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NASA SATELLITE HELPS AIRLINERS AVOID OZONE CONCENTRATIONS

Encouraging initial results were reported from the first operational test to determine the effectiveness of satellite data for helping airlines avoid heavy concentrations of ozone.

The two-month experiment, started last March, was conducted jointly by NASA, the Federal Aviation Administration (FAA), the National Center for Atmospheric Research (NCAR), and Northwest Airlines.

In the test, information from an instrument known as Total Ozone Mapping Spectrometer aboard the experimental Nimbus-7 spacecraft was transmitted, to NASA scientists at Goddard who processed the data and relayed it within three hours to Northwest Airlines meteorologists in Minnesota for use in meteorological forecast activities.

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HELPS AIRLINERS AVOID OZONE CONCENTRATIONS
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Ozone, which can be encountered by airliners at high altitudes, has caused shortness of breath as well as eye, nose and throat irritation among some airline passengers.

Early analysis of the results from the experiment show:

1. The Total Ozone Mapping Spectrometer profile of total ozone in the atmosphere accurately represents upper air patterns and can be used to locate or verify meteorological activity, such as trough lines and rapidly moving fronts. The latter are associated with clear air turbulence and improved knowledge of their location over the oceans can assist airline pilots to avoid them.

2. Route forecasting of highly concentrated ozone appears feasible because the tests showed that higher amounts of ozone in aircraft were found in areas where Total Ozone Mapping Spectrometer measured high total ozone amounts.

Additionally, five research aircraft flights were flown in jet stream regions located by the Total Ozone Mapping Spectrometer to determine winds, temperatures, and air composition at as many as 10 different flight levels.

Initial findings from these flights showed that the jet stream axis (pattern) coincides with the area of highest total ozone gradient, and low total ozone amounts are found where tropospheric air has been carried along above the tropopause on the anticyclonic side of the subtropical jet stream.

Additional research, current or planned, includes estimation of tropopause heights from total ozone data for airline use and for improvement of satellite temperature sounding data, and the quantitative inference of meteorological parameters, such as vertical motions, winds and vorticity, from total ozone maps.

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