

AVP Support of Past Field Campaigns



ARM AVP Workshop

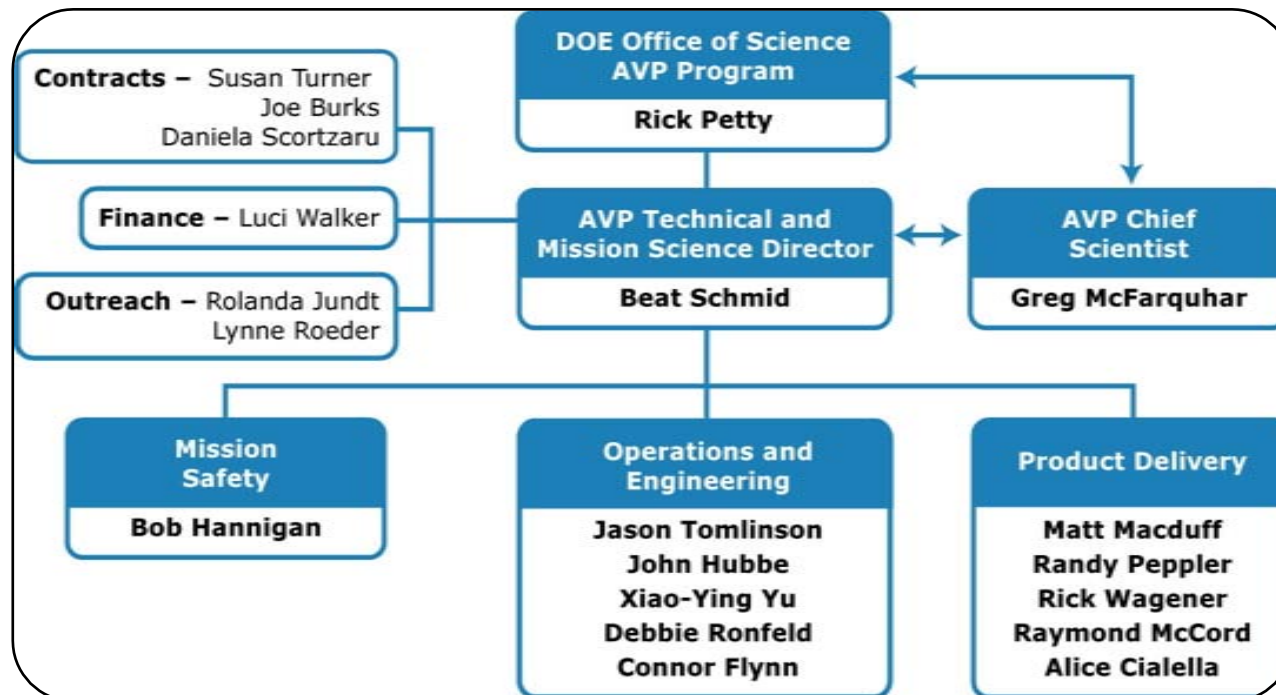
University of Illinois, Champaign, IL

October 14, 2008

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Pacific Northwest National Laboratory***

AVP History & Organization

- ▶ June 2006: Former ARM UAV program was re-competed as ARM AVP among DOE National Labs
- ▶ Oct 2006: PNNL proposal (PI J. Voyles) successful



Outline of AVP Activities

- ▶ Costing of proposals
- ▶ Implementation of field campaigns
 - Contracting of aircraft platform(s)
 - Contracting with PI's for requested instruments
- ▶ Field Support
 - Logistics and Flight Planning
 - Safety
- ▶ Communication
 - Websites, WIKI, and Data and Instrument Workshops
- ▶ Facilitate the archiving of data
- ▶ Participate in the Interagency Coordinating Committee for Airborne Geoscience Research and Applications (ICCAGRA)
- ▶ Instrumentation

CLASIC (2007)

- ▶ **C**loud and **L**and **S**urface **I**nteraction **C**ampaign
- ▶ ARM Southern Great Plains Climate Research Facility
 - June 8-July 2, 2007
- ▶ Coordination between 9 aircraft
 - CLASIC
 - CIRPAS Twin Otter, NASA P3, NASA ER2, NASA J-31, Twin Otter International, Duke University Helicopter Observation Platform, and Cessna 206
 - CHAPS
 - NASA B-200 and DOE G-1
- ▶ A workshop was held in March 2008
- ▶ Finalized data are available

CLASIC/CHAPS 2007 (*in situ*)

G-1



CIRPAS Twin Otter



C206



CLASIC/CHAPS 2007 (*remote sensing*)



- ▶ Indirect and Semi-Direct Aerosol Campaign
- ▶ Measured aerosol and cloud properties over the North Slope of Alaska in close proximity to the ARM site located in Barrow
- ▶ April 1st to 30th
 - 103 Flight hours
- ▶ AVP collaborated with Environment Canada, the National Research Council of Canada, and various U.S. research entities
 - Aircraft platform was the NRC Convair-580
- ▶ Over 40 instruments measured cloud microphysical and aerosol properties; visible, infrared, and microwave radiation; and atmospheric state parameters

ISDAC (2008)



<http://acrf-campaign.arm.gov/isdac/tour.stm>

- ▶ Field campaign overlapped with the NASA ARCTAS and NOAA ARCPAC campaigns all based in Fairbanks, AK
 - 5 coordinated flights with the NASA B-200
 - 1 intercomparison flight with the NOAA P-3 within an aerosol layer and clouds
- ▶ Highly successful project
 - 2 golden cases for cloud aerosol interaction
 - Several cases of very high aerosol concentration resulting from biomass burning in southern Russia
 - 1 CALIPSO and 2 Cloudsat validation flights
- ▶ ISDAC Workshop
 - November 13th and 14th
- ▶ Data should be public by beginning of 2009

First Deployments

SPLAT-II

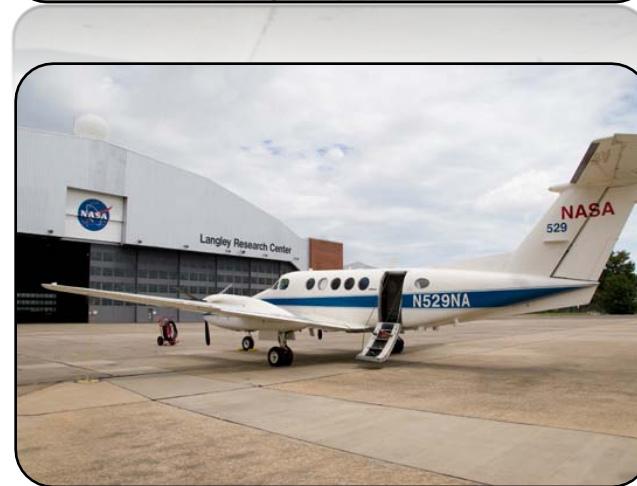


CFDC

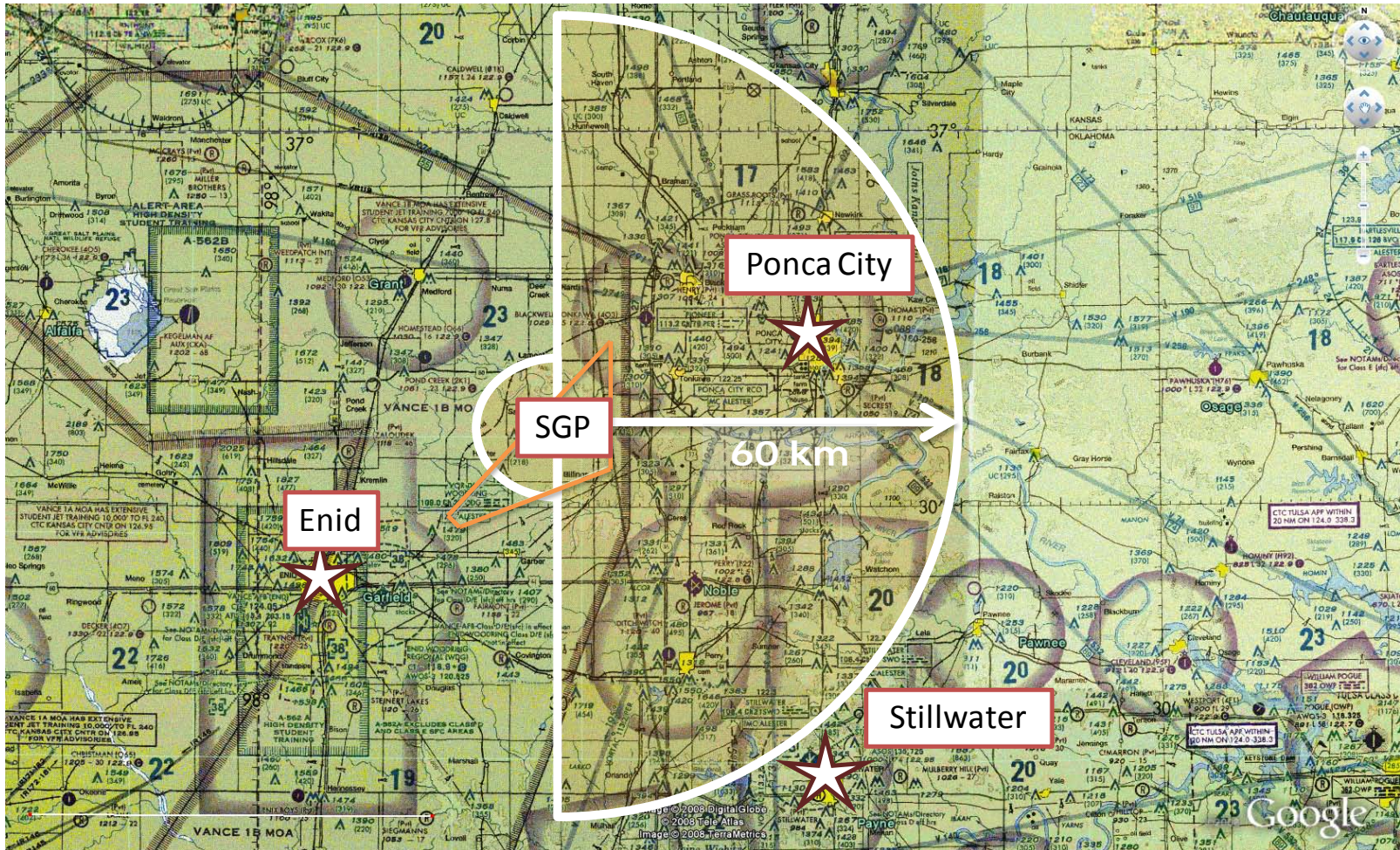


- ▶ **R**outine **A**VP **C**loud with Low Optical Water Depths (CLOWD) **O**ptical **R**adiative **O**bservations
 - January 22nd to June 30th 2009
- ▶ CLOWD Type clouds
 - Low-level, boundary-layer clouds constitute the largest uncertainty in climate models
 - Low-level cloud properties are very sensitive to changes in aerosol loading, and the aerosol effect on cloud albedo remains the dominant uncertainty in radiative forcing
- ▶ Routine Measurements
 - 300 Flight Hours
 - 2 to 3 flights per week

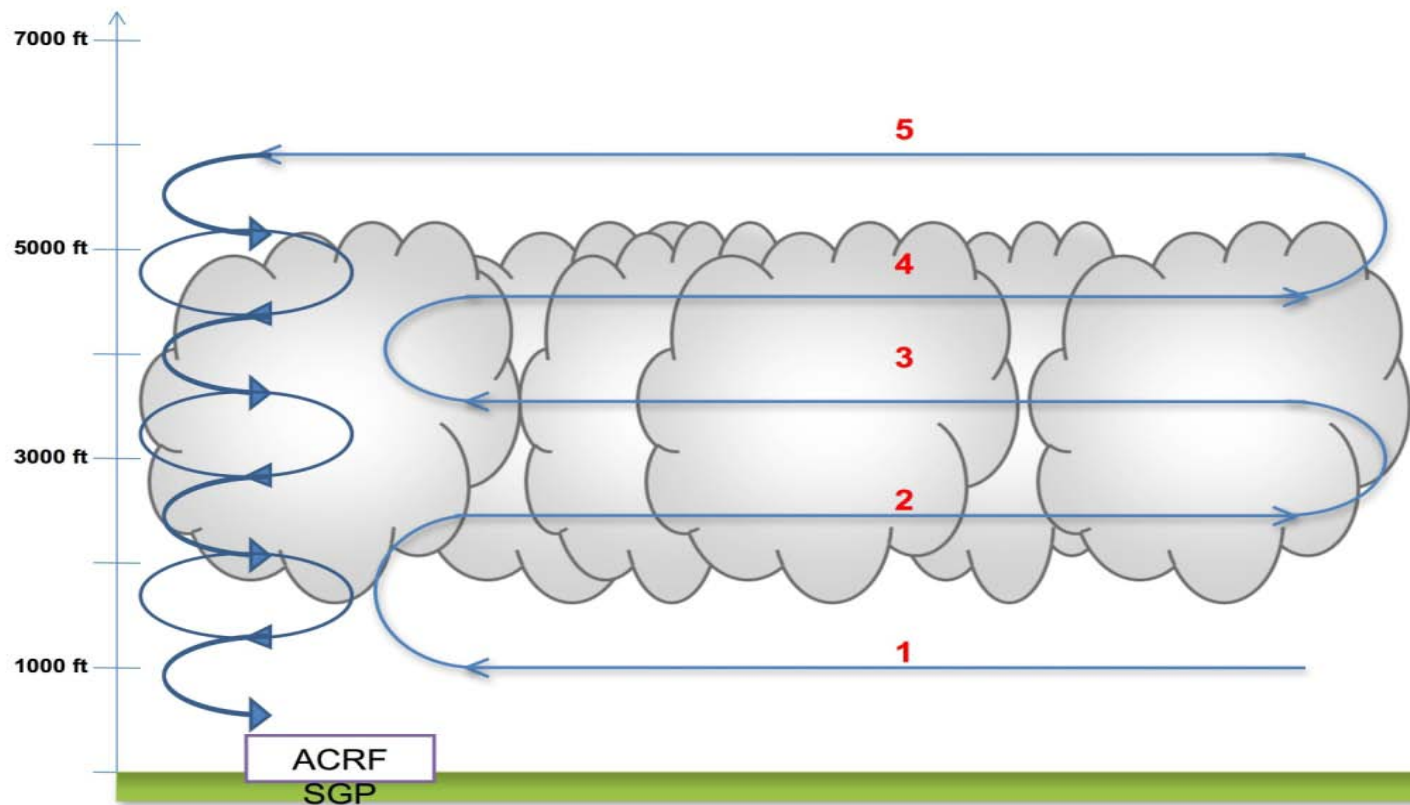
RACORO Aircraft



RACORO Flight Plans



RACORO Flight Plans



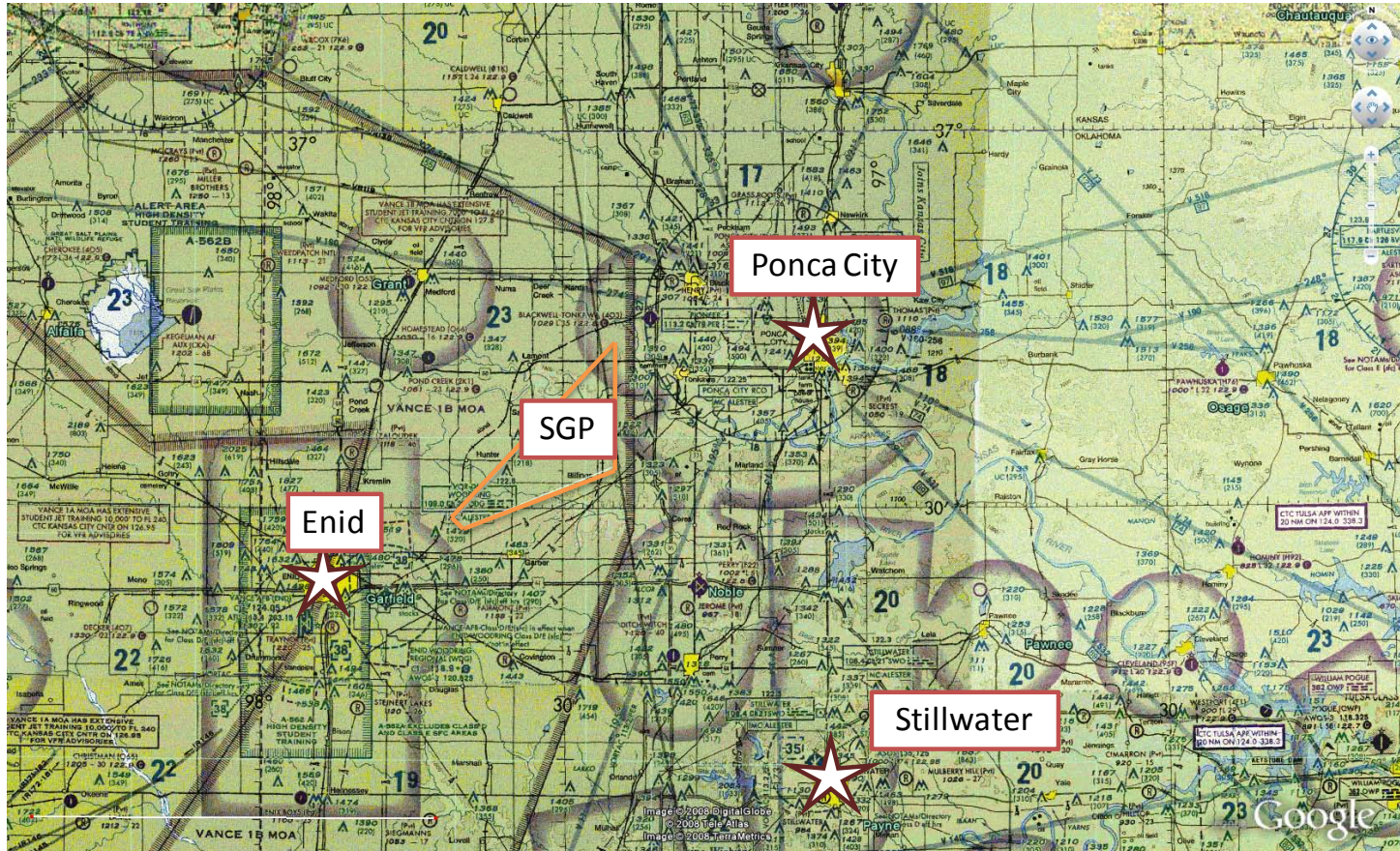
Cessna 206

- ▶ Two-year airborne study of atmospheric composition and carbon cycling in the Southern Great Plains



- ▶ PI's: Sébastien Biraud & Margaret Torn, Lawrence Berkeley National Laboratory

Cessna 206





- ▶ **Small Particles In Cirrus**
 - October 1, 2009 – May 30, 2010
- ▶ Routine measurements of Cirrus microphysical properties
- ▶ Flights will be over the SGP ACRF site
- ▶ NASA Support?
 - WB-57 may participate in early summer 2010
- ▶ PI: Jay Mace, University of Utah

Summary

- ▶ AVP facilitates airborne science activities for the ARM program
- ▶ Orchestrated the CLASIC and ISDAC field campaigns
 - Finalized CLASIC data are available
 - Finalizing the data collected from ISDAC
- ▶ Moving forward with missions that are based on Routine Flying
 - RACORO
 - C206 Carbon Flights
 - SPARTICUS
- ▶ Moving forward with instrumentation goal