A Taster of Bayesian Statistics for the Environmental Sciences (One-day workshop)

Prof Jason Matthiopoulos, University of Glasgow, Scotland

The Laboratory of Ecology is pleased to announce a one-day workshop on Bayesian statistics on Monday 10th April 2017. This course will begin at 10am and finish at 5pm in Laboratory of Lecture Theatre Y1 of the Dept. of Biological Applications and Technology (New BET Building, basement Floor).

Bayesian Statistics is one of the most flexible modern approaches to data analysis in the environmental and other biological sciences. This one-day lecture- and discussion-driven workshop offers an introduction to the basic theory & practice of Bayesian statistics drawing its inspiration and examples from the fields of ecology and epidemiology. Lectures will provide worked examples in the statistical language R and the software JAGS. We will allow a comfortable entryway for scientists with different levels of quantitative skills, by starting with a refresher on probability & likelihood. All the basic concepts will be developed through interactive lectures, with minimal requirements for mathematical technique.

Course prerequisites: Attendees should have taken a good course in undergraduate statistics or equivalent (exposure to probability distributions and linear regression). To get the most out of the course you should ideally have a working knowledge of basic R usage (command-line interactive, generation of graphs, manipulation of data-frames in R). In addition you should have had some exposure to programming structures (loops, conditional statements). Bring your laptop.

Course contents

10:00-11:00 From processes to data and back again (Stochastic processes and inference by likelihood)

11:00-12:00 Bring in the experts! (Conditional and Bayesian probability)

12:00-13:00 How to make a computer sweat (MCMC and the JAGS implementation of computer intensive Bayesian inference)

13:00-14:00 Lunch break

14:00-15:45 You thought you knew all about lines? (Doing simple models the Bayesian way)

15:45-16:00 Coffee break

16:00-17:00 Not getting lost in state-space (Fitting dynamical models to data)

Participation: The course is free but is limited to 25 persons.

Credits: Participants will receive a c**ertificate** of attendance.

Suggested Reading

- Basic ideas in probability and likelihood: Matthiopoulos, J. (2011) How to be a quantitative ecologist: The A-to-R of green mathematics and statistics.

- Bayesian modelling: Kery, M. & Royle, J.A. (2015) Applied Hierarchical Modeling in Ecology: Analysis of distribution, abundance and species richness in R and BUGS: Volume 1:Prelude and Static Models

- Clark, J.S., 2005. Why environmental scientists are becoming Bayesians. *Ecology letters*, *8*, pp.2-14.

Those interested in attending should e-mail your name and affiliation in the title bar to the following address: ecolab.bet@gmail.com (specify return receipt)

John M. Halley, University of Ioannina, Greece