

Some Thoughts on Extending and Updating the CLM Forcing Dataset

Aiguo Dai

LMWG, NCAR, Feb. 8, 2010

Approach used by Qian et al. (2006)

- **Data Period:** 1948-2004, 3-hourly, T62
- **T and P:** monthly mean from analyses of station data + sub-monthly variations from 6-hourly NCEP reanalysis interpolated to 3-hourly
- **Observed cloud cover** was used to estimate monthly mean downward surface solar radiation, with satellite-based radiation estimates used to adjust mean biases. Sub-monthly variations from reanalysis
- **Surface wind speed, specific humidity, and pressure** were interpolated directly from 6-hourly reanalysis

Suggestions for 1900-present Forcing data

- **Data Period:** 1900-2009, 3-hourly, $1^\circ \times 1^\circ$
- **Monthly data: need homogenized data**
 - **T:** CRU 1° climatology + CRU dT (on 5° grid, used for IPCC), avoid using CRU 1901-2002 gridded T products (not suitable for long-term change analyses)
 - **P:** GPCP product: 1901-2007; NCEP CPC product: 1948-present; GPCP v2.1: 1979-present; CRU product: 1901-2002; Dai product: 1850-1995. Need compare and merge them.
 - **cloud cover:** sparse and unreliable before ~1950
 - **sfc. V, q, and Ps:** First step: interpolated directly from 6-hourly reanalysis;
Future improvements: using monthly analysis of sfc. obs.

Suggestions for 1900-present Forcing data - cont'd:

- **Sub-Monthly data:** T, P, S, V, q, Ps
 - Interpolated from reanalysis data:
 - 1958-1987: ERA-40
 - 1988-present: ERA-Interim
 - 1948-1957: NCEP/NCAR reanalysis
 - 1900-1947: Gil Compo's reanalysis