NASA's Aura Satellite Sheds New Light on Air Quality and Ozone Hole

December 15 2004

NASA scientists announced the agency's Aura spacecraft is providing the first daily, direct global measurements of low-level ozone and many other pollutants affecting air quality. For the first time, Aura will help scientists monitor global pollution production and transport with unprecedented spatial resolution. Aura's measurements offer new insights into how climate changes influence the recovery of the Earth's protective stratospheric ozone layer.

"Data from NASA missions like Aura are a valuable national asset," said Aura Program Scientist Phil DeCola of NASA Headquarters, Washington. "Clean air is a vital need, and air quality is not merely a local issue. Pollutants do not respect state or national boundaries. They can degrade air quality far from their sources. Aura's view from space enables us to understand the long-range transport of pollutants," he added.

"Aura's early results are nothing short of astounding; measurements like these will help us better understand how the ozone hole will react to future stratospheric cooling, which is expected as carbon dioxide levels continue to rise," said Aura Project Scientist Mark Schoeberl of NASA's Goddard Space Flight Center, Greenbelt, Md.

Aura's instruments study tropospheric chemistry and will provide daily, global monitoring of air pollution. The complexity of pollution transport makes it difficult to quantify how much industry and cars contribute to poor local air quality. Also, the presence of stratospheric ozone

sandwiched between the satellite and the troposphere makes seeing tropospheric ozone very difficult. Aura's Tropospheric Emission Spectrometer (TES) uses new technology to see through the stratospheric ozone layer, to measure tropospheric ozone.

Aura also provides new insights into the physical and chemical processes that influence the health of the stratospheric ozone layer and climate. It's producing the most complete suite of chemical measurements ever available to understand the ozone layer and its recovery.

Data will include the first measurements of chemically reactive hydrogen-containing species involved in ozone destruction. The satellite also will provide the first simultaneous measurements of key forms of chlorine and bromine, also important for ozone destruction. Aura measures the upper-tropospheric water-vapor abundance, a key component in the radiation budget, needed to understand climate change.

Launched July 15, 2004, Aura is the third and final major Earth Observing System satellite. Aura's view of the atmosphere and its chemistry will complement the global data already being collected by NASA's other Earth Observing System satellites. These projects are Terra, primarily focused on land, and Aqua, which comprehensively observes Earth's water cycle. Collectively, these satellites allow scientists to study the complexities of how land, water and our atmosphere work as a system.

Aura carries four instruments: Ozone Monitoring Instrument (OMI), Microwave Limb Sounder (MLS), High Resolution Dynamics Limb Sounder (HIRDLS) and the Tropospheric Emission Spectrometer (TES). OMI was built by the Netherlands and Finland in collaboration with NASA. HIRDLS was built by the United Kingdom and the United States.

The information was released during the American Geophysical Union Fall meeting in San Francisco.

Source: NASA