





KANSAS 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.

IN THIS REPORT



03 **08** 09

Report Terminology

Lightning Counts

06 Lightning Density

Dangerous Thunderstorm Alerts

Thunder Days

Contact

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





LIGHTNING COUNT RANKINGS



Kansas ranked 4 in total lightning pulses for 2020.



COUNTIES

ttler	
viley ood ood yon less ove nery lark vick nne	
Ford ood yon less ove nery lark vick nne tber	
ood yon less ove nery lark vick nne tber	
yon less ove hery ner lark vick nne fber	
less ove hery ner lark vick nne 	
ove ove nery ner lark vick nne 'ber 'ber	
ove	
nery - Inner -	
nner - Inne - In	
lark - vick - Inne - In	
vick nne ber nrny	
nne ber nrny	
ber hinny -	
nrny	
0 200K 400K	600

TOTAL (CG+IC) PULSE DENSITY MAP







Total Pulse Density (sqmi)

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.

500

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 2,259 Dangerous Thunderstorm Alerts for the state in 2020.



TOTAL STATE THUNDER DAYS: 179



-10 -5 -15 **Change in Thunder Days Map**

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.

10

15

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.

EARTH NETWORKS®



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 cloudto-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
ТХ	63,683,799	278
FL	35,430,198	246
ОК	26,159,420	205
KS	23,125,675	179
IL	16,785,149	166
NE	14,433,875	178
МО	14,081,658	184
VA	13,234,163	176
GA	13,016,803	217
ОН	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
	3,465,297	96
	1,951,574	172
	1,518,171	172
	1,207,040	5U 146
	1,237,002	00
	056 197	151
OP	930,187	131
	\$13,633 802 252	70
	618 242	70
	402 333	117
ME	358 334	<u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u>81</u></u>
	254 695	75
	190 992	42
	130,332 AA 20A	-τ2 Λ7
	47,204	** /

APPENDIX

This table ranks all U.S. states by total lightning pulses, including in-cloud and cloudto-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.

COUNTY	TOTAL LIGHTNING PULSES	TOTAL THUNDER DAYS	ςοι
Butler County	577,947	64	Mars
Cowley County	504,568	72	Grah
Ford County	388,975	56	Jewe
Greenwood County	387,901	63	Mari
Lyon County	367,451	58	Treg
Ness County	344,677	55	Prat
Gove County	340,415	58	Harp
Montgomery County	337,242	73	Rool
Sumner County	324,173	70	Raw
Clark County	323,584	62	Wilso
Sedgwick County	322,302	57	Gray
Cheyenne County	319,701	67	Kiow
Barber County	318,284	66	Otta
Kearny County	318,066	56	Ham
Lincoln County	314,605	53	Clou
Thomas County	307,845	65	Wich
Reno County	306,474	64	Neos
Logan County	302,649	62	Bour
Sherman County	298,661	63	Ellis
Russell County	292,599	54	Wall
Finney County	287.353	65	Craw
Chase County	286.038	59	Clay
Dickinson County	283.020	60	Jack
Wabaunsee County	281.689	53	Aller
Ellsworth County	278.001	49	McP
Osage County	277.900	50	Osbo
Morris County	272.721	51	Salir
Washington County	269.557	62	Scot
Labette County	267.516	81	Hask
Pottawatomie County	261.195	58	Woo
Hodgeman County	255.603	52	Ande
Chautaugua County	255.332	69	Nem
Elk County	251.993	66	Gree
Stafford County	249.144	55	Fran
Edwards County	247.141	50	Gear
Rush County	246.658	49	Linn
Coffey County	244.166	54	Sewa
Meade County	241.764	64	Shav
Barton County	239.016	51	Rile
Pawnee County	235,481	51	Lane
Mitchell County	235.476	56	Gran
Cherokee County	233.328	79	Deca
Sherid <u>an County</u>	227.597	54	Mort
Rice County	226.749	55	Brow
Republic County	226.001	57	Harv
Kingman County	225.824	57	Phill
Comanche County	225,274	56	Nort
	· ·	1 I	

	TOTAL LIGHTNING PULSES	TOTAL THUNDER DAYS
unty	224,765	61
unty	222.729	51
nty	220,253	61
ntv	218.228	58
ty	216.191	51
v	214.354	55
nty	211,515	63
nty	208,166	47
unty	206,373	69
nty	202,548	69
y	199,530	63
nty	199,243	51
inty	199,234	57
ounty	198,700	60
ty	192.665	60
inty	191.059	57
unty	189.461	75
ounty	187.748	68
1	187.507	54
unty	186.838	62
ountv	184.794	70
1	181.536	57
untv	179.826	48
V	178,406	58
, County	174.366	59
ounty	172.910	49
ntv	169.376	57
.V	168.939	54
inty	167.548	61
ounty	167.219	65
ounty	167.213	54
unty	167.001	58
inty	162.558	63
unty	156.702	47
ty	155.876	57
/	155.142	56
inty	151.620	66
ounty	149.849	52
V	148.803	71
V	135.816	59
ty	135.697	57
unty	133.249	60
inty	131.224	59
nty	130.154	60
ntv	130.120	46
inty	129.206	50
nty	126.891	50

NTY

iall C

l Cou n Coi

Cou Cour er Co

s Cou ns Co n Co

Coun a Cou /a Co

ton Cou

ita Co ho Cc

on C

ce Co

ord (

Coun on C

Cour ersoi

ne C Cou Coui

ell Co son

rson (iha C ey Co

lin Co / Cou

Count rd Co

nee (Cour Cour

tur Co on Cou n Cou ey Cou ps Co on Cou

COUNTY	TOTAL LIGHTNING PULSES	TOTAL THUNDER DAYS
Smith County	123,991	54
Stanton County	115,816	58
Jefferson County	111,755	53
Douglas County	105,882	45
Atchison County	100,474	46
Stevens County	98,646	57
Doniphan County	87,128	53
Miami County	84,655	49
Leavenworth County	81,081	47
Johnson County	75,113	52
Wyandotte County	21,961	40