Geospatial methods in the Garden City

Following the success of our multi-level course presented by Ian Dohoo in 2018, we happy to announce that another international expert, Dr Emanuele Giorgi, will deliver outstanding teaching near the Great Dividing Range, around 700 metres above sea level.

Topic: Geostatistical methods for Public and Veterinary Health

The course provides an introduction to geostatistical models and their application to disease mapping problems. Participants will learn how to carry out geostatistical analysis using state-of-the-art methods and statistical software. Using data-sets from a variety of epidemiological studies, the participants will be guided through every step of the geostatistical modelling: spatial exploratory analysis through the variogram; formulation of suitable geostatistical models that address relevant research questions; spatial prediction; validation and critical assessment of the modelling assumptions. The PrevMap package, developed by Dr Giorgi in the R software environment, will be used to illustrate the use of geostatistical methods to challenging public health problems. Participants are encouraged to pre-load R (public domain software) before attending the workshop. All the material of the workshop, including slides and R scripts, will be made freely available at sites.google.com/site/mbgglobalhealth.

Workshop Contents

By keeping the mathematical formalism to the minimum required, the classes will be delivered as a mix of lectures and lab demonstrations while fostering a friendly and interactive environment.

Day 1 – Testing for spatial correlation using Monte Carlo methods based on the variogram; model formulation and parameter estimation for the linear geostatistical model; definition of predictive targets and inference.

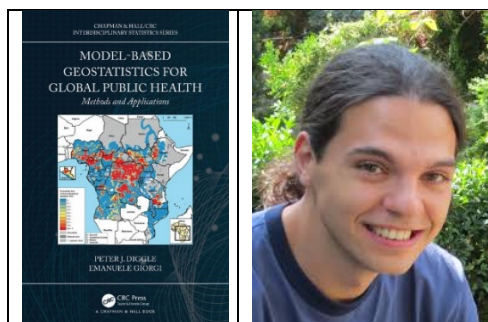Day 2 – Generalized linear geostatistical models for counts data; Monte Carlo maximum likelihood; Introduction to Bayesian methods of inference; Validation of the fitted spatial correlation structure; Disease mapping.

Day 3 - Extension of the geostatistical modelling framework to spatio-temporal analysis with applications to historical malaria mapping.

Day 4 - Advanced topics in model-based geostatistics: dealing with multiple disease diagnostic tests; combining data from multiple surveys. Time for participants to analyse their own data with guidance from Emanuele

Emanuele

Dr Emanuele Giorgi is a Senior Lecturer in Biostatistics and member of the CHICAS research group at Lancaster University, where he formerly obtained a PhD in Statistics and Epidemiology in 2015, under the supervision of Distinguished Professor Peter Diggle, the founder of modern geostatistics . His research interests involve the development of novel geostatistical methods for disease mapping, with a special focus on malaria and other tropical diseases. In 2018, Dr Giorgi was awarded the Royal Statistical Society Research Prize "for outstanding published contribution at the interface of statistics and epidemiology." He is also the lead developer of PrevMap and co-author of Model-based Geostatistics for Global Public Health: Methods and Applications, the textbook for this course.

Venue: Toowoomba, QLD

Location: **Toowoomba City Library** (corner of Victoria and Herries Street)

Dates: **Tuesday, 22nd to Friday, 25th October 2019, 8am-4.30pm**

Registration and fees:

To register, please visit the event registration website. The registration fee includes e-notes, tea breaks and lunches.

Graduate student   AUS$800
Non-student   AUS$1,000

A copy of the book *Model-based Geostatistics for Global Public Health: Methods and Applications* (valued at $158) can be purchased during the registration process at a heavily discounted price of $99.

Practical information

Toowoomba is 1.5 hours' drive from Brisbane. If you come from interstate you could fly into Brisbane and then take a bus or hire a car to drive to Toowoomba.

Toowoomba has also its own airport with flights to major Australian cities. There are many accommodation options in Toowoomba.

Ancillary activities:

Depending on your energy after along of day of statistics, activities include:

- Visiting Preston Peak Winery
- Climbing Table Top Mountain
- Visiting the Japanese Garden

Workshop dinner in one of the great restaurants in Toowoomba.

Contact

For more information about this course, please contact Joerg Henning from The University of Queensland (j.henning@uq.edu.au).