

Press release

STRICTLY EMBARGOED UNTIL: 8 April 2013, 4pm CET (10am EST)

Fasten your seatbelts: climate change doubles turbulence risk to aircraft

The aviation industry has long been accused of contributing to climate change. Now, in a new study, scientists have found that climate change will affect aviation – by increasing air turbulence and causing flights to get bumpier.

In the first study to examine the future of aviation turbulence, Dr Paul Williams from the University of Reading, together with Dr Manoj Joshi from the University of East Anglia, analysed supercomputer simulations of the atmospheric jet stream over the North Atlantic Ocean.

The study found that, by the middle of this century, the chances of encountering significant turbulence will increase by between 40% and 170%, with the most likely outcome being a doubling of the airspace containing significant turbulence at any time. The average strength of turbulence will also increase, by between 10% and 40%.

Dr Williams said: “Most air passengers will have experienced the uncomfortable feeling of mid-flight air turbulence. Our research suggests that we’ll be seeing the ‘fasten seatbelts’ sign turned on more often in the decades ahead.

“Air turbulence does more than just interrupt the service of in-flight drinks. It injures hundreds of passengers and aircrew every year – sometimes fatally. It also causes delays and damages planes. The total cost to society is about £100 million (US\$150 million) each year.

“Any increase in turbulence would make flying more uncomfortable and increase the risk to passengers and crew. Re-routing flights to avoid stronger patches of turbulence could increase fuel consumption and emissions of atmospheric pollutants, make delays at airports more common, and ultimately push up ticket prices.”

Dr Joshi said: “Our research focused on clear-air turbulence in winter. This is especially problematic to airliners, because clear-air turbulence is invisible to pilots and satellites, and winter is when it peaks.”

Dr Williams added: “Aviation is partly responsible for changing the climate in the first place. It is ironic that the climate looks set to exact its revenge by creating a more turbulent atmosphere for flying.”

The study, ‘Intensification of winter transatlantic aviation turbulence in response to climate change’, is published 8 April (3pm GMT+1) in the journal *Nature Climate Change*.

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For more details or interview requests, contact the University of Reading press office on +44 (0)118 378 7391, +44 (0)7876 498702 or p.castle@reading.ac.uk.

Notes to editors

For recorded interviews (embargoed until 8 April, 3pm GMT+1), Dr Williams will be available in the UK until Friday 5 April. He will have some availability for interview, with ISDN facilities available, in Vienna from Monday 8 April. He will be giving a press conference in Vienna on Monday 8 April, 4pm CET, at the General Assembly of the European Geosciences Union: <http://media.egu2013.eu/press-conferences/#impacts>. The press conference will be streamed live on the internet, with journalists able to ask questions remotely via Twitter and Skype. More details from the EGU website or media@egu.eu.

Full reference: 'Intensification of winter transatlantic aviation turbulence in response to climate change', by Paul D. Williams and Manoj M. Joshi, will be published online in *Nature Climate Change* (<http://www.nature.com/natureclimatechange>) on 8 April. The paper is available in advance (under embargo) from the University of Reading press office on request.

See video of Paul Williams talking about the research: <http://youtu.be/XJ1CpekOMNE> (unlisted YouTube video until after embargo).

Dr Paul Williams is a Royal Society University Research Fellow in the National Centre for Atmospheric Science at the University of Reading. Dr Manoj Joshi is a lecturer in climate dynamics in the School of Environmental Sciences at the University of East Anglia.

The [University of Reading](#) is ranked among the top 1% of universities in the world (THE World University Rankings 2012). Its [Department of Meteorology](#) and the [Walker Institute for Climate System Research](#) are internationally renowned as leading centres for teaching and research into weather and climate.