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Jet Trails May Change Global Climate

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HALF MOON BAY, California, September 12, 1997 (ENS) - Jet planes leave behind vapor condensation trails called "contrails," which often stay in the sky for many hours and spread out to become icy cirrus clouds. They are not as innocent as they appear.

Contrails are similar to the white steam we exhale in cold weather. Until recently, almost nothing was known about how clouds affect climate, but current research indicates the problem of clouds is an important one for global climate change. A recent statement released by the National Science Foundation (NSF) explains that the effect of the wispy plumes from jet exhausts is "an emerging question."

There are 62 million commercial and military flights across U.S. skies each year. "An endless queue of aircraft produce persistent contrails in their wakes, seen or unseen, night and day, coming and going from airport to airport across the planet," says Jim Scanlon, a science writer.

An NSF funded study by Steven Ackerman of the University of Milwaukee, Wisconsin finds that jet contrails indeed influence regional climate. He says, "It's been estimated that in certain heavy air traffic corridors, cloud cover has increased by as much as 20 percent."

Patrick Minnis of NASA's Langley Research Center, in the June 13 issue of Science News, says it is hard to research these vapor trails, but cloud cover is up about 5% in the U.S. since jet travel mushroomed several decades ago. Most of the new clouds may be in the form of cirrus that contrails evolve into, says Minnis.

Satellite observations miss a lot of detail, but imaging large areas every 15 minutes with the advanced Geostationary Operational Environmental Satellite has detected extremely long lived contrails.

Ackerman's research is considering whether the contrails are changing the chemistry in the upper atmosphere and how great is the effect. Jet motors expel invisible oxides of nitrogen, carbon (dioxide and monoxide), soot, and unburned hydrocarbon fuel, in addition to the water vapor which becomes the white trails we see. Jet planes pollute just as autos do, but the location of jet pollution is more serious in terms of impact on atmosphere and climate.

On the ground and while climbing, the effect of jet exhaust is similar to that of other vehicles. Once at cruising altitude, either slightly below the stratosphere or in it, the temperature is very low. The air is also very dry and relatively much cleaner than at the level on the ground where we live. The waste gases in aircraft exhaust have very complicated effects that are different from the effects of vehicle exhaust. Exactly what these effects are has not yet been accounted for in theories of climate change.

It appears that high clouds originating from contrails spread to cover tens of thousands of square kilometers. They trap heat.

Warming a part of the atmosphere that is normally much colder may break down the structure of it. This effect is more pronounced where a large number of planes fly fixed routes. Also, water from jet exhausts is being introduced in massive and ever increasing amounts at the boundary of the stratosphere.

The gases emitted from the jet aircraft flying in the stratosphere reduce the natural ozone and have other effects, according to Scanlon, and allow energetic ultraviolet radiation to penetrate lower where it warms the air and may even reach the surface of the earth.

Many climate scientists are now asking, "Can clouds from contrails contribute toward changing the local, regional, or perhaps global climate?"

Ulrich Schumann of the German Aerospace Research Organization (DRL) in Oherpfaffenhofen thinks the global effect is small. However, from the standpoint of scientific research, the effects of contrails confuse finding a distinctive pattern for other human influences on climate.

The thousands of aircraft traversing the North Atlantic Flight Corridor, fly an estimated 44% of the time in the stratosphere. Civil aircraft fly in the stratosphere from 17% to 25% of the time. This flight time will increase as the fleet grows and newer generations of sub-sonic jets, being introduced right now, will enter service and fly higher and longer. Some estimates predict the total flight time of civil aircraft in the stratosphere could double by 2020.

It will be very hard to sell the public on the idea that jet planes can cause serious climate change. There is a trillion dollar industry involved which provides millions of high paying, glamorous jobs and the magic carpets which carry us across continents in a few drowsy hours. Who wants to think that jet flying might be highly dangerous to life on earth?

{Please send any comments to Claire Gilbert at claire@blazingtattles.com}

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