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CURRICULUM VITAE

GEORGIOS MARIOS HORSCH

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EDUCATION

- Ph.D. (1988), Department of Civil and Mineral Engineering,
University of Minnesota, Minneapolis, U.S.A.,
Major Field: Environmental Fluid Mechanics,
Doctoral Thesis: "*Cooling-Induced Convective Littoral Currents in Lakes: Simulation, Experiment, Analysis*".

- M.S. (1982), Department of Civil and Environmental Engineering,
Rutgers University, New Brunswick, New Jersey, U.S.A.,
Major Field: Hydraulic Engineering.

- Degree in Mathematics (1980), Department of Mathematics,
University of Athens, Athens.

ACADEMIC POSITIONS

1982-1987   Teaching Assistant, Department of Civil and Mineral Engineering, *University of Minnesota*.

1984-1988   Research Assistant**,** St. Anthony Falls Hydraulic Laboratory, *University of Minnesota*.

(1988-1989   Military Service, Office of Naval Research and Technology, Greek Navy)

1990-1991   Scientific Collaborator, Institute of Nuclear Technology and Radiation Protection, National Center for Scientific Research "Demokritos", Greece.

1992-1995   Collaborating Researcher D, Institute of Nuclear Technology and Radiation Protection, National Center for Scientific Research "Demokritos", Greece.

1995   Researcher D (elected), Hellenic Centre for Marine Research, Greece.

1995-pres.   Assistant Professor, Department of Civil Engineering, University of Patras, Greece.

REFEREED JOURNAL PUBLICATIONS

i) In English

1. Horsch, G.M. and H.G. Stefan. (1988). "*Convective Circulation in Littoral Water Due to Surface Cooling*", Limnology and Oceanography, Vol 33(5), pp 1068-1083.
2. Stefan, H.G., G.M. Horsch and J.W. Barko. (1989). "*A Model for the Estimation of Convective Exchange in the Littoral Region of a Shallow Lake During Cooling*", Hydrobiologia, Vol 174, pp. 225-234.
3. G.M. Horsch, H.G. Stefan and S. Gavali. (1994) "*Numerical Simulation of Cooling-Induced Convective Currents on a Littoral Slope*", Int. J. for Numerical Methods in Fluids, Vol 19, pp. 105-134.

4. M. Varvayanni, N. Catsaros, J.G. Bartzis, K. Konte, G.M. Horsch. (1995) "*Wind Flow Simulation over the Greater Athens Area with Highly Resolved Topography*", Atmospheric Environment Â, Vol 29, Iss 24, pp. 3593-3604.

5. Horsch, G.M. (1998). *"Steady, Diffusive-Reactive Transport in a Shallow Triangular Domain"*, Jour. of Engineering Mechanics, ASCE, Vol 124, No 10.

6. Horsch, G.M. (2004). *"The Structure of Two-Dimensional, Steady, Miscible Laminar Density Currents flowing Down an Incline"*, Journal of Hydraulic Research, Vol. 42, No 2, pp. 173-181.

7. A.G. Venetsanos, G.M. Horsch, G.C. Christodoulou (2005). *"Assessment of Turbulence Modeling of Density Currents Developing Three-Dimensionally on a Slope"*, J. of Marine Env. Eng, Vol. 7, pp. 325-343.

8. Ch.M. Dietz, P. Diplas, G.M. Horsch (2010). *"A Spectral Method Determination of the first critical Rayleigh Number in a Cylindrical Container"*, Appl. Math. Modelling, Vol. 34, Iss. 8, pp 2178-2191.

9. N.Th. Fourniotis, G.M.Horsch (2010). *"Three-Dimensional Simulation of Wind-Induced Barotropic Circulation in the Gulf of Patras"*, Ocean Engineering, Vol. 37, pp. 355-364.

10. Fourniotis, N.Th. and Horsch, G.M. (2011). "Simulation of the Far-Field Dilution of Effluents into the Gulf of Patras (Greece)", Journal of Hydraulic Research (second stage of review).

11. Horsch, G.M. and Fourniotis, N.Th. (2011) "On strong neashore wind-induced currents in flow-through, semi-enclosed gulfs", (submitted), (submitted).

    ii) In Greek

12. Σωτηρόπουλος, Δ.Α., Δήμας, Α.Α., Χορς, Γ.Μ., Γιαννόπουλος, Π.Χ., Φουρνιώτης, Ν.Θ. και Δημητρακόπουλος, Α.Κ. (2011). "Πειραματική Μελέτη Αποτελεσματικότητας Διατάξεων Καταστροφής Ενέργειας σε Ανοικτό Αγωγό Απότομης Κλίσης", ΥΔΡΟΤΕΧΝΙΚΑ, Επιστημονικό Περιοδικό της Ε.Υ.Ε. Τόμος 19, σ.σ. 1-12.

REFEREED CONFERENCE PAPERS

    i) In English

1. Horsch, G.M. and H.G. Stefan (1986). "*Convective Currents on Sloping Boundaries*", International Symposium on Buoyant Flows, Athens, Greece, G. Noutsopoulos (ed.), 1986, G.M. Horsch and H.G. Stefan.
    Also as: University of Minnesota Supercomputer Institute, RR 86/29

2. Horsch, G.M. and H.G. Stefan (1988). "Cooling-Induced Natural Convection in a Triangular Enclosure as a Model for Littoral Circulation", Comput. Meth. Water Resour. Vol 1 Modeling Surface and Sub-Surface Flows, Elsevier, 388pp, M.A. Celia et al. (eds).

    Also as: University of Minnesota Supercomputer Institute, RR 88/11

3. Horsch, G.M., J.G. Bartzis and N. Catsaros (1994). "*ADREA-EY: A Code for Three-Dimensional Flow Simulation in Water Bodies of Irregular Bathymetry*", Free Surface Flow and Hydraulic Software, W.R. Blain and K.L. Katsifarakis (eds), Comput. Mechanics Publications.

4. Horsch, G.M. (1994).*"Scaling of the Conduction Corner in Littoral Circulation"*, International Conference: Restoration and Protection of the Environment II, A.C. Demetracopoulos et al. (eds), University of Patras Press.

5. Horsch, G.M., J.G. Bartzis and N. Catsaros (1994)."*Testing a Three-Dimensional-Simulation Code: the Wind-Induced Circulation in Amvrakikos Gulf*", International Conference: Restoration and Protection of the Environment II, A.C. Demetracopoulos et al. (eds), University of Patras Press.

6. Horsch, G.M., G.C. Christodoulou, J.G. Bartzis, A.I. Stamou (1995). "*A Comparison of 3-D with 2-D Hydrodynamic Modeling of Coastal Flows*", XXVI th Congress of the International Association for Hydraulic Research, London, England.

7. Horsch, G.M, G.C. Christodoulou, M. Varvayanni (1999). "*Simulation of steady three-dimensional boundary-attached density currents*", Proc. of the Second Int. Symposium on Environmental Hydraulics, (eds. J.H.W. Lee, A.W. Jayawardena, Z.Y Wang), Hong Kong, China, Balkema.

8.   Horsch, G.M (2000). "*Numerical study of laminar three-dimensional negatively buoyant density currents*", Proc. of the Fifth International Conference on Protection and Restoration of the Environment, July 3-6, , Thassos, Greece.

9.   Horsch, G.M (2002). "*Numerical simulation of the development of miscible density currents on an incline*", 4th GRACM Congress on Computational Mechanics, Patras, Greece.

10.   Horsch, G.M (2002). "*Scaling of two-dimensional, miscible, laminar density currents flowing down an incline*", Proc. of the Sixth International Conference on Protection and Restoration of the Environment, July 1-5, Skathos, Greece.

11.   G.M. Horsch, G.C. Christodoulou, C. Birakis (2003). "Experimental and numerical features of laminar three-dimensional gravity currents on a slope", XXX IAHR Congress, Thessaloniki, Greece.

12.   Fourniotis, N.Th. and Horsch, G.M. (2007). "*3-D Numerical Modeling of Wind-Induced Circulation in the Gulf of Patras: Winter Season*", Congress of EWRA, European Water Resources Association, Water Resources Management: New Approaches and Technologies, 14-16 June, Chania, Crete, Greece.

13.   Fourniotis, N.Th. and Horsch, G.M. (2007). "*Validation of a Three-Dimensional Hydrodynamic Model and Application to the Gulf of Patras in Greece*", Proc. 32nd Congress of IAHR, the International Association of Hydraulic Engineering and Research, 1-6 July, Venice, Italy, paper SS13-21, Vol.1, pp. 1-10.

14.   Fourniotis, N.Th. and Horsch, G.M. (2008). "*Simulation of the Winter Meso-Scale Wind and Tidal Circulation in the Gulf of Patras (Greece)*", Proc. 27th International Conference on Offshore Mechanics and Arctic Engineering OMAE2008-57394, 15-20 June, Estoril, Portugal.

15.   Fourniotis, N.Th. and Horsch, G.M. (2009). "*Modeling Wind and Tide-Induced Currents in the Eastern Ionian Sea: Patraikos Gulf (Greece)*", Proc. 16th Congress of Asia and Pacific Division of International Association of Hydraulic Engineering and Research and 3rd IAHR International Symposium on Hydraulic Structures, paper A4a125, 20-23 October, Nanjing, China, Vol. IV, pp. 1201-1206.

16.   Fourniotis, N.Th. and Horsch, G.M. (2011). "Dilution of Effluents into the Gulf of Patras: Winter Regime and Glafkos Stream Influence", 13th International Conference on Civil, Structural and Environmental Engineering Computing, 6-9 September, Chania, Crete, Greece, (accepted).

        ii) In Greek

17.   Χορς, Γ.Μ. (1997). "*Οι κλίμακες της διάχυσης μη διατηρούμενης ουσίας σε επιμήκεις περιοχές με επικλινή πυθμένα*", Πρακτικά 7ου Συνεδρίου Ε.Υ.Ε., επιμέλεια Π. Χρ. Γιαννόπουλος κ.ά., Πάτρα.

18.   Χριστοδούλου, Γ., Γ. Χορς, Φ. Τζάχου, Γ. Νουτσόπουλος (1997)."*Τρισδιάστατα ρεύματα πυκνότητας σε κεκλιμένο πυθμένα*", Πρακτικά 7ου Συνεδρίου Ε.Υ.Ε., επιμέλεια Π. Χρ. Γιαννόπουλος κ.ά., Πάτρα.

19.   Φουρνιώτης, Ν.Θ. και Γ.Μ. Χορς (2008). «*Τρισδιάστατη Αριθμητική Μελέτη της Ανεμογενούς και Παλιρροϊκής Βαρότροπης Κυκλοφορίας του Πατραϊκού Κόλπου*», Τέταρτο Πανελλήνιο Συνέδριο: Διαχείριση και Βελτίωση Παράκτιων Ζωνών, 23-27 Σεπτεμβρίου, Μυτιλήνη.

20.   Φουρνιώτης, Ν.Θ. και Γ.Μ. Χορς (2009). «Τρισδιάστατη Αριθμητική Προσομοίωση της Χειμερινής Κυκλοφορίας στον Πατραϊκό Κόλπο», Ένατο Πανελλήνιο Συμπόσιο Ωκεανογραφίας και Αλιείας, 13-16 Μαΐου, Πάτρα.

ORAL PRESENTATIONS

1.   J.G. Bartzis, N. Catsaros, M. Varvayanni, C. Housiadas, G.M. Horsch, A. Megaritou, G. Amanatidis, K. Konte (1991). "*ADREA-I: a Finite Volume Nonhydrostatic Fully Compressible Transport Code for Mesoscale Analysis*", ASCOT Scientific Meeting, November, Seattle U.S.A.,

2.   Γ. Χριστοδούλου, Γ. Χορς, Φ. Τζάχου και Γ. Νουτσόπουλος (1998). «*Πειραματική και Θεωρητική Διερεύνηση Τρισδιάστατων Ρευμάτων Πυκνότητας σε Κεκλιμένο πυθμένα*», Ερευνητικές Δραστηριότητες στη Μηχανική των Ρευστών στον Ελληνικό Χώρο, Μάιος, Εργ. Αεροδυναμικής Ε.Μ.Π.

TECHNICAL REPORTS

1. Stefan, H.G., G.J. Farrell, M.J. Riley, K.F. Lindquist, G.M. Horsch (1984). "*Mixing of the Seneca and Blue Lake Waste Treatment Plant Effluents with the Minnesota River*", Project Report No 277, St. Anthony Falls Hydraulic Laboratory, University of Minnesota, November, 135 pp.
2. G.M. Horsch, A.Y. Fu, H.G. Stefan (1985). "*A Submodel of Ice Formation for the Winter Thermal Regime of Lakes Under Freezing Conditions*", Internal Memo No 109, St. Anthony Falls Hydraulic Laboratory, May, 37pp.
3. G.M. Horsch and J.G. Bartzis (1992). "*Modeling-Aspects of Dry Deposition of Gases and Particles at the Air-Sea Interface*", Demo Report 92/4 NCSR Demokritos.
4. J.G. Bartzis, M. Varvayanni, A. Venetsanos, N. Catsaros, C. Housiadas, G. Horsch, J. Statharas, G.T. Amanatidis, A. Megaritou, K. Konte (1993). "*ADREA -1 A Three-Dimensional Finite Volume Transport Code for Mesoscale Atmospheric Transport, Part I: Model Description*", Demo Report 93/2, NCSR "Demokritos".
5. J.G. Bartzis, A. Megaritou, K. Konte, M. Varvayanni, N Catsaros, A. Venetsanos, C. Housiadas, G. Horsch, J. Statharas, G.T. Amanatidis (1993). "*ADREA -1 A Three-Dimensional Finite Volume Transport Code for Mesoscale Atmospheric Transport, Part II: Code structure and User's Manual*", 1993, Demo Report 93/2 pt 2, NCSR "DEMOKRITOS".
6. N. Catsaros, D. Robeau, J.G. Bartzis, N. Varvayanni, G.M. Horsch (1993). "*The DELTA Code: A Computer Code for Simulating Air/Ground Interaction Zone - User's Manual*", Demo Report 93/17, NCSR "Demokritos".
7. Χορς Γ.Μ. (2009). «Τρισδιάστατη αριθμητική προσομοίωση της διάχυσης-μεταφοράς των επεξεργασμένων αποβλήτων από τον αγωγό της ΔΕΥΑ ΠΑΤΡΑΣ», Πάτρα.

VIDEO MOVIE

Horsch, G.M. and H.G. Stefan. (1988). "*Convective Circulation due to surface Cooling*", colored, 5min & 30sec, University of Minnesota Supercomputer Institute, G.M. Horsch and H.G. Stefan

CITATIONS

90 citations in the Science Citation Index (approximately, excluding self-citations)
A number of citations in Conferences, and Ph.D. and M.S. degrees of U.S.A. and European Universities (including theses at Virginia Polytechnic Institute, University of California, Davis, M.I.T, Australian National University, Swiss Federal Institute of Technology, Zurich).

REVIEWER

1. Journal of Fluid Mechanics
2. Journal of Hydraulic Engineering, ASCE
3. Journal of Hydraulic Research, IAHR
4. Applied Mathematical Modelling
5. International Journal of Heat and Fluid Flow
6. Marine Geology
7. Annales Geophysicae
8. Water, Air and Soil Pollution
9. In a number of Conferences

FUNDED RESEARCH

- "Analysis and simulation of two-dimensional and three-dimensional density currents along sloping bottoms", 2001-2004, "C. Karatheodory" program, 22,000 €, G.M. Horsch principal investigator.
- "Numerical simulation of the advection-diffusion of the treated effluents into the Gulf of Patras, 2009, 3,000 €, G.M. Horsch principal investigator.
- "Numerical prediction of waves, currents and environmental parameters in the coastal zone of the old and mew Port of Patras", PENED, 2005-2008, A.A. Dimas principal investigator. Participated supervising a Ph.D. thesis.
- Participated in a number of funded projects of the Hydraulics Laboratory, Department of Civil Engineering, University of Patras.
- "Development of a comprehensive decision support system for nuclear emergencies in Europe following an accidental release to the atmosphere", Radiation Protection, BI7 - 0045C, 100,000 ECU, J. Bartzis principal investigator.

- "Coordination of Atmospheric Dispersion Activities for the Real-Time Decision Support System Under Development at KfK", FI3P-CT92-0044, J. Bartzis principal investigator.
- "Three-dimensional density currents forming from the disposal of heavier fluids into receiving water bodies", 1992-94, PENED, G. Christodoulou principal investigator (N.T.U.A).
- Participated in projects at the St. Anthony Falls Hydraulic Laboratory, H.G. Stefan principal investigator, on:
  Modeling the dynamics of the ice cover that forms on lakes under freezing conditions.
  Mixing of the Seneca and Blue Lake Waste Treatment Plant Effluents with the Minnesota River
  Simulation of the barge fleeting area on the transverse diffusion of effluents from the Metro Wastewater Treatment plant.

HONORS
Bodossaki Foundation Scholarship, 1980-82.
A.S. Onassis Foundation Scholarship, 1982-84.

CURRENT RESEARCH INTERESTS
Hydrodynamics of coastal waters, lakes and reservoirs
Density currents
Numerical methods in Fluid Mechanics
Environmental heat and mass transfer

STUDENTS SUPERVISED
- Ph.D. thesis supervisor. Topic: the simulation of the hydrodynamic circulation in the Gulf of Patras (N. Fourniotis)
- M.S. theses supervisor: i) on simulation and analysis of density currents (C. Birakis), ii) simulation of wind-induced flow in channels (P. Alexopoulou), iii) two theses in progress.
- Participated in one Ph.D. and a number of M.S. theses committees.
- Supervised a number of undergraduate diploma theses.

TEACHING ACTIVITIES
A. *National Center for Scientific Research "Demokritos"*
Graduate courses
- Numerical analysis in fluid mechanics I.
- Numerical analysis in fluid mechanics II.
- Fluid Mechanics.

B. *Univesrity of Patras*
Undergraduate courses
- Fluid Mechanics
- Hydrodynamics of bays and reservoirs
- Laboratory topics in hydraulic engineering
Graduate courses
- Hydromechanics
- Hydrodynamics of bays and reservoirs

PROFESIONAL ACTIVITIES
- Served as representative of Greece (1994-95) in the NATO Committee on the Challenges of Modern Society (CCMS) on "The Use of Simulators as a means of Reducing Environmental Impacts Caused by Military Activities" (Report 210). He organized the committee meeting in Sparta, Greece (1994).
- Authored or co-authored about 10 technical reports.
- Co-produced a 5min colored video movie on "Convective Circulation due to surface Cooling", University of Minnesota Supercomputer Institute, 1988.