

Main thematic area: *Economics/Science/Technology*
Cost: £/££/£££

Contrails: adding to a climate model

Modelling aviation's impact on climate

Climate models give insight into the long term behaviour of the world's weather system and produce projections of the impacts of emissions of carbon dioxide and other greenhouse gases. Very few climate models currently take aviation contrails into account.

Aircraft have several impacts on climate. As well as emitting carbon dioxide, they produce contrails and cirrus, high clouds of ice crystals. The effects of aviation induced cirrus are particularly uncertain and need further investigation.

To date, aviation effects on climate have been largely quantified using a concept called radiative forcing. However this method has limitations for quantifying detailed future impacts of aviation emissions. Furthermore, as a global mean response it does not provide a geographically specific representation of impacts and this breakdown is needed to enable a full assessment of aviation's role in climate change.

New aviation modelling and assessment tools

This study will incorporate aviation contrails and greenhouse gas emissions into one of the world's foremost climate models – that of the Hadley Centre, part of the UK Met Office. It will enable scientists to examine climate impacts of aircraft in depth, giving one of the first insights into daytime temperature range effects and regional climate responses.

Lead: University of Leeds
Duration: 24 months
Partners: Cambridge, MMU, Reading

www.omega.mmu.ac.uk



The project will also develop understanding of contrail formation and the associated climate change effects of contrails.

The study will take two years. A knowledge transfer fellow from Leeds University will be seconded to the Met Office Hadley Centre and further university collaborations will form part of the project.

The state-of-the-science model that will result represents the first evolution of a UK climate model that explicitly includes aviation effects. A policy-relevant tool ideal for potential mitigation studies, the model will provide a unique resource for academia and government and is a significant step forward in the UK's capacity to analyse the climate impacts of aviation.

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