

**With Steve LaNore, CBM
December 22, 2016**

2016: Billion-Dollar Disasters Everywhere

The year 2016 was one with a multitude of billion-dollar natural disasters, especially epic fires and tremendous floods. We'll walk through some of the most expensive ones in 2016; hopefully it's not too depressing during this Holiday season!

February 23-24: Biggest Tornado Outbreak of the Year

While overall it was a rather quiet year for twisters, February was the exception with over 100 tornadoes logged during the month. A major outbreak on Feb 23-24 would be the largest of the entire year, affecting eight states and racking up damage of \$1-2 billion.

Here are some statistics from the event:

- Two EF3 tornadoes, one in Pensacola, Florida and one in Virginia
- Pensacola's largest tornado since 1971, an entire apartment complex leveled
- Six EF2 tornadoes, winds 111 to 135 mph, four of these in Louisiana
- Over 50 tornadoes total during the outbreak, 4th highest number on record for a winter outbreak
- Virginia's first February tornado death on record
- Seven killed, about 100 injured across eight states

The El Nino feeding this event dissipated as we moved into mid-spring and while there were a few smaller outbreaks in April and May, the 2016 tornado count is the lowest in the modern record at just under 900

(through Dec 22). An average year sees about 1300. Only 17 people died in tornadoes this year, the lowest in 30 years. It's a good thing!



*This massive EF3 tornado struck Appomattox, Virginia in February mauling about 100 structures, many beyond repair
Image: Jason Smith*

March 8-12: 1000-Year Flood Strikes LA, TX

Early spring brought billion-dollar flooding to Louisiana and east Texas, the skies opened up over much of northern Louisiana on March 8, beginning four days of a serious deluge; Monroe racked up over 26 inches of rain during the period. Bossier City, a Shreveport suburb, was waterlogged by some 20 inches of rain that led to disastrous flooding:



The Tall Timbers subdivision near Haughton, Louisiana (a Shreveport suburb) experienced catastrophic flooding March 9.

The floods worked their way southward, waterlogging river communities in east Texas as the flood wave made its way toward the Gulf of Mexico. Record levels were reached along the Sabine River. Schools were underwater and they had lots of company with at least 5,500 structures flooded, damage estimated at 1 ½ to 2 billion for the two-state event.

March-April: Hail-Pocalypse I, II, and III

One was enough, but two sequels in less than a month bordered on the ridiculous. Texas is no stranger to hailstorms, but an unprecedented three mega-hailstorms pummeled the Lone Star State between March 17 and April 12, and these together with a November 4 Hail storm in El Paso racked up \$4 billion in collective property losses according to Aon Benefeld. The first one hit on March 17, a rare morning hailstorm that dumped out \$600 million worth of damage in Fort Worth and Arlington - 50,000 cars were damaged!

Just three weeks later, softball hail and 70-mph winds brought memorable images of a truly biblical hailstorm to the Dallas suburb of Wylie:



This windshield in Wylie, Texas one of thousands battered by monster hail on April 11, 2016 / CBS News



The hail bashed its way into this Wylie home / CBS-11

The next day, April 12, the storm cross-hairs moved southward to San Antonio, a 30-mile long hail corridor banged its way across the city and left property losses of \$1.4 billion, number 2 for Texas' most expensive hailstorm ever. What a mess! The El Paso event damaged 40,000 vehicles – no slouch for adjusters, either.



Baseball-size hail literally shredded the siding on this San Antonio home / KSAT-TV

April 18: Houston - Second Big Flood in Less than a Year

And, there were more floods, this time in Houston; just six days after the S.A. hailstorm, another 100-year flood struck the Energy Capital of the United States, the second one in less than a year. Two thousand homes were flooded along with hundreds of businesses as well.



Look at the submerged cars in this Houston apartment complex parking lot...devastating flooding on April 18, 2016.

May 9: Picturesque Tornado

April, May and June turned out to be rather quiet tornado months; there were of course several outbreaks but the numbers were small. Perhaps the most photogenic tornado of the year happened over central Oklahoma on May 9. This storm did kill one person, but property damage was quite low for an EF4, it remained over rural areas:



The Wynnewood, Oklahoma EF4 tornado of May 9, 2016 / Getty Images

June 22: Catastrophic Flooding Kills 23 in West Virginia

Floods roared back with a vengeance as we moved into the summer of 2016, the skies opened up and dumped as much as 10" of rain in just eight hours on the rugged terrain of West Virginia, leading to hundreds of washed out roads, over a thousand structures damaged or destroyed, and 23 people dead.

The incredible deluges forced the governor to declare 44 of the states' 55 counties as disaster areas. The National Weather Service described the intensity and widespread nature of the disaster as a "Thousand Year Flood"- West Virginia's mountainous terrain amplified flood conditions that would have been less severe over flatter landscapes, compounding the scope of the destruction.



Aerial view of Clendenin, W.V. during the flood / Spencer Daily

June 23: California Blaze torches hundreds of homes

The day after the West Virginia floods, a wildfire erupted northeast of Bakersfield, California in a place called Lake Isabella. The fire went wild, torching 250 structures in its path, 150 of them homes, and killed two elderly people who were trying to escape. Seventy five more buildings were damaged. Known as the “Erskine Fire” it grew to 30,000 acres in a mere 24 hours. Kern County Fire Chief Brian Marshall said, “The mountain terrain, five years of drought and wind gusts of over 20 mph all drove the fire over 11 miles in 13 hours. Our firefighters have been engaged in a firefight of epic proportions, trying to save every structure possible.” In fact, the wind topped 40 mph at times...making the fire almost impossible to get in front of.



This wildfire raced across the countryside after beginning near Lake Isabella, California. Photograph: Ryan Babroff/AP

August 12-13: Extreme Louisiana Flood

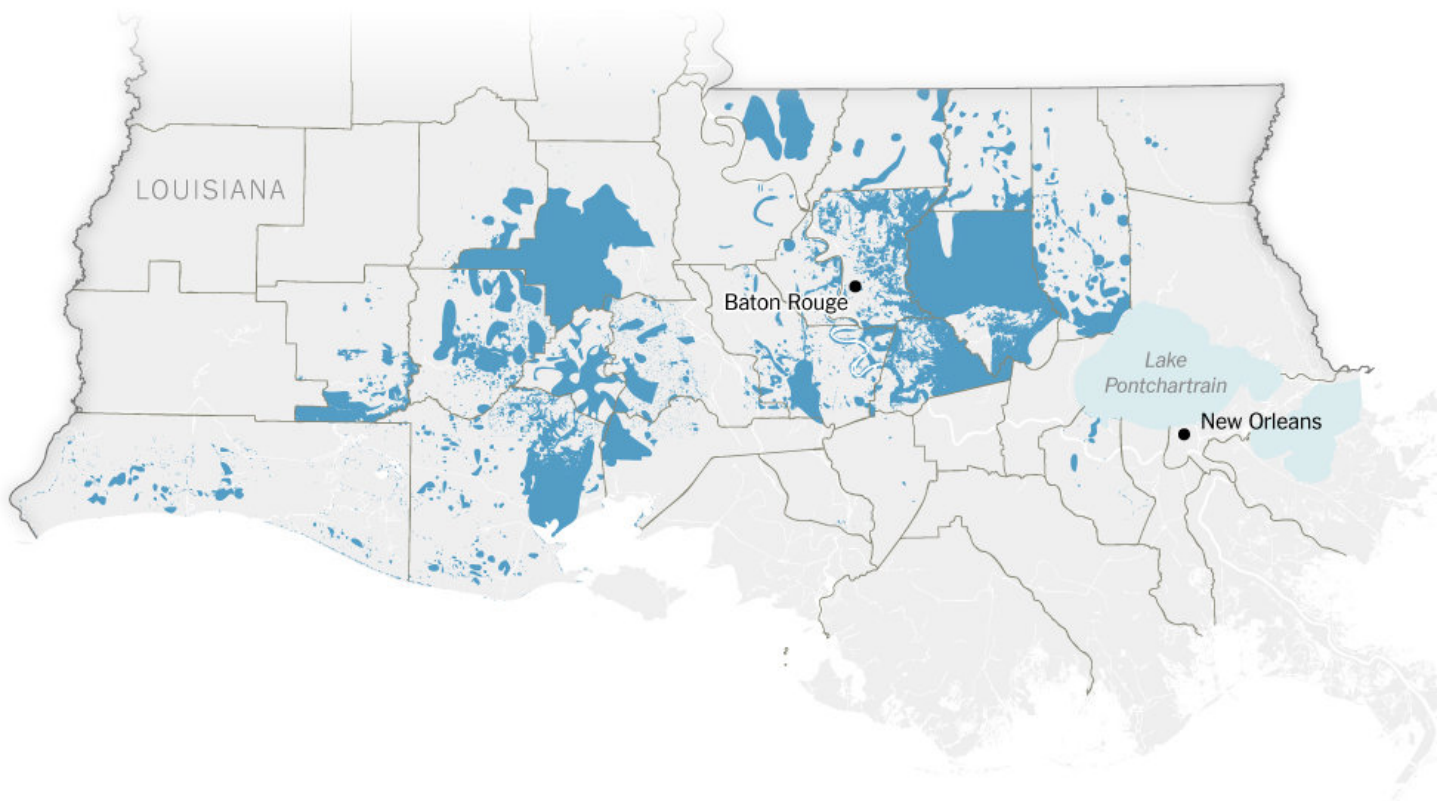
The third devastating flood of 2016 was the second of the year for waterlogged Louisiana. The National Weather Service called it a 500-year flood, and it gets top spot as the most destructive United States natural disaster of the year. We're talking over 30,000 vehicles flooded, and at least 60,000 homes and businesses. Sadly, the percentage of residents insured against flooding was as low as 12 percent in Baton Rouge and only about 1 in 4 had flood insurance in Livingston Parish, the hardest-hit zone. Property losses tallied about \$9 billion according to Louisiana Emergency Management. Eight died; insured losses were about \$5 billion.



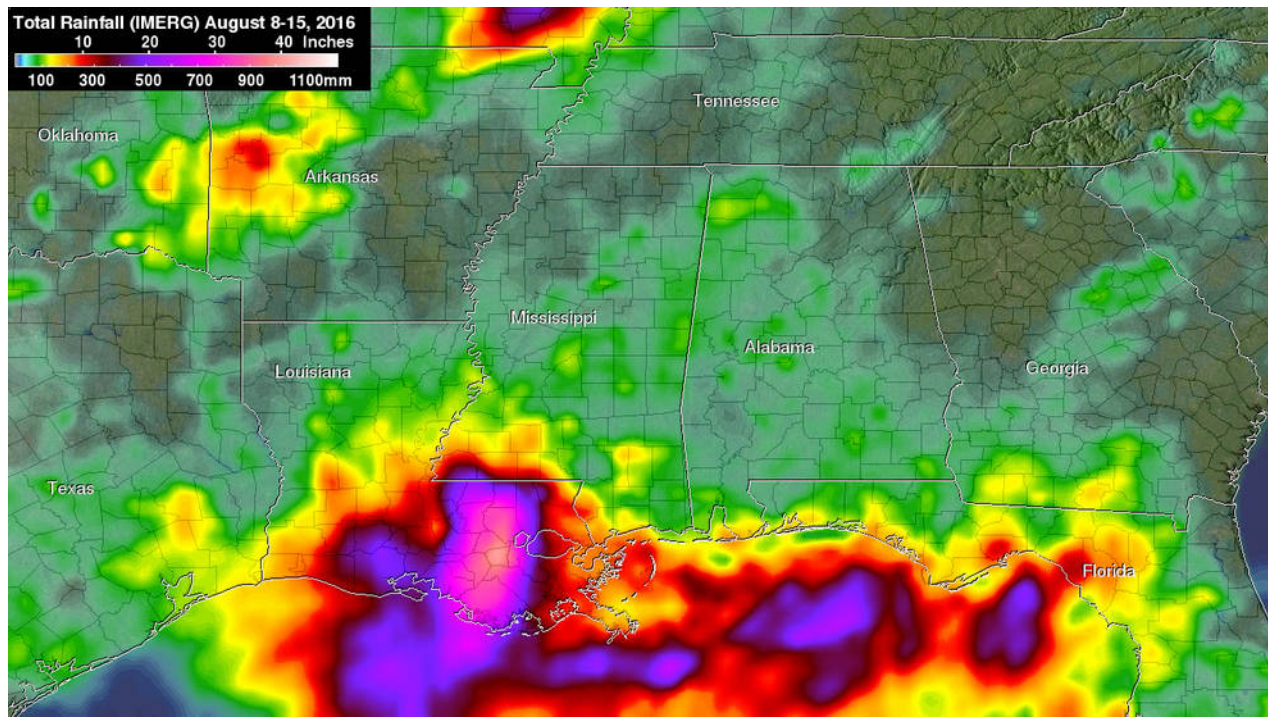
Denham Springs High School and adjacent homes with water up to 5 feet deep / Bill Feig / The Advocate



This split-screen view shows the difference 24 hours made on one Baton Rouge street as floodwaters rose / CNN



This map shows how extensive the flooding was, covering more than 5,000 square miles (blue shading) / FEMA



A huge area was swamped with 12-25" of rain (note color scale upper left) / Data for period Aug 8-15, 2016 / NOAA

August 13-14: Arsonist Destroys Large Portions of California Town

California endured its second large fire in just six weeks when the Clayton fire flared up August 13 in the community of Lower Lake (90 miles north of San Francisco). It spread very rapidly on the 14th, driven by high winds and temperatures to 100 degrees. This was an arson fire, and the person that allegedly set it has been arrested.

Residents reported that in some cases they had a mere 10 minutes warning to evacuate, leaving them time to take little more than a suitcase, their pets and their wallet. This fire encroached on the downtown area, incinerating the post office, a winery, and a Habitat for Humanity office, some 40 other businesses and 190 residences. The fire was brought under control a few days later.



Lower Lake, California in flames at the hands of the arsonist-ignited Clayton Fire / August 14

August 16: 80-Foot Wall of Flame in Southern California

And then we have the Blue Cut Fire, which seemed determined to outdo every other fire in California in terms of intensity and speed. No one is sure what started it, but a blaze ignited in the Cajon Pass east of Los Angeles on August 16 and “exploded” to nearly 30,000 acres in just 36 hours. An 80-foot high wall of flame had seasoned firefighters scratching their heads at the speed and ferocity of this inferno.



This neighborhood along Highway 138 is being over-run by the Blue Cut Fire August 17 / Will Lester



A fearsome “firenado” spinning within the Blue Cut Fire on August 17 / David McNew / Getty Images

September 2-3: “Hermine” a Pussycat, Relatively Speaking

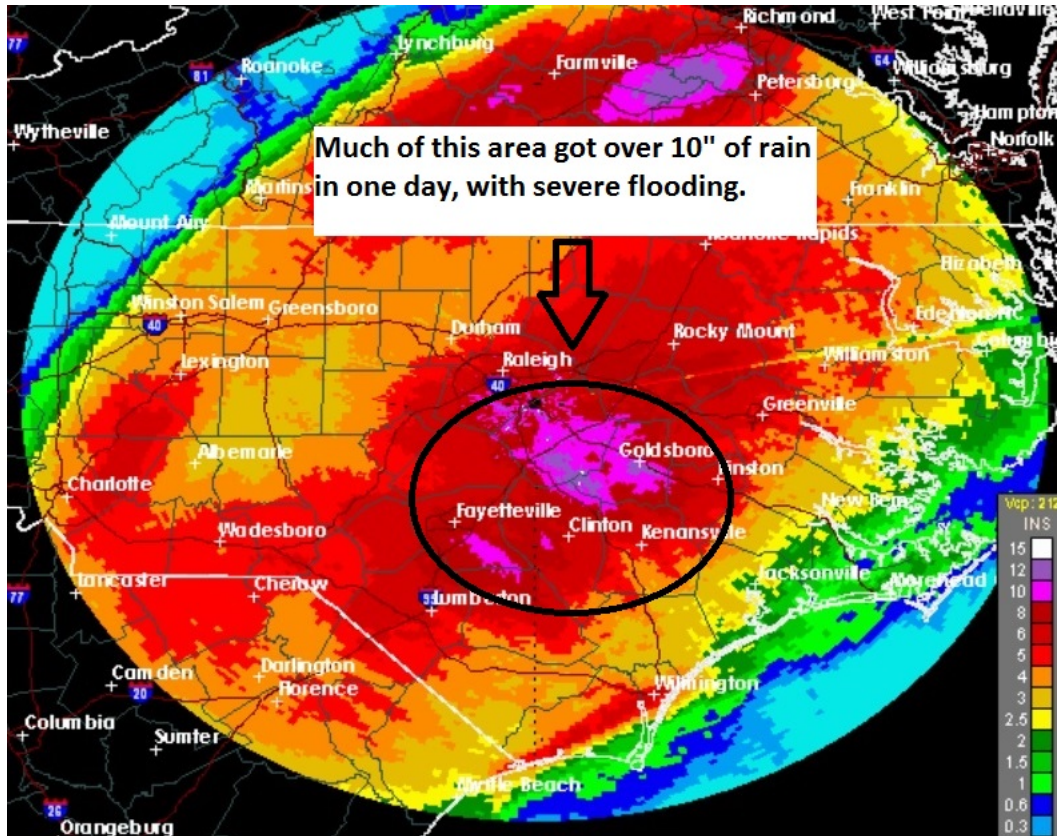
Florida’s first hurricane since 2005 brought some damage and flooding from Florida to North Carolina, but it was a low-end deal as hurricanes go, as top winds only reached 80 mph. Risk management firm Karen Clark & Co. (KCC) said at \$500 million, this was a very low-end insurance tally for a hurricane and typical for a Cat 1.



Manteo, North Carolina, on Saturday, Sep 3 as weakening Hermine passed the Outer Banks / Tom Copeland / AP

October 9-24: Matthew Devastates Eastern N.C.

A stalled cold front and copious moisture streaming in from Hurricane “Matthew” brought the most severe flooding on record to eastern North Carolina. Some waterways rose to levels that broke records dating back 150 years. This flood was similar in scope to the August Louisiana floods, but since areas affected were less densely populated, the total losses were much lower: about \$1.5 billion. Tragically, 26 people perished, many of them in vehicles. The flooding lasted for almost two weeks in some places as rivers receded slowly.



November 28: Gatlinburg: Tennessee's Worst Fire Disaster in 100 Years

A multi-year drought and incredibly strong winds on the 28th caused what was initially a small wildfire to spread at an epic rate, literally exploding, to more than 15,000 acres by early on the 29th. Tennessee governor Bill Haslam said it's the worst wildfire in the Volunteer State in more than 100 years, and the most expensive ever in the state.

The location of the fire and fierce winds to 87 mph pushing it forward set the stage for a terrifying firestorm that killed 14 people. The wind-driven fire front was bad enough, but the hurricane-force winds also downed power lines and transformers, sparking even more fires, and completely overwhelming local fire-fighting resources. Some 2,100 structures were reduced to ashes. Sevier County Mayor Larry Waters said the damage estimate was about \$500 million, but to this author that figure seems low.

Below is the highly unusual bulletin issued by the Weather Service as the fire raced toward the resort town:

URGENT - IMMEDIATE BROADCAST REQUESTED
EVACUATION IMMEDIATE
SEVIER COUNTY EMERGENCY MANAGEMENT AGENCY
RELAYED BY NATIONAL WEATHER SERVICE MORRISTOWN TN
903 PM EST MON NOV 28 2016

THE FOLLOWING MESSAGE IS TRANSMITTED AT THE REQUEST OF THE SEVIER
COUNTY EMERGENCY MANAGEMENT AGENCY.

THE CITY OF GATLINBURG AND NEARBY COMMUNITIES ARE BEING EVACUATED
DUE TO WILDFIRES. NOBODY IS ALLOWED INTO THE CITY AT THIS TIME. IF
YOU ARE CURRENTLY IN GATLINBURG AND ARE ABLE TO EVACUATE...EVACUATE
IMMEDIATELY AND FOLLOW ANY INSTRUCTIONS FROM EMERGENCY OFFICIALS.
IF YOU ARE NOT INSTRUCTED TO EVACUATE...PLEASE STAY OFF THE ROADS.



This 3-story apartment complex in Gatlinburg burned to the ground / CBS News

Disaster Summary

Off-the-scale floods and huge fires were the disaster headlines of 2016; the two hurricanes that hit the U.S. did only moderate wind damage, it was the flooding from Matthew that was so horrific. And of course the fires in California and Tennessee that collectively destroyed more than 3,000 buildings. Just awful.

>>> The Louisiana floods of August were the most expensive disaster of the year at \$9 billion.

>>> Texas's four hailstorms came in second at \$4 billion.

Closing Thoughts: 2017 Outlook

Two brutal cold waves descended on places like Minneapolis and Chicago during early to mid-December; the Chicago Bears played their 5th coldest home football game ever against Green Bay (and got beat). It was a brutal 10 degrees during the game! There's also been plenty of lake-effect snow in places like Buffalo, which was expected.

- The rest of the winter will be one of variability, but expect more cold and big snows across the northern U.S. Especially mid-January to early February as we're in an oscillating pattern with a cycle of about three weeks. Another arctic surge or two is likely into the southern U.S., but overall temperatures for the entire winter will likely be above average there, with precipitation below average. This is very bad news for the parched mid-south where more fires are likely. Drought will also increase in Texas and Oklahoma.
- California will remain warm and dry so we can only forecast another severe fire season in 2017.
- Tornadoes will be much more numerous; research shows a definite connection between La Nina springs and more tornadoes, so we could see 200 or 300 more in 2017 than we saw in the record low year of 2016, given a lingering La Nina or neutral conditions expected.
- Hurricane season is projected to be near to slightly below average as the forecast is for another EL Nino to develop, not nearly as strong as last winter's, though. Of course, that's a long way off and adjustments to the outlook will no doubt come.

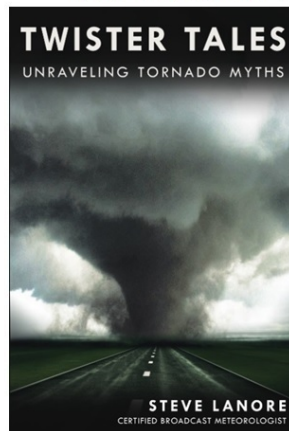
Here's wishing you a safe and prosperous beginning to the New Year!

Take Care,

Steve LaNore, CBM

Author of "Twister Tales" and "Weather Wits and Science Snickers" on Amazon

**Great gifts any time of year
For weather and science buffs!**



For adults



For the kids

Available on Amazon.com