FEBRUARY 16, 2022

More Storms – Greater Uncertainty? Advances in Total Lightning Detection Keep Getting Better









Before we get started....

- We're happy to respond to your questions! By default, all attendees are MUTED.
- Use "Ask Questions" at any time during today's webinar session to ask questions.
- We will review posted questions later in the webinar.

Feel free to contact us after the presentation at info@earthnetworks.com



Your speakers today



DR. ELIZABETH DIGANGI Postdoctoral Researcher

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DR. JEFF LAPIERRE Lightning Scientist

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Our speakers



DR. ELIZABETH DIGANGI

Postdoctoral Researcher

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Biography

Dr. Elizabeth DiGangi is a post-doctoral researcher at Earth Networks. She completed her Ph.D. in Meteorology at the University of Oklahoma in 2019.

Dr. DiGangi is involved in projects at Earth Networks studying thunderstorm climatology and lightning classification, and she also helps maintain the EN greenhouse gas detection network. Her areas of research expertise also include thunderstorm charge characteristics and the relationships between lightning and storm structure.

Our speakers



DR. JEFF LAPIERRE

Lightning Scientist

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Biography

Dr. Jeff Lapierre has a Ph. D. in Physics from the New Mexico Institute of Mining and Technology and is a Lightning Scientist at Earth Networks.

Dr. Lapierre performs both hardware and software development and serves as a scientific consultant for the company and its partners. He also continues his scientific research involving lightning physics and chemistry, volcano plume electrification, and high energy physics.



- United States Lightning Report: 2021 Highlights
- Case Studies: Lightning in Action in 2021
- Earth Networks Total Lightning Network: Now Better Than Ever

AEM United States Lightning Report

2021 Highlights

1.3 % More Lightning Detected in 2021

Total lightning

is the combination of cloud-to-ground (CG) and in-cloud (IC) lightning strikes



In-Cloud lightning: Lightning that occurs between opposite charges within a thunderstorm cloud



Cloud-to-Ground lightning: Lightning that happens between opposite charges in a cloud and on the ground

446,726,668

Total lightning pulses | 100%

411,322,119

In-Cloud



8%

35,505,549

Cloud-to-Ground



Lightning Counts: 5 States Hold Top Spots from 2020



Pulse density highest in Southern Plains, Midwest, Mid Atlantic, and Gulf Coast

Pulse density allows us to compare different sized areas (like states and counties) fairly.

With every pulse we detect, we receive a more precise measure of lightning activity.



Top pulse density states reflect highest activity in Mid Atlantic and Gulf Coast



Dangerous Thunderstorm Alerts (DTAs)

DTA map reflects another active severe weather year for the Midwest and an active Monsoon season for the Southwest.

29,245

Dangerous Thunderstorm Alerts | 2021



Thunder Days anomalies



Case Studies

Lightning in Action in 2021

Tornadoes and La Niña in first half 2021: Less active than expected



Influence of El Niño and La Niña on the frequency of tornadoes, March-May

Lightning adds more to the story



Pulse counts for the SEUSA during March-May



The North American Monsoon

Widespread positive thunder day anomalies in the Southwest United States reflects a wetter-than-average, and therefore stormier-than-average, North American Monsoon season.



Thunder Days Map



Jun – Sept Pulse Density Difference: 2021 – 2020 [Pulse/sqkm]

December 2021 Tornado Outbreak

1.5M Lightning pulses detected

80 People killed

Earth Networks Total Lightning Network®

Now Better Than Ever

Earth Networks Total Lightning Network history of expansion

Importance of Total Lightning

Improvement to key lightning detection metrics

50	<100	95	90
percent	meters	percent	percent
Morelightning	Improved location	Regional improvement	Improved cloud-to-ground
detected globally	accuracy <100 meters	in detection efficiency	and in-cloud lightning
	(144% improvement)	up to 95%	classification accuracy of 90%

50% more lightning detected worldwide

More lightning detected across every region

Location accuracy now better than 100m

Improvement

144%

<100m

Accuracy

False alarm rates remain extremely low

More accurate classification of Total Lightning

The most reliable and precise global lightning network

37 #...format.=.'ascii'|'binary'...-.format.of.lightning-38 #...type...=.'flash'|'pulse'|'combo'.-.type.of.lightni 39 #.See.implementation.for.more.notes.on.options 40 feed.= FeedReceiver.FeedReceiver('partnerId="<partnerI 41 #.the.FeedReceiver.using.Threading, and is.fully.async 42 #.getting.data, you.need.to.start.the.thread.(as.per.s 43 feed.start() 44 print.(feed.connectionString) 45 46 #.enter.main.loop 47 #.each.iteration,.check.to.see.if.the.FeedReceiver.has 48 #.if.it.has,.pop.it.off.and.print.something.to.standar 49 while.True: 50 |...if.len(feed.received.).==.0:

Precision technology

Sophisticated technology and algorithms deliver exceptional location accuracy of <100 meters and detection efficiency of 95%

Most accurate global in-cloud and cloud-to-ground total lightning detection with superior classification accuracy of 90%

Global coverage

1,800+ innovative lightning sensors deployed in 100+ countries provide reliable, complete data anywhere global companies operate

Questions?

Be sure to download a copy of the 2021 U.S. Lightning Report <u>here</u>.

For more information, let's talk at: info@earthnetworks.com | 1.301.250.4000

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