



VIU
Graduate
Seminar
**Learning From
Geoenvironmental
Data: Tools
For a Changing
Planet**

**Learning from Geoenvironmental Data:
Tools for a Changing Planet**

May 23-27, 2022

**Venice International University
Isola di San Servolo, Venice**

VIU Graduate Seminar

Learning from Geoenvironmental Data: Tools for a Changing Planet

Venice International
University

May 23-27, 2022

Scientific Coordinator:

Sebastiano Trevisani
IUAV University of Venice

The interactions between geoenvironmental and anthropic processes are increasing due to the ever-growing population and its related side effects (e.g., urban sprawl, natural resource and energy consumption, etc.). Natural hazards, land degradation, environmental pollution and climate change are some of the most evident results of the “interactions” between geosphere and anthroposphere. At a finer spatial scale, geoenvironmental and geo-engineering issues in urban contexts or in the proximity of infrastructures represent a wide set of challenges that directly affect the critical zone. In this context, spatial and spatiotemporal data are crucial for the analysis, modelling and forecasting of the possible interactions between human activities and the geoenvironment.

The technological developments achieved in the field and laboratory instruments, including geophysical, proximal and remote sensing devices, increase exponentially the amount and heterogeneity of geoenvironmental data potentially available. The ever-growing quantity of geoenvironmental data is characterized by an extreme variability of information, including its spatial sampling network geometry, its spatial support, its uncertainty, and its typology (e.g., hard/soft data). The cited aspects have a strong influence on the spatial analysis methodologies that can be adopted. Moreover, the choice of a specific spatial data analysis methodology is also dependent on the objectives of the study and on users’ specific knowledge. And, of course, there is no single approach that will always perform better than all the others. This means that finding satisfying solutions in specific applications requires a good understanding of the strengths and weaknesses of existing approaches. Modern Earth Scientists need also to interact with other disciplines, apparently far from the Earth Sciences and Engineering. Disciplines related to history and philosophy of science are emblematic from this perspective. From one side, the quantitative analysis of information extracted from historical records (documents, maps, paintings, etc.) represents an exciting research topic, requiring a truly holistic approach. On the

other side, epistemological and philosophical considerations on the relationship between the geoscience and society in history are of fundamental importance for understanding past, present and future geosphere-anthroposphere interlinked and reflexive dynamics.

This Graduate Seminar will be led by:

- IUAV University of Venice, Italy
- University of Lausanne, Switzerland
- Ca' Foscari University of Venice, Italy

Faculty

Sebastiano Trevisani, Iuav University of Venice, Italy (Scientific Coordinator)

Mikhail Kanevski, University of Lausanne (Scientific Co-coordinator)

Pietro Omodeo, Ca' Foscari University of Venice (Scientific Co-coordinator)

Marj Tonini, University of Lausanne (Scientific Co-coordinator)

Dario Camuffo, National Research Council of Italy, Institute of Atmospheric Sciences and Climate (ISAC, Padova)

Donata Canu, Istituto Nazionale di Oceanografia e di Geofisica Sperimentale OGS

Paolo Fabbri, University of Padua

Carlo Giupponi, Ca' Foscari University of Venice

Francesco Luzzini, Johns Hopkins University, USA, and Ca' Foscari University of Venice, Italy

Jürgen Renn, Max Planck Institute for the History of Science, Germany

Andrea Trucchia, CIMA Foundation, Italy

Georg Umgiesser, National Research Council of Italy, Institute of Marine Sciences (ISMAR, Venice)

Methodology

The Graduate Seminar will involve theory and important practical exercises; open discussion among the participants will be encouraged. The last day will be dedicated to students' activities and presentations and to a final open discussion on the topics considered.

Topics

- Theoretical and practical introduction to the main techniques of spatial geoenvironmental data analysis (in particular geostatistics and machine learning)

- Role of geoenvironmental data and observations for the characterization, analysis and modelling of the environment from historical times to present (in this part also the derivation of quantitative data from historical documents will be discussed).

Learning outcomes for participants

- To highlight the relevance on the quantitative use of geoenvironmental data in the context of sustainability and management of the environment in current and historical times
- To provide a basic knowledge in spatial data analysis, with elements of geostatistics and machine learning, permitting further autonomous development
- To highlight the role of expert-knowledge on the application of geocomputational approaches
- To furnish an overview on the characteristics of geoenvironmental data and on the potential sources of environmental information, including historical sources
- To stimulate a wide and holistic view on geoenvironmental and geoengineering issues

Who can apply?

This Graduate Seminar is offered to advanced Master and early PhD students in Earth/Environmental Sciences, Biology and Spatial Ecology, Physical Geography. Applicants from humanities-related disciplines with computational skills and sound mathematical knowledge will be considered. Participation of young researchers is also welcome. Participants should have a basic knowledge of mathematics and statistics; skills with geographical information systems and basic notions in R programming language would be a benefit. Student participants will need to bring their own laptops for the practical parts of the seminar.

Open to candidates from all the VIU Member Institutions; applications from excellent candidates from non-member institutions will be also considered and evaluated.

Fees & Grant Support

Students from the VIU member institutions will pay no participation fees. Grant support is also available to support, partially or fully, the costs of international travel and accommodation. The

participation fee for students of non-member institutions is Euro 1.150 VAT included. The fee is inclusive of tuition, course materials, accommodation, lunches, social events and taxes. Students from non-member institutions are not eligible for VIU grant support. VIU Alumni are eligible for a reduced fee.

Credits

Participation in the Graduate Seminar is considered equivalent to **2 ECTS**.

The program is available on the VIU website.

Applications

December 1, 2021 – January 31, 2022
via the VIU website

Applicants must submit the application form, a letter of motivation – which should include a brief description of the candidate’s research interests, a curriculum vitae and a photo.

VIU Graduate Seminars

These are thematic intensive seminars given in a concentrated period on subjects of universal interest, open to a broad spectrum of disciplines. They are suited to both Master’s and PhD students and are open to candidates from all the VIU member institutions. The young researchers will receive support in defining their research proposal. Significant cooperation among departments in the member institutions is expected.

Venice International University is a consortium of 20 universities, representing 14 countries throughout the world.

The mission of VIU is to foster cooperation among VIU member institutions while facilitating the exchange of knowledge and ideas, by developing, promoting and organizing joint academic, research and training/capacity-building program. Students from non-member institutions may participate in selected academic programs. The academic programs at VIU are distinguished by a markedly interdisciplinary approach to the topics, and by the international perspectives that the participants contribute to the discussions. The VIU campus is on the island of San Servolo in Venice, Italy.

As the COVID-19 pandemic is ongoing, VIU will continue to monitor the situation, and in the event that it is not possible to confirm the program on the VIU campus as scheduled, other practicable solutions will be evaluated. Applicants and confirmed participants will be informed of any changes.

Location



Venice International University

Isola di San Servolo
30133 Venice
Italy

T +39 041 2719511

F +39 041 2719510

E summerschools@univiu.org

www.univiu.org