

EARTH
NETWORKS®

2020

IOWA ***LIGHTNING REPORT***



ABOUT THIS REPORT

The 2020 Lightning Report was prepared by Earth Networks using the Earth Networks Total Lightning Network (ENTLN). The following report includes in-cloud, cloud-to-ground, and total lightning data for this state and the surrounding water bodies (if any) throughout 2020. Counts, densities, rankings, Dangerous Thunderstorm Alerts (DTAs), and Thunder Days in this report are from January 1, 2020 to December 31, 2020.

THE EARTH NETWORKS TOTAL LIGHTNING NETWORK (ENTLN)

The lightning data in this report is derived from the Earth Networks Total Lightning Network (ENTLN), which monitors the combination of in-cloud and cloud-to-ground lightning strikes over 100 countries. With over 1,800 sensors, the ENTLN is the most extensive and technologically advanced total lightning network in the world. ENTLN has been specifically deployed to detect real-time lightning and provide advanced warning for severe weather events that could threaten public safety and operational efficiency.

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REPORT TERMINOLOGY

To help you better understand the insights from this lightning report, we've included definitions of our frequently used report terminology below.

Lightning Pulse: This report measures lightning pulses. A pulse is a surge of electric current in lightning usually accompanied by a burst of light. Pulses are classified as In-cloud (IC) or Cloud-to-Ground (CG).

Lightning Flash: A lightning flash is a collection of pulses close in space and time that approximates the continuous ionized channels of a complete bolt of lightning.

Cloud-to-Ground Lightning (CG): Lightning that happens between opposite charges in a cloud and on the ground.

In-Cloud Lightning (IC): Lightning that occurs between opposite charges within a thunderstorm cloud.

Total Lightning Detection: The combination of all in-cloud and cloud-to-ground lightning activity.

Pulse Density: The number of lightning pulses per square mile per year.

Dangerous Thunderstorm Alerts (DTAs): Earth Networks patented advanced severe weather warnings that notify users of incoming storms up to 45 minutes before storm arrival.

Thunder Days: Any given day where lightning was detected in a certain area.

TOTAL LIGHTNING

is the combination of cloud-to-ground (CG) and in-cloud (IC) lightning strikes



Cloud-to-Ground lightning:

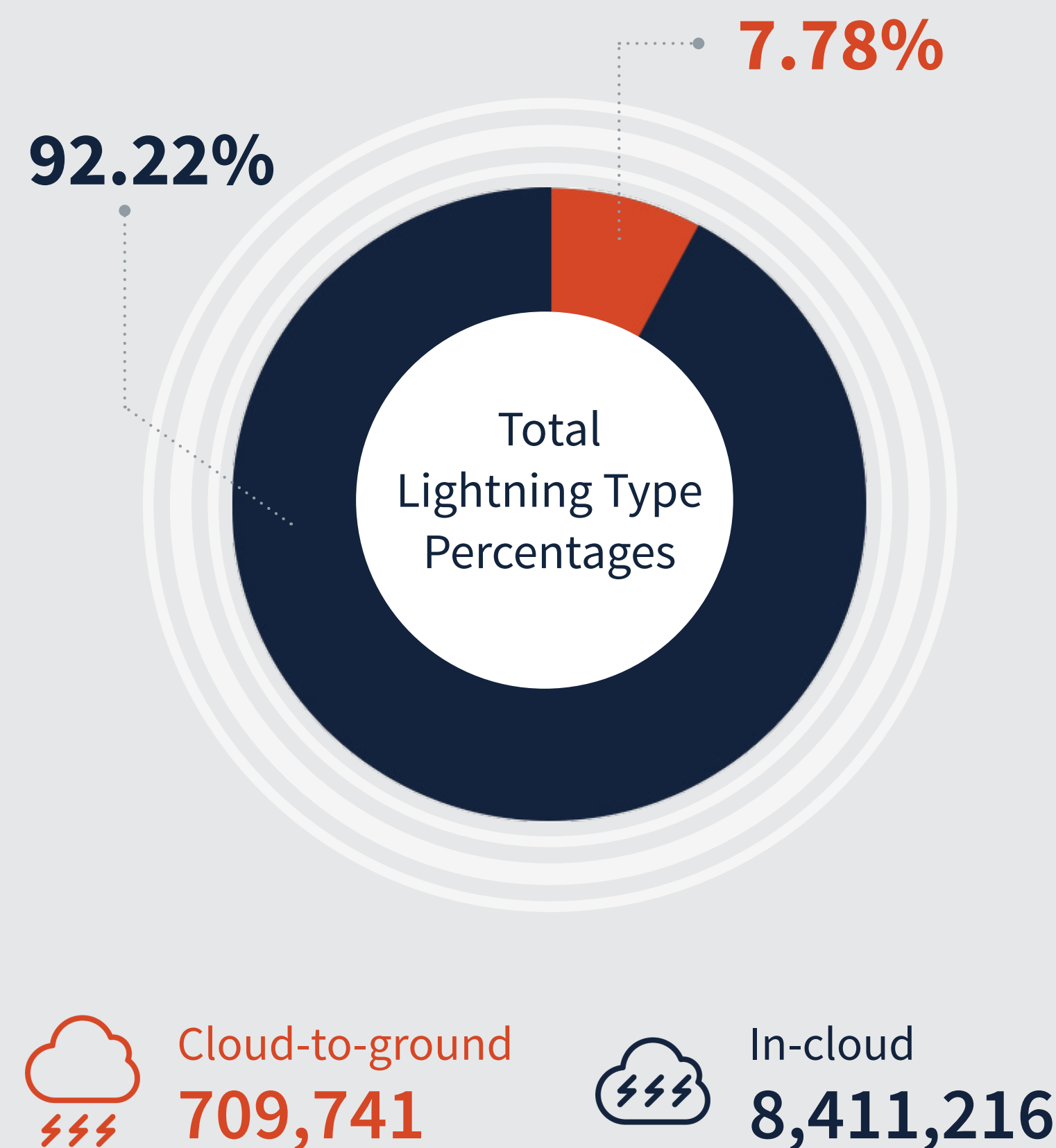
Lightning that happens between opposite charges in a cloud and on the ground

In-Cloud lightning:

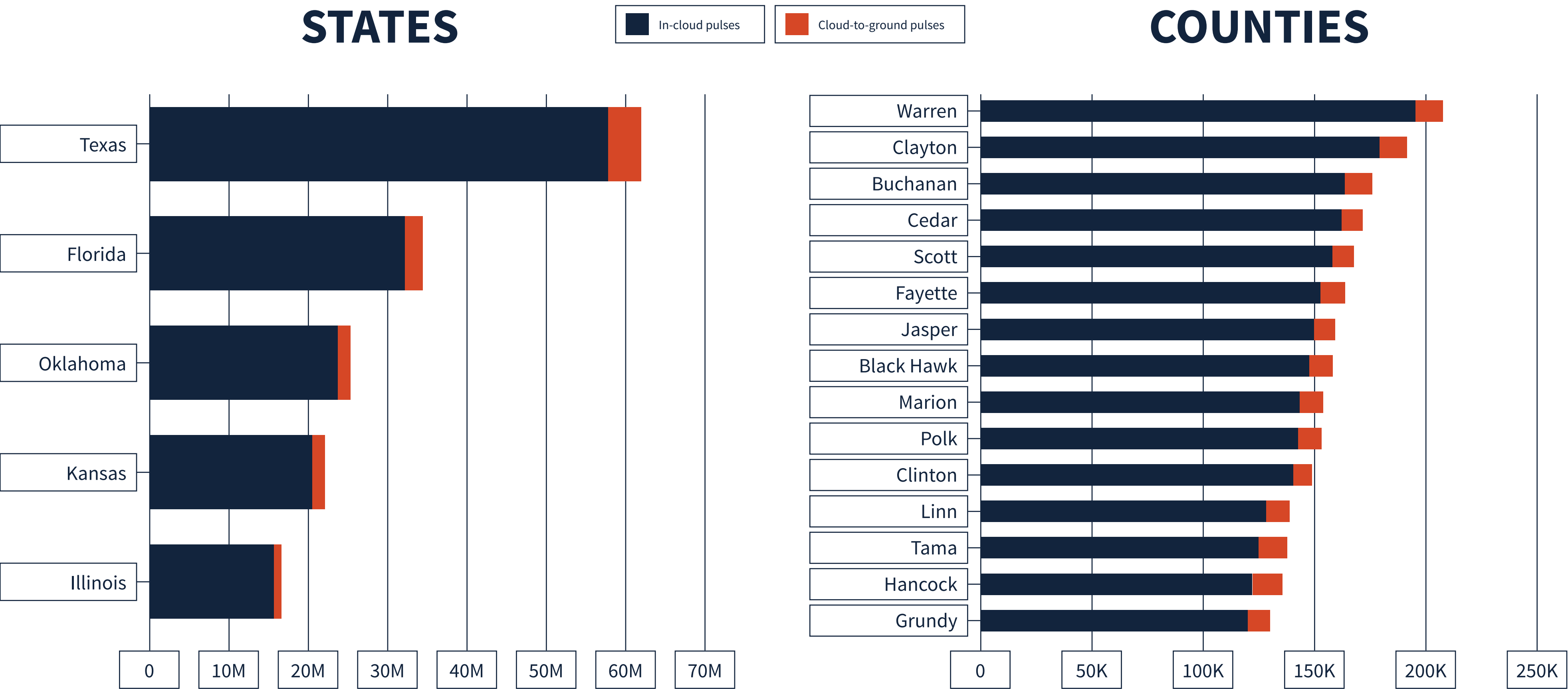
Lightning that occurs between opposite charges within a thunderstorm cloud

IOWA TOTAL LIGHTNING PULSES

9,121,097

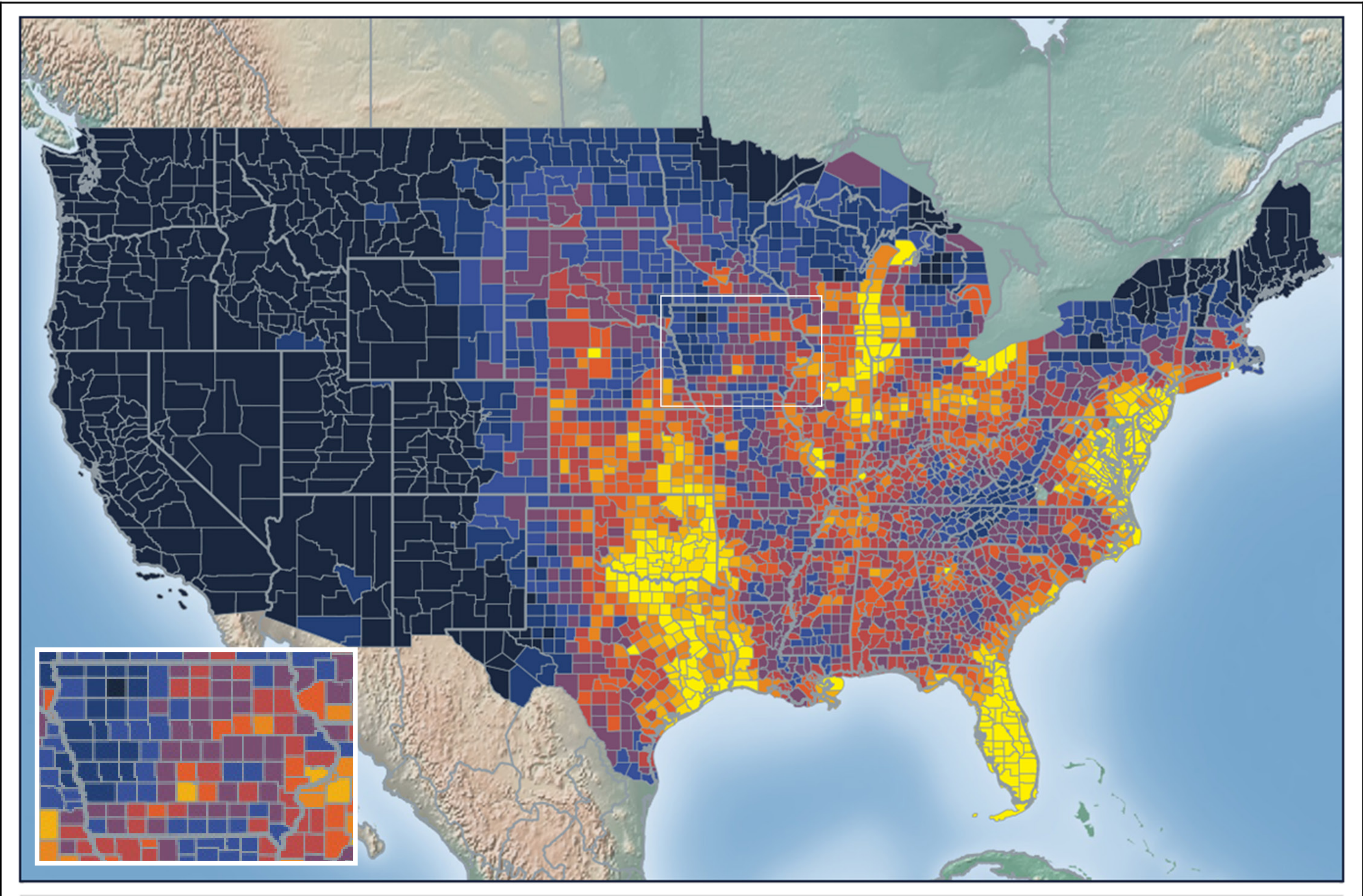


LIGHTNING COUNT RANKINGS

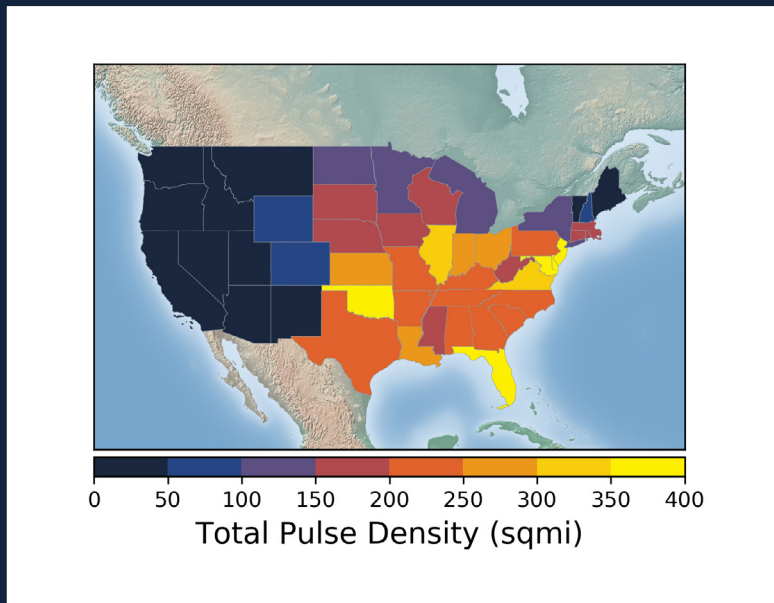


Iowa ranked 19 in total lightning pulses for 2020.

TOTAL (CG+IC) PULSE DENSITY MAP



Total Pulse Density (lightning pulses per square mile per year)

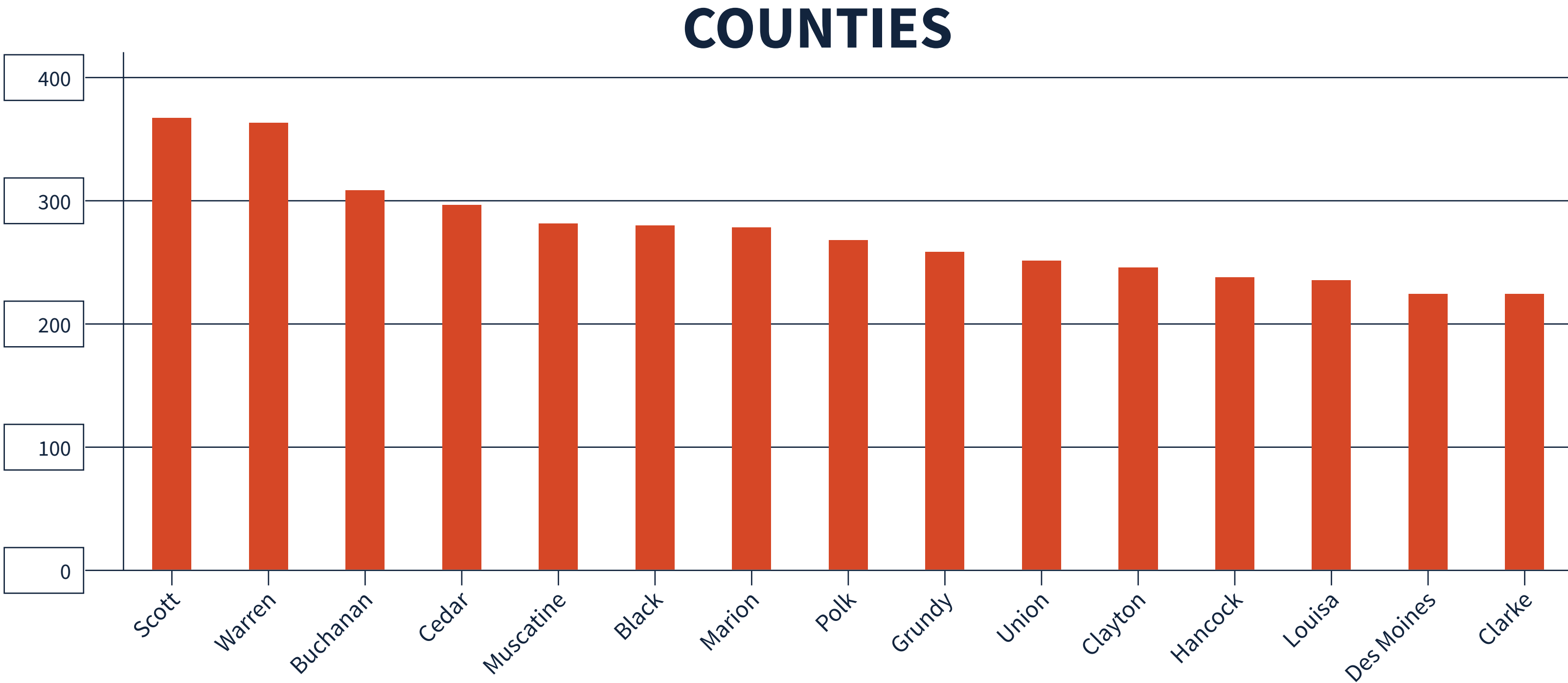


Pulse density is a better indicator of lightning activity than total lightning counts because it enables us to compare different sized areas (like states and counties) fairly.

We cluster pulses together into a flash. With every pulse we detect, we receive a more precise measure of lightning activity. At left, areas in bright yellow experienced the highest lightning pulse density per square mile in 2020.

TOTAL PULSE DENSITY RANKINGS

This chart shows the top 15 counties in the state ranked by total pulse density, which is the total lightning divided by the area of the county (in square miles).



DANGEROUS THUNDERSTORM ALERTS IN THE U.S.

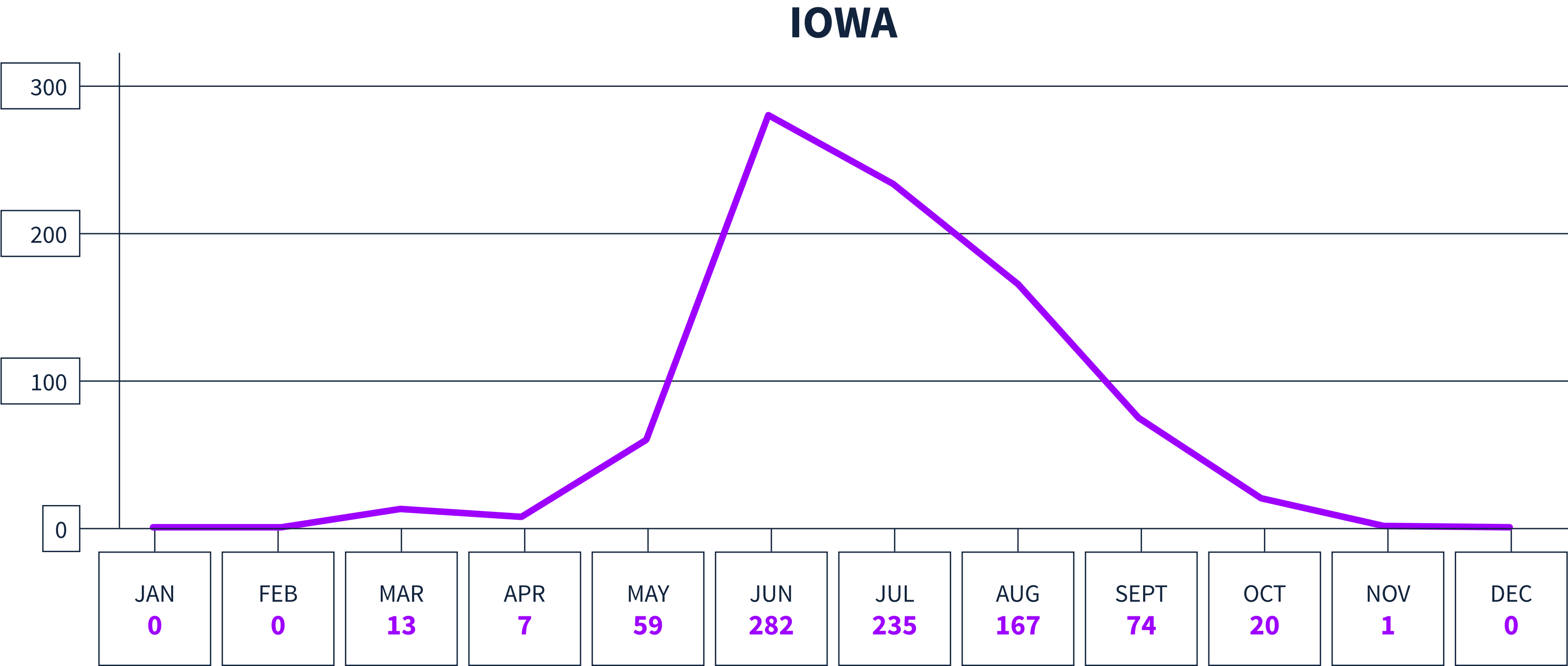


Earth Networks issued 29,401 Dangerous Thunderstorm Alerts (DTAs) in 2020. This year's map clearly shows the persistent drought conditions that have plagued the South and Southwest.

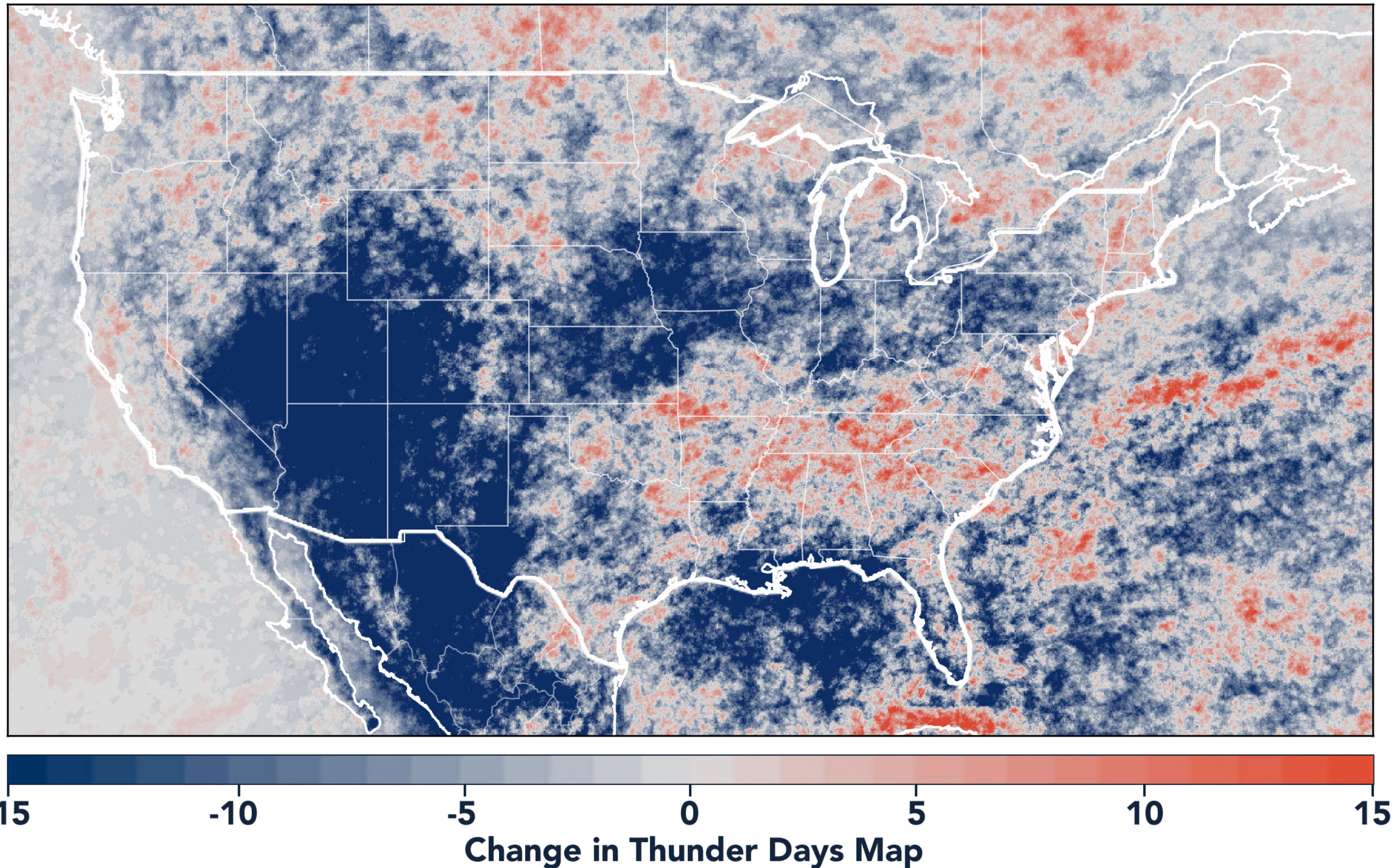
Dangerous Thunderstorm Alerts (DTAs), available exclusively to Earth Networks, provide **50% more lead time** to severe storms compared to publicly available alerts.

DANGEROUS THUNDERSTORM ALERTS BY MONTH

Earth Networks issued 858 Dangerous Thunderstorm Alerts for the state in 2020.



TOTAL STATE THUNDER DAYS: 140



Thunder Days are the days we detected lightning over a certain area. The map shows a deviation from our 7-year average and illustrates our overall finding that lightning decreased about 15% from 2019.

This year, the Southwest and Midwest experienced significantly less lightning than in previous years due to a persistent drought and weak monsoon. States in the Southeast experienced a substantial uptick in lightning activity this year, including Tennessee, North Carolina, South Carolina, Virginia, West Virginia, Georgia, Alabama, Mississippi, Florida, Louisiana, Arkansas, and Kentucky.



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THANK YOU

For additional insights or permission to use data or graphics from this report, please contact us at: info@earthnetworks.com or call 1 301.250.4000



APPENDIX

This table ranks all U.S. states by total lightning pulses, including in-cloud and cloud-to-ground from highest to lowest. Total number of thunder days in each state (the total number of days in the year when lightning was detected by ENTLN) are also included. The period covered is January 1, 2020 to December 31, 2020.

STATE	TOTAL LIGHTNING PULSES	TOTAL THUNDER DAYS
TX	63,683,799	278
FL	35,430,198	246
OK	26,159,420	205
KS	23,125,675	179
IL	16,785,149	166
NE	14,433,875	178
MO	14,081,658	184
VA	13,234,163	176
GA	13,016,803	217
OH	12,009,955	143
SD	11,940,870	156
LA	11,787,379	230
AL	11,448,621	202
AR	11,417,155	211
NC	10,666,834	203
PA	10,024,978	151
MS	9,236,279	210
IN	9,175,986	149
IA	9,121,097	140
WI	8,812,327	145
TN	8,458,373	186
MN	8,009,792	148
KY	7,974,926	166
MI	7,769,382	159
ND	7,634,287	131
SC	7,454,219	197
CO	7,360,769	185
MD	6,666,766	124
NM	5,819,550	196
MT	5,107,593	154
WY	4,951,397	166
NY	4,943,122	152
WV	4,684,226	150
AZ	3,532,759	151
NJ	3,465,297	96
UT	1,951,574	162
ID	1,518,171	172
MA	1,267,046	80
NV	1,237,862	146
DE	1,168,918	89
CA	956,187	151
OR	915,855	132
CT	802,252	70
NH	618,242	70
WA	402,333	117
ME	358,334	81
VT	354,695	75
RI	190,992	42
DC	44,204	47

APPENDIX

This table ranks all counties in the state by total lightning pulses, including in-cloud and cloud to-ground from highest to lowest. Total number of thunder days in each county (the total number of days in the year when lightning was detected by ENTLN) are also included. The period covered is January 1, 2020 to December 31, 2020.

COUNTY	TOTAL LIGHTNING PULSES	TOTAL THUNDER DAYS
Warren County	207,403	48
Clayton County	191,285	49
Buchanan County	175,793	48
Cedar County	171,766	53
Scott County	167,756	47
Fayette County	163,807	51
Jasper County	159,518	53
Black Hawk County	158,262	51
Marion County	154,029	45
Polk County	153,507	51
Clinton County	148,907	50
Linn County	138,967	57
Tama County	137,798	55
Hancock County	135,758	48
Grundy County	130,021	47
Jones County	125,671	51
Kossuth County	124,986	59
Delaware County	123,839	49
Muscatine County	122,770	42
Cerro Gordo County	121,075	43
Plymouth County	120,344	45
Keokuk County	118,432	52
Benton County	112,627	55
Butler County	111,740	45
Taylor County	110,657	52
Mahaska County	108,715	48
Allamakee County	107,994	46
Marshall County	106,693	47
Union County	106,270	46
Washington County	104,731	48
Dallas County	103,796	44
Johnson County	102,698	47
Madison County	102,483	45
Van Buren County	102,263	43
Hamilton County	101,576	51
Hardin County	101,494	47
Chickasaw County	100,013	45
Howard County	98,292	45
Story County	98,233	53
Ringgold County	97,305	49
Clarke County	97,050	43
Louisa County	94,745	46
Page County	94,683	44
Des Moines County	93,766	48
Dubuque County	93,299	56
Franklin County	93,086	39
Winneshiek County	90,821	47

COUNTY	TOTAL LIGHTNING PULSES	TOTAL THUNDER DAYS
Adams County	88,992	47
Boone County	88,413	52
Webster County	87,015	49
Iowa County	85,715	54
Poweshiek County	85,385	49
Wright County	85,124	42
Pottawattamie County	85,071	56
Woodbury County	84,941	51
Jackson County	84,079	55
Worth County	82,623	44
Sioux County	82,589	41
Monroe County	81,247	45
Floyd County	79,389	47
Henry County	78,211	47
Bremer County	77,783	48
Mitchell County	77,078	48
Lee County	75,191	56
Adair County	72,505	50
Humboldt County	70,992	38
Wapello County	70,285	43
Mills County	69,704	50
Crawford County	68,927	49
Decatur County	68,877	51
Greene County	68,229	49
Davis County	68,144	43
Harrison County	67,614	41
Montgomery County	67,601	46
Fremont County	66,389	55
Lucas County	66,161	41
Pocahontas County	65,551	49
Jefferson County	65,039	47
Monona County	63,970	50
Guthrie County	62,786	43
Cass County	62,062	44
Wayne County	60,930	49
Winnebago County	60,017	48
Sac County	58,805	47
Calhoun County	57,880	49
Appanoose County	52,253	42
Lyon County	51,458	39
Carroll County	51,076	48
Shelby County	50,963	40
Buena Vista County	50,904	41
Ida County	42,797	42
Cherokee County	39,723	41
Audubon County	38,182	38
O'Brien County	35,073	41

COUNTY	TOTAL LIGHTNING PULSES	TOTAL THUNDER DAYS
Palo Alto County	31,747	44
Clay County	25,677	37
Dickinson County	24,738	34
Osceola County	24,338	41
Emmet County	23,720	40