

NASA Earth Science Studies of the Global Atmosphere

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Documentation of the changes of the composition and dynamics of the Earth's atmosphere with sufficient detail to provide reliable understanding of the causes of those changes, the nature of interactions between the atmosphere and the other components of the Earth system, and predictive capability for the future evolution of the atmosphere's composition and dynamics requires a sustained mix of observations using surface-, aircraft, and space-based platforms. NASA's Earth Science Division has carried out such a program for several decades, and plans to continue this into the future. Activities of NASA's atmospheric composition and dynamics research include currently operating satellite missions, those now in formulation and development, and those planned in response to the National Research Council's 2007 Decadal Survey *Earth Science and Applications from Space: National Imperatives for the Next Decade and Beyond* and the 2010 NASA plan *Responding to the Challenge of Climate and Environmental Change: NASA's Plan for a Climate-Centric Architecture for Earth Observations and Applications from Space*. The NASA program is implemented in the context of plans of other US agencies and international partners, notably the Committee on Earth Observing Satellites and the Coordination Group on Meteorological Satellites, as well as through the World Climate Research Programme and the International Geosphere-Biosphere Programme. Accomplishments of the current program, and plans for near-term and longer-term observations in this broader context will be addressed, including opportunities for sustained measurements addressing long-term earth system evolution, infusion of new capability into the global observation system, and innovative use of new airborne platforms and surface-based measurement capability.