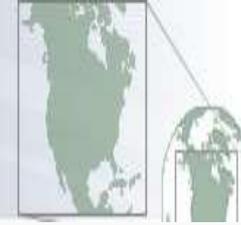




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The Experimental Climate Prediction Center Regional Spectral Model (ECPC-RSM) Contribution to the North American Regional Climate Change Assessment Program (NARCCAP)

Ana Nunes and John Roads

Scripps Experimental Climate Prediction Center (ECPC)

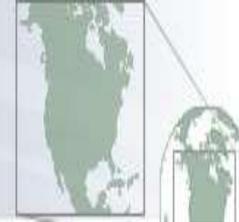
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ECPC-RSM Initial Efforts

- Phase I:
- The ECPC-RSM 26-year simulation (from 0 UTC Jan 1st, 1979 to 0 UTC Jan 1st, 2005) using NCEP/DOE AMIP II (R-2) boundary conditions is complete; and the table 2¹ + zg500² variables were sent to the data storage.
- Initial RCM evaluation started. Processing remaining tables.
- Output storage managed by LLNL.

We thank the NARCCAP teams at NCAR and LLNL, and especially at the Iowa State for their support during this phase.

¹ I. e., precipitation, 2-m specific humidity and air temperature, surface downwelling sw radiation, 10-m zonal and meridional wind speed, and surface pressure.

² From table 3, 500-hPa geopotential height.



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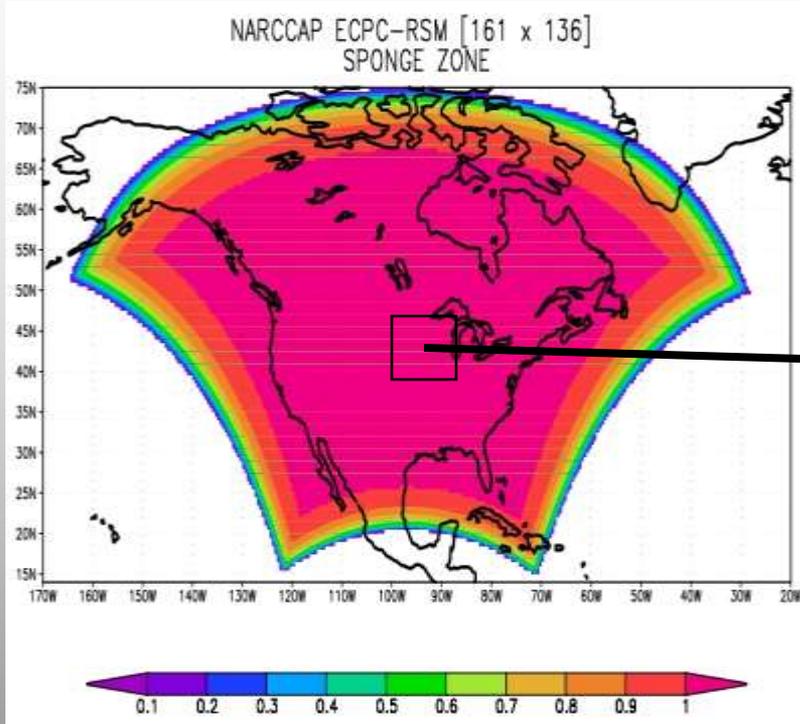
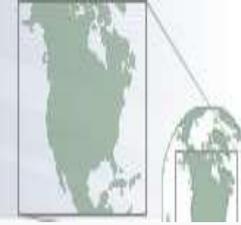


ECPC-Regional Spectral Model: CVS Version 2005

Hydrostatic, Primitive Equations (RSM; Juang and Kanamitsu 1994)	50-km resolution, 28 vertical layers; 4-min resolution orography	Noah Land- Surface Model (Mitchell et al. 2004); 4- soil layers	Simplified Arakawa- Schubert cumulus convection scheme (SAS; Pan and Wu 1995)	Boundary Forcing: Scale- Selective Bias Correction (Kanamitsu and Kanamitsu 2007)
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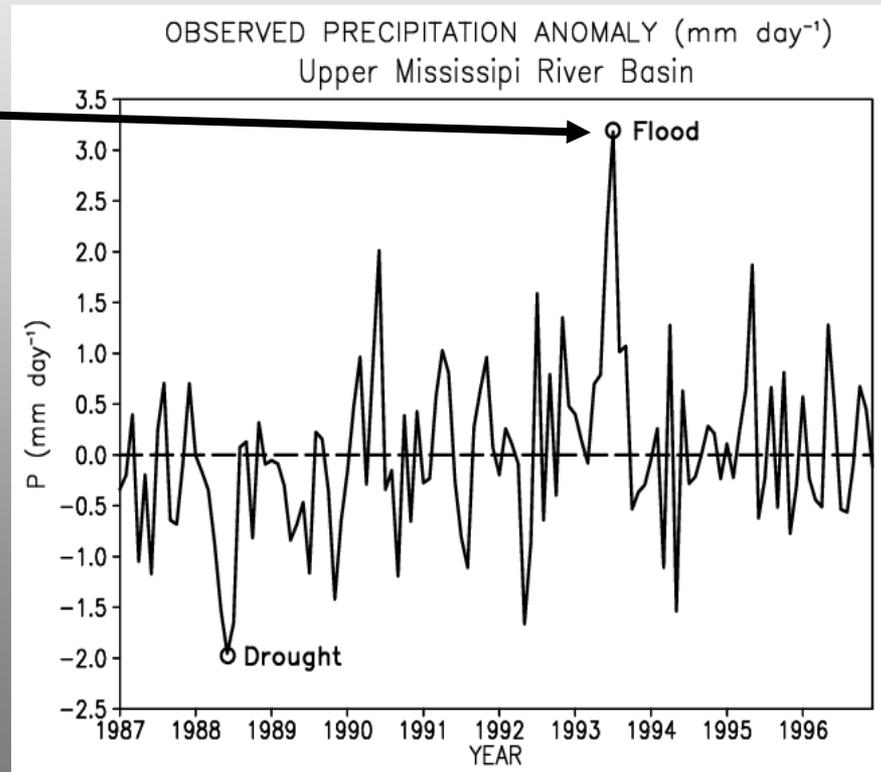


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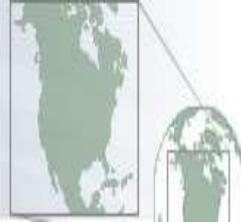
On the left is the model domain for the 50-km/28-layer regional climate simulations.

The NOAA Climate Prediction Center (CPC) provided the precipitation analysis from which the 1987-1996 anomalies were calculated.



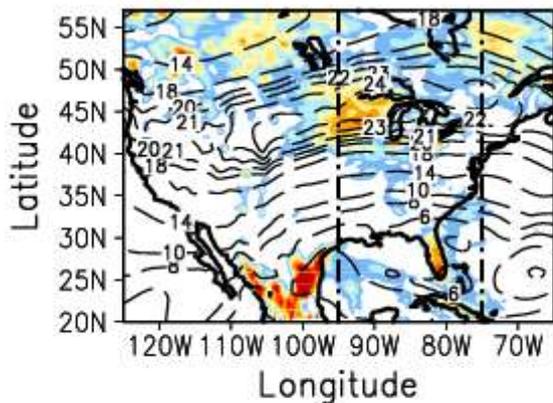


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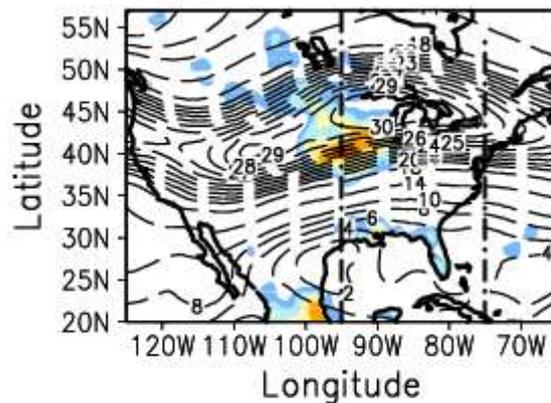


JJ 1993 Precipitation (mm day^{-1})
200-hPa Isotachs (m s^{-1})

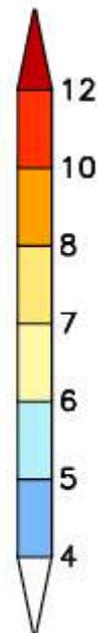
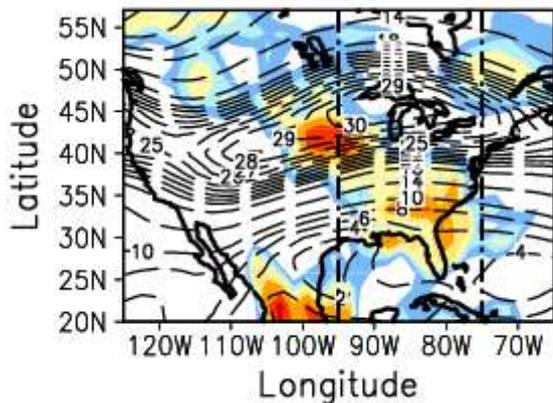
(a) ECPC-RSM



(b) NARR

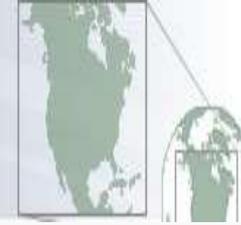


(c) R-2





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Remarks

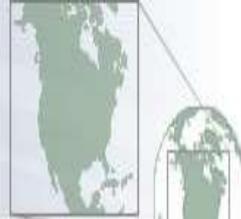
The increased rainfall over the upper Mississippi River Basin during the 1993 summer was directly related with the location and intensity of the upper-level jet (well south of the normal summer location). The ECPC-RSM showed a weaker jet streak, with a precipitation core shifted to north of its observed location seen in NARR and R-2.

Acknowledgments

This research used NCEP/DOA AMIP-II reanalysis obtained from the NCEP (NOMADS2) data server, and the NCEP NARR data from <http://www.emc.ncep.noaa.gov/mmb/rreanl>.

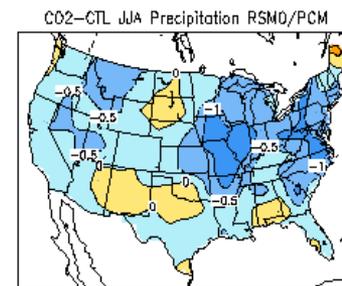
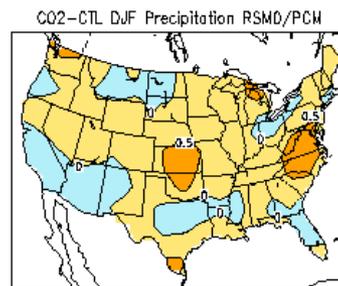
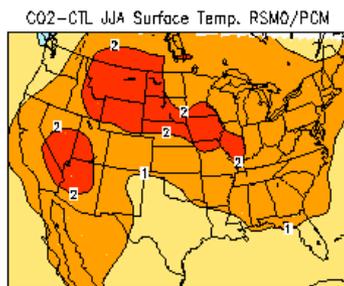
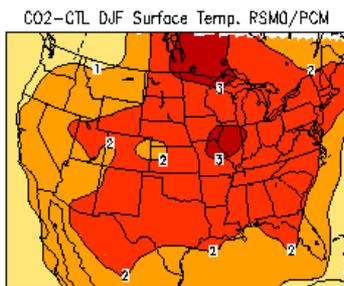
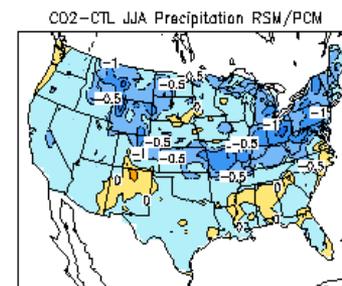
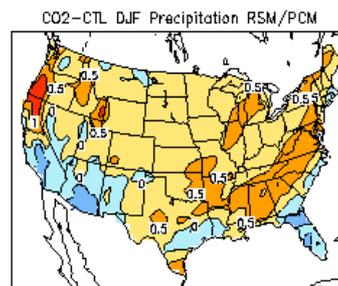
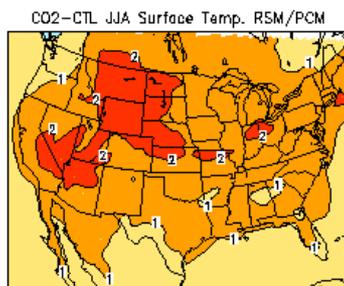
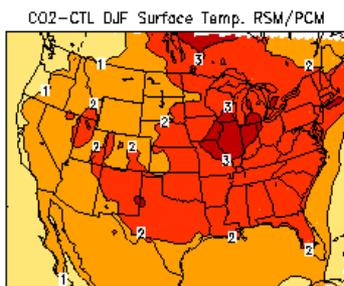
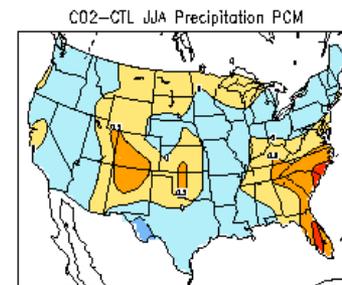
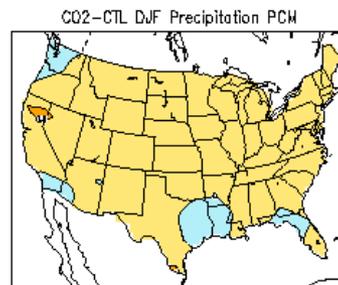
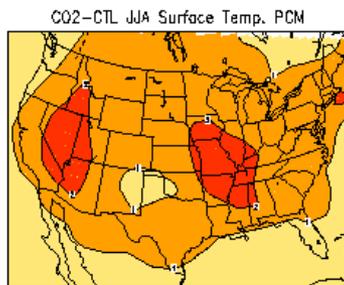
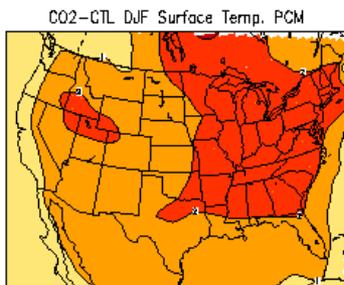


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ECPC-RSM AOGCM Forced Runs

- Phase IIa: control [1971-2000] and future climate [2041-2070] runs
- ECPC-RSM will be using initial and boundary conditions from the GFDL CM2.1 and the NCAR CCSM3, over the chosen domain, respectively, for the regional climate simulation of the present or control climate and SRES A2 future climate projections.
- The ECPC-RSM present climate simulation driven by the GFDL will start in March 2008 followed by the NCAR CCSM3 driven run in late spring.
- The RSM driven by the SRES A2 future climate will start toward the fall and winter of 2008.



Seasonal (winter and summer) climate sensitivity in surface temperature and precipitation with increased (~36%) CO₂ concentration from the PCM, RSM/PCM, and RSM0/PCM simulations.