

BABAK RAZDAR

EDUCATIONS

Doctor of Philosophy in Hydraulic Engineering for the Environmental and Territory

Dept. of Environmental and Chemical Engineering, University of Calabria, Rende, Italy

2012-2016

Dissertation title: “Accuracy aspects in flood propagation studies due to dam failures”

Master of Science in Civil Engineering – Water

Dept. of Civil Engineering, Islamic Azad University - Tehran Central Branch, Iran

2004-2007

Dissertation title: “Simulation of Nitrate and Phosphate parameters in the Pasikhan river using CE-QUAL-W2 model and comparing the results with results of Mike11 and WASP models”

Bachelor of Science in Agricultural Engineering – Irrigation

Dept. of Irrigation Engineering, University of Guilan, Iran

2000-2004

Dissertation title: “Thesis title: Design of water distribution system (Case study in the Shoaibieh plain, Khuzestan, Iran)”

RESEARCH INTERESTS

I have extensive experience in the fields of hydraulic and environmental engineering. My research cores over the past ten years of my professional career include, but are not limited to, the following; Mathematical simulation for the solutions of two-dimensional shallow water equations, 1D/2D Numerical modeling of flood propagation studies, Dam break problems, Water quality modeling, Environmental assessment, Hydraulic and Hydrological studies, Using Machine learning, GIS and GNSS applications in water resource management and environmental issues, Sediment transport, Climate change modeling and related scenarios, and River engineering (IPCC — Intergovernmental Panel on Climate Change).

WORK EXPERIENCE

Postdoctoral positions

Department of Civil, Environmental, Architectural Engineering and Mathematics (DICATAM), Università degli Studi diBrescia, Brescia (Italy)

Projects:

- **Support for research activities on urban resilience to climate change**

Summary:

- Collection of disaggregated climate scenarios for some Italian cities
- Preparation of graphs and tables to be included in scientific project reports
- Simulations of local drainage networks using SWMM and HECRAS software
- Verification of the efficiency of drainage networks in relation to future climate scenarios

2023-2024

- **Participatory research projects concerning environmental issues in the Oglio river watershed**

Summary:

Supporting the development of the participatory research projects. Collecting data and information on the crop characteristics, irrigation supply and hydroelectric power production in the Oglio river basin (BS). Preparing ad hoc future climate scenarios.

Supervisor: Professor Giovanna Grossi

- **Mathematical modeling of flooding scenarios in industrial and highly anthropogenic sites**

Summary:

The research activity will focus on the simulation of flooding scenarios in industrial sites and highly anthropized areas through mathematical modelling based on 2D Shallow Water Equations, dealing also with the presence of complex topographies, wetting/drying fronts, and transcritical flows. The simulations will be performed by means of well-documented computational codes. If necessary, specific numerical codes will have to be developed to simulate local scale effects. The study will have to include the prediction of the hydrodynamic thrusts on structures and industrial facilities (e.g. storage tanks containing hazardous substances). Physically based vulnerability models will have to be developed to describe the interactions of the flow field with this kind of structure in view of a quantitative risk assessment.

2022 - 2023

Supervisor: Professor Massimo Tomirotti

- **Development of resilience improvement strategies for road infrastructures affected by hydrogeologic hazards using mobile phone data.**

Summary:

The main purpose of this research program was the development of ICT platforms capable of detecting different types of events and emergencies, such as floods, and providing services to citizens. It was focused on the detection and short-term forecasts of potential emergency situations, such as crowds in meteorological alert conditions and critical hydrological-hydraulic disasters for road infrastructure and vehicle mobility. This project has collaborated with the Department of Economics and Management. In this project, the dynamic maps of exposure of people and vehicles to the flooding hazard were developed. In consideration of meteorological observations and forecasts of possible floodings affecting the road network, useful information has been provided to communicate dangerous situations on warning panels and to recommend alternative routes.

2021-2022

Supervisor: Professor Roberto Ranzi

Researcher - Engineer

Department of Water resource monitoring, Environmental Research Institute of Academic Center for Education, Culture and Research (ACECR), Rasht, Guilan, Iran .

Projects:

- Sampling and analyzing river water quality incoming to Anzali wetland.
- Environmental water requirement studies of Evan Lake, Ghazvin province, Iran.
- Water resource management and environmental water requirement studies using the WEAP model in Amirkelayeh wetland.

2019 - 2020

Member of the academic staff with the rank of Assistant Professor, lecturer of the civil engineering department

Higher education institute of Academic Center for Education, Culture and Research (ACECR), Rasht, Guilan, Iran.

2018 – 2020

Freelance Engineer

As a freelance engineer I participated in several hydraulic and environmental engineering projects

2016 - 2018

Researcher - Engineer

Department of Environmental engineering, Environmental Research Institute of Academic Center for Education, Culture and Research (ACECR), Rasht, Guilan, Iran .

2009 - 2011

Projects:

- Environmental assessment of sediment traps in the Anzali Lagoon.
- Environmental assessment of the Saravan Landfill with GIS.
- Water quality assessment of several important rivers in Guilan Province with water quality models and water quality indexes.
- Environmental assessment of the Caspian port in the Caspian Sea, Guilan, Iran.

Member of a conference executive team

Tarbiat Modares University, Tehran, Iran.

2006-2007

Main tasks:

Organizing the international seminar on new technologies in water desalination, Water Engineering Research Institute, Tarbiat Modares University (Joint conference with the International Desalination Association – IDA), Tehran, Iran.

Member of a conference executive team

Tarbiat Modares University, Tehran, Iran.

2005

Main tasks:

Organizing the workshop on data management in GIS for groundwater modeling, Water Engineering Research Center, Tarbiat Modares University, Tehran, Iran.

Member of a conference executive team

University of Guilan, Rasht, Iran.

2004

Main tasks:

Organizing the first workshop on principles of design in paddy fields consolidation, University of Guilan, Guilan, Iran.

TEACHING AND MENTORING EXPERIENCES

• **Lecturer and Mentoring**

Higher education institute of Academic Center for Education, Culture and Research (ACECR), Rasht, Guilan, Iran.

Lectures:

B.Sc.

- Strength of materials
- Design of hydraulic structures

M.Sc.

- River engineering
- Fundamental and modelling pollution transport
- Hydraulic structures

2018 – 2020

Theses:

- Feasibility study of extraction and purification of methane gas from Saravan landfill and its use as fuel, Master of science in Civil engineering – Environmental engineering, 2019, Higher education institute of Academic Center for Education, Culture and Research (ACECR), Rasht, Guilan, Iran.

- Feasibility study of using effluent of Rasht wastewater treatment plant for irrigation of urban green space (Case study of Fakhab Rasht treatment plant), Master of science in Civil engineering – Environmental engineering, 2019, Higher education institute of Academic Center for Education, Culture and Research (ACECR), Rasht, Guilan, Iran.
- Investigating the leakage rate of water branches systems in Amlash city using the hydraulic analysis model, Master of science in Civil engineering – Environmental engineering, 2019, Higher education institute of Academic Center for Education, Culture and Research (ACECR), Rasht, Guilan, Iran.
- Reservoir water quality assessment using multivariate methods (Case study: Diversion dams in Guilan province), Master of science in Civil engineering – Environmental engineering, 2019, Higher education institute of Academic Center for Education, Culture and Research (ACECR), Rasht, Guilan, Iran.
- Investigative procedures for assessing subsidence risk for earth dams using Geo-slope model (Case study: Emarat dam), Master of science in Civil engineering – Environmental engineering, 2019, Higher education institute of Academic Center for Education, Culture and Research (ACECR), Rasht, Guilan, Iran.
- Investigation and tracking of floating debris at the Caspian Sea using Mike 21 model (Case study, Caspian commercial zone , Guilan, Iran), Master of science in Civil engineering – Environmental engineering, 2018, Higher education institute of Academic Center for Education, Culture and Research (ACECR), Rasht, Guilan, Iran.
- Assessment and monitoring of groundwater pollution in landfill sites (Case study, Saravan Landfill, Rasht, Iran), Master of science in Civil engineering – Environmental engineering, 2018, Higher education institute of Academic Center for Education, Culture and Research (ACECR), Rasht, Guilan, Iran.

- **Lecturer**

The 10th Iranian Hydraulic Conference in the University of Guilan, Guilan, Iran.

Nov 2010

Lecturer in the technical workshop on flow simulation with the computational fluid dynamic method by FLUENT Software

- **Lecturer**

Islamic Azad University, Minab branch, Iran.

2008-2009

Lectures:

B.Sc.

- Statics

SHORT COURSES AND WORKSHOPS ATTENDED

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| • Webinar on Decision Support Modelling and PEST
<i>International Association for Hydro-Environment Engineering and Research, 20 May 2021.</i> | 2021 |
| • Technology transfer offices (TTOS) and intellectual property (IP)
<i>Guilan Science and Technology Park (GSTP) and Astrakhan State University (ASU), 19 Oct 2020.</i> | 2020 |
| • The educational course of fundamental Arc GIS
<i>Environmental research centre of Iranian academic centre of education, Guilan, Iran.</i> | 2010 |
| • Workshop on water resource comprehensive management
<i>Water engineering research centre, Tarbiat Modares University, Tehran, Iran.</i> | 01 Jun 2010 |
| • The short-term educational course on fundamentals of decreasing water consumption and wastewater production in industry.
<i>The 4th national conference on environment world day, University of Tehran, Tehran, Iran.</i> | Jun 2010 |

HONORS AND AWARDS

- Member of the academic committee of the 6th International Conference on Science and Technology with Sustainable Development Approach, Tehran, Iran. 2020
- The full scholarship (board and lodging at the residential center) to pursue a PhD from the University of Calabria. 2013-2016
- Certificate of Appreciation for Organizing the International Seminar on New Technologies in Water Desalination, Tehran, Iran (Joint conference with the International Desalination Association-IDA). Nov 2006

PUBLICATIONS

- Modaberi, H., Karimi, M., Moghadami, S., Yazdany, P., & **Razdar, . B.** (2024). Determination of Minimum Ecological Value of Wetland and Assessment of Hydrologic Alteration Indicators Affecting Local Communities' Livelihood: Case Study Anzali Wetland. *Journal of Global Humanities and Social Sciences*, 5(2), 67–76. <https://doi.org/10.61360/BoniGHSS242016010202>.
- Mahsa Malmir, Saman Javadi, Ali Moridi, Aminreza Neshat & **Babak Razdar**. (2021). A new combined framework for sustainable development using the DPSIR approach and numerical modeling. *Journal of Geoscience Frontiers* (12). <https://doi.org/10.1016/j.gsf.2021.101169>
- Sami ghordoei, Milan., Arya azar, Naser., Javadi, Saman & **Razdar, Babak**. (2020). Comparison Groundwater level simulation results using Least-Squares Support-Vector Machine (LS-SVM) model with Artificial Neural Network (ANN) and Multivariate Linear Regression (MLR), *Journal of Hydrogeology, University of Tabriz*, 5 (1), 118- 133. (in Persian) https://hydro.tabrizu.ac.ir/article_10455.html?lang=en
- Macchione, F., Costabile, P., Costanzo, C., De Lorenzo, G & **Razdar, B.** (2016). Dam breach modelling: influence on downstream water levels and a proposal of a physically based module for flood propagation software. IWA Publishing. *Journal of Hydro informatics*, 18 (4): 615–633. <https://doi.org/10.2166/hydro.2015.250>
- Macchione, F., De Lorenzo, G., Costabile, P., & **Razdar, B.** (2015). The power function for representing the reservoir rating curve: morphological meaning and suitability for dam breach modeling. *Water Resources Management*. (13) DOI 10.1007/s1 1269-016-1458-8
- **Razdar, B.**, Mohammadi, K., Samani, J.M.V & Pirooz, B. (2012). Determining the best water quality model for the rivers in the north of Iran (case study: Pasikhan River). *Journal of Computational Methods in Civil Engineering (CMCE)*. 2 (1). https://cmce.guilan.ac.ir/article_898.html

CONFERENCE PRESENTATIONS

ORAL PRESENTATIONS

- **Razdar, B.**, Metulini, R., Carpita, M., Vassena, G. P. M, and Ranzi, R.: Flood risk management using mobile phone data and hydrological modeling in a heavily urbanized area in Lombardy, 9th International Conference on Risk Analysis (ICRA9), Perugia, Italy, 25-27 May 2022.
- **Razdar, B.**, Metulini, R., Carpita, M., and Ranzi, R.: Dynamic flood hazard maps based on traffic flow forecasts using mobile phone data, EGU General Assembly 2022, Vienna, Austria, 23–27 May 2022, EGU22-3200, <https://doi.org/10.5194/egusphere-egu22-3200>, 2022.
- Mirzaei, H & **Razdar, B.** (2021). Risk analysis of urban drainage systems (Case study of surface water drainage systems in Baqer mahaleh, Tolamshahr), The 7th International Conference on Environmental

Engineering and Natural Resource, Tehran, Iran.

- Mirbolooki, H., **Razdar, B** & Mohafezatkar, M. (2020). Reservoir water quality assessment using multivariate methods (Case study: Diversion dams in Guilan province), 6th International Conference on Science and Technology with Sustainable Development Approach, Tehran, Iran.
- Meshkin, M & **Razdar, B**. (2020). Feasibility study of using effluent of Rasht wastewater treatment plant for irrigation of urban green space (Case study of Fakhad Rasht treatment plant), 6th International Conference on Science and Technology with Sustainable Development Approach, Tehran, Iran.
- Ghavidel, A., **Razdar, B.**, Roohi, A & Karimi, M. (2020). Investigation and tracking of floating debris at the Caspian Sea using Mike 21 model (Case study, Caspian commercial zone, Guilan, Iran). The 6th International conference on environmental engineering and natural resource, Tehran, Iran.
- Macchione, F., Costabile, P., Costanzo, C., & **Razdar, B**. (17-20 Giugno 2015). Ricostruzione numerica dell'evento di piena generato dalla rottura della diga di Big Bay, USA. Atti del 36° Corso di Aggiornamento in Tecniche per la Difesa dall'Inquinamento, Guardia Piemontese, Edibios (CS), 2015, 129-151
- Pirooz, B., & **Razdar, B**. (2010, 23-24 Feb). Numerical analyses of flow in WSPs with CFD to the optimum operation, 3rd National Water & Wastewater Conference on Demand Management, Tehran, Iran.
- Pirooz, B., **Razdar, B** & Bagherzadeh, A. (2010, 23-24 Feb). Wastewater use in agriculture: a survey of pollution factors on the Oushmak drain in Guilan province, 3rd National Water & Wastewater Conference on Demand Management, Tehran, Iran.
- Kardar S., **Razdar, B.**, Pirooz, B and Mirbagheri, S.A. (19-20 Jan. 2010). Wastewater quality modeling in south-Tehran waste stabilization ponds using CE-QUAL-W2, The Second International Symposium on Environmental Engineering, K.N. Toosi University of Technology, Tehran, Iran.

POSTER PRESENTATIONS

- Golmar Golmohammadi, **Babak Razdar**, Kouros Mohammadi, Giovanna Grossi, and Saman Javadi.: A comprehensive method based on machine learning schemes in predicting river flow, case study: Po River, EGU General Assembly 2024, Vienna, Austria, 16 Apr 2024, EGU24-4402, <https://doi.org/10.5194/egusphere-egu24-4402>.
- **Razdar, B.**, Pirooz, B., Ghavidel, A & Bagherzadeh, A. (2012). The assessment of the effect of landfill leachate on ground and surface water quality. A case study Saravan landfill site in the north of Iran, 3rd International conference on HSE, Tehran, Iran, (Abstract Accept).
- Pirooz, B., **Razdar, B.**, Kardar, S & Kavianpoor, M. Survey of drain's water quality for irrigation purposes and their economic analysis, International Water Recovery Forum, Kerman, Iran, 29-30 Nov. 2010.
- **Razdar, B.**, Ghavidel, A & Pirooz, B. (02-04 Nov. 2010). Development of qualitative models in the management of surface water resource on demand management, The 13th National Congress on Environmental Health, Kerman University of medical Sciences, Kerman, Iran.
- **Razdar, B.**, Ghavidel, A & Pirooz, B. (30 Oct-03 Nov. 2010). Heavy metal assessment on the Amirkelaye Lagoon, The 4th Conference and Exhibition on Environmental Engineering, University of Tehran, Tehran, Iran.
- **Razdar, B.**, Ghavidel, A, Zoughi, M & Pirooz, B. (02-04 Aug 2010). Impact assessment of urban flood. Conference on Urban Flood Management and the relevant educational workshops, Water Engineering Research Centre, Tarbiat modares University, Tehran, Iran.
- Pirooz, B., **Razdar, B** & Bagherzadeh, A. (10-11 Feb. 2010). Environmental impact assessment of Rasht landfill within Saravan forest in Guilan province, The National Conference of Human, Environmental and Sustainable Development. Hamedan, Iran.
- **Razdar, B.**, Mohammadi, K & Samani, J.M.V. (05 Nov. 2009). Simulating nitrate and phosphate in the Pasikhan River using CE-QUAL-W2 model and comparing with the MIKE11 model, The 12th National Congress on Environmental Health, Shahid Beheshti University, Tehran, Iran.

PROFESSIONAL EXPERIENCE

TECHNICAL SKILLS

- Good command of general software such as Microsoft Office™ tools, Photoshop and AutoCAD.
- Good command of programming languages such as Matlab and Python.
- Good command of Machine learning.
- Good command of Technical Software such as CE-QUAL-W2, QUAL2K, MIKE11, WASP, ArcGIS, Global navigation satellite system (GNSS), QGIS, SWMM, HEC-HMS, HEC-RAS (1D/2D), SMS, FLUENT, Mod flow, and CALPUFF.

LANGUAGES

Mother tongue: Persian

Other languages	Listening	Reading	Spoken interaction	Spoken production	WRITING
English	Excellent		Excellent		Excellent
Italian	Good		Good		Good
Arabic	Fair		Fair		Fair