

The NASA Decadal Survey Aerosol, Cloud, Ecosystems Mission

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In 2007, the National Academy of Sciences delivered a Decadal Survey (Earth Science and Applications from Space: National Imperatives for the Next Decade and Beyond) for NASA, NOAA, and USGS, which is a prioritization of future satellite Earth observations. The recommendations included 15 missions (13 for NASA, two for NOAA), which were prioritized into three groups or tiers. One of the second tier missions is the Aerosol, Cloud, (ocean) Ecosystems (ACE) mission, which focuses on climate forcing, cloud and aerosol properties and interactions, and ocean ecology, carbon cycle science, and fluxes. The baseline instruments recommended for ACE are a cloud radar, an aerosol/cloud lidar, an aerosol/cloud polarimeter, and an ocean radiometer. The instrumental heritage for these measurements are derived from the Cloudsat, CALIPSO, Glory, SeaWiFS and Aqua (MODIS) missions.

In 2008, NASA HQ, lead by Hal Maring and Paula Bontempi, organized an interdisciplinary science working group to help formulate the ACE mission by refining the science objectives and approaches, identifying measurement (satellite and field) and mission (e.g., orbit, data processing) requirements, technology requirements, and mission costs. Originally, the disciplines included the cloud, aerosol, and ocean biogeochemistry communities. Subsequently, an ocean-aerosol interaction science working group was formed to ensure the mission addresses the broadest range of science questions possible given the baseline measurements,

The ACE mission is a unique opportunity for ocean scientists to work closely with the aerosol and cloud communities. The science working groups are collaborating on science objectives and are defining joint field studies and modeling activities. The presentation will outline the present status of the ACE mission, the science questions each discipline has defined, the measurement requirements identified to date, the current ACE schedule, and future opportunities for broader community participation.