

CEOP Model Validation and Data Integration

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Workshop Overview

- ◆ EOP3 Reference Site Data Update
- ◆ Modeling and Analysis Centers Update
 - Status of data, Issues in File Transfers
- ◆ Specialized Topics
 - Data Integration
 - Independent Model Evaluation
 - GEWEX Modeling and Prediction Panel (GMPP)
 - Regional Modeling Topics
 - Flux Station Validations

Workshop Discussion

- ◆ Data Transfer to/from MPI
- ◆ File Formats
 - ASCII for MOLTS, but should we use a uniform format, as in S. Williams?
- ◆ Developing an “independent” Model Intercomparison
- ◆ Developing data integration across In-situ, Remotely Sensed and Model-Analysis Data

Data Assimilation vs. Data Integration

- ◆ Data Assimilation
 - Merge prognostic variables into model simulations to derive continuous fields
 - Consider uncertainty to weight the merging process
- ◆ Data Integration
 - Any available data could be integrated
 - Wide variety of tools (services) to utilize data
 - Must handle any data format

Issues for Data Integration

◆ Temporal

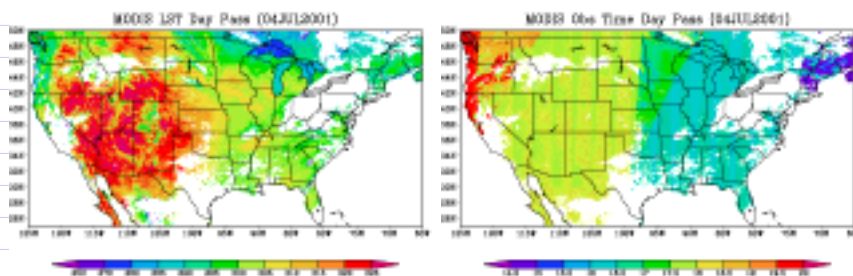
- Varying intervals
- Missing data
- Averaging period or Instantaneous

◆ Spatial

- Different resolutions
- Different mappings
- Missing Obs or No Obs

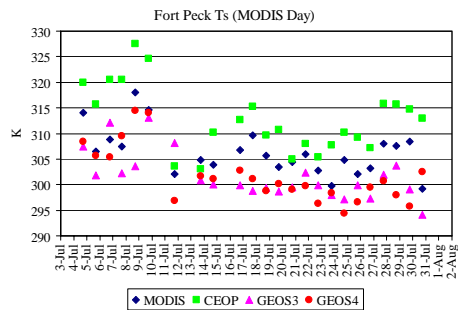
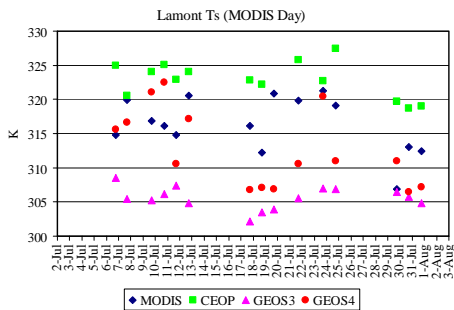
◆ Representativeness

MODIS LST product



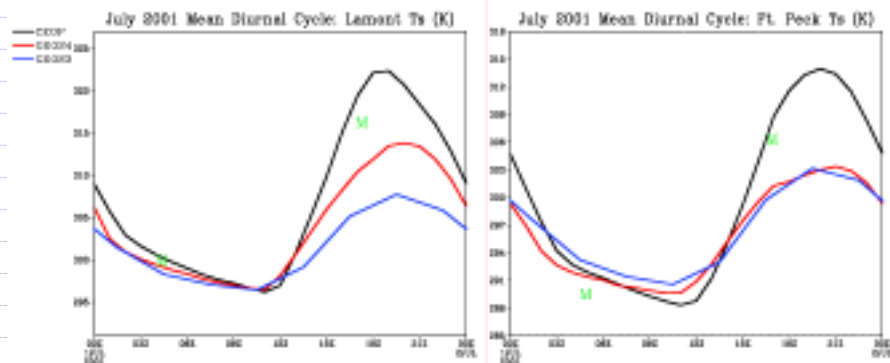
◆ MODIS Day Pass Compared to GEOS3

Site Surface Temperature



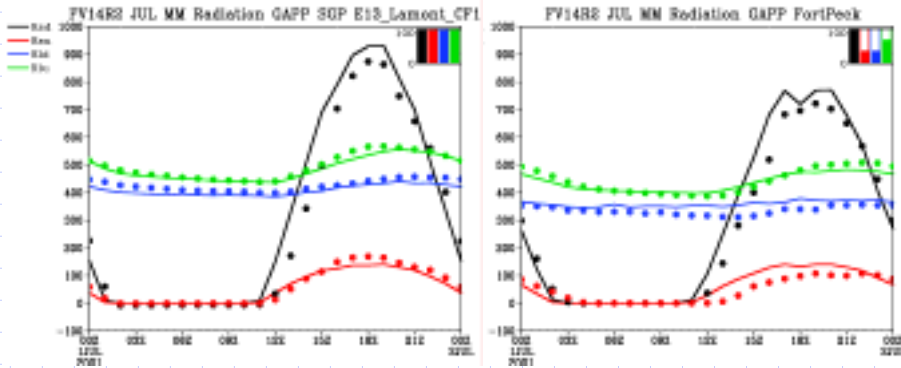
- ◆ MODIS Day Time Passes
- ◆ GEOS4 – Hourly Average
- ◆ GEOS3 – 3-hourly Average

Mean Diurnal Cycle



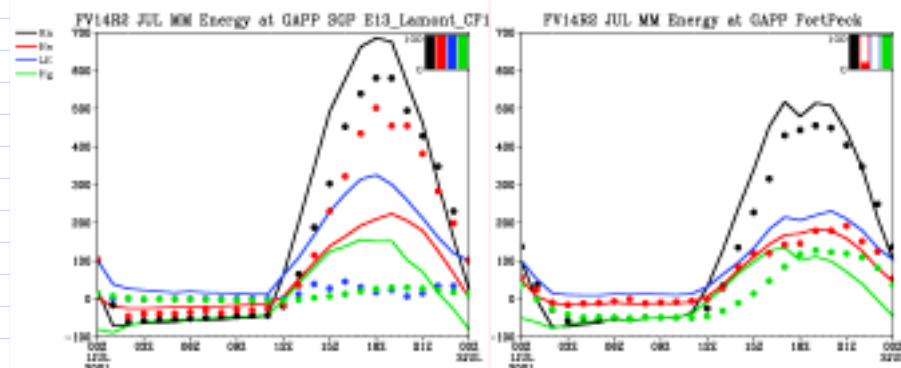
- ◆ Missing observed data not considered in model calculations

Mean Radiation Diurnal Cycle



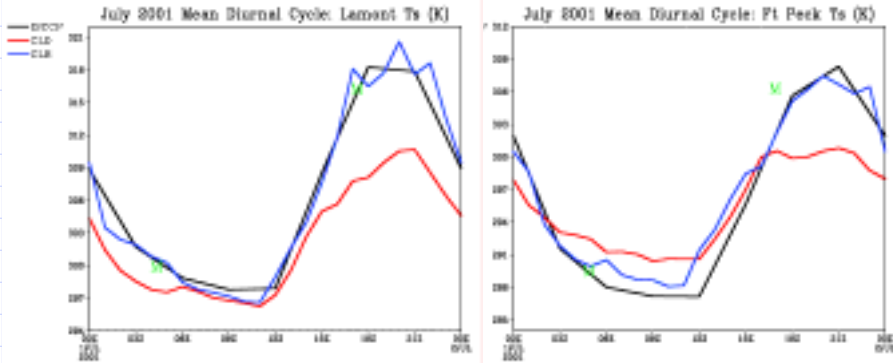
◆ GEOS4 and CEOP monthly mean diurnal cycles

Turbulent Flux Diurnal Cycle



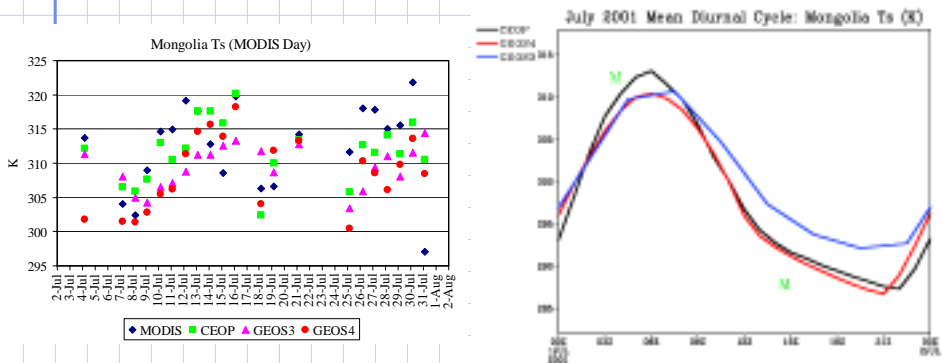
- ◆ At the ARM SGP site, too much latent heating, not enough sensible heating
- ◆ Anomalous Lamont mid-month Precip. event

Cloud Interactions at the Surface



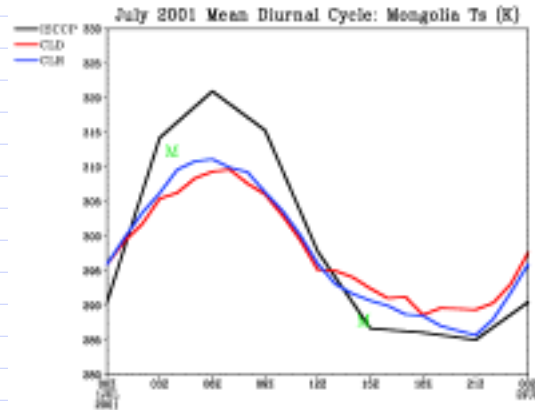
- ◆ ISCCP Skin Temperature (3-hourly)
- ◆ Data is Clear if < 40% cloud fraction

Surface Temperature at CAMP – Mongolia (203)



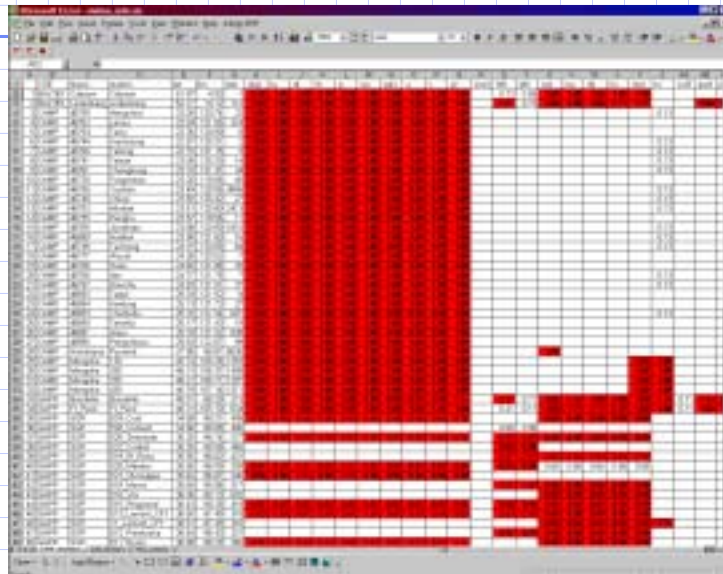
- ◆ Surface T are more clustered
- ◆ Radiation and Flux data not available

Cloud Interactions at Mongolia(203)

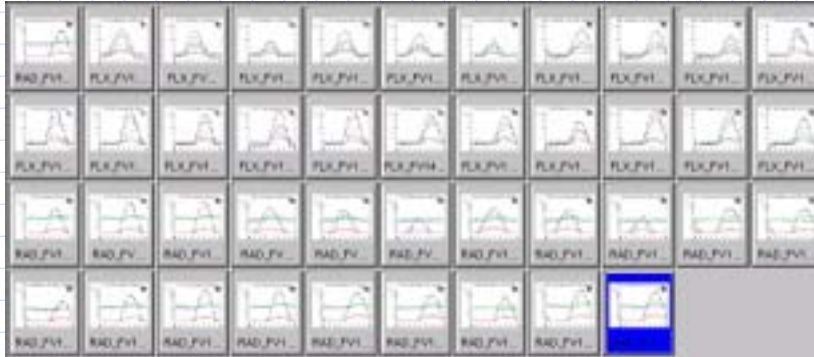


- ◆ 2/3 GEOS4 data is already “clear”
- ◆ No easy answers

Station Vital Info Quick Look



A little more work to do....



- ◆ Flux Data for available stations EOP1
- ◆ Not considering global maps yet

Heterogeneity and Representativeness

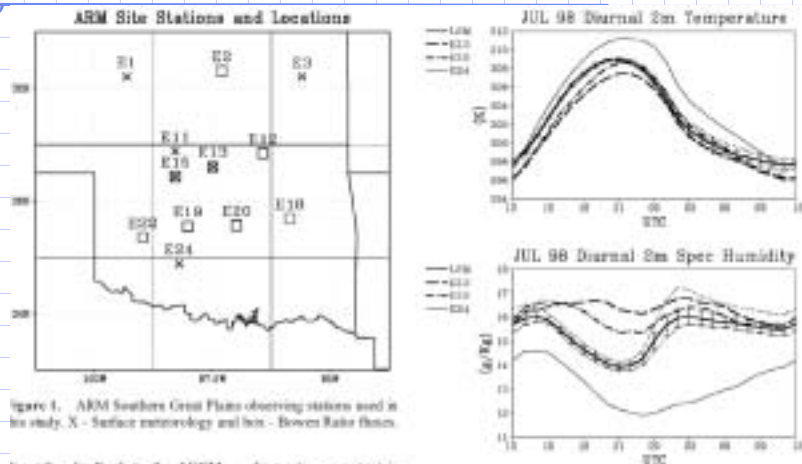


Figure 1. ARM Southern Great Plains observing stations used in this study. X - Surface meteorology and box - Down-Radar fluxes.

ARM Southern Great Plains Data Set: 01/19/94 to 01/31/94

- ◆ From Bosilovich (2002, GRL)

How to implement DI?

◆ Lessons Learned

- AMIP
 - Data centers (including analysis systems)
- ◆ What software and networking is needed?
- ◆ How much data provider input is needed (providing data in a uniform format)?
- ◆ How much user input is required?

Issues in Validation

◆ Validation

- Station Cloud observations not available
- Soil moisture data? (Fort Peck)

◆ Transferability

- Not all Stations have all data which can prevent clear comparisons between regions