

APPLIED MATHEMATICS COLLOQUIUM

Date: Wednesday, October 26, 2016

Time: 2:30 – 3:30 p.m.

Location: Middlesex College Room 204

Markov chains, mark-recapture, and misidentification: why I am Bayesian and now you could be too

Professor Simon Bonner

Department of Biology and

Department of Statistics and Actuarial Sciences

University of Western Ontario

Abstract: With four weeks to go before the US Presidential Election Nate Silver's website (fivethirtyeight.com) has predicted that Donald Trump has a 17.2% chance of winning. Statements like this can only be interpreted using the Bayesian interpretation of probability (unless you care to imagine a world in which Donald and Hillary face-off against each other many, many times). Bayesian inference was once hotly debated, but the war has ended and Bayesian methods are now a mainstream part of applied statistics in most areas of the physical, biological, and social sciences. The main driver behind this surge has been the development of general Markov chain Monte Carlo algorithms that allow samples to be drawn from complex, multivariate probability distributions. I will introduce the basic methods of Bayesian inference and discuss why Bayesian methods have been so important in my own research in ecological statistics. In particular, I will focus on my recent work developing new statistical models to analyse data from mark-recapture-like studies of wild animal populations while accounting for possible errors identifying individuals, presenting data from a study of queen snakes as an example of my work.

