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## The Sensitivity of Regional Climate Projections to SSP-Based Land Use Changes in the North American CORDEX Domain

Melissa Bukovsky<sup>1</sup>, Linda Mearns<sup>1</sup>, Jing Gao<sup>2</sup>, and Brian O'Neill<sup>3</sup>

<sup>1</sup>UCAR/NCAR, RISC, Boulder, United States of America (bukovsky@ucar.edu)

<sup>2</sup>Department of Geography and the Data Sciences Institute, University of Delaware, Newark, USA

<sup>3</sup>Josef Korbel School of International Studies, Pardee Center for International Futures, University of Denver, Denver, USA

In order to assess the combined effects of green-house-gas-induced climate change and land-use land-cover change (LULCC), we have produced regional climate model (RCM) simulations that are complementary to the North-American Coordinated Regional Downscaling Experiment (NA-CORDEX) simulations, but with future LULCCs that are consistent with particular Shared Socioeconomic Pathways (SSPs). In standard, existing NA-CORDEX simulations, land surface characteristics are held constant at present day conditions. These new simulations, in conjunction with the NA-CORDEX simulations, will help us assess the magnitude of the changes in regional climate forced by LULCC relative to those produced by increasing greenhouse gas concentrations.

Understanding the magnitude of the regional climate effects of LULCC is important to the SSP-RCP scenarios framework. Whether or not the pattern of climate change resulting from a given SSP-RCP pairing is sensitive to the pattern of LULCC is an understudied problem. This work helps address this question, and will inform thinking about possible needed modifications to the scenarios framework to better account for climate-land use interactions.

Accordingly, in this presentation, we will examine the state of the climate at the end of the 21<sup>st</sup> century with and without SSP-driven LULCCs in RCM simulations produced using WRF under the RCP8.5 concentration scenario. The included LULCC change effects have been created following the SSP3 and SSP5 narratives using an existing agricultural land model linked with a new long-term spatial urban land model.