MM5I simulations for NARCCAP

William Gutowski

Iowa State University

Model Features

- Dynamics: Non-hydrostatic (like 2 others)
- Spectral nudging? No (like 3 others)
- Vertical levels: 23 (others: 18 – 35)
- "Sponge zone": 4 grid points (4 – 15)
- Land model: NOAH, 4 layers (like 2 others)
- Convection: Kain-Fritsch2 (unique)
- Cloud microphysics: Dudhia simple ice (unique)
- Boundary layer: Hong-Pan, non-local K (like 1 other)

MM5-UDEL Winter Temperatures
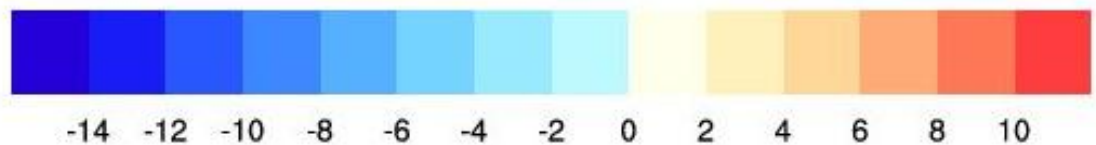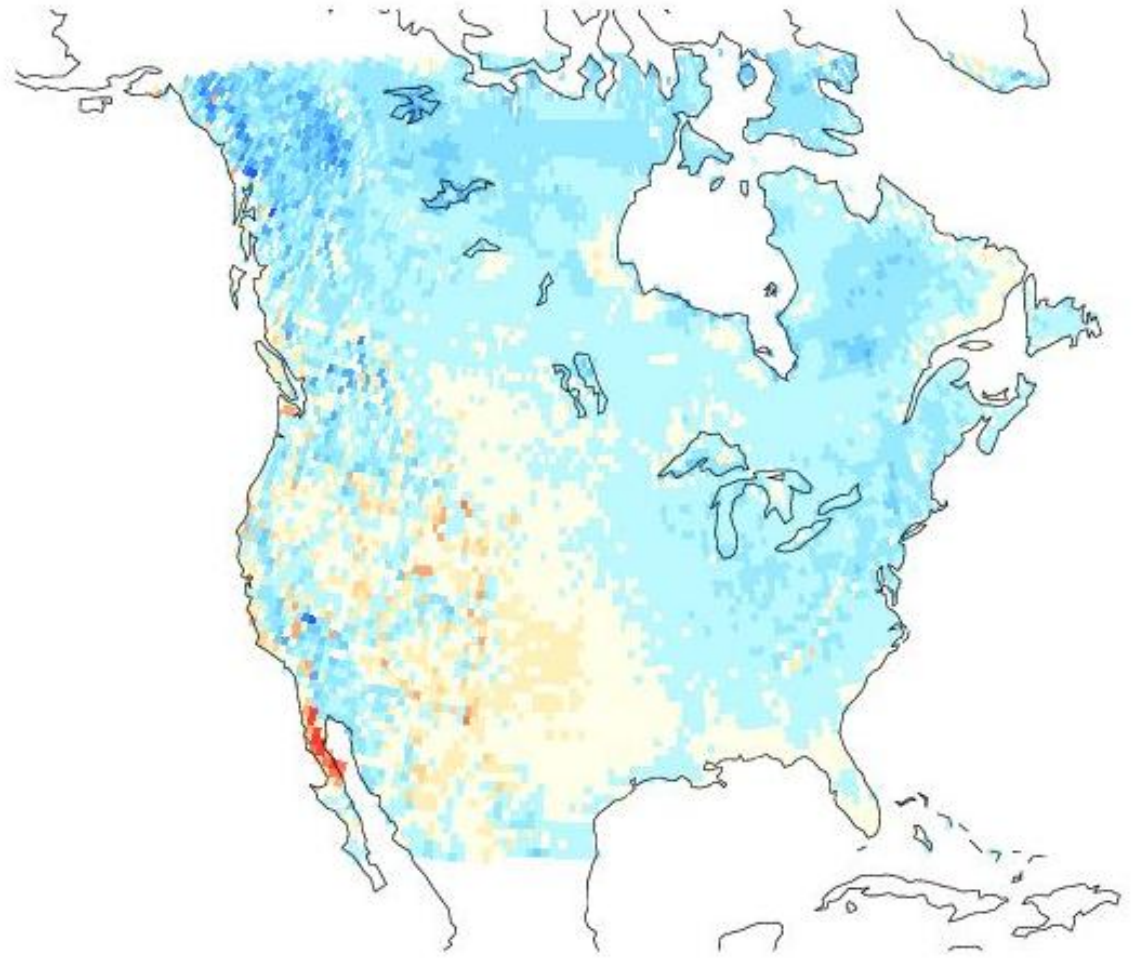

Temperature Bias [˚C] DJF

Spatial RMSE = 2.8˚C
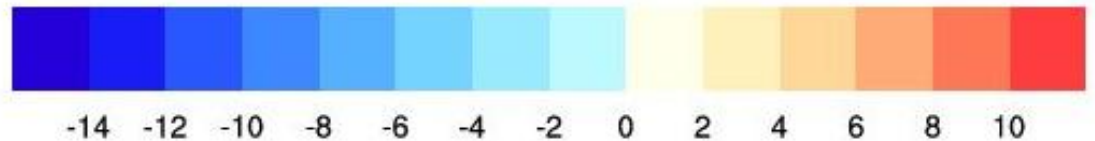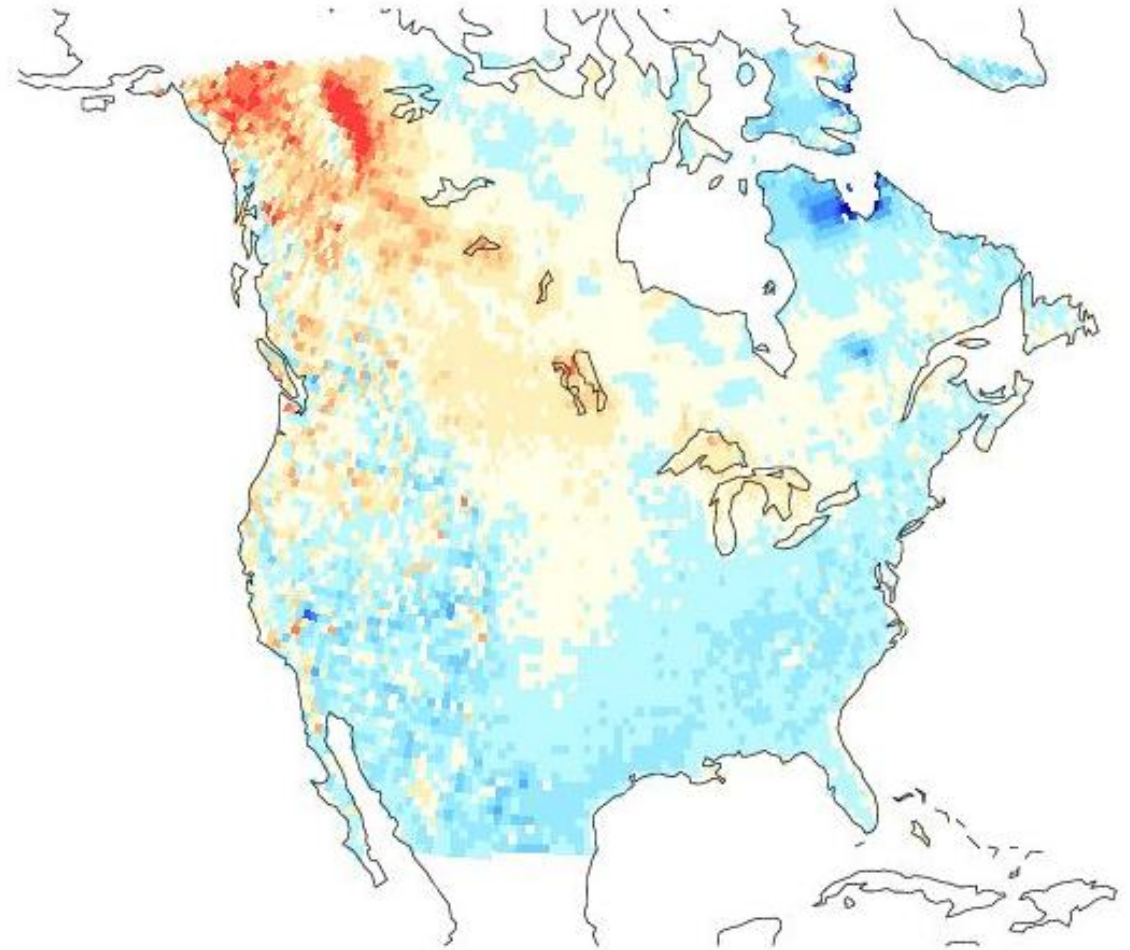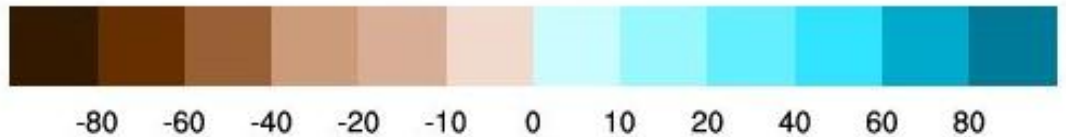
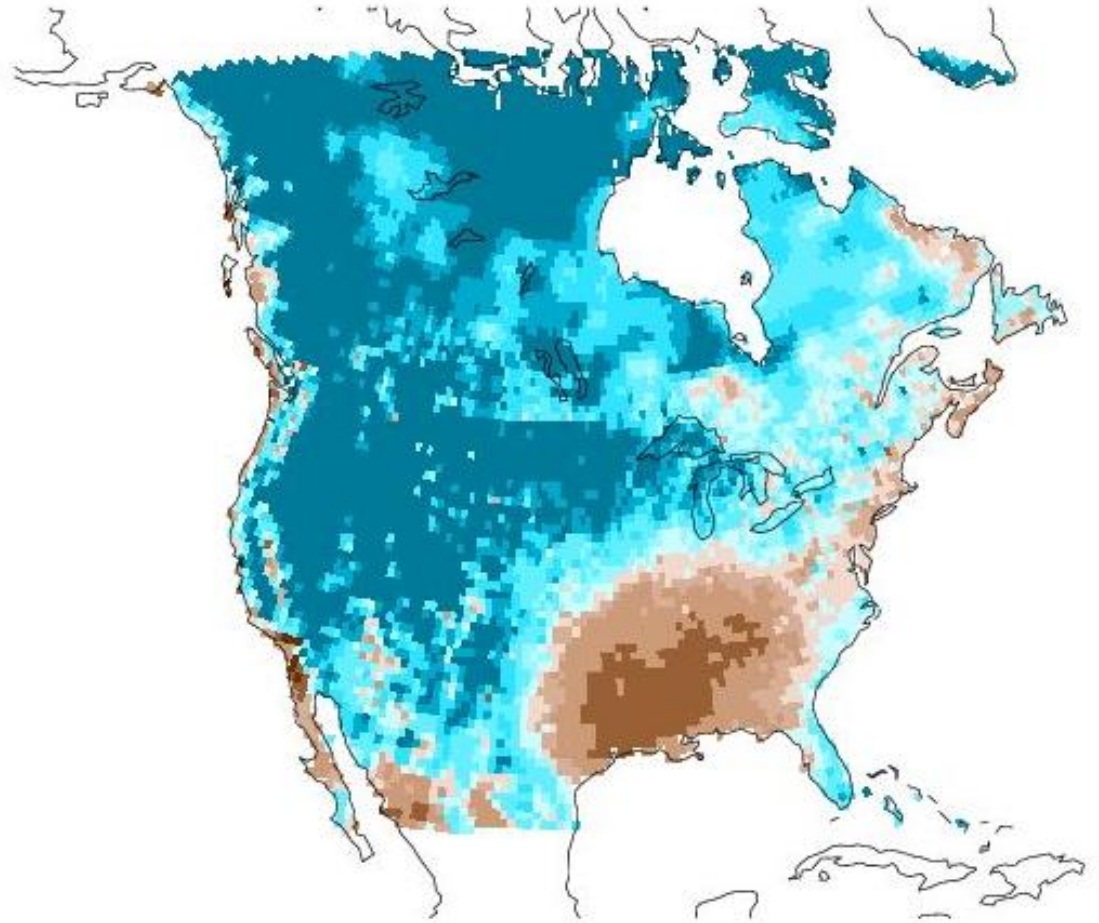# MM5-UDEL Summer Temperatures

Temperature Bias [˚C] JJA

Spatial RMSE = 2.3˚C

Precipitation Bias [%] DJF

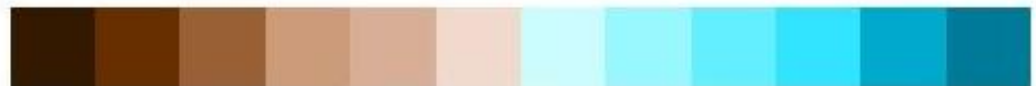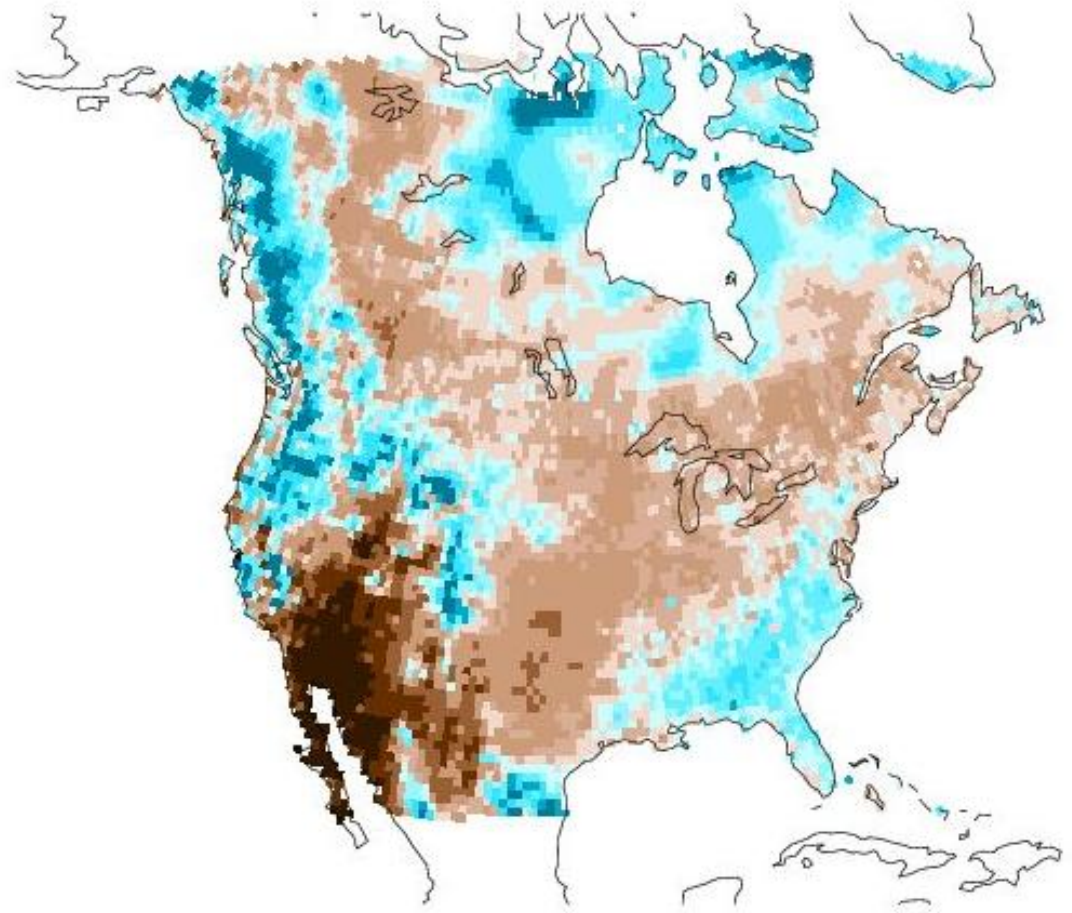Spatial RMSE = 1.1 mm/d

% Difference MM5-UDEL Winter Precipitation

Precipitation Bias [%] JJA

Spatial RMSE = 0.6 mm/d

% Difference MM5-UDEL Summer Precipitation
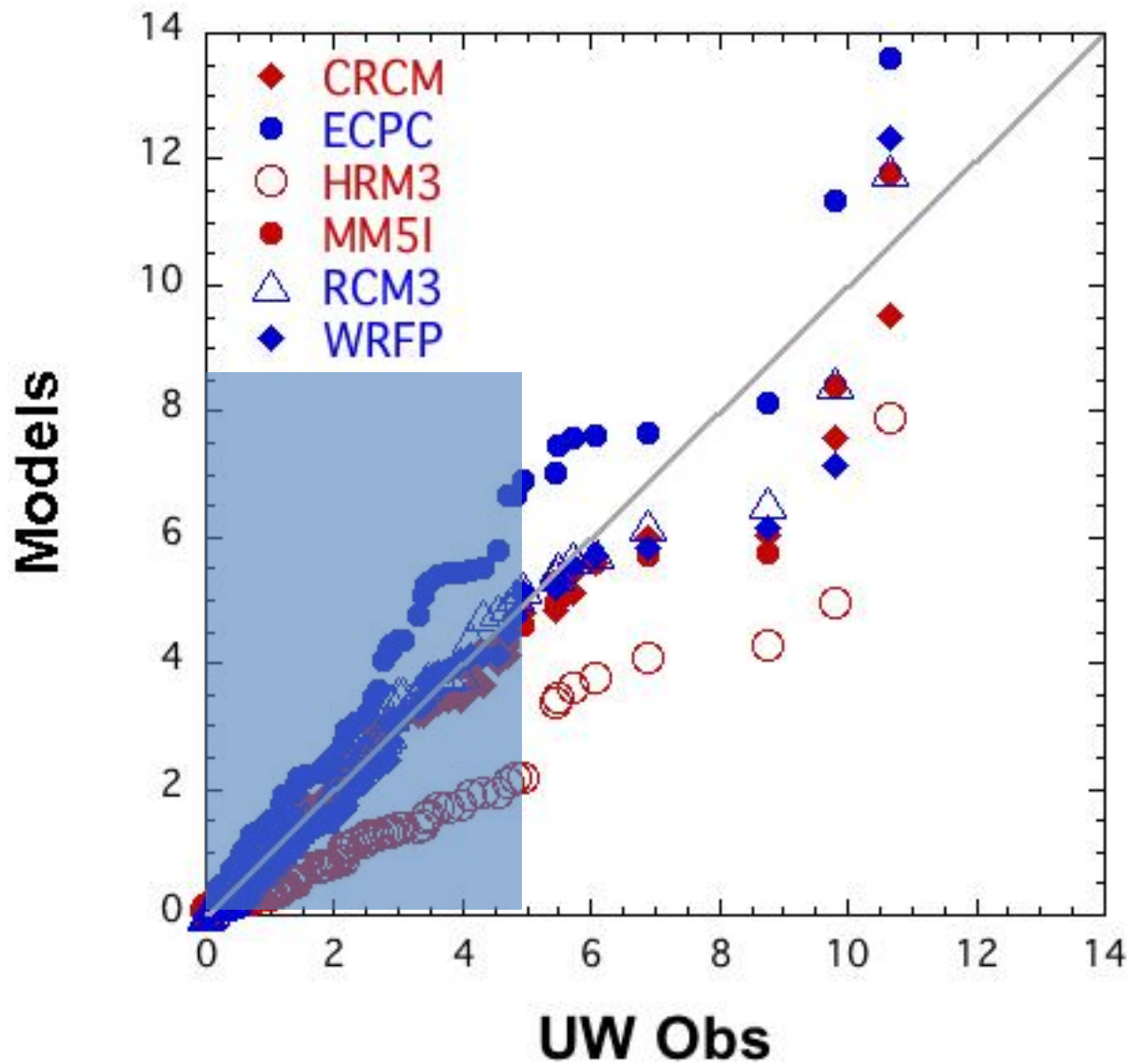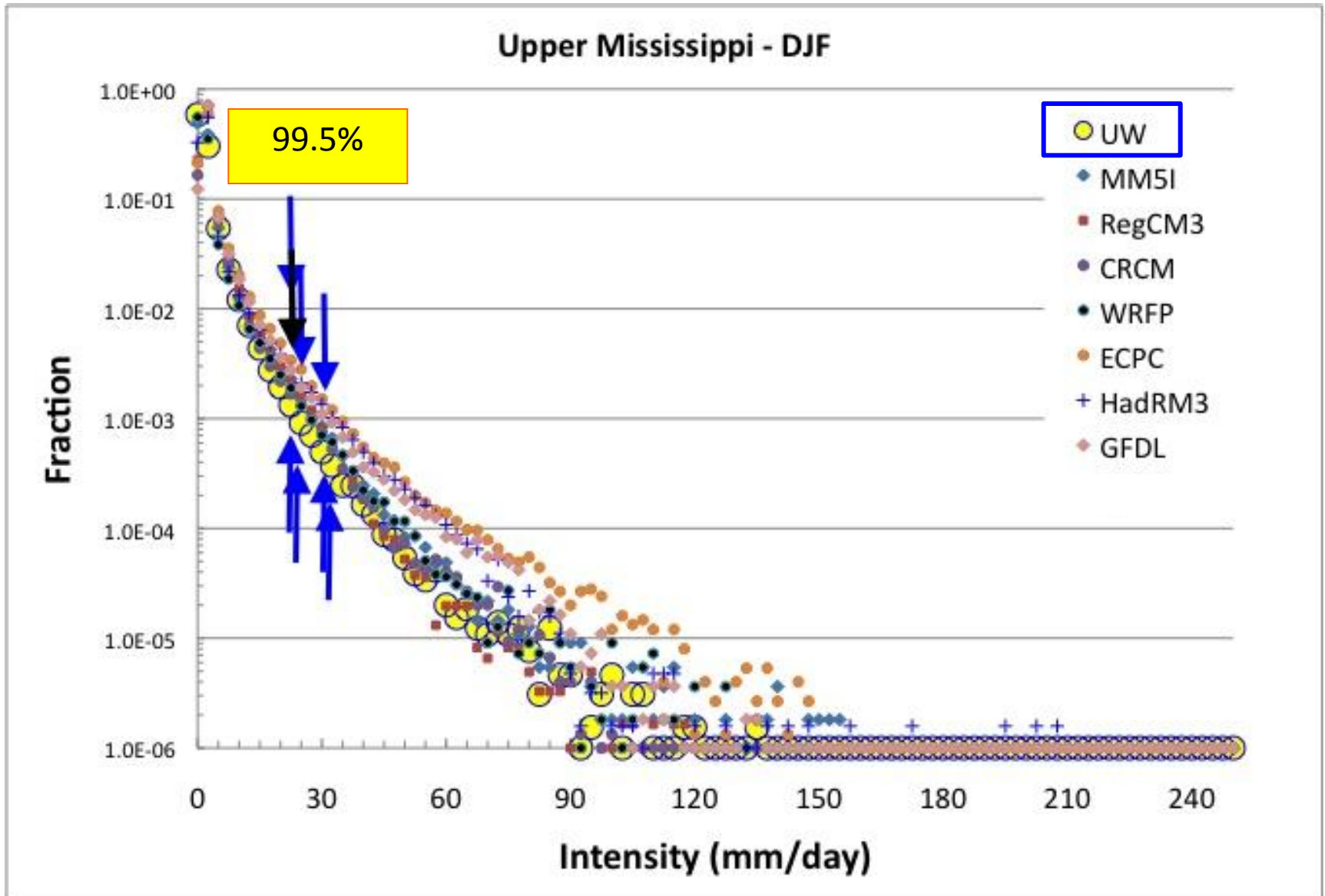
-80 -60 -40 -20 -10 0 10 20 40 60 80

Ranked Monthly Precipitation – Coastal CA

Precipitation Frequency vs. Intensity

Upper Mississippi - DJF

Caution: Snow depth (SND)

❋ The model did not save snow-water equivalent.

❋ It saves an estimated depth of the snow (SWE / snow density)

Final Remarks

◆ MM5I tends to fall in the middle in overall statistics …

◆ … but note regional differences. (This should not be interpreted to simply use the "best" model for a region.)

◆ See Melissa's talk for some MM5 problems

Analyses at an advanced stage (see posters)

◆ Extreme Winds:
Rachel Hatteberg (Gene Takle)

◆ Extreme Precipitation:
Sho Kawazoe (Bill Gutowski)