



2020

VIRGINIA 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:

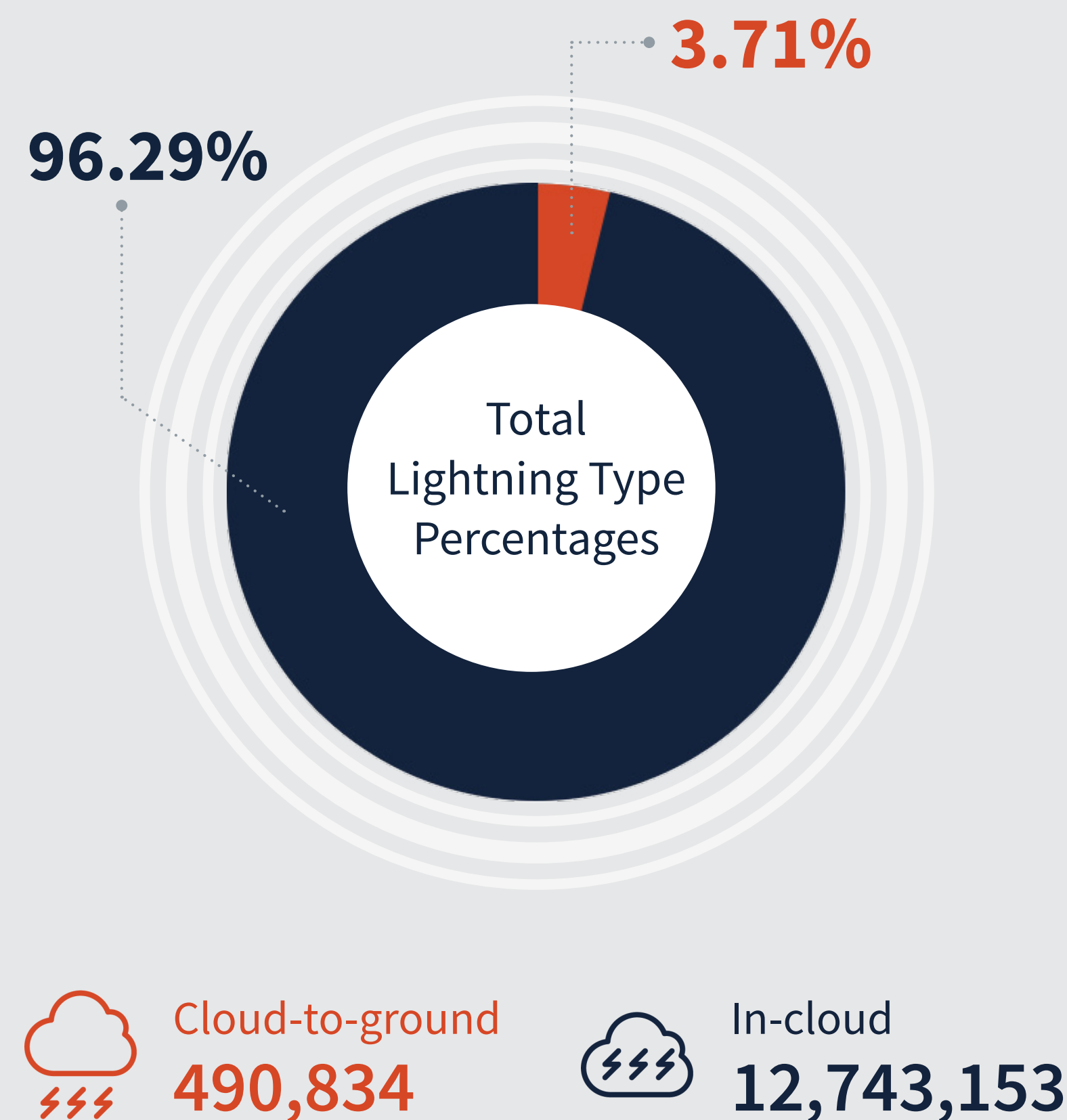
Lightning that happens between opposite charges in a cloud and on the ground

In-Cloud lightning:

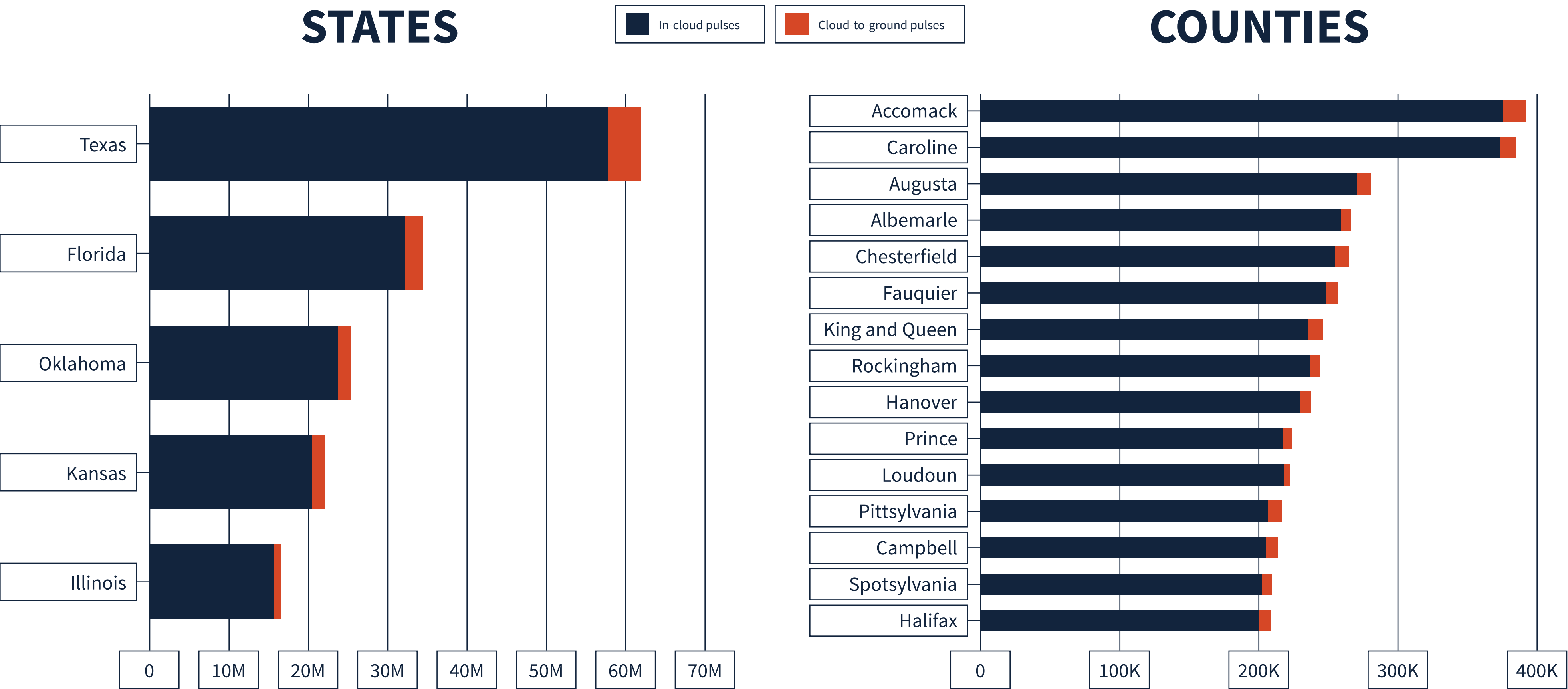
Lightning that occurs between opposite charges within a thunderstorm cloud

VIRGINIA TOTAL LIGHTNING PULSES

13,234,163

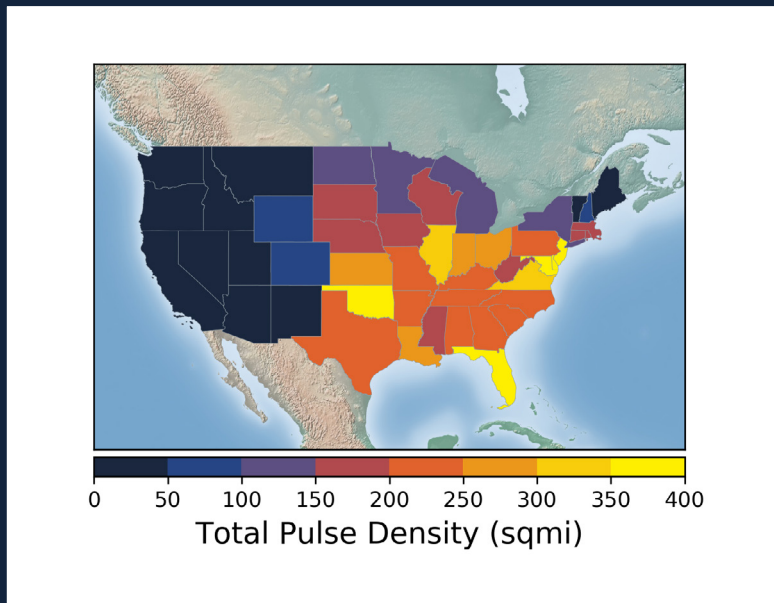
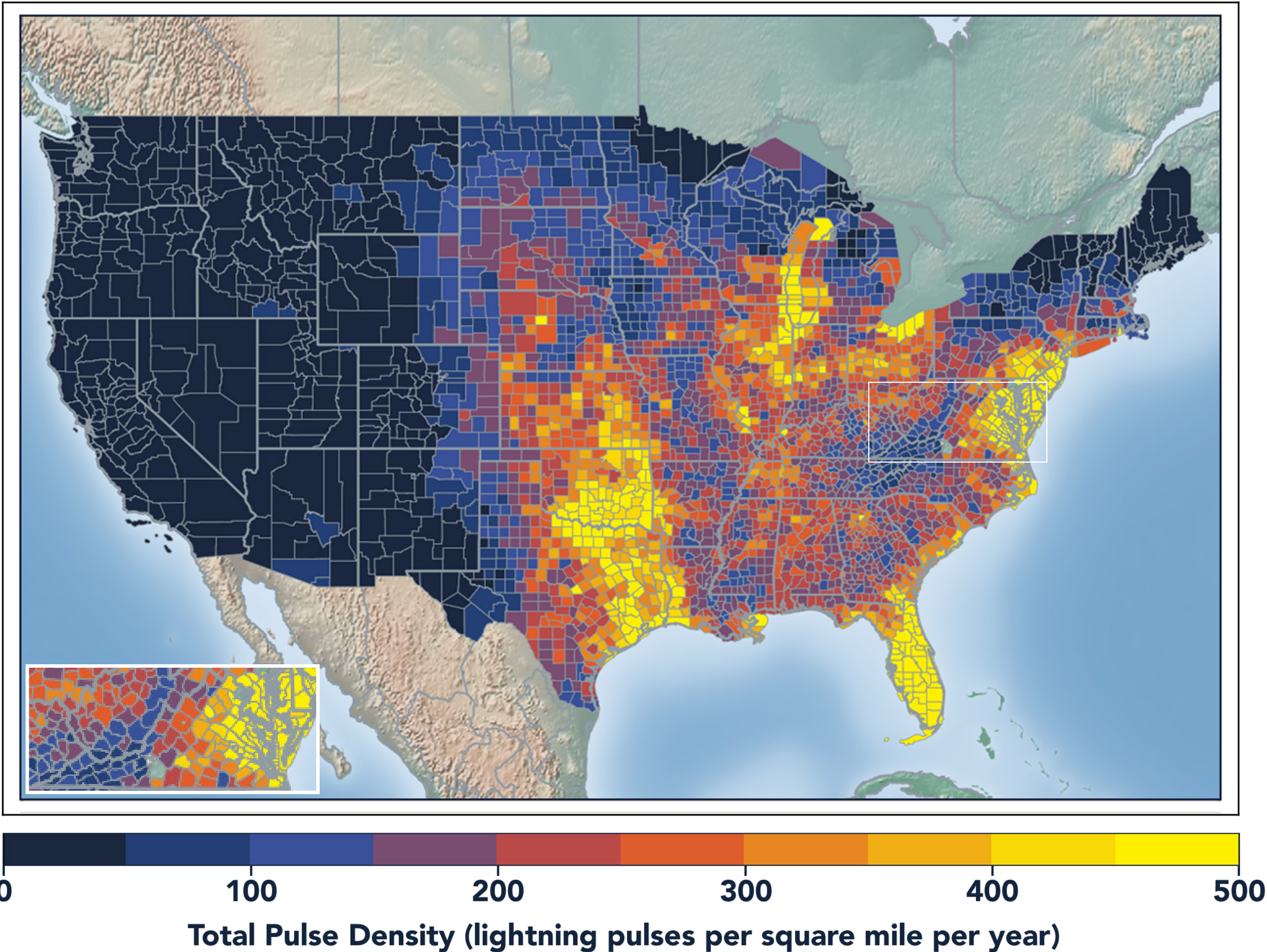


LIGHTNING COUNT RANKINGS



Virginia ranked 8 in total lightning pulses for 2020.

TOTAL (CG+IC) PULSE DENSITY MAP

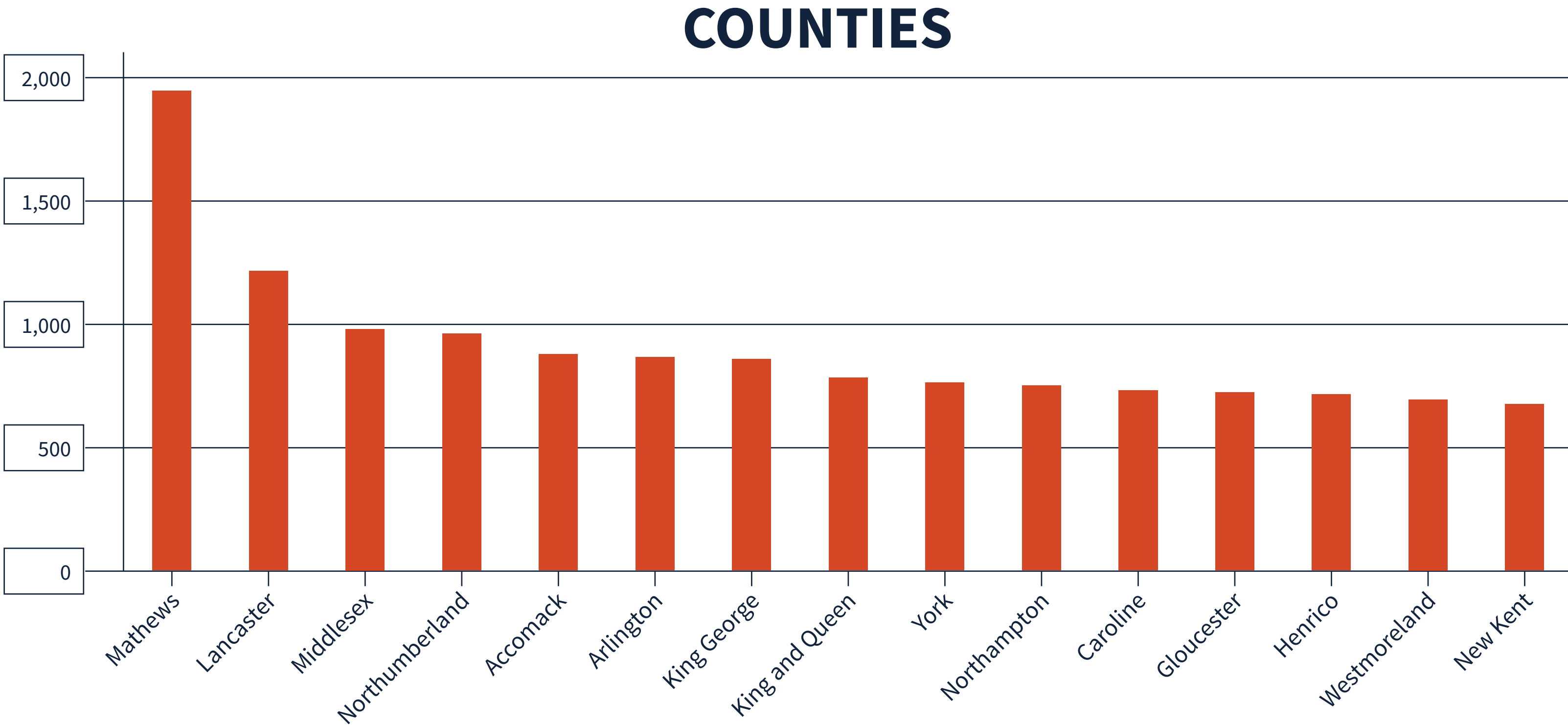


Pulse density is a better indicator of lightning activity than total lightning counts because it enables us to compare different sized areas (like states and counties) fairly.

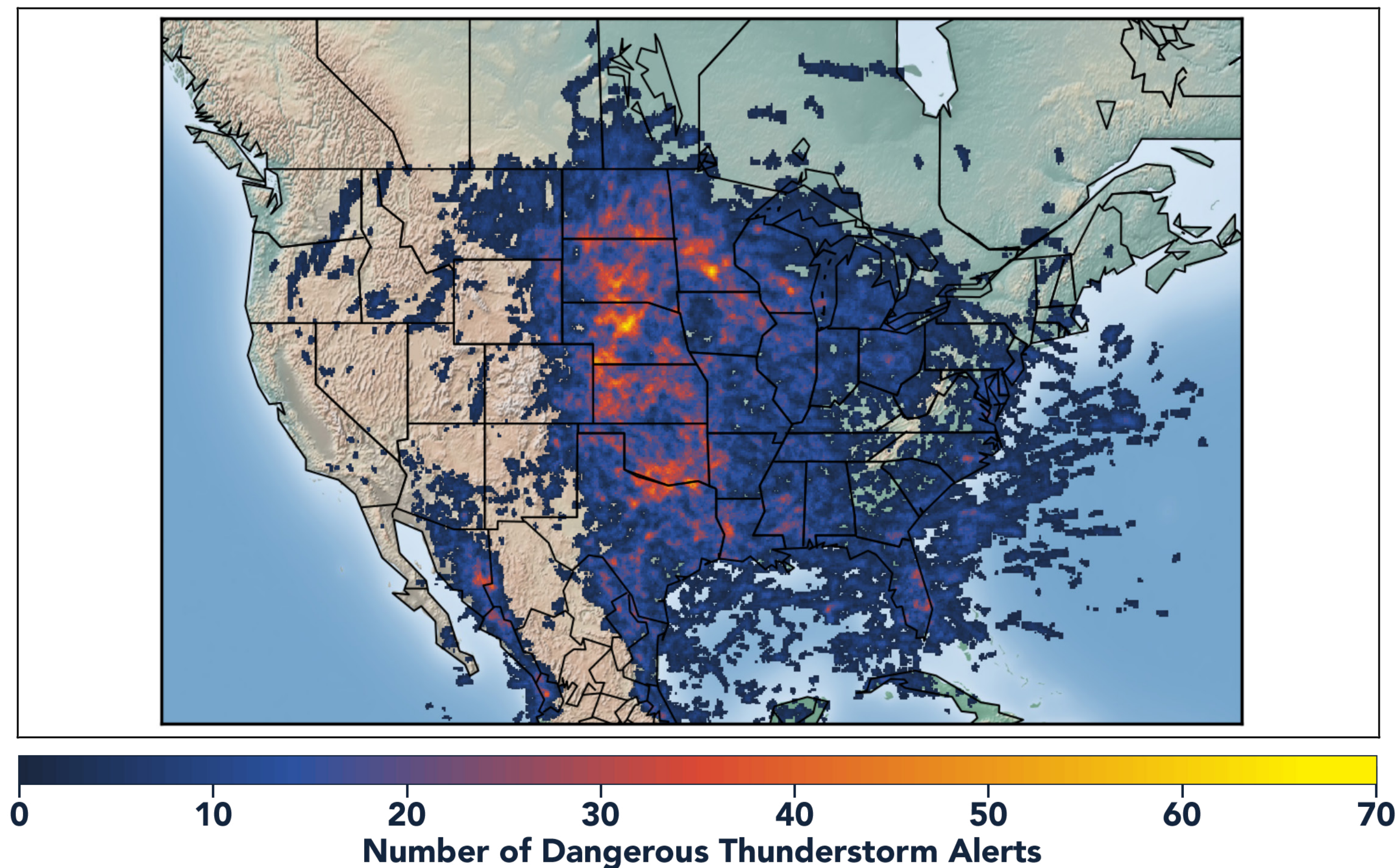
We cluster pulses together into a flash. With every pulse we detect, we receive a more precise measure of lightning activity. At left, areas in bright yellow experienced the highest lightning pulse density per square mile in 2020.

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.



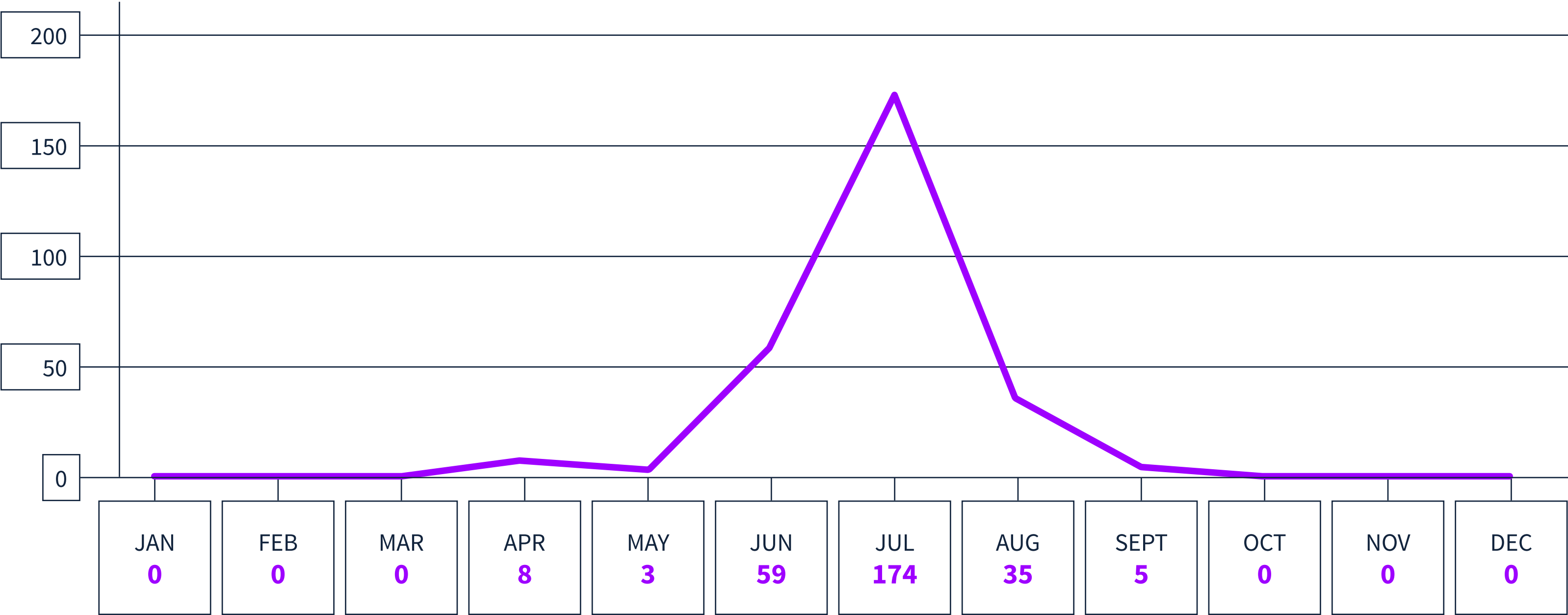
Earth Networks issued 29,401 Dangerous Thunderstorm Alerts (DTAs) in 2020. This year's map clearly shows the persistent drought conditions that have plagued the South and Southwest.

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

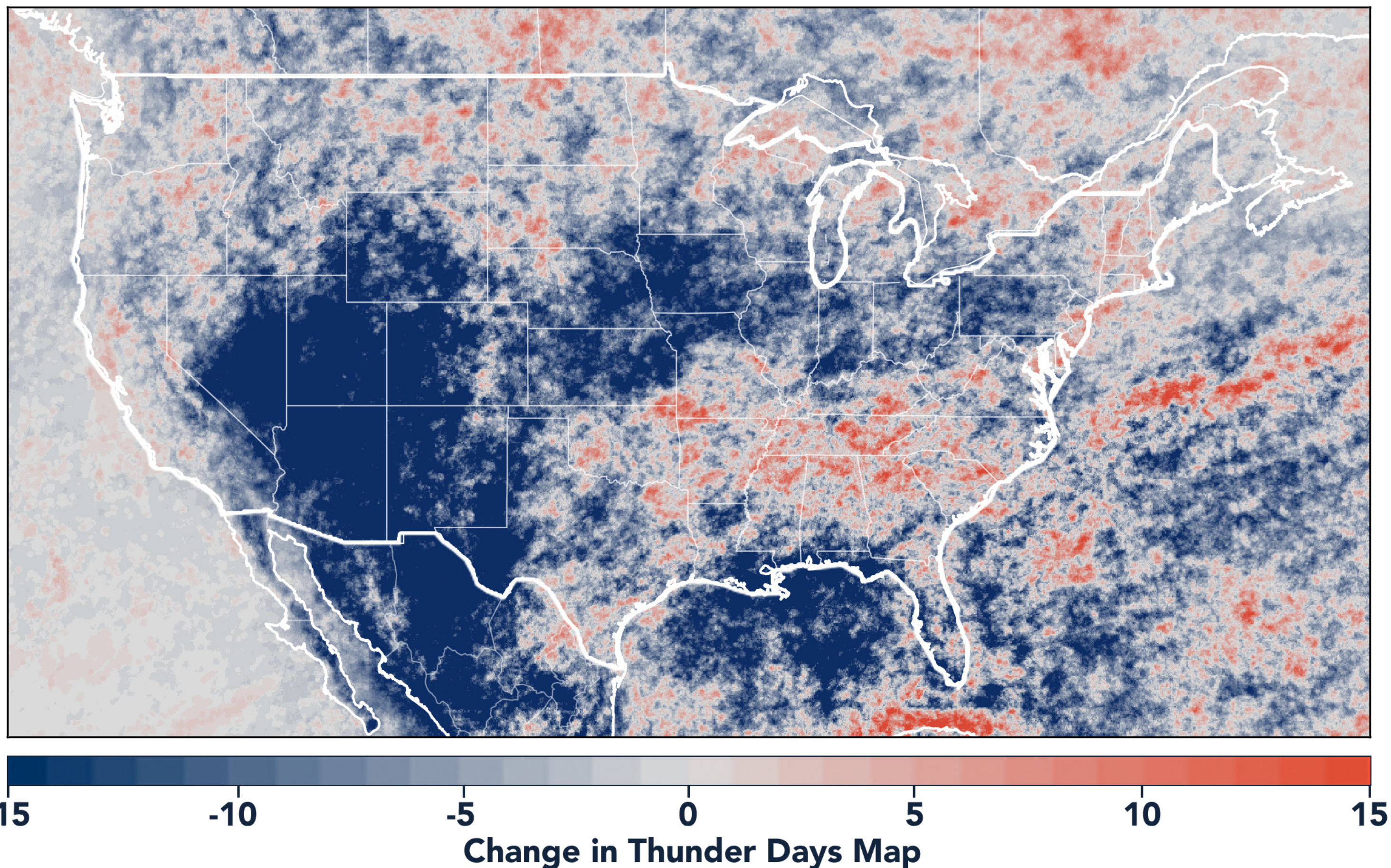
DANGEROUS THUNDERSTORM ALERTS BY MONTH

Earth Networks issued 284 Dangerous Thunderstorm Alerts for the state in 2020.

VIRGINIA



TOTAL STATE THUNDER DAYS: 176



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.

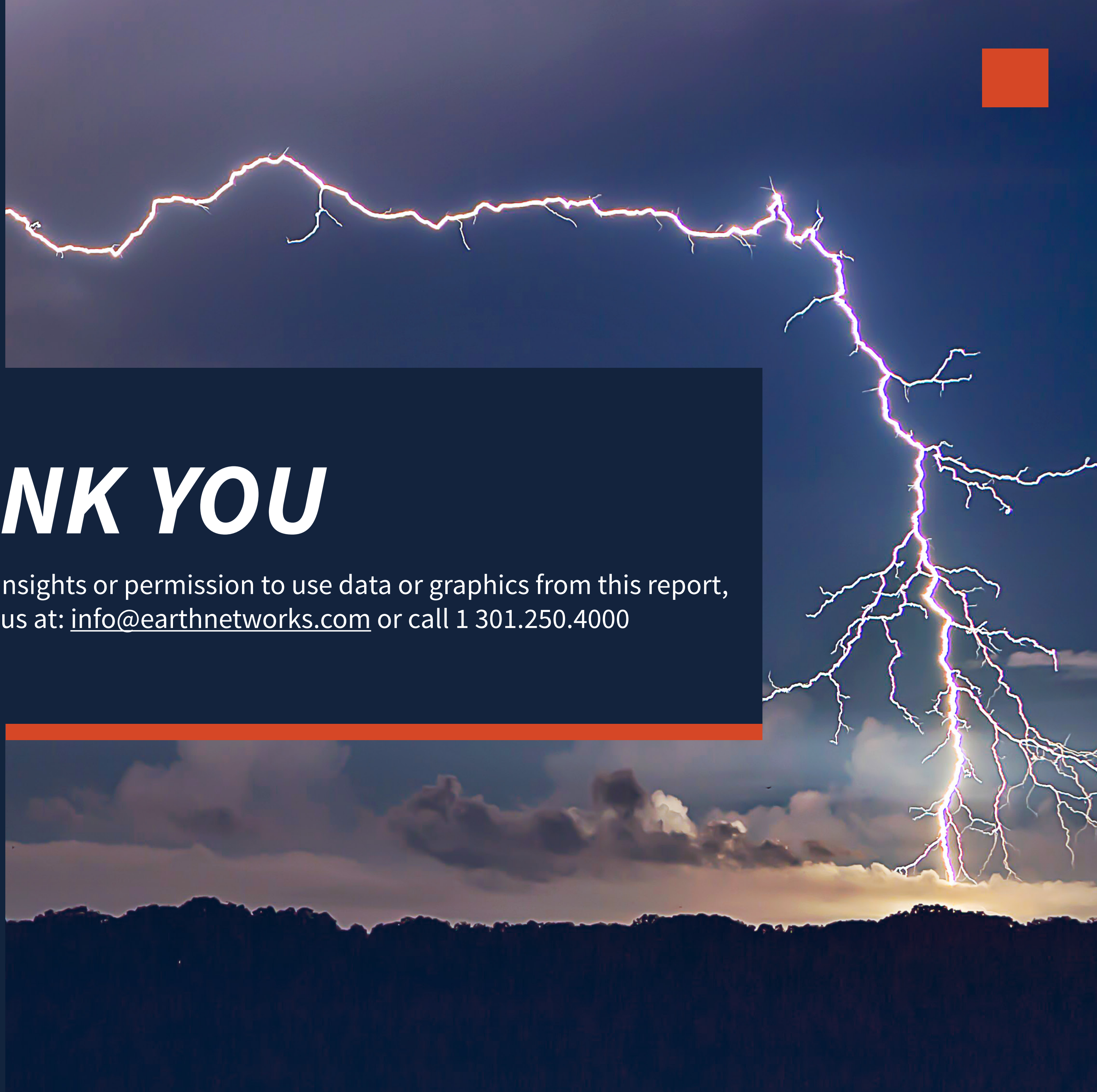
This year, the Southwest and Midwest experienced significantly less lightning than in previous years due to a persistent drought and weak monsoon. States in the Southeast experienced a substantial uptick in lightning activity this year, including Tennessee, North Carolina, South Carolina, Virginia, West 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
Accomack County	391,850	57
Caroline County	384,252	59
Fairfax city	299,148	85
Virginia Beach city	280,868	71
Augusta County	279,497	75
Albemarle County	266,420	67
Chesterfield County	264,868	54
Fauquier County	256,762	58
King and Queen County	245,468	57
Rockingham County	243,703	60
Hanover County	237,147	57
Prince William County	224,389	50
Loudoun County	222,587	51
Pittsylvania County	216,434	71
Campbell County	213,125	68
Spotsylvania County	209,781	49
Halifax County	208,995	70
Madison County	201,486	52
Louisa County	200,418	53
Northumberland County	183,277	51
Sussex County	179,532	61
King William County	179,021	49
Richmond city	177,508	88
Mecklenburg County	175,914	64
Dinwiddie County	168,352	59
Mathews County	167,794	41
Essex County	167,742	51
Henrico County	167,442	52
Chesapeake city	166,886	69
Surry County	162,665	57
Prince George County	162,118	54
Lancaster County	161,715	46
Northampton County	158,595	54
Franklin city	158,409	102
Gloucester County	158,269	47
Westmoreland County	158,217	57
King George County	154,244	50
Southampton County	151,915	69
Stafford County	146,460	50
Buckingham County	145,452	68
Charlotte County	145,351	69
New Kent County	141,967	51
Rockbridge County	139,470	68
Culpeper County	136,272	61
Suffolk city	132,799	69
Henry County	131,339	64
Botetourt County	130,784	59

COUNTY	TOTAL LIGHTNING PULSES	TOTAL THUNDER DAYS
Nelson County	130,529	65
Bedford County	130,464	72
Middlesex County	127,554	48
Isle of Wight County	125,644	64
Prince Edward County	123,398	55
Bath County	116,745	67
Orange County	114,992	52
Appomattox County	114,171	61
Lunenburg County	112,398	55
Amelia County	112,119	53
Fluvanna County	111,775	51
Amherst County	110,352	65
Frederick County	110,122	48
Cumberland County	107,232	56
Goochland County	102,652	50
Charles City County	102,491	54
Powhatan County	98,555	51
Rappahannock County	96,423	49
Carroll County	91,379	62
Shenandoah County	87,766	51
Nottoway County	82,318	46
York County	79,846	53
James City County	79,745	53
Page County	75,689	49
Brunswick County	72,562	59
Patrick County	72,365	70
Highland County	70,118	60
Greensville County	66,509	52
Scott County	60,934	70
Alleghany County	58,844	61
Buchanan County	57,855	63
Greene County	54,614	44
Wythe County	47,260	62
Roanoke city	46,240	84
Dickenson County	42,408	55
Lee County	42,205	67
Smyth County	41,807	64
Pulaski County	41,154	58
Grayson County	38,356	57
Wise County	37,192	66
Hampton city	36,451	42
Craig County	36,244	51
Washington County	36,015	68
Tazewell County	35,925	63
Montgomery County	34,710	48
Russell County	33,157	69
Floyd County	32,906	56

COUNTY	TOTAL LIGHTNING PULSES
Norfolk city	32,004
Clarke County	31,847
Newport News city	31,615
Giles County	31,221
Bland County	29,721
Warren County	28,088
Poquoson city	27,320
Arlington County	22,495
Portsmouth city	20,116
Lynchburg city	19,245
Alexandria city	17,575
Danville city	17,021
Hopewell city	9,965
Staunton city	9,434
Petersburg city	8,993
Fredericksburg city	8,492
Manassas city	6,976
Harrisonburg city	5,991
Charlottesville city	5,589
Martinsville city	4,952
Colonial Heights city	4,403
Waynesboro city	4,299
Williamsburg city	4,072
Salem city	2,511
Manassas Park city	2,010
Emporia city	1,643
Winchester city	1,584
Buena Vista city	1,176
Falls Church city	965
Radford city	811
Galax city	809
Bristol city	664
Norton city	490
Covington city	339