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Evaluation of the coupled CWRF-Crop modeling system

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The crop growth models, GOSSYM for cotton and DSSAT CERES for maize, were re-engineered in software, improved in physics, and coupled with the state-of-the-art Climate extension of the Weather and Research Forecasting model (CWRF). This poster will first describe the major changes that lead to the final distributed crop with interactive climate modeling system for efficient parallel supercomputing. It will then present an initial evaluation of the new crop models over the United States based on the standalone simulations as driven by the observational reanalysis of climate conditions. The results show that the modeled yields on average during 1979-2005 are within ±10% of observations over virtually the entire Cotton and Corn Belts. Their interannual variations are significantly correlated with observations over most crop grids, with 87% for cotton and 88% for corn. The new models also faithfully represent the crop responses to the major climate (temperature and precipitation) stresses. This lays a solid foundation for further physics improvements and more rigorous evaluation such that the fully coupled system can be applied to better predict climate-crop interactions. For a poster in Session C10: Land, Water and Climate (Conveners: D. Lawrence, P. Kabat). Corresponding author address: Dr. Xin-Zhong Liang, Earth System Science Interdisciplinary Center, University of Maryland, 5825 University Research Court (Suite 4001), College Park, MD 20740. E-mail: xliang@umd.edu, Phone: 301-405-6300.