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High clouds show effects of climate change: study

By Clare Baldwin

SAN FRANCISCO (Reuters) - Clouds at the edge of space are showing the effects of climate change, scientists said on Monday.

These so-called polar mesospheric clouds are occurring more often and appearing at lower latitudes than they used to, researchers reported at a meeting of the American Geophysical Union in San Francisco.

"It won't affect people, but we're causing the outer part of the atmosphere to change, which means we are changing the entire atmosphere, which is important to know," said James Russell III, a scientist from Hampton University in Virginia.

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The build-up of the greenhouse gases [carbon dioxide](#) and methane in the upper atmosphere may be responsible for the cloud changes, scientists said at a news conference.

Increased carbon dioxide cools the upper atmosphere and makes it easier for ice crystals to form. Methane reacts with [oxygen](#) to form water vapor.

The clouds, made of ice crystals formed around dust particles more than 50 miles above Earth's surface, form in conditions 100,000 times drier than the air in the Sahara and 100,000 times lower pressure than the surface of the planet.

This means that temperatures need to be extremely cold -- at least minus 210 degrees [Fahrenheit](#) (minus 134 Celsius) -- for the clouds to form. As increased carbon dioxide causes the temperature to drop and increased methane produces more water vapor, more clouds form.

"The clouds are an exquisite thermometer," said Scott Bailey, a scientist from Virginia Polytechnic Institute and State University.

Carbon dioxide and methane are responsible for trapping solar radiation and heating the planet when they build up in the lower atmosphere. The carbon dioxide and methane building up in the mesosphere is above where the [greenhouse effect](#) is taking place.

The polar mesospheric clouds don't contribute to climate change, but are indicators that humans are affecting even the farthest parts of the [Earth's atmosphere](#).

(Editing by Eric Beech)

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