





SOUTH DAKOTA 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 88.98%

SOUTH DAKOTA TOTAL LIGHTNING PULSES **11,940,870**

·11.02%

Total Lightning Type Percentages



LIGHTNING COUNT RANKINGS



South Dakota ranked 11 in total lightning pulses for 2020.



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 1,771 Dangerous Thunderstorm Alerts for the state in 2020.



TOTAL STATE THUNDER DAYS: 156



-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.

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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 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	47
	47,204	** /

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	COUN
Meade County	678,221	77	Potter
Perkins County	537,963	61	Jerau
Pennington County	462,067	84	Yankto
Haakon County	439,056	63	Dougl
Jackson County	387,156	71	Camp
Corson County	386,196	57	Clay C
Todd County	372,012	69	Grant
Ziebach County	353,172	58	Lake (
Butte County	329,121	67	Mood
Dewey County	311,357	54	Brook
Harding County	309,726	60	Sanbo
Lyman County	290,921	54	Hanso
Stanley County	285,198	59	Hamli
Brown County	262,881	51	Deuel
Hand County	250,461	58	Lincol
Tripp County	248,326	65	Minne
Jones County	232,866	49	Turne
Bennett County	232,690	64	Daviso
Mellette County	229,761	62	McCo
Charles Mix County	216,198	53	
Fall River County	208,867	79	
Oglala Lakota County	204,371	70	
Custer County	200,702	72	
Sully County	188,352	44	
Gregory County	172,397	48	
Spink County	170,451	50	
Hughes County	167,756	45	
Brule County	166,676	44	
Beadle County	165,592	53	
McPherson County	157,646	48	
Roberts County	152,627	45	
Hyde County	148,897	54	
Edmunds County	148,239	44	
Lawrence County	148,028	68	
Faulk County	143,005	42	
Union County	122,513	46	
Aurora County	119,371	44	
Marshall County	115,256	45	
Bon Homme County	114,760	40	
Day County	111,966	49	
Clark County	108,537	43	
Hutchinson County	103,198	40	
Codington County	97,151	42	
Walworth County	94,948	42	
Kingsbury County	93,417	47	
Miner County	91,560	39	
Buffalo County	91,258	40	

	TOTAL LIGHTNING PULSES	TOTAL THUNDER DAYS
unty	89,657	37
ounty	86,080	41
County	85,624	36
County	82,818	32
l County	82,046	41
nty	81,257	39
unty	81,151	45
nty	80,159	43
ounty	72,155	41
s County	70,157	48
County	68,596	42
County	66,714	37
ounty	66,107	37
unty	63,354	45
ounty	52,720	36
na County	50,709	39
ounty	46,768	37
County	46,712	35
County	45,040	32