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Cloud 'Feedback' Affects Global Climate and Warming

Changes in clouds will amplify the warming of the planet due to human activities, according to a breakthrough study by a Texas A&M University researcher.

Andrew Dessler, a Professor in the Department of Atmospheric Sciences, says that warming due to increases in greenhouse gases will cause clouds to trap more heat, which will lead to additional warming. This process is known as the "cloud feedback" and is predicted to be responsible for a significant portion of the warming over the next century.

Dessler used measurements from the Clouds and the Earth's Radiant Energy System instrument onboard NASA's Terra satellite to calculate the amount of energy trapped by clouds as the climate varied over the last decade. He also used meteorological analyses provided by NASA's Modern Era Retrospective-Analysis for Research and Applications and by the European Center for Medium-Range Weather Forecasts.

"It's a vicious cycle -- warmer temperatures mean clouds trap more heat, which in turn leads to even more warming," Dessler explains. His work is published in the Dec. 10 issue of Science magazine and is supported by a NASA research grant.

While climate models had long predicted that the cloud feedback would amplify warming from human activities,

until recently it was impossible to test the models using observations.

"This work suggests that climate models are doing a pretty decent job simulating how clouds respond to changing climates," Dessler says.

Some prominent climate skeptics have recently been arguing that clouds would act to stabilize the climate, thereby preventing greenhouse gases from causing significant warming.

"Based on my results, I think the chances that clouds will save us from dramatic climate change are pretty low," he explains. "In fact, my work shows that clouds will likely be amplifying the warming from human activities".

"I think we can be pretty confident that temperatures will rise by several degrees Celsius over the next century if we continue our present trajectory of greenhouse gas emissions."

A. E. Dessler. A Determination of the Cloud Feedback from Climate Variations over the Past Decade. Science, 10 December 2010: 1523-1527 DOI: 10.1126/science.1192546