

Climate change brings more Sahel storms

Climate change is upsetting rainfall patterns and the frequency of flooding in West Africa as it makes the region's Sahel storms three times likelier.



Driving into the storm in Tapoa Province, Burkina Faso in 2008. Meteorologists have detected more intense storms in the region in recent years which they believe are resulting from global warming. Image: Eric Haglund, CC BY-NC-ND 2.0

Climate change has already made a difference to life in the West African Sahel, the arid belt of land stretching from the Atlantic to the Red Sea which separates the Sahara desert from the African savanna. It has [made catastrophic storms](#) three times more frequent.

And, according to a new [study in the journal Nature](#), Sahel storms are among the most powerful on the planet. In 2009, one vast downpour deposited 263mm of rain over Ouagadougou, the capital of Burkina Faso, claiming eight lives, flooding half the city and forcing 150,000 people out of their homes.



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Researchers believe [the pattern of thunderstorms known as mesoscale convective systems](#) will increase in frequency as global temperatures rise, as a consequence of increasing levels of carbon dioxide in the atmosphere, in turn driven by worldwide use of fossil fuels as sources of energy.

Mesoscale convective systems are big, bad and very cold columns of thunderous cloud: up to 16km high, covering an area of 25,000 square kilometres, and with temperatures at the highest altitude as low as minus 40°C.

Global warming is expected to produce more intense storms, but we were shocked to see the speed of changes taking place in this region of Africa.

Christopher Taylor, meteorologist, UK's Centre for Ecology and Hydrology

Between 1986 and 2005, Burkina Faso registered floods at a rate of little more than one a year. In the 11 years between 2006 and 2016, it was hit by 55 flood events

Repeated warnings

Climate scientists have been warning for three decades that global warming will be accompanied by an increase in "extreme" events: in particular drought, flood, heat wave and tropical cyclone.

Global warming has already been observed in the Sahel, and the consequences have not necessarily been bad: overall, precipitation has increased, and [farmers have benefited](#), although in a dryland region south of the Sahara where people have endured a 2,000-year history of periodic drought, [famine remains a constant hazard](#).



And now, so do massive downpours of rain: the Sahel storms. British and French scientists examined 35 years of satellite data and the rain gauges in the region to identify a rise in extreme daily rainfall totals. They found 85 per cent of extreme rainfall cases coincided with satellite records of a passing mesoscale convection system.

They also examined the pattern of temperatures over the region and found that although the annual average temperatures have risen, the so-called "wet season" temperatures have remained steady. That is, locally warmer conditions alone have not brought more rainfall.

Instead, they blame man-made global warming which has changed wind and rain conditions, and this will go on strengthening during this century, "suggesting the Sahel will experience particularly marked increases in extreme rain," they conclude.

"Global warming is expected to produce more intense storms, but we were shocked to see the speed of changes taking place in this region of Africa," said [Christopher Taylor, a meteorologist](#) at the UK's Centre for Ecology and Hydrology, who led the study.

His [co-author Douglas Parker](#), professor of meteorology at the University of Leeds in the UK, said: "African storms are highly organised meteorological engines, whose currents extract water from the air to produce torrential rain.

"We have seen these engines becoming more efficient over recent decades, with resulting increases in the frequency of hazardous events."

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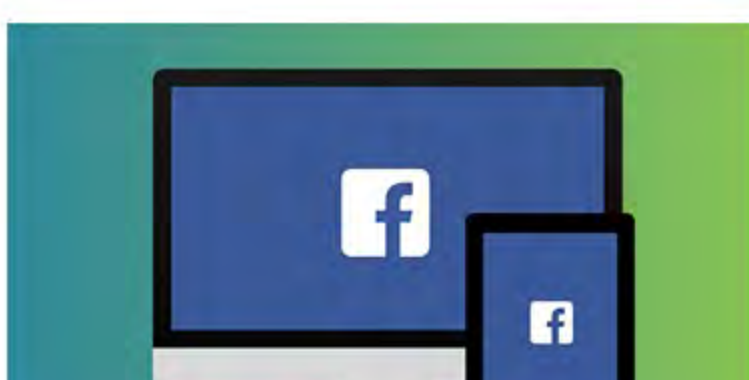
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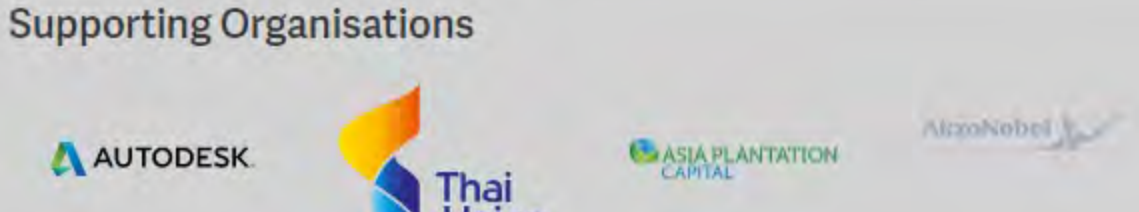
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