

# Lightning fatalities and injuries in Caribbean, Central and South American nations



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Lightning Safety Awareness: Online Mode  
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# Outline

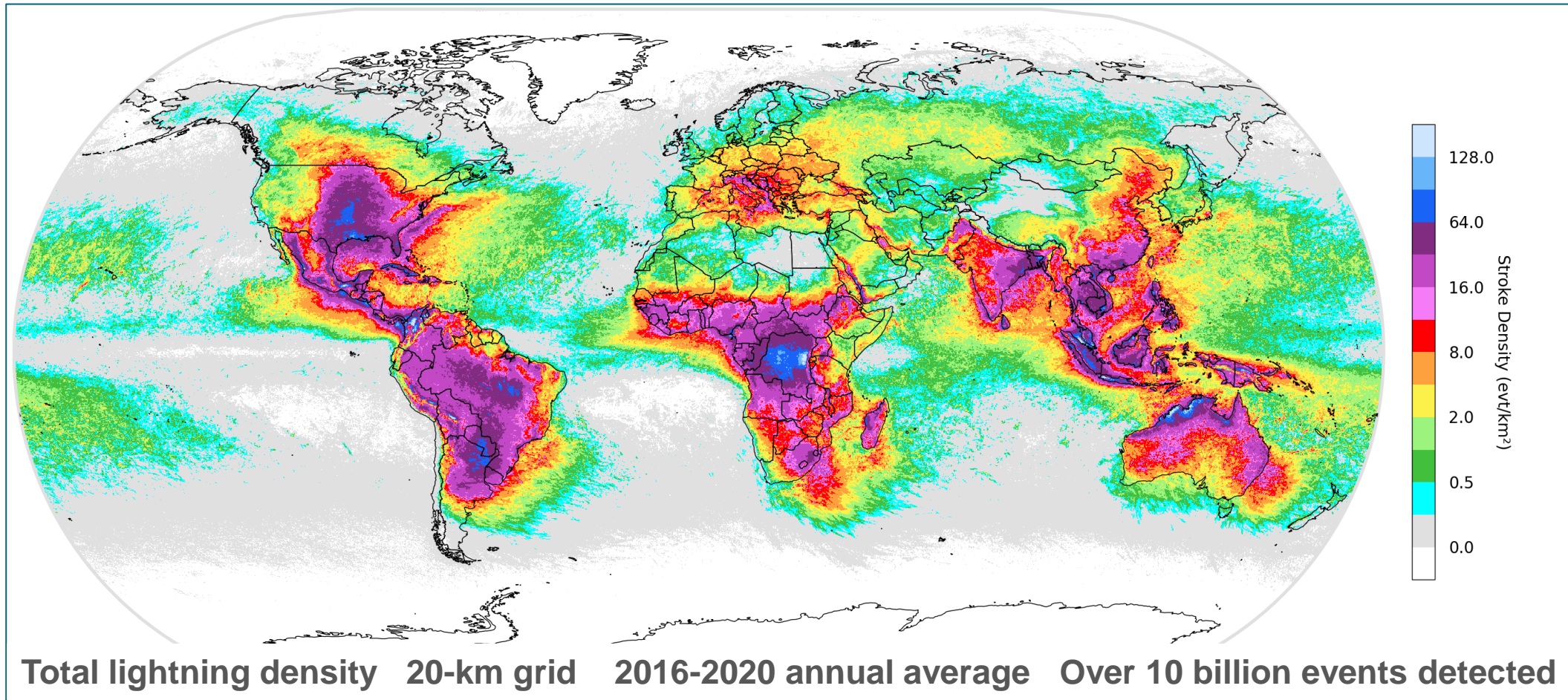
Lightning occurrence

Lightning casualties

**VAISALA**

# Global total lightning from GLD360: Two billion per year

Global Lightning Dataset GLD360 is owned and operated by Vaisala

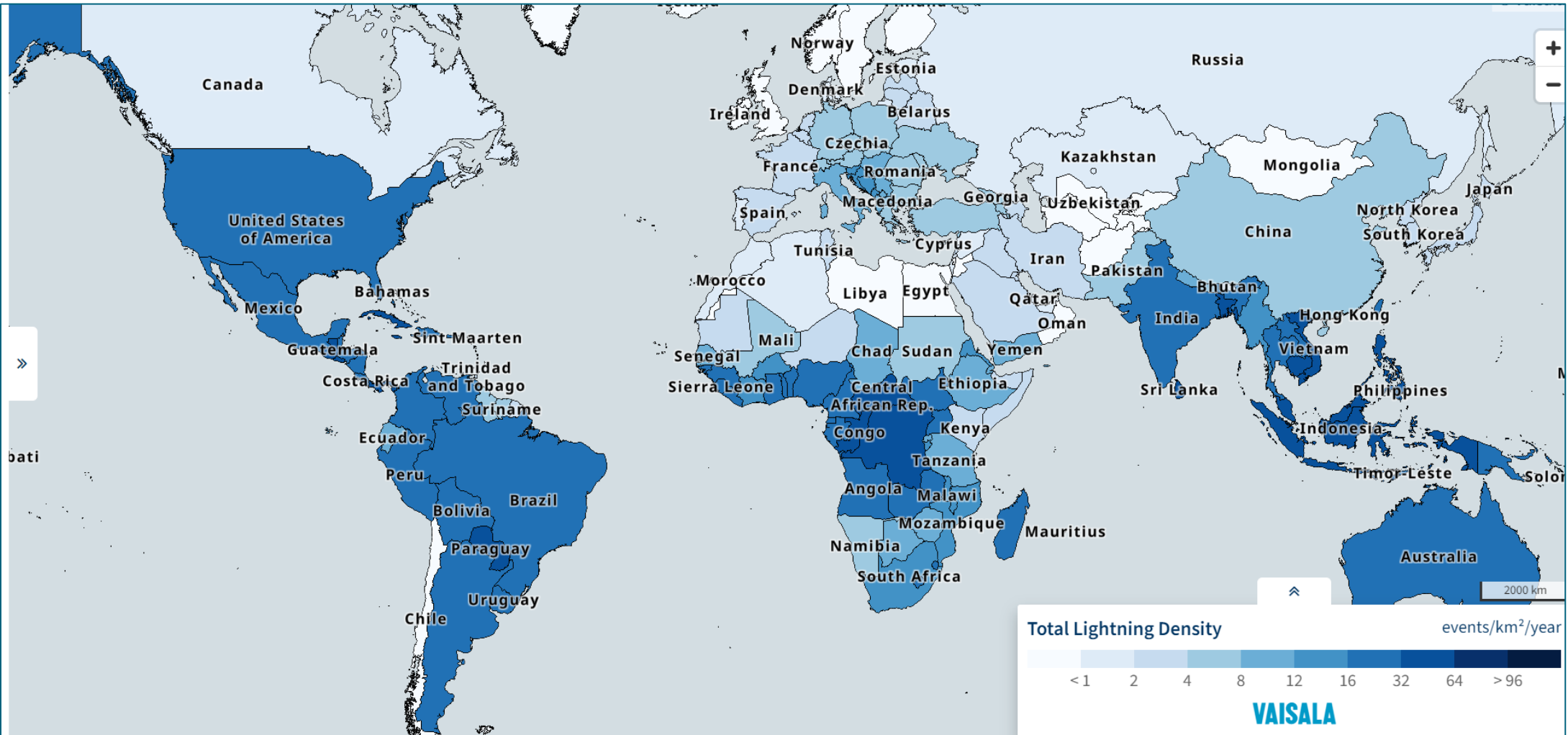


Said, R.K.,  
2017: Towards a  
global lightning  
locating system.  
*Weather*, **72**, 36-  
40.

# GLD360 interactive map

<https://interactive-lightning-map-vaisala.com>

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*Weather*, **72**, 36-  
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# Outline

Lightning occurrence

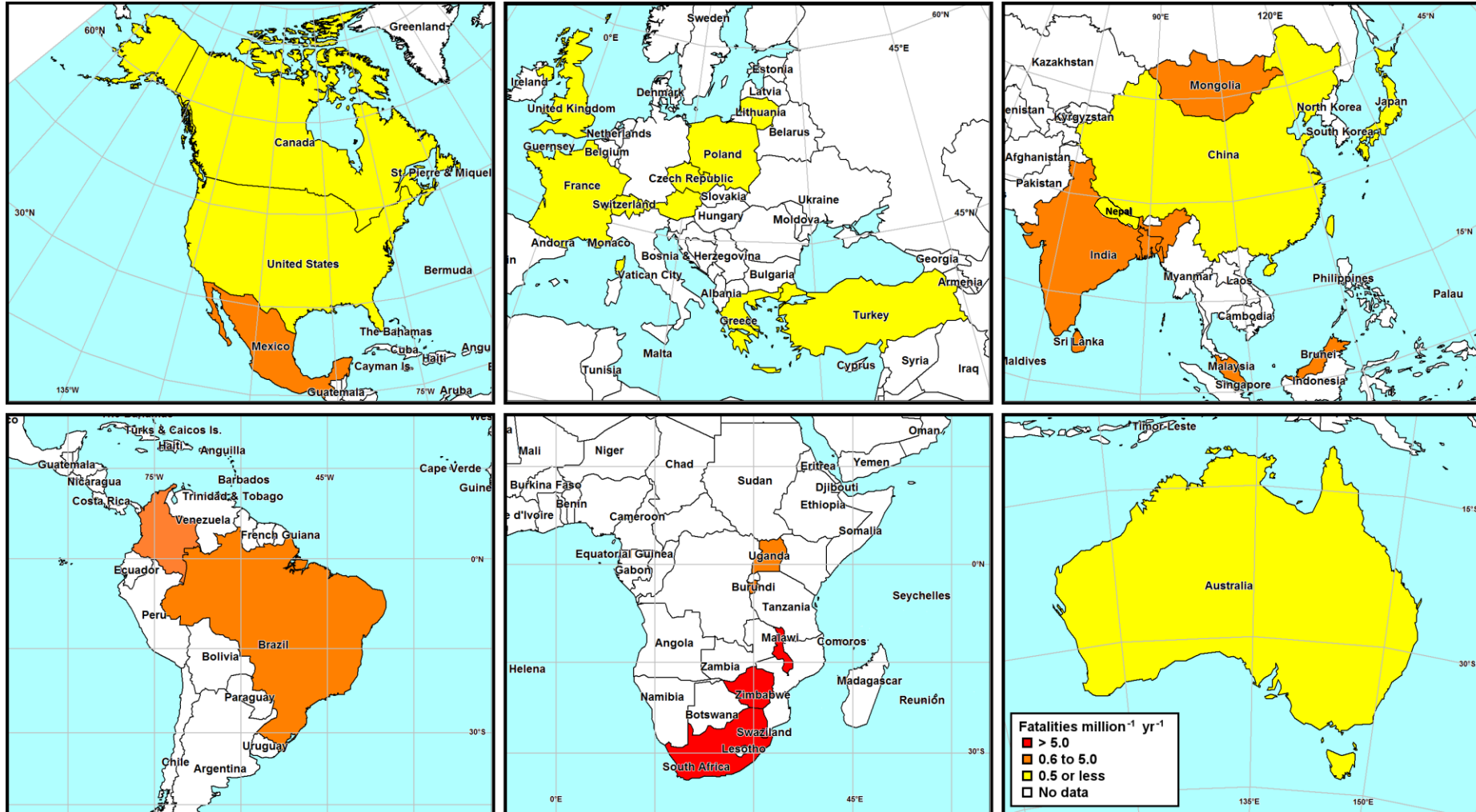
Lightning casualties

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# Global lightning fatalities and threats to people

- My estimate: 24,000 people are killed and 240,000 are injured per year by lightning
- Lightning deaths and injuries are steadily decreasing in developed nations
- Lightning deaths and injuries are increasing in developing nations
- Studies can use online and print news sources, national medical records, national meteorological services, personal data collection from a variety of sources, natural hazards database, or a mixture

# 4,621 lightning deaths per year based on published studies



Holle, R.L., 2016: A summary of recent national-scale lightning fatality studies. *Weather, Climate, and Society*, **8**, 35-42.

Many countries have no published fatality data --white shading--

# Caribbean

▪ Jamaica	23 events
▪ Belize	7
▪ Bahamas	4
▪ Trinidad	3
▪ Cuba	2
▪ Barbados	1
▪ Bermuda	1
▪ Bonaire	1
▪ Dominican Rep.	1
▪ Grenada	1
▪ Puerto Rico	1

<u>45 events</u>	
▪ Deaths	31
▪ Injuries	43
▪ <i>Male</i>	34
▪ <i>Female</i>	7

**LARGEST EVENT**  
***August 1943***  
**7 children killed**  
**12 children injured**  
**School in Jamaica**  
**--Similar to African school events now**



# Central America

- Costa Rica 9 events
- El Salvador 3
- Nicaragua 2
- Guatemala 1
- Honduras 1
- Panama 1

- 17 events
- Deaths 29
  - Injuries 81
  - *Male* 22
  - *Female* 5

**LARGE EVENT ONE**  
***Honduras, 1995***  
**17 killed**  
**35 injured**  
**Soccer**

**LARGE EVENT TWO**  
***Guatemala, 2001***  
**2 killed**  
**25 injured**  
**Soccer**

# South America

▪ Brazil	24 events
▪ Argentina	8
▪ Peru	8
▪ Bolivia	4
▪ Guyana	3
▪ Venezuela	3
▪ Uruguay	3
▪ Colombia	2
▪ Ecuador	2

<u>57 events</u>	
▪ Deaths	62
▪ Injuries	195
▪ <i>Male</i>	42
▪ <i>Female</i>	16

**LARGE EVENT ONE**  
***Argentina, 2014***  
**3 killed, 22 injured**  
**Beach**

**LARGE EVENT TWO**  
***Ecuador, 2015***  
**52 injured**  
**Police school**

**LARGE EVENT THREE**  
***Guyana, 2013***  
**1 killed, 7 injured**  
**Sugar cane workers**

# Mexico

- Quintana Roo 5 events
- Michoacán 3
- Chiapas 2
- Guerrero 2
- Mexico City 2
- Sonora 2
- Guanajuato 1
- San Luis Potosi 1
- Tlaxcala 1

## 20 events

- Deaths 39
- Injuries 31
- *Male* 15
- *Female* 16

## **LARGE EVENT ONE**

***April 2006***

**5 killed**

**All were children**

**Near large metal  
cross on hill**

## **LARGE EVENT TWO**

***July 2015***

**7 killed**

**2 injured**

**'Farming country'**

# Caribbean

## Activity/location

▪ Agriculture	9 events
▪ Fishing	3
▪ Soccer	3
▪ Yard of home	3
▪ Beach	2
▪ Under tree	2
-----	
▪ Single category	23

## 45 events

▪ Deaths	30
▪ Injuries	43
▪ <i>Male</i>	34
▪ <i>Female</i>	7

## Damages and impacts

▪ Golf tourney	2 events
▪ Oil facility	2
▪ Airport runway	1
▪ Airport building	1
▪ Govt. building	1
▪ Horse race	1
▪ Historic sugar mill	1
▪ Yacht	1

# Central America

## Activity/location

- Soccer 7 events
- Boat 2
- Volcano tourism 2
- Zipline tourism 2
- 
- Single category 3

## 17 events

- Deaths 29
- Injuries 81
- *Male* 22
- *Female* 5

## Damage

Boeing 777 on runway 1 event

# South America

## Activity/location

▪ Soccer	9 events
▪ Inside house	7
▪ Agriculture	6
▪ Beach	6
▪ Fishing	4
▪ Motorcycle	3
▪ Boat	2
▪ Military	2
▪ Machu Picchu	2
-----	
▪ Single category	8

## 57 events

▪ Deaths	62
▪ Injuries	195
▪ Male	42
▪ Female	16

## Damages

Cattle (52 and 22)	2 events
Commuter train	1
Golf tourney	1
Oil storage tanks	1

Cardoso, I., O. Pinto Jr., I.R.C.A. Pinto, and R. Holle, 2014: Lightning casualty demographics in Brazil and their implications for safety rules. *Atmospheric Research*, **135-136**, 374-379.

# Mexico

## Activity/location

- Agriculture 3 events
  - Beach 3
  - Under tree 3
  - Soccer 2
- 
- Single category 9

## 20 events

- Deaths 39
- Injuries 31
- *Male* 15
- *Female* 16

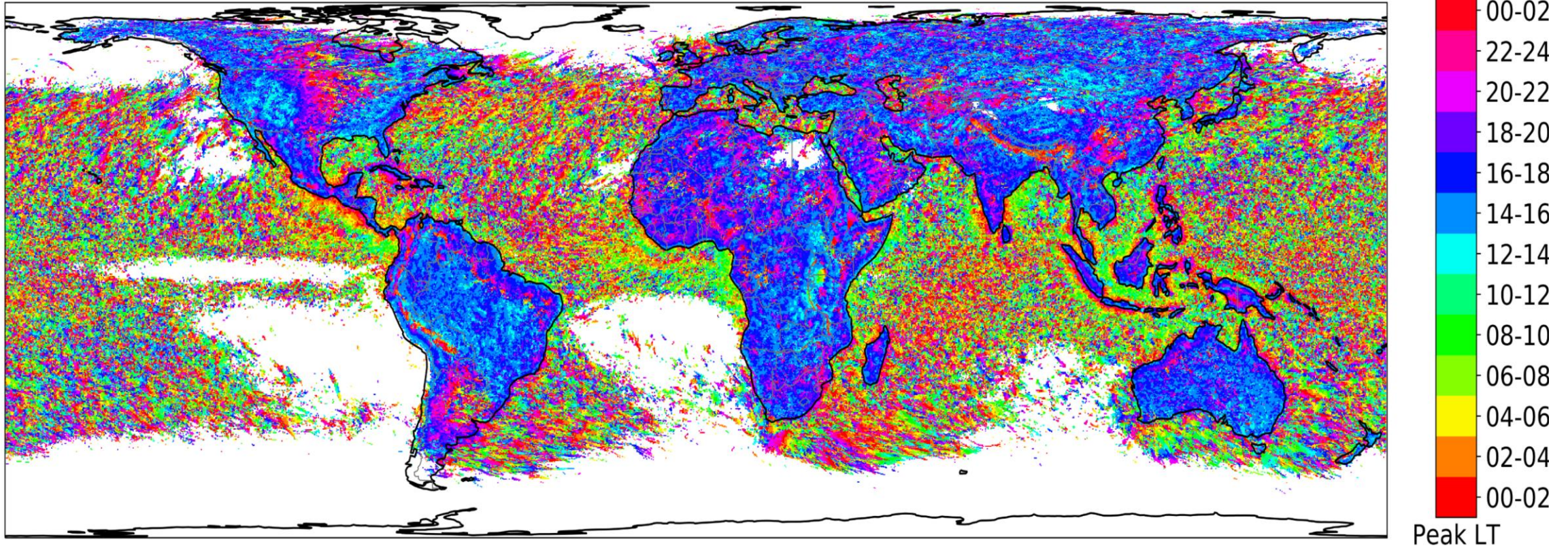
## Damages

No reports

Raga, G.B., M.G. de la Para, and B. Kucienska, 2014: Deaths by lightning in Mexico (1979-2011): Threat or vulnerability? *Weather Climate, and Society*, **6**, 434-444.

# Diurnal map from GLD360

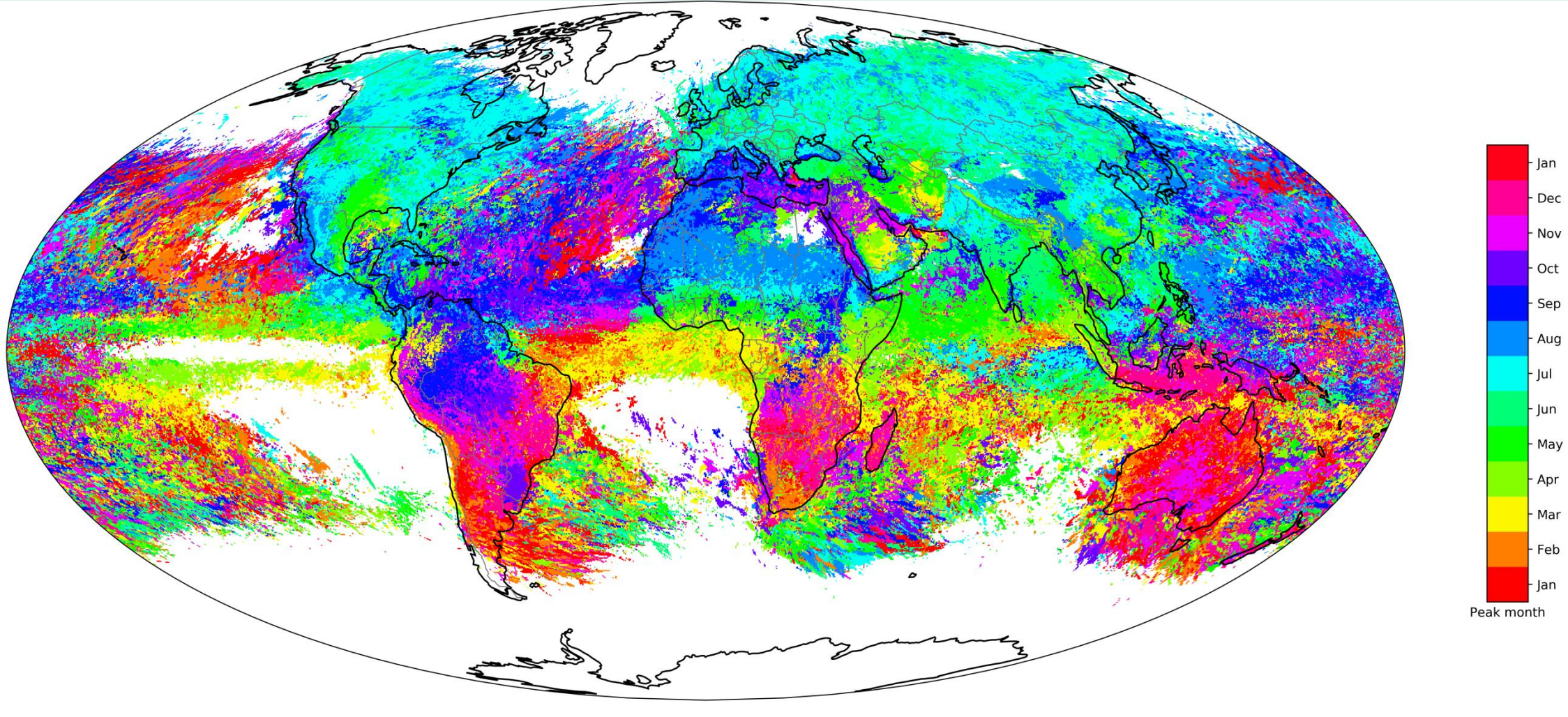
All



Said, R.K., and R.L. Holle, 2021: Maximum hour and month of lightning around the globe. Poster, 10<sup>th</sup> Conf. on the Meteorological Applications of Lightning Data, American Meteorological Society, <https://ams.confex.com/ams/101ANNUAL/meetingapp.cgi/Paper/379220>.



# Monthly map from GLD360



# Websites on lightning safety



**LIGHTNING KILLS  
SAVE A LIFE IN AFRICA**  
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Headquartered at Makerere University Business School

## African Centres for Lightning and Electromagnetics Network

[www.ACLEnet.org](http://www.ACLEnet.org)



## National Lightning Safety Council (U.S.)

<http://lightningsafetycouncil.org/>



## Vaisala lightning education booklet

Google 'So You Think You Know Lightning'