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**Department of Mathematics and Statistics**

**COLLOQUIUM**

**Tuesday, March 10th, 2015**

4:00 – 5:00 pm, Adel Mathematics Bldg., Room 164

(refreshments at 3:45)

Dr. Jarrett Barber

Arizona State University

**Emulating an individual based model of tree growth**

Abstract: We wish to use large data sets to inform an individual based model for learning about tree growth and forest dynamics over regional scales and more broadly. The computational complexity of our model and our regional scope make traditional approaches to Bayesian estimation and forecasting, e.g., MCMC, practically infeasible. To address the computational issue, we borrow perspective from the complex computer experiments literature to view our model as a complex simulator for which the goal is to create a computationally more tractable emulator model. From this perspective our situation is relatively unique because we can run our simulator a relatively large number of times, and we have a large number of actual observations, two situations that are relatively rare in this context. Consequently, with many data and simulator runs, the familiar use of Gaussian processes as the basis of emulation becomes problematic. We will review the emulator literature and explore initial efforts to develop an emulator to calibrate our simulator and to predict tree growth.

Keywords: Bayesian; emulator; meta-model; surrogate model; tree growth; tree traits

Applied Math Seminar (AMS) cancelled Thursday March 12th.

Friday Afternoon Undergraduate Mathematics Seminar (FAMUS) cancelled Friday March 13th.