EARTH NETWORKS®

2019

INDIA
LIGHTNING REPORT

ABOUT THIS REPORT

This 2019 India Lightning Report was prepared by Earth Networks using the Earth Networks Global Lightning Network (ENGLN). The following report includes in-cloud, cloud-to-ground, and total lightning data from India and the surrounding water bodies during the first eight months of 2019. Counts, rankings, and Dangerous Thunderstorm Alerts (DTAs) in this report are from January 1, 2019 to August 31, 2019.

THE EARTH NETWORKS GLOBAL LIGHTNING NETWORK (ENGLN)

The lightning data in this report is derived from the Earth Networks Global Lightning Network (ENGLN), which monitors the combination of in-cloud and cloud-to-ground lightning strikes over 100 countries. With over 1,700 sensors, the ENGLN is the most extensive and technologically advanced total lightning network in the world. ENGLN 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

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2,00,89,806

TOTAL LIGHTNING STRIKES

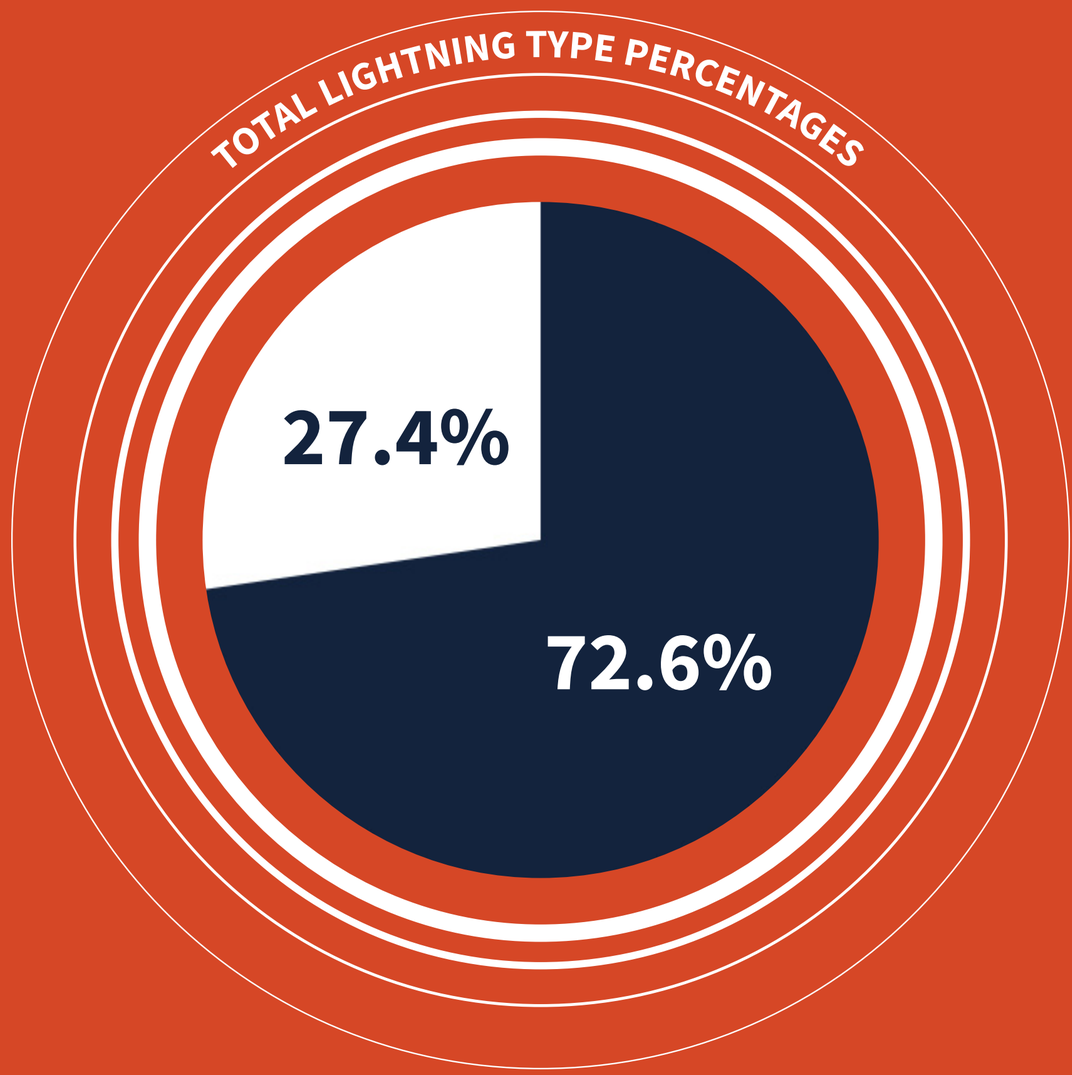
TOTAL LIGHTNING

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

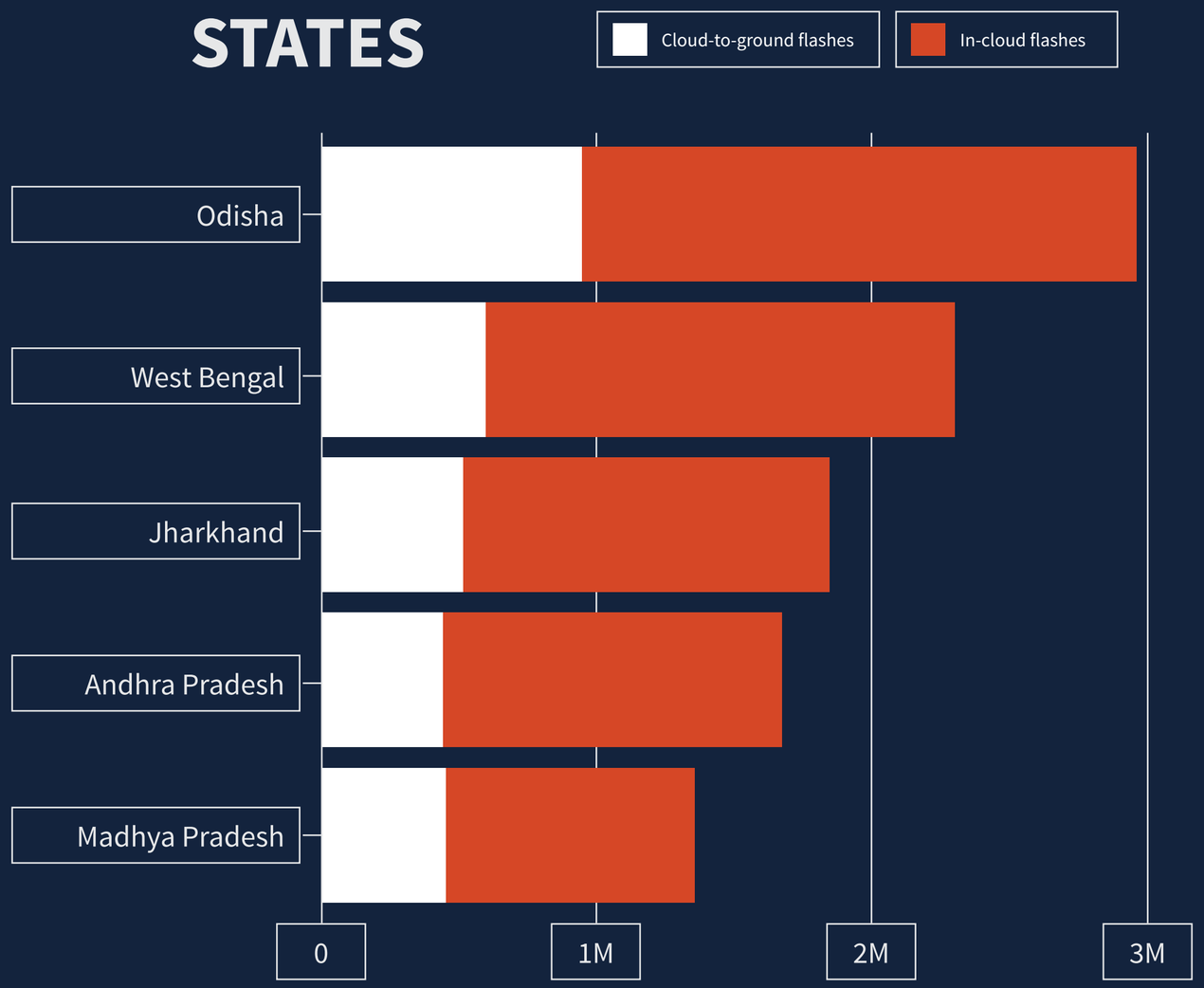
1,45,79,247
In-cloud



55,10,559
Cloud-to-ground

LIGHTNING COUNT STATE RANKINGS

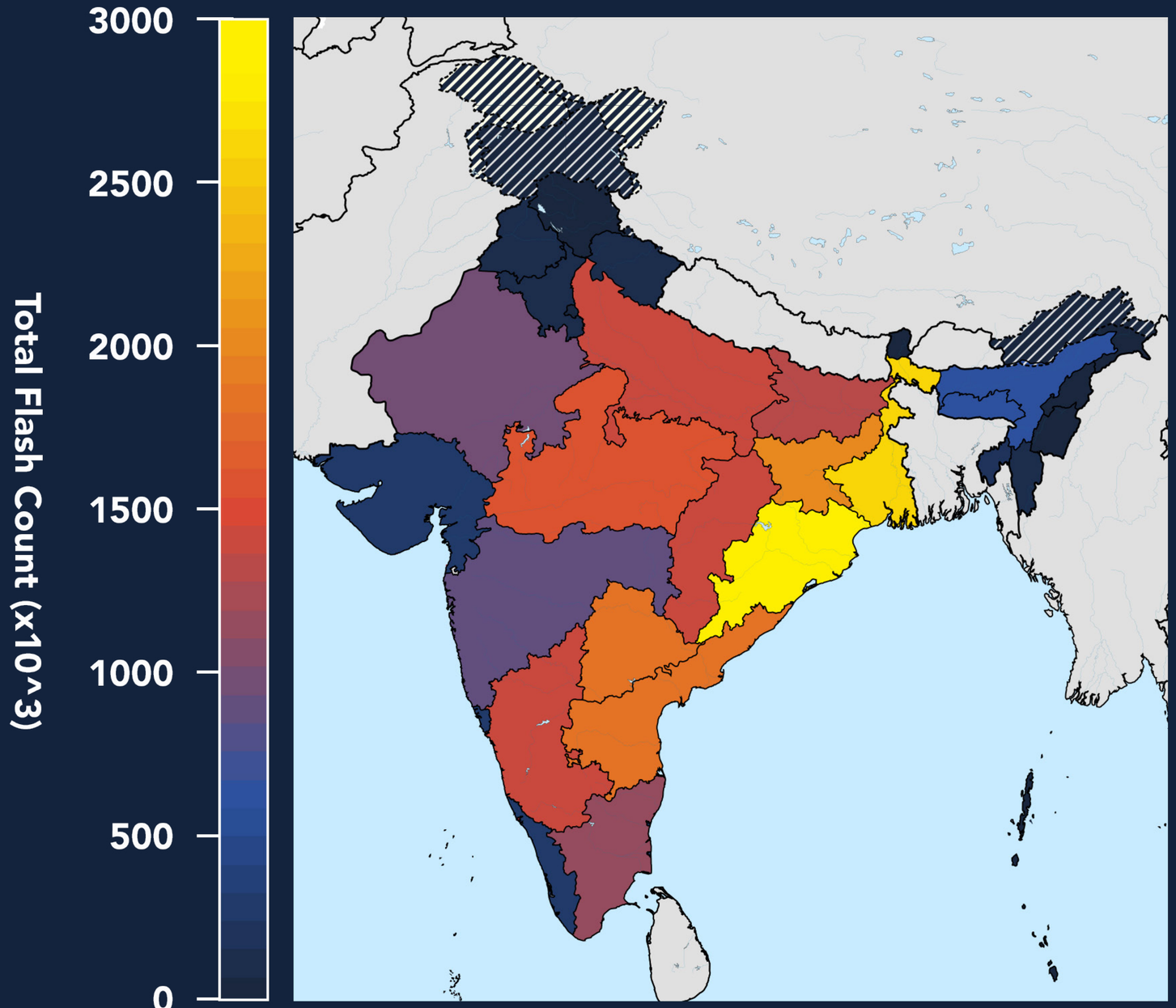
These are the Indian states with the highest lightning counts during the first 8 months of 2019.



State Name	Cloud-to-Ground Count	In-Cloud Count	Total Count
Odisha	**9,37,462**	**20,21,140**	**29,58,602**
West Bengal	**5,87,387**	**17,12,524**	**22,99,911**
Jharkhand	**5,09,758**	**13,34,727**	**18,44,485**
Andhra Pradesh	**4,42,954**	**12,30,281**	**16,73,235**
Madhya Pradesh	**4,44,743**	**9,07,505**	**13,52,248**

Odisha saw nearly 7,00,000 more total lightning strikes than second place West Bengal. Four out of the five top states for total lightning flash counts during the first eight months of 2019 are located on the Indian east coast. This is historically a very lightning prone area.

LIGHTNING COUNT MAP



As you can see from the map (besides) ENGLN detected high total flash counts along the Indian east coast.

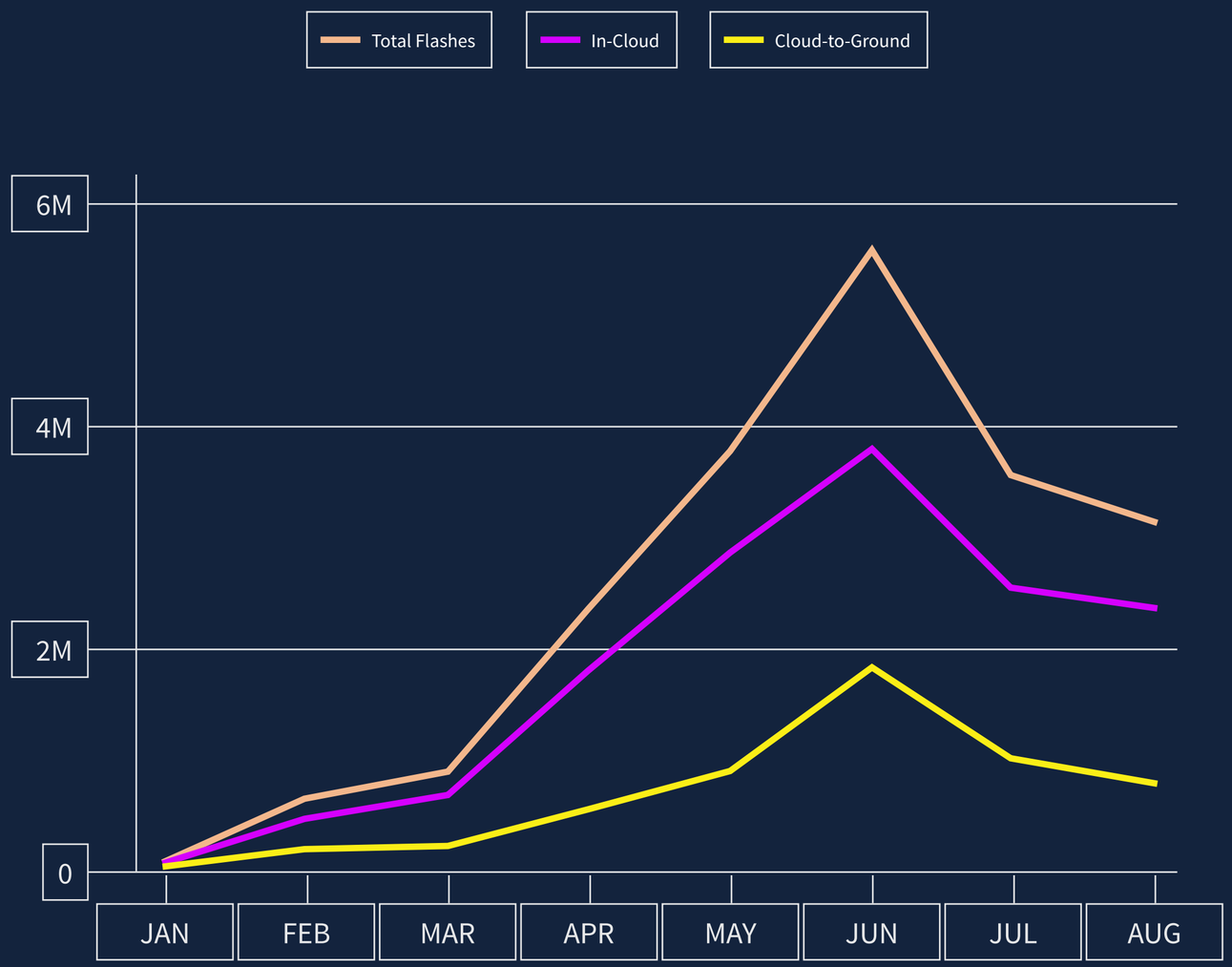
The bright yellow “hot spot” on the map is Odisha: The Indian state with the highest total lightning count during the first eight months of 2019, with 29,58,602 total lightning strikes.

Odisha has historically seen a lot of lightning deaths, but is proactively trying to prevent them with help from Earth Networks Dangerous Thunderstorm Alerts.

LIGHTNING COUNT MONTH RANKINGS

Which months saw the most lightning strikes from January through August in India?

TOTAL LIGHTNING FLASH COUNT

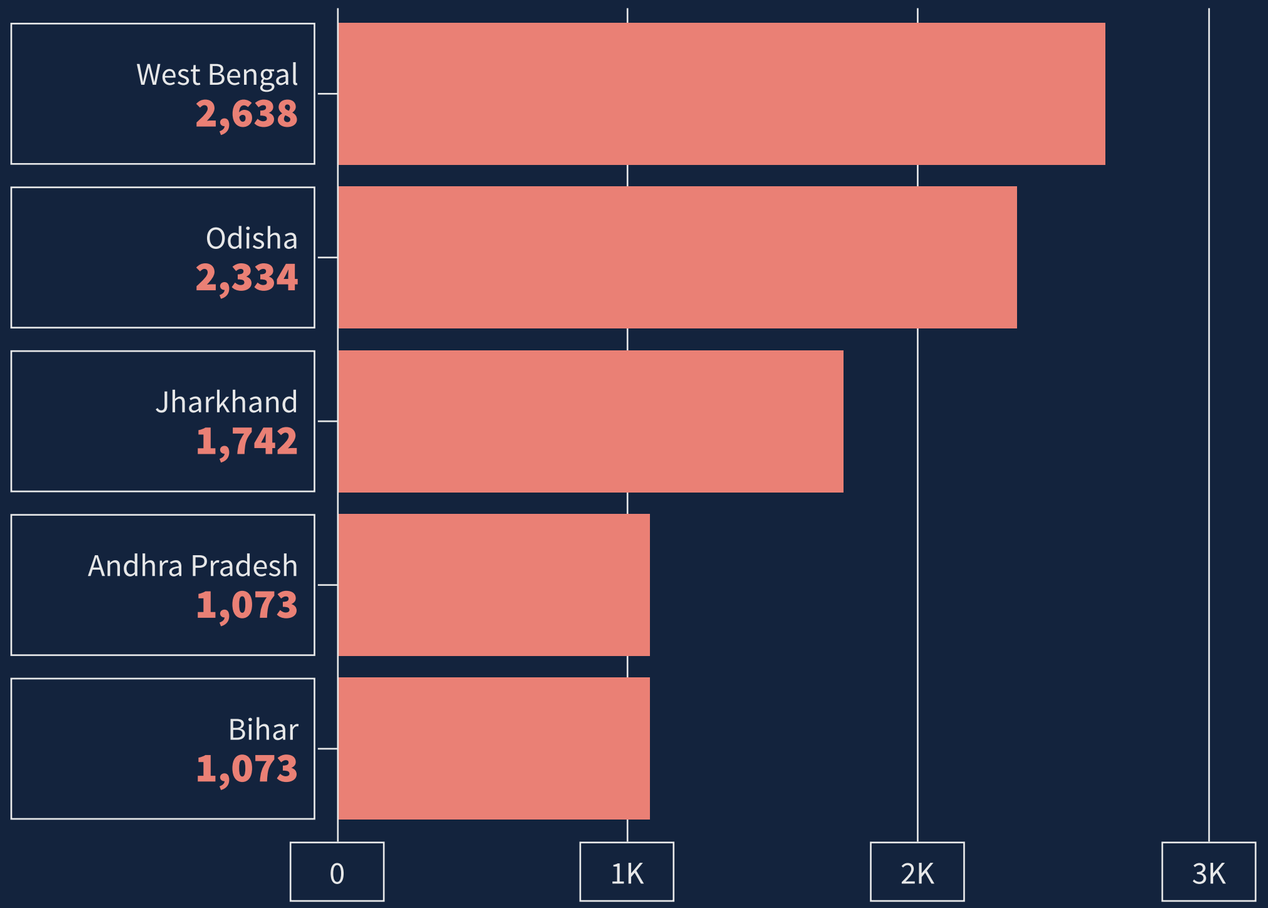


June saw the most lightning flashes during the first 8 months of 2019, with 56,04,214. This makes sense because it’s during Monsoon Season, which slowly sweeps across the country beginning in late May or early June. Temperatures are extremely hot during June, ranging from 32-40 C (90-104 F).

DANGEROUS THUNDERSTORMS ALERTS RANKINGS

Our Total Lightning Network generated 13,994 Dangerous Thunderstorm Alerts during the first eight months of 2019. These are the Indian states where we issued the most DTAs.

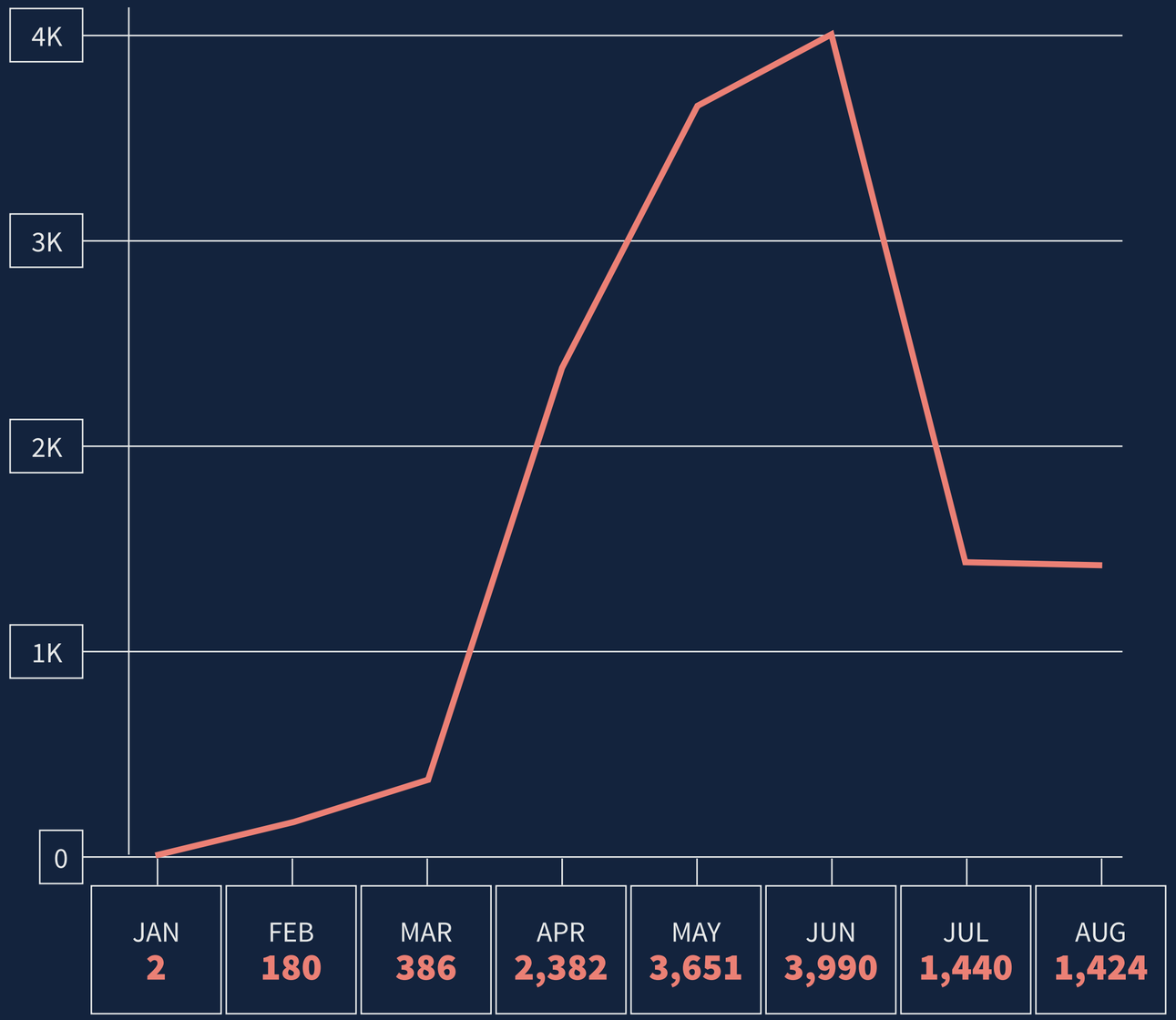
STATES



Dangerous Thunderstorm Alerts are extremely advanced severe weather warnings exclusive to Earth Networks. These patented alerts notify users severe weather is approaching up to 45 minutes before storms arrive.

DTA MONTH RANKINGS

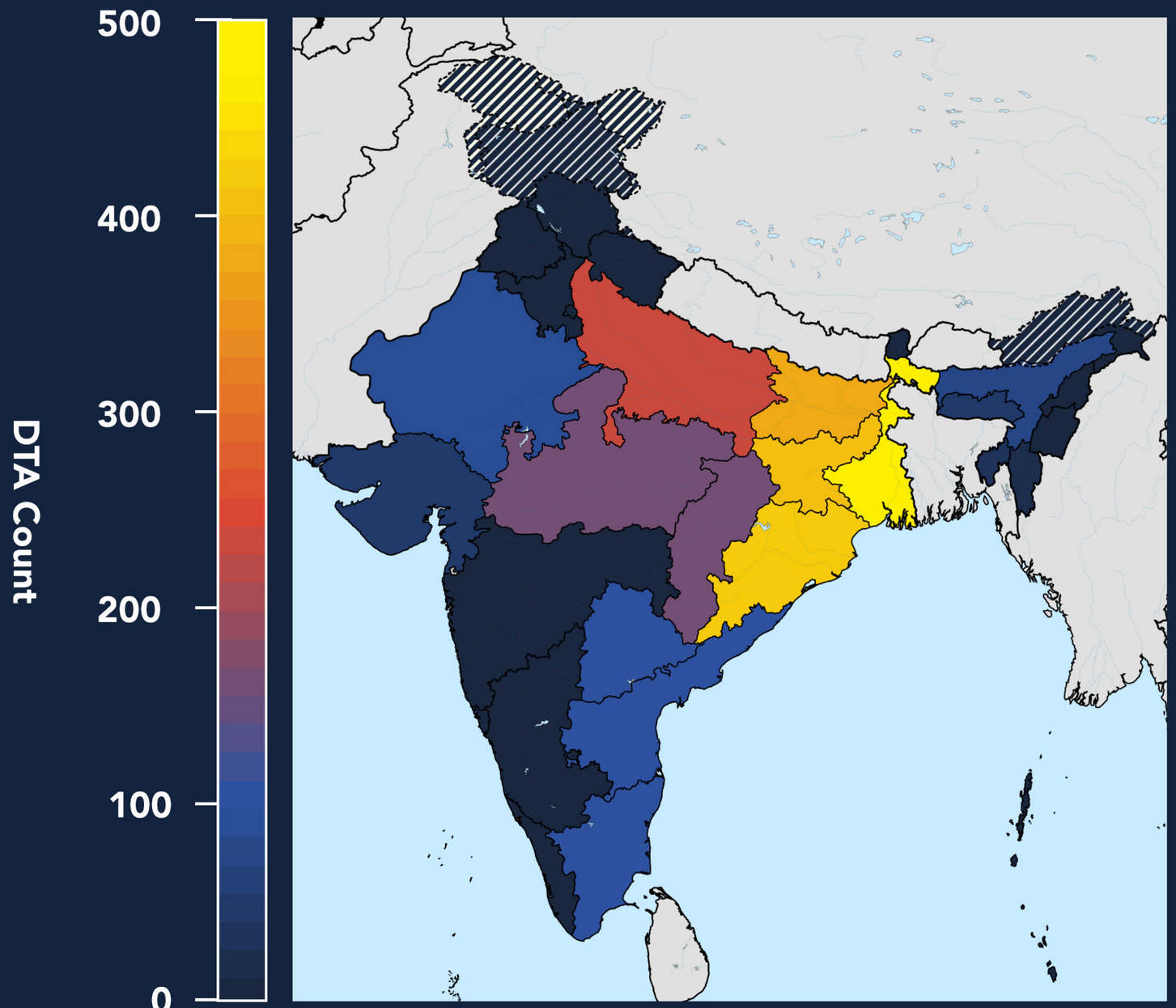
Which months saw the most severe thunderstorms from January through August 2019?



While June, May, and July had the top three total lightning flash counts, June, May, and April had the top three DTA counts. This means that although July had more total lightning activity than April, it didn't have as many severe storms.

There were only 2 DTAs in January.

DANGEROUS THUNDERSTORM ALERTS MAP



This map of Dangerous Thunderstorm Alerts highlights areas of India that saw the most storms during the first eight months of 2019.

States with lower total lightning flash counts that had high DTA counts include Bihar and Jharkhand. This is most likely due to their smaller area size. Although they didn't get as high lightning counts as bigger states, they saw their fair share of intense storms during the first eight months of 2019.

States with higher total lightning flash counts with low DTA counts include states in the center of the country like Madhya Pradesh, Andhra Pradesh, Karnataka, and Tamil Nadu. While these states saw a lot of lightning activity so far this year, they didn't see as many intense storms as states in the northeastern section of India.

LIGHTNING IN INDIA

Severe weather is a huge problem in India and lightning is the number one killer.
Lightning kills over 2,000 people in India annually. That’s more than floods and cyclones.

This is due to two main factors:

1

India’s geography near the equator and the Indian Ocean provide it with a lot of heat and moisture that generate thunderstorms

2

Lack of weather safety awareness and lightning warning tools that allow people to respond in time, especially those working outdoors

WHAT WE'RE DOING TO HELP

Earth Networks contributes to national, state and municipal efforts to minimize lightning deaths, injuries, and damage throughout India by deploying and operating national total lightning detection networks and supporting stakeholders with much needed data and analytics.

Earth Networks patented lightning sensors are located in the most states in India. We work together with governments in states like Andhra Pradesh, Bihar, Karnataka, Odisha, NESAC (NE India), and West Bengal.

Andhra Pradesh collaborated with Earth Networks and other experts to establish standard procedures for lightning alerting. These procedures are now part of the recommended best practices published by the National Disaster Management Authority (NDMA). You can read about it on page 33 of their report.

We also work alongside top atmospheric scientists studying thunderstorm dynamics throughout the country.


Bihar to Set Up Lightning Alert System to Save Lives

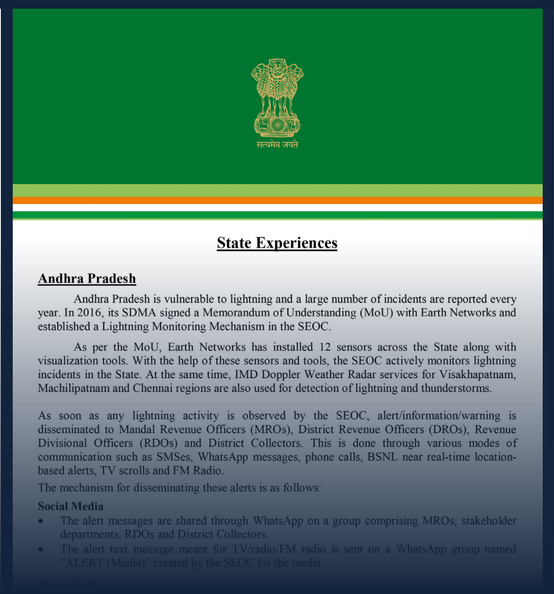
By IANS - 19 August 2019 - TWC India

Lightning

IANS

Alarmed over the rising number of deaths due to lightning strikes, the Bihar State Disaster Management Authority (BSDMA) has signed an agreement with Bengaluru-based Earth Networks to set up a lightning forecast system in the state.

Earth Networks monitors and collects data on lightning strikes around the world.


सत्यमेव जयते

State Experiences

Andhra Pradesh

Andhra Pradesh is vulnerable to lightning and a large number of incidents are reported every year. In 2016, its SDMA signed a Memorandum of Understanding (MoU) with Earth Networks and established a Lightning Monitoring Mechanism in the SEOC.

As per the MoU, Earth Networks has installed 12 sensors across the State along with visualization tools. With the help of these sensors and tools, the SEOC actively monitors lightning incidents in the State. At the same time, IMD Doppler Weather Radar services for Visakhapatnam, Machilipatnam and Chennai regions are also used for detection of lightning and thunderstorms.

As soon as any lightning activity is observed by the SEOC, alert/information/warning is disseminated to Mandal Revenue Officers (MROs), District Revenue Officers (DROs), Revenue Divisional Officers (RDOs) and District Collectors. This is done through various modes of communication such as SMSes, WhatsApp messages, phone calls, BSNL near real-time location-based alerts, TV scrolls and FM Radio.

The mechanism for disseminating these alerts is as follows:

Social Media

- The alert messages are shared through WhatsApp on a group comprising MROs, stakeholder departments, RDOs and District Collectors.
- The alert text message meant for TV/radio/FM radio is sent on a WhatsApp group named "ALERT (Media)" created by the SEOC for the media.


Odisha registers 31% decline in number of lightning deaths

PTI | Updated: Jul 14, 2019, 5:29 IST

A- A+

AD

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Kanakia Group

Representative image.

BHUBANESWAR: Odisha has registered a decline in human casualty due to lightning by 31 per cent during 2018-19 following effective use of Early Warning Communication system (EWCS), a senior official said.

While 465 lightning deaths were recorded in Odisha during the year 2017-18, it came down to 320 in 2018-19 which is about 31 per cent decline in rate of human casualty, said Special Relief Commissioner (SRC) B P Sethi.

The SRC said 401 people died due to lightning in the year 2015-2016 and in 2016-17 the figure was 400, the SRC said.

Asked about the reason behind the decline in lightning deaths, Sethi said the office


Odisha Trying To Send SMS For Lightning Warning, Alert System In OSDMA On Offing

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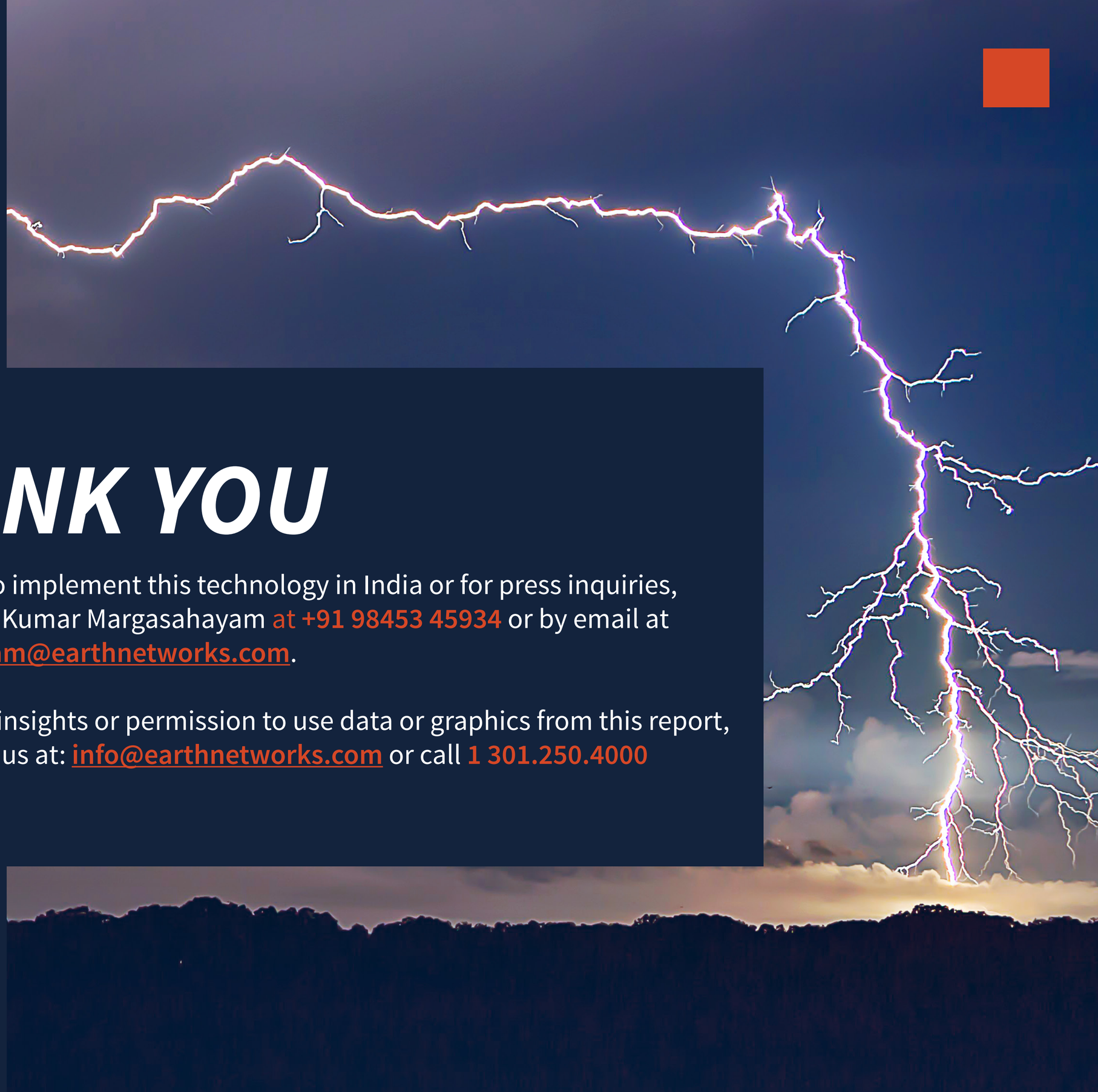
www.earthnetworks.com

THANK YOU

To learn how to implement this technology in India or for press inquiries, please contact Kumar Margasahayam at +91 98453 45934 or by email at kmargasahayam@earthnetworks.com.

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



LIGHTNING FLASH COUNT APPENDIX

STATE	CLOUD-TO-GROUND	IN-CLOUD	TOTAL COUNT
Orissa	9,37,462	20,21,140	29,58,602
West Bengal	5,87,387	17,12,524	22,99,911
Jharkhand	5,09,758	13,34,727	18,44,485
Andhra Pradesh	4,42,954	12,30,281	16,73,235
Madhya Pradesh	4,44,743	9,07,505	13,52,248
Karnataka	2,66,100	10,45,001	13,11,101
Bihar	2,67,950	9,86,301	12,54,251
Chhattisgarh	4,63,536	7,72,350	12,35,886
Uttar Pradesh	2,93,869	9,35,725	12,29,594
Tamil Nadu	1,42,594	9,30,957	10,73,551
Rajasthan	2,51,592	6,35,738	8,87,330
Maharashtra	2,86,676	5,21,393	8,08,069
Meghalaya	1,10,959	3,85,976	4,96,935
Assam	1,25,362	3,38,397	4,63,759
Kerala	44,581	2,12,272	2,56,853
Gujarat	1,25,905	1,21,908	2,47,813
Tripura	42,099	1,03,939	1,46,038
Punjab	31,351	82,474	1,13,825
Haryana	27,279	79,252	1,06,531
Mizoram	27,401	61,837	89,238
Uttarakhand	17,810	44,689	62,499
Jammu And Kashmir	16,824	30,499	47,323
Himachal Pradesh	11,644	23,139	34,783
Manipur	10,870	20,767	31,637
Nagaland	7,255	11,718	18,973
ANDAMAN AND NICOBAR ISLANDS	6,934	9,268	16,202
Arunachal Pradesh	5,612	7,611	13,223
Nct Of Delhi	1,798	4,894	6,692
Goa	902	2,587	3,489
Sikkim	971	2,210	3,181
Pondicherry	359	2,136	2,495
DAMAN AND DIU	10	19	29
LAKSHADWEEP	12	13	25

* Lightning flash count data from January 1, 2019 - August 30, 2019

DTA COUNT APPENDIX

STATE	JAN DTA	FEB DTA	MAR DTA	APR DAT	MAY DTA	JUN DAT	JUL DTA	AUG DTA	TOTAL DTA
ANDAMAN AND NICO-	0	0	0	0	0	0	0	1	1
Andhra Pradesh	0	4	13	167	435	343	42	69	1,073
Arunachal Pradesh	0	0	0	0	0	0	0	0	0
Assam	0	0	8	73	143	65	35	45	369
Bihar	0	8	10	264	89	253	154	220	998
CHANDIGARH	0	0	0	0	0	0	0	0	0
Chhattisgarh	0	3	7	18	86	255	97	71	537
DADRA AND NAGAR	0	0	0	0	0	2	0	0	2
DAMAN AND DIU	0	0	0	0	0	0	0	0	0
Goa	0	0	1	2	0	3	0	0	6
Gujarat	0	0	0	0	0	28	23	18	69
Haryana	0	0	0	0	0	3	1	6	10
Himachal Pradesh	0	0	0	0	0	0	0	0	0
Jammu And Kashmir	0	0	0	0	0	0	4	0	4
Jharkhand	0	37	52	363	339	541	193	217	1,742
Karnataka	0	0	39	225	492	193	1	1	951
Kerala	0	0	10	74	130	24	0	0	238
LAKSHADWEEP	0	0	0	0	0	0	0	0	0
Madhya Pradesh	0	0	2	0	4	69	102	59	236
Maharashtra	0	0	4	23	8	136	11	0	182
Manipur	0	0	0	5	7	2	2	3	19
Meghalaya	0	0	18	123	283	109	13	34	580
Mizoram	0	0	0	18	16	3	7	8	52
Nagaland	0	0	0	2	1	0	1	1	5
Nct Of Delhi	0	0	0	0	0	0	0	2	2
Orissa	0	17	94	330	560	909	231	193	2,334
Pondicherry	0	0	0	0	1	2	1	2	6
Punjab	0	0	0	0	0	0	0	0	0
Rajasthan	0	0	0	3	5	14	50	36	108
Sikkim	0	0	0	0	0	0	0	0	0
Tamil Nadu	0	8	4	60	414	189	73	38	786
Tripura	0	0	7	53	83	12	7	13	175
Uttar Pradesh	2	0	0	10	6	70	110	123	321
Uttarakhand	0	0	0	0	0	11	0	0	11
West Bengal	0	103	117	569	549	754	282	264	2,638
Totals	2	180	386	2,382	3,651	3,990	1,440	1,424	13,455

PRESS COVERAGE APPENDIX

- https://timesofindia.indiatimes.com/india/odisha-registers-31-decline-in-number-of-lightning-deaths/articleshow/70214221.cms
- https://weather.com/en-IN/india/news/news/2019-08-19-bihar-set-up-lightning-alert-system-save-lives
- https://www.ommcomnews.com/odisha-news/odisha-trying-to-send-sms-for-lightning-warning-alert-system-in-osdma-on-offing-
- https://scroll.in/article/915759/lightning-kills-more-people-in-india-than-other-extreme-weather-events-finds-study
- https://ndma.gov.in/images/guidelines/Guidelines-on-TSL-HSW.pdf