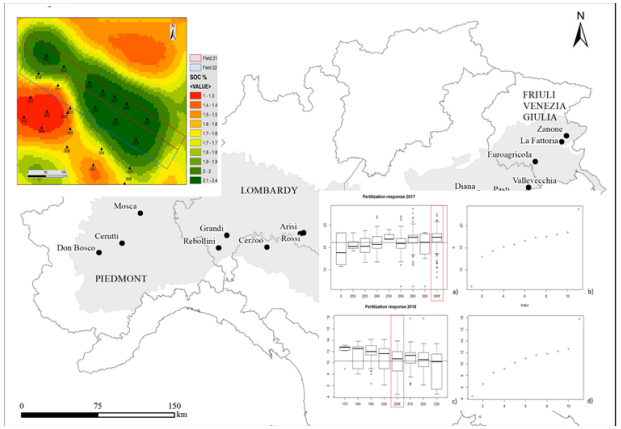
1st International Summer School on Statistical analysis of spatial Data in Agro-Environmental research

Location:

COMO ITALY
VILLA DEL GRUMELLO
August, 26-30 2019



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FONDAZIONE ALESSANDRO VOLTA

UNIVERSITÀ DEGLI STUDI DI MILANO

Società Italiana di Agronomia

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AIGeo

SDAE 2019

The **S**tatistical analysis of spatial **D**ata in **A**gro-**E**nvironmental research summer school (**SDAE**) aims to present statistical analysis of agro-environmental data at different scales, from catchment to regional scale.

Topics: Sample design, advanced literature search and analysis (e.g., meta-analysis), techniques for estimation and visualization of data at territorial scale (e.g., spatial mixed models, random forest, regression boosted trees), methods for covariate acquisition and selection, use of reference databases on land cover (CORINE land cover), soil data and maps (LUCAS and ESDAC-JRC products), and weather data (MARS, Worldclim).

At the end of the **SDAE** summer school, participants will be able to treat spatial data (e.g., visualization, spatial references and projections, digital elevation models and terrain analysis), and to use advanced literature analysis tools.

The school has received the support of the Italian Society of Agronomy (**SIA**) and the Italian Association of Physical Geography and Geomorphology (**AiGEO**), and it is divided into theoretical lessons in the morning and computer sessions in the afternoon with applications and case studies of agronomy, spatial data management, and terrain analysis.

The course is dedicated to PhD students, young researchers, master students, professionals specialized in territorial analysis with numerical-statistical background

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SCHOOL DIRECTORS

Marco Acutis
Professor of Agronomy University of Milan.

Michael Märker
Professor of Physical Geography and Geomorphology, University of Pavia.

SPEAKERS

Aldo Lipani, PhD, UC London, UK

Alessia Perego, PhD, Univ. Milan Italy

Dario Sacco, professor, University of Turin

Sergio Saia, PhD CREA, Italy

Calogero Schillaci, PhD, Univ. Milan, Italy

Elena Valkama, PhD, Luke Institute, Finland

Fabio Veronesi, PhD, WRc plc Consulting, UK

General information

General information: The course runs from 26 to 30 August 2019 (daily timetable: 09.00-13.00 and 14.00-18.00)

Costs and requirements: The course fee is 250 € and includes lunches, coffee breaks. Transfer and accommodation are on students expenses. The course is limited to 25 students. Admission will be subject to evaluation of the CVs. At the end of the course a certificate will be issued, upon a verification. Interested students and professionals are requested to apply online at the following link: http://sdae.lakecomoschool.org/application/. Within **May 10th 2019**, further information can be obtained by email (**sdaestat@gmail.com**).

The selected participants will be informed on June 1st 2019 and the registration form will be sent with payment details. Accommodation in the nearby guest house (multiple rooms) is available at about 35€/night for a maximum of 15 participants, hotels within walking distances from the venue are also available. Participants will use their own lap-tops; software will be open source or under a 6-month licence. **Credits:** Attendees will receive a course certificate (4 credits). However, it is up to the participant's institution to recognize the summer school as official course credit.

Location: Villa del Grumello, Fondazione Alessandro Volta. Via Cernobbio, 11, 22100 Como Italy.

Preliminary Program (1)

Monday 26 August 2019 - **Introduction to the Course and training objectives (school directors).**

Basic of statistical models and sampling. Prof. Acutis, Dr. Perego. **First class**: ANOVA (one way, factorial), regression (linear, non linear and multiple). **Second class:** Sampling size, number of replication, and sampling design. **Practical**: use of Anova, regression and general linear models, mixed models. Sample size determination and definition of the number of replication, complex sampling designs (e.g . latin hypercube).

Tuesday 27 August 2019 – **Quantitative methods in literature search and analysis: "Meta -analysis for environmental science".** Dr. Valkama. **First class:** introduction on literature analysis, **Second class:** Meta-analysis. **Practical:** Creation of a literature database and applications using "OpenMEE" software.

Wednesday 28 August 2019 - **Topography as source for agro-environmental information. Spatial mixed model**. Prof. Michael Märker, **First class:** SAGA GIS terrain analysis, environmental process modelling such as soil erosion and storm flow. **Second class:** Spatial mixed models, Prof. Dario Sacco, **Practical**: terrain analysis and erosion modelling using GIS. Examples and applications of spatial mixed model in R, Dr. Schillaci, Dr. Veronesi.

Preliminary Program (2)

Thursday 29 August 2019 - **Machine learning and Geostatistics for environmental modelling using reference databases.** Dr. Veronesi, Dr. Lipani, Dr. Schillaci, Dr. Saia. **First class:** introduction to soil and climate spatial databases, digital soil mapping and local uncertainty for environmental mapping; **Second Class:** Geostatistics and Machine learning as a tool for environmental mapping **Practical:** examples and applications using R and GIS.

Friday 30 August 2019- **Digital soil mapping for spatial assessment of the agro-environment**. Dr. Schillaci, Dr. Lipani, Dr Veronesi, Dr. Saia, prof. Acutis and prof. Märker: **First class**: Dataset assessment and covariate selection (DEM, Remote sensing covariate, regression based methods, LASSO etc.). **Second Class:** Digital soil mapping of soil properties (Boosted regression trees, Random Forest); **Practical:** examples and applications using R and GIS.

Application link: http://sdae.lakecomoschool.org/application/
Contact: sdaestat@gmail.com