Biometrics by the Blowholes
IBS-AR conference
December 4-8, 2011
Kiama NSW
Australia

Satellite workshops (All rates are in Australian dollars)

Note: all telephone numbers are shown with the area code in parentheses (02) and the local 8-digit number. To call from overseas, see the general information link on the conference sidebar.

Two workshops have been organized pre-conference in Sydney and Wollongong respectively. Earlybird fees apply until Friday October 14, 2011 for both the conference and workshops. After that the fee reverts to the full fee.

Workshop 1 (Pre-conference)
Title: Spatial analysis of public health data: a practical introduction to the analysis of geocoded and areal health data
Date: Friday, December 2, 2011 (9:00am-5:00pm)
Place: Port Jackson Room, Citigate Central Sydney Hotel
Presenter: Professor Montserrat Fuentes (North Carolina State University)
Transport: The hotel is close to Sydney Central Train Station. Participants to make their own way to the venue.
Maximum number of participants: 30 (Thirty)

Fees:	Earlybird	Full
IBS Member	☐ $275	☐ $325
Non-Member	☐ $325	☐ $375

Overview
New methods for recording the locations of health data due to recent advances in Geographical Information Systems (GIS) and Global Positioning Systems (GPS) have permitted new types of disease mapping and spatial modeling of health data, as well as new approaches to support disease prevention and control activities in public health. This has generated considerable interest in statistical modeling for location-referenced (point-level or geostatistical) data and areal (aggregated over regions) data. This course offers an introduction to the methods for modeling and carrying out inference with spatial point-level and areal data. Basic elements such as classical approaches in geostatistics, spatial disease mapping, and Bayesian inference for spatial data will be covered in detail. Each topic will include theory, examples and data analysis along with live interactive computing demonstrations. The course will also detail recent advancements in Bayesian hierarchical models for spatial data using Markov chain Monte Carlo (MCMC) methods.

Specific topics that will be covered include: geostatistical modeling, spatial risk assesment, disease mapping, CAR models for areal data, spatial linear regression, generalized linear models, uncertainty analysis, diagnostics and validation for spatial models, and spatial Bayesian inference.

We will offer a hands-on opportunity to explore the use of WinBUGS, the leading Bayesian software package, as well as several spatial packages in R for spatial geocoded and areal data. The computing demonstrations will encompass exploratory spatial data analysis as well as estimation of statistical models with practical data sets in public health and the environmental sciences.

The following are useful textbooks for Bayesian statistics and hierarchical models for spatial data analysis:
· Banerjee, S., Carlin, B.P. and Gelfand, A.E. (2004). Hierarchical Modeling and Analysis for Spatial Data. Publisher: CRC/Chapman and Hall.
· Diggle, P.J. and Ribeiro Jr., P.J. (2007). Model-based Geostatistics. Publisher: Springer.
· Waller, L. and Gotway, C. (2004). Applied Spatial Statistics for Public Health Data. Publishers: John Wiley and Sons.
· Carlin, B.P. and Louis, T.A. (2000).Bayes and Empirical Bayes Methods for Data Analysis. Second Edition. Publisher: CRC/Chapman and Hall.
· Diggle, P., Fuentes, M., Gelfand, A.E. and Guttorp, P. (2010). Handbook of Spatial Statistics. Publisher: CRC/Taylor and Francis.
· Gelman, A., Carlin, J.B., Stern, H.S. and Rubin, D.B. (2004). Bayesian Data Analysis. Second Edition. Publisher: CRC/Chapman and Hall.
· Dalgaard, P. (2002). Introductory Statistics with R.
· Faraway, J.J. (2005). Linear Models with R. Publisher: CRC/Chapman and Hall.
· Lee, P. M. (2004). Bayesian Statistics Publisher: Hodder Arnold.
· Venables, W.N., Smith, D.M. and the R Development Core Team (2002). An Introduction to R: Revised and Updated.

The web sites for software:
- **WinBUGS** or **OpenBUGS**
- You can download the new registration key for WinBUGS from **HERE**. NOTE THAT YOU DO NOT REQUIRE ANY REGISTRATION KEY FOR OPENBUGS.
- **R**.

Workshop 2 (Pre-conference)
Title: A modern application of linear mixed models with case studies.
Date: Saturday, December 3, 2011 (9:00am-5:00pm)
Place: The Innovation Campus, University of Wollongong
(http://www.innovationcampus.com.au/)
Presenter: Professor Brian Cullis (University of Wollongong and CSIRO)
Co-presenter: Dr David Butler (Queensland Department of Department of Employment, Economic Development and Innovation)
Transport: A coach will transport delegates after the workshop 5.30pm to Kiama (Sebel Harbourside Hotel) for those staying in Kiama. We will contact all registrants after November 11, 2011 regarding transportation.
Maximum number of participants: 30 (Thirty)

Fees:	Earlybird	Full
IBS Member	☐ $275	☐ $325
Non-Member	☐ $325	☐ $375

Overview
Linear mixed effects models provide a rich and flexible tool for the analysis of many data-sets commonly arising in the agricultural, biological, medical and environmental sciences. Typical applications include the analysis of balanced and unbalanced longitudinal data, repeated measures, balanced and unbalanced designed experiments, multi-environment trials, multi-centre trials, multivariate datasets and regular or irregular spatial data.

Consistent with the themes of this conference we will present the analysis of three examples taken from plant genetics (2) and environmental applications. The analysis will be undertaken within the R platform of the ASReml software (known as ASReml-R) and will showcase new theoretical approaches as well as new features of the software which allow novel and complex

modelling of the variance structure of composite terms in the linear mixed model. Equivalent scripts will be available for the standalone version of ASReml.

The workshop will commence with a basic presentation of the linear mixed model within the ASReml family. In particular, our focus will be on the development of a general syntax for specification of extended variance models for single and composite terms in the random component of the linear mixed model. Following this we will then present a detailed description of the each of the motivating data-sets, and the aim(s) of the analyses. Additional theory relevant for the analysis of each example will also be presented as required. Each analysis will be undertaken using live demonstrations of the software but we will also offer the opportunity for hands-on analysis.

Format: A mixture of lecture-style presentations blended with hands-on tutorial sessions. Each tutorial session will be supervised by the presenters to allow participants to become familiar with the ASREml-R syntax as well as the underlying theory.

References:

- ASReml-R user guide
- www.mmontap.org

<u>Pre-requisites for workshop</u>: This is a practical workshop and you are allowed to bring your own laptop. We suggest that people share for optimal benefit of the course (2 to a laptop) and also to minimise the number of power cords floating around the room.

You should download and install the following software before the course. Some assistance will be provided at the course should you encounter problems with installation.

- R Statistical System (latest available from http://www.r-project.org)
- ASReml-R and ASReml standalone available from http://www.vsni.co.uk (temporary licenses will be provided)

Overhead data projector will be available, plus a whiteboard and pens.

Course notes
Course notes will be provided, formatted for convenient additional annotation through the workshop sessions.

Last updated June 13, 2011. MF&BC-DB&MD