“Bayesian spatio-temporal modeling for blending in-situ observations with satellite precipitation estimates”

Abstract:

Traditionally, precipitation amount is measured with a precipitation gauge. While gauge measurements provide the most reliable point observations of precipitation, gauge data suffer from several problems including that the data are only available at limited sites. Satellite observations of infrared and microwave radiance have been used successfully to retrieve precipitation information. The satellite based precipitation estimates/data sets provide better representation of the precipitation field (the spatial variability), although they also contain non-negligible errors because of the indirect nature of the relationship between observations and precipitation, and because of the inadequate sampling and algorithm imperfections. Blending satellite precipitation estimates that have better spatial coverage with in situ gauge data that have better temporal coverage has become the most promising approach to produce a gridded precipitation data set that can well represent both the temporal and spatial variations of precipitation over regions of insufficient gauge density. In this talk, we first review the latest development in blending satellite precipitation estimates with in situ gauge data. We then propose a methodology for blending in-situ gauge precipitation measurements with satellite precipitation estimates in a region, which uses a Bayesian spatio-temporal model. A fast and simple procedure is proposed for implementing the proposed methodology. The evaluation study has confirmed that the use of the new method has helped to improve the quality of the prediction when the available gauge stations are very sparse. Moreover, the proposed methodology can be easily extended to blend in-situ gauge observations with satellite estimates for other types of climate data.

(This talk is based on joint work with B. Jin, B. Miao, X. L. Wang, and P. Guo)

Friday, September 26, 2014
3:00 PM in 372 Jabara Hall

Please come join us for refreshments before the lecture at 2:30 p.m. in room 353 Jabara Hall.