

## NASA believes jet contrails contribute to climatic changes

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NASA RESEARCHER Patrick Minnis studied satellite photos of the airplane jetstreams, which occur only when the sky is moist, close to forming thin clouds.

What he discovered may sound far-fetched — but the evidence is clear.

For example, a distinctive oval-shaped contrail left behind by a test flight drifted across California for six hours, finally turning into a 60-mile-long cloud system.

“We were very excited because it opened our eyes up to the fact that there’s possibly a lot of clouds up in the sky that were originally contrails,” Minnis said.

In another case, a figure-8 cloud created its own 60-mile swath of clouds over Texas and Louisiana over a nine-hour period.

NASA’s Bruce Anderson actually went aloft to follow in the turbulent wake of a contrail. He came up with a theory for the role of contrails in causing atmospheric moisture to condense into clouds.

“We do know that the sulfur in the fuel from aircraft generate aerosol particles, and those in turn can influence the formation of clouds,” Anderson said.

### **Could jet-caused clouds be enough to affect climate?**

**“The number of clear days over the U.S. has decreased in the last 30 years, and we suspect that much of that is due to an increase in cirrus clouds, which we suspect is probably due to an increase in air traffic,” Minnis said.**

And if such clouds trap heat, could they even contribute to global warming?

That connection to the greenhouse effect is still murky. But there is evidence that contrail clouds can have a big impact on weather patterns. Last year, in the wake of Hurricane Nora, researchers got their most dramatic view yet: Moist air blanketed the nation’s midsection from Nebraska to Texas, and scores of contrails fused into one enormous cloud — stretching for more than 800 miles.

Part of its Atmospheric Effects of Aviation Project, NASA has placed much of the research data on the Web.

NASA contrails: <http://cloud1.arc.nasa.gov/espo/success/index.html>

(ed. Emphasis added.)