

## 2020 EOL Seminar Series

### THE GREAT PLAINS IRRIGATION EXPERIMENT (GRAINEX): LAND COVER CHANGE AND ASSESSING IRRIGATION IMPACTS ON THE PLANETARY BOUNDARY LAYER ATMOSPHERE

#### Prof. Rezaul Mahmood

School of Natural Resources, University of Nebraska-Lincoln  
Director, High Plains Regional Climate Center

DATE: May 12, 2020

TIME: 2:30 - 3:30 pm MT

WEBCAST: [www.ucar.edu/live?room=f121022](http://www.ucar.edu/live?room=f121022)



#### ABSTRACT

Land use land cover change (LULCC) plays an important role in the climate system. Impacts of LULCC can be observed at all spatio-temporal scales. It is found that LULCC can both increase and lower the long-term maximum temperature over a region by changing energy partitioning (latent vs. sensible energy flux). LULCC also changes timing and location of convection and amount of precipitation. These impacts can be observed at the meso-, regional-/sub-continental scale. LULCC may also remotely impacts sub-continental scale climate. Moreover, as demand for food has increased globally, irrigated agriculture has also expanded in many regions of the world.

In 2017, we launched the NSF funded project GRAINEX which was designed to investigate the impacts of the rapid commencement irrigation and subsequent sustained irrigation on the evolution of planetary boundary layer atmosphere in an extensively irrigated region of the Northern Great Plains, specifically in Nebraska. To fulfill the objective of this study, we collected field data during the growing season of 2018 in collaboration with the NCAR Earth Observing Laboratory, the Center for Severe Weather Research (CSWR) and the University of Alabama in Huntsville. In addition to analysis of observed data, we are currently conducting model simulations to further understand the impacts of irrigation on the atmosphere.

I will discuss the early results from this study which suggest that irrigation has modified near surface energy balance, temperatures, atmospheric heat content, various other measures of lower atmospheric moisture content, and potentially precipitation.

**Webcast:** [www.ucar.edu/live?room=f121022](http://www.ucar.edu/live?room=f121022)

For more information, contact Melissa Ward: [mward@ucar.edu](mailto:mward@ucar.edu)