PERSONAL INFORMATION

Elena Toth

Affiliation

University of Bologna
Dept. of Civil, Chemical, Environmental and Materials Engineering (DICAM)
Viale Risorgimento, 2 – 40136. Bologna, Italy.

+39-051-2093364

elena.toth@unibo.it

https://www.unibo.it/sitoweb/elena.toth

- https://orcid.org/0000-0002-9652-7901
- https://scholar.google.com/citations?user=2uH74qwAAAAJ&hl=en
- https://www.scopus.com/authid/detail.uri?authorId=7103175905

Sex Female | *Date of birth* 21/09/1971 | *Nationality* Italian

Enterprise	University	EPR
☐ Management Level	☒ Full professor	☐ Research Director and 1st level Technologist / First Researcher and 2nd level Technologist / Principal Investigator
☐ Mid-Management Level	☐ Associate Professor	☐ Level III Researcher and Technologist
☐ Employee / worker level	☐ Researcher and Technologist of IV, V, VI and VII level / Technical collaborator	☐ Researcher and Technologist of IV, V, VI and VII level / Technical collaborator

Academic discipline: Hydraulic Structures, Maritime Engineering and Hydrology
SSD ICAR/02 COSTRUZIONI IDRAULICHE E MARITTIME E IDROLOGIA

WORK EXPERIENCE

From Sept 2014—Oct 2023
Employer: Alma Mater Studiorum - University of Bologna – Department of Civil, Chemical, Environmental and Materials Engineering (DICAM)
Associate Professor of Hydraulic Structures, Maritime Engineering and Hydrology

From Oct 2002 to Aug 2014
Employer: Alma Mater Studiorum - University of Bologna – Department of Civil, Chemical, Environmental and Materials Engineering (DICAM)
Assistant Professor of Hydraulic Structures, Maritime Engineering and Hydrology

From Nov 2000 to Oct 2002
Employer: Alma Mater Studiorum - University of Bologna
Positions held: Post-doc research grant, Civil and Environmental Engineering Dept.

From Jan 2000 to Nov 2000
Employer: Alma Mater Studiorum - University of Bologna
Post-doctoral scholarship at the Faculty of Engineering.

From March 1996 to Dec 1996
Employer: ET&P (Environmental Technologies and Products) srl, Bologna, Italy
Research Consultant: development of a Decision Support System aimed at flood forecasting and water resources management, developing the integration of GIS functions.

Maternity leaves
2004 (birth of Marco), 2006 (birth of Stefano), 2012 (birth of Giovanni).

EDUCATION AND TRAINING

From Dec 1996 to Dec 1999
Polytechnic of Milan, Italy
Scholarship for PhD Course in Hydraulic Engineering
25/01/2000: Ph.D. Degree in Hydraulic Engineering at the Polytechnic of Milan. Title of dissertation: "Time-series analysis techniques for improving real-time flood forecasting".

From Sept 1998 to March 1999
University of Arizona, Tucson (USA)
Visiting Scholar, University of Arizona, Tucson (USA,) in the Research Group on Surface Hydrology (Prof. S. Sorooshian) of the Dept. Hydrology and Water Resources

November 1996 Qualified for engineering practice in Italy (Bologna)

From Sept. 1990 to March 1996 University of Bologna, Italy.
Master course (5-years programme) in Environmental Engineering
20 March 1996: MSc Degree (summa cum laude). Title of MSc dissertation: “Procedure per la valutazione delle aree inondabili tramite utilizzo di Sistemi Informativi Geografici (GIS)”

From Sept 1995 to March 1996 Erasmus student at the Ecole Politechnique Federale Lausanne (Switzerland): research activity for the MSc thesis.

1990: High School Diploma (Liceo Scientifico “A. Righi”, Bologna), grade 60/60.

LANGUAGES

Mother tongue **Italian**

Other language(s)

Language	Reading	Speaking	Writing
English*	Very good	Very good	Very good
French	Good	Fair	Fair

* University of Cambridge Certificate of Proficiency in English (CPE), C2

WORK ACTIVITIES

Research interests

- Real-time flood forecasting systems (modelling chain) and flood warning systems; Flood warning thresholds;
- Rainfall-runoff modelling, with i) physically-based spatially-distributed models, ii) conceptual lumped models and iii) data-driven models; Calibration of hydrological models (mono and multi-objective, utility functions) and impact of data availability;
- Hydrological modelling of ungauged/poorly gauged basins (PUB); Classification of watersheds in homogeneous regions (hydrological similarity assessment);
- Estimation and nowcasting of rainfall fields through remote sensing (radar and satellite);
- Indicators for drought monitoring and warning;
- Impact of climate change on river flow: coupling of climate change scenarios and rainfall-runoff modelling;
- Bridge safety: estimation of scour depth around bridge piers;
- Smart and low cost river monitoring: non-intrusive Image-based methods for flow velocity measurement;
- Nature Based Solutions for flood risk mitigation: role of deep-rooted herbaceous vegetation in mitigating riverbanks erosion, for preventing flooding due to bank failures.
- Water resource management: optimisation of reservoir management for water scarcity mitigation;
- Urban water scarcity: water demand analysis and modelling as a function of climatic and socio-economic drivers; Tourism water use: assessment, saving measures and policies, role of stakeholders. Smart-metering of urban water uses.

Main research projects

RECENT EUROPEAN RESEARCH PROJECTS

2013-2017: " Sharing Water-related Information to Tackle Changes in the Hydrosphere - for Operational Needs” (SWITCH-ON), financed within the EU 7th Framework Programme.
Role: participant.

2018-2022: "OPEn-air laboRAtories for Nature baseD solUtions to Manage environmental risks" (OPERANDUM) to mitigate the impact of hydro-meteorological phenomena in risk-prone areas, financed within the EU Horizon 2020 Programme.
Role: leader of the OpenAir Lab Panaro River research activities, including deployment and monitoring of the proposed Nature Based Solution (riverbanks deep-rooted herbaceous vegetation to reduce erosion risk in flood-prone areas), set up and validation of the modelling chain (climatic, hydrologic, hydraulic and geotechnical modelling) and stake-holder engagement activities.

2019-2022: "Simulating Tourism Water Consumption with Stakeholders" (SIMTWIST), financed within the EU Water JPI programme.
Role: leader of Italian unit.

RECENT NATIONAL PROJECTS/GRANTS

1999 to today: Research contracts with Agenzia di Protezione Civile della Regione Emilia-Romagna, “Servizio di supporto tecnico, scientifico ed informativo per le attività di protezione civile di competenza regionale: previsione, prevenzione, pianificazione e gestione delle emergenze relative al rischio idraulico”.
Role: partecipant.

2013-2020: Research contract with Romagna Acque – Società delle Fonti spa, "Attività di ricerca finalizzate al miglioramento della gestione della risorsa idrica" (Rep. 141/2013).
Role: co-leader.

2016-2018: "Monitoraggio intelligente per infrastrutture sicure" (INFRASAFE), POR FESR 2014-2020 – ASSE 1 – AZIONE 1.2.2, 2015-2018.
Role: leader of the SSD ICAR/02 research group, working on non-intrusive image-based monitoring of river velocity.

2018-2022: "WATERTECH - Smart Community per lo Sviluppo e l'Applicazione di Tecnologie di Monitoraggio Innovative per le Reti di Distribuzione Idrica negli usi idropotabili ed agricoli", Progetto MIUR Smart Cities and Communities SCN_00489.
Role: partecipant.

2022-2025: National Project Extended Partnership PE3 PNRR RETURN (Multi-risk science for resilient communities under a changing climate), Next-GenerationEU. Spoke TS2: Multi-Risk Resilience of Critical Infrastructures. Role: partecipant.

Teaching and tutoring activities

Teacher (as Instructor of record) of courses (hydrology and urban drainage systems, hydraulic infrastructures, water supply systems, water resources management, flood and drought risk management), in Italian or in English, in Bachelor or Master programmes at the School of Engineering and Architecture (Bologna and Ravenna campuses), University of Bologna, in all the academic years since 2003/04 to the current year.
Academic supervision: on average 8/10 students (either bachelor or master degree) per year.

Editorial activities

Editor of the international journal ‘Hydrology and Earth System Sciences (HESS)’ (the EGU Hydrological Sciences journal): 2007-present.

Ass. Editor of the international journal ‘Hydrological Sciences Journal’ (the International Association of Hydrological Sciences journal) 2013-2015.

Roles and services in the national and international scientific community

2015-2019: President of the Hydrological Sciences Division of the European Geosciences Union (EGU). As Programme Committee Chair, she has coordinated the entire scientific programme of the Hydrological Sciences Division (more than 100 sessions) of the yearly EGU General Assembly. Previously (2011-2015): chair of the scientific committee of the "Hydrological Forecasting" EGU sub-division.

Convener (or co-convener) of 39 sessions at the European Geosciences Union General Assemblies on the following topics:prediction of extreme precipitation events (2000), statistical solutions in surface hydrology (2000), impacts of climate change on hydrological response and on water resources (2003, 2005 and 2005), Hydroinformatics (from 2006 to 2016), catchment classification (2007 and 2009), medium and long-term hydrological forecasting (2008 and 2009), drought and water scarcity hydrological forecasting (from 2010 to 2016), Hydrological risk under a gender and age perspective (2017 and 2018), UPH IAHS-initiative (2020 and 2021), Water science and policy (2019, 2020, 2021, two events in 2022, 2023, 2024).

Chair of the Working Group “Data-driven hydrology” of the International Research Initiative “Panta Rhei - Change in Hydrology and Society” of the International Association of Hydrological Sciences (IAHS), 2013-2023.

Member of the Advisory Board of the Centre for Doctoral Training in Water Informatics: Science and Engineering (WISE) funded by the UK EPSRC (Engineering and Physical Sciences Research Council) and by the Universities of Exeter, Bath, Bristol and Cardiff, 2014-2024.

Member of the International Advisory Board of the research network FloodNet, funded by the Natural Sciences and Engineering Research Council of Canada (NSERC).

Vice-president of the Italian Hydrological Society (Societa' Idrologica italiana) since 2017.

Member of the Academic Senate of the University of Bologna May 2018-May 2021.

Chair of the Henry Darcy Medal Committee of the European Geosciences Union, 2019-2023.

Member of the “Water & Climate” Expert Group of the European network Water Europe, since 2020.

Chair of the Teaching Committee of the Civil, Chemical, Environmental and Materials Engineering Department (University of Bologna), 2021-2024.

Chair of the Committee for the Professional Engineering State Examinations (Civil and Environmental Enginneers), 1st and 2nd sessions 2024.

Member of the Self-Steering Committee for Sustainabilty of the UNA-FUTURA (UNA-EUROPA) alliance of European universities since 2023.

President of the Italian Hydrological Society (Societa' Idrologica italiana) since 2023.

PUBLICATIONS

ORCID: https://orcid.org/0000-0002-9652-7901
SCOPUS: https://www.scopus.com/authid/detail.uri?authorId=7103175905
Web of Science: https://www.webofscience.com/wos/author/record/29814039