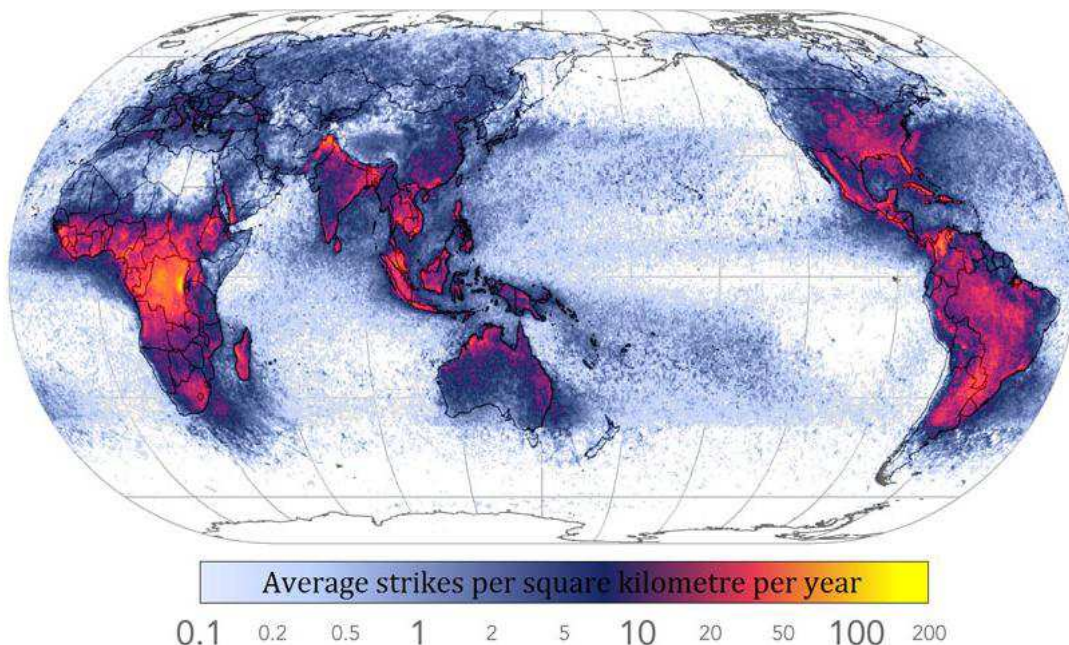


LIGHTNING DATA CENTER MINUTES
October 11, 2013
ST. ANTHONY HOSPITAL WEST, LAKEWOOD, CO
On the Web at: www.stanthonyhosp.org/ldc

Monthly Quote: “Why am I stopped here?” Quote from a Washington state man after he had stopped his motorcycle and collapsed at the side of the road following a lightning strike to his head while riding his bike. See the articles in the Lightning Links section.

1. The meeting began at 11:45 AM and adjourned at 1:10 PM. Members Present: Clark, Collier, Yarnell, Nibbe, Wells, Wachtel, Gift, Cui-Gift, Elder, Swanson, Stewart, Shay, Roche and Langford. Clark moderated the meeting.
2. From our colleagues at the Yahoo Lightning Protection Group: The lightning conference titled: “6th LPE & GROUND2014: International Conferences on Lightning Physics and Effects & Grounding” will be held in Manaus, AM, Brazil on May 12-16, 2014 at the Hotel Tropical. For more information, visit their website at: <http://mail.aol.com/38099-111/aol-6/en-us/Suite.aspx>.
3. Pictured below is a lightning map of the world, as of 2008/2009, based on data from NASA. The highest flash densities are in south central Africa and the very northwestern “corner” of South America.

33. Frequency of Lightning Strikes Throughout the World



Map by [Citynoise on Wikimedia Commons](#)

4. Clark presented two articles for review:

The first was about a lightning strike to an air traffic control tower at the Baltimore airport, which injured one of the air traffic controllers and caused closure of the tower and flights to be cancelled and diverted until operations could be resumed. Greg Stewart wondered what the degree of lightning protection is available and if the tower was equipped with standard Franklin rods. Clark thought the FAA would have some description of lightning protection and safety requirements in some kind of manual.

The second was an article Michael Foley had asked Clark to present. Scientists at the University of Alabama at Huntsville have redesigned a sensor, initially designed in the 1950s, to better detect the radiation field in the atmosphere when lightning strikes. The Huntsville Alabama Marx Meter Array (HAMMA) operates in the Very Low Frequency (VLF) spectrum and converts the lightning-induced change to the electric field to a voltage, which is stored on a computer. The researchers hope to combine data from a network of these sensors, coupled with VHF sensors, to learn how lightning strikes are initiated. That process is still not understood. Other sensors are being designed to further address the question.

Phil Yarnell asked if there is a standard lightning detector. Carl Swanson doesn't think so and thought there may be 4, maybe 5 companies manufacturing equipment – each type with its strengths and weaknesses.

Phil also wondered if any lightning detection equipment was in use during the Denver Broncos home opener, when storms in the area forced a 45-minute weather delay. Carl noted the closest strike to the stadium was 6 miles away, which is well within the selectable detection radii of modern detection equipment.

Howard Wachtel said he saw a tall pole on the University of Colorado campus with a solar panel and a Thor label on it and thought it might be a lightning detection system. Most likely, he saw a Thor-Guard system, which has been noted in previous minutes.

5. Phil Yarnell presented an update and two new cases.

In July 2013, Phil presented a patient that was struck while holding a hose. Since the presentation, the patient has developed worsening pain and the flexion has taken over the whole arm and not just the wrist. Patient is receiving nerve block treatments, which allows the arm to relax. The treatments are ongoing and it is unknown how long they will continue.

A man was in his workshop using a power tool, when lightning struck and went through the tool and into his hand. Persistent pain developed, initially in his hand and then slowly advanced through his arm to his neck and shoulder. Patient reports a burning, uncomfortable sensation. Nerve velocity tests were normal. Discussion suggests the individuals in this case and the previous case may have Complex Regional Pain Syndrome (CRPS), formerly known as Reflex Sympathetic Dystrophy (RSD). Greg Stewart asked if deep brain stimulation might help to alleviate the pain.

Two men in a cherry picker-type bucket came into contact with a high-power line, estimated to be in the kV range. One of the men died in 25 minutes. Phil wanted to know how and why he would die 25 minutes after contact with the line, and not sooner. The man appeared to be drifting in and out of consciousness. An autopsy was done. There were no signs of internal bleeding, hemorrhage, or bloating. Howard Wachtel thought it could be cardiac arrest, although most people suffering cardiac arrest die within a minutes of the arrest. Howard then thought it might be intermittent afibrillation. This would explain why he did not pass on until 25 minutes after contact.

Greg Stewart wondered about the number of people injured or killed by electric shock in industrial settings and/or while on the job. Ken Langford noted approximately 60 injuries per year are attributed to consumer electronics. Carl Swanson noted utilities are not apt to release injury and fatality data for electric shocks due to negative publicity. According to the Electrical Safety Foundation International (ESFI), from 1992 to 2009, inclusive, the number one cause of electrical fatalities in each year was contact with overhead power lines. There are multiple sources of data from government entities (e.g. OSHA) and by specific industries. An example of industry-specific data is incidents where fatalities and injuries occur when cranes contact power lines. See the Lightning Links section below for more information.

6. Carl Swanson expressed concern about the lack of new members in the LDC. Karen Wells suggested LDC reach present itself to various societies. She also suggested presentations in more public forums, such as Café Scientifique. Other ideas included announcing our meetings in internal St. Anthony bulletins and a meeting to devise and implement action items. Ken Langford suggested asking St. Anthony physicians if they have treated any patients struck by lightning, and if they have, what the experience was like. I do favor Ken's idea, as it could bring some physicians into the meeting to exchange what they learned and hopefully, lead to ideas for better medical treatment, both of which are components of the LDC's Mission Statement. Following the meeting, Clark presented this to administrative personnel at St. Anthony for consideration.
7. Carl also advised the Lightning Strike & Electric Shock Survivors International group is holding its annual world conference on May 26-28, 2014 at Pigeon Forge, TN.

8. Greg Stewart gave a quick recap of several lightning fatalities/injuries during September. On the 20th, a 30-year-old biologist with the Arizona Game and Fish Department was struck and killed in a canoe on Big Lake. On the 19th, a worker was struck and killed on a metal-framed billboard. Greg noted this was an elevated exposure and stressed the importance for companies with workers in the field to have heightened awareness of the lightning hazard. On the 11th, lightning entered a house through a window and injured the occupant. The occupant noted: "It hit me and knocked me against the wall". This highlights lightning's ability to penetrate structures. The National Weather Service advises to stay away from windows when lightning is present (see link below). On the 2nd, a father and son were killed under an abandoned shelter. Their bodies were discovered under a small tin structure. A "shelter" of this kind may keep rain off, but is wholly inadequate for lightning protection.
9. The Denver Post has produced a three-part series titled: "Chasing the Beast", which details the record-setting tornado near El Reno, Oklahoma, which took the lives of Tim and Paul Samaras and Carl Young. This series is online at: <http://extras.denverpost.com/stormchaser/>
10. Next meeting: Friday, November 8, 2013 at 11:45 AM at St. Anthony Hospital West. Conference Room TBA.

Respectfully Submitted,

Steven E. Clark, Consulting Meteorologist

In Case You Missed It...Lightning Links

This is a monthly listing of news, articles, websites, and videos about lightning and allied areas as reported in the media. A headline or description is listed, followed by the link. Please note that some of the links are perishable, which means you'll need to go to the source for the information. Enjoy!

"Red Sprites Snapped Dancing Above a Nebraska Storm"

<http://www.newscientist.com/article/dn24111-red-sprites-snapped-dancing-above-a-nebraska-storm.html#.Uh50qr3nZdh>

From our colleagues at the Yahoo Lightning Protection Group

"2 Rescue Horses Struck, Killed by Lightning"

<http://www.9news.com/news/article/354159/222/2-rescue-horses-struck--killed-by-lightning->

"Autopsy: QB Died from Pneumonia, Had Brain Disease"

<http://denver.cbslocal.com/2013/08/08/autopsy-qb-died-from-pneumonia-had-brain-disease/>

"Durango Lightning-Strike Map Finds Fires"

<http://denver.cbslocal.com/2013/08/11/durango-lightning-strike-map-finds-fires/>

From our colleagues at the Yahoo Lightning Protection Group:

"FAA Confirms Lightning Strike at BWI, Shutting Down Airport; 1 Injured"

<http://www.wbaltv.com/news/maryland/anne-arundel-county/weather-shuts-down-bwi-thurgood-marshall-airport/-/10137088/21905528/-/141rcs1/-/index.html>

From Michael Foley: "Device Gives Scientists Front-Row Seat to Lightning Strikes"

<http://www.claimsjournal.com/news/southeast/2013/09/11/236587.htm#.UjDHex7YCKA.email>

Source Study: "Characterization and application of VLF/LF source locations from lightning using the Huntsville Alabama Marx Meter Array," Phillip M. Bitzer, Hugh J. Christian, Mike Stewart, Jeff Burchfield, Scott Podgorny, David Corredor, John Hall, Evgeny Kuznetsov, Veronica Franklin; *Journal of Geophysical Research: Atmospheres*, Vol. 118, Issue 8; April 2013. Here's the article abstract:

<http://onlinelibrary.wiley.com/doi/10.1002/jgrd.50271/abstract>

“Motorcyclist Hit by Lightning in Stormy End-of-Week Weather”

http://seattletimes.com/html/localnews/2021764645_rainyweatherxml.html

“Motorcyclist ‘Doing Well’ After He’s Struck by Lightning in Chehalis”

<http://blogs.seattletimes.com/today/2013/09/motorcyclist-doing-well-after-struck-by-lightning-in-chehalis/>

<http://blogs.seattletimes.com/today/topic/accident/> (Scroll down to the bottom of the webpage. There are photos of the outside and inside of the helmet following the strike.)

“Lightning-Struck Motorcyclist Released from Hospital”

<http://blogs.seattletimes.com/today/2013/09/motorcyclist-struck-by-lightning-expected-to-be-discharged-from-hospital-today/>

Electrical Safety Foundation International homepage

<http://www.esfi.org/>

Crane Accidents – Injuries and Fatalities by Electrocution

<http://www.craneaccidents.com/tag/electrocuted/page/2/>

“National Weather Service Lightning Safety: Safe Shelters and Indoor Safety”

<http://www.lightningsafety.noaa.gov/indoors.htm>