

Petros Gaganis, Dr.

SHORT CURRICULUM VITAE

Current occupation:

Assistant Professor
University of the Aegean, Department of Environment
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Educational Background

Ph.D. in Stochastic Hydrogeology: January 1997 – September 2000
University of British Columbia, Department of Earth and Ocean Sciences, Vancouver, British Columbia, Canada

M.Sc. in Contaminant Hydrogeology: September 1995 – December 1996
University of British Columbia, Department of Earth and Ocean Sciences, Vancouver, British Columbia, Canada

B.Sc. in Geology: September 1981 – December 1985
Aristotle University of Thessaloniki, Department of Geological Sciences, Thessaloniki, Greece.

Academic Awards

- Performance Award/ Scholarship, Aristotle University of Thessaloniki, 1982-1983
- Competitive Scholarship (three years), National Scholarship Foundation of Greece, 1995 - 1998
- Research Assistantship, Natural Science and Engineering Research Council of Canada, 1998 - 2000
- MacKay Scholarship/ Award, University of British Columbia, 1999-2000

Research Experience

Assistant Professor, Department of Environment, University of the Aegean, Mytilene, Greece, October 2004 – today.

Subject: Management of water resources at a watershed scale. Integration of multidisciplinary data in risk-cost-benefit analyses and development of decision models to identify optimal management alternatives.

Research Fellow, FORTH/ICE-HT, HELLAS, (Foundation of Research and Technology - Institute of Chemical Engineering and High Temperature Chemical Processes), Patras, Greece, February 2001 – 2004.

Subject: Numerical modeling and identification of physical/chemical processes and critical parameters that affect the transport of volatile organic contaminants (VOCs) in the unsaturated zone and risk assessment. Scenario specific modelling of transport of organic mixtures in the vadose zone and application to lab and field experiments. Determination of the characteristics of contaminant transfer and quantification of pollutant transport (by advection, diffusion and dispersion) across the capillary fringe. Development of a cost-effective methodology to modeling transport of multicomponent VOC mixtures in the vadose zone.

Research Assistant, University of British Columbia, Department of Earth and Ocean Sciences, Vancouver, British Columbia, Canada, 1996-2000

Subject: Stochastic modeling of flow and transport of radionuclides in groundwater, risk-cost-benefit analyses. Methodology development for quantifying the effect of errors in the structure of a model (model error) on groundwater model predictions. Methodology development to account for model error in parameter estimation (inverse method). Development of a decision model, which takes into account both parameter and model uncertainty, for evaluating the necessity of protective measures for the Pripyat Town well field located near the Chernobyl Nuclear Plant.

Research Associate, Golder Associates, Vancouver, British Columbia, Canada, 1999

Subject: Post-mining environmental impact assessment through numerical modeling (Diavik Mines).

Participation in Relevant International and National Research Projects

- 1997-2000 - Project title: “Quantification of the Effect of Model Error on Groundwater Model Predictions and Risk assessment”, University of British Columbia (funded by the Natural Science and Engineering Research Council of Canada (NSERC)).
- 2000-2003 - Project title: “Groundwater Risk Assessment at Contaminated Sites (GRACOS)”, EVK1-1999-00148, 5th European Community Framework Programme
Total Budget : 2.550.000 EURO
Partners: (i) Eberhard-Karls University Tübingen (D), (ii) Netherlands Energy Research Foundation, Netherlands (NL), (iii) Technical University of Denmark (DK), (iv) Ecole Polytechnique Federale de Lausanne (CH), (v) ICE/HT – FORTH, HELLAS (GR), (vi) Foundation Labein (E), and (vii) Foundation Gaiker (E)
- 2002-2003 - Project title: “Droplet-substrate interaction for micro patterned film fabrication”, ICE/HT – FORTH, HELLAS (funded by SEIKO EPSON CORPORATION)
Total Budget : 81.000 EURO
- 2005- 2009 - Project title: “Assessment of the effect of permanent and temporary sources of contamination on water resources quality in N.W. Achaia using information and communication technologies”, ICE/HT – FORTH, HELLAS (funded by Region of western Greece, Prefecture of Achaia).
Total Budget : 100.000 EURO
- 2009-20011- Project Title: “Long term Runoff Monitoring of the main rivers of the proposed dam sites Tsiknias & polichnitos, Lesvos” (funded by Region of Eastern Aegean, Prefecture of Lesvos).
Total Budget : 110.000 EURO
- 2010-20013- Project Title: “ Surface water and Groundwater Nutrient Dynamics in a watershed of East Mediteranean” (funded by EPEAEK “Iraklitos II”)
Total Budget : 45.000 EURO

Scientific Publications

Ph.D. Thesis

Gaganis, P., 2000. On the Quantification of the Effect of Model Error on Groundwater Model Predictions and Risk assessments. *Ph.D. Thesis*, University of British Columbia, Vancouver BC, Canada.

Refereed journals and books

Smith, L. and **P. Gaganis**. 1998. Strontium-90 Migration to Water Wells at the Chernobyl Nuclear Power Plant: Re-evaluation of a Decision Model, *Environmental and Engineering Geoscience*, vol. IV, no. 2, pp. 161-174.

Gaganis, P. and L. Smith. 2001. A Bayesian Approach for Evaluating the Effect of Model Error on the Predictions of Groundwater Models. *Water Resources Research*, vol. 37, no. 9, pp. 2309-2322.

Gaganis, P., H. K. Karapanagioti and V. P. Burganos. 2002. Modeling Multicomponent NAPL Transport in the Unsaturated zone with the Constituent Averaging Technique. *Advances in Water Resources*, vol. 25, no. 7, pp. 723-732.

Smith, L., D. Bugai, **P. Gaganis** and R. Beckie. 2002. Application of Decision Models in the Assessment of Strontium-90 Migration to Water Wells at the Chernobyl Nuclear Power Plant, in *Chernobyl Disaster and Groundwater*, Ed. V. Shestopalov, A.A. Balkema Publishers/Rotterdam/Netherlands.

Karapanagioti H. K., **P. Gaganis**, and V. N. Burganos. 2003. Modeling Attenuation of Volatile Organic Mixtures in the Unsaturated Zone: Codes and Usage. *Environmental Modelling and Software*, vol. 18, no. 4, pp. 329-337.

Grathwohl P., A. Bonilla, M. Broholm, V. Burganos, M. Christophersen, R. Comans, **P. Gaganis**, I. Gorostiza, P. Höhener, P. Kjeldsen, H. van der Sloot. 2003. *Guideline for Groundwater Risk Assessment at Contaminated Sites. Scenarios and recommendations for the assessment of a potential risk of groundwater contamination originating from a contamination in the unsaturated soil zone.* Campus Druck, Tübingen, Germany.

Karapanagioti H.K., **P. Gaganis**, V.N. Burganos, and P. Höhener. 2004. Reactive transport of volatile organic compound mixtures in the unsaturated zone: modeling and tuning with lysimeter data. *Environmental Modelling and Software*, vol. 19, no 5, pp. 435-450.

Gaganis, P., P. Kjeldsen and V. P. Burganos. 2004. Modeling Natural Attenuation of Multicomponent Fuel Mixtures in the Vadose Zone: Use of Field Data and Evaluation of Biodegradation Effects. *Vadose Zone Journal*, vol. 3, pp. 1262-1275.

Gaganis, P., E.D. Skouras, M.A. Theodoropoulou, C.D. Tsakiroglou, V.N. Burganos. 2005. On the evaluation of dispersion coefficients from visualization experiments in artificial porous media. *Journal of Hydrology*, 307, pp. 79-91.

Gaganis, P. 2005. Modelling the spatial and temporal trends of carbon isotope fractionation of voc mixtures in the unsaturated zone. *Global Nest: The International Journal*, vol. 7, no. 2, pp. 155-162.

Gaganis, P., and L. Smith. 2006. Evaluation of the uncertainty of groundwater model predictions associated with conceptual errors: A per-datum approach to model calibration. *Advances in Water Resources*, vol. 29, pp. 503-514.

Daniel Bouchard, Daniel Hunkeler, **Petros Gaganis**, Ramon Aravena, Patrick Höhener, Mette M. Broholm and Peter Kjeldsen. 2008. Carbon isotope fractionation during migration of petroleum hydrocarbon vapors in the unsaturated zone: field experiment at Værløse Airbase, Denmark, and modeling. *Environmental Science and Technology*, vol. 42, no. 2, pp. 596-601.

Gaganis, P., and L. Smith. 2008. Accounting for Model Error in Risk Assessments: Alternatives to Adopting a Bias Towards Conservative Risk Estimates in Decision Models. *Advances in Water Resources*, Vol. 31, no. 8, pp. 1074-1086.

P. Gaganis. 2009. Model calibration/parameter estimation Techniques and model conceptual errors, in *Uncertainties in environmental modelling and consequences for decision making*, Baveye, Philippe; Mysiak, Jaroslav; Laba, Magdeline (Eds.), Springer Verlag, 410 p.

Nikoleta Jones, Konstantinos Evangelinos, **Petros Gaganis**, Eugenia Polyzou. 2010. Citizens' perceptions on water conservation policies and the role of social capital. *Water Resources Management, Water Resources Management*, vol. 25, no. 2, p 509.

Kontis E. and **Gaganis P.** 2012. Hydrochemical Characteristics and Groundwater Quality in the Island of Lesvos, Greece. *Global Nest: The International Journal* (in press)

Conference proceedings

Gaganis, P. and L. Smith. 1999. Accounting for Model Error in Calibrating Groundwater Models. *Eos Trans. AGU, 80(46), Fall Meet. Suppl.*, 1999.

Gaganis, P. and L. Smith. 2000. A Bayesian Method for Quantifying Model Error in Groundwater Problems. *Computational Methods in Water Resources XIII*, A.A. Balkema Publishers/Rotterdam/Netherlands, pp 511-516.

Gaganis, P. and L. Smith. 2000. Accounting for Model Error in Risk Assessments: Application to the Chernobyl Site, Ukraine. *Eos Trans. AGU, 81(48), Fall Meet. Suppl.*, 2000.

Gaganis, P., H. K. Karapanagioti and V. P. Burganos. 2002. Modeling Multicomponent NAPL Transport with the Constituent Averaging Technique. *1st International Workshop on Groundwater Risk Assessment at Contaminated Sites*, Tübingen, Germany. *Tübinger Geowissenschaftliche Arbeiten*, Vol. 61, pp. 238-243.

Gaganis, P., E. D. Skouras, M. Theodoropoulou and V. P. Burganos. 2002. Modeling Contaminant Emission Across the Capillary Fringe. *1st International Workshop on Groundwater Risk Assessment at Contaminated Sites*, Tübingen, Germany. *Tübinger Geowissenschaftliche Arbeiten*, Vol. 61, pp. 119-124.

Gaganis, P. and V. P. Burganos. 2002. Modeling Transport of VOC Mixtures Using Composite Constituents. *Computational Methods in Water Resources XIV*, Delft, The Netherlands, Elsevier, pp. 185-192.

Gaganis, P. and L. Smith. Quantification of the Effect of Model Error on Groundwater Model Predictions and Risk Assessment. *Eos Trans. AGU, 83(47), Fall Meet. Suppl., Abstract H71A-0774*, 2002 (**INVITED**).

Gaganis, P. and V. P. Burganos. 2002. A Computationally Cost Effective Approach to Modeling Transport of Multicomponent VOC Mixtures in the Vadose Zone. Validation with Field Data. *Eos Trans. AGU, 83(47), Fall Meet. Suppl.* 2002.

Gaganis, P., P. Kjeldsen and V. P. Burganos. 2003. Cost-effective modelling of fuel mixture transport in the vadose zone: Application to a field experiment, Airbase Værløse, Denmark. *2nd International Workshop on Groundwater Risk Assessment at Contaminated Sites and Integrated Soil and Water Protection*, Tübingen, Germany. Tübingen Geowissenschaftliche Arbeiten Vol. 69, pp 53-58.

Daniel Hunkeler (Key note speaker), Daniel Bouchard, Patrick Höhener, Ramon Aravena, Peter Kjeldsen, **Petros Gaganis**. 2004. Compound-specific isotope analysis as a tool to assess biodegradation of organic contaminants in the unsaturated zone. *UNESCO Workshop on transport and fate of diffuse contaminants in catchments with special emphasis on stable isotope applications*. GSF, Munich, Germany, 30 November - 2 December 2004 (**INVITED**).

Gaganis, P. 2005. Modelling the spatial and temporal trends of carbon isotope fractionation of voc mixtures in the unsaturated zone. *9th Conference on Environmental Science and Technology, Rhodes, 2005*.

Bouchard, D., D. Hunkeler, R. Aravena, P. Kjeldsen, **P. Gaganis** and P. Höhener. 2005. Use of stable carbon isotope analysis to assess natural attenuation of organic contaminants in the unsaturated zone. *Proceedings of the 9th International FZK/TNO Conference on Soil-Water Systems*, Bordeaux, pp 283-89, 2005.

Karapanagioti, H., Werner, D., Höhener, P. and **Gaganis, P.**, 2006. Modeling a diffusive tracer test for determining NAPL residual saturation in the unsaturated zone. In: NATO Committee on the Challenges of Modern Society (CCMS), 4th CCMS/NATO Workshop on "MANAGEMENT OF INDUSTRIAL TOXIC WASTES AND SUBSTANCES RESEARCH", Ioannina, Greece, 26-27 AUGUST 2006, pp. 34-39. (**INVITED**).

P. Höhener, N. Dakhel, G. Pasteris, M. Christophersen, M. Broholm, P. Kjeldsen, U. Maier, P. Grathwohl, **P. Gaganis, D. Bouchard, D. Hunkeler**. 2007. What is the degradation rate of benzene in the unsaturated zone underneath the Airbase Værløse, Denmark ? A comparison of laboratory and field methods, modelling and results from stable isotope data. Workshop of AquaTerra Subproject BIOGEOCHEM combined with KNOWMAN course on Brévilles: Long-term fate of pollutants in soils: Mobility, stability, and transformation. 15th – 16th March 2007.

S. Mimis and **P. Gaganis**. 2007. Vertical Flow Constructed Wetlands for Wastewater Treatment: A Pilot Scale Study. 10th Conference on Environmental Science and Technology, Kos, Sept. 2007.

P. Gaganis. 2007. Techniques for model calibration/parameter estimation and model conceptual errors. NATO institute on "Uncertainties in environmental modelling and consequences for decision making", Sept 30 to Oct 11, 2007, Vrsar (Croatia) (**INVITED**).

P. Gaganis. 2007. Agricultural management practices and water pollution risk. Agriculture and Environment: The two sides of the moon. Mytilene, Dec. 2007 (**INVITED**).

M. Giannaletsou, C., Klonari, **P. Gaganis**, N.Zouros. 2008. Investigation of pre-school children's ideas about volcanoes through their paintings and their narrations. 5th Pan-Hellenic Conference with International Participation "Science and Society: Natural Sciences in Early Childhood", Ioannina, November 2008.

Professional Affiliations

- Geotechnical Chamber of Greece, since 1986

- Greek Association of geologists, since 1986
- American Geophysical Union, since 1998
- Greek Committee for Water Resources Management (ΕΕΔΥΠ), since 2006

Other Professional Activities

- **Reviewer** for the international journal “Environmental Science and Technology”
- **Reviewer** for the international journal “Water Resources Research”
- **Reviewer** for the international journal “Journal of Contaminant Hydrology”
- **Reviewer** for the international journal “Journal of Environmental Quality”
- **Reviewer** for the international journal “Journal of hazardous Materials”
- **Reviewer** for the international journal “Global Nest: The international journal”

Research Interests

Numerical modeling of processes involved in (i) groundwater flow in homogeneous and heterogeneous soils, and (ii) transport and natural attenuation of contaminants in the vadose and saturated zones

Optimization algorithms and methodologies in mathematical modeling of hydrologic systems, methods for quantifying the reliability of flow and transport model predictions

Stochastic methods, risk analyses regarding (i) groundwater contamination and (ii) water management problems

Integration of multidisciplinary data in risk-cost-benefit analyses and development of decision models to identify optimal management alternatives