Will flights get bumpier because of climate change?

Paul Williams (1) and Manoj Joshi (2)

(1) University of Reading, Department of Meteorology, Reading, United Kingdom (p.d.williams@reading.ac.uk), (2) University of East Anglia, School of Environmental Sciences, Norwich, United Kingdom

Atmospheric turbulence is the leading cause of aircraft incidents. Every year, turbulence injures hundreds of passengers (sometimes fatally) and costs airlines around $100m. Turbulence in clear air (as opposed to clouds) is especially difficult to avoid, because it is invisible. Clear-air turbulence is produced by atmospheric wind shears, which are expected to get stronger because of climate change. However, until recently, the response of clear-air turbulence to climate change had not been studied. We have shown using climate model simulations that clear-air turbulence changes significantly when the atmospheric CO$_2$ is doubled. For example, within the busy North Atlantic flight corridor in winter, most clear-air turbulence measures show a 10–40% increase in the average strength of turbulence. They also show a 40–170% increase in the likelihood of encountering turbulence strong enough to dislodge unsecured objects. We conclude that climate change will lead to bumpier transatlantic flights by the middle of this century.

Reference