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SCIENTISTS LOCATE WORLD'S TOP LIGHTNING HOTSPOT

*Lake Maracaibo's Unique Geography Helps Produce
Thunderstorms Nearly 300 Days per Year*

MARCH 9, 2016 – BOSTON, MA – New research published by the American Meteorological Society (AMS) uses satellite data to determine that the world's top lightning hotspot is in northwest Venezuela, not in Africa's Congo Basin, as previously thought.

The findings, published in an article for the *Bulletin of the American Meteorological Society (BAMS)*, pinpoint the hotspot at Lake Maracaibo, where combined coastal and mountain wind flows trigger thunderstorms nearly three hundred days each year. These storms produce what is known locally as "Catatumbo lightning," vivid and wild displays of both cloud-to-cloud and cloud-to-ground lightning that can last many hours through the night. According to the article, "Nocturnal thunderstorms over Lake Maracaibo are so frequent that their lightning activity was used as a lighthouse by Caribbean navigators in colonial times."

The *BAMS* article, "Where are the Lightning Hotspots on Earth?" by Rachel I. Albrecht, Steven J. Goodman, Dennis E. Buechler, Richard J. Blakeslee, and Hugh J. Christian, details how the data, derived from 16 years of space-based Lightning Imaging Sensor observations, more accurately pinpoint Earth's hot spots for lightning flash rate density (FRD), which indicates the average number of times lightning flashes each year over an area one square kilometer in size.

Lead author Dr. Rachel I. Albrecht of the University of São Paulo in Brazil, said, "One of the most interesting aspects was to discover that the place with the most lightning on Earth is over water, and during the night, opposing the general behavior of more thunderstorm development during the afternoon and over land."

The team—representing the University of Maryland, Universidade de São Paulo (Brazil), NOAA, NASA, and the University of Alabama in Huntsville—cites several factors for the new lightning champion, including its unique geography and climatology.

Lake Maracaibo's pattern of convergent wind flow, which includes land-sea and mountain-valley breezes over the warm lake waters, occurs nearly year-round and contributes to

nocturnal thunderstorm development 297 days per year on average. These thunderstorms are very localized and their persistent development anchored in one location accounts for the high FRD.

The Lake Maracaibo region sees an astonishing 232 lightning flashes per year per square kilometer, which puts it far ahead of the number two spot, Kabare in the Democratic Republic of Congo, which has an FRD of 205, according to the authors.

North America falls far behind these top hotspots, with only four locations in Guatemala, Cuba, and Haiti having more than 100 flashes per square km per year. The most lightning-prone U.S. location, ranked 122nd globally, was in the Everglades not far from Ft. Myers, Florida, with 79 flashes per square km per year.

Climatology over the Americas will be extended 20 more years with even greater temporal detail through the new Geostationary Lightning Mapper (GLM), which launches in October on the new GOES-R satellite.

Before satellite data were available, scientists had estimated that the entire global average was around 100 lightning flashes per second (fl s^{-1}). However recent studies have shown that the mean global flash rate is closer to 46 fl s^{-1} , which means Earth experiences nearly 1.4 billion lightning flashes each year.

[Read the early online release of this BAMS article here.](#)

The new list of the world's top ten lightning flash density hotspots is:

World Rank	Flash Rate Density (FRD)	Location
1	232.52	Lake Maracaibo, Venezuela
2	205.31	Kabare, Dem. Rep. of Congo
3	176.71	Kampene, Dem. Rep. of Congo
4	172.29	Caceres, Colombia
5	143.21	Sake, Dem. Rep. of Congo
6	143.11	Dagar, Pakistan
7	138.61	El Tarra, Colombia
8	129.58	Nguti, Cameroon
9	129.50	Butembo, Dem. Rep. of Congo
10	127.52	Boende, Dem. Rep. of Congo

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