

CLOWD Breakout Meeting

1:30 to 3:00

Meeting Charges

- 1. Brainstrom CLOWD's "legacy"**
- 2. Establish task ownership**

Breakout Primer

Focus Groups Are not intended to live forever

- Form on a pressing topic
- Do a few highly visible things
- Disband to make room for new Focus Groups

Why Invitation Only? Not a normal Breakout Session



- Navigate Breakout conflicts (1.5 hrs)
- Minimal Introduction (know the issues already)
- Small, dynamic group
 - Facitates discussion
 - Say the hard things (if needed)

Breakout Primer

Summary of Current Activities

Field Studies

- Maria Cadeddu (MWR IOP [SGP], GVR [NSA])

Programmatic Proposals

- COPS-CLOWD
April deployment of 90/150
- RACORO

RACORO Overview



Routine

Aerial Vehicle Program (AVP)

Clouds with Low Optical Water Depths (CLOWD)

Optical

Radiative

Observations

Steering Committee

**Andy Vogelmann, Greg McFarquhar, Dave Turner,
Jennifer Comstock, Graham Feingold, Chuck Long
and John Ogren**

Overview

- Conduct long-term, routine flights in boundary layer, liquid-water clouds at SGP to measure
 - Microphysical properties
 - Optical properties and radiative fluxes, and
 - Associated aerosol properties & atmospheric state
- Long-term statistics needed because these clouds are thin and/or broken, which make retrievals highly uncertain
 - Help develop & evaluate ARM retrievals
 - Improve our understanding of how boundary layer clouds interact with aerosols & radiative fluxes

Relevancy to ACRF

- Climatology critical for cloud modeling & interpretation
 - 50% of liquid clouds have LWP < 100 g m⁻²
 - Retrieval algorithms differ by 50 to 100% for these clouds
- CLOUD has shown that their cloud radiative effects must be determined with greater accuracy
 - Small uncertainties in their optical properties can affect energy balance & their response to climate forcing
- Clouds with low liquid-water amounts are one of greatest uncertainties in climate models (these clouds are not even resolved in GCMs)
 - these data can help develop & evaluate their improvement in climate models.

Proposed Experiment

- Fly pre-determined flight tracks over the SGP 2 to 3 times/week for 1 year
- Flight legs envisioned:
 - Focus on low LWP clouds, but sample whatever clouds present to get representative statistics
 - Straight, ~20 km long legs at multiple heights where clouds are present
 - Spirals over central facility
- Times may be planned with satellite overpasses
- Some nighttime flying
- Routine observations must use instrumentation with very high reliability and “easy” processing

Instrument Suite

- Envision low-level, slow-flying aircraft observing:
 - Cloud microphysics (SDs, bulk LWC, β_e)
 - Radiometric quantities (\uparrow and \downarrow SW & LW radiometers, SW spectra to map surface albedo)
 - State parameters (fast response T, water concentration, & turbulence)
 - Aerosol properties (SD [$D > 50$ nm], CCN and CN)
 - Aircraft telemetry (speed, pitch, roll, video?)

Proposed Meeting Agenda

Step 1. Firm up “Base”

a. Support CLOWD Infrastructure

Jennifer needs CLOWD-critical instruments and VAPs

b. RACORO

Ideas, concerns, add ons?

c. Impediments

“Scale Clash” (better than “Scale babble”?)

Step 2: “Go long” – GROUP Efforts

Some Possible Discussion Ideas...

PI Products

- **“Model” of what works**
Can't be too taxing for PI
Must be “rewarded”
- **BBHRP vetting?**

Direct link to modeling

- **RACORO?**

