Weather news

2015: The warmest year on record

Provisional full-year figures for global average temperatures reveal that 2015 was the warmest year in a record dating back to 1850. Scientists at the Met Office Hadley Centre and the University of East Anglia's Climatic Research Unit produce the HadCRUT4 dataset, which is used to estimate global temperature. The global temperature series shows that 2015 was 0.75±0.1°C above the long-term (1961–1990) average, a record since at least 1850. When compared with the pre-industrial period, the 2015 average global temperature was around 1°C above the long-term average from 1850 to 1900.

The estimated figure of 0.75 ±0.1 degC above the long-term (1961–1990) average is within the predicted range from the Met Office annual global temperature forecast. The forecast was for the average global temperature in 2015 to be between 0.52 degC and 0.76 degC above the long-term (1961–1990) average, with a central estimate of 0.64 degC. The forecast made in 2014 had correctly predicted that 2015 was very likely to be one of the warmest years in the record.

Hurricane Patricia – a record breaker?

Hurricane Patricia formed over the eastern Atlantic in October 2015. In February 2016 NOAA's National Hurricane Centre released a 32-page report covering Patricia's timeline from 20 to 24 October 2015. They summarise their report as follows. Patricia was a category 5 hurricane (on the Saffir–Simpson Hurricane Wind Scale). Its maximum sustained winds are estimated to have reached a peak intensity of 185kt (215mph) near 1200 UTC on 23 October while centred about 130 nautical miles south-west of Manzanillo, Mexico. This makes Patricia the strongest hurricane on record in the eastern North Pacific, surpassing Hurricane Linda in 1997, and is also stronger than any Atlantic basin hurricane on record. It is important to note, however, that records for the most intense eastern North Pacific hurricanes are particularly uncertain prior to 1988. Records for the most extreme Atlantic hurricanes are considered reliable beginning in the early 1970s.

Another remarkable aspect was the minimum central pressure of 872hPa which was the lowest tropical cyclone pressure on record in the Western Hemisphere and the second lowest globally (behind only the 870hPa pressure for 1979's typhoon Tip). Over the 24-hour period ending at 0600 UTC on 23 October, the pressure is estimated to have fallen 100hPa and the wind to have increased from 75kt to 180kt. The 1-day intensification of 105kt exceeds a 95-kt increase for hurricane Wilma in 2005 while over the western Caribbean Sea.

Patricia weakened substantially before making landfall along a sparsely populated part of the coast of south-western Mexico as a category 4 hurricane, with an estimated landfall intensity of 130kt (150mph) and an estimated landfall pressure of 932hPa. This makes Patricia the strongest hurricane on record to make landfall in Mexico, eclipsing the October 1959 Manzanillo hurricane (recently reassessed to have made landfall at category 4 intensity), and hurricane Madeline in 1976. It should be noted, however, that the reliable record for extreme landfalling Mexican hurricanes extends back only to 1988.

India's 2015 climate significantly warmer than normal

The climate of India was significantly warmer than normal during 2015, in line with the warmer than normal global climate observed during the period. According to the India Meteorological Department, the annual mean land-surface air temperature averaged over the country during 2015 was +0.67 degC above the 1961–1990 average, thus making the year 2015 as the third warmest year on record since nation-wide records commenced in 1901. The warmest ever annual mean temperature was recorded in 2009 (+0.77 degC) followed by 2010 (+0.75 degC).

The warmer than normal climate over India can also be attributed to the below-average rainfall level observed over the country as a whole, which was 91% of the Long Period (1951–2000) Average (LPA). The annual rainfall deficiency was mainly due to the significantly below-average (86% of LPA) rainfall during the principal rainy season (the southwest monsoon season in June–September).

Will climate change delay transatlantic flights?

A new study led by Dr Paul Williams at the University of Reading has shown that aircraft flying between Europe and North America will be spending more time in the air due to the effects of climate change. By accelerating the jet-stream, climate change will speed up eastbound flights but slow down westbound flights, so the net result is that roundtrip journeys will significantly lengthen. Their findings may have implications for airlines, passengers and airports with a risk of increasing ticket prices as well as worsening the environmental impacts of aviation. They calculate that transatlantic aircraft will spend an extra 2000h in the air every year, adding an extra $22 million to airline fuel costs annually as well as increasing the risk of delays. This would mean the aircraft would emit 70 million kg of CO_2 – equivalent to the annual emissions of 7100 British homes.

The study, published in *Environmental Research Letters*, looks at the effects of doubling the amount of CO_2 in the atmosphere, which will occur within the next few decades unless emissions are cut quickly. The average jet-stream winds along the flight route between London's Heathrow airport and New York's John F. Kennedy International airport are predicted to become 15% faster in winter, increasing from 77 to 89kmh^{-1} (21 to 25ms^{-1}), with similar increases in the other seasons.

As a result, London-bound flights will become twice as likely to take under 5h 20m, implying that record-breaking crossing times will occur with increasing frequency in future. On the other hand, New York-bound flights will become twice as likely to take over 7h 00m, suggesting that delayed arrivals there will become increasingly common.

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