



Total lightning statistics

2021 ANNUAL LIGHTNING REPORT

VAISALA

Highlights of lightning activity in 2021

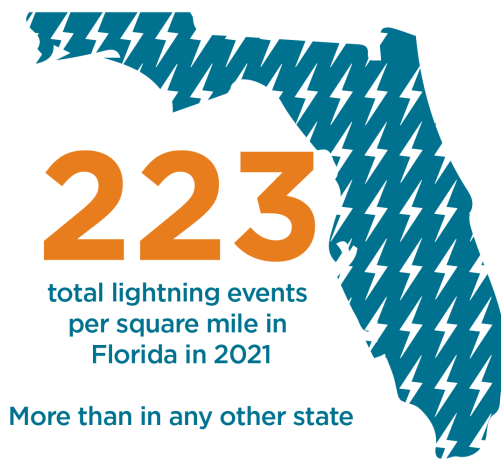
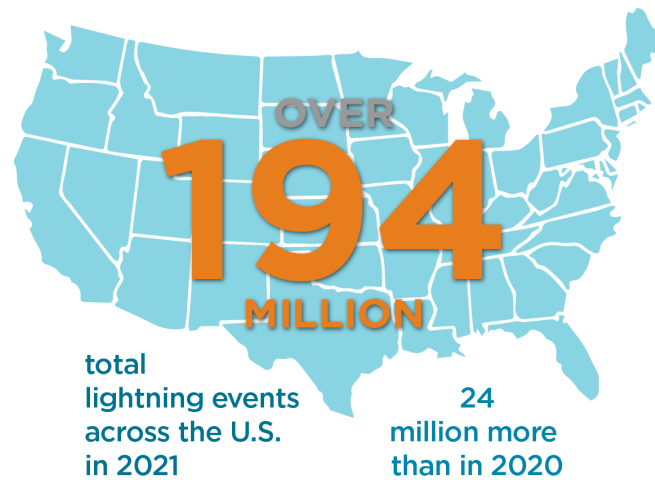
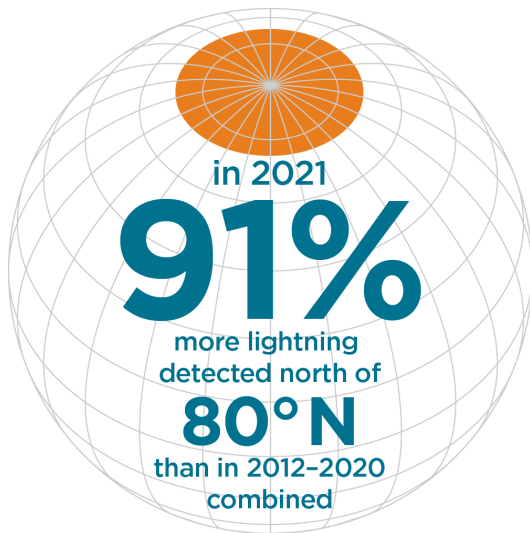


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2021 Annual Lightning Report

The data are from the Vaisala NLDN U.S. National Lightning Detection Network and the Vaisala GLD360 Global Lightning Detection Network, that monitor total lightning activity, including both in-cloud (IC) and cloud-to-ground (CG) lightning, 24 hours a day, 365 days a year.

Data analysis provided by **Ronald Holle** and **Chris Vagasky**
Maps created by **Jesse Hietanen**

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Detecting lightning across the United States for almost 40 years

Vaisala's U.S. [National Lightning Detection Network[®] \(NLDN\)](#) is the longest continuously operating and most scientifically validated lightning detection network in the world. The earliest version of NLDN detected its first cloud-to-ground lightning stroke on June 1, 1983, at 00:04:47 UTC, about three miles northwest of New Milford, Pennsylvania.

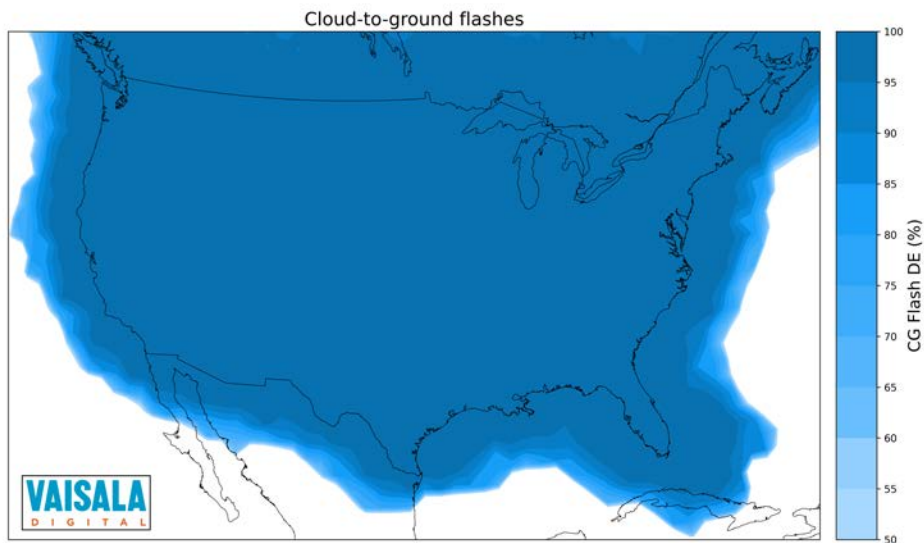
NLDN is recognized as representing the gold standard in lightning detection. It provides

industry leading data availability and detection performance, detecting in-cloud lightning flashes and cloud-to-ground strokes with the highest location accuracy.

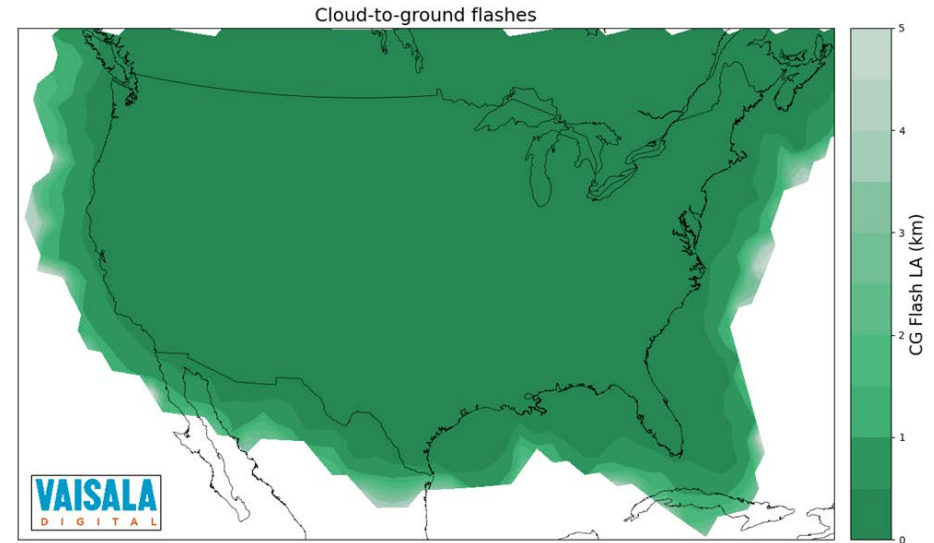
NLDN's technology, built on an evenly distributed network of ground-based sensors, guarantees detected lightning trends reflect meteorological reality, not sensor density. This allows for accurate year-over-year comparisons and provides a reliable climatological record.

NLDN has been the primary source of lightning information for major organizations including the National Weather Service, Federal Aviation Administration, and United States Air Force for more than 30 years. The largest electric power utilities in the United States use NLDN to help manage the reliability of their transmission and wind power assets.

NLDN Detection Efficiency over CONUS



NLDN Location Accuracy over CONUS



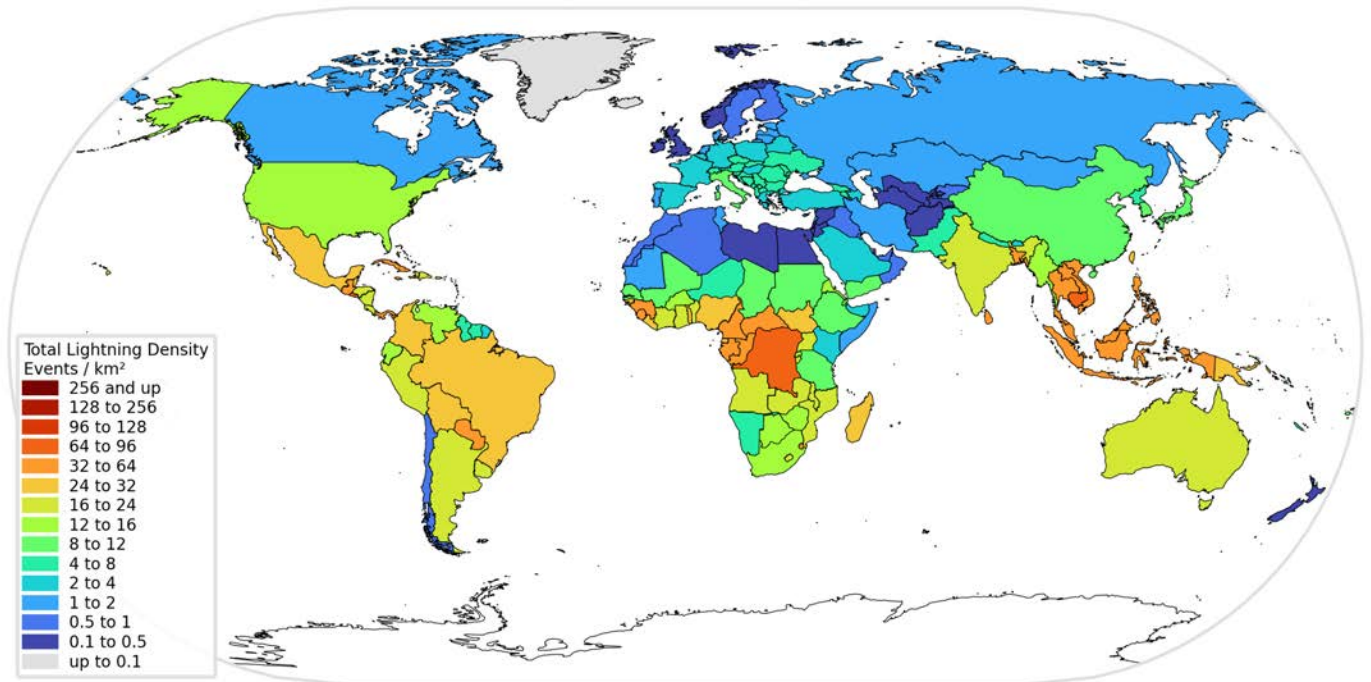
Global lightning detection for more than 10 years

Vaisala's owned-and-operated [Global Lightning Dataset GLD360](#) is the only truly global lightning detection network and has been detecting lightning around the planet since 2009. It is the most advanced and accurate long-range lightning detection network in the world and instantly detects lightning anywhere over land and sea.

GLD360 sensors, sensitive to Very Low Frequency signals emitted by lightning, use magnetic direction finding and time of arrival technologies and lightning waveform recognition to detect lightning at long ranges of up to 10,000 kilometers. GLD360 is unique among long range lightning detection networks in its ability to detect and accurately classify both in-cloud and cloud-to-ground lightning discharges and provide both polarity and peak current information.

GLD360 detects nearly 100% of thunderstorms globally and represents the industry standard in global lightning detection. The data from GLD360 are trusted by global organizations, including the United States Navy and Deutscher Wetterdienst to provide real-time lightning data anywhere on the planet.

Global lightning density 2021



GLD360 detects more than 2 billion lightning events every year, including at the highest latitudes of the planet. In 2019, lightning was detected just 52 kilometers from the North Pole, setting the Guinness World Record for the furthest north lightning ever detected.

For further information

You can find out more about lightning around the globe by visiting the interactive global total lightning density map at interactive-lightning-map.vaisala.com.

What are we counting?



In-cloud lightning

A cloud flash is lightning that connects regions with opposite polarity (+/-) within one cloud or between multiple clouds. In-cloud lightning usually precedes cloud-to-ground lightning.

A cloud flash has one or more cloud pulses. Pulses are the components of cloud flashes detected by NLDN and GLD360.



Cloud-to-ground lightning

A cloud-to-ground flash consists of at least one cloud-to-ground stroke and is dangerous to life and property.

A cloud-to-ground stroke, also known as a stroke, is lightning that connects a charge region in a cloud to the ground and is the bright, high-current, visible part of lightning that touches the ground or an object.



Total lightning

Both NLDN and GLD360 detect and classify in-cloud and cloud-to-ground lightning, which together are called total lightning. In this report, in-cloud pulses and cloud-to-ground strokes are collectively referred to as “lightning events”.

Strike points

Strokes in multiple-stroke, cloud-to-ground flashes usually follow the same lightning channel and strike the same ground point but can occasionally follow their own path resulting in multiple separated strike points on the ground. Vaisala's Strike Damage Potential data identifies the ground strike points from cloud-to-ground flashes.

For further reading

Blog:

[What is a lightning strike?](#)

Blog:

[Introducing Strike Damage Potential - rapid, automated, global lightning event analysis](#)

Monitoring trends in Arctic lightning to evaluate impacts of climate change

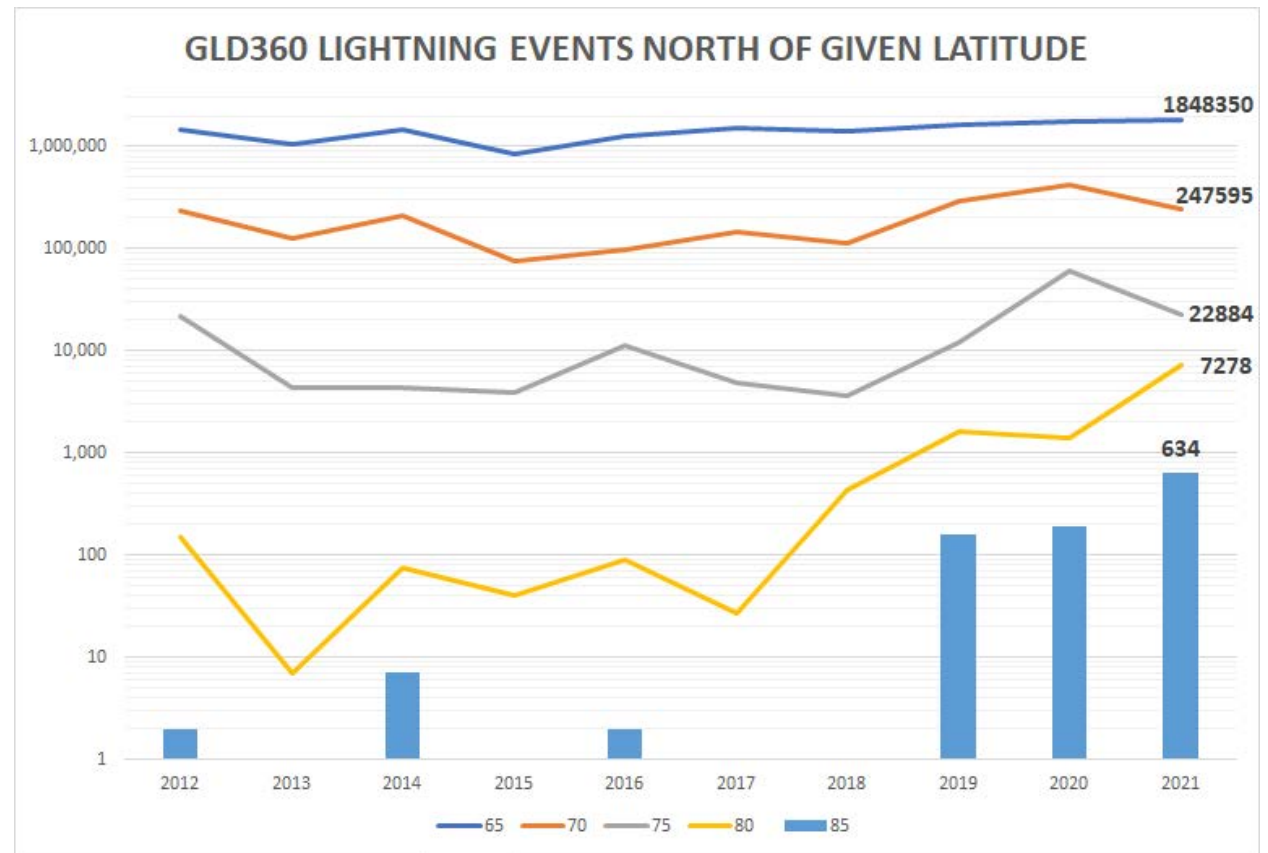
The World Meteorological Organization declared lightning as an Essential Climate Variable because understanding where and how frequently it occurs can help us better understand changes to our climate. Lightning in the Arctic region is an important indicator for the potential impacts of climate change because it identifies intrusions of warm, high-humidity air.

At most latitudes in the Arctic, lightning counts have remained consistent in the last 10 years, but are trending significantly higher north of 80°N. In 2019, the furthest north lightning on record was detected by GLD360, just 52 km from the North Pole. Climate scientists and other researchers will continue to monitor the trends in lightning in the Arctic to understand how conditions are changing in this remote location.

For further reading

Blog:
[Revising the record on record lightning at the North Pole](#)

Nearly twice as much lightning was detected north of 80° N in 2021 than in the previous nine years combined



We didn't start the fire, but lightning did

Thousands of lightning-triggered fires burn millions of acres annually

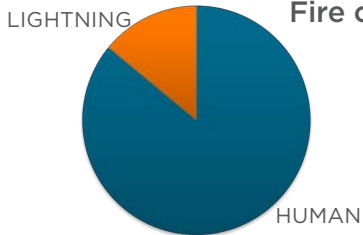
Lightning is the cause of just 14% of United States wildfires, but these fires result in 58% of the acreage burned each year.

Not all lightning is the same and some strikes have more potential for damage than others, so Vaisala released a new analytical tool called Strike Damage Potential in November. For every lightning flash that occurs around the world, Vaisala can identify the most likely ground contact point and categorize the potential for the lightning to cause damage to energy infrastructure, buildings, and other objects on the ground. Strike Damage Potential also identifies the strikes most likely to contain long continuing current, the longest lasting lightning strikes with potential to cause extreme heating and fires.

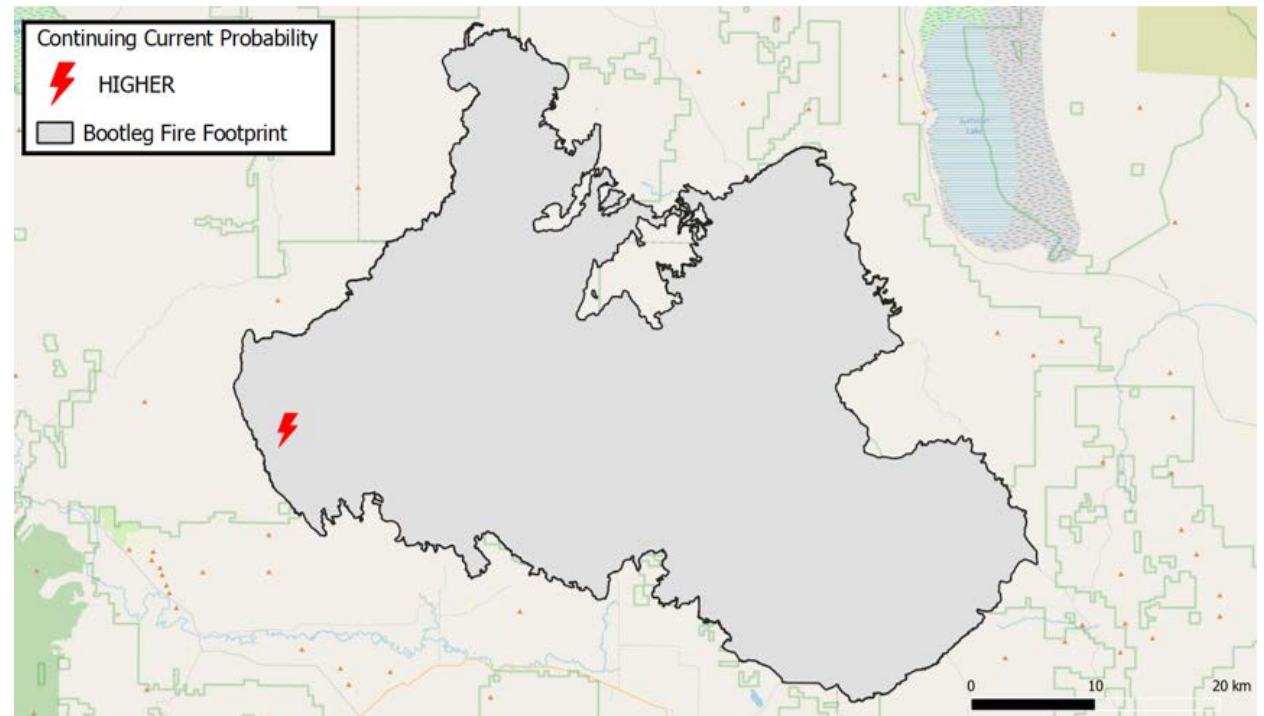
The Bootleg Fire became the third-largest wildfire in Oregon history in 2021, burning more than 400,000 acres. The fire was triggered by lightning that occurred on June 24 and was identified on July 6. The National Lightning Detection Network detected 14 cloud-to-ground strokes on June 24 that struck six individual ground points.

One ground contact point containing eight cloud-to-ground strokes was identified by the Strike Damage Potential algorithm as having a higher probability of continuing current, which lasts hundreds of times longer than lightning without continuing current.

Fire causes in the U.S.



Acres burned in the U.S.



Lightning leaders – United States

Top 10 states with the most total lightning by count and by density

TOP TEN STATES BY TOTAL LIGHTNING COUNT IN 2021

1	Texas	41,914,516
2	Florida	14,645,013
3	Louisiana	11,071,444
4	Oklahoma	9,940,752
5	Kansas	8,855,790
6	Missouri	7,690,990
7	Mississippi	6,999,388
8	Illinois	6,263,862
9	Nebraska	6,143,147
10	Arkansas	5,659,900

TOP TEN STATES BY TOTAL LIGHTNING DENSITY PER km² IN 2021

1	Florida	85.99
2	Louisiana	81.62
3	Texas	60.25
4	Mississippi	55.79
5	Oklahoma	54.91
6	District of Columbia	53.14
7	Missouri	42.60
8	Illinois	41.76
9	Kansas	41.55
10	Arkansas	41.09

Lightning count or lightning density?

There are two primary ways to look at how much lightning occurred over a region – the lightning count and the lightning density. In the case of the United States, Texas always has higher lightning count than any other state, due in part to its size and location. To enable comparisons between regions, dividing the number of lightning events by the square area gives us lightning density.

Definition: stepped leader

The stepped leader is the beginning of the cloud-to-ground lightning flash. It moves in 50-meter (165 feet) intervals from the cloud to the ground at speeds of 90,000 meters per second (200,000 miles per hour)! The stepped leader branches downward and outward as it senses the electric charge near it as it approaches ground. Lightning occurs when the stepped leader connects with an upward leader.

Definition: upward leader

As the stepped leader approaches ground, oppositely charged particles begin accumulating on trees, buildings, and other objects. The attraction of the particles on the ground to the stepped leader causes them to rise into the air as an upward leader. When the upward leader connects to the stepped leader, the lightning channel is complete, electricity flows from the cloud to the ground, and a bright flash of lightning occurs.

Lightning leaders – globally

Top 10 countries with the most total lightning by count and by density

TOP TEN COUNTRIES BY TOTAL LIGHTNING COUNTS IN 2021

1	Brazil	225,607,575
2	United States of America	194,549,696
3	Democratic Republic of the Congo	180,105,987
4	Australia	146,629,026
5	Mainland China	86,102,056
6	Indonesia	81,767,821
7	India	51,501,500
8	Mexico	50,751,946
9	Argentina	44,924,969
10	Colombia	36,435,131

TOP TEN COUNTRIES BY TOTAL LIGHTNING DENSITY PER km² IN 2021

1	Singapore	163.08
2	Macao S.A.R.	135.61
3	Brunei	105.22
4	Democratic Republic of the Congo	77.14
5	Cambodia	67.53
6	El Salvador	65.33
7	Republic of the Congo	60.80
8	Cuba	60.67
9	Vietnam	58.01
10	Philippines	56.59

Spotlight: Lake Maracaibo

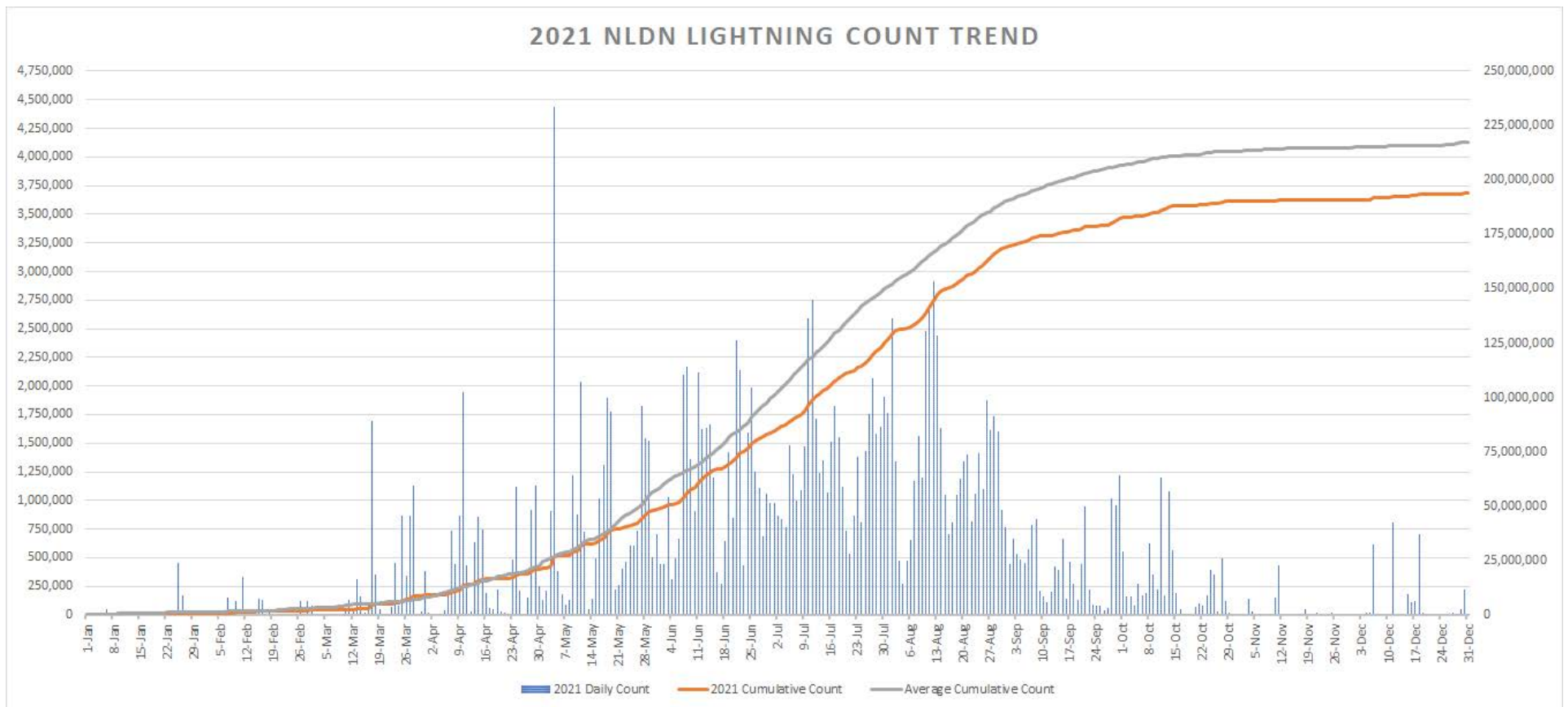
On average, lightning occurs nearly 300 days per year over Lake Maracaibo, the largest lake in South America. Lake Maracaibo is located in Venezuela, between the northernmost ridges of the Andes Mountains. Warm water temperatures, favorable winds, and its location in the tropics create prime conditions for thunderstorms to develop and make Lake Maracaibo the lightning capital of the world.



Seasonality of lightning in the United States

Lightning is highly seasonal in the United States. On average, two-thirds of the lightning in the United States occurs during the summer months. This can be seen in the chart with the higher daily totals appearing in June, July, and August.

There are subseasonal patterns visible as well. Numerous peaks and declines in lightning activity are visible because storm systems develop, move, and dissipate across the country, resulting in stormier and calmer patterns.



Flashy days – Top 10 dates with the most total lightning in the U.S.

Cloud-to-ground strokes plus cloud pulses

TOP TEN TOTAL LIGHTNING COUNTS BY DATE IN 2021

1	May 2	4,432,595
2	August 10	2,917,861
3	July 9	2,751,234
4	August 9	2,716,196
5	July 8	2,595,228
6	July 30	2,587,063
7	August 8	2,477,441
8	August 11	2,439,023
9	June 19	2,396,518
10	June 6	2,168,905

More lightning was detected by NLDN on May 2, 2021, during a multiple day severe weather outbreak across the country, than on any other day since 2017. 88 tornadoes were reported between May 2–3 across the United States.

August 11 (3rd), July 9 (7th), and August 10 (10th) ranked among the ten most active severe weather days in the United States this year.

Identifying weather patterns conducive to frequent lightning improves preparation for potential severe weather, operational interruptions, and power outages.

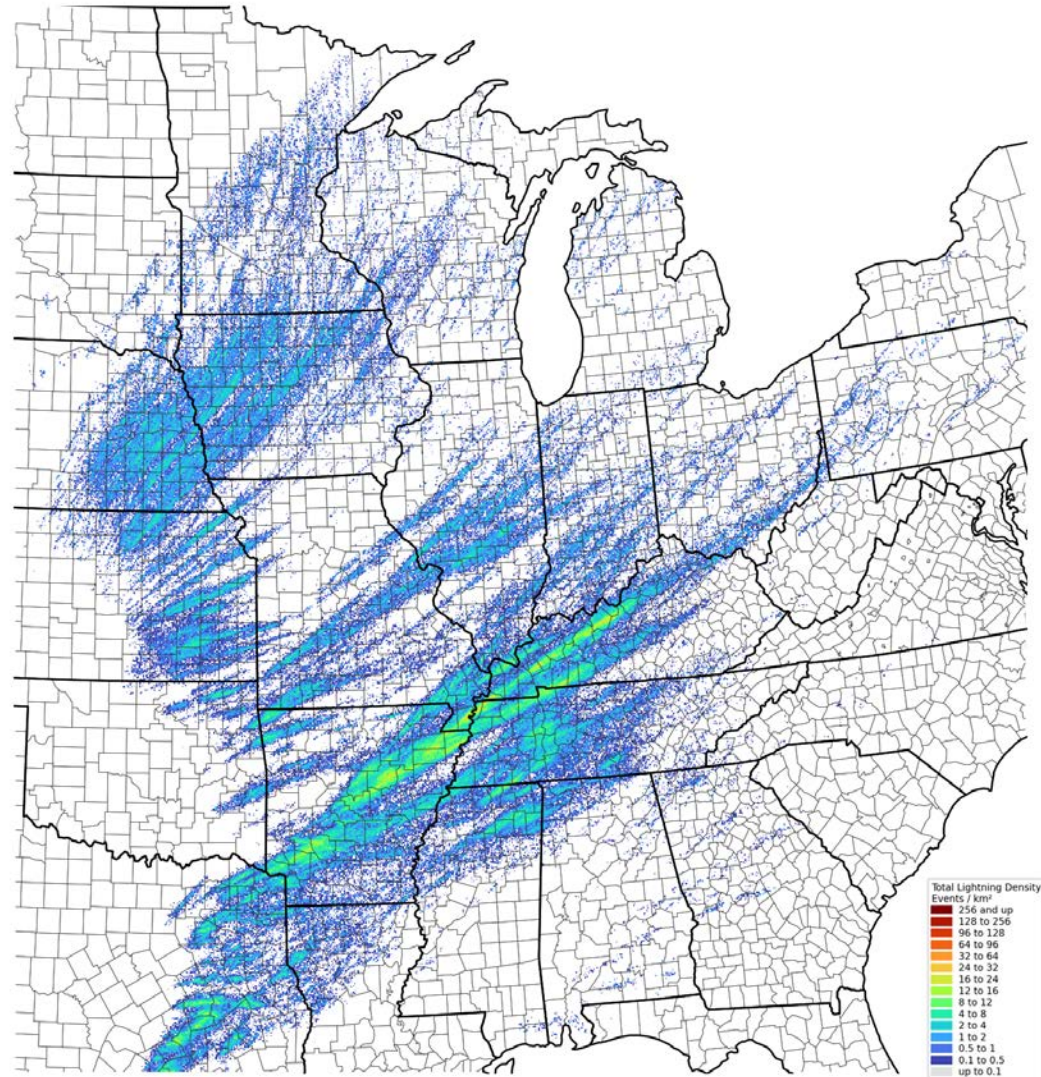


Historic severe weather outbreaks impact central and eastern portions of the United States in mid-December

Severe weather is typically at a minimum in December, but the tragic events of December 2021 reminded us that severe thunderstorms can occur any time and any place the conditions are favorable. In the United States, severe weather is defined as hail larger than 2.5 cm (1 in) in diameter, thunderstorm wind gusts stronger than 93 kph (58 mph), or tornadoes.

Severe weather outbreaks on December 10-11 and December 15 produced record numbers of tornadoes and wind gusts higher than 121 kph (75 mph) across large swaths of the United States. Between 2000 and 2020, only two December days were ranked in the top-10 active severe weather days for the year. Both December 10 and December 15 were among the top-10 active severe weather days of 2021, with December 15 ranking as the most active.

The map on this page shows NLDN lightning density for the two December severe weather outbreaks. Highest lightning density regions are associated with the strongest thunderstorms from the outbreaks. NLDN detected more than 1,000,000 lightning events during the two severe weather episodes.

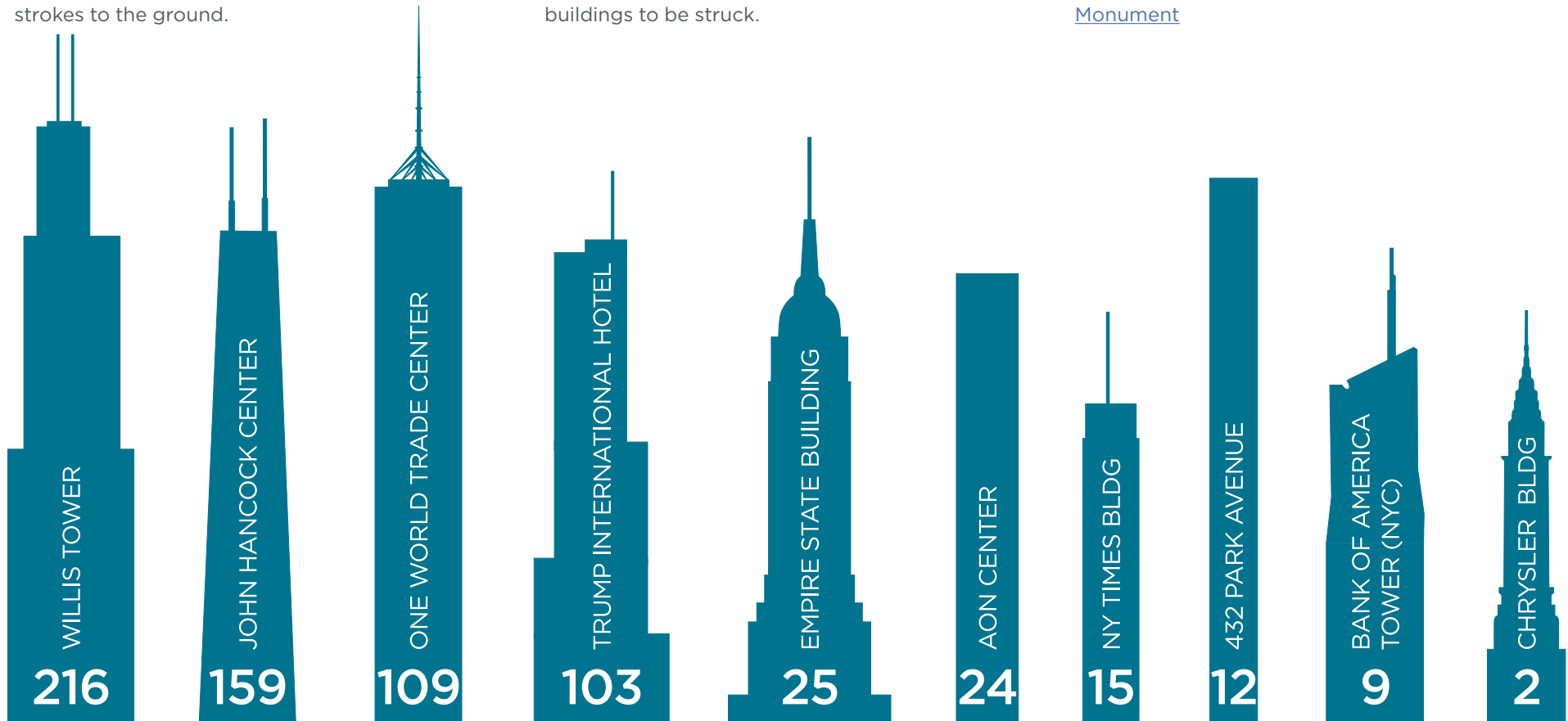


Scraping the sky and catching lightning

Don't believe the myth - lightning does strike the same place twice! Skyscrapers, radio and TV towers, and wind turbines are frequently struck by lightning, sometimes even triggering lightning during winter storms. Skyscrapers are built with lightning protection in mind and have systems in place to safely take electricity from lightning strokes to the ground.

Even though Willis Tower, Trump International Hotel, and the John Hancock Center are all shorter than One World Trade Center, they are struck by lightning as frequently or more frequently. Chicago, Illinois, averages more lightning than New York City, New York, each year, so there is more opportunity for these buildings to be struck.

The Washington Monument was struck by lightning on August 15 and closed for almost two weeks as repairs to the electrical access system were completed. In 2020, a Vaisala analysis found the Washington Monument is struck up to twice per year. Read more in a blog: [Striking history: Lightning and the Washington Monument](#)



Total lightning counts per state in 2021

Cloud-to-ground strokes plus cloud pulses – with rankings compared to 2020

1	↔	Texas	41,914,516	18	↗13	Arizona	3,573,539	35	↘3	Maryland	893,700
2	↔	Florida	14,645,013	19	↗5	Colorado	3,451,756	36	↗5	Nevada	730,222
3	↗3	Louisiana	11,071,444	20	↘5	North Dakota	3,196,746	37	↘1	Idaho	458,158
4	↘1	Oklahoma	9,940,752	21	↗4	Michigan	2,901,150	38	↔	New Jersey	452,997
5	↘1	Kansas	8,855,790	22	↘1	Ohio	2,767,782	39	↔	California	438,137
6	↘1	Missouri	7,690,990	23	↔	Virginia	2,704,205	40	↘5	Alaska	306,298
7	↗1	Mississippi	6,999,388	24	↘8	Minnesota	2,632,119	41	↘1	Oregon	196,356
8	↗3	Illinois	6,263,862	25	↘7	North Carolina	2,545,156	42	↔	Delaware	151,534
9	↔	Nebraska	6,143,147	26	↗1	Indiana	2,490,408	43	↗5	Connecticut	134,073
10	↘3	Arkansas	5,659,900	27	↗3	Pennsylvania	2,255,845	44	↔	Maine	109,705
11	↘1	Georgia	5,533,354	28	↔	Wisconsin	2,118,168	45	↗1	Massachusetts	109,277
12	↗2	Alabama	5,142,748	29	↘10	South Carolina	2,117,027	46	↗1	Vermont	71,264
13	↗7	New Mexico	5,114,235	30	↘4	Montana	1,976,333	47	↘2	New Hampshire	56,754
14	↗8	Iowa	4,134,343	31	↘2	Wyoming	1,563,326	48	↘5	Washington	55,779
15	↘3	South Dakota	4,063,473	32	↗5	Utah	1,256,895	49	↔	Hawaii	17,110
16	↘3	Tennessee	3,914,936	33	↔	West Virginia	1,071,308	50	↔	District of Columbia	9,408
17	↔	Kentucky	3,703,268	34	↔	New York	1,037,412	51	↔	Rhode Island	8,590

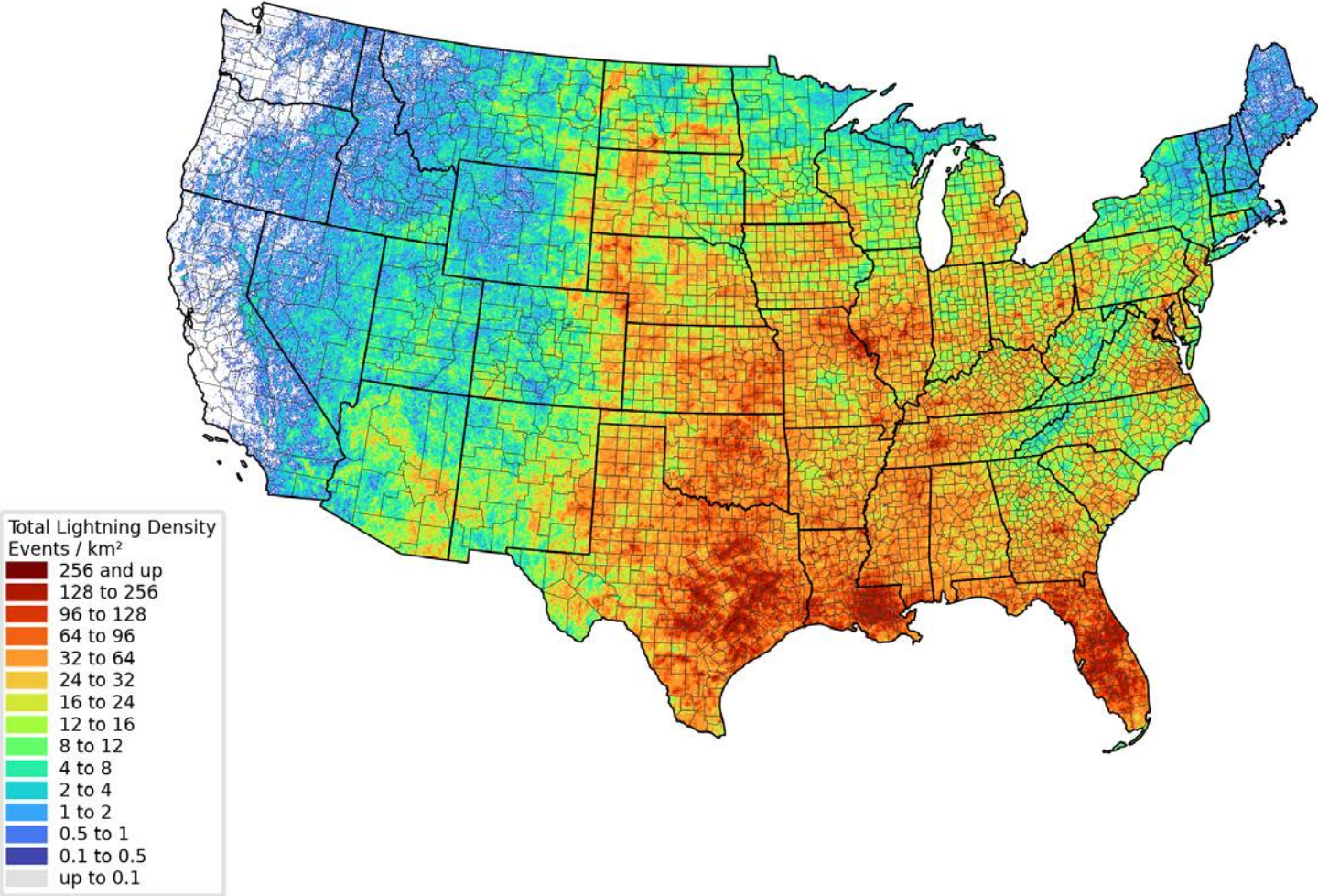
Total lightning density per state in 2021

Cloud-to-ground strokes plus cloud pulses – with rankings compared to 2020

1	↔	Florida	85.99	18	↗6	Indiana	26.40	35	↗2	Connecticut	9.34
2	↗2	Louisiana	81.62	19	↘7	South Carolina	25.52	36	↔	New York	7.34
3	↗4	Texas	60.25	20	↗2	Virginia	24.41	37	↘3	Wyoming	6.17
4	↗1	Mississippi	55.79	21	↘1	Ohio	23.84	38	↗6	Utah	5.72
5	↘3	Oklahoma	54.91	22	↘4	Delaware	23.51	39	↘4	Montana	5.19
6	↘3	District of Columbia	53.14	23	↘2	South Dakota	20.34	40	↗1	Massachusetts	4.00
7	↗3	Missouri	42.60	24	↗4	New Jersey	20.05	41	↘1	Vermont	2.86
8	↗5	Illinois	41.76	25	↗4	Pennsylvania	18.91	42	↗6	Nevada	2.55
9	↔	Kansas	41.56	26	↘7	North Carolina	18.26	43	↘4	New Hampshire	2.34
10	↘3	Arkansas	41.09	27	↘4	North Dakota	17.46	44	↘2	Rhode Island	2.15
11	↗4	Alabama	37.87	28	↘1	West Virginia	17.07	45	↘2	Idaho	2.12
12	↘1	Georgia	35.95	29	↗3	New Mexico	16.24	46	↘1	Maine	1.20
13	↘5	Tennessee	35.87	30	↗1	Colorado	12.80	47	↗2	California	1.03
14	↔	Kentucky	34.43	31	↗2	Wisconsin	12.49	48	↗2	Hawaii	1.01
15	↗1	Nebraska	30.66	32	↗6	Arizona	12.10	49	↘2	Oregon	0.77
16	↗9	Iowa	28.37	33	↘7	Minnesota	11.69	50	↘4	Washington	0.30
17	↔	Maryland	27.81	34	↘4	Michigan	11.58	51	↔	Alaska	0.20

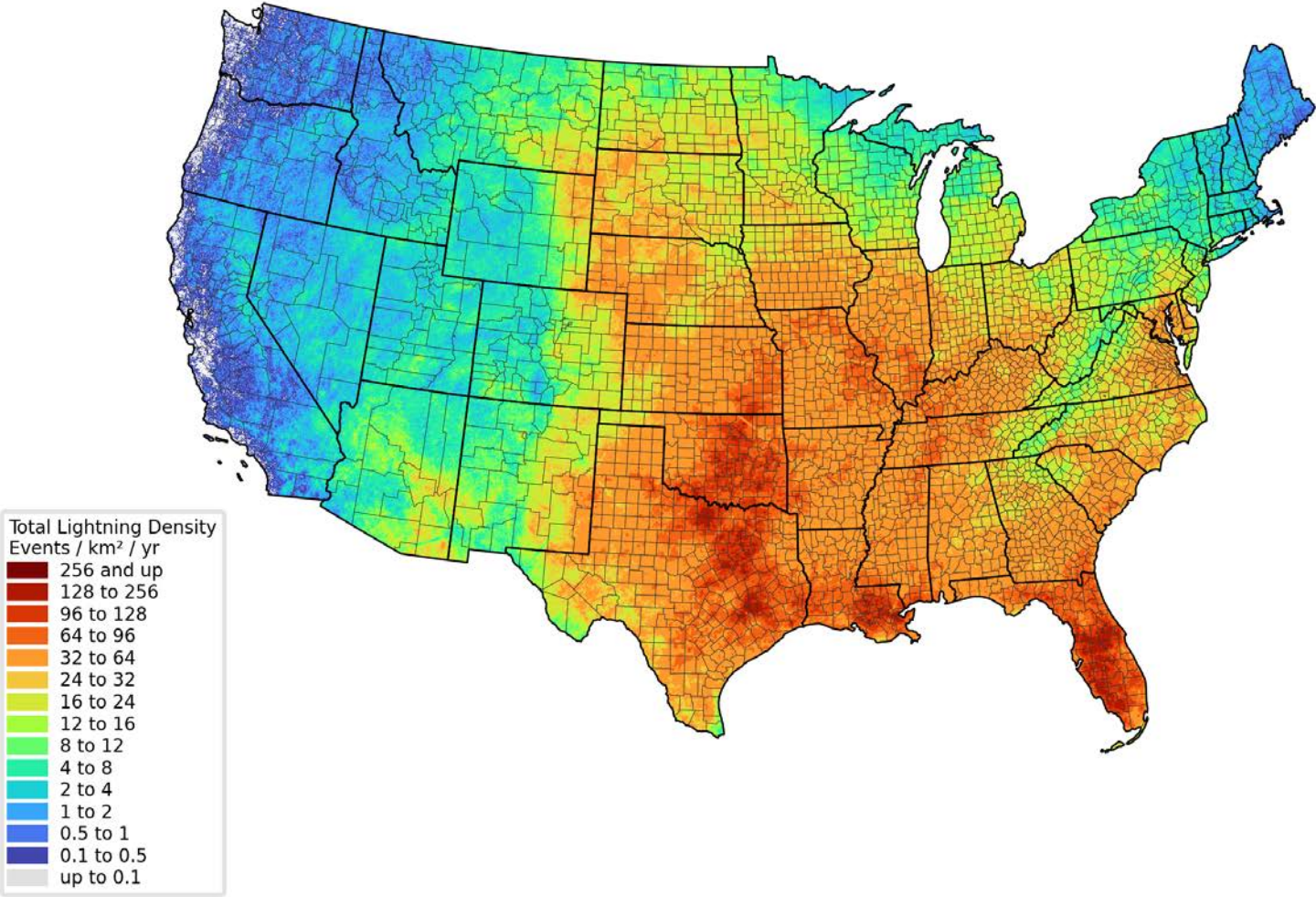
Total lightning density gridded map 2021

Cloud-to-ground strokes plus cloud pulses



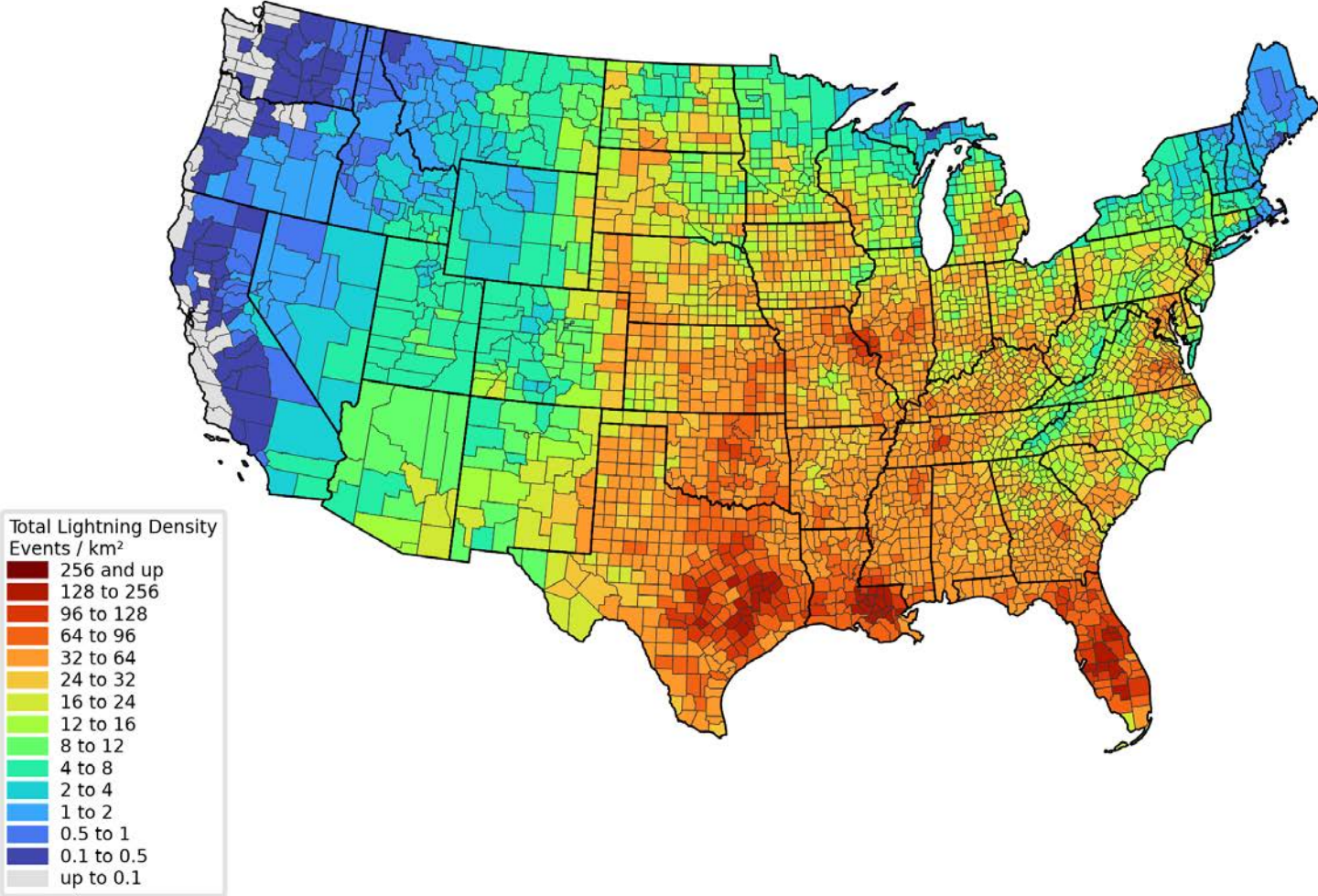
Total lightning density gridded map 2015-2020

Cloud-to-ground strokes plus cloud pulses



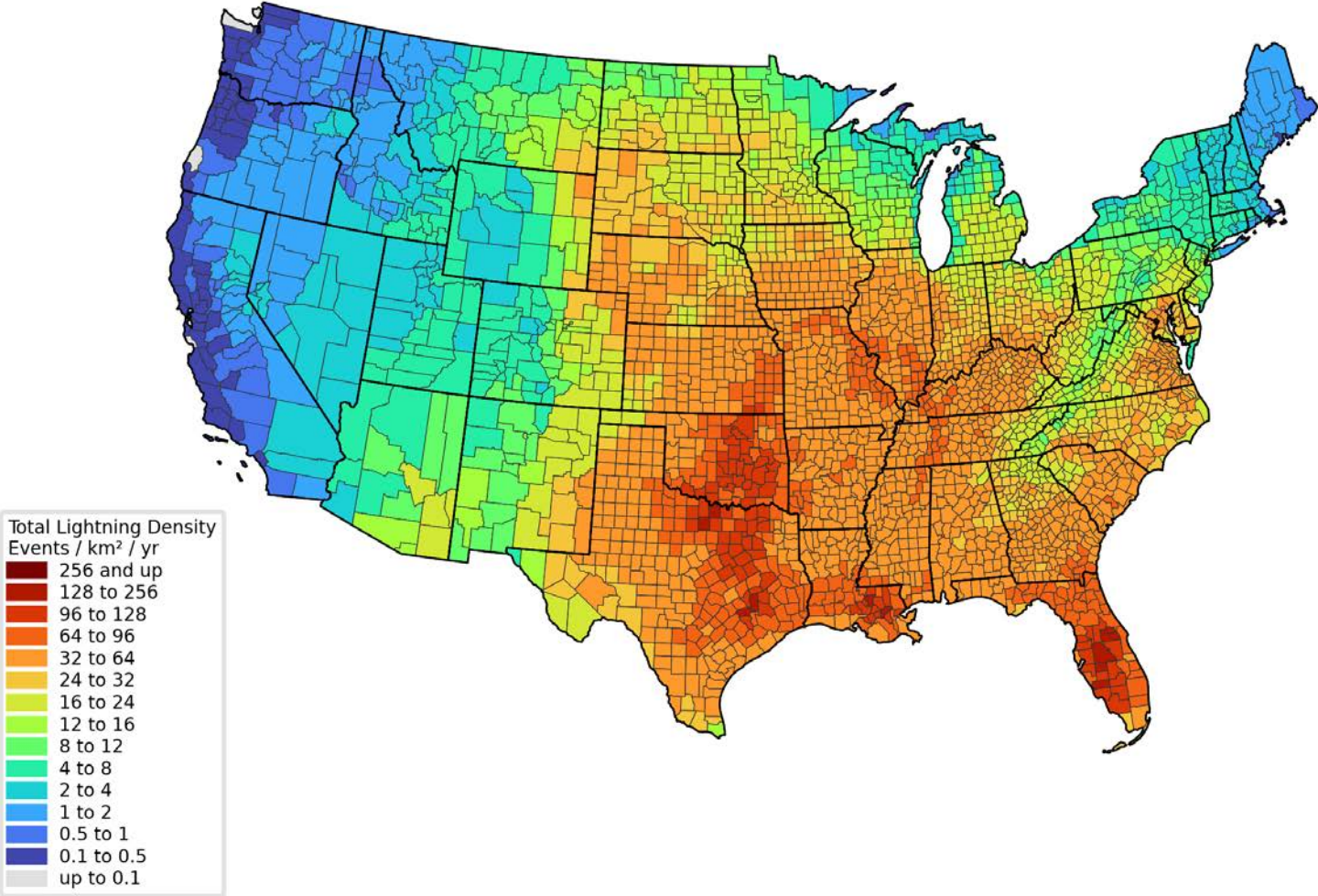
Total lightning density 2021

per county



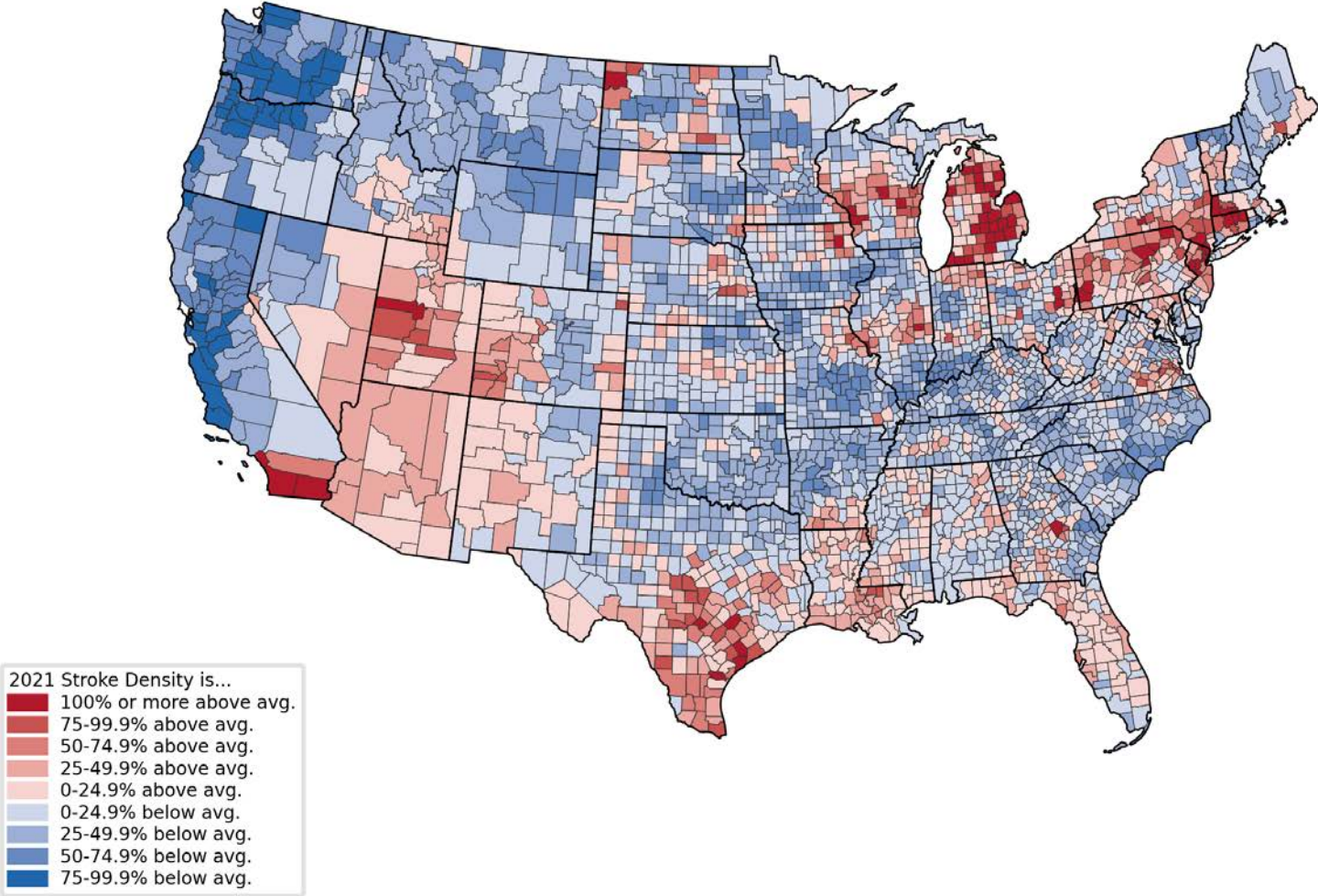
Total lightning density 2015-2020

per county

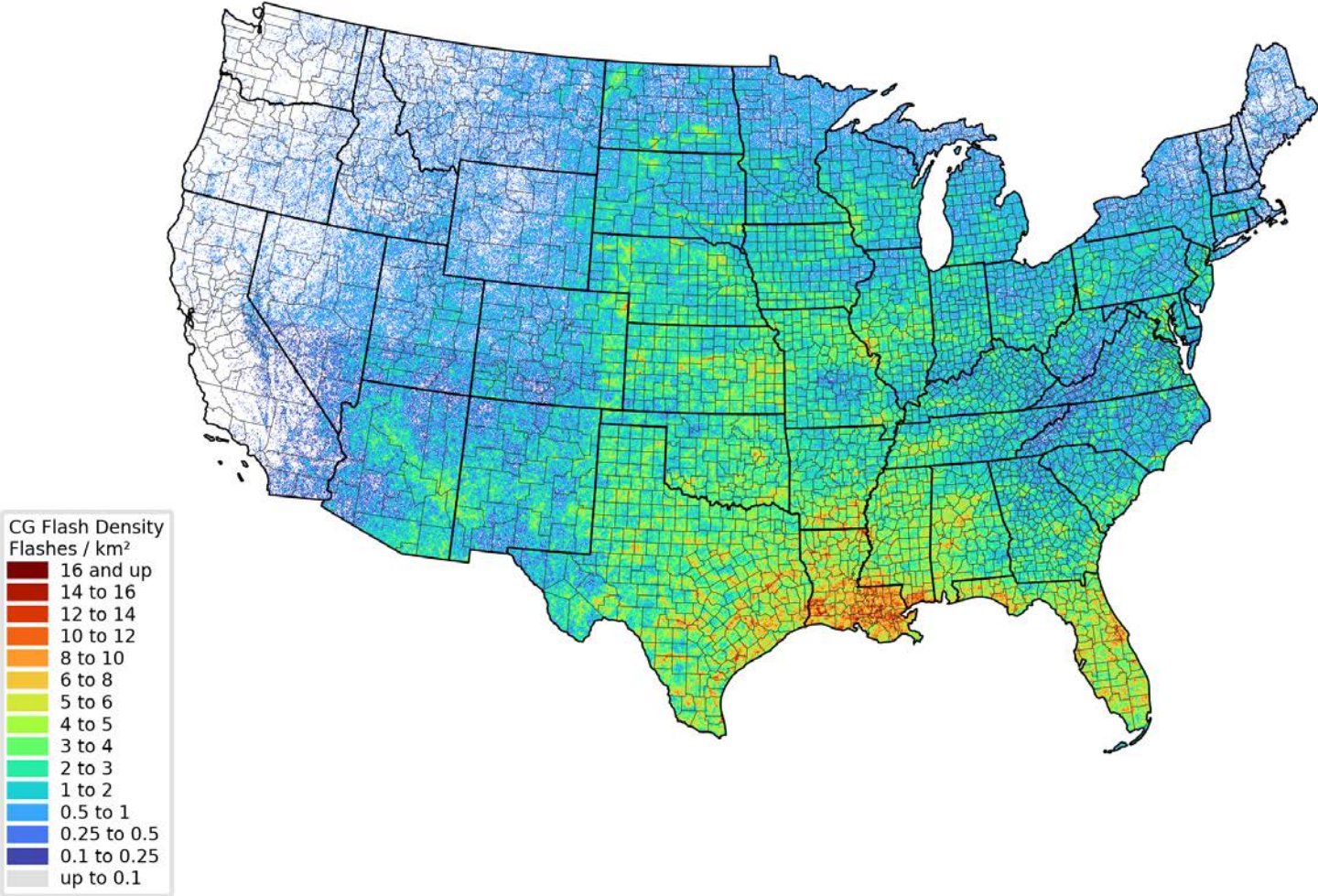


Total lightning density ratio 2021 vs 2015-2020

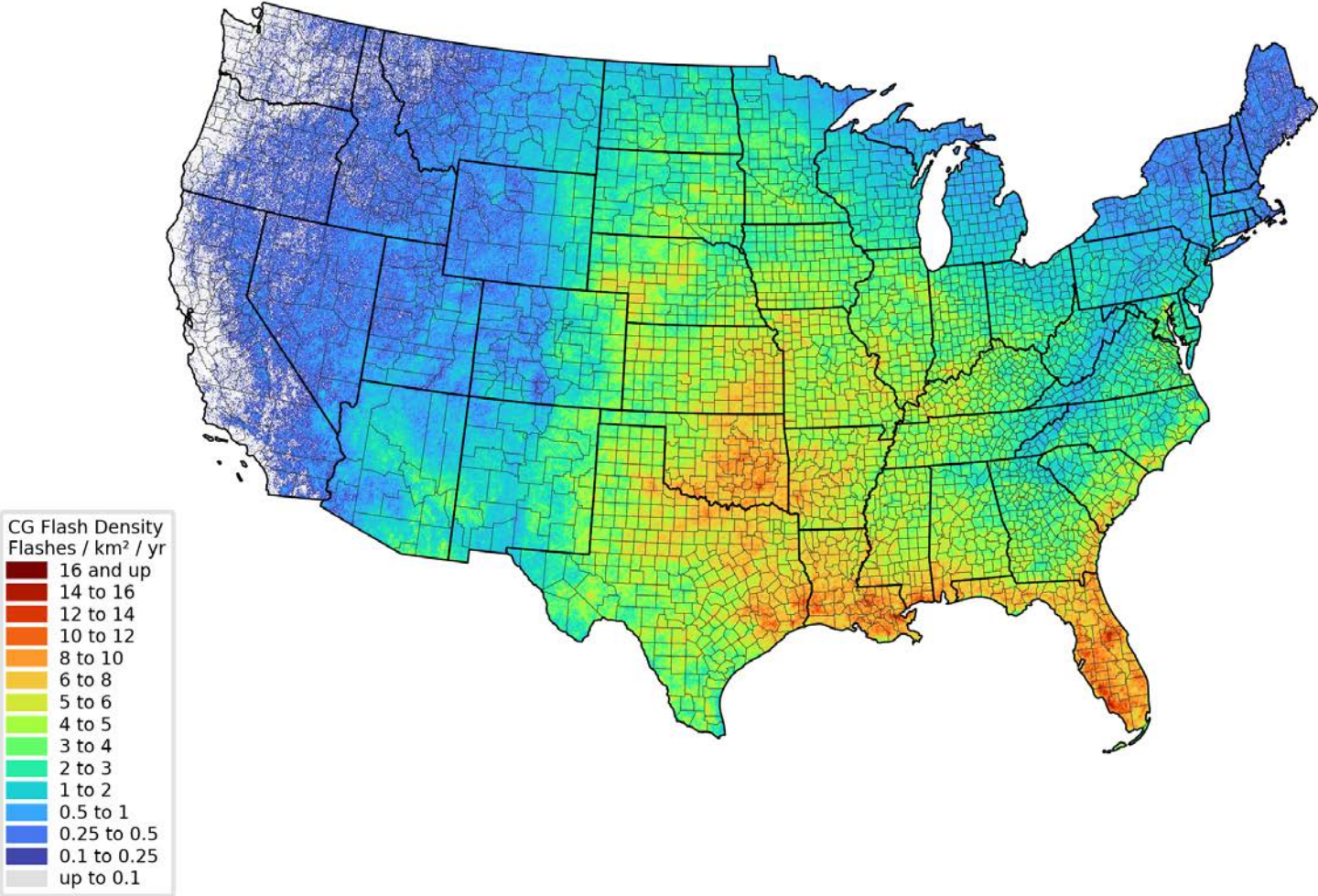
per county



Cloud-to-ground flash density gridded map 2021

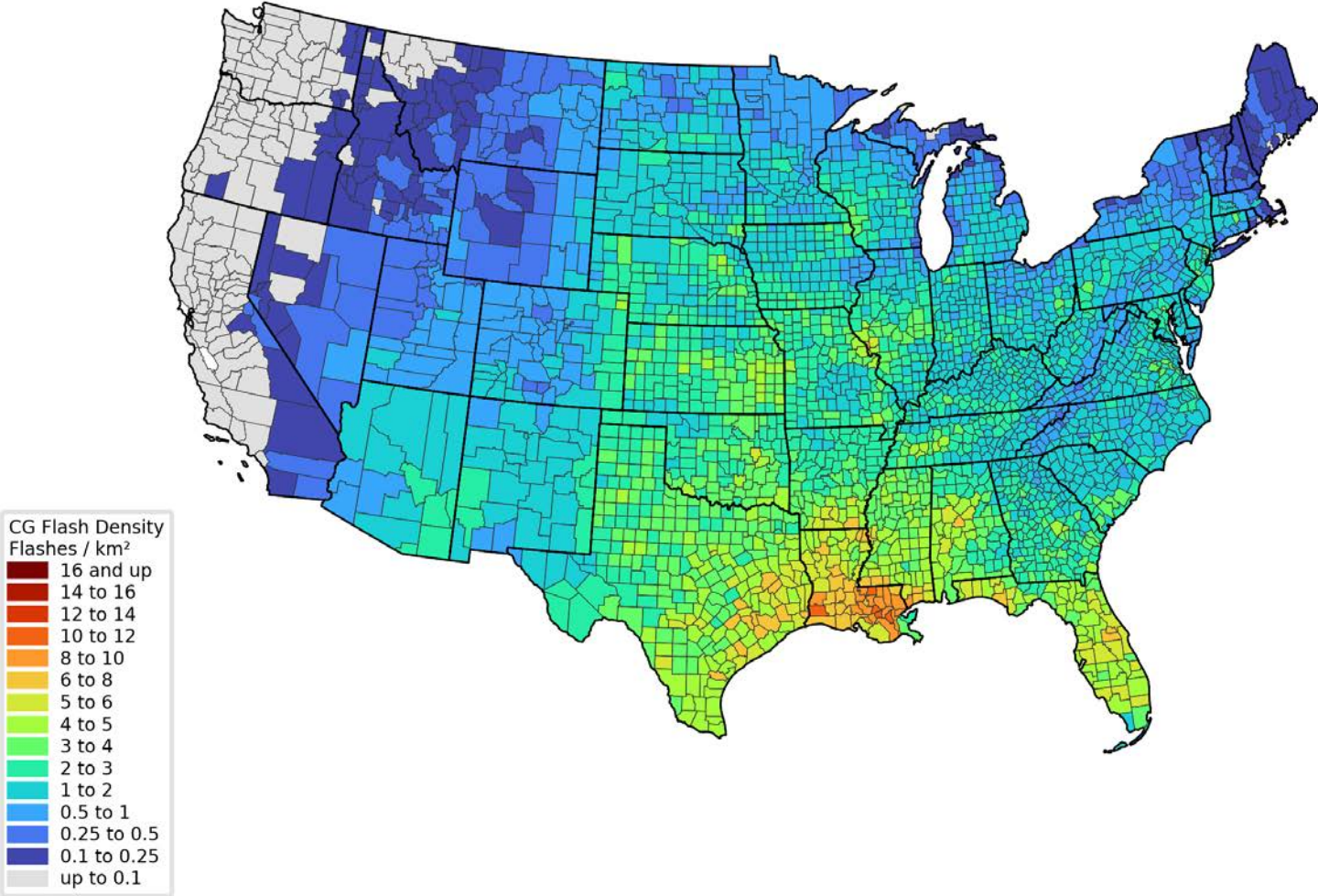


Cloud-to-ground flash density gridded map 2015-2020



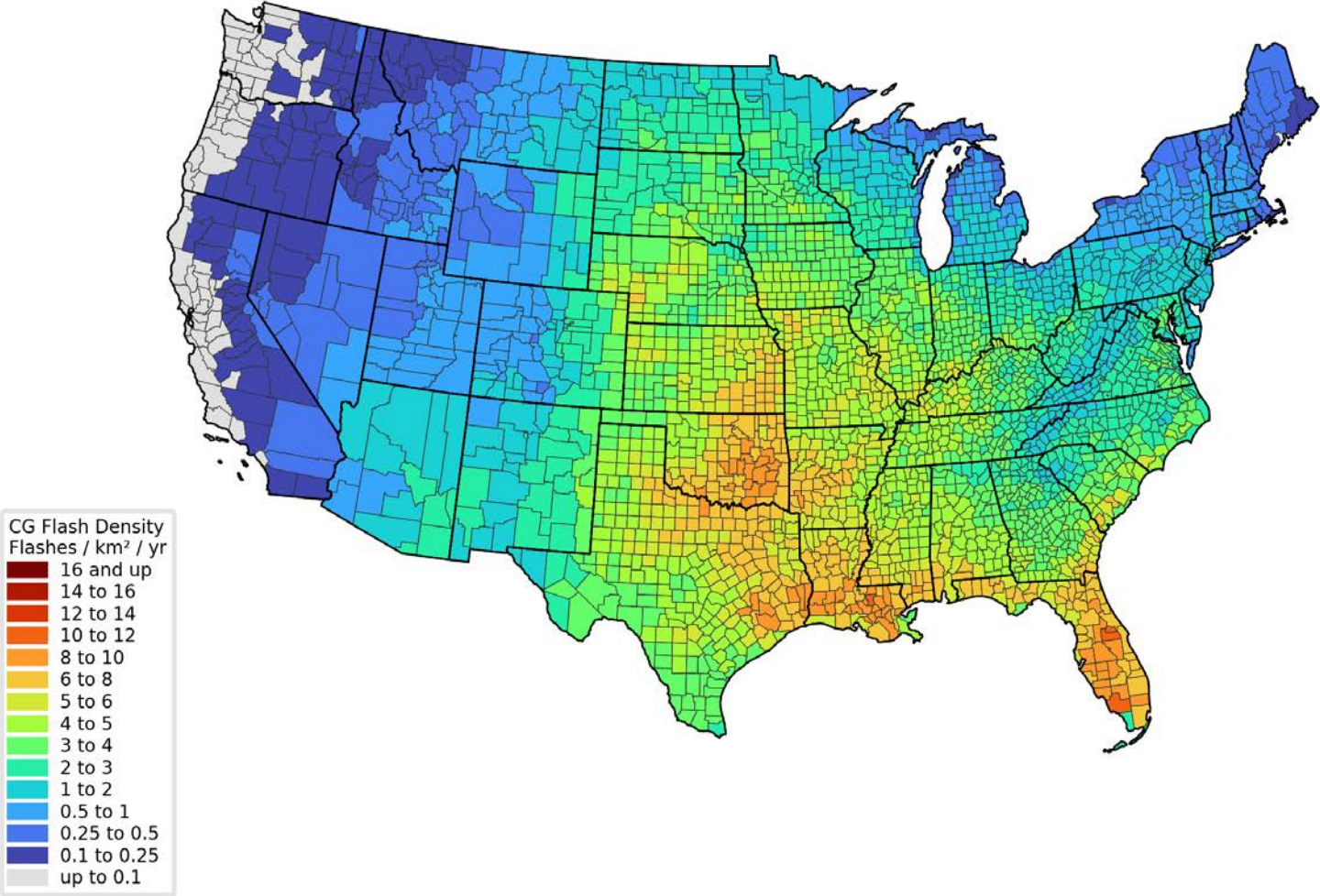
Cloud-to-ground flash density 2021

per county



Cloud-to-ground flash density 2015-2020

per county



We've lost the bleeps, the sweeps, and the creeps

Weather radar sites impacted by lightning

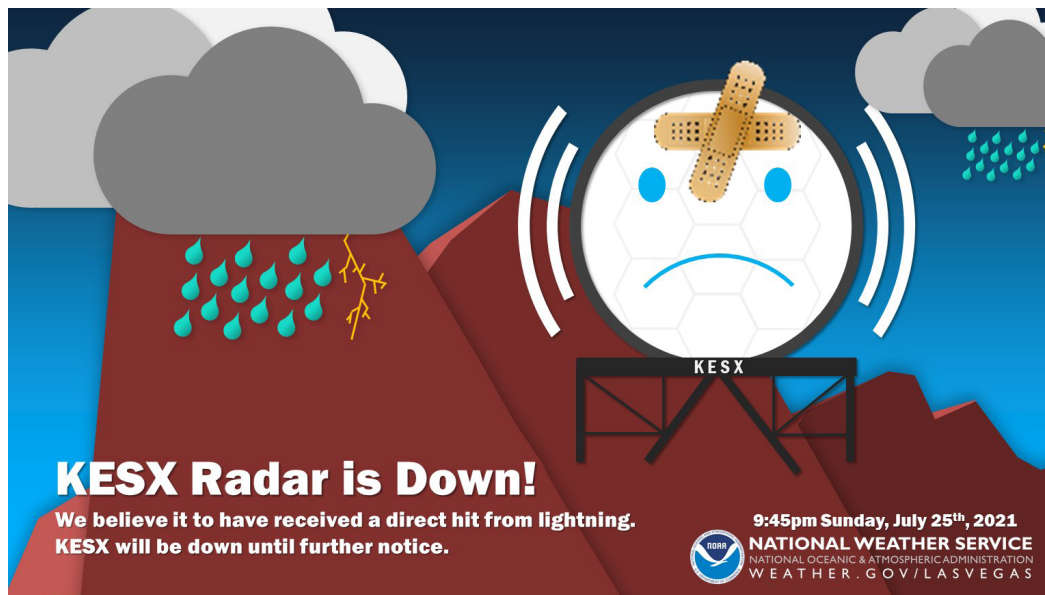
Doppler weather radars monitor the skies for rain, snow, sleet, and hail, and for potential wind hazards, like damaging wind gusts, wind shear, and developing tornadoes. Standing high above their surroundings, radars are also at risk of being struck by lightning.

In 2021, the weather radars in Grand Rapids, Michigan; Las Vegas, Nevada; and Tulsa, Oklahoma, were all knocked offline after lightning at the radar sites. None of those radars were the most likely to be impacted by lightning in the last 5 years, though. That title went to the radar in Reno, Nevada.

Hitting the jackpot in Reno

When it comes to weather preparedness, a mantra to live by is, "it only takes one". Just one thunderstorm, one tornado, or one hurricane can have major impacts. Reno, Nevada, certainly isn't a place you would think of to be among the leaders of lightning - but the National Weather Service radar in Reno had more lightning near it between 2016 and 2021 than any other NWS radar in the continental United States. And it was substantially because of one day. On May 5, 2016, multiple thunderstorms developed near Reno, Nevada, and impacted the radar site with 46 cloud-to-ground lightning strokes.

Radar	Location	Lightning within 150 meters, 2016-2021
KRGX	Reno, NV	61
KLZK	Little Rock, AR	19
KMXX	Maxwell AFB, AL	17
KCYS	Cheyenne, WY	16
KLIX	New Orleans, LA	14
KJAX	Jacksonville, FL	12
KEMX	Tucson, AZ	11
KVAX	Moody AFB, GA	11
KEOX	Fort Rucker, AL	10
KMAF	Midland, TX	10



Total lightning counts per country in 2021

Cloud-to-ground strokes plus cloud pulses – visit vaisala.com/lightning for the full list

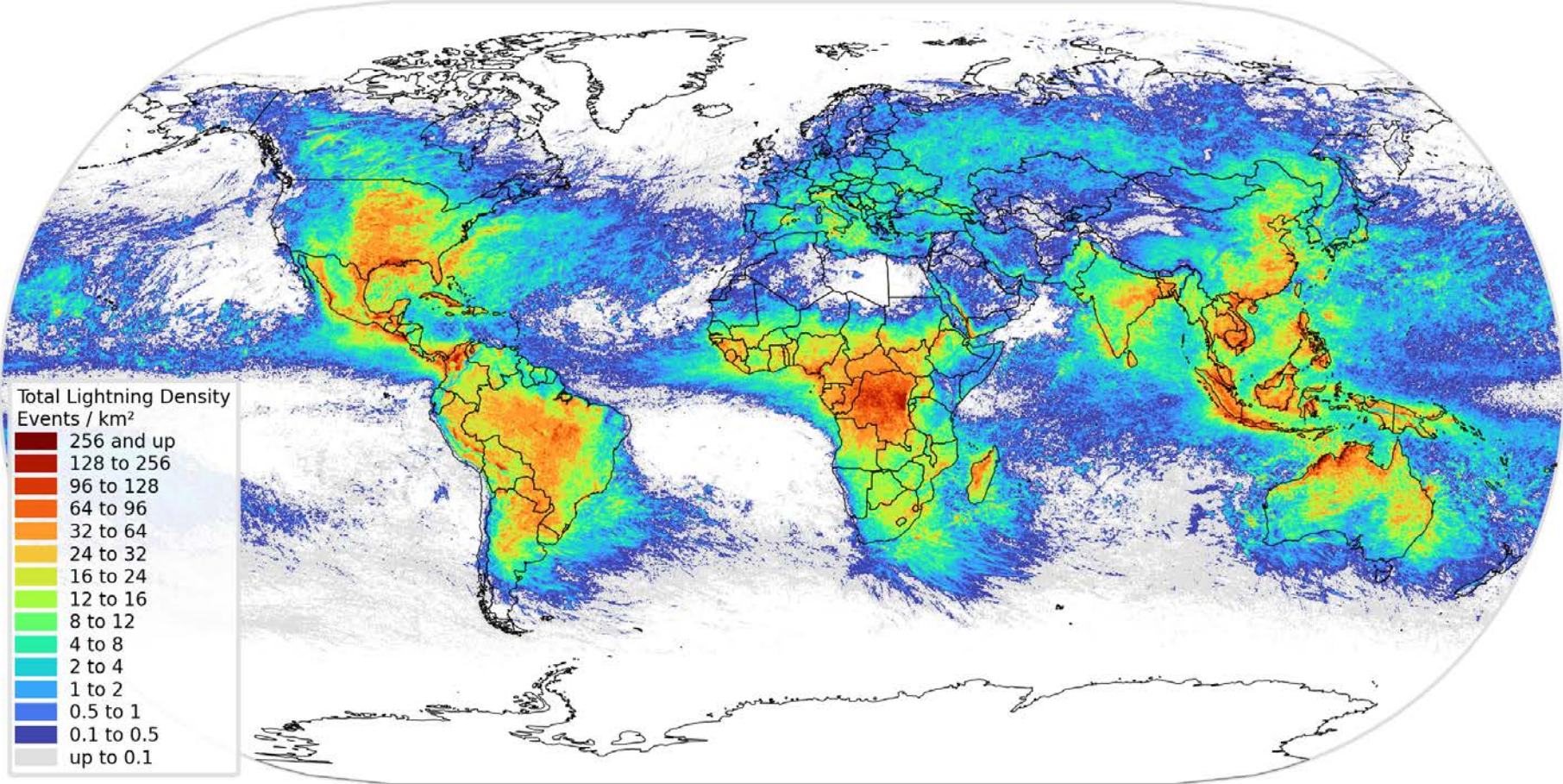
1	Brazil	225,607,575	18	Vietnam	19,084,100	35	Ethiopia	11,110,966
2	United States of America	194,549,696	19	South Sudan	18,874,542	36	Gabon	10,908,095
3	Democratic Republic of the Congo	180,105,987	20	Sudan	18,414,509	37	Mali	10,580,574
4	Australia	146,629,026	21	Canada	17,934,373	38	United Republic of Tanzania	10,366,766
5	Mainland China	86,102,056	22	Malaysia	17,738,435	39	Myanmar	9,424,011
6	Indonesia	81,767,821	23	Thailand	17,434,214	40	Botswana	8,255,351
7	India	51,501,500	24	Madagascar	17,173,300	41	Laos	8,149,090
8	Mexico	50,751,946	25	Philippines	16,430,847	42	Guinea	7,951,690
9	Argentina	44,924,969	26	Paraguay	15,831,613	43	Cuba	6,631,685
10	Colombia	36,435,131	27	Cameroon	15,798,178	44	Niger	6,580,066
11	Central African Republic	29,324,897	28	South Africa	15,218,008	45	Bangladesh	5,757,836
12	Angola	29,212,237	29	Chad	14,881,673	46	Uganda	5,718,017
13	Russia	28,937,138	30	Papua New Guinea	14,190,419	47	Guatemala	5,281,714
14	Peru	28,754,564	31	Venezuela	13,500,639	48	Ghana	5,270,657
15	Bolivia	27,831,934	32	Zambia	13,193,767	49	Ivory Coast	5,254,329
16	Nigeria	24,579,034	33	Mozambique	12,998,483	50	Namibia	5,057,306
17	Republic of the Congo	21,091,349	34	Cambodia	12,248,660	51	Zimbabwe	4,993,109

Total lightning density per country in 2021

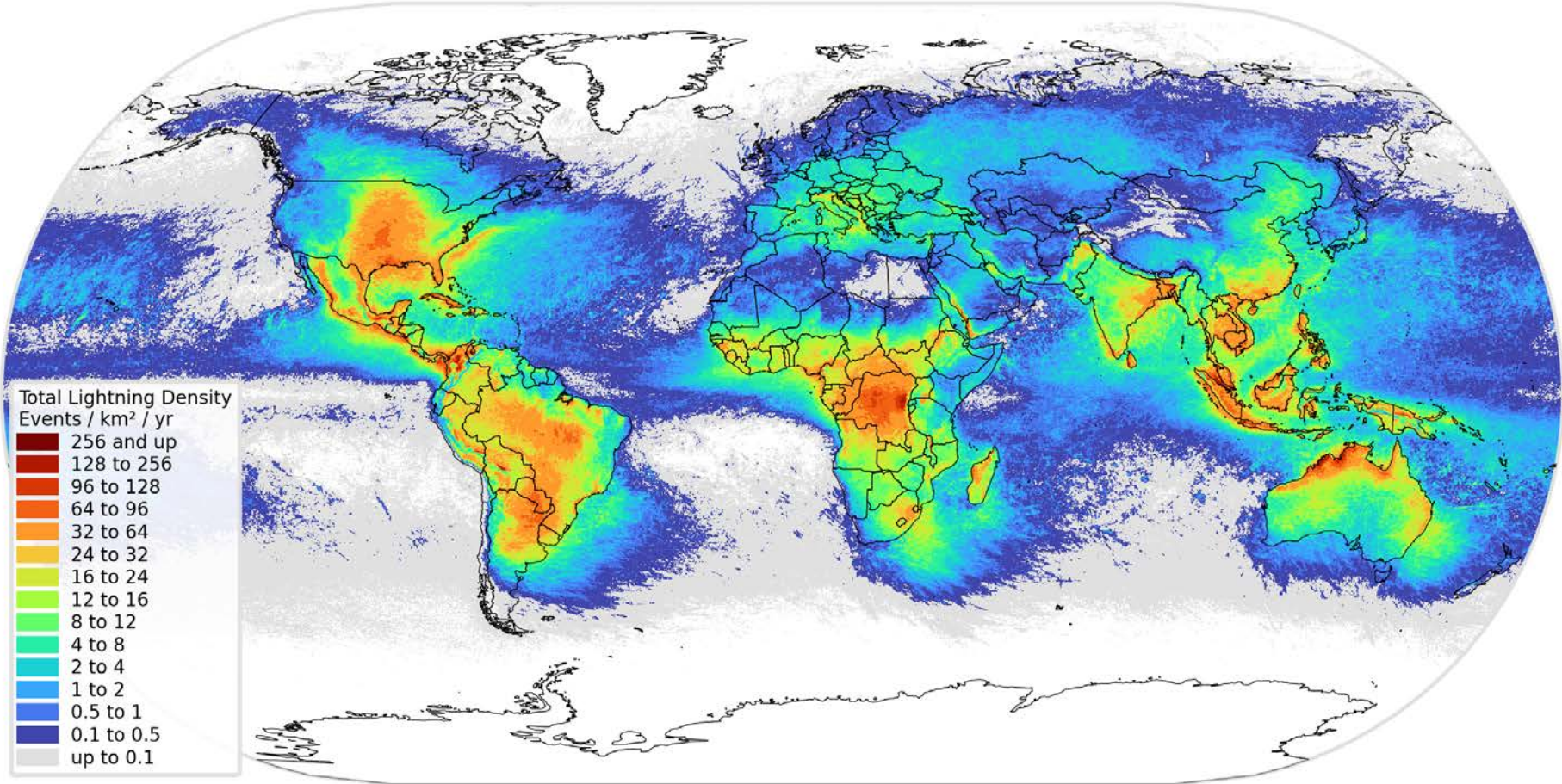
Cloud-to-ground strokes plus cloud pulses – visit vaisala.com/lightning for the full list

1	Singapore	163.08	18	Gabon	41.84	35	Nigeria	26.96
2	Macao S.A.R.	135.61	19	Paraguay	39.49	36	Belize	26.69
3	Brunei	105.22	20	East Timor	37.81	37	Brazil	26.54
4	Democratic Republic of the Congo	77.14	21	Eswatini	35.89	38	Mexico	25.86
5	Cambodia	67.53	22	Laos	35.59	39	Liberia	25.77
6	El Salvador	65.33	23	Sierra Leone	34.64	40	Bolivia	25.53
7	Republic of the Congo	60.80	24	Sri Lanka	34.52	41	Guinea-Bissau	25.36
8	Cuba	60.67	25	Cameroon	33.91	42	Togo	24.61
9	Vietnam	58.01	26	Thailand	33.80	43	Taiwan	24.23
10	Philippines	56.59	27	Guinea	32.46	44	Uruguay	23.96
11	Malaysia	54.14	28	Hong Kong S.A.R.	32.25	45	Uganda	23.57
12	Guatemala	48.68	29	Colombia	31.97	46	Angola	23.38
13	Central African Republic	47.22	30	Haiti	31.64	47	Benin	23.17
14	Indonesia	43.67	31	Papua New Guinea	30.56	48	Honduras	23.07
15	Jamaica	42.77	32	South Sudan	30.25	49	Costa Rica	22.19
16	Panama	42.58	33	Madagascar	28.88	50	Peru	22.18
17	Bangladesh	42.44	34	Equatorial Guinea	28.87	51	Ghana	22.00

Global lightning density 2021



Average global lightning density 2016-2020



Spotlight: Canada

A major lightning outbreak punctuates extreme summer weather in Canada

Situated on the cool waters of the northern Pacific Ocean, British Columbia typically does not see as much lightning as other parts of Canada, like Manitoba or Saskatchewan. This was not the case between June 30 and July 1, 2021. An unprecedented heat wave, which set a new Canadian high temperature record, helped to cause major wildfires across the province.

In extreme fire conditions, pyrocumulonimbus clouds developed and lightning occurred over the fires. At the same time, a storm system moved into northern British Columbia and triggered severe thunderstorms.

All told, Vaisala detected more than 710,000 lightning events across British Columbia and far northwestern Alberta in just 15 hours.

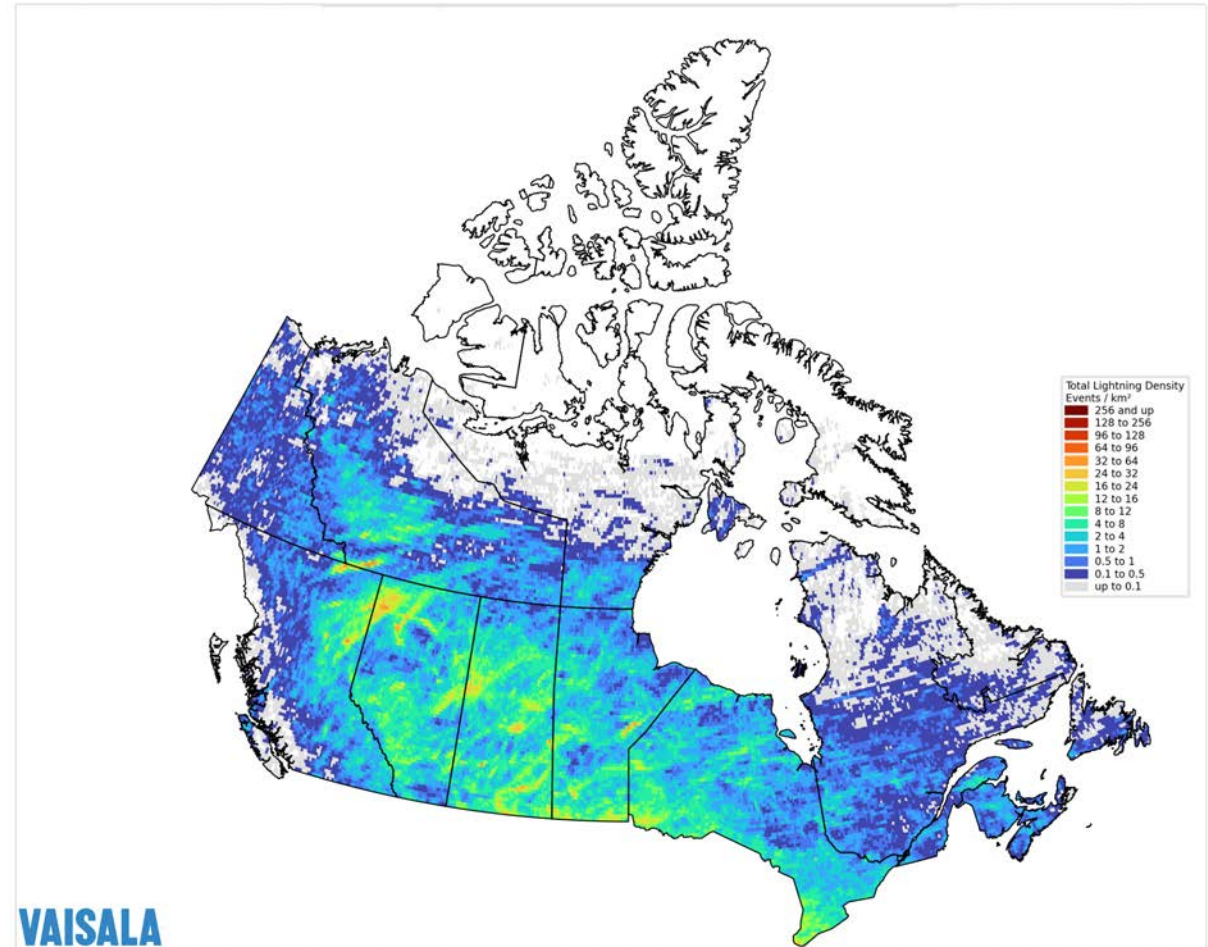
For further reading

Blog: [Pyrocumulonimbus event in British Columbia, Canada](#)

Total Lightning Density
20 km grid

Canada
2021

GLD360 data
17934373 events



Spotlight: Brazil

2021's global lightning count leader

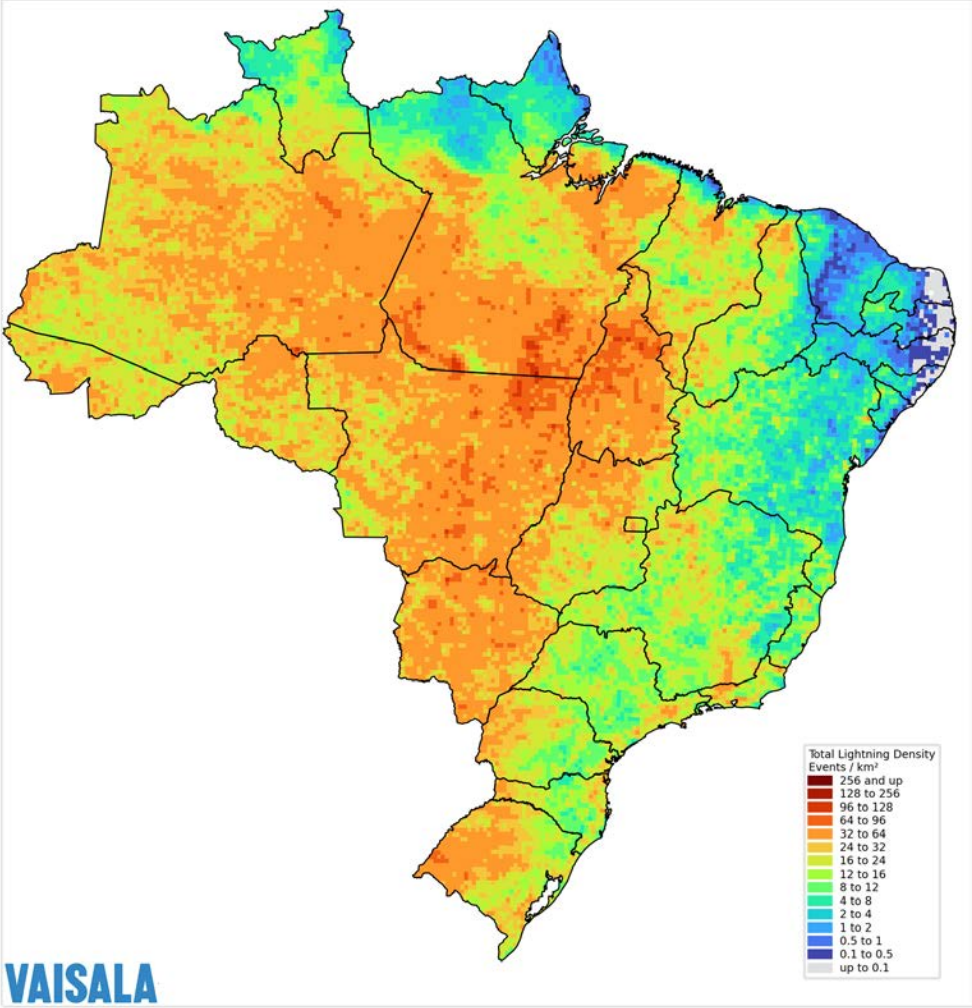
On October 31, 2018, a lightning flash over southern Brazil covered a horizontal distance of more than 700 kilometers (435 miles) and was validated as the world record longest flash distance.

Research from 2010 estimates that severe thunderstorms in January 2005 destroyed 500 million trees in the Amazon Rainforest over Brazil. The Amazon Rainforest is the largest rainforest in the world and plays major roles in the oxygen, carbon, and water cycles on Earth.

Total Lightning Density
20 km grid

Brazil
2021

GLD360 data
225607575 events



Spotlight: Italy

Mediterranean climate creates favorable conditions for Europe's lightning leader

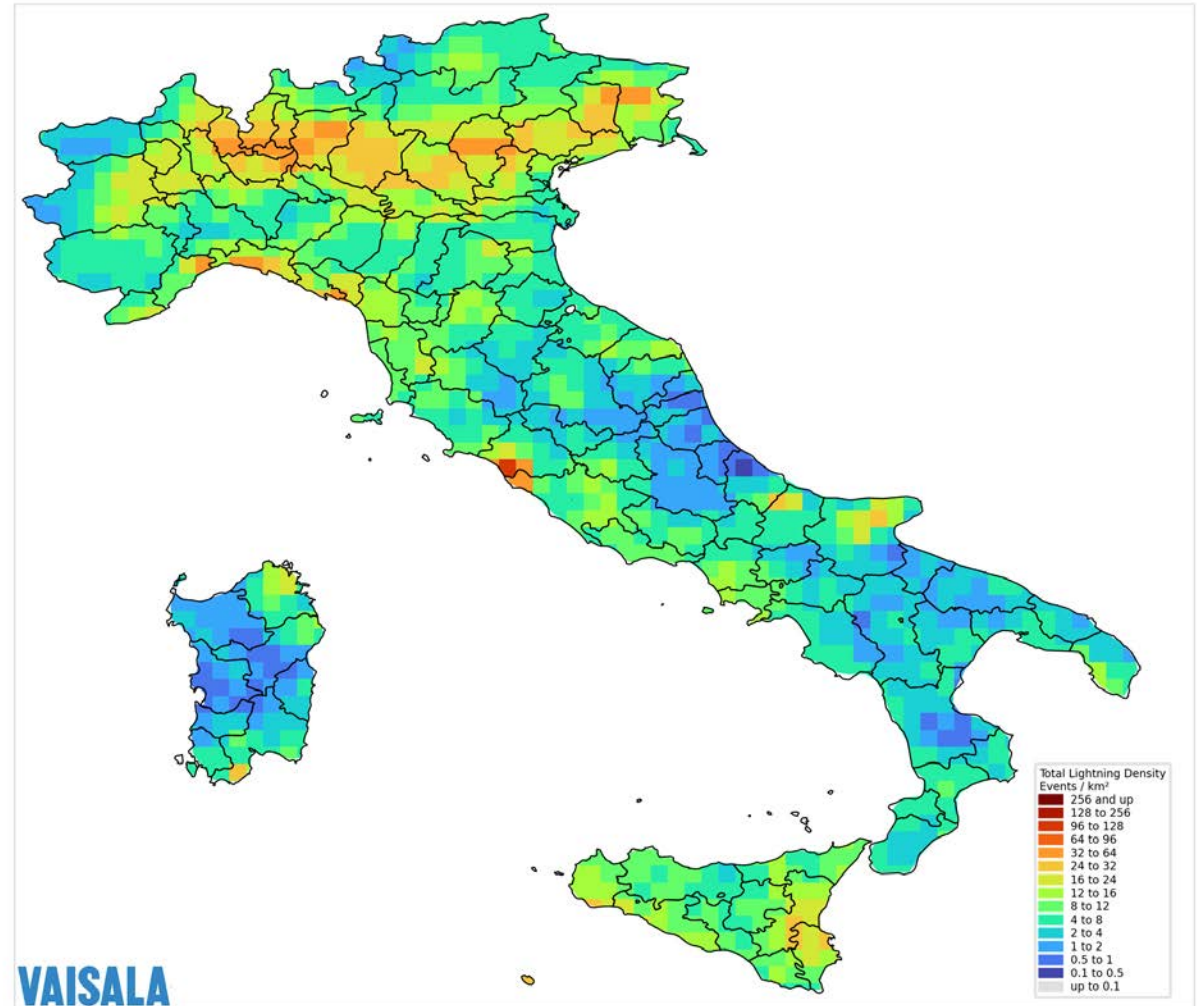
On October 4, 2021, more than 74 cm (29 in) of rain fell on Rossiglione, Italy, in just 12 hours. Just to the west, in Cairo Montenotte, more than 49 cm (19 in) of rain fell in six hours.

Thunderstorms repeatedly moved from the Mediterranean Sea over the region dumping heavy rainfall and producing copious amounts of lightning. GLD360 detected hundreds of thousands of lightning events over the region between October 4 and 5.

Total Lightning Density
20 km grid

Italy
2021

GLD360 data
2788581 events



Spotlight: India

Increasing awareness of lightning to protect people and property

Lightning is a significant threat to life and property in India. Its location in the tropics, surrounded by the Indian Ocean, with the Himalaya Mountains to the north create favorable geographic conditions for thunderstorm development.

The summer monsoon increases thunderstorm activity. Efforts to improve lightning safety awareness are underway and high-quality information produced from GLD360 lightning data highlights the most at risk regions in the country.

For further reading

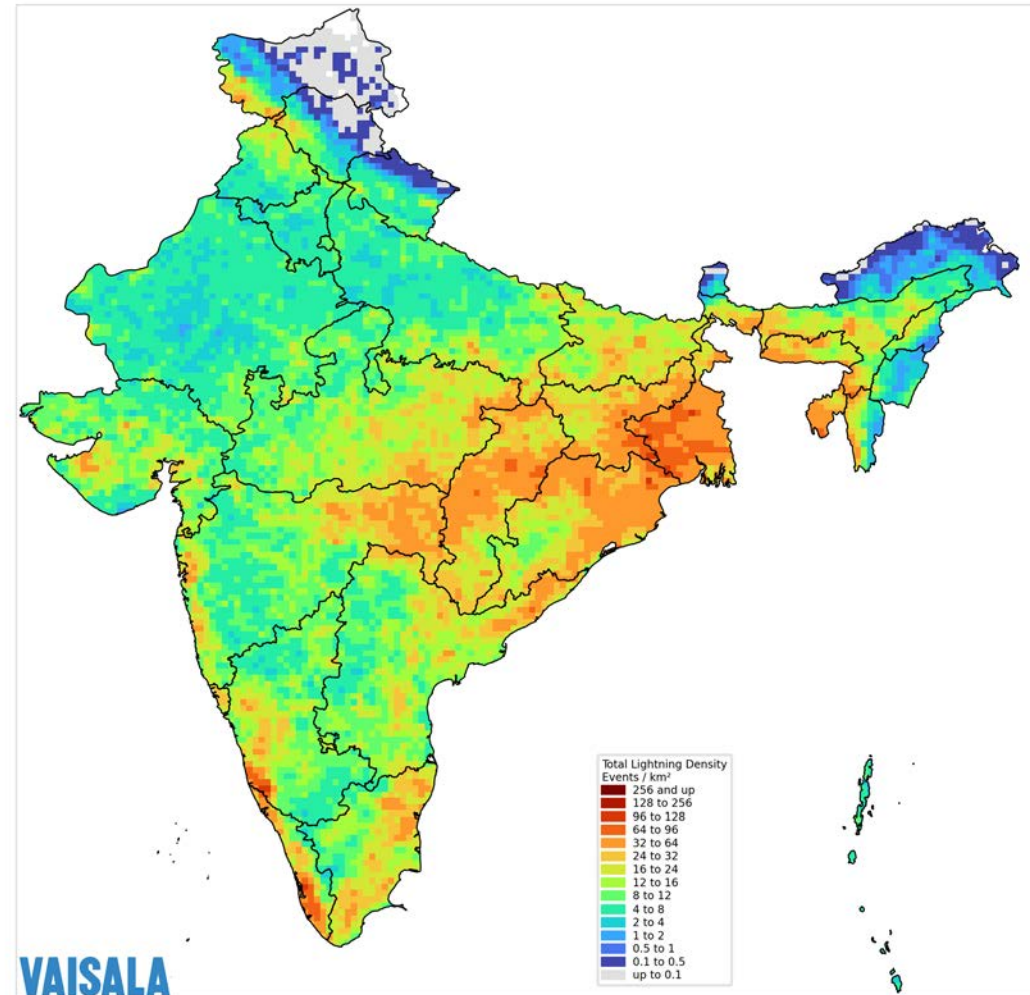
Article:

[Why India Experiences a High Rate of Lightning Deaths](#) (Discover Magazine, August, 2021)

Total Lightning Density
20 km grid

India
2021

GLD360 data
51501500 events



Spotlight: Ethiopia

Enhanced lightning detection to minimize the impact of thunderstorm hazards

High-quality weather and air quality observations are critical to helping society respond to the challenges of climate change.

Over the next several years, Vaisala and the Finnish Meteorological Institute will be working with the National Meteorological Agency in Ethiopia to strengthen the weather observation network across the country. Included in the project will be new weather radars, a high-precision lightning detection network, and an air quality network in Addis Ababa.

For further reading

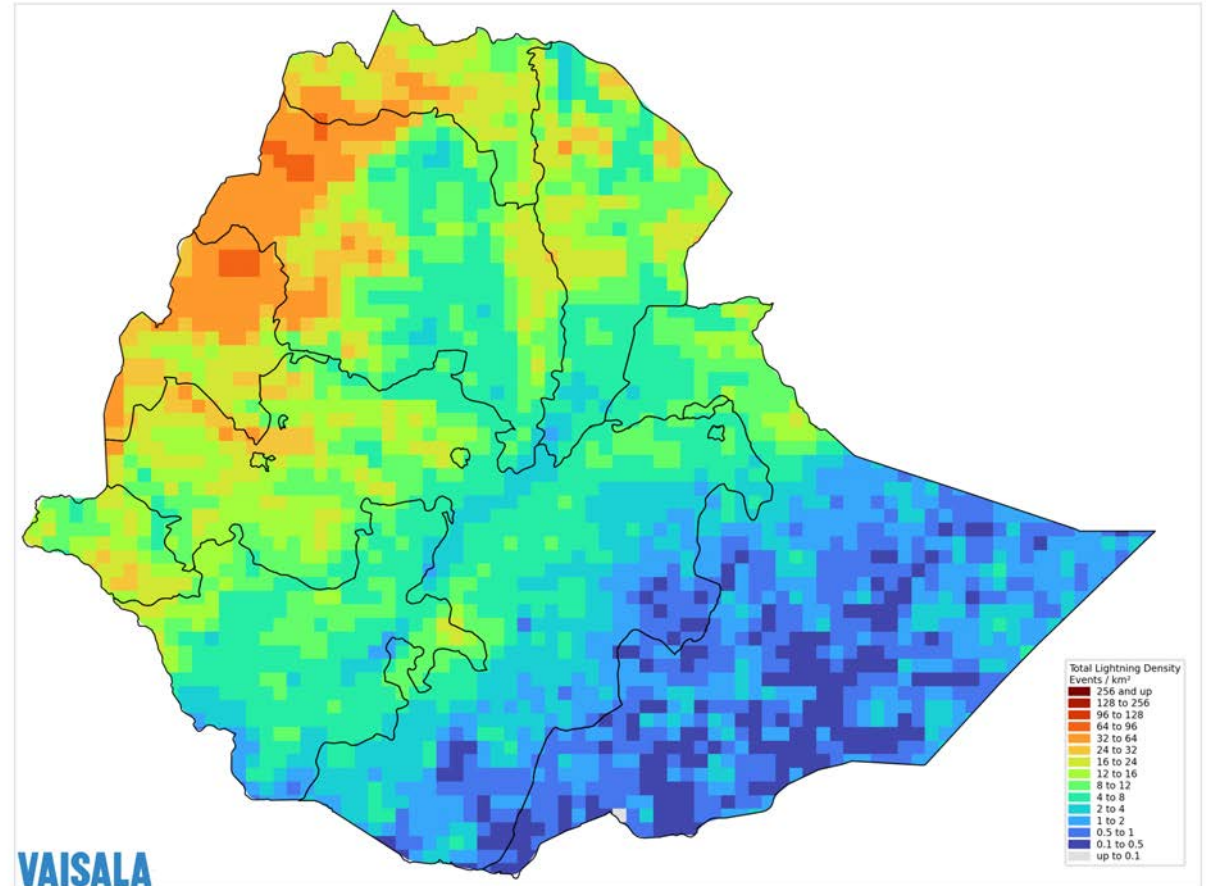
Press release:

[Vaisala's meteorological infrastructure project in Ethiopia gets go-ahead](#)

Total Lightning Density
20 km grid

Ethiopia
2021

GLD360 data
11110966 events



Spotlight: Australia

Detecting lightning in thunderstorms, fires, and cyclones in the Land Down Under

Millions of acres of land are burned across Australia each year during wildfires, damaging homes and buildings, threatening human and animal lives, and costing billions of dollars to respond. Dry thunderstorms and lightning from pyrocumulonimbus clouds put first responders at risk and initiate additional fires.

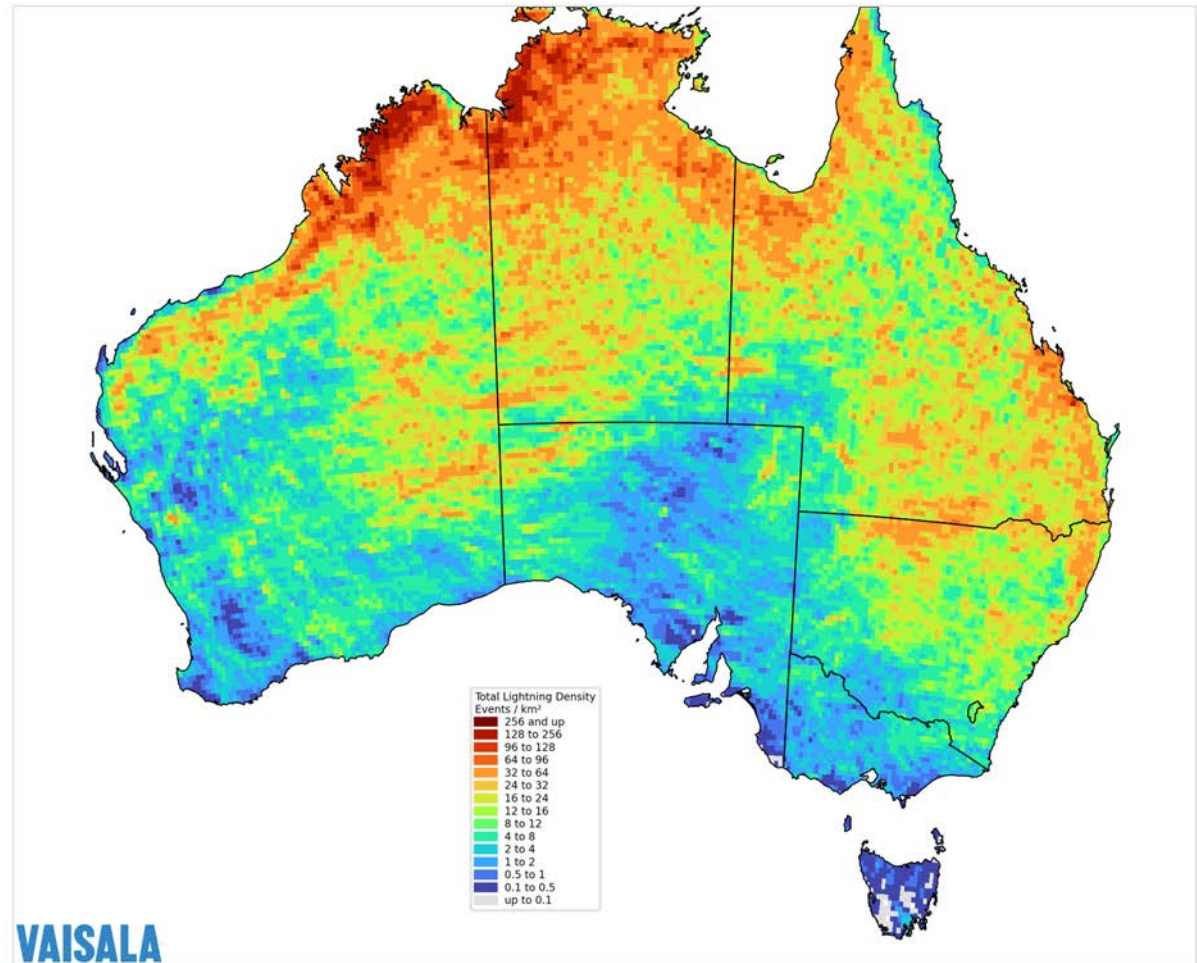
Lightning data that accurately identifies in-cloud and cloud-to-ground lightning provides critical insights to wildland fire agencies, keeping first responders safe and identifying regions at risk for lightning-triggered fires.

October 2021 brought severe thunderstorms to portions of Australia, including a supercell near Yalboroo, Queensland. The storm produced hail larger than softballs and one of the stone set the Australia record for largest hail, measuring 16 cm (6.3 in) in diameter.

Total Lightning Density
20 km grid

Australia
2021

GLD360 data
146629026 events



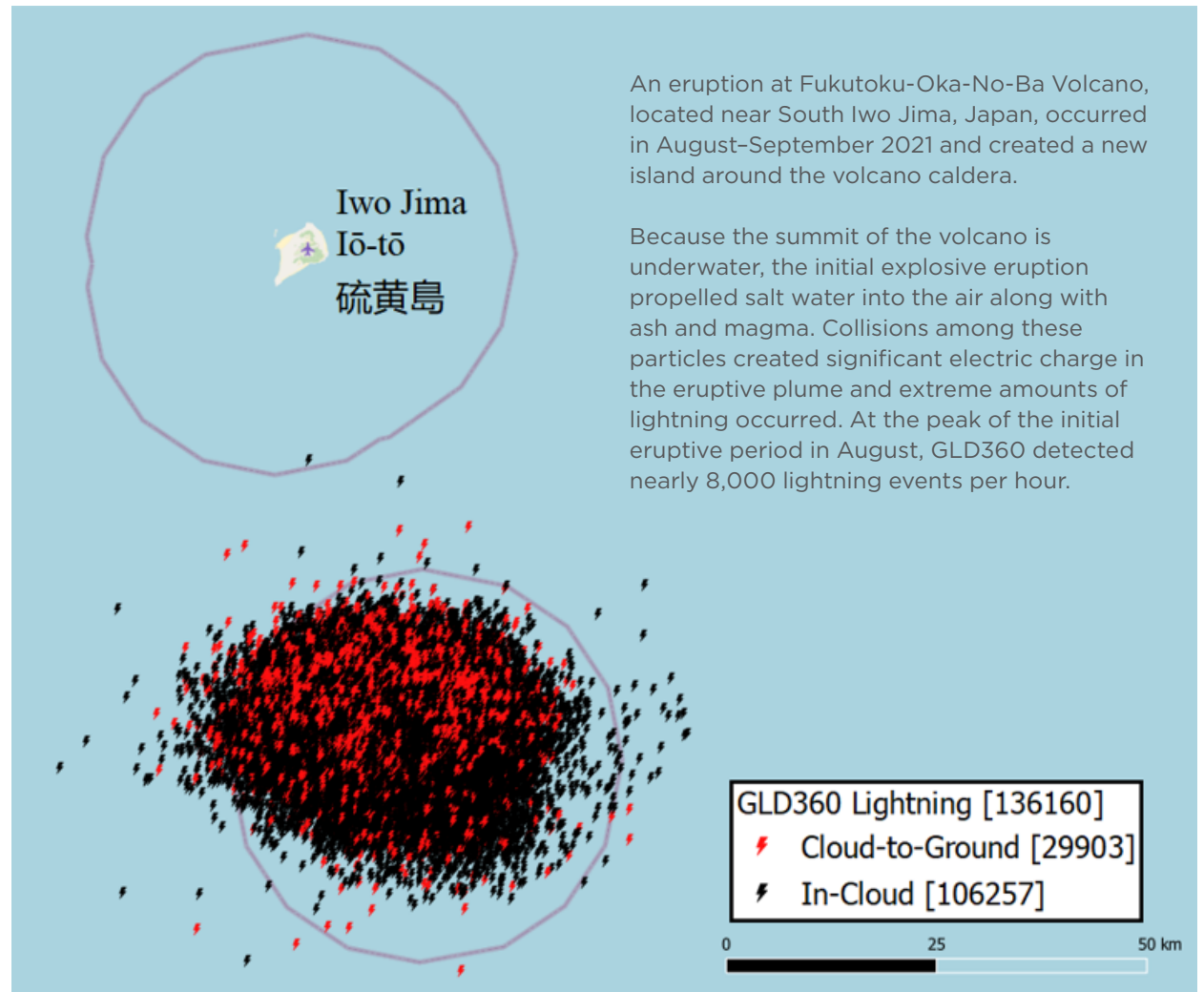
An island is born

Lightning data improves monitoring of remote volcanoes



For further reading

Blog:
[Real-time volcanic eruption monitoring with GLD360](#)



Lightning safety

Tips to stay safe when lightning is nearby

Any thunderstorm, whether it has one cloud-to-ground flash or one thousand, has the potential to be dangerous. That's why it is important to know what to do when lightning is in the area.

Know the forecast!

If you have outdoor plans, make sure you check the weather forecast! If thunderstorms are predicted, you might want to change your plans.

When to get to safety

If you see tall, towering clouds, hear thunder, or see lightning, it's time to end outdoor activities and get to a safe place. A subscription to Vaisala lightning data will tell you when lightning is too close.

When thunder roars, go indoors!

The only safe place during a thunderstorm is inside away from lightning. Get inside a house or other building that has electrical wiring and plumbing in the walls or a metal-topped vehicle.



Safely resuming outdoor activities

A subscription to Vaisala lightning data will tell you when lightning has moved far enough away for you to return to outdoor activities. If you don't have access to lightning data, waiting 30 minutes after the last thunder can keep you safe.

What to do if someone is struck by lightning

People struck by lightning don't carry an electric charge, you can begin first aid immediately! Call for medical help right away. If the person is not breathing or has no pulse, start CPR and continue until help arrives.

Lightning fast reads

2021 blogs and further reading on vaisala.com/lightning

BLOGS

January

- [Top lightning events of 2020](#)

February

- [A flashy landing in Sitka](#)

March

- [Operate safely when thunderstorms are near with Vaisala's updated lightning software](#)

April

- [Real-time volcanic eruption monitoring with GLD360](#)
- [Lightning density maps for every country in the world](#)

May

- [Vaisala AI outdoes itself in latest upgrade to the National Lightning Detection Network](#)

June

- [EURO 2020 – Strikes on the pitch](#)
- [Where does the world's lightning occur?](#)
- [Aviation lightning safety](#)
- [Lightning in U.S. national parks](#)
- [Lightning by the numbers](#)
- [The role of lightning detection networks](#)

July

- [Pyrocumulonimbus event in British Columbia, Canada](#)
- [Gold medal lightning](#)

October

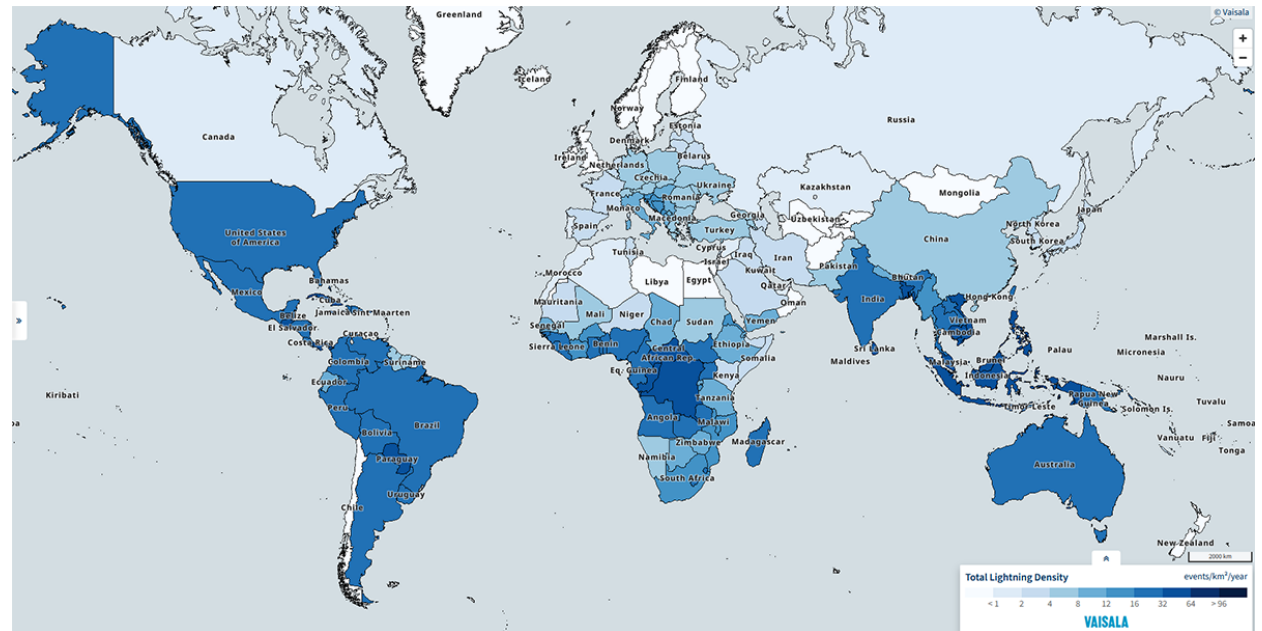
- [Talking climate in the polar regions](#)

November

- [50 volcanoes erupting around the globe – every day](#)

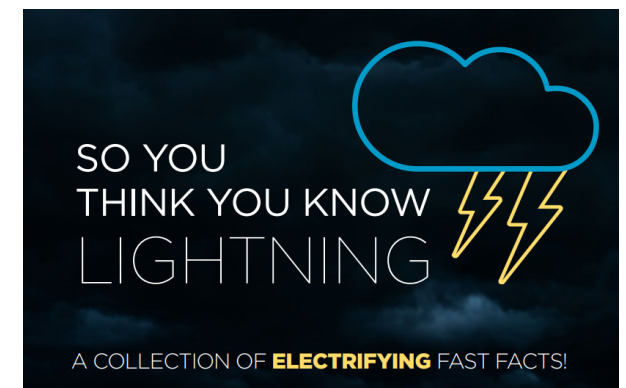
INTERACTIVE GLOBAL LIGHTNING DENSITY MAP

- interactive-lightning-map.vaisala.com



EBOOK

- [Electrifying fast facts about lightning](#)



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vaisala.com/lightning

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