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CURRICULUM VITAE

GEORGIOS MARIOS HORSCH

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	26504 Aktaion, Patras, Greece
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EDUCATION

- Ph.D. (1988), Department of Civil and Mineral Engineering, University of Minnesota, Minneapolis, MN, 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.
1995-2013.	Assistant Professor, Department of Civil Engineering, University of Patras, Greece.
2013-pres.	Associate 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. (2012). "Simulation of the Far-Field Dilution of Effluents into the Gulf of Patras (Greece)", Fresenius Environmental Bulletin, Vol. 21, No. 4, pp. 868-879.

11. Fourniotis, N.Th. and **Horsch, G.M.** (2013). "*The Fate of Pollution due to a River: A numerical study for south-eastern coasts of the Gulf of Patras (Greece)*", Fresenius Environmental Bulletin, in press.

    ii) In Greek

12. Sotiropoulos, D.A., A.A. Dimas, G.M. Horsch, P.C. Yannopoulos, N.Th. Fourniotis, and A.C. Demetracopoulos. "Experimental study on the effectiveness of an energy dissipation configuration in an open channel of a steep slope", Hydrotechnika (Jounal of the Hellenic Hydrotechnical Association), Vol. 19, pp. 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.
    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, Skiathos, 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.   Dietz, Ch.M., P. Diplas, G.M. Horsch. (2005). "*Determination of the onset of convection in a cylindrical container by a Chebyshev-Galerkin method*", 1st International Conference on Experiments /Processes /System /Modelling/ Simulation / Optimization, Athens 6-9 July.

13.   Horsch, G.M. (2006). "*Scaling of three-dimensional, miscible, laminar density currents flowing down an incline*", Proc. of the International Conference on Protection and Restoration of the Environment VIII, 3-7 July, Chania, Greece.

14.   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.

15.   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.

16.   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.

17.   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.

18.   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.

19.   *Fourniotis, N.Th. and Horsch, G.M. (2012). "*Early Summer Circulation in the Gulf of Patras (Greece)*", ISOPE-2012 Conference, The 22nd International Offshore and Polar Engineering Conference, Rhodes, Greece, June 17−22, pp. 740-745.

20.   Leftheriotis, G.A., Horsch, G.M. and Fourniotis, N.Th. (2013). "*A Numerical Study of the Hydrodynamic Circulation of the Messolonghi-Aetoliko Lagoonal System*", Coastal Dynamics 2013, 7th International Conference on Coastal Dynamics, 24−28 June, Arcachon, France, paper No. 125, pp. 1-10.

ii) In Greek

21.   Horsch, G.M. (1997). "*Scaling of the diffusion of a non-conservative substance in an elongated domain with sloping bottom*", Proceedings of the 7th Conference of the Hellenic Hydrotechical Association, P.C. Yannopoulos et al. (eds), Patras.

22.   Christodoulou, G., Horsch, G., Tzachou, F., Noutsopoulos, G. "*Three dimensional density currents on an inclined bottom*", 7th Conference of the Hellenic Hydrotechical Association, P.C. Yannopoulos et al. (eds), Patras.

23. Fourniotis, N.Th. and Horsch, G.M. (2007). *"Three-dimensional simulation of the winter-time, wind-induced circulation in the Gulf of Patras"*, Proceedings of the 6th National Conference of EEDYP, 14-16 June, Chania, pp 71-79.

24. Fourniotis, N.Th. and Horsch, G.M. (2008). *"A three-dimensional numerical study of the wind-induced and tidal barotropic circulation in the Gulf of Patras"*, 4th Pan-Hellenic Conference on management and improvement coastal zones, 23-27 September, Mytilini.

25. Sotiropoulos, D.A., A.A. Dimas, G.M. Horsch, P.C. Yannopoulos, N.Th. Fourniotis, and A.C. Demetracopoulos(2008). *"Experimental study of effectiveness of flow velocity reduction devices in open channel with steep bed slope"*, 1rst Panhellenic Conference on Large Dams, TEE 13-15 November, Larissa, pp. 1-12.

26. Fourniotis, N.Th. and Horsch, G.M. (2009). "Three-dimensional winter-time circulation in the Gulf of Patras", 9th Panhellenic Symposium on Oceanography and Fisheries, 13-16 May, Patras.

27. Fourniotis, N.Th. and Horsch, G.M. (2012). "Estimation of the final dilution of the sewage effluents in the southeastern coast zone in the Gulf of Patras: Summer Period.", 2nd Conference of EYE-EEDYP, 11-13 October, Patras.

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. Christodoulou, G., Horsch, G., Tzachou, F. and Noutsopoulos G. (1998). *"Laboratory and theoretical study of three dimensional density currents on a sloping bottom"*, Research Activities in the area of Fluid Mechanics in Greece, May, Aerodynamics Laboratory, N.T.U.A. (in Greek).

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. Horsch G.M. (2009). "Three-dimensional simulation of the advection-diffusion of treated effluents from the sewage outfall of the City of Patras", Patras (in Greek).

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

120 citations in the Science Citation Index (approximately), 170 in Publish or Perish.
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. Physics of Fluids
3. Journal of Hydraulic Engineering, ASCE
4. Journal of Hydraulic Research, IAHR
5. Applied Mathematical Modelling
6. International Journal of Heat and Fluid Flow
7. Marine Geology
8. Annales Geophysicae
9. Water, Air and Soil Pollution
10. In a number of Conferences

FUNDED RESEARCH

- "Investigation of the sediment transport mechanisms in the northwestern coasts of the Gulf of Patras, with emphasis on the sand bars in front of the openings of the eastern Klisova and Tholi lagoons", 2013, G.M. Horsch principal investigator.
- "Hydraulic behavior and improvement of water distribution in the expansion of Diakoniaris stream training works via a physical model", YDRETME, A.C. Demetracopoulos principal investigator, 2013.
- "Numerical simulation of the advection-diffusion of the treated effluents into the Gulf of Patras, 2009, G.M. Horsch principal investigator.
- "Impact of Sediment Transport due to Potential Removal of Bottom Sediments in Five semi-Mountainous Streams", APION KLEOS Cons, A.C. Demetracopoulos principal investigator, 2009-2010.
- "Impact of Sediment Transport due to Potential Removal of Bottom Sediments in Five semi-Mountainous Streams", APION KLEOS Cons, A.C. Demetracopoulos principal investigator, 2008-2009.
- "Physical Model Testing of an Energy Dissipation Configuration in an Open Channel with Steep Slope", AKTOR A.E., A.C. Demetracopoulos, principal investigator, 2007-2008.
- "Hydraulic behavior of Asterion Dam Spillway via a Physical Model, YPECHODE, A.C. Demetracopoulos, principal investigator, 2007-2008.
- "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.
- "Analysis and simulation of two-dimensional and three-dimensional density currents along sloping bottoms", 2001-2004, "C. Karatheodory" program, G.M. Horsch principal investigator.
- "Development of a comprehensive decision support system for nuclear emergencies in Europe following an accidental release to the atmosphere", Radiation Protection, BI7 - 0045C, 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.

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

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

STUDENTS SUPERVISED
Supervised one Ph.D. thesis, 5 M.S. thesis and a number of undergraduate Diploma thesis projects.

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. *University of Patras*
Undergraduate courses
- Fluid Mechanics
- Hydrodynamics of bays and reservoirs
- Laboratory topics in hydraulic engineering

Graduate courses
- Hydromechanics
- Hydrodynamics of bays and reservoirs
- Special topics on Stratified Flows.

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 at the Sparta Institute, in Sparta, Greece (1994).