PERSONAL INFORMATION

Emmanouil A. Varouchakis

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Scopus, Google Scholar, Researchgate

WORK EXPERIENCE

02/2022-today

Assistant Professor: Environmental Mining & Sustainable development

School of Mineral Resources Engineering, Technical University of Crete (TUC), Chania, Greece.

- Teaching: Applied Geostatistics, Probabilities & Statistics for Engineers, Geostatistical & Simulation methods (Graduate), Time series Analysis (Graduate),
- Research: spatio-temporal geostatistics/ spatial statistics / Risk Analysis / mathematical geosciences / time-series analysis / groundwater / water resources / hydroclimate /environmental statistics / machine learning / cost benefit analysis / environmental impact assessment/ SDGs

Business or sector University

9/2016-today

Guest Lecturer/Researcher

IHE-Delft (UNESCO), Research Institute for water education, Chair Group of Hydroinformatics, Department of Integrated Water Systems and Governance, Delft, Netherlands.

- Teaching of the Geostatistics graduate course, collaborative researcher – Geostatistical analysis / Spatio-temporal data analysis, Data driven models, Data visualization in hydroinformatics

Business or sector Research Institute

09/2020-02/2022

Specialized teaching personnel: Spatio-temporal geostatistics

School of Sciences & Engineering, Department of Materials Science & Technology University of Crete, Heraklion, Crete.

- Research: Mathematical geostatistics/ spatial statistics

Business or sector University

09/2013-09/2020

Specialized teaching personnel: Spatio-temporal geostatistics

Geoenvironmental Engineering Lab, School of Environmental Engineering, Technical University of Crete (TUC), Chania, Greece.

- Teaching of undergraduate courses: Applied Geostatistics, Risk Analysis, Groundwater hydrology.
- Research: spatio-temporal geostatistics/ time-series analysis / groundwater modelling / hydrology / water resources / machine learning / mathematical geosciences / game theory

Business or sector University

02/2019-07/2019

Researcher Sabbatical

IHE-Delft (UNESCO), Delft, Netherlands

- Research: Spatio-temporal Geostatistical analysis / hydroinformatics

Business or sector Research Institute

06/2018-09//2018

Assistant Professor

Faculty of Geo-Information Science and Earth Observation (ITC), Department of Earth Observation Science, University of Twente, Netherlands

- Position title: Spatiotemporal Statistics. Development and application of spatiotemporal statistical methods for Geoinformation processing.

Business or sector University

06/2003-08/2013

Specialized Teaching and Laboratory Personnel

School of Environmental Engineering, Technical University of Crete (TUC), Chania, Greece.

06/2002-06/2003

Junior Research Assistant

Environmental Technology Laboratory, Institute of Electronic Structure & Laser, Foundation of Research and Technology (FORTH), Heraklion, Greece.

Business or sector Research Institute

EDUCATION AND TRAINING

2007-2012

PhD - Spatio-temporal Geostatistics in Geosciences, Graduate program: Geo-technology & Environment (advisor: D.T. Hristopulos)

School of Mineral Resources Engineering, Technical University of Crete (TUC), Chania, Greece.

- Spatial & Spatio-temporal Geostatistics, Water Resources, Stochastic and Data Driven Models in Time Series Analysis, Statistical Methods in Data Analysis, Data mining, Machine learning, Mapping

2004-2006

MSc in Geo-technology & Environment - Geostatistics (advisor: D.T. Hristopulos)

School of Mineral Resources Engineering, Technical University of Crete (TUC), Chania, Greece.

- Geostatistics, Remote sensing and Hydrogeology

1999-2000

MSc in Clean Technology

Newcastle University, School of Chemical and Process Engineering, Newcastle, UK.

- Environmental Statistics, Operational research, Monitoring, Data mining, Pollution mitigation

1996-1999

BEng Hons Degree in Chemical and Process Engineering

Newcastle University, School of Chemical and Process Engineering, Newcastle, UK

- Environmental Impact Assessment, Industrial Statistics, Fluid Mechanics, Process Design

ACADEMIC INFORMATION

Teaching experience

10/2022– today, **Time series Analysis (Graduate),** School of Mineral Resources Engineering, Technical University of Crete

02/2022– today, **Statistics & Probabilities for Engineers** (2nd semester), School of Mineral Resources Engineering, Technical University of Crete, Topics: Basics of statistics & probabilities

02/2022– today, **Geostatistical & Simulation methods (Graduate),** School of Mineral Resources Engineering, Technical University of Crete

10/2015 – 02/2016 & 10/2020 – today, **Applied Geostatistics** (7th semester), School of Mineral Resources Engineering, Technical University of Crete. Basic Topics: Applied geostatistics & applications in geosciences

02/2016 - 10/2022, Geostatistics for Water Management and Environmental Sciences, Postgraduate course, IHE-Delft, Institute for water education, Chair Group of Hydroinformatics, Department of Integrated Water Systems and Governance Delft, Netherlands (Guest Lecturer contract)
Basic Topic: Space-time geostatistics in hydroinformatics

10/2021-02/2022 – **Mathematics I**, School of Sciences & Engineering, Department of Materials & Technology, University of Crete

10/2021-02/2022 – **Fluid Mechanics**, co-Teaching, School of Sciences & Engineering, Department of Materials & Technology University of Crete

10/2013 – 02/2021, **Risk Analysis** (9th semester/Erasmus (2013/14)), School of Environmental Engineering, Technical University of Crete. Basic Topics: Spatial statistical methods, Risk analysis/mapping and decision-making theory in water resources, Statistical/Stochastic methods

10/2015 – 02/2020, **Hydraulics II**, co-Teaching (7th semester), School of Environmental Engineering, Technical University of Crete. Basic Topic: Groundwater hydrology

02/2014 - 07/2014, **Introduction to Geostatistics** (6th semester), School of Mineral Resources Engineering, Technical University of Crete (PD/407). Basic Topics: Basics of statistics & probabilities and geostatistics, applications in geosciences

Laboratory courses and tutorials

Teaching of the Fluid Mechanics and Groundwater Flow and Transport of Pollutants course Tutorials, School of Environmental Engineering, Technical University of Crete (2003-2020).

Teaching of the Fluid Mechanics and Groundwater Flow and Transport of Pollutants laboratory projects, School of Environmental Engineering, Technical University of Crete (2003-2020)

Teaching of the laboratory projects of the undergraduate laboratory course Hydraulics II, School of Environmental Engineering, Technical University of Crete (10/2012-10/2014).

A. Thesis

E. A. Varouchakis, 2012, "**Geostatistical Analysis and Space -Time Models of Aquifer Levels: Application to Mires Hydrological Basin in the Prefecture of Crete** (in English)". PhD Thesis, School of Mineral Resources Engineering / School of Environmental Engineering, Technical University of Crete (TUC), Greece. pp 233. Advisor: Prof. D.T. Hristopulos,

E. A. Varouchakis, 2006, "**Application of Spartan Spatial Random Fields in the geostatistical analysis of environmental pollutants** (in Greek)" MSc in Geo-technology & Environment, School of Mineral Resources Engineering, Technical University of Crete (TUC), pp. 162. Advisor: Prof. D.T. Hristopulos

E. A. Varouchakis, 2000, "A Sustainable Waste Management Strategy for Newcastle City Council", Thesis, School of Chemical & Process Engineering, University of Newcastle Upon Tyne, pp 200.

B. Journal publications (47)
+ corresponding author
* most significant publications

* Deveci, M., Brito-Parada, P.R., Pamucar, D., ***Varouchakis, E.A***., 2022. Rough sets based Ordinal Priority Approach to evaluate sustainable development goals (SDGs) for sustainable mining. Resources Policy 79, 103049. DOI:https://doi.org/10.1016/j.resourpol.2022.103049

Varouchakis, E., Kalaitzaki, E., Trichakis, I., Corzo, G., Karatzas, G., 2022. An integrated method to study and plan aquifer recharge. Hydrology Research. DOI:10.2166/nh.2022.054

* ***Varouchakis, E.A***., Guardiola-Albert, C., Karatzas, G.P., 2022. Spatiotemporal Geostatistical Analysis of Groundwater Level in Aquifer Systems of Complex Hydrogeology. Water Resour. Res. 58(3), e2021WR029988. DOI:https://doi.org/10.1029/2021WR029988

Spanoudaki, K., Dimitriadis, P., ***Varouchakis, E.A.***, Perez, G.A.C., 2022. Estimation of Hydropower Potential Using Bayesian and Stochastic Approaches for Streamflow Simulation and Accounting for the Intermediate Storage Retention. Energies 15(4), 1413.

Tzanakakis, V. A., A. Pavlaki, E. Lekkas, **E. A. Varouchakis**, N. V. Paranychianakis, G. Fasarakis, and A. N. Angelakis, 2022. Uncoupled Precipitation and Water Availability: The Case Study of Municipality of Sfakia, Crete, Greece. Water 14(3), 462.

* **Varouchakis, E.A**., Perez, G.A.C., Loaiza, M.A.D., Spanoudaki, K., 2022. Sustainability of mining activities in the European Mediterranean region in terms of a spatial groundwater stress index. Spatial Statistics 50, 100625. DOI:https://doi.org/10.1016/j.spasta.2022.100625

Parasyris, A., Spanoudaki, K., ***Varouchakis, E.A***., Kampanis, N.A., 2021. A decision support tool for optimising groundwater-level monitoring networks using an adaptive genetic algorithm. ***J. Hydroinformatics***. 23(5), 1066-1082. DOI:10.2166/hydro.2021.045

Koutroulis, E., G. Petrakis, V. Agou, A. Malisovas, D. Hristopulos, P. Partsinevelos, A. Tripolitsiotis, N. Halouani, P. Ailliot, M. Boutigny, V. Monbet, D. Allard, A. Cuzol, D. Kolokotsa, ***E. Varouchakis***, K. Kokolakis and S. Mertikas (2021). Site selection and system sizing of desalination plants powered with renewable energy sources based on a web-GIS platform. ***International Journal of Energy Sector Management*** **ahead-of-print**, Vol. 16 No. 3, pp. 469-492. https://doi.org/10.1108/IJESM-04-2021-0018

Sole author publication

* ***E. A. Varouchakis***+. "Median polish kriging and sequential gaussian simulation for the spatial analysis of source rock data", ***Journal of Marine Science and Engineering***, 9(7), 717, 2021, https://doi.org/10.3390/jmse9070717 (Sole author publication)

* ***E. A. Varouchakis***+, A. Kamińska-Chuchmała, G. Kowalik, K. Spanoudaki and M. Graña. "Combining Geostatistics and Remote Sensing Data to Improve Spatiotemporal Analysis of Precipitation", ***Sensors***, 21(9), 3132, 2021, https://doi.org/10.3390/s21093132

Sole author publication

* ***E. A. Varouchakis***+, "Gaussian Transformation Methods for Spatial Data", ***Geosciences***, 11, 196, 2021, https://doi.org/10.3390/geosciences11050196 (Sole author publication)

* ***E. A. Varouchakis***+, D. T. Hristopulos, G. P. Karatzas, G. A. Corzo Perez, V. Diaz, "Spatiotemporal geostatistical analysis of precipitation combining ground and satellite

observations", ***Hydrology Research journal***, 52(3), 804–820, 2021, https://doi.org/10.2166/nh.2021.160

V. Diaz, G.A. Corzo Perez, H.A.J. Van Lanen, D. Solomatine, ***E. A. Varouchakis***, "An approach to characterise spatio-temporal drought dynamics". ***Advances in Water Resources***, 137, 103512, 2020, Doi:https://doi.org/10.1016/j.advwatres.2020.103512

V. Diaz, G.A. Corzo Perez, H.A.J. Van Lanen, D. Solomatine, ***E. A. Varouchakis***, "Characterisation of the dynamics of past droughts" ***Science of the Total Environment***, 718, 134588, 2020, Doi:https://doi.org/10.1016/j.scitotenv.2019.134588

E. A. Varouchakis+, P.G. Theodoridou, G.P. Karatzas., "Groundwater level spatial distribution and risk assessment using geostatistics in R: a decision making tool" ***Journal of Hazardous, Toxic, and Radioactive Waste (ASCE)***", special issue: Sustainable Environmental Management, 24(1), 04019031, 2020, Doi:10.1061/(ASCE)HZ.2153-5515.0000464

D. Peña-Angulo, E. Nadal-Romero,**…. *E. A. Varouchakis*** (group of authors), "Relationship of Weather Types on the Seasonal and Spatial Variability of Rainfall, Runoff, and Sediment Yield in the Western Mediterranean Basin" ***Atmosphere***, 11(6): 609, 2020.

***** ***E. A. Varouchakis+*** and D. T. Hristopulos, "Comparison of spatiotemporal variogram functions based on a sparse dataset of groundwater level variations" ***Spatial Statistics Journal***, 34, 100245, December 2019, DOI: 10.1016/j.spasta.2017.07.003

* ***E. A. Varouchakis***+, P.G. Theodoridou, G.P. Karatzas., "Spatiotemporal geostatistical modeling of groundwater levels under a Bayesian framework using means of physical background" ***Journal of Hydrology***, 575, 487-498, 2019, DOI:https://doi.org/10.1016/j.jhydrol.2019.05.05

V. D. Agou**, *E. A. Varouchakis***, D. T. Hristopulos, "Geostatistical Analysis of Precipitation on the Island of Crete (Greece) based on a Sparse Monitoring Network" ***Environmental Monitoring and Assessment***, 191(6), 191-353, 2019, DOI:10.1007/s10661-019-7462-8

E. Tapoglou, ***E. A. Varouchakis***, I. C. Trichakis, G. P. Karatzas, "Hydraulic head uncertainty estimations of a complex artificial intelligence model using multiple methodologies" ***Journal of Hydroinformatics***, 22 (1): 205–218, 2020, DOI:10.2166/hydro.2019.137

***** ***E. A. Varouchakis+***, K. Yetilmezsoy, G. P. Karatzas, "A decision-making framework for sustainable management of groundwater resources under uncertainty: Combination of Bayesian risk approach and statistical tools", ***Water Policy Journal***, 21 (3): 602–622, 2019, https://doi.org/10.2166/wp.2019.128

D. Peña-Angulo, E. Nadal-Romero,…. ***E. A. Varouchakis*** (group of authors), "Spatial variability of the relationships of runoff and sediment yield with weather types throughout the Mediterranean basin", ***Journal of Hydrology***, 571, 390-405, 2019, https://doi.org/10.1016/j.jhydrol.2019.01.059

I. Matiatos, ***E. A. Varouchakis+***, M.P. Papadopoulou, "Performance evaluation of multiple groundwater flow and nitrate mass transport numerical models", ***Environmental Modelling & Assessment***, 2019, https://doi.org/10.1007/s10666-019-9653-7

E. A. Varouchakis+, G. A. Corzo Perez, G. P. Karatzas, A. Kotsopoulou "Spatio-temporal analysis of annual rainfall in Crete, Greece" ***Acta Geophysica***, 66 (3),319–328, 2018,, DOI: 10.1007/s11600-018-0128-z

Sole author publication

* ***E. A. Varouchakis***+, "Spatiotemporal geostatistical modeling of groundwater level variations at basin scale", ***Hydrology Research journal***, 49 (4), 2018 DOI: 10.2166/nh.2017.146

* ***E. A. Varouchakis***+, A. Apostolakis, M. Siaka, K. Vasilopoulos,, A. Tasiopoulos, "Alternatives for Domestic Water Tariff Policy in the Municipality of Chania, Greece, towards Water Saving Using Game Theory", ***Water Policy***, 20 (1), 175-188, 2018, DOI: 10.2166/wp.2017.182

P.G. Theodoridou, **E. A. Varouchakis**+, G.P. Karatzas, "Spatial analysis of groundwater levels using Fuzzy Logic and geostatistical tools", ***Journal of Hydrology***, 555, 242-252, December 2017. DOI: 10.1016/j.jhydrol.2017.10.027

Sole author publication

* ***E. A. Varouchakis***, "Modeling of Temporal Groundwater Level Variations Based on a Kalman Filter Adaptation Algorithm with Exogenous Inputs", ***Journal of Hydroinformatics***, 19 (2), 191-206, 2017.

* ***E. A. Varouchakis***+, I. Palogos, and G.P. Karatzas, "Application of Bayesian and cost benefit risk analysis in water resources management". ***Journal of Hydrology***, 534, 390-396, 2016.

Sole author publication

E. A. Varouchakis+, "Integrated water resources analysis at basin scale: a case study in Greece", ***Journal of Irrigation and Drainage Engineering-ASCE***, 142 (3), 05015012, 2016.

* ***E. A. Varouchakis***+, G. V. Giannakis, M. A. Lilli, E. Ioannidou, N. P. Nikolaidis, and G. P. Karatzas "Development of a statistical tool for the estimation of riverbank erosion probability", ***SOIL JOURNAL (EGU)***, 2, 1-11, 2016.

E. A. Varouchakis+, Spanoudaki, K., Hristopulos, D.T., Karatzas, G.P., Corzo Perez, G.A. "Stochastic Modeling of Aquifer Level Temporal Fluctuations Based on the Conceptual Basis of the Soil-Water Balance Equation", ***Soil Science***, 181 (6), 2016.

E. A. Varouchakis+, K. Kolosionis, and G.P. Karatzas "Spatial variability estimation and risk assessment of the aquifer level at sparsely gauged basins using geostatistical methodologies", ***Earth Science Informatics***, 9 (4), 437–448, 2016.

Z. Dokou, M. Dettoraki, G .P. Karatzas, ***E. A. Varouchakis***, A. Pappa, "Utilizing Successive Linearization Optimization to Control the Saltwater Intrusion Phenomenon in Unconfined Coastal Aquifers in Crete", Greece. ***Environmental Modeling & Assessment***, 22 (2), 115–128, 2016.

I. N. Daliakopoulos, I. K. Tsanis, A. Koutroulis, N. N. Kourgialas, ***E. A. Varouchakis***, G. P. Karatzas, C. J. Ritsema, "The threat of soil salinity: A European scale review". ***Science of the Total Environment***. 573, 727-739, 2016.

I. N. Daliakopoulos, P. Pappa, M. G. Grillakis, ***E. A. Varouchakis***, I. K.Tsanis "Modeling Soil Salinity in Greenhouse Cultivations Under a Changing Climate with SALTMED: Model Modification and Application in Timpaki, Crete", ***Soil Science***, 181 (6), 2016.

E. K. Vozinaki, G. P. Karatzas, I. A. Sibetheros and ***E. A. Varouchakis***, "An agricultural flash flood loss estimation methodology: the case study of the Koiliaris basin (Greece)", ***Natural Hazards***, 79 (2), 899-920, 2015.

M. Tsiknia, N. V. Paranychianakis, ***E. A. Varouchakis*** and N. P. Nikolaidis, "Environmental drivers of the distribution of nitrogen functional genes at a watershed scale", ***FEMS Microbiology Ecology***, 91 (6), 2015.

E. A. Varouchakis+, G. P. Karatzas and G. P. Giannopoulos, "Impact of irrigation scenarios and precipitation projections on the groundwater resources of Viannos basin in the island of Crete, Greece", ***Environmental Earth Sciences Journal***, 73, (11), 7359-7374, 2015.

E. Tapoglou, G. P. Karatzas, I. C. Trichakis and ***E. A. Varouchakis***, "A spatio-temporal hybrid neural network-kriging model for groundwater level simulation", ***Journal of Hydrology***, 519 (D), 3193–3203, 2014.

M. Tsiknia, N. V. Paranychianakis, ***E. A. Varouchakis***, D. Moraetis and N. P. Nikolaidis, "Environmental drivers of soil microbial community distribution at the Koiliaris Critical Zone Observatory", ***FEMS Microbiology Ecology***, 90 (1), 139–152, 2014.

* ***E. A. Varouchakis*** and D. T. Hristopulos, "Improvement of groundwater level prediction in sparsely gauged basins using physical laws and local geographic features as auxiliary variables", ***Advances in Water Resources***, 52 (C), Pages 34–49, 2013.

* ***E. A. Varouchakis*** and D. T. Hristopulos, "Comparison of stochastic and deterministic methods for mapping groundwater level spatial variability in sparsely monitored basins", ***Environmental Monitoring and Assessment***, 185 (1), 1-19, 2013.

* ***E. A. Varouchakis***, D. T. Hristopulos and G. P. Karatzas, "Improving kriging of groundwater level data using non-linear normalizing transformations-A field application", ***Hydrological Sciences Journal***, 57 (7), 1404 – 1419, 2012.

M. P. Papadopoulou, ***E. A. Varouchakis*** and G. P. Karatzas, "*Terrain Discontinuities Effects in the*

Regional Flow of a Complex Karstified Aquifer", ***Environmental Modeling & Assessment***, 15 (5), 319 –328, 2010.

M. P. Papadopoulou, ***E. A. Varouchakis*** and G. P. Karatzas, "Simulation of complex aquifer behavior using numerical and geostatistical methodologies", ***Desalination***, 237 (1-3), 42 – 53, 2009.

S. N. Elogne, D. T. Hristopulos, and **E*. Varouchakis***, "An Application of Spartan Spatial Random Fields in Environmental Mapping: Focus on Automatic Mapping Capabilities", ***Stochastic Environmental Research and Risk Assessment* (SERRA)**, 22 (5), 633 – 646, 2008.

C. Editorials

Hristopulos, D.T., ***Varouchakis, E.A***., Skøien, J.O., Solomatine, D., "Space–time models for hydrological and environmental applications". ***Stochastic. Environmental Research & Risk Assesment***, 2020, DOI:10.1007/s00477-020-01830-z

E.A Varouchakis, D.T. Hristopulos, G.B.M., Heuvelink,, G.A. Corzo Perez, "Spatio-temporal statistical methods for analysis of hydrological events and related hazards". ***Spatial Statistics***, 34, 100387, 2019. DOI:https://doi.org/10.1016/j.spasta.2019.100387

E. V. Taguas, **E. A. Varouchakis**, "Introduction to the Special Issue on Soil Hydrology: Part 1". ***Soil Science***, 181(6), 223, 2016.

E. A. Varouchakis, E. V. Taguas, "Introduction to the Special Issue on Soil Hydrology: Part 2". ***Soil Science***, 181(7), 273-274, 2016.

D. Books -Chapters-Technical reports

D. T. Hristopulos and ***E. A. Varouchakis***, "*Maximum Entropy Method*" Earth Sciences Series. Encyclopedia of Mathematical Geosciences (2019-2022) Springer Publishers

G. A. Corzo Perez, ***E. A. Varouchakis***, "Spatio-temporal analysis of extreme hydrological events", **Elsevier**, Published Date: January 2019.

- Chapter 1, **Varouchakis, E.A**., 2019. *Geostatistics: Mathematical and Statistical Basis*. Spatiotemporal Analysis of Extreme Hydrological Events. Elsevier, pp. 1-38. DOI:https://doi.org/10.1016/B978-0-12-811689-0.00001-X
- Chapter 2, **Varouchakis, E.A**., 2019. *Background of Spatiotemporal Geostatistical Analysis*: Application to Aquifer Level Mapping. Spatiotemporal Analysis of Extreme Hydrological Events. Elsevier, pp. 39-57. DOI:https://doi.org/10.1016/B978-0-12-811689-0.00002-1

K. Tsanis, I. N. Daliakopoulos, A G. Koutroulis, G P. Karatzas, ***E. A. Varouchakis***, N. N. Kourgialas, *Soil Salinization*, In: "Soil threats in Europe, Status, methods, drivers and effects on ecosystem services", Editors: J. Stolte et al., **JRC Technical Reports**, European Commission, pp 207, 2016

E. Conference Publications

Emmanouil Varouchakis, Leonardo Azevedo, João L. Pereira, George P. Karatzas, Seifeddine Jomaa, Blending geostatistics and geophysics to develop the hydrogeological structure of a coastal aquifer system, 7th IAHR Europe Congress, Athens, Greece on September 7 – 9, 2022

Ioanna Anyfanti, George P. Karatzas, ***Emmanouil Varouchakis***, Paraskevas Diakoparaskevas, Application of a Fuzzy Inference System in Decision Making for Water Resources Management, 7th IAHR Europe Congress Athens, Greece on September 7 – 9, 2022

Paraskevas Diakoparaskevas, ***Emmanouil Varouchakis***, Georgios Panagopoulos, Panteleimon Soupios, Antonis Vafidis,Georgios Karatzas and Emmanouil Manoutsoglou, Groundwater flow simulation in the Tymbaki aquifer by using different subsurface geological models, GEOLOGICAL SOCIETY OF GREECE, 16th International Congress, October 17-19, 2022, Patras, Greece

João Lino Pereira, Mafalda Oliveira, Rui Guinote, ***Emmanouil A. Varouchakis***, J. Jaime Gómez-Hernández, Leonardo Azevedo, Geostatistical electrical resistivity tomography inversion for groundwater characterization, 14th International Conference on Geostatistics for Environmental Applications geoENV, June 22-24 2022, Parma, Italy

E. A. Varouchakis , G. P. Karatzas, I. Trichakis, Application of geostatistics and self-organizing maps for estimation of groundwater level spatial distribution in complex hydrogeological systems, 14th International Conference on Geostatistics for Environmental Applications geoENV, June 22-24 2022, Parma, Italy

Diaz, G.A. Corzo Perez, ***E. A. Varouchakis***, D. Solomatine, "Feature analysis of spatial structure of drought. Case study of Crete Island, Greece" 14th International Conference on Hydroinformatics – HIC2020, Mexico 26-30 July.

E. A. Varouchakis , G. A. Corzo, I. Trichakis, G. P. Karatzas, "Groundwater quantity and quality improvement in Messara basin Crete", Adapt 2 Clima conference 2019, Heraklion Crete, 24-25 July.

E. Tapoglou, ***E. A. Varouchakis***, G. P. Karatzas, "Uncertainty estimations in different components of a hybrid ANN - fuzzy - kriging model for water table level simulation", EPiC Series in Engineering 3, 13th International Conference on Hydroinformatics, Palermo-Italy, Jul. 1 - 6, 2018.

P.G. Theodoridou, ***E.A. Varouchakis***, G.P. Karatzas, "Regression Analysis and Risk Assessment of Groundwater Levels", Proceedings, 2(11), 641, Presented at the 3rd EWaS International Conference on Insights on the Water ‐ Energy ‐ Food Nexus, Lefkada Island, Greece, 27–30 June 2018.

E.A. Varouchakis, P.G. Theodoridou and G.P. Karatzas, "Spatiotemporal Geostatistical Modeling Of Aquifer Levels Using Physically Based Tools", Protection and Restoration of the Environment XIV, Thessaloniki, July 3-6, 2018.

E.A. Varouchakis, P.G. Theodoridou, G.P. Karatzas, "Space-time modelling of aquifer level using novel geostatistical tools", European Water Resources Association global conference, Athens, July 2017.

P.G. Theodoridou, ***E.A. Varouchakis***, G.P. Karatzas, G.A. Corzo Perez, "Groundwater level geostatistical analysis using non-Euclidean distance metrics and variable variogram fitting criteria", 12th International Conference on Hydroinformatics, South Korea, Aug. 21 - 26, 2016.

E. A. Varouchakis, K. Kolosionis, G. P. Karatzas, and D. T. Hristopulos, "Groundwater level spatial variability distribution and risk assessment in a sparsely gauged basin using the Spartan covariance function and auxiliary information", 10th International Congress of the Hellenic Geographical Society, Thessaloniki, 22-24 of October, 2014
I. Matiatos, ***E. A. Varouchakis*** and M.P. Papadopoulou, "Statistical Sensitivity Analysis Of Multiple Groundwater Mass Transport Models", 10th International Hydrogeological Congress, Thessaloniki, 8-10 of October, 2014.

G. P. Giannopoulos, ***E. A. Varouchakis*** and G. P. Karatzas, "Assessment of potential climatic and pumping changes on the groundwater resources of a Mediterranean basin", Protection and Restoration of the Environment XI, Thessaloniki, July 3-6, 2012.

Papadopoulou M. P., ***E. A Varouchakis*** and G. P. Karatzas "A study of the complex karstification phenomenon in nature: an analysis of the flow in a fractured medium in Crete", 10th International Conference on Environmental Science and Technology, CEST 2007-Cos island, 2007.

Papadopoulou M. P., ***E. A. Varouchakis*** and G. P. Karatzas, "A Comparison Between two Numerical Simulators Using Different Geostatistical Methodologies for the Solution of Complex Environmental Design Problems", European Water Resources Association conference, Chania, Greece, 2007.

E. Varouchakis and D. T. Hristopoulos, "Mapping of Soil Contaminants Using Spartan Spatial Random Fields: A Comparative Study", Proceedings of International Workshop in “Geoenvironment and Geotechnics” (GEOENV), Milos island, Greece, September 2005.

E. Varouchakis and D. T. Hristopoulos, "An Application of Spartan Spatial Random Fields in Geostatistical Mapping of Environmental Pollutants", International Conference of Computational Methods in Sciences and Engineering (ICCMSE), Athens, Greece, November 2004, pp.741-744.

E. Varouchakis and D. T. Hristopoulos, I. Vardavas, "Stochastic modelling of groundwater level in the Messara valley of Crete ", 1st International Conference of Advances in Mineral Resources Management & Environmental Geotechnology (AMIREG), Chania, Greece, June 2004, pp 139-144.

Research Projects
Scientific coordinator

Uncertainty-aware intervention design for Mediterranean aquifer recharge, Funding: Prince Albert II of Monaco Foundation, 2019-2022 (Scientific coordinator, Principal proposer and researcher along with IHE-Delft).

Topic: Design and development of a system for suggesting suitable locations for aquifer recharge in Crete, Greece, under conditions of uncertainty. Spatiotemporal statistical geodata analysis and water systems modelling.

Natural Resources Research Postdoc Research Scholarship: A Bayesian space-time geostatistical model for groundwater level variability estimation, Funding: International Association for Mathematical Geosciences (IAMG), 10/2015-10/2016. (Principal Researcher)

Research Projects
Associate Researcher

InTheMed, Innovative and Sustainable Groundwater Management in the Mediterranean, under PRIMA call - Coordination and support for the partnership for research and innovation in the Mediterranean area, April 2020-April 2023. (Associate Researcher)

Topic: Water resources management, development of cost-benefit analysis system for decision support.

Sustain-Coast, Sustainable coastal groundwater management and pollution reduction through innovative governance in a changing climate, under PRIMA call - Coordination and support for the partnership for research and innovation in the Mediterranean area, June 2019-June 2022. (Associate Researcher)

Topic: Water resources management, development of a decision support system under conditions of uncertainty.

ELIDEK 2018 (National grant): Spatio-temporal Modelling of the Significant Wave Height Variability for Estimating the Wave Energy Potential in the Mediterranean Sea, with field applications in the Aegean and Ionian Sea, Foundation of Research and Technology (FORTH), Heraklion, Crete, 2019-2021. (Researchers consortium member)

Topic: Spatio-temporal geostatistical analysis of sea wave data

DESIRES: Platform for Desalination Plant powered with RES design, Sea wave spatiotemporal analysis in the Mediterranean Region, Funding: ERANET-MED, September 07/2017-07/2018. (Associate Researcher)

Topic: Spatio-temporal analysis of climate data

RECARE: Preventing and remediating degradation of soils in Europe through land care, Funding: EU FP7-ENV, 1/02/2013 – 28/02/2017. (Associate Researcher)

Topic: Statistical and Geostatistical analysis of hydrological, soil and geomorphological data.

SPARTA: Development of Space-Time Random Fields based on Local Interaction Models and Applications in the Processing of Spatiotemporal Datasets, Excellence Research Grant 2011, 01/2012 – 11/2015. (Associate Researcher)

Topic: Development of Space-time geostatistical models for geo-information analysis based on the Bayesian theory.

THALIS – CYBERSENSORS: High frequency monitoring system for integrated water resources management of rivers, Funding: Hellenic Ministry of Education, GSRT-EU-GR, 1/1/2013 – 30/9/2015. (Associate Researcher)

Topic: Spatiotemporal Statistical analysis / Data mining of climatic and hydrological data. Development of a statistical model to determine the riverbank erosion probability considering geo-hydrological variables.

SPATSAT: Development of Spartan Spatial Random Fields for geostatistical applications. The Marie Curie Transfer Of Knowledge Grant, Funding: EU Contract No. MTKD-CT-2004-014135, 1/9/05 – 1/9/08. (Junior Researcher)

Topic: Development of covariance functions based on Spartan Spatial Random Fields.

Application of geostatistical methods in environmental applications-Geostatistical analysis of hydrological data from the island of Crete. Funding: Hellenic Ministry of Education, Pythagoras Program II, 1/1/06 – 30/4/07. (Junior Researcher)

Spartan Spatial Random Fields for environmental geostatistical applications. Funding: Technical University of Crete. Support funding for basic research, 1/4/05 – 31/3/06. (Scholar Researcher)

Topic: Geostatistical Analysis of hydrological data.

Editor in international journals

Associate editor: Hydrology Research Journal, IWA, 2020-today

Guest Editor: Hydrogeology Journal, Application of geostatistics to hydrogeology, 2022-2023

Guest Editor: *Entropy Journal*: Spatiotemporal Prediction and Simulation Methods at the Nexus of Statistical Physics, Spatial Statistics and Machine Learning, 20 June 2022

Guest Editor: *Stochastic Environmental Research & Risk Assessment Journal*, Special Issue: Space–time models for hydrological and environmental applications, July 2020.

Guest Editor: *Spatial Statistics Journal*, Special Issue: Spatio-temporal and geostatistical analysis of hydrological events and/or related hazards, December 2019.

Guest Editor: *SOIL Science Journal*, Special Issue vol: 1-2, Soil Hydrology, June-July 2016.

Reviewer in major international journals

Hydrology and Earth System Sciences (2022-today), Environmental Modelling & Software (2021-today), Science of the total environment (2019-today), International Journal of Systems Science (2019-today), Hydrology Research (2018-today), Environmental Modelling & Assessment,(2017-today), Water Resources Research (2016-today), Advances in Water Resources, (2016-today), Spatial Statistics (2016-today), Applied Statistics (2016-today), Journal of Hydroinformatics (2016-today), Water Resources Management Journal (2016-today), Hydrological Sciences Journal (2016-today), Water Policy Journal (2016-today), Water MDPI (2016-today), Journal of hydrology (2015-today), Hydrogeology Journal (2015-today), Computer & Geosciences (2015-today), Journal of Hydrologic Engineering (ASCE) (2013-today), Environmental Monitoring & Assessment (2012-today), Stochastic Environmental Research and Risk Assessment (SERRA) (2011-today)

External examiner-evaluator

Polish National Science Centre, Reviewer of research proposals in Physical Sciences and Engineering discipline, (2019,2021,2022)

External reviewer of proposals for Chile Research Council (2020)

Undergraduate program evaluator of the new undergraduate program BSc in Environmental Science, Sultan Qaboos University, Oman (2016)

MSc Thesis evaluator, Faculty of Engineering, Built Environment and Information Technology, University of Pretoria, South Africa (2014)

Invited-lectures/ seminars/workshops

Invited workshop/Seminar, GEOSTAT2018, "Spatial analysis and applications in geological, mining and environmental problems", Wroclaw University of Science and Technology, Poland, 22 – 25 January 2018. (http://geostat2018.pwr.edu.pl/)

Invited Lecture on "Applied Geostatistics, Hydroinformatics for hydrology: geostatistical modelling". Hydrological Sciences Division (HS), Hydroinformatics Session, EGU, 27 of April 2017. (http://meetingorganizer.copernicus.org/EGU2017/session/25340).

Invited workshop/Seminar, "Spatiotemporal geostatistics for environmental applications", University of Cordoba, Spain, 14 – 16 June 2016.

Symposium in the area of uncertainty analysis and geostatistical applications in water resources and environmental science, "Space-time geostatistical modelling of aquifer level in conjunction with simulation methods for uncertainty estimation" 28/10/2016 UNESCO-IHE, Delft, Netherlands.

Guest Lecture under Erasmus+ staff mobility action "Geostatistics in water resources management" 10/02/2016, UNESCO-IHE, Delft, Netherlands.

Member of scientific and organising committees of international conferences

Organizer of the 15th International Conference on Geostatistics for Environmental Applications, Chania, Greece, 19-21 June 2024

Member of the scientific committee of the Spatial Statistics 2023: Climate and the Environment 19 – 22 July 2023 | University of Colorado Boulder, USA

Member of the scientific committee of the 13 th and 14th International Conference on Geostatistics for Environmental Applications, Parma, Italy, 2021,2022

Convener of the sessions at EGU General Assembly Conference, Vienna:

- Hydroinformatics for Mineral Resources applications, 2023
- Advanced Geostatistics for Water, Earth and Environmental Sciences (2020 & 2021)
- Spatio-temporal and/or geostatistical analysis of hydrological events, extremes, and related hazards (2015-2020)
- Innovation and new challenges in sharing research results and knowledge of soil and water resources: experiences on strategic thinking, technologies and collaborative work (2017)
- Instrumented Catchments and Demonstration Areas: the scientific and social impact of research through experiments and modelling about water and soil (2015)

Member of the scientific committee of Spatial Statistics conference: Towards Spatial Data Science 10 – 13 July 2019 | Sitges, Spain

Member of the 15th CEST International Conference on Environmental Science And Technology, Rhodes, September 2017.

Member of the scientific committee of the 2nd EWaS International Conference: “Efficient & Sustainable Water Systems Management toward Worth Living Development”, Chania, Crete, 2016.

Honours and awards

Chair of Hydroinformatics subdivision, Hydrological Sciences Division, European Geoscience Union, 2022-2024

Natural Resources Research Postdoc Scholarship 2015, Iinternational Association for Mathematical Geosciences (IAMG).

Technical University of Crete award for Excellence in Applied Teaching, 2015.

Young Scientist Award (invited presentation) after review "Geostatistical Applications of Spartan Spatial Random Fields in Environmental Mapping", Emmanouil Varouchakis, Samuel Elogne, Dionisios Hristopulos, EGU General Assembly Conference, Vienna, 2006.

Research scholarship, Technical University of Crete, funding for basic research, "Spartan Spatial Random Fields for geostatistical applications", 1/4/05 – 31/3/06.

Junior researcher scholarship, Foundation of Research and Technology (FORTH), Heraklion, Crete-Greece, Research and Development grant, "Environmental data management", 1/7/2002 – 30/6/2003.

Memberships

International Association of Mathematical Geosciences (IAMG) (2013-today)
International Association of Hydrological Sciences (I.A.H.S.), (2009-today)
European Geosciences Union (E.G.U) (2006-today)
Hellenic Association of Chemical Engineers (2006-today)
Technical Chamber of Greece (2002-today)