

## **STATISTICS SEMINAR**

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**Fish, Wildlife, & Conservation Biology  
and Statistics, Colorado State University**

**Thursday, September 3, 2015**

**Dickens Hall, Room 207, 4:00-5:00 pm**

**Refreshments: Dickens 108, 3:30-4:00 pm**



### **Spatio-temporal Statistics for Ecological Data**

Ecological processes are dynamic in both space and time. Spatio-temporal statistical models capture these dynamics, but many challenges exist to obtain reliable statistical inferences. Here I demonstrate two examples of spatiotemporal statistical models used to map and understand the spread of chronic wasting disease in white-tailed deer and habitat requirements for one of the rarest species of bird in the world—the whooping crane. Motivated by these two examples, I provide an overview of challenges including spatial confounding, location error, non-ignorable missing data, and infinite maximum likelihood estimates. These challenges inspired methodological developments including the spatial group lasso, calibrated regression, an expert elicitation process, and regularization methods for Poisson point process and generalized linear mixed models.