OIE Collaborating Centre for epidemiology, training and control of emerging avian diseases

OIE Collaborating Centre for veterinary epidemiology and public health

OIE training course on GIS management and spatial analysis in veterinary public health

GIS tools and methods in the control of emerging avian diseases

Venice area, Italy

10th-14th November 2014

Jointly organized by

Istituto Zooprofilattico Sperimentale delle Venezie

MASSEY UNIVERSITY
TE KUNENGA KI PŪREHUROA
UNIVERSITY OF NEW ZEALAND

Course description

Geographic Information System (GIS) is particularly important for the harmonisation, comparison and presentation of information used to support decision-making process. In the veterinary public health context, GIS is an essential technology to recognise new and re-emerging infections, to understand the factors involved in disease emergence and to plan prevention, control and eradication strategies.

The present course focuses on the application of advanced knowledge of GIS planning and spatial analysis in the control of animal diseases in general, with a particular focus on emerging avian diseases. By means of theoretical presentations and practical exercises, participants will be taught how to design a GIS project and perform spatial analysis for investigating disease clustering. Examples will be illustrated to determine both temporal and spatial evolution of epidemics, as well as maps with a scale variation to identify unexpected clustering of cases and maps derived from data interpolation to define a scale of the territorial density of events.

Mini project activity will be assigned to groups of 4 or 5 participants coupled to a staff member. The assignments will consist on essay indicating how to exploit the apprehended knowledge on GIS and other spatial tools to creatively design a framework for the analysis of a given set of data. Participants will be given the possibility to provide a set of data or a specific GIS theme that will be used in the mini project.

By the end of the course, participants will have a thorough understanding of the GIS planning strategies, data collection techniques and performance of spatial analysis of animal diseases.

The Lectures cover the following topics:

- Advanced GIS Management.
- Spatial Veterinary Epidemiology

Course learning objectives

Upon successful completion of this course, participants will be able to:

- consider the steps in developing and implementing a GIS,
- understand the management, planning, and strategic challenges for the use of GIS in organizations,
- analyze real world cases involving GIS and spatial analysis in epidemiology and control of animal diseases,
- understand the basic principles of global, local and focused spatial analysis,
- apply basic and advanced spatial analysis algorithms to detect clustering of events, to generate sound epidemiological hypothesis.

Course Language

English

Venue

The course will be held nearby Venice (20 minutes by public transport from Venice). More details will be provided with the e-mail admission.

Prerequisites

- knowledge of basic GIS principles
- attendees must bring their own laptop
- QGIS software (http://www.qgis.org) need to be already installed
- SaTScan software (http://www.satscan.org/) need to be already installed.

Lecturers

Simona Forcella
OIE Headquarters, France

Tim Carpenter
OIE Collaborating Centre for veterinary epidemiology and public health, EpiCentre/mEpilab, Institute of veterinary, animal and biomedical sciences - New Zealand

Nicola Ferrè, Paolo Mulatti
Monica Lorenzetto, Matteo Mazzucato, Matteo Trolese
OIE Collaborating Centre for epidemiology, training and control of emerging avian diseases, Istituto Zooprofilattico Sperimentale delle Venezie - GIS Unit, Italy

Programme

DAY 1

10th November 2014

Hours	Title	Lecturer
9:00 – 09:30	**Welcome notes** Presentation of course, teachers, participants, and course topics	Nicola Ferrè
9:30 – 10:00	**GIS applications at OIE/international level** Presentation: • WAHIS • WAHID	Simona Forcella
10:00 – 11:00	**How GIS is used in veterinary medicine** Presentation: • Essential use • Emerging use • Examples of successful GIS applications in veterinary medicine	Nicola Ferrè
11:00 – 11:30	*Coffee break*	
11:30 – 13:00	**GIS Management** Presentation: • Overview of the GIS implementation process • GIS planning principles • GIS requirement analyses • GIS design • Building the GIS • Operating the GIS	Nicola Ferrè
13:00 – 14:00	*Lunch*	
14:00 – 17:30	**Practical exercise: mini project** • Class discussion on personal dataset • Group organisation • Project and objective assignment	GIS Unit staff
17:30 – 18:00	**Hard talk: GIS office, structure and organisation**	Nicola Ferrè

DAY 2
11th November 2014

Hours	Title	Lecturer

9:00 – 11:00	**GIS data models**
	Presentation:
	• Spatial data collection. The OIE perspective
	• How best to geo-reference farms? –Conceptual Farm model
	  ◦ indirect methods
	  ◦ geocoding
	  ◦ design a GPS survey
	• Geo database organisation – data mart approach
	• Metadata principle and organisation
	• OGC standards
		Simona Forcella
		Nicola Ferrè

11:00 – 11:30	*Coffee break*	
11:30 – 13:00	**Making pretty maps** Presentation: • Introducing Cartography • Elements of semiotic – Bertin rules • Map Elements • Using styles – Introduction to SLD concepts Simulation exercise: exercises will be done using QGIS and SLD editor	Nicola Ferrè GIS Unit staff
13:00 – 14:30	*Lunch + mini project networking*	
14:30 – 15:30	**Data collection - GPS survey** Presentation: • GPS fundamentals • Design and develop a GPS survey exercise Simulation exercise: collecting, processing, and integrating GPS data into GIS	Nicola Ferrè
15:30 – 17:30	**Practical exercise: mini project** • Abstract – development • Abstracts - presentation and discussions	GIS Unit staff
17:30 – 18:00	**Hard talk: GPS – uses and misuses**	Nicola Ferrè

DAY 3
12th November 2014

Hours	Title	Lecturer
9:00 – 9:30	**Spatial epidemiology – Introduction** • What Spatial Epidemiology is, how and why it was developed	Tim Carpenter
9:30 – 11:00	**Spatial epidemiological data** Presentation: • Use of georeferenced data for epidemiological studies • Use of different type of data (points vs aggregated data) • Brief overview on using remote sensed data in epidemiology Simulation exercise: • Adding spatial information to epidemiological data • Manage spatial data for epidemiological analyses • Visualise spatial data of epidemiological interest	Paolo Mulatti
11:00 – 11:30	*Coffee break*	
11:30 – 13:00	**Spatial autocorrelation** Presentation: • Definition of spatial and autocorrelation • Description of methods to investigate spatial autocorrelation (including global and local measures) Simulation exercise: some of the methods discussed will be applied to the practice and students will have the opportunity to keep on exploring the dataset used so far	Tim Carpenter Paolo Mulatti
13:00 – 14:30	*Lunch*	
14:30 – 18:00	**Practical exercise: mini project** Mini project - development	GIS Unit staff

DAY 4

13th November 2014

Hours	Title	Lecturer
9:00 – 11:00	**Purely spatial disease clustering** Presentation: • Definition of clustering (global, local and focused) • Description of some methods to be used to investigate pure spatial clustering (including K(d) function and purely spatial scan statistics) Simulation exercise: Different datasets will be explored using different methods for disease clustering detection, both global and local. Exercises will be done using SatScan and simple R scripts (exploiting some of the most commonly used library)	Tim Carpenter Paolo Mulatti
11:00 – 11:30	*Coffee break*	
11:30 – 13:00	**Adding further complexity – Space-time disease clustering** Presentation: • Importance of considering temporally explicit information • Description of some methods to investigate space-time clustering (including space-time K(d) function and space-time Scan Statistics) Simulation exercise: Similarly to the previous exercise, students will be asked to analyse a dataset using one or more of the described methods. Software used will include SatScan and R	Tim Carpenter Paolo Mulatti
13:00 – 14:30	*Lunch + mini project networking*	
14:30 – 17:30	**Practical exercise: mini project** • Mini project - development	GIS Unit staff
17:30 – 18:00	**Hard talk: Why should we want to perform spatial analysis?**	Paolo Mulatti

DAY 5

14th November 2014

Hours	Title	Lecturer
9:00 – 10:00	**Course wrap-up and open questions**	Nicola Ferrè Paolo Mulatti Tim Carpenter
10:00 – 12:30	**Mini project presentations and discussion**	
12:30 – 13:00	**Closing remarks**	
13:00 – 14:30	*Lunch*	

Registration

Registration fee: € 750 (VAT 22% included*).

The fee includes training materials, coffee breaks and lunches.

*If you are not subject to VAT, special agreements have to be arranged in advance.
In this case before making the bank transfer please inform the Organizing secretariat by email (formazione@izsvenezie.it).

Fill in the online registration form before 8th September 2014

online registration

Payment instructions

Bank transfer made out to
ISTITUTO ZOOPROFILATTICO SPERIMENTALE DELLE VENEZIE

stating "GIS TRAINING COURSE + name of the person registered"

drawn on: Tesoriere Cassa di Risparmio del Veneto
Via Jappelli, 13 - 35121 Padova, Italy

IBAN: IT 34 J 06225 12186 06700007583T
BIC/SWIFT: IBSPIT2P

Bank charges are the responsibility of the participant and must be paid in addition to the registration fee. If payment is made for more than 1 person or by a company, make sure all names are fully indicated. Participants are also kindly requested to send a copy of their bank statement to the Organizing secretariat by email (formazione@izsvenezie.it).

The Organizing Secretariat will confirm the admission to paying participants by e-mail.

Complete registrations and payments must be received by 8th September 2014.

The course will have a maximum of 20 participants and will be held with minimum of 13.
In case the minimum number of participants will not be reached, the Organizing secretariat will refund registration fees to prepaid participants, covering also administration fees.

Cancellation policy

All cancellations must be made in writing to Organizing secretariat formazione@izsvenezie.it or faxed to +390498084270.

For refunds, please indicate IBAN. The Organizing secretariat will refund registration fees to prepaid participants who cancelled their registration with the amount of the refund based on the following schema:

- cancellations received up and including 29th August 2014 - full refund
- cancellations received between 30th August to 30th September - 50% will be refunded
- after 1st October 2014 - no refund will be made.

Administration fees will be deducted from the amount to be refunded.

Scientific secretariat

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Organizing secretariat

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