About AEROSE

AEROSE, the Saharan Dust AERosols and Ocean Science Expeditions are an internationally recognized series of trans-Atlantic field campaigns conducted onboard the NOAA Ship Ronald H. Brown, which is designed to explore African air mass outflows and their impacts on climate, weather, and environmental health. AEROSE sounding data are used to provide independent correlative statistics necessary for validation of environmental data records (EDRs) derived from the new NOAA Joint Polar Satellite System (JPSS), Cross-track Infrared Microwave Sounding Suite (CrIMSS) and Geostationary Operational Environmental Satellite (GOES-R) Advanced Baseline Imager (ABI), as well as earlier legacy systems such as the NASA Aqua Atmospheric Infrared Sounder (AIRS).

Past Expeditions

AEROSE began with a cruise in 2004 and has been annually conducted since 2006 to generate the most comprehensive data set of complementary atmospheric and oceanographic observations. These expeditions focus on characterizing the impact and microphysical evolution of Saharan dust aerosols transported across the Atlantic Ocean.

- AEROSE-I (March 2004; 4 weeks)
- AEROSE-II (Jun-Jul 2006; two legs, 8 weeks)
- AEROSE-III (May 2007; 4 weeks)
- AEROSE-IV (Apr-May 2008; 3.5 weeks)
- AEROSE-V (Jul-Aug 2009; 4 weeks)
- AEROSE-VI (Apr-May 2010; 4 weeks)
- AEROSE-VII (Jul-Aug 2011; 5 weeks)
- AEROSE-VIII (Jan-Feb 2013; 5.5 weeks)
- AEROSE-IX (Nov-Dec 2013; 4 weeks)

Our Discoveries

AEROSE has yielded an unprecedented collection of in situ measurements of the Saharan air layer (SAL) and associated African dust and smoke outflows over the tropical Atlantic Ocean.

- Transport, microphysical evolution and regional impacts
- Regional atmospheric chemistry and marine meteorology

The AEROSE domain is germane to satellite sounder mesoscale-synoptic observing missions (e.g., operational user Advanced Weather Interactive Processing System, AWIPS).

- Saharan air layer (SAL) and distribution of tropical water vapor
- Dust and biomass burning aerosols
- Tropospheric ozone dynamics

AEROSE has compiled a multiyear set of ship-based, marine in situ cross-sectional truth measurements over the tropical Atlantic Ocean.

- The cruise domains span a region of meteorological interest in terms of the SAL, tropical storm formations and tropospheric ozone/carbon/aerosol chemistry and transport.