

Dr Martina Egedusevic

Hydrologist | Natural flood management | Climate resilience | Environmental modelling

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Academic profile

Hydrologist and environmental scientist with more than fifteen years of experience spanning academic research, public water management, engineering consultancy and knowledge exchange. My work examines how land management, woodland creation and nature-based interventions alter runoff, erosion, sediment movement and flood risk, and how hydrological evidence can support practical investment and policy decisions. I combine field monitoring, hydrological and hydraulic modelling, GIS, spatial and statistical analysis, smart sensing, stakeholder engagement and environmental-economic assessment.

Research themes and methods

- Catchment hydrology; rainfall-runoff processes; flood and drought risk; hydrogeomorphology and erosion.
- Natural flood management and nature-based solutions, including woodland creation and leaky barriers.
- Field instrumentation, low-cost sensing, monitoring design, event analysis and evidence synthesis.
- GR4H/GR4J, HEC-RAS, HEC-HMS, SHETRAN, R, GIS and spatial decision support.
- Natural capital, public-benefit appraisal, climate adaptation and co-production with decision-makers.

Academic and professional appointments

Impact Fellow, Green Futures Solutions | University of Exeter

August 2024 - present

- Lead and deliver interdisciplinary projects at the interface of hydrological evidence, spatial analysis, natural capital and environmental economics.
- Translate research into decision tools, business cases and partner-facing recommendations for landowners, infrastructure organisations, public bodies and charities.
- Contribute to proposal development, project design, stakeholder workshops and supervision and support of early-career colleagues.

Independent Member | South West Regional Flood and Coastal Committee, Environment Agency

February 2025 - present

- Provide independent scrutiny and strategic input on flood and coastal erosion risk management, investment priorities, climate adaptation and partnership delivery across South West England.

Environmental Scientist | Arup

October 2022 - July 2024

- Delivered natural flood management, nature-based solutions, catchment drainage, flood-recovery, Water Framework Directive and environmental assessment work.
- Combined technical analysis with project management, client engagement, interdisciplinary coordination and supervision of postgraduate researchers.

Research Assistant (part-time) | King's College London

July 2023 - December 2023

- Investigated how flood-defence spending by government agencies in England and Wales relates to flood exposure, vulnerability and distributive outcomes.

Research Associate, SENSUM project | University of Exeter

December 2020 - September 2022

- Developed and deployed innovative sensors to monitor woody debris dams, transported wood and sediment in landscapes exposed to hazardous hydrogeomorphic movement.
- Undertook fieldwork, data processing and event analysis; collaborated across geography and engineering; supported undergraduate students and postgraduate researchers.

Lecturer / Teaching Assistant / Student Supervisor | Heriot-Watt University

October 2016 - January 2020

- Taught hydraulics and hydrology practicals and supervised undergraduate and postgraduate projects.

- Led a civil-engineering water design project using GIS, HEC-GeoRAS and HEC-RAS to develop hydraulic models for a flood-alleviation scheme.
- Provided e-learning support and formative guidance to students with varied disciplinary and educational backgrounds.

Flood Protection Engineer | Public Water Management Company Srbijavode, Serbia

May 2009 - June 2016

- Planned, designed and managed flood-risk and river-basin work across the Danube, Sava and Morava basins.
- Contributed to national preliminary flood-risk assessment, flood-risk management planning, World Bank rehabilitation projects, transboundary GIS initiatives and post-2014 flood recovery.
- Worked with government, municipalities, emergency-management bodies, communities and international partners.

Education**PhD, Natural Flood Management | Heriot-Watt University, 2016-2022**

Field and modelling research on woodland creation, cultivation practice, erosion control and flood reduction in the Menstrie catchment, Scotland. Methods included plot and stream monitoring, rainfall-runoff analysis and GR4H modelling.

Academic Specialist, Water Resources and Environmental Engineering | University of Belgrade and international partner universities, 2012

Postgraduate professional qualification delivered with the National Technical University of Athens, the Technical University of Civil Engineering Bucharest and the University of Ljubljana.

MSc, Hydraulic and Environmental Engineering | University of Belgrade, Faculty of Civil Engineering, 2009

Advanced study in hydraulics, hydrology, water resources and environmental engineering.

Selected research, innovation and impact projects

Hydrological effects of woodland creation, Menstrie catchment | *Scottish Forestry Trust; Heriot-Watt University; local partners*

Designed field monitoring across cultivation treatments and contrasting young-forest catchments; analysed runoff generation, erosion and peak-flow response; developed rainfall-runoff modelling to connect plot evidence with catchment behaviour.

SENSUM: smart sensing of hazardous hydrogeomorphic movement | *University of Exeter and interdisciplinary partners*

Applied accelerometer, gyroscope and tracking technologies to evaluate the stability and function of woody debris dams and the movement of large wood and sediment, building evidence relevant to downstream infrastructure risk.

Multifunctional land-use and natural-capital decision support | *Green Futures Solutions; Ernest Cook Trust*

Led spatial analysis integrating land-use opportunities, ecosystem-service evidence and decision-support tools to inform estate-scale choices and multiple public benefits.

Climate adaptation and public-benefit frameworks | *Green Futures Solutions; National Trust and other partners*

Contributed hydrology, resilience, heritage, wellbeing and natural-capital evidence to adaptation guidance, validation frameworks and business-case tools for changing landscapes.

Catchment and regional environmental-economic analysis | *Green Futures Solutions*

Delivered or supported spatial baselines, future scenarios and economic/public-benefit assessment for the Isles of Scilly, River Trent and other partner landscapes.

Flood investment, vulnerability and fairness | *King's College London*

Linked spatial patterns of flood vulnerability and government flood-defence spending to examine how risk-reduction resources are distributed.

Climate-smart disaster-risk reduction in Bosnia and Herzegovina | *OSCE; Folke Bernadotte Academy; municipalities and local stakeholders*

Combined field reconnaissance, GIS/data scoping and participatory work on flood risk, erosion, drainage, nature-based solutions and citizen engagement in the Una and Sana region.

Flood-risk planning and recovery in Serbia | *Srbijavode; Government of Serbia; World Bank; EU and bilateral partners*

Contributed to national and local flood-risk assessments, strategic project pipelines, transboundary river-basin cooperation, public engagement and urgent recovery following the May 2014 floods.

Teaching, supervision and student support

- Hydraulics and Hydrology practical teaching, Heriot-Watt University (2019-2020).
- Lecturer and supervisor, Civil Engineering Water Design Project, including GIS and HEC-RAS flood-alleviation modelling (2017-2018).
- Supervision and academic support for undergraduate and postgraduate students at Heriot-Watt and Exeter; supervision and mentoring of Master's and PhD researchers in consultancy settings.
- Design and facilitation of practitioner workshops on nature-based solutions, climate resilience, citizen engagement and disaster-risk reduction.
- Contributor to the University of Exeter Student-parents: Barriers to progression study and active supporter of student-parent and early-career researcher communities.

Selected publications and research outputs

Conference papers and academic outputs

Baharuddin, I.N.Z., Husemann, J. and Egedusevic, M. (2025). Advancing environmental resilience with innovative nature-based geo-construction solutions. GeoAsia8, Brisbane, Australia.

Egedusevic, M., Bennett, G., Roskilly, K., Sgarabotto, A., Manzella, I., Raby, A., Boulton, S.J., Clark, M., Curtis, R., Panici, D. and Brazier, R.E. (2022). Monitoring the stability of leaky dams and their influence on debris transport with innovative sensor technology on the SENSUM project. EGU General Assembly 2022, EGU22-8642. <https://doi.org/10.5194/egusphere-egu22-8642>

Egedusevic, M., Arthur, S. and Beevers, L. (2019). Runoff characteristics of different cultivations in Menstrie catchment, Scotland: from field observations to model development. EGU General Assembly 2019.

Egedusevic, M., Allen, D., Beevers, L., Arthur, S. and Haynes, H. (2017). Runoff characteristics of cultivation practices for woodland creation: field evidence from the Menstrie catchment. 7th International Conference on Flood Management, Leeds.

Egedusevic, M., Vujanic, I. (2011). Completion of the Aleksinac urban area flood protection system. 11th International Multidisciplinary Scientific GeoConference SGEM.

Reports, evidence syntheses and public scholarship

- Carmichael, L., Norman, E., Pearson, W. and Egedusevic, M. (2026). Student-parents: Barriers to progression report. University of Exeter.
- Coomes, D. and Egedusevic, M. (2021). Woodland. In: Nature-based solutions for climate change in the UK. British Ecological Society.
- Egedusevic, M. and Green, D. (2024). Five surprising ways that trees help prevent flooding. The Conversation, 17 October 2024.
- Egedusevic, M. (2025). Rooted in resilience: integrating trees into flood management strategies for a sustainable water future. Institute of Water magazine.
- Egedusevic, M. (2010). First draft of a flood risk management plan for the Tamnava river basin. Serbia on the Water, 35.

Selected knowledge exchange and invited contributions

- Panellist, 'Nature as infrastructure', Financial Times Climate & Impact Summit, London, June 2026.
- Speaker and facilitator, Citizen Engagement and Nature-based Solutions expert workshop, Folke Bernadotte Academy, Bosnia and Herzegovina, June 2026.
- Panellist, 'Nature-based Solutions: Partnerships for Resilience', Exeter Climate Forum, June 2026.
- Expert commentary on flood and climate risk for the Science Media Centre and wider media.
- Presenter at EGU General Assemblies (2019 and 2022), ICFM7 (2017) and professional flood-risk and disaster-management events across Europe.

Funding, proposal development and recognition

- Scottish Forestry Trust and Heriot-Watt University support for Menstrie natural flood management research (project value approximately GBP 15,000).
- Named researcher/contributor on two Horizon Europe proposals (2026).
- British Ecological Society grant (2019).
- Arup LNA/PCM Flood Recovery Team Award, jointly recognised with Environment Agency colleagues (2024).
- Contributor to multidisciplinary commercial and research proposals for public, charitable, infrastructure and land-management partners.

Academic citizenship and professional service

- Independent Member, South West Regional Flood and Coastal Committee.
- Editorial Board Member, International Journal of Disaster Risk Management.
- Board Member and mentor, Bosnia & Herzegovina Futures Foundation.
- Mentoring and advocacy for early-career researchers and student parents at the University of Exeter.
- Professional and learned-society engagement through the British Ecological Society, Royal Society of Biology, Women's Engineering Society, Water Youth Network and Serbian Chamber of Engineers.

Technical and field capabilities

Hydrology and hydraulics: GR4H/GR4J, HEC-RAS, HEC-GeoRAS, HEC-HMS, SHETRAN. Data and spatial analysis: R, ArcGIS, QGIS, statistical and event analysis, spatial decision support, remote sensing and drone-derived data. Natural-capital tools: LUCI, InVEST, ORVal, NEVO. Field practice: water-level and motion sensors, drone operations, safe working in water, field risk assessment and off-road driving.

Languages

Serbian / Bosnian / Croatian: native | English: C2 | German: A1

Referees

Associate Professor Georgie Bennett | *Associate Professor in Physical Geography, University of Exeter*

Email: G.L.Bennett@exeter.ac.uk

Professor Aleksandra Drizo | *Professor of Sustainability Science and Management, Tunghai University*

Email: adrizo@phosphoreduc.com