

DOE Atmospheric Radiation Measurement Aerial Facility

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May 4th, 2009

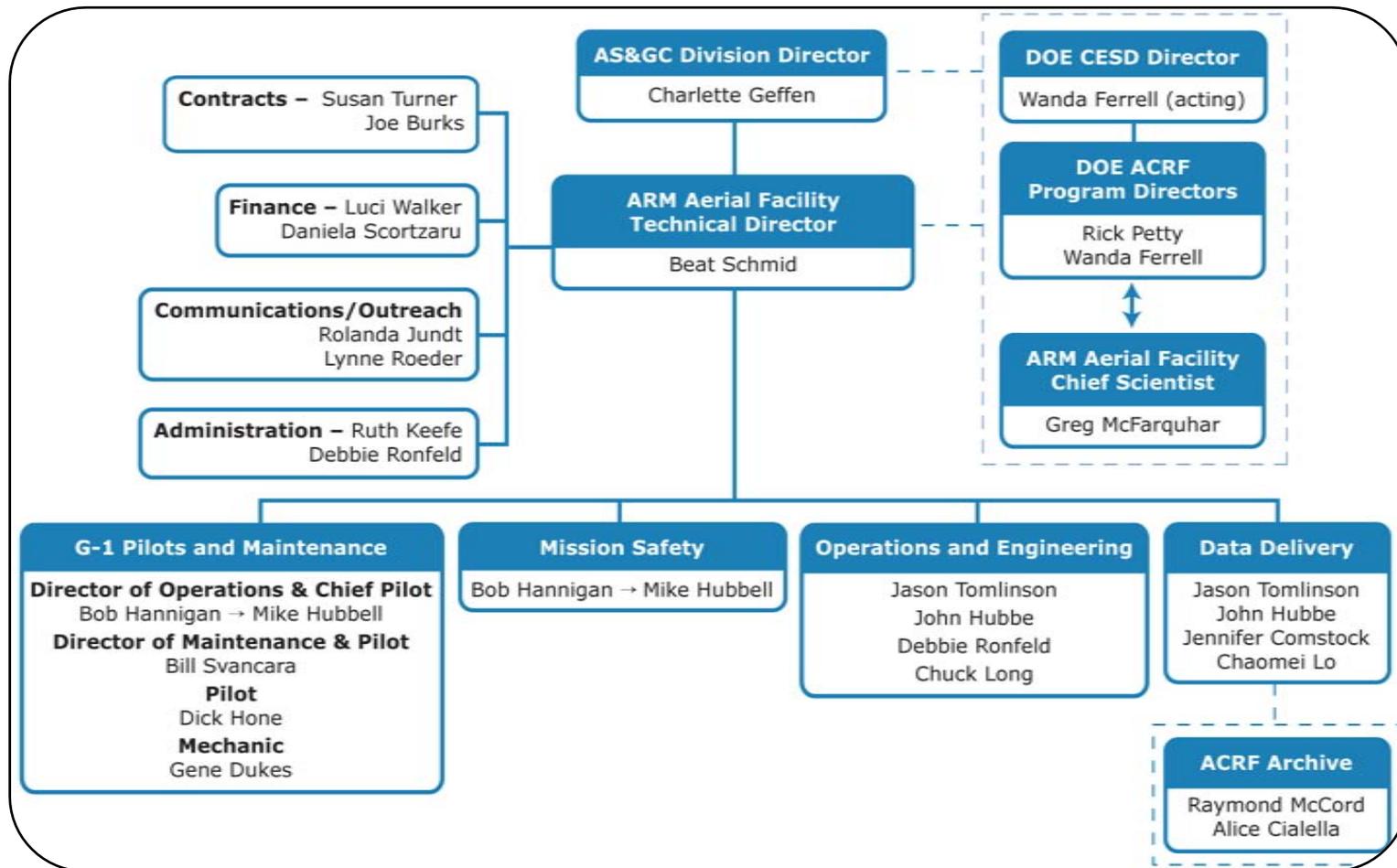
ICCAGRA Spring Meeting

Stresa, Italy

AAF Major Changes

- ▶ Aerial Vehicles Program is now the ARM Aerial Facility
- ▶ The G1 is now part of the AAF
 - Considered an ARM Climate Research Facility Site
 - AAF will now be conducting at minimum 2 projects a year
- ▶ American Recovery and Reinvestment Act
 - Purchasing new instruments and making improvements to the G1
 - Cloud Probes
 - Cloud Radar
 - Aerosol instrumentation

AAF Organizational Chart



ACRF Sites



- ▶ 2 New Sites under Development
 - Mobile Aerosol Observing system
 - ARM Mobile Facility – 2
- ▶ Possibly move AAF IOPs away from fixed sites

G1 Aircraft



Aircraft Technical Information

Length: 63.75 feet (19.44 m)

Wingspan: 78.33 feet (23.88 m)

Height: 23.33 feet (7.11 m)

Cabin space: 165 square feet

External probes (PMS cans, etc.) : now 2 | in FY10, 8

Maximum gross weight: 36,000 pounds (16,330 kg)

Endurance with maximum fuel: 6 hours

Crew capacity: 2 pilots, 1-4 scientists

Cabin payload: 4,200 pounds

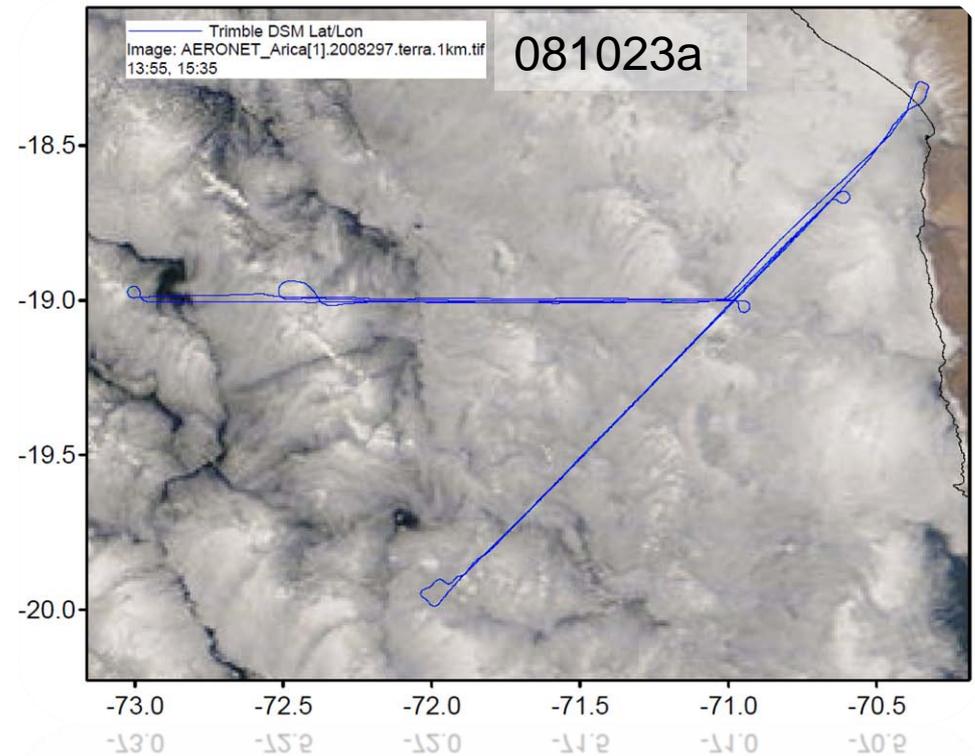
Research Power: 400A @ 28 VDC (incl. 4 KVA @ 110 VAC, 4 KVA @ 220 VAC, 60 Hz, 1-phase).

G1 Projects

The Variability of the American Monsoon Systems (VAMOS) Ocean Cloud Atmosphere Land Study (VOCALS) 2008

▶ VOCALS 2008

- Dates: 10/14 – 11/13
- Flight Hours: 102(63)
- Number of Flights: 17
- Collaboration with
 - NSF/NCAR C-130
 - Met Office BAE-146
 - Met Office Dornier
 - CIRPAS Twin Otter

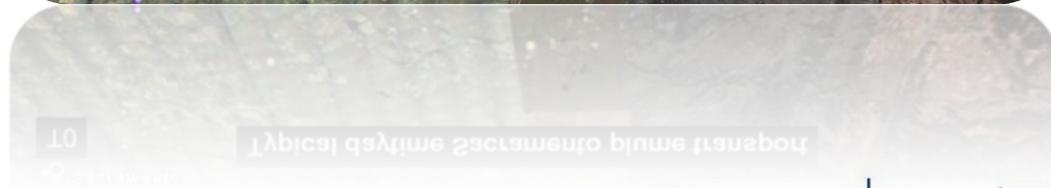
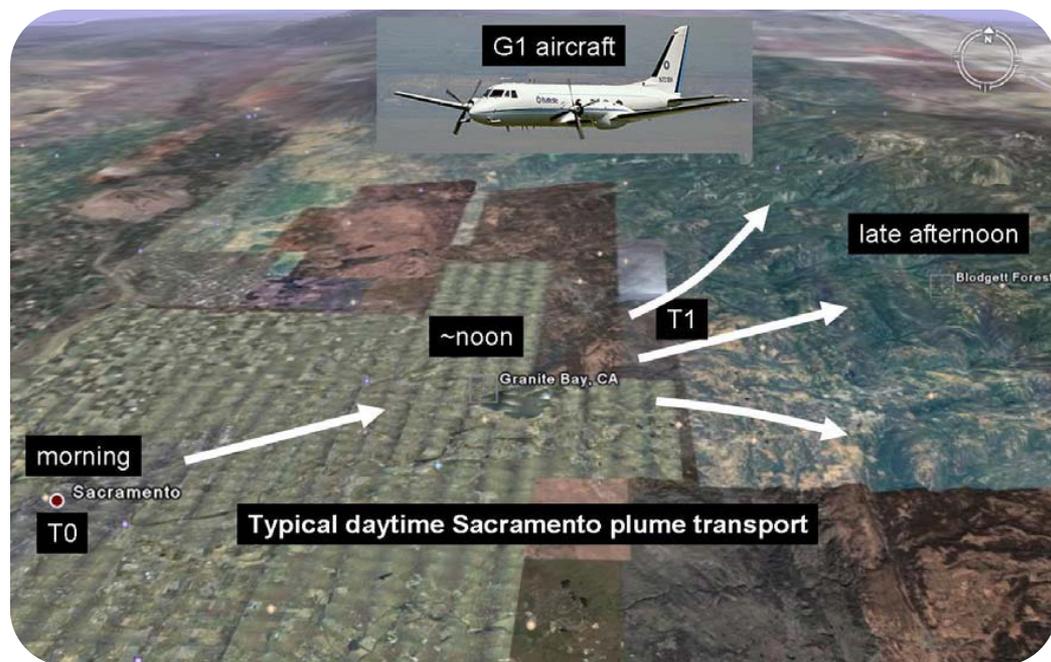


G1 Projects

Carbonaceous Aerosols and Radiative Effects Study (CARES)

► CARES 2010

- June 2010
- Evolution of the Sacramento plume
- Coordination with CalNex
 - NOAA WP-3D
 - CIRPAS Twin Otter



RACORO



**Routine AAF Clouds with Low Optical Water Depths
(CLOWD) Optical Radiative Observations (RACORO)**

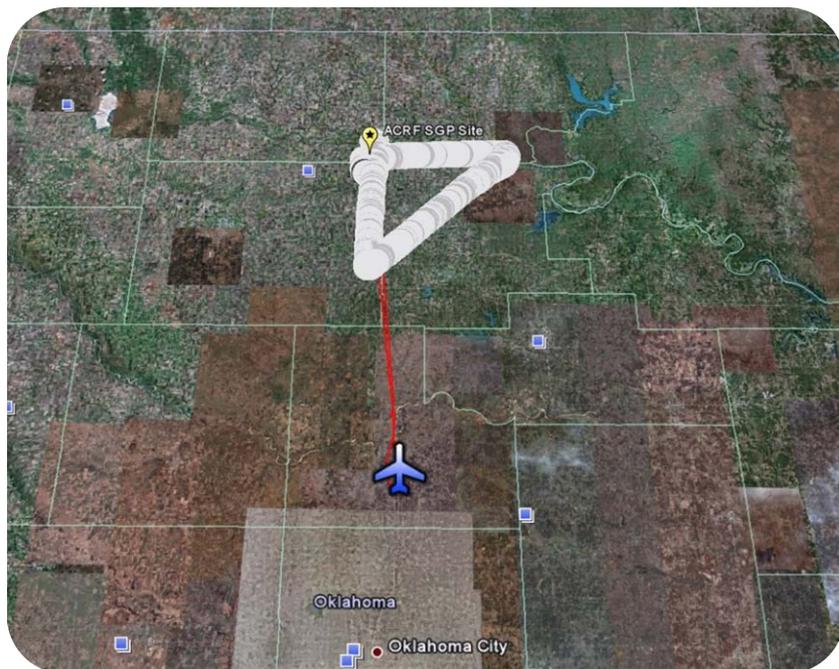
<http://acrf-campaign.arm.gov/racoro/>

RACORO



- ▶ January 22nd – June 30th, 2009
- ▶ Routine measurements of CLOUD type clouds
- ▶ Also measuring surface albedo and aerosols near the ACRF Southern Great Plains Site
- ▶ Collaborating with NASA B-200 in June

RACORO



- ▶ Triangle Pattern with one apex over the SGP site
 - 1 loop above, 1 below, and 3 within the clouds
 - Spiral profiles over the SGP site
 - 4 hour flight time

SPartICus

Small Particles in Cirrus (SPartICus)

- ▶ Routine Measurements of small ice crystals in cirrus clouds.
- ▶ Conducted over the SGP site to facilitate improvement in retrievals
- ▶ Will try to coordinate with A-train overpass
- ▶ October 15th, 2009 to April 15th, 2010
- ▶ Mid-latitude Airborne Cirrus Properties Experiment (MACPEX)

■ WB-57

<http://acrf-campaign.arm.gov/sparticus>

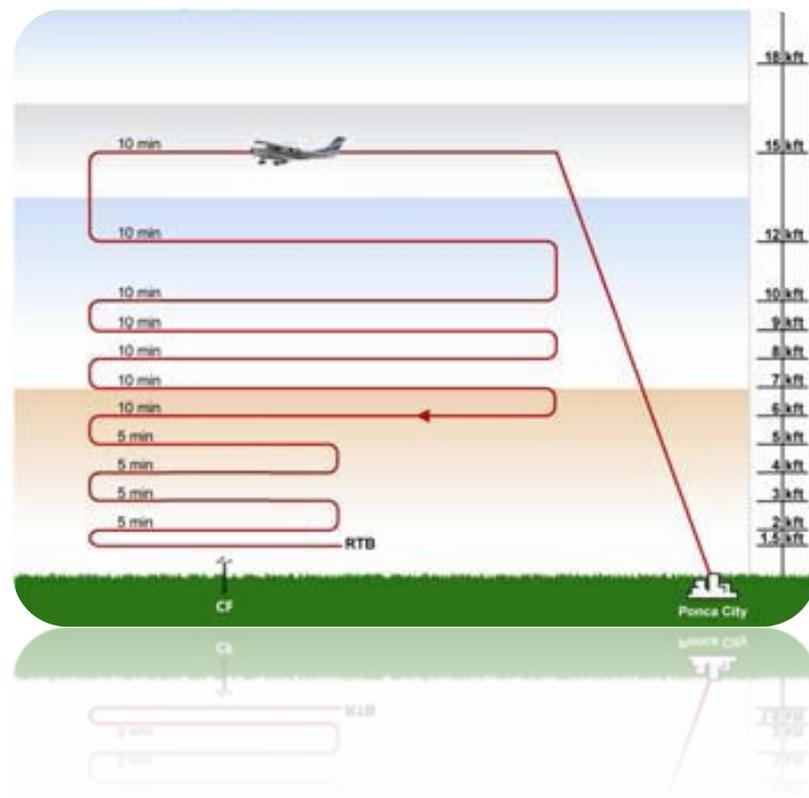


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ARM-ACME

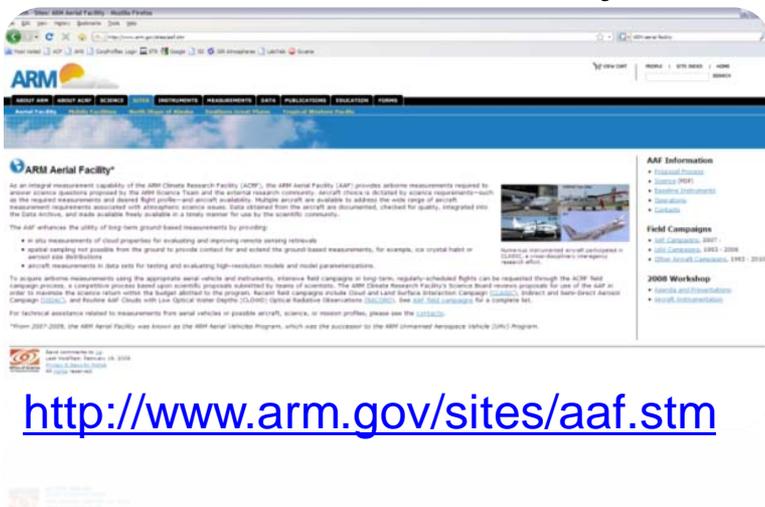
ARM Airborne Carbon Measurement Experiment (ACME)

- ▶ Routine flights over the SGP site using a Cessna 206
- ▶ Measurements of carbon cycle gases and ozone
- ▶ A main objective was to validate the OCO satellite

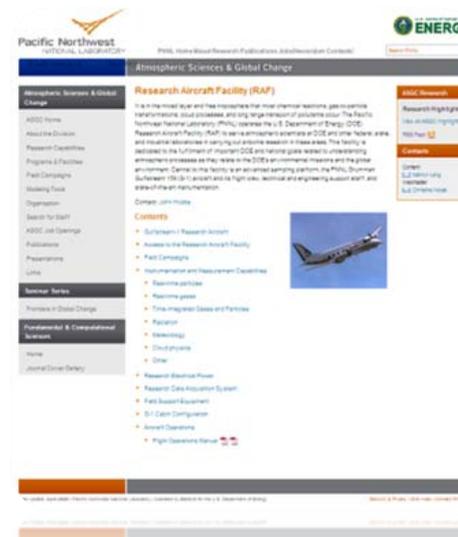


More Information

ARM Aerial Facility



G1



<http://www.arm.gov/sites/aaf.stm>

<http://www.pnl.gov/atmospheric/programs/raf.stm>

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