P24 Initial development for simulating land surface change impacts on climate in the northern plains.

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Over the past several decades, the coverage of crops has changed dramatically over the Northern Great Plains (NGP). In North Dakota for example, barley and wheat acreages have decreased while leafier plants such as corn and soybeans have seen increases in planting. The leafier crops are more effective at evapotranspiration, and this interaction between the soil and the atmosphere modifies the atmospheric boundary layer. Most notably, recent decades have seen increases in precipitation and minimum temperatures across the region. Prior studies suggest that at least some of this signal is due to land cover (crop) changes. The Weather Research and Forecasting (WRF) model is used to downscale a member of the CESM climate model. Initial yearly simulations are performed using standard model settings at 12 km grid spacing (2001-2005) in the NP region. Next, simulations are performed including the Noah-MP-Crop model to simulate dynamic crop growth. Comparisons are made between the models and the crop growth parameters are adjusted to better suit the types of genetic hybrid crops grown in the NGP region.