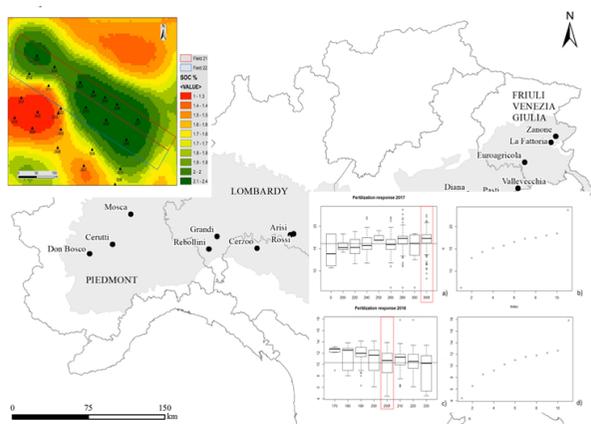


Ist International “Quantitative Approach To Soil System Dynamics” Summer School

As much as the Covid-19 pandemic will allow for travelling, the school will be held in presence for a maximum of 25 participants. Otherwise the school will be held in hybrid format or totally on-line.

Location:

COMO ITALY
VILLA DEL GRUMELLO



SPONSORS



UNIVERSITÀ DEGLI STUDI
DI MILANO



Contact informations:

qssd.school@gmail.com

At global scale, there is the need to increase soil carbon storage and biodiversity and to maximise yield using fewer resources. In line with this aim, agronomists and soil scientists are required to offer the scientific base for driving these changes and setting up the new management strategies for the agro-ecosystem. Key points behind this land management revolution is the use of evidence-based results, soil monitoring data (physical, chemical and biological properties), process-based models and advanced data analysis instruments in a context of an integrated framework.

Topics:

1. Advanced Systematic literature analysis (meta-analysis and evidence based scientific approach).
2. Introduction to the rational use of process-based models.
3. Modelling of C dynamics in the agro-ecosystem.
4. Soil organisms, microbial decomposition, factors of influence, effects of climate change, greenhouse gas flux measurements, C and N cycling, and water balance.
5. Statistical models for soil mapping and soil characteristics estimation (e.g. linear models, machine learning).
6. Environmental Risk Assessment of pesticides with a focus on soil and groundwater modelling and an introduction to spatial modelling for the evaluation of territorial vulnerability to pesticides.

At the end of the **QSSD** summer school, participants will be able to use advanced literature analysis tools, process – based and statistical models.

The course is divided into theoretical lessons in the morning and computer sessions in the afternoon with applications and case studies of literature analysis, process based and statistical models.

The course is dedicated to PhD students, young researchers, master students, professionals specialized in soil and agronomy

The school has received the support of the Italian Society of Agronomy (**SIA**).

Ist International “Quantitative Approach To Soil System Dynamics” Summer School

SCHOOL DIRECTORS

Marco Acutis

Professor of Agronomy University of Milan.



Antonio Finizio

Professor of Ecology, University of Milano-Bicocca.



SPEAKERS

Andrea Di Guardo, PhD, Univ. Milano-Bicocca



Alessia Perego, Prof, PhD, Univ. Milan Italy



Calogero Schillaci, PhD, Joint Research Centre (European Commission)



Elena Valkama, Senior scientist, Luke Institute, Turku, Finland



Sophie Zechmeister-Boltenstern, Prof. University of Natural Resources and Life Sciences Vienna



General information

Dates: The course runs from 20 to 24 September 2021 (daily timetable: 09.00-12.00 and 14.00-17.00)

Costs and requirements: The course fee is 350 € 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 send to compile the application form within **July 25th 2021** at the link <https://qssd.lakecomoschool.org/application/>

The selected participants will be informed on July **30th 2021** and the registration form will be sent with payment details. Accommodation in the nearby guest house is available at low fairs, hotels within walking distances from the venue are also available. Guest house will be offered free of cost for participant from Università Statale di Milano, Università di Milano Bicocca, Università dell'Insubria, Università di Pavia e Politecnico di Milano

Participants have to use their own laptop; software will be supplied with trial versions.

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 credits.

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

Preliminary Program (1)

Monday 20 September 2021 - **Introduction to the Course and training objectives (school directors).**

Advanced Systematic literature search and meta-analysis, Dr. E. Valkama. **First class:** introduction on literature analysis, **Second class:** Meta-analysis. **Practical:** Creation of a literature database and applications using specific software

Tuesday 21 September 2021 – **Soil and climatic databases freely available**, Dr C. Schillaci. **First class:** Soil database, as WoSIS, SoilGrid, LUCAS, WordClim and Agri4Cast. Description and methodology to access it. **Second class:** prof. M. Acutis, Prof A. Perego. Introduction to process-based models (e.g. RothC, AR-MOSA). **Practical:** extraction of soil and me-teo data from public available sources.; practical use of process-based models.

Wednesday 22 September 2021 - **Environmental Risk Assessment of pesticides**, prof A. Finizio, Dr. A Di Guardo. **First class:** regulatory contexts and current advancements . **Second class** : Use of models in the context of Environmental Risk Assessment of pesticides: Scenario based and Landscape analysis. **Practical:** Modelling of C dynamics in agro-ecosystems Application of modelling C dynamics in agro-ecosystems.

Preliminary Program (2)

Thursday 23 September 2021, Prof. S. Zechmeister - **First class:** Soil organisms and factors influencing microbial decomposition. **Second class:** effects of climate change. **Practical:** Method demonstrations: greenhouse gas flux measurements and C, N and water balance.

Friday 24 September 2021 Statistical models for soil characteristics estimation and soil mapping, Prof A. Perego, Dr. C. Schillaci, **First class:** Linear models. **Second Class:** Machine learning based methods (Boosted regression trees, Random Forest); **Practical:** examples of soil mapping and applications using R and GIS.

The school aims to analyze case studies that may lead to a scientific publication in collaboration between teachers and students on a voluntary basis. An example of a previous collaborative work in the context of the Como Lake School is the publication "New pedotransfer approaches to predict soil bulk density using WoSIS soil data and environmental covariates in Mediterranean agro-ecosystems" <https://doi.org/10.1016/j.scitotenv.2021.146609>

School website: <https://qssd.lakecomoschool.org/>

Contact: qssd.school@gmail.com

For information, please contact the Organizing Secretariat (Ms. Alessandra Cazzaniga email: alessandra.cazzaniga@fondazionealessandrovolta.it).