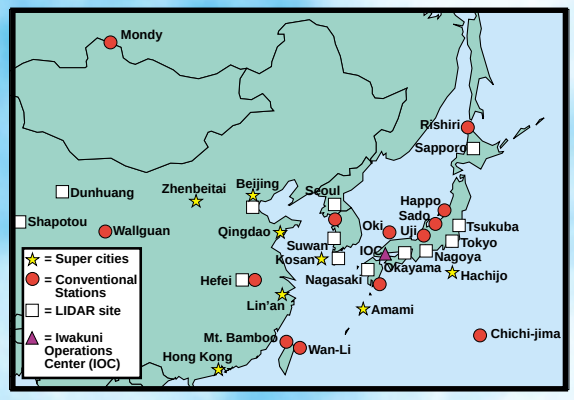
The Aerosol Characterization Experiments (ACE) are designed to increase our understanding of how atmospheric aerosol particles affect the Earth's climate system. These experiments improve the ability of models to predict the influences of aerosols on the Earth's radiation balance. ACE-Asia is the fourth in a series of ACE projects organized by the International Global Atmospheric Chemistry Program (A Core Project of the International Geosphere Biosphere Program).

The ACE-Asia region includes many types of aerosol particles of widely varying composition and sizes derived from one of the largest aerosol source regions on Earth. These particles include those emitted by human activities and industrial sources, as well as wind-blown dust, that may be especially important in influencing radiative and cloud nucleating properties of the atmosphere.

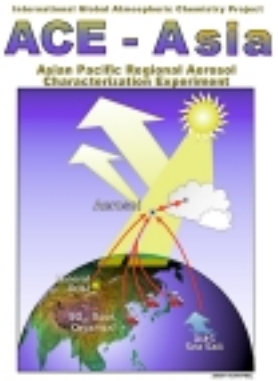


ACE-Asia is an international field experiment with participation from Australia, China, United Kingdom, France, Germany, Japan, Korea, Russia, Chinese Taipei, and the United States. The Operations Center from which scientists are directing the aircraft studies is located at the US Marine Corps Air Station at Iwakuni Japan.

Details of the ACE-Asia project can be found at
<http://saga.pmel.noaa.gov/aceasia/> or
<http://www.ogp.noaa.gov/ace-asia>

For more information on ACE-Asia, contact Professor Barry Huebert at
<huebert@soest.hawaii.edu>

The U.S. contribution to ACE-Asia is sponsored by the National Science Foundation, the National Oceanic and Atmospheric Administration, and the Office of Naval Research. Contacts: Dr. Anne-Marie Schmoltner (aschmolt@nsf.gov), Dr. Joel Levy (joel.levy@noaa.gov), and Dr. Ron Ferek (ferekr@onr.navy.mil)



National Science Foundation
Celebrating 50 Years

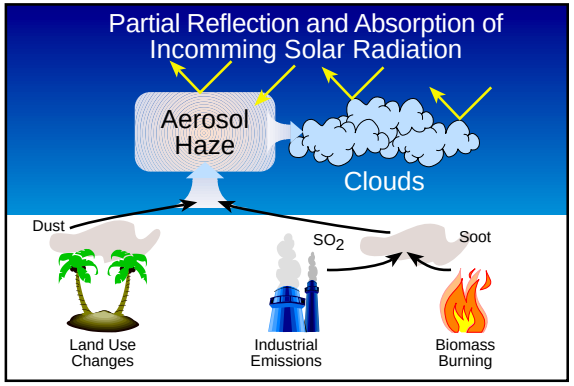
International Global Atmospheric Chemistry Project

ACE - Asia

Asian Pacific Regional Aerosol Characterization Experiment

ACE-Asia Program Description

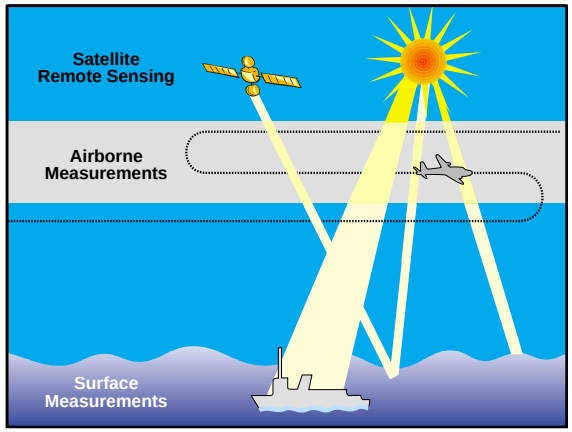
Atmospheric aerosol particles affect the Earth's radiative balance directly by scattering or absorbing light, and indirectly by acting as cloud condensation nuclei, thereby influencing the reflectivity, life-time, spatial extent and precipitation of clouds. What we experience as visibility-reducing haze can cause a wide range of climatic effects.



Comprehensive observations of Asian aerosols are needed to understand the nature of these particles and to test complex models of their radiative impacts. Because particle size and chemical composition control the radiative effects of aerosols, Ace-Asia focuses on these measurements at the ground and in the layers above the surface.

In addition to longer-term ground and satellite measurements, ACE-Asia scientists are simultaneously measuring chemical and physical aerosol properties and their radiative impacts at many locations and altitudes during the Intensive Operations Period in the Spring, 2001. It is during springtime that offshore transport of aerosols from the Asian Continent, especially dust, occurs most frequently. Aerosol layers are being investigated with the use of satellite remote sensing and surface and airborne measurements.

Measurement Platforms



The international ACE-Asia observing facilities include instruments at ground stations throughout Asia and aboard several aircraft and research vessels. Flight plans and ship operations are directed to sample regional aerosol features under varying meteorological conditions and distances from shore. These measurements provide data to test and refine radiative transfer and chemical transport models that are used to quantify aerosol radiative forcing. Organic, inorganic and elemental tracers are used to assess the contributions of different sources to the measured aerosol concentrations.

The aircraft being used in the ACE-Asia Intensive Operations Period include two from the U.S.; the National Science Foundation's C-130 and the Navy's Twin Otter. Airborne measurements of radiation intensity above and below aerosol layers enable an assessment of the impact of the aerosols on the energy impinging on the Earth's surface. Aircraft from other participating countries, such as the Australian KingAir, are also making measurements during the Intensive Operations Period.

The NOAA U.S. Research Vessel Ronald H. Brown is providing a mobile surface station for use in conjunction with the aircraft to study how aerosol properties change with time throughout the region.

Other vessels, such as the Japanese Research Vessel Mirai, are participating as well to provide mobile stations.

Ground stations across eastern Asia provide information on the longer-term spatial and temporal variability of key aerosol properties in near surface air over the study domain. A range of instrumentation at the ground sites enables collection of data on meteorology, precursor gases, and aerosol chemical and physical size distributions and optical properties. The most comprehensive set of instruments is deployed at Kosan, Korea.

ACE-Asia is also featured as a tool for science education. A practicing teacher is working with the scientists aboard the NOAA Research Vessel Ronald H. Brown and reporting back daily via the worldwide web to students around the world.

Results from ACE-Asia will improve our ability to understand how atmospheric aerosols influence the chemical and radiative properties of the Earth's atmosphere. They will also help us understand how future changes in aerosol concentration and composition may influence changes in the Earth's climate system as a whole.