



2020

NORTH CAROLINA 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

NORTH CAROLINA TOTAL LIGHTNING PULSES 10,666,834 •**5.94**% 94.06% Total Lightning Type Percentages





LIGHTNING COUNT RANKINGS



North Carolina ranked 15 in total lightning pulses for 2020.

COUNTIES

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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 465 Dangerous Thunderstorm Alerts for the state in 2020.

NORTH CAROLINA



TOTAL STATE THUNDER DAYS: 203



-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.

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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		
NJ	3,465,297	96		
	1,951,574	172		
	1,518,171	172		
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	930,107	122		
	913,033 802 252	70		
	612 7/3	70		
	402 333	117		
	702,333	£17 §1		
	350,337	75		
	190 992	42		
	44 204	<u>47</u> <u>4</u> 7		
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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	COUNTY
Dare County	387,461	81	Chowan
Carteret County	307,715	92	Stanly Co
Wake County	267,145	77	Pasquot
Beaufort County	246,353	78	Martin C
Onslow County	240,864	89	Hoke Co
Tyrrell County	228,885	69	Rocking
Robeson County	223,331	91	Montgor
Hyde County	222,322	84	Rowan C
Columbus County	221,314	97	Clevelan
Pamlico County	220,238	75	Orange (
Currituck County	213,771	71	Cheroke
Pender County	210,124	93	Surry Co
Craven County	205,070	89	Scotlanc
Duplin County	201,440	90	Person C
Johnston County	199,867	87	McDowe
Brunswick County	191,262	104	Edgecon
Sampson County	173,659	87	Henders
Wavne County	167.837	75	New Har
Randolph County	161.477	80	Anson Co
Lenoir County	151.407	72	Warren (
Bertie County	147.273	72	Cabarrus
Gates County	141.073	54	Caswell
Franklin County	135.598	71	Catawba
Halifax County	131.942	75	Durham
Granville County	131.549	67	Richmor
Pitt County	130.270	76	Wilson C
Nash County	120.507	75	Transvlv
Bladen County	119.097	93	Alamano
Harnett County	117.453	76	Forsyth (
Chatham County	115.590	73	Greene
Guilford County	115.473	73	Buncom
Moore County	113.820	83	Macon C
Cumberland County	112,998	80	lackson
Hertford County	111,583	66	Наумоо
Mecklenburg County	108 193	80	Swain Co
Wilkes County	107,967	79	Graham
Northampton County	105 758	62	Clay Cou
Camden County	104 483	71	
Perquimans County	107,705	62	Alevande
Iones County	102,052	72	Gaston
Washington County	07 602	70	Stokes C
Davidson County	91,092 07 22A	00	Vanco G
Burke County	51,554 06 007	0U 76	Valle CC
	JO,UU1	01	Madison
Coldwell County	33,445	ō5 70	Lipsolo
	33,383	19	
	35,512	18	POIKCOL
Rutherford County	93,405	۲۵	Davie Co

	TOTAL LIGHTNING PULSES	TOTAL THUNDER DAYS
County	92,088	59
unty	90,352	68
nk County	89,820	58
untv	89,693	71
nty	88,959	78
am County	86,583	68
ery County	86,449	70
ounty	85,960	72
l County	85,188	72
ounty	83.876	58
County	80,254	82
inty	79.903	70
County	79.134	68
ounty	78.829	49
County	76.717	79
be County	75.770	65
n County	74.675	80
over County	74,467	77
untv	73.683	74
	73,332	65
County	71,542	70
	70 877	55
County	69,795	68
County	69 446	56
	68 686	74
	67 602	67
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	53,528	0U 0E
	54,900	00
County	52,68U	83 76
County	49,224	70
	49,057	19
ounty	41,211	71
ity	47,173	11
	46,376	60
County	45,250	65
bunty	44,542	/1
unty	43,951	77
unty	40,222	53
unty	37,796	63
Lounty	36,593	63
ounty	33,576	74
ity	26,745	66
inty	23,413	62

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COUNTY	TOTAL LIGHTNING PULSES	TOTAL THUNDER DAYS	
Ashe County	22,285	64	
Yancey County	21,117	67	
Watauga County	20,594	62	
Alleghany County	20,412	56	
Avery County	19,438	68	
Mitchell County	7,801	61	
Morton County	322,126	66	
Grant County	273,996	53	
Dunn County	260,172	64	