



Title: Machine learning approaches to crop yield prediction and climate change impact assessment on agriculture

Date/Time: February 7, 2018 12:30 – 2:00 PM (ET)

Speakers: Andrew Crane-Droesch, USDA

Chair: Mike Bellow, USDA

Sponsor: WSS Agriculture and Natural Resources

Abstract: Crop yields are critically dependent on weather. A growing empirical literature attempts to model this relationship in order to project the impacts of climate change on agriculture. Approaches heretofore have used classical statistical and econometric methods. Here we describe an approach to yield modeling using a semiparametric variant of a deep neural network, which can simultaneously account for complex nonlinear relationships in high-dimensional datasets, as well as known parametric structure and cross-sectional heterogeneity. Using data on corn yield from Iowa and Illinois, we show that this model outperforms both parametric models and nonparametric machine learning algorithms in predicting yields out-of-sample. Using simulated weather data from a climate model, we show that yield projections to the end of the 21st century vary substantially by the statistical model used.

Location: Bureau of Labor Statistics Conference Center, Room 9

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