# Tropical cloud 'dust' could hold the key to climate change

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Scientists at the University of Manchester will set off for Australia this week to undertake an in-depth study of tropical clouds and the particles sucked up into them to gain further insight into climate change and the depletion of the ozone layer.

The research will take place in Darwin, Australia as part of a major international field experiment to study transport by tropical thunderstorms and the type of high-altitude clouds they produce.

Manchester's research will focus on the analysis of tiny particles, known as aerosols, which determine cloud properties. Aerosols include materials like desert dust, sea salt and other organic materials which are drawn up into the clouds from the earth's surface. These particles control the physics of the clouds and can have a dramatic effect on the climate.

The aim of the experiment is to gain a better understanding of the kind of aerosol particles and gases which are injected by the storms into the Tropical Tropopause Layer, a poorly-understood region of the atmosphere sandwiched between the main tropical weather systems and the stratosphere above.

Data will be collected by two planes carrying high-tech monitoring equipment at different altitudes through a series of storms over a four month period. The data will then be used to create computer models of the clouds and the chemicals contained within them.

Professor Geraint Vaughan, of the University's School of Earth, Atmospheric and Environmental Sciences, who will lead the study, said: "The tropics drives global atmospheric circulation, so it is extremely important for us to understand how atmospheric processes operate there.

"Deep thunderstorms are a major feature of tropical weather, but their overall effect on the transport of material to high levels is poorly understood. This is important because it helps determine the composition of the stratosphere and the kinds of clouds which form high in the atmosphere."

He added: "If we can understand the nature and composition of these clouds, we will be able to use this information to help predict future climate change."

The research is being undertaken as part of the Natural Environment Research Council's (NERC) £1 million ACTIVE project. The research team will use the Australian Egrett aircraft and the NERC's Dornier aircraft to measure chemical and aerosol which are drawn into and expelled from tropical storms. The measurements will be interpreted using cloud-scale and large-scale modelling to distinguish the contribution of different sources to the Tropical Tropopause Layer.

ACTIVE is a NERC-funded consortium project involving the Universities of Manchester, Cambridge and, York (UK); DLR and Forschungszentrum Julich (Germany); York University (Canada), Bureau of Meteorology (Australia) and Airborne Research Australia.

Source: University of Manchester