

## PERSONAL INFORMATION

## Sara Todeschini

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Address: Via Ferrata 3, Pavia 27100 Italy

Phone: +39 0382 985 331

E-mail: sara.todeschini(at)unipv.it

ORCID: 0000-0002-5498-4370

Scopus ID: 37065449800

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Citations: 604

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## ACADEMIC POSITIONS

Jan. 2022

**Associate Professor** of Hydraulic and Maritime Constructions and Hydrology CEAR-01/B (ex ICAR/02), Department of Civil Engineering and Architecture – University of Pavia.

June 2015 – Dec. 2021

**Tenured Assistant** of Hydraulic and Maritime Constructions and Hydrology, Department of Civil Engineering and Architecture – University of Pavia.

Dec. 2011 – May 2015

**Assistant Professor** of Hydraulic and Maritime Constructions and Hydrology, Department of Civil Engineering and Architecture – University of Pavia.

## ACADEMIC CONTRACTS

Oct. 2009 – Dec. 2011

**Adjunct Professor** of Urban Hydraulic Structures at the Faculty of Engineering – University of Pavia

Oct. 2007 – Sept. 2011

**Post-doctoral Research Fellow** at the Department of Hydraulic and Environmental Engineering – University of Pavia

## EDUCATION

- 2008 Philosophy Doctor in Civil Engineering (Hydraulics), thesis title: "Design and management of stormwater tanks for the environmental safeguard of receiving water bodies", Advisor Prof. S. Papiri, University of Pavia.
- 2008 Master of High Education (3 years scholarship) from the Advanced School of Integrated Education SAFI of the University School for Advanced Studies IUSS Pavia, theses on "Feedback and control in the operation of stormwater tanks"; "Tides: a sustainable and renewable energy source"(awarded thesis); "Climate change on Earth related to interaction between Sun and Earth"(awarded thesis).
- 2003 Master of Science in Environmental Engineering with grade of 110/110 summa cum laude, thesis title: "Water consumptions and leakages in the water distribution system of Versa and Scuropasso Valleys". Advisor: Prof. S. Papiri, University of Pavia.

## TEACHING ACTIVITIES

Currently B.Sc. M.Sc. Courses "Costruzioni idrauliche urbane" (6 CFU), "Progetto di acquedotti e fognature" (6 CFU), "Tecnologie a basso impatto ambientale per le infrastrutture idrauliche" (1 CFU), University of Pavia.

PhD courses: "Models for risk analysis in urban drainage systems" (2 CFU) PhD program in Design, Modeling, and Simulation in Engineering, University of Pavia; "Integrated water service for small communities" (4 CFU) "Sewage sludge: rheological aspects and energy recovery alternatives" (1 CFU) PhD Program DICATAM 2017, University of Brescia.

Winter School "Social Sciences for Global Challenges" "Hydraulic modelling for the analysis of weather-related hazard", University of Pavia.

Advisor of B.Sc., M.Sc. and PhD theses, University of Pavia

## RESEARCH INTERESTS

- Experimental and theoretical research in the field of urban hydrology and hydraulics, including water quality aspects.
- Integrated urban water cycle management.
- Trenchless techniques and technologies for inspection, new installations and rehabilitation of existing pipelines.
- Modelling of water flows and contaminant transport in natural and anthropic environments including uncertainty.

## RECENT RESEARCH PROJECTS

Dec. 2023 – present	PRIN 2022 PNRR national project "Uncertainty Quantification of coupled models for water flow and contaminant transport" (No. P2022LXLYY), financed by the European Union – Next Generation EU. Coordinator: Dott. L. Tamellini, CNR-IMATI, Pavia. Role: Leader RU Unipv.
May 2022 – present	PRIN 2020 national project "Urban Resilience to Climate change: to Activate participatory mapping and decision support tool for enhancing the sustainable urban drainage URCA!" (Prot. 20208TAK3H) Coordinator: Prof. A. Palla, University of Genoa. Role: Team member.
2023 - present	DICAR-UNIPV DORIAN "modellazione Digitale a supporto del progetto di Ambienti sicuri, sostenibili e resilienti", MUR program "Dipartimenti di Eccellenza 2023-2027". Role: Team member.
2017-2023	MIUR "Smart Cities and Communities" project "SWaRM-Net Smart Water Resource Management – Networks", Coordinator IRSA-CNR. Role: Leader RU Unipv.
Aug. 2021 – Jul. 2022	HP10CCMFKT Italian National HPC Research Project - ISCRA-C "High Performance Computing for the SPH simulation of Natural Hazard related to Landslide and Water wave" HPCNHLW3, 64'000 standard hours. Principal Investigator: Prof. S. Manenti, University of Pavia. Role: Team member.
Feb. 2020 – Nov. 2022	Call Hub Innovazione e Ricerca of Regione Lombardia CE4WE - Circular Economy for Water and Energy. Coordinator: Prof. A. Di Giulio, University of Pavia. Role: Team member.
Nov. 2019 – Aug. 2020	HP10C8P4DP Italian National HPC Research Project - ISCRA-C "High Performance Computing for the SPH analysis of Natural Hazard related to Landslide and Water wave" HPCNHLW2, 150'000 standard hours. Principal Investigator: Prof. S. Manenti, University of Pavia. Role: Team member.
Mar. 2019 – Dec. 2019	HP10C4QW9Q Italian National HPC Research Project - ISCRA-C "High Performance Computing for the SPH Analysis of Natural Hazard related to Landslide and Water interaction" HPCNHLW1, 360'000 standard hours. Principal Investigator: Prof. S. Manenti, University of Pavia. Role: Team member.
May 2018 – Nov. 2020	CARIPLO 2017 national project "NEWFRAME NetWork-based Flood Risk Assessment and Management of Emergencies". Coordinator: Prof. E. Creaco, University of Pavia. Role: Team member.

## RECENT CONSULTANT – SCIENTIFIC ACTIVITIES

2024 – Present	Research agreement with ASM Pava Spa "Characterization of microplastics in fine particulate matter accumulating on urban surfaces" Scientific Coordinators: Prof. S. Todeschini, Prof. MC Collivignarelli, University of Pavia.
2023	Scientific consultant for Italgas Reti Spa "Monitoring and early warning systems applied to low pressure gas distribution networks", Scientific Coordinators: Proff. A. Penna C. Lai, University of Pavia.
Dec. 2020 – Mar. 2021	Scientific consultant for Associazione Irrigazione Est Sesia "Study of the impact of the pumping plant on the Gravellone and Fuga channels during flood events of the Ticino river". Scientific Coordinator: Prof. S. Todeschini, University of Pavia.

Oct. 2018 – Feb. 2019	Scientific consultant for SGM Lektra srl (Milan) "Theoretical and experimental investigations on flexible-shape Palmer-Bowlus flumes" Scientific Coordinator: Prof. S. Todeschini, University of Pavia.
Sept. 2016 – July 2017	Scientific consultant for Consorzio di Bonifica della Media Pianura Bergamasca " Hydrological and hydraulic analysis on the water management/control problems within the urban territory of Bergamo in 2016". Scientific Coordinator: Prof. C. Ciaponi, University of Pavia.

## PROGRAMMING – SOFTWARE

Languages: Fortran, C.  
OS: Windows, Unix.  
Software: Matlab, Modflow, OpenFoam, Hec-Ras, TOPKAPI, SMWW, EPANET, Qgis.

## EDITORIAL ACTIVITIES – REVIEW

Apr. 2023 - present	<b>Associate Editor</b> Frontiers in Environmental Science – Special Session Water and Wastewater Management (EISSN 2296-665X; I.F.: 5.411; <a href="https://www.frontiersin.org/">https://www.frontiersin.org/</a> ). <b>Topic Editor</b> Sustainability - MDPI (ISSN 2071-1050; I.F. 3.251, <a href="https://www.mdpi.com/journal/sustainability">https://www.mdpi.com/journal/sustainability</a> ).
2021	<b>Guest Editor</b> Sustainability - MDPI (ISSN 2071-1050; I.F. 3.251, <a href="https://www.mdpi.com/journal/sustainability">https://www.mdpi.com/journal/sustainability</a> ). Special Issue "Hydrogeological Environment and Water Resources Research".
2020	<b>Guest Editor</b> Sustainability - MDPI (ISSN 2071-1050; I.F. 3.251, <a href="https://www.mdpi.com/journal/sustainability">https://www.mdpi.com/journal/sustainability</a> ). Special Issue " Sustainable Urban Stormwater Management ".
Since 2011	<b>Reviewer</b> for International Journals (Web of Science ResearcherID: M-7949-2015). "Certificate 2018 Outstanding Reviewer Awards" Water (MDPI). "Top reviewers in Environment and Ecology" - September 2019 (Web of Science).

## SELECTED PUBLICATIONS

- Assaf, M.N., Manenti, S., Creaco, E., Giudicianni, C., Tamellini, L., Todeschini, S. (2024) New optimization strategies for SWMM modeling of stormwater quality applications in urban area. *Journal of Environmental Management* 361, 121244 (10.1016/j.jenvman.2024.121244).
- Todeschini S. (2024). Innovative and Reliable Assessment of Polluted Stormwater Runoff for Effective Stormwater Management. *Water* 16(1):16 (10.3390/w16010016).
- Baker, E.A., Manenti, S., Reali, A., Sangalli, G., Tamellini, L., Todeschini, S. (2023) Combining noisy well data and expert knowledge in a Bayesian calibration of a flow model under uncertainties: an application to solute transport in the Ticino basin. *GEM - International Journal on Geomathematics* 14(1), 8 (10.1007/s13137-023-00219-8).
- Giudicianni C., Assaf M.N., Todeschini S., Creaco E. (2023). Comparison of nonlinear reservoir and UH algorithms for the hydrological modeling of a real urban catchment with EPASWMM. *Hydrology* 10(1), 24 (10.3390/hydrology10010024).
- Cappato, A., Baker, E.A., Reali, A., Todeschini, S., Manenti, S. (2022) The role of modeling scheme and model input factors uncertainty in the analysis and mitigation of backwater induced urban flood-risk. *Journal of Hydrology* 614, 128545 (10.1016/j.jhydrol.2022.128545).
- Baker, E.A., Cappato, A., Todeschini, S., Tamellini, L., Sangalli, G., Reali, A., Manenti, S. (2022) Combining the Morris method and multiple error metrics to assess aquifer characteristics and recharge in the lower Ticino Basin, in Italy. *Journal of Hydrology* 614, 128536 (10.1016/j.jhydrol.2022.128536).
- Minaei A., Todeschini S., Sitzenfrei R., Creaco E. (2022). Ensemble evaluation and member selection of regional climate models for impact models assessment. *Water* 14(23): 3967 (10.3390/w14233967).
- Avvedimento, S.; Todeschini, S.; Manenti, S.; Creaco, E. (2022). Comparison of Techniques for Maintaining Adequate Disinfectant Residuals in a Full-Scale Water Distribution Network. *Water* 14: 1029 (10.3390/w14071029).

- Collivignarelli M.C., Todeschini S., Abbà A., Ricciardi P., Carnevale Miino M., Torretta V., Rada E.C., Conti F., Cillari G., Calatroni S., Lumia G., Bertanza G. (2021) The performance evaluation of wastewater service: a protocol based on performance indicators applied to sewer systems and wastewater treatment plants. *Environmental Technology* (10.1080/09593330.2021.1922509).
- Avvedimento S., Todeschini S., Giudicianni C., Di Nardo A., Walski T., Creaco E. (2020). Modulating nodal outflows to guarantee sufficient disinfectant residuals in water distribution networks. *ASCE's Journal of Water Resources Planning and Management* 146(8): 04020066 (10.1061/(ASCE)WR.1943-5452.0001254).
- Todeschini S., Manenti S., Volponi F., Ciaponi C. (2020). An analytical methodology for the discharge-stage relation of flexible shape "Palmer-Bowlus" flumes. *ASCE's Journal of Irrigation and Drainage Engineering*, 146(8): 04020017, DOI: 10.1061/(ASCE)IR.1943-4774.0001486.
- Amicarelli A., Manenti S., Albano R., Agate G., Paggi M., Longoni L., Mirauda D., Ziane L., Viccione G., Todeschini S., Sole A., Baldini L.M., Brambilla D., Papini M., Khellaf M.C., Tagliaferro B., Sarno L., Pirovano G. (2020) SPHERA v.9.0.0: A Computational Fluid Dynamics research code, based on the Smoothed Particle Hydrodynamics mesh-less method. *Computer Physics Communications* V. 250, 107157 (10.1016/j.cpc.2020.107157).
- Todeschini, S., Manenti, S., Creaco, E. (2019) Testing an innovative first flush identification methodology against field data from an Italian catchment. *Journal of Environmental Management*, 2019, 246, pp. 418–425 (10.1016/j.jenvman.2019.06.007).
- Manenti, S., Amicarelli, A., Todeschini, S. (2018) WCSPH with Limiting Viscosity for Modeling Landslide Hazard at the Slopes of Artificial Reservoir. *Water*, 10(4), 515 (10.3390/w10040515).
- Todeschini S., Papiri S., Ciaponi C. (2018). Placement strategies and cumulative effects of wet-weather control practices for intermunicipal sewerage systems. *Water Resources Management*, 32(8), 2885-2900 (10.1007/s11269-018-1964-y).
- Manenti S., Todeschini S., Collivignarelli M.C., Abbà A. (2018). Integrated RTD–CFD hydrodynamic analysis for performance assessment of activated sludge reactors. *Environmental Processes* 5: 23-42 (10.1007/s40710-018-0288-5).
- Manenti, S., Pierobon, E., Gallati, M., Sibilla, S., D'Alpaos, L., Macchi, E., Todeschini, S. (2016) Vajont Disaster: Smoothed Particle Hydrodynamics Modeling of the Postevent 2D Experiments. *Journal of Hydraulic Engineering*, 2016, 142(4), 05015007-1 (10.1061/(ASCE)HY.1943-7900.0001111).
- Todeschini, S. (2016). Hydrologic and Environmental Impacts of Imperviousness in an Industrial Catchment of Northern Italy. *ASCE's Journal of Hydrologic Engineering*, 21(7), 05016013 (10.1061/(ASCE)HE.1943-5584.0001348).
- Ciaponi C., Murari E., Todeschini S. (2016). Modularity-Based Procedure for Partitioning Water Distribution Systems into Independent Districts. *Water Resources Management*, 30(6): 2021-2036 (10.1007/s11269-016-1266-1).
- Barbero G., Moisello U., Todeschini S. (2014). Evaluation of the areal reduction factor in an urban area through rainfall records of limited length: a case study. *ASCE's Journal of Hydrologic Engineering*, 19(11): 05014016-1-10 (10.1061/(ASCE)HE.1943-5584.0001022).
- Moisello U., Todeschini S., Vullo F. (2013). The effects of water management on annual maximum floods of Lake Como and River Adda at Lecco (Italy), *Civil Engineering and Environmental Systems*, 30(1): 56-71 (10.1080/10286608.2012.710606).
- Todeschini S., Papiri S., Ciaponi C. (2012). Performance of stormwater detention tanks for urban drainage systems in northern Italy. *Journal of Environmental Management*, 101: 33-45 (10.1016/j.jenvman.2012.02.003).
- Todeschini S. (2012). Trends in long daily rainfall series of Lombardia (Northern Italy) affecting urban stormwater control. *International Journal of Climatology*, 32(6): 900-919 (10.1002/joc.2313).
- Todeschini S., Papiri S., Sconfietti R. (2011). Impact assessment of urban wet-weather sewer discharges on the Vernavola river (Northern Italy). *Civil Engineering and Environmental Systems* 28(3): 209-229 (10.1080/10286608.2011.584341).
- Todeschini S., Ciaponi C., Papiri S. (2010). Laboratory experiments and numerical modelling of the scouring effects of flushing waves on sediment beds. *Engineering Applications of Computational Fluid Mechanics*, 4(3): 365–373 (10.1080/19942060.2010.11015324).