

FACT SHEET



Steamboat Springs, Colorado
(2010–2011)



Cape Cod, Massachusetts
(2012–2013)



Los Angeles, California, to Honolulu,
Hawaii (2012–2013)

The Atmospheric Radiation Measurement (ARM) Climate Research Facility maintains field sites in the Southern Great Plains, the North Slope of Alaska, the Tropical Western Pacific, and the Eastern North Atlantic to obtain continuous measurements of cloud and radiative properties for improving climate models. These measurements are supplemented through periodic field campaigns by the ARM Aerial Facility and ARM Mobile Facilities (AMF). The first mobile facility, AMF1, was first deployed in 2005; the second facility, AMF2, deployed in October 2010; and the third facility, AMF3, is scheduled to begin extended operations in Oliktok, Alaska, in fall of 2013.

Consisting of several portable shelters, a baseline suite of instruments, data communications, and data systems, the AMF is easily transported. An experienced team is deployed with the facility to set up the shelters and instruments. AMF data undergo quality checks and are made available in near-real-time.

Because of its flexibility and portability, the AMF is an ideal platform for conducting collaborative research anywhere in the world. Scientific and infrastructure staff are available for collaborative planning activities, and systems are available to provide local on-site or virtual support for collaborating scientists using the AMF for their research.

Baseline Capabilities

Measurement capabilities of AMF1 and AMF3 include the standard meteorological instrumentation, broadband and spectral radiometer suite, and remote sensing instruments. Instrumentation for AMF2 is, with a few notable exceptions, the same as used by AMF1 and AMF3. Because shipboard deployments of AMF2 are encouraged, the baseline suite of instruments is marine-focused.

- 95-GHz W-Band ARM Cloud Radar
- Balloon-Borne Sounding System
- Doppler Lidar, Micropulse Lidar, and Laser Ceilometer
- Microwave Radiometer
- Microwave Radiometer Profiler
- Sky Radiation System
- Ground Radiation System
- Atmospheric Emitted Radiance Interferometer
- Radar Wind Profiler
- Total Sky Imager
- Aerosol Observing System
- Surface Meteorology Station
- Eddy Correlation System
- Cimel Sun Photometer
- W- and Ka-Band Scanning ARM Cloud Radar (AMF1)
- X- and Ka-Band Scanning ARM Cloud Radar (AMF2)
- Ocean Meteorology Instruments (AMF2)

Measurements obtained by these instruments are collected by computers inside an operations shelter. This shelter houses numerous computer stations for data and communication systems. The AMF operates on a continuous 24/7 schedule and is maintained by ARM Facility staff. Because it is designed to collaborate with experiments from other agencies, the AMF can also host instruments other than the baseline collection. For a full list of available instruments, see <http://www.arm.gov/sites/amf>.

AMF Science

The purpose of the AMF is to collect essential information about cloudy and clear atmospheres in under-sampled climatically important regions. In some of these regions, even the macroscopic cloud structure is relatively unknown. The AMF produces data sets for use by the atmospheric community to test and improve parameterizations in global climate models.

Data from the AMF instruments are processed using specialized routines to produce cloudy and clear-sky data products. These data are evaluated by scientific staff for overall quality and then processed and made available to the world, free of charge, in near-real-time through the ARM Data Archive—
<http://www.archive.arm.gov>.

Each deployment is the result of a competitive process based upon proposals submitted by teams of scientists. Details about the AMF proposal process can be found at <http://www.arm.gov/campaigns/submit-proposals>.

Steamboat Springs, Colorado (2010–2011)

In late 2010, AMF2 made its first deployment to Steamboat Springs, Colorado, to study liquid and mixed-phase clouds in conjunction with the Storm Peak Lab (SPL), a cloud and aerosol research facility operated by the Desert Research Institute. The already extensive instrument suite at SPL was augmented with additional state-of-the-art instruments that are typically used for airborne cloud research by the Stratton Park Engineering Corporation (SPEC). SPL and SPEC collected in situ cloud and precipitation property measurements while AMF2 operated at a lower elevation, gathering complementary measurements.

Gan Island, Maldives (2011–2012)

The AMF2 obtained data from October 2011 through February 2012 using



instruments located near the airport on Gan Island and a cloud radar at the wharf on Hithadoo Island for the ARM Madden-Julian Oscillation (MJO) Investigation Experiment (AMIE) on Gan Island, or AMIE-Gan. Instruments at ARM's permanent research site on Manus Island, Papua New Guinea, obtained additional measurements, including increased sonde launches. This campaign was part of a large international research effort using instruments on land, sea, and aircraft to obtain data for studying tropical weather cycles in the equatorial Indian Ocean into the western Pacific. The MJO begins in the Indian Ocean near the Maldives and moves eastward toward Papua New Guinea.

Cape Cod, Massachusetts (2012–2013)

From July 2012 to June 2013, the AMF1 is operating at Cape Cod National Seashore for the Two-Column Aerosol Project (TCAP). Cape Cod's unique geography makes it an ideal location to measure cloud and aerosol properties as air moves between North America and the Atlantic Ocean. Continuous measurements by the AMF were supplemented by research flights in

July 2012 and February 2013 to gather data from two atmospheric "columns:" one above the AMF site and another above the ocean, about 155 miles from the coast.

In addition, a Mobile Aerosol Observing System joined the AMF at Cape Cod for added detailed measurements of aerosol and atmospheric gases. Scientists will use data from the TCAP campaign to compare the impacts of aerosols during summer and winter, during polluted and clean times, and in different weather conditions.

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