

SEMINAR ANNOUNCEMENT

Title: Modeling and Spatial Prediction of Pre-Settlement Patterns of Forest Distribution using Witness Tree Data

Speaker: Professor Stephen L. Rathbun
Department of Statistics
Pennsylvania State University

Date: Friday, April 22, 2005

Time: 4:00 pm – 5:00 pm

Location: Monroe Hall (2115 G Street NW), Room 206

Abstract: Prior to European settlement, land surveys were conducted throughout the United States. These surveys include records of witness trees at grid intersections, providing quantitative information on pre-settlement forest composition and species-site relationships. Such information can provide insight into environmental factors influencing the distributions of each tree species, free from European influences. Assuming that the locations trees of each species are realized from independent inhomogeneous Poisson processes whose respective log intensities are linear functions of environmental covariates (i.e., elevation, land form, and province), the species observed at the survey-grid intersections are independently sampled from generalized logistic regression model. A model for all 68 species found in the survey would be highly over-parameterized, so only the distribution of the most common species, longleaf pine, will be considered at this time. To assess the impact of environmental factors not included in the model, a hidden Gaussian Markov random field shall be added as a random effect. A Markov Chain Monte Carlo algorithm is developed for Bayesian inference on model parameters, and Bayes posterior prediction of the distribution of longleaf pine in southeastern Alabama.

Directions: Foggy Bottom-GWU Metro Stop on the Orange and Blue Lines. The campus map is at <http://www.gwu.edu/~map>.

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