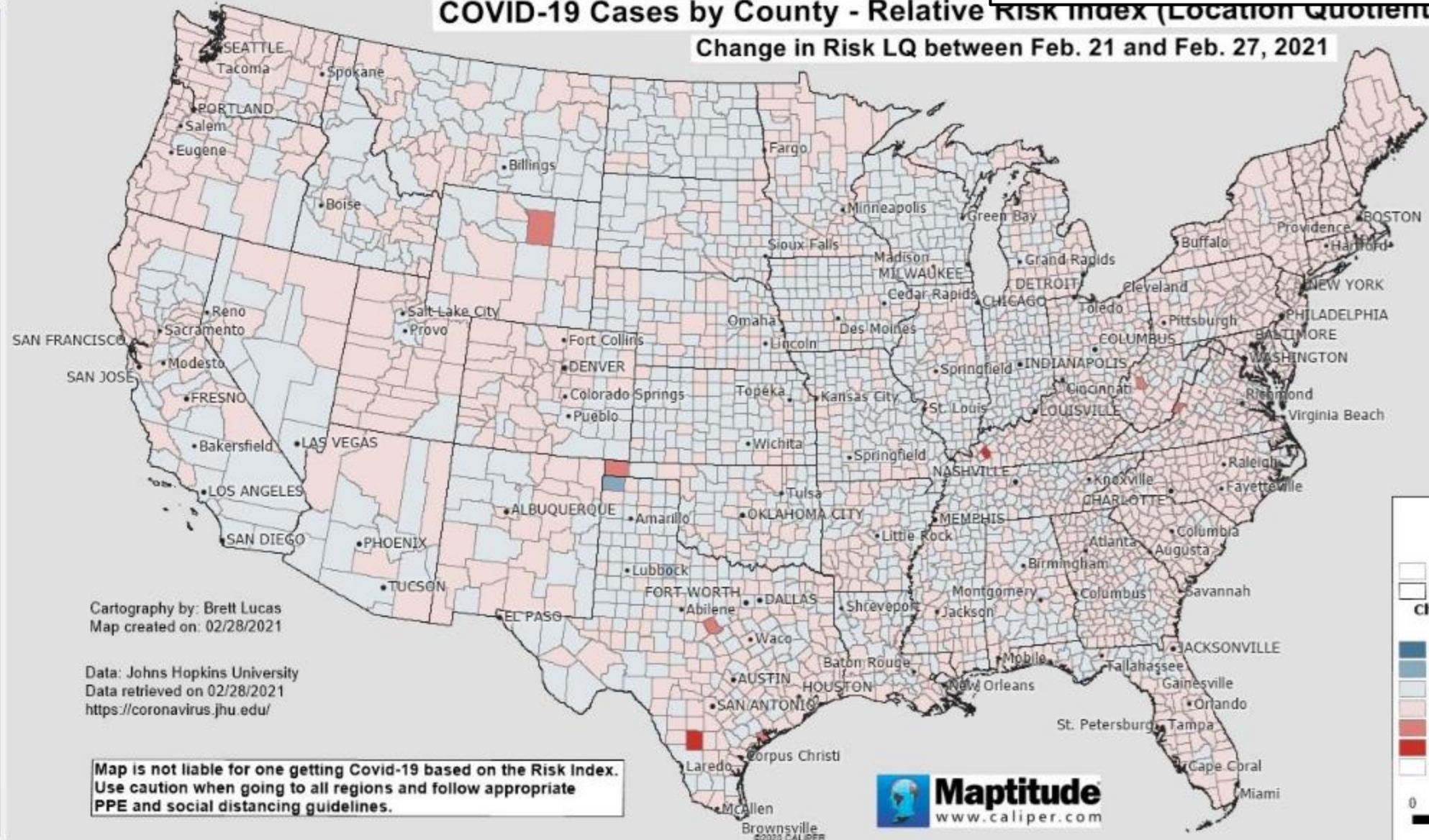


Display Manager

- 10 Degree Grid Area
- World Country
- World Province
- Census Place
- Landmark Area
- Water Area
- Census Tract
- 5-Digit ZIP Code
- 3-Digit ZIP Code
- County Subdivision
- County**
- Sets
- Theme: Feb-27
 - Other
 - 0.13 and below
 - 0.13 to -0.06
 - 0.06 to 0.00
 - 0.00 to 0.07
 - 0.07 to 0.13
 - 0.13 and above
- State
- MSA & Micropolitan
- CBSA Micropolitan
- Building Footprint
- River/Brook/Stream
- Street
- Highway/Freeway
- Railroad
- Density
- Time Zone
- 5-Digit ZIP Centroid
- Landmark
- World City
- Interstate
- Populated Place
- County-Cent

COVID-19 Cases by County - Relative Risk Index (Location Quotient)

Change in Risk LQ between Feb. 21 and Feb. 27, 2021



Cartography by: Brett Lucas
Map created on: 02/28/2021

Data: Johns Hopkins University
Data retrieved on 02/28/2021
<https://coronavirus.jhu.edu/>

Map is not liable for one getting Covid-19 based on the Risk Index. Use caution when going to all regions and follow appropriate PPE and social distancing guidelines.



LEGEND

Map layers

- County
- State

Change in Risk LQ Feb-27

- 0.13 and below
- 0.13 to -0.06
- 0.06 to 0.00
- 0.00 to 0.07
- 0.07 to 0.13
- 0.13 and above
- Other

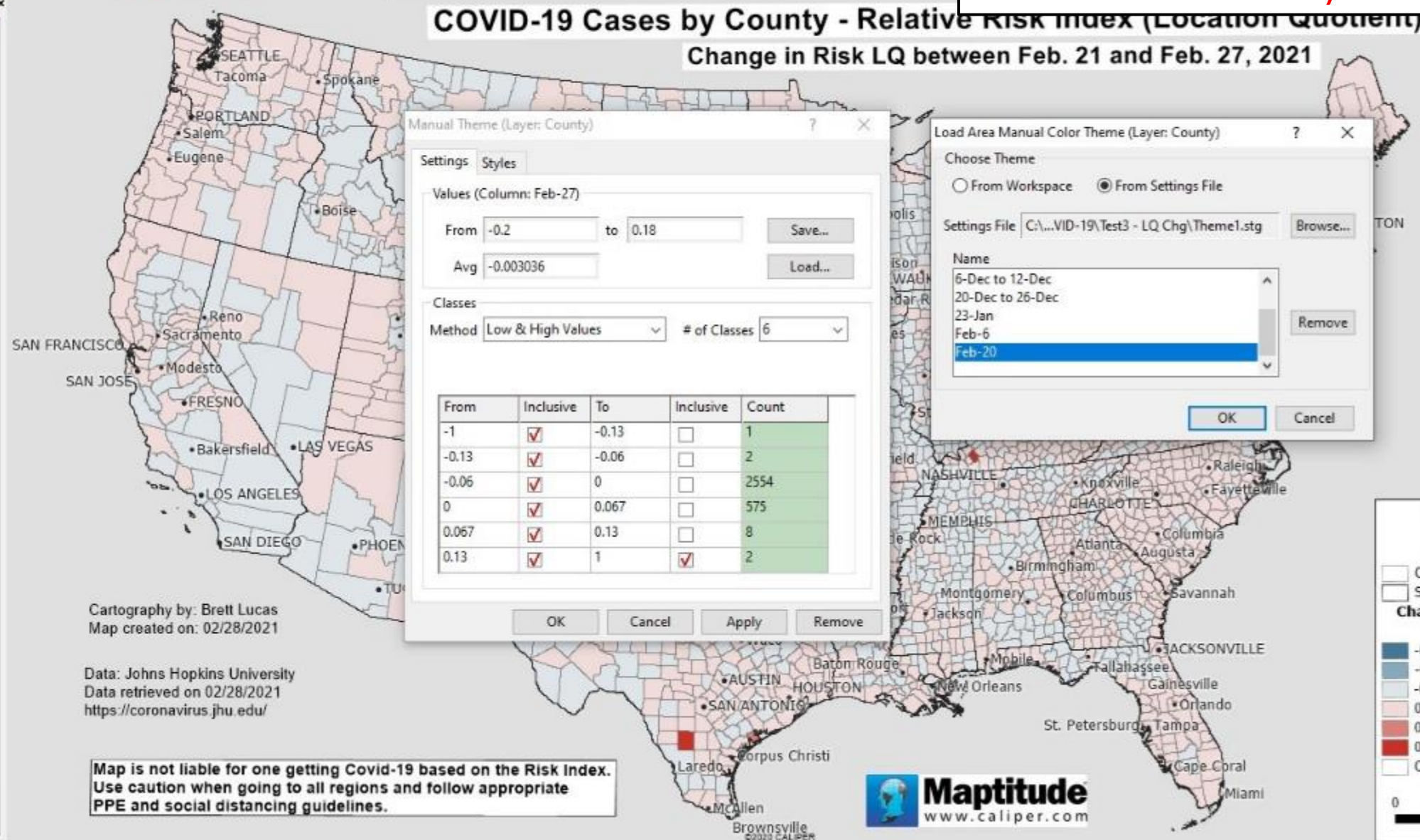
0 100 200 300 Miles

I cheated here, as I used a theme I had already created



Display Manager

- 10 Degree Grid Area
- World Country
- World Province
- Census Place
- Landmark Area
- Water Area
- Census Tract
- 5-Digit ZIP Code
- 3-Digit ZIP Code
- County Subdivision
- County**
- Sets
- Theme: Feb-27**
 - Other
 - 0.13 and below
 - 0.13 to -0.06
 - 0.06 to 0.00
 - 0.00 to 0.07
 - 0.07 to 0.13
 - 0.13 and above
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- MSA & Micropolitan
- CBSA Micropolitan
- Building Footprint
- River/Brook/Stream
- Street
- Highway/Freeway
- Railroad
- Density
- Time Zone
- 5-Digit ZIP Centroid
- Landmark
- World City
- Interstate
- Populated Place
- County-Cent



Manual Theme (Layer: County)

Settings Styles

Values (Column: Feb-27)

From -0.2 to 0.18 Save...

Avg -0.003036 Load...

Classes

Method Low & High Values # of Classes 6

From	Inclusive	To	Inclusive	Count
-1	<input checked="" type="checkbox"/>	-0.13	<input type="checkbox"/>	1
-0.13	<input checked="" type="checkbox"/>	-0.06	<input type="checkbox"/>	2
-0.06	<input checked="" type="checkbox"/>	0	<input type="checkbox"/>	2554
0	<input checked="" type="checkbox"/>	0.067	<input type="checkbox"/>	575
0.067	<input checked="" type="checkbox"/>	0.13	<input type="checkbox"/>	8
0.13	<input checked="" type="checkbox"/>	1	<input checked="" type="checkbox"/>	2

OK Cancel Apply Remove

Load Area Manual Color Theme (Layer: County)

Choose Theme

From Workspace From Settings File

Settings File C:\...VID-19\Test3 - LQ Chg\Theme1.stg Browse...

Name

- 6-Dec to 12-Dec
- 20-Dec to 26-Dec
- 23-Jan
- Feb-6
- Feb-20**

Remove

OK Cancel

Cartography by: Brett Lucas
Map created on: 02/28/2021

Data: Johns Hopkins University
Data retrieved on 02/28/2021
<https://coronavirus.jhu.edu/>

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LEGEND

Map layers

- County
- State

Change in Risk LQ Feb-27

- 0.13 and below
- 0.13 to -0.06
- 0.06 to 0.00
- 0.00 to 0.07
- 0.07 to 0.13
- 0.13 and above
- Other

0 100 200 300 Miles



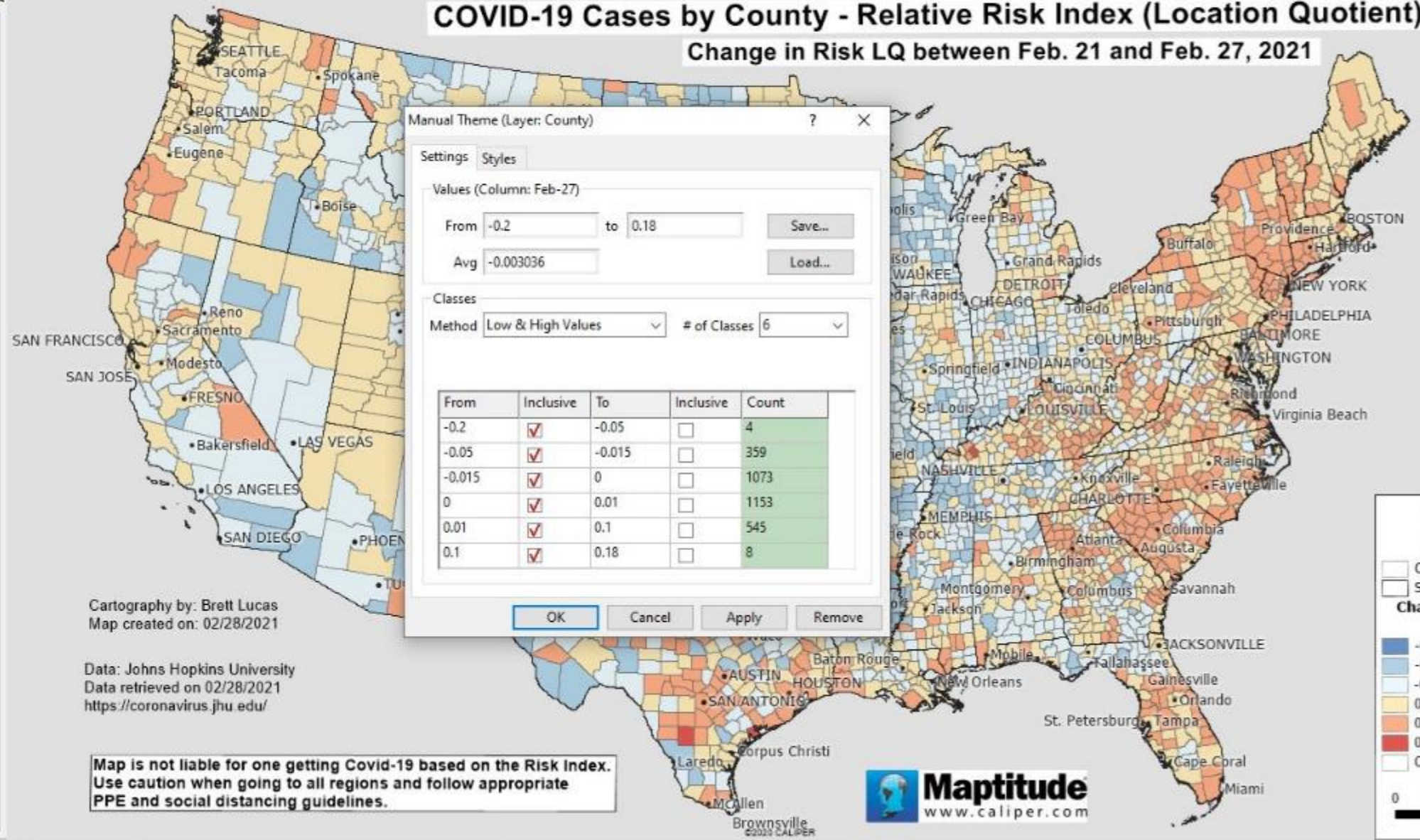
County Selection (0)

Display Manager

- 10 Degree Grid Area
- World Country
- World Province
- Census Place
- Landmark Area
- Water Area
- Census Tract
- 5-Digit ZIP Code
- 3-Digit ZIP Code
- County Subdivision
- County**
- Sets
- Theme: Feb-27
 - State
 - MSA & Micropolitan
 - CBSA Micropolitan
 - Building Footprint
 - River/Brook/Stream
 - Street
 - Highway/Freeway
 - Railroad
 - Density
 - Time Zone
 - 5-Digit ZIP Centroid
 - Landmark
 - World City
 - Interstate
 - Populated Place
 - County-Cent

COVID-19 Cases by County - Relative Risk Index (Location Quotient)

Change in Risk LQ between Feb. 21 and Feb. 27, 2021



Manual Theme (Layer: County)

Settings Styles

Values (Column: Feb-27)

From -0.2 to 0.18 Save...

Avg -0.003036 Load...

Classes

Method Low & High Values # of Classes 6

From	Inclusive	To	Inclusive	Count
-0.2	<input checked="" type="checkbox"/>	-0.05	<input type="checkbox"/>	4
-0.05	<input checked="" type="checkbox"/>	-0.015	<input type="checkbox"/>	359
-0.015	<input checked="" type="checkbox"/>	0	<input type="checkbox"/>	1073
0	<input checked="" type="checkbox"/>	0.01	<input type="checkbox"/>	1153
0.01	<input checked="" type="checkbox"/>	0.1	<input type="checkbox"/>	545
0.1	<input checked="" type="checkbox"/>	0.18	<input type="checkbox"/>	8

OK Cancel Apply Remove

Cartography by: Brett Lucas
Map created on: 02/28/2021

Data: Johns Hopkins University
Data retrieved on 02/28/2021
<https://coronavirus.jhu.edu/>

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LEGEND

Map layers

- County
- State

Change in Risk LQ Feb-27

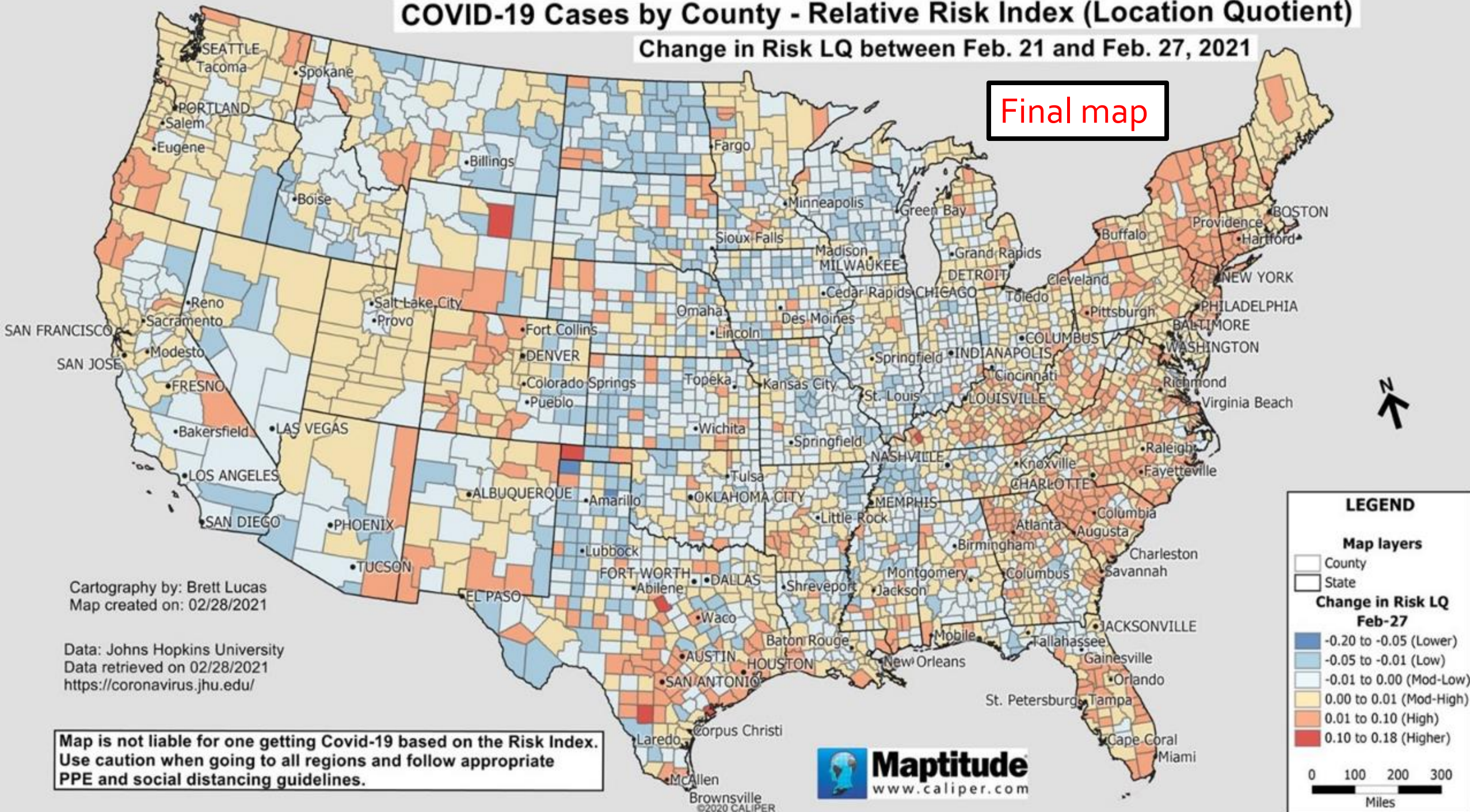
- 0.20 to -0.05
- 0.05 to -0.01
- 0.01 to 0.00
- 0.00 to 0.01
- 0.01 to 0.10
- 0.10 to 0.18
- Other

0 100 200 300 Miles

COVID-19 Cases by County - Relative Risk Index (Location Quotient)

Change in Risk LQ between Feb. 21 and Feb. 27, 2021

Final map



Cartography by: Brett Lucas
Map created on: 02/28/2021

Data: Johns Hopkins University
Data retrieved on 02/28/2021
<https://coronavirus.jhu.edu/>

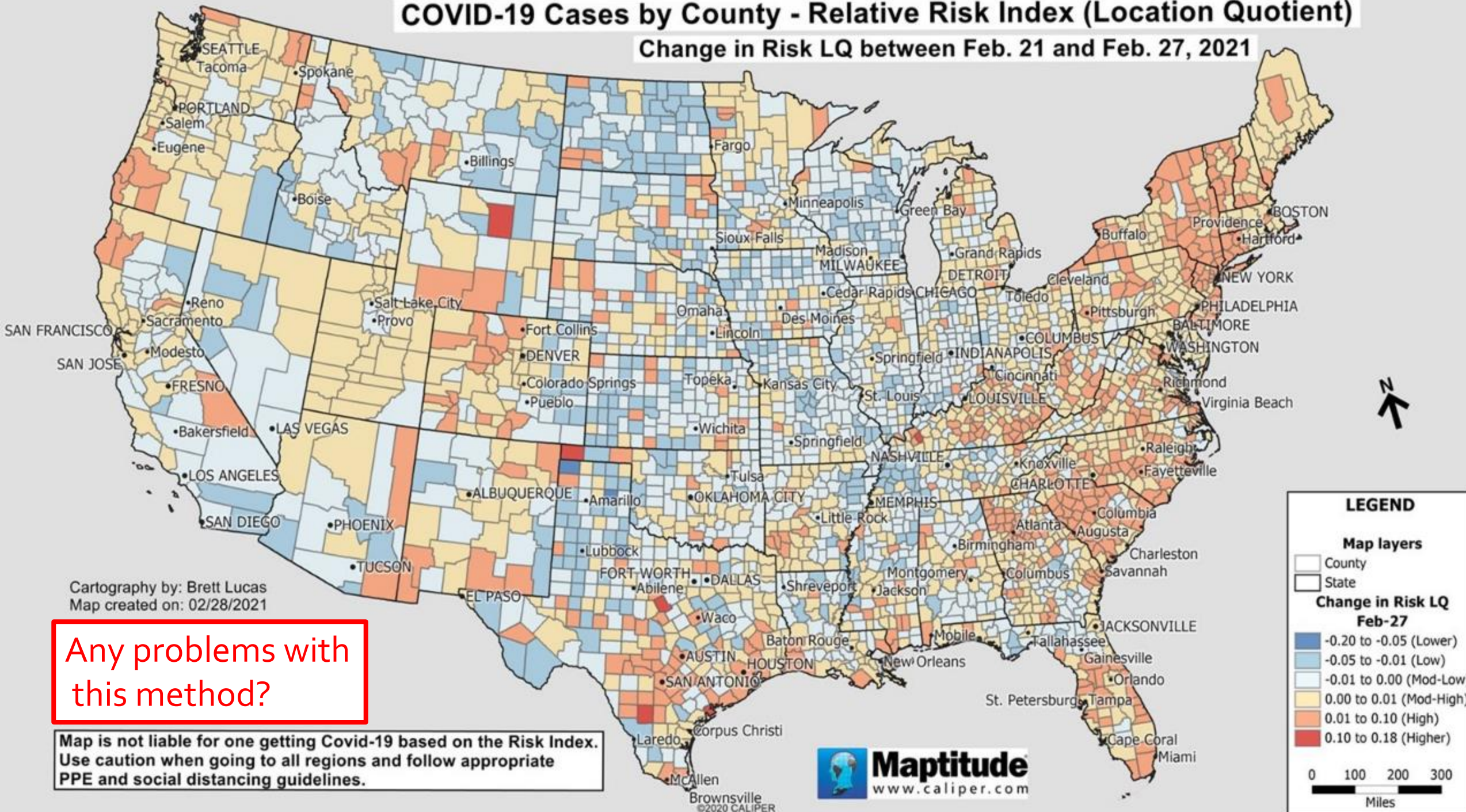
Map is not liable for one getting Covid-19 based on the Risk Index. Use caution when going to all regions and follow appropriate PPE and social distancing guidelines.



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COVID-19 Cases by County - Relative Risk Index (Location Quotient)

Change in Risk LQ between Feb. 21 and Feb. 27, 2021



Cartography by: Brett Lucas
Map created on: 02/28/2021

Any problems with this method?

Map is not liable for one getting Covid-19 based on the Risk Index. Use caution when going to all regions and follow appropriate PPE and social distancing guidelines.



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- Any questions ?
- Maptitude: <https://www.caliper.com/maptovu.htm>
 - Free student license!! – **Use your .edu email address to make the request**
- My contact email: brett.lucas@yahoo.com



Use aerial and satellite images for geographic editing and reference



Analyze sales and customer data by postal code or ZIP Code



Perform nationwide Census demographic analysis



Locate your customers and facilities



Find Crime hot spots



Create territories based on drive time or distance