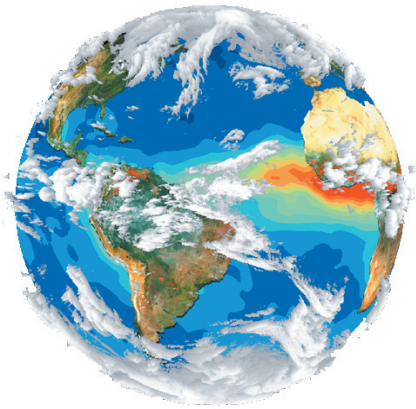
NASA Scientists Use Empty Skies to Study Climate Change

by Julia Cole, SAIC-NASA Langley Research Center

When the tragic events of September 2001 temporarily halted U.S. commercial air traffic, it created an opportunity to study the relationship between aviation and clouds. From satellite observations taken during the air traffic shutdown, NASA scientists gained insight into the atmospheric conditions that govern the formation of contrails -- clouds caused by aircraft emissions.

Jet Contrails: NOAA Image; Flagstaff, AZ

This Earth image is a compilation of data from several different remote sensing satellites.



"Because air traffic is expected to grow over the next 50 years, contrail coverage will also increase and may significantly impact the Earth's radiation budget by 2050," said Patrick Minnis, a senior research scientist at NASA's Langley Research Center in Hampton, Va.

The Earth's radiation budget -- the balance between the planet's incoming sunlight and outgoing heat energy -- drives climate change. Contrails can spread into extensive high, thin cirrus clouds that tend to warm the Earth because they reflect less sunlight back to space than the amount of heat they trap.

Tracking the formation of contrails is key to determining their contribution to cirrus clouds and their effect on the energy balance. But contrails typically form in large numbers from overlapping commercial flights, making it difficult for scientists to follow their development.

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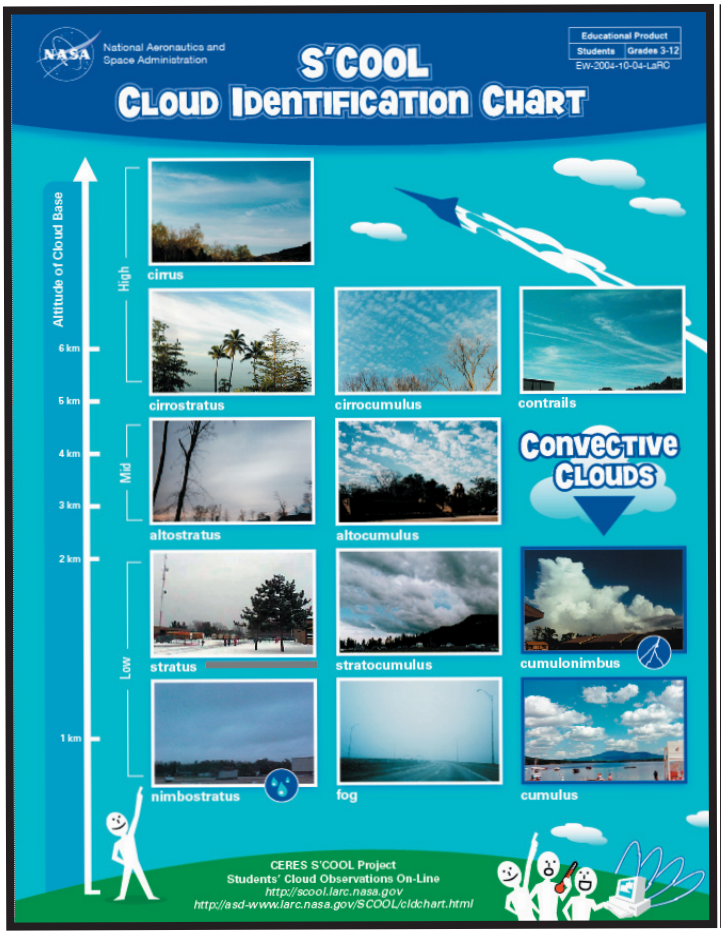

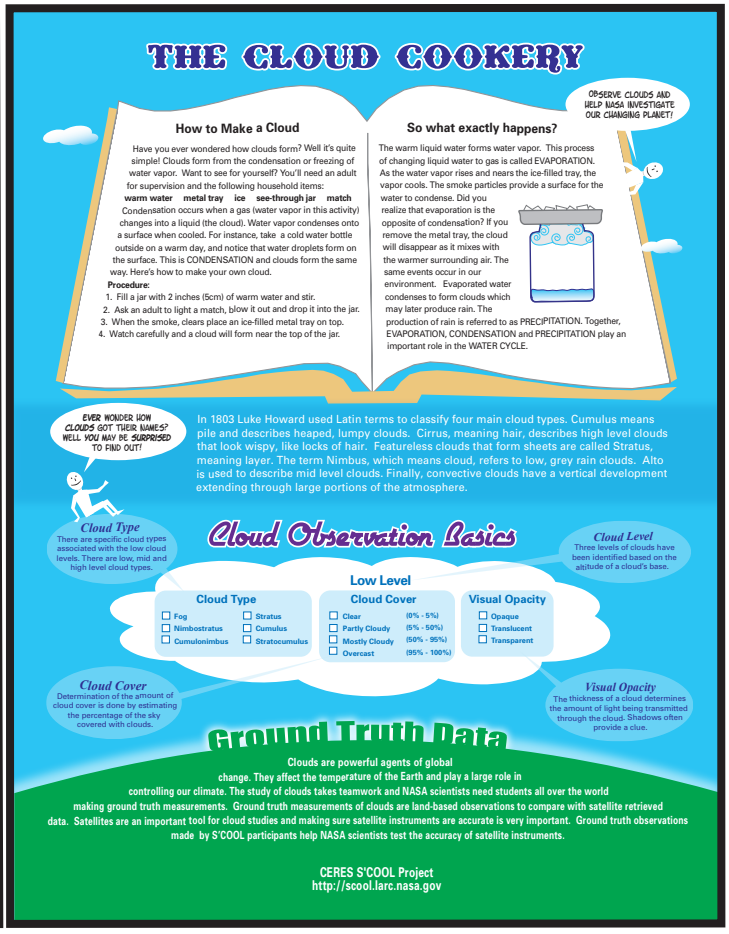

As you begin your Cloud Observations be sure to visit the S'COOL website for great downloadable resources on clouds and valuable lesson plans and activities related to weather. S'COOL Resources URL: http://asd-www.larc.nasa.gov/SCOOL/teachers.html