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.