

ARM Cloud Modeling Working Group Translator Update

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Outline

1. Data development in support of CMWG

- Climate modeling best estimate data
- Extended and updated TWP-ICE forcing and evaluation data
- Radiative heating and cloud microphysics data for TWP-ICE
- BBHRP for SGP
- Other relevant data

2. Survey results for data used by CMWG and future forcing data development

Climate Modeling Best Estimate Dataset

Initial data list

- Cloud fraction from ARSCL and TSI
- Liquid water path and precipitable water from MWRRET
- Surface Radiative Fluxes from QCRAD

Data available at all five ARM primary research sites

<http://iop.archive.arm.gov/arm-iop/0showcase-data/cmbe/>

SGP.C1	Lamont, OK	1996 -- 2007
NSA.C1	Barrow, AK	1998 -- 2007
TWP.C1	Manus Island, PNG	1996 -- 2007
TWP.C2	Nauru, PNG	1998 -- 2007
TWP.C3	Darwin, AU	2002 -- 2007

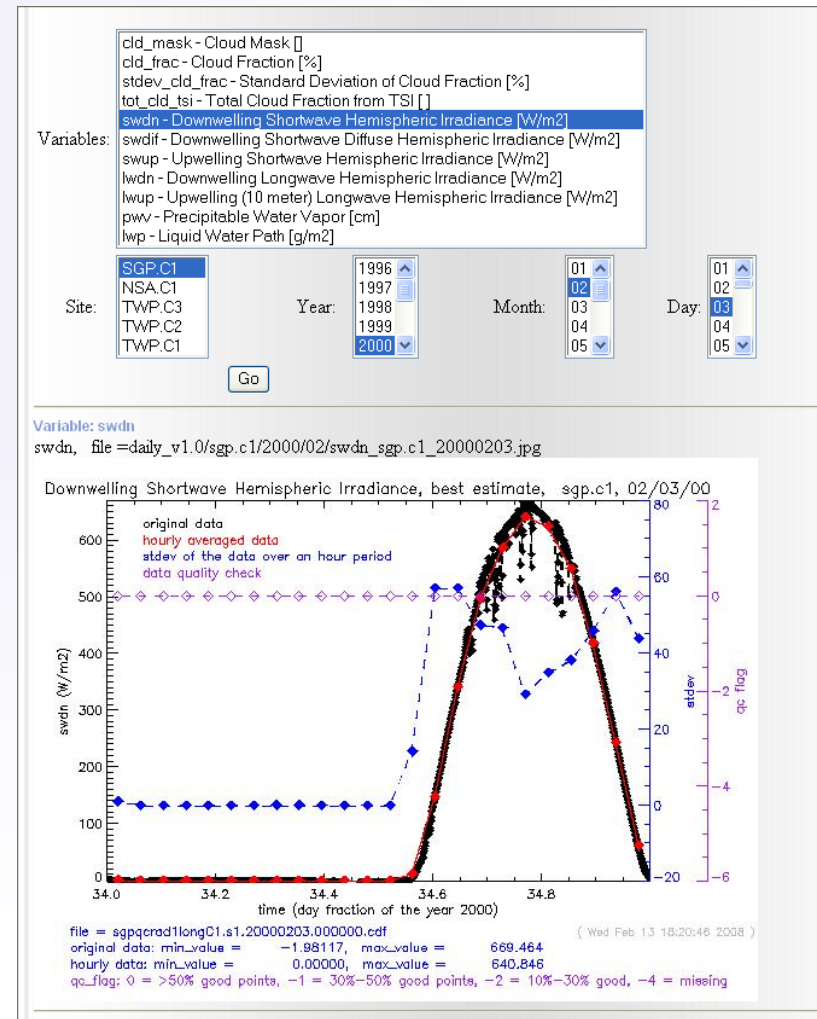
See McCoy et al. Poster and Xie et al. Poster

CMBE Homepage

http://science.arm.gov/wg/cpm/scm/data/best_estimate/

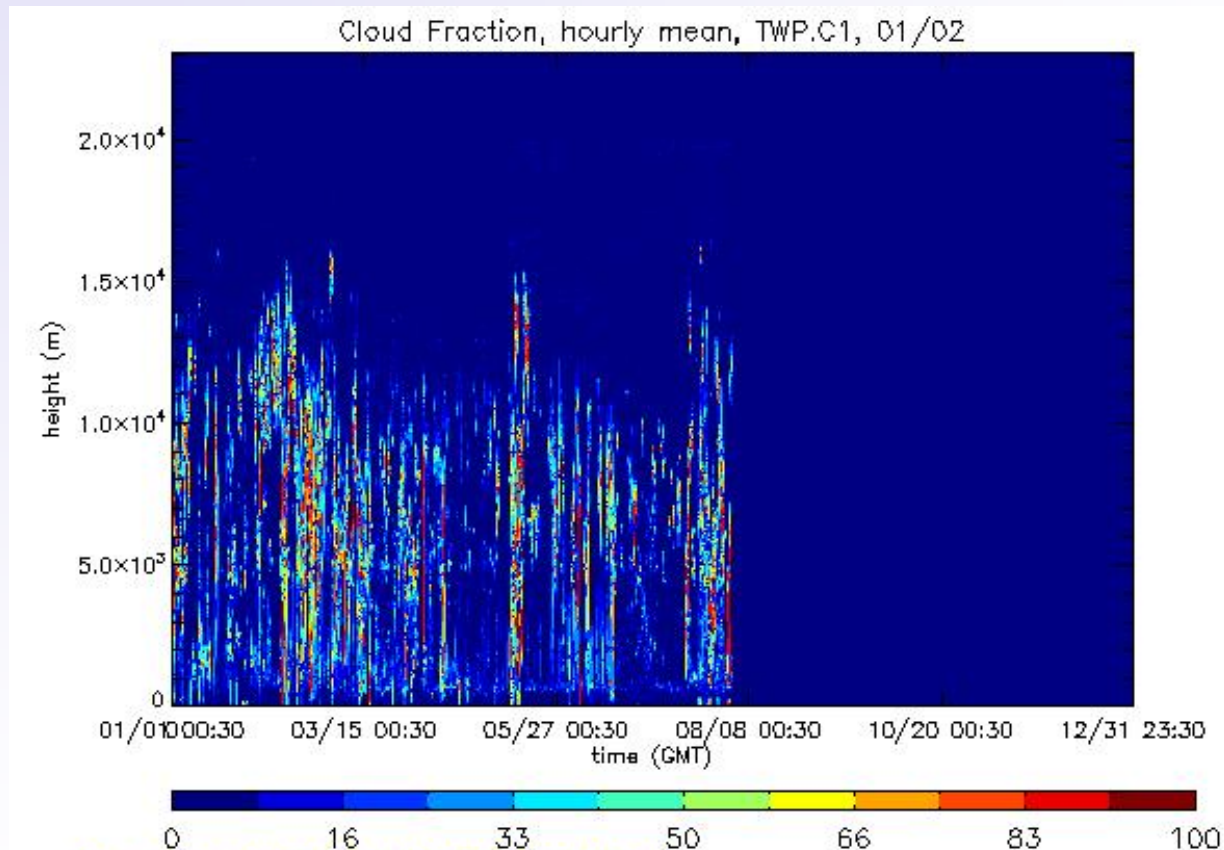
- Details about the algorithms used for CMBE
- Daily, monthly, and yearly plots

These plots help identify problems in the original data



Data Quality Issues with Current CMBE Data

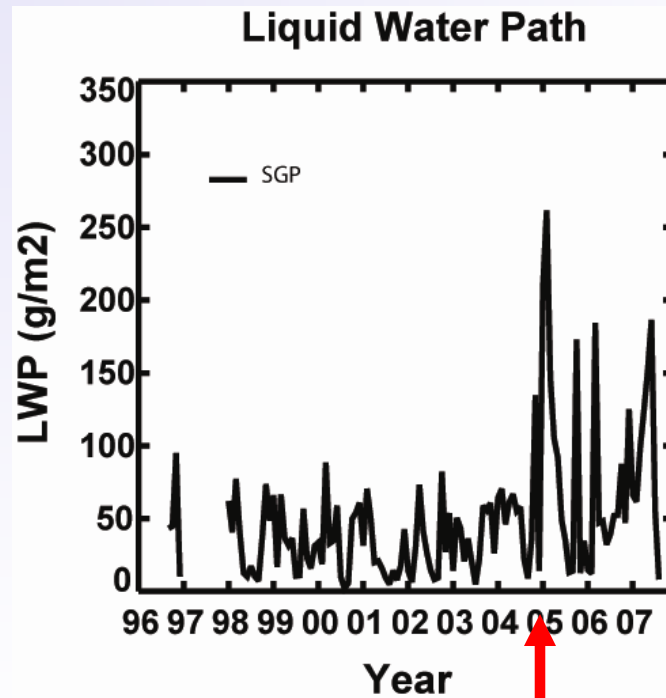
ARSCCL Cloud Fraction at Manus for 2002



Data are not marked as missing for some periods

Data Quality Issues with Current CMBE Data

Monthly Changes in LWP at SGP (1997-2007)



Reprocessing
starts at 2005

Inconsistency between the original and reprocessed data

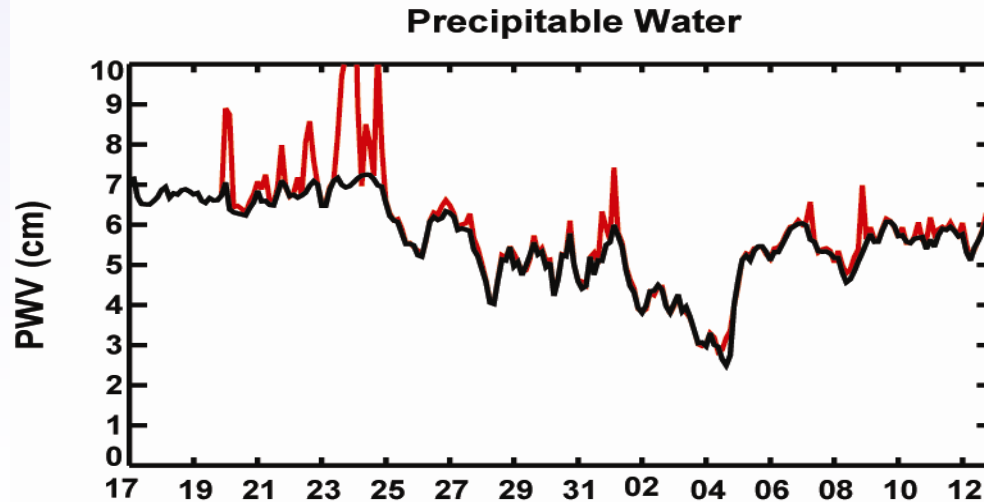
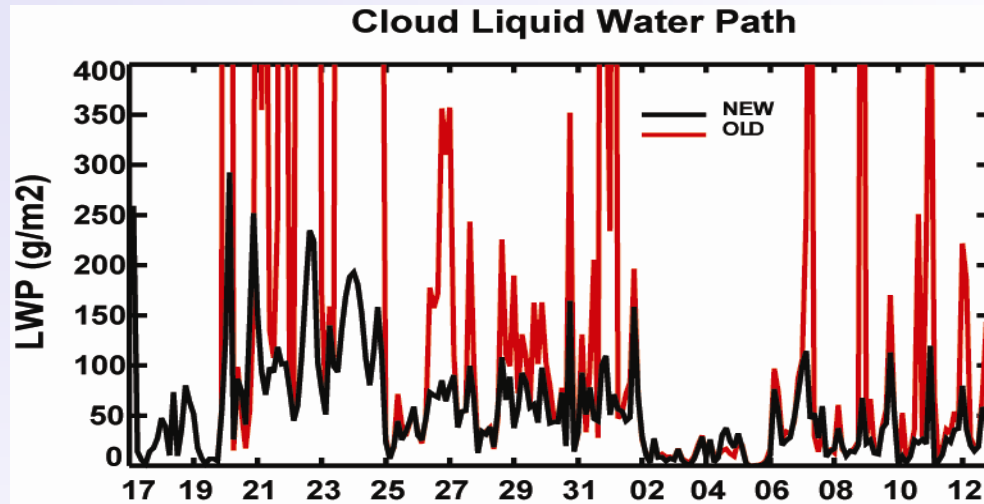
Future Work on CMBE

- **Data quality issues with these relevant VAPs need to be solved in order to further improve the quality of the CMBE data**
- **More variables will be added**
 - Surface precipitation
 - **Merged soundings (almost done)**
 - Satellite data (TOA radiative fluxes and satellite derived clouds)
 - Cloud properties (MICROBASE)
 - Radiative heating rates (BBHRP)

TWP-ICE Analysis

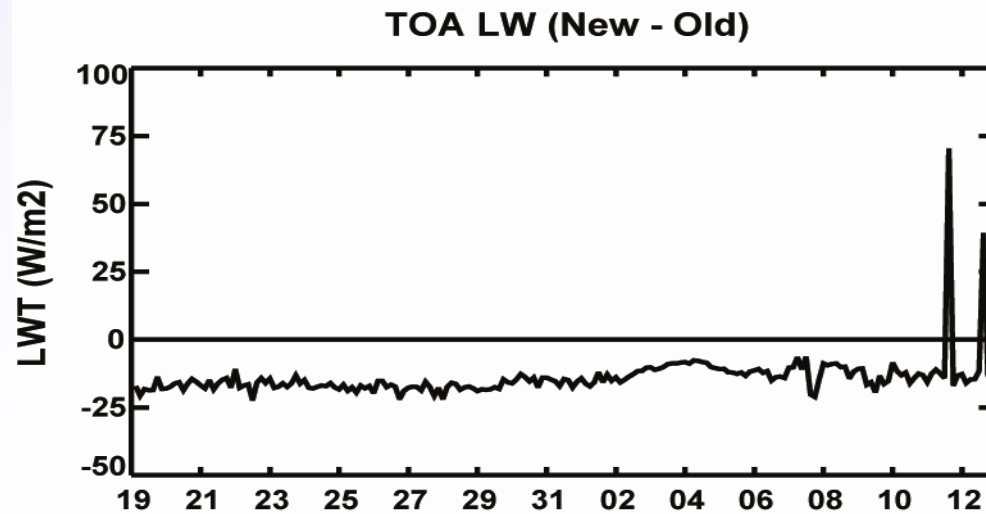
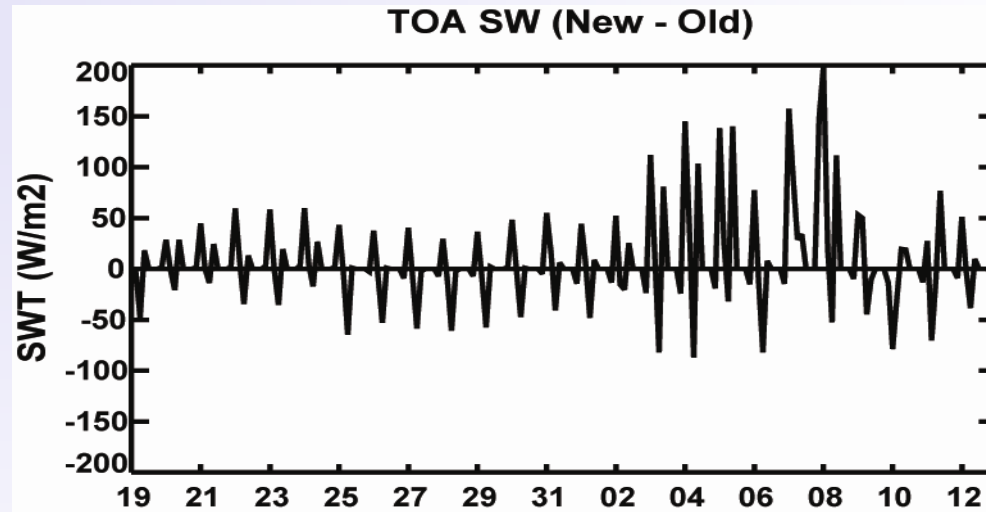
- **The TWP-ICE forcing data have been extended to 17 January 2006 using the ECMWF analysis to support the upcoming ARM/GCSS TWP-ICE case study**
- **The forcing data have been updated using the revised PWV and LWP from MWRRET and TOA radiation fluxes from satellite retrievals**
- **Revised data will be in the Archive soon**

LWP and PWV: New vs. Old



Jan. 17- Feb 13, 2006 TWP-ICE

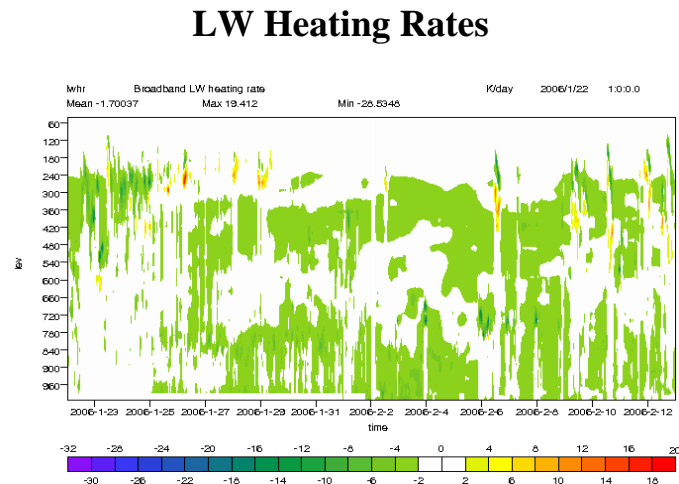
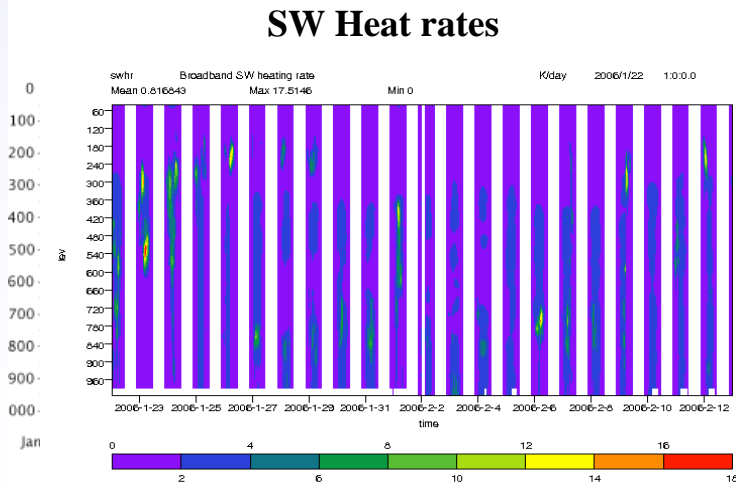
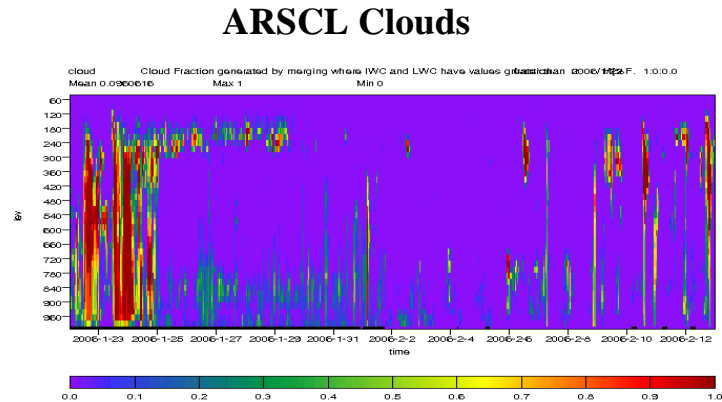
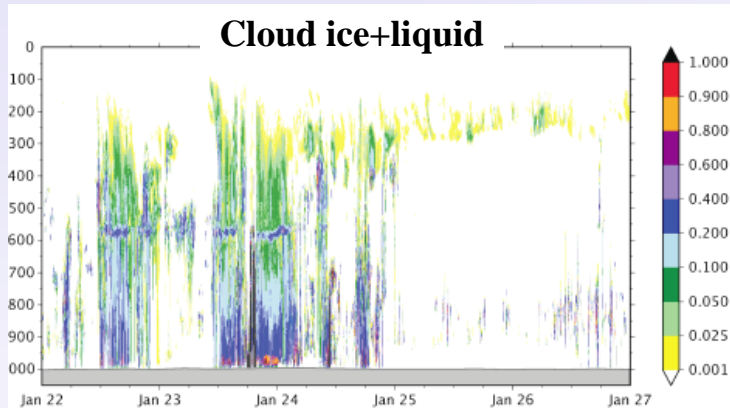
Difference in TOA Radiation: New vs. Old



Jan. 17 - Feb. 13, 2006 TWP-ICE

Radiative Heating and Microphysics data for TWP-ICE

From Sally McFarlane and Jim Mather



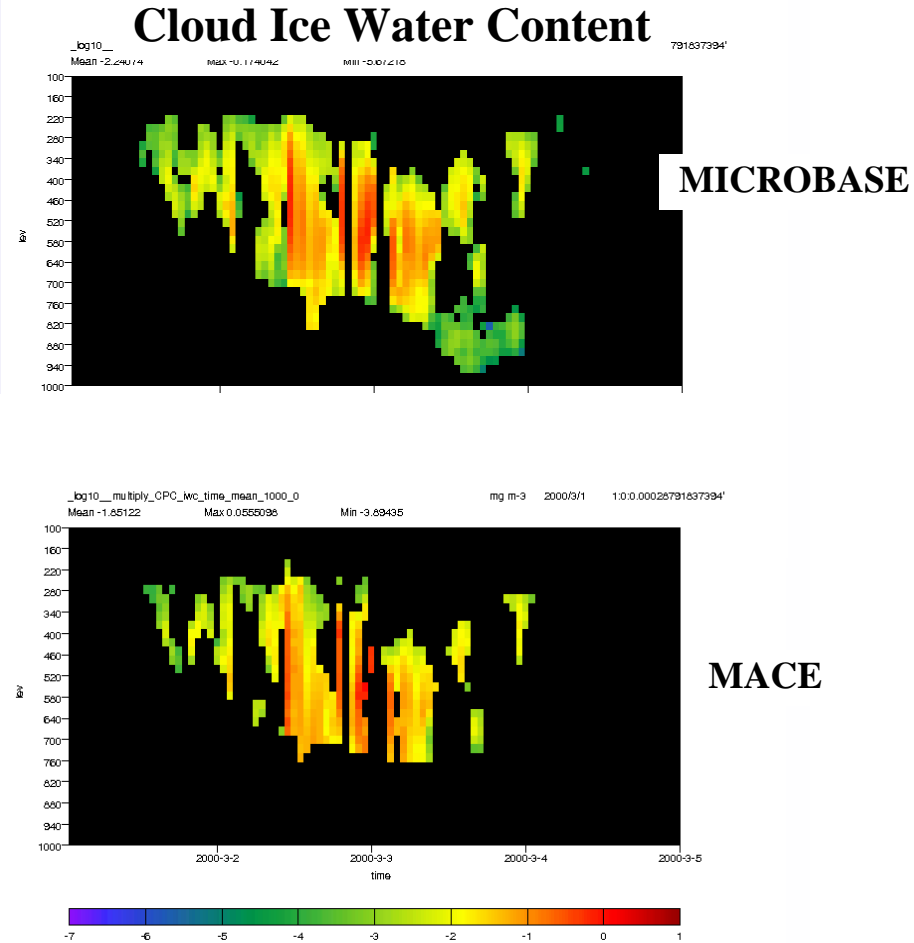
Data will be available in the Archive soon

BBHRP

- **Data for year 2000 at SGP will be available soon**
- **Include radiative heating rates, cloud fraction, cloud and aerosol properties, and TOA and surface radiative fluxes**
- **Will generate multi-year data at SGP and other ARM sites**

Cloud microphysical properties compatible with forcing data

1. Microbase products from BNL
 2. Mace's 8-year cloud property data at SGP
- The regridded data are currently available for the period of 03/2000 – 02/2001 for MICROBASE and 1999-2001 as well as all IOPs between 1997 and 2003 for Mace's data at SGP
 - We have put the data along with our forcing data in the ARM archive
 - The MICROBASE data will be updated soon using the new released version



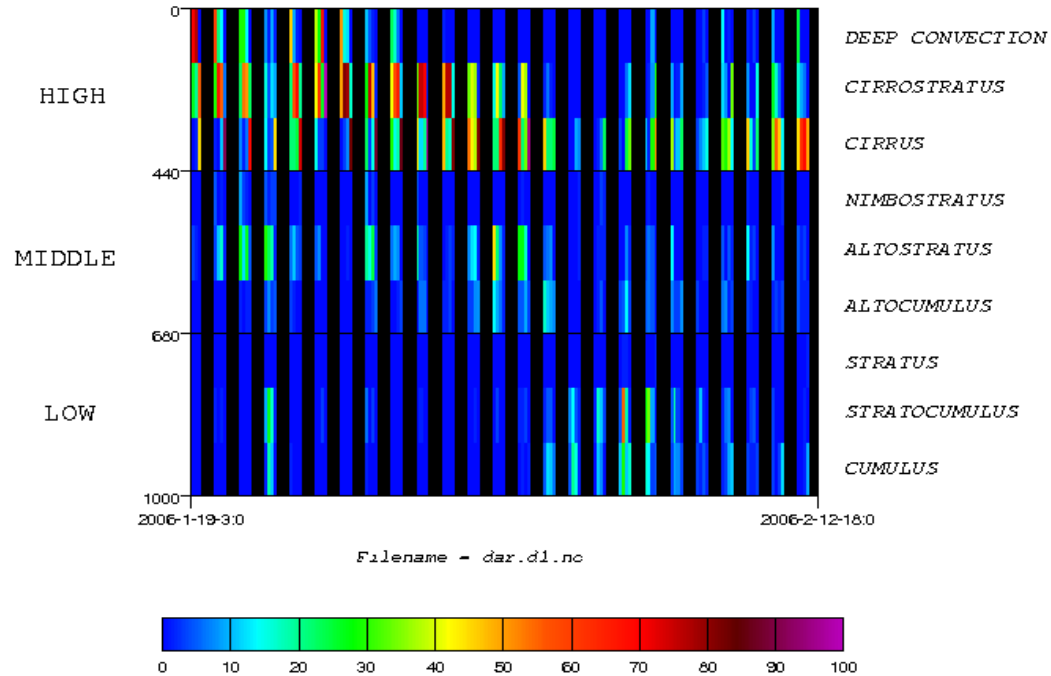
March 1 – 4, 2000, SGP

ISCCP near the all ARM sites

ISCCP Data

Lat: -13.75
Lon: 128.75

D1 ISCCP DATA AT THE DARWIN SITE
(Percent Cloud Cover)



Available in the ARM archive

Questions????

Survey Results

1. Data used by CMWG
2. Future forcing data development

Data Used by CMWG Members (total 18 responses)

--- Popular VAPs in CMWG ---

- VAR ANAL: 18
- ARSCL: 12
- MICROBASE: 9
- MWRRET: 6
- BAEBBR: 5

--- Less than 3 groups used ---

- QCRAD
- MFRSR CLDOD
- RLPROF
- LS SONDE
- Merge-sounding
- SW DIFF CORR
- SW FLUX ANAL

--- PI and other analysis data ---

- MACE SGP cloud retrievals
- Mather/McFarlane TWP heating profiles
- Liu's ice water content retrieved from satellite data
- C-POL radar retrievals
- McFarquhar's aircraft data
- ABRFC precipitation
- RUC analysis

--- Desirable Data ---

- BBHRP
- 3-D clouds
- Data for evaluating surface land model

Vote Results for Future Forcing Developments

(total 17 votes)

	Total votes	# of votes (≥ 4)	Effort needed
• Long-term at SGP	59	9	1yr data/month
• CLASIC:	51	9	3-5 months
• ISDAC	46	7	1 months
• AMF China	37	4	unknown
• AMF AMMA	34	4	unknown

Long-term forcing at TWP (will work with Christian Jakob's group)

THE END