

Here's what scientists have to say about blizzards and climate change

Gayathri Vaidyanathan, Environment & Energy Publishing, 1-25-16

As the East Coast digs itself out of a record snowstorm that buried much of the region over the weekend, scientists say the severity of classic winter storms may have worsened due to climate change.

Winter Storm Jonas claimed at least 28 lives, according to the Associated Press. The National Weather Service says it delivered between 2 and 3 feet of snow to the District of Columbia, Maryland, New Jersey, New York, Pennsylvania, Virginia and West Virginia.

Experts not only said the blizzard doesn't disprove climate change, as some skeptics gleefully claimed on Twitter, but also that rising temperatures may actually make bad blizzards worse and more frequent.

"The storm is basically a winter storm. Not unexpected," said Kevin Trenberth, a climate scientist with the National Center for Atmospheric Research (NCAR), said in an email. "What the climate change aspect does is to make it more intense and with much greater snowfalls."

Scientists noted that it would take many months to unravel the contribution of climate change to the severity of the past weekend's snowstorm, in which Baltimore, New York City, Philadelphia and Washington, D.C., saw their snowiest days on record.

The snowstorm, which dumped an estimated 17.8 inches of snow at Virginia's Ronald Reagan Washington National Airport, tied with the 2010 blizzard (popularly dubbed "Snowmageddon") as the fourth-biggest on record. Snowfall totals were higher at Washington Dulles International Airport in Virginia, at 29.3 inches, and at Baltimore-Washington International Airport, at 29.2 inches. Several media outlets claimed that snow totals at Reagan might have been underestimated.

Some 26.8 inches of snow fell in Central Park in New York City, making the snowstorm the second-largest since record keeping began in 1869, according to the National Weather Service.

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Higher moisture levels a factor

Jay Lawrimore, director of the National Oceanic and Atmospheric Administration's National Centers for Environmental Information, noted that the East Coast is no stranger to winter storms.

But while very snowy winters seem to have decreased, extreme snowstorms globally are occurring with greater frequency with climate change, he said.

Within living memory, there was the Storm of the Century in 1993; Snowmageddon in 2010; Snowtober in 2011; the West Spanish Pyrenees Winter in southern Europe in 2013; and the Deadly Himalayan Snowstorm in 2014.

The trend seems pronounced in the U.S. Northeast, Midwest and Northern Plains, Lawrimore said.

"Approximately twice as many extreme U.S. snowstorms occurred in the latter half of the 20th century than the first," Lawrimore said.

Winter Storm Jonas began in the Pacific Ocean, went through Northern California and continued east, said Trenberth of NCAR.

Climate change could worsen storms of this sort by contributing to unusually high ocean temperatures, Trenberth theorized. The Atlantic Ocean is 3 degrees Fahrenheit warmer than the 20th-century average, which means the air above it has about 15 percent more moisture than usual, he said.

This may have led to exceptionally high amounts of moisture flowing into the storm, intensifying it.

The Arctic amplification controversy

High temperatures in the Atlantic Ocean were a contributing factor to Snowmageddon in 2010, Lawrimore of NOAA said.

The high ocean temperatures are partly due to climate change and partly due to the ongoing El Niño in the Pacific Ocean. Global ocean temperatures have increased by 0.18 degree Fahrenheit per decade since 1950.

Some scientists have suggested that declining sea ice in the Arctic Ocean could be worsening winters in the eastern United States. The controversial theory, called Arctic amplification, suggests that high-pressure blocking patterns over the North Atlantic could result in cold outbreaks and slow-moving systems that exacerbate storms.

El Niños may also influence severe snowstorms on the East Coast, Lawrimore said. When scientists analyzed the top 100 snowstorms east of the Rocky Mountains, they found that severe snowstorms were twice as likely to occur in years with a moderate to strong El Niño, he said.

"It is to be determined the role that factors such as ocean surface temperatures, the influence of El Niño, conditions in the Arctic and other factors have had on the severity of this week's snowstorm," he said.