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The NASA Orbiting Carbon Observatory: Development status

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The Orbiting Carbon Observatory (OCO) is scheduled for launch in December 2008. This NASA Earth System Science Pathfinder (ESSP) mission will measure the column averaged CO_2 dry air mole fraction, X_{CO2} over the sunlit hemisphere. These data will be analyzed to infer CO_2 sources and sinks on regional scales and quantify their variability over the seasonal cycle. The observatory consists of a dedicated spacecraft bus that carries and points a single instrument. This instrument incorporates 3 high resolution grating spectrometers that make coincident measurements of reflected sunlight in near-infrared CO_2 and molecular oxygen (O_2) bands. It was designed and manufactured by Hamilton Sundstrand (Pomona, CA) and is being integrated, flight qualified, and calibrated at the NASA Jet Propulsion Laboratory (Pasadena, CA). Instrument testing will be completed in late February, 2008. The spacecraft bus is provided by Orbital Sciences Corporation (OSC, Dulles, VA). The instrument will be shipped to Dulles VA in early March for integration with the bus. Observatory integration and testing will proceed through mid summer, followed by delivery to the launch site at Vandenberg Air Force Base (CA). There, it will be integrated with a OSC Taurus XL Launch vehicle in preparation for a mid December launch. OCO will initially be launched into 635 km radius orbit. The on-board propulsion system will then raise the orbit and insert OCO into the 705 km Earth Observing System Afternoon Constellation (A-Train). The orbit raising and in-orbit checkout (IOC) activities are expected to last $\sim$45 days. The first routine X_{CO2} data are anticipated in early February 2009. Calibrated, geolocated spectral radiances will be archived in a NASA Distributed Active Archive Center (DAAC) starting 6 months after the end of IOC. An exploratory

X_{CO2} product will start be delivered to the DAAC within 9 months of the end of IOC.