



Mattia Bosio

EDUCATION AND TRAINING

Air Quality Data Analysis Intern - ARPA Liguria

Agenzia regionale per la protezione dell'ambiente ligure [01/03/2026 – Current]

City: Genova | Country: Italy | Website: <https://www.arpal.liguria.it/> | Field(s) of study: Atmospheric sciences, air pollution, and data analysis

- Managed and analysed air-quality monitoring datasets from ARPAL monitoring stations, with a particular focus on particulate matter (PM) measurements.
- Analysed and interpreted data from different monitoring technologies, including optical and gravimetric samplers, assessing their measurement characteristics and comparability.
- Developed a methodology for the comparison and cross-validation of measurements from different sensors and sampling techniques, identifying discrepancies and assessing data consistency.
- Integrated meteorological and environmental variables, including temperature, wind speed and direction, to investigate their influence on particulate matter concentrations and measurement variability.
- Developed automated and streamlined workflows for dataset querying, processing and comparison, improving the efficiency and reproducibility of air-quality data analysis.

Internship at CSIC-IDAEA

CSIC - IDAEA [14/01/2025 – 14/07/2025]

City: Barcelona | Country: Spain | Website: <https://www.idaea.csic.es/> | Field(s) of study: Natural sciences, mathematics and statistics

- Investigation of the role of urban vegetation in atmospheric particulate matter retention and pollution mitigation, with particular focus on plant-particle interactions.
- Scanning Electron Microscopy (SEM) analysis of leaf surfaces to characterise morphological features and particulate matter deposition.
- Acid digestion of plant samples followed by Inductively Coupled Plasma (ICP) analysis to characterise the chemical composition of particulate matter captured by vegetation.
- Development of user-friendly digital applications for the online consultation and visualisation of environmental data by citizens and decision-makers.

Ph.D. Student in Science and Technology for the Earth and the Environment (STAT) - Urban Greenery and Nature-Based Solutions for Fine Dust Mitigation

University of Genova [01/11/2023 – Current]

City: Genova | Country: Italy | Website: www.unige.it | Field(s) of study: Natural sciences, mathematics and statistics

PhD research investigating particulate matter capture by urban trees and shrubs through experimental analyses, species-specific assessment, and GIS-based spatial modelling. The project aimed to translate leaf- and species-level measurements into spatially explicit tools for urban green planning and air-quality management.

Winter School - Green & blue spaces for urban and planetary health

Università di Bologna [16/03/2026 – 20/03/2026]

City: Bologna | Country: Italy | Field(s) of study: Health and welfare: • Inter-disciplinary programmes and qualifications involving health and welfare

Interdisciplinary training on the role of green and blue infrastructure in improving urban and planetary health, with a focus on ecosystem services, climate change adaptation, urban biodiversity and nature-based solutions. The programme combined lectures, practical activities and collaborative workshops, exploring approaches for assessing the environmental and health benefits of urban vegetation and integrating scientific knowledge into sustainable urban planning.

International IAS Summer School - Aerosol in Polar and Mountain Areas: Theoretical and Practical Aspects

Italian Aerosol Society [17/06/2024 – 21/06/2024]

City: Mestre, Venezia | Country: Italy | Website: <https://www.iasaerosol.it/>

Training on atmospheric aerosols in polar and mountain environments, combining theoretical lectures with practical activities and visits to mountain atmospheric monitoring stations. Focus on aerosol measurement, transport and environmental interactions.

Scholarship recipient for the 121st congress of the Italian Botanical Society & XII INTERNATIONAL PLANT SCIENCE CONFERENCE (IPSC)

Società Botanica Italiana [02/09/2026 – 05/09/2026]

City: Reggio di Calabria | Country: Italy | Website: <https://congresso.societabotanicaitaliana.it/it/>

Scholarship recipient for the 119th congress of the Italian Botanical Society (X International Plant Science Conference)

Società Botanica Italiana [09/2024]

City: Teramo | Country: Italy | Website: <https://www.societabotanicaitaliana.it/>

Master's Degree in Nature Conservation and Management (cum laude)

University of Genova [17/12/2021]

City: Genova | Country: Italy | Website: <https://unige.it/> | Field(s) of study: Natural sciences, mathematics and statistics | Final grade: 110/110 cum laude | Thesis: Analysis of trophic strategies of *Speleomantes strinatii* and *Salamandrina perspicillata* populations in Valbrevenna

Bachelor's Degree in Natural and Environmental Sciences (Nature Curriculum)

University of Genova [18/12/2018]

Website: <https://unige.it/> | Field(s) of study: Natural sciences, mathematics and statistics | Final grade: 108/110 | Thesis: Analysis of the pedofauna of Castello d'Albertis

24CFU Certification for Teaching (D.M. 616/2017)

University of Genova [11/2021]

City: Genova | Country: Italy | Website: <https://unige.it/>

Pedagogy, Psychology, Anthropology, and Educational Methodologies

Training Course held by Wiki-Trade Project

Fondazione Politecnico di Milano [05/2021 – 06/2021]

Website: <https://www.fondazionepolitecnico.it/progetti/wiki-trade/>

Link: https://it.wikipedia.org/wiki/Acidificazione_delle_acque_dolci

- The topics addressed focused on the climate and environmental impacts of today's economy
- Introduction to the use of Wikimedia Italia's free knowledge platforms, in particular Wikipedia.
- At the end of the course, an encyclopaedic entry was drafted on the topics of the meetings (water acidification), which was later uploaded and made available on Wikipedia.

Training Course on Techniques for Monitoring Wolves (*Canis lupus*) in Liguria (Italy)

LIFE WolfAlps EU Project [10/2020 – 11/2020]

City: Liguria | Country: Italy | Website: <https://www.lifewolfalps.eu>

"Festival della Scienza" Training Course for Science Animators (8h)

Festival della Scienza [10/2020]

City: Genova | Country: Italy

Training course for guides at the 'Acquario di Genova'

Dafne Cooperative [01/2018 – 03/2018]

City: Genova | Country: Italy | Website: <https://www.dafnet.it>

WORK EXPERIENCE

 **Ministero della Salute, ARESS Puglia** – Genova, Italy

Collaboration within the National Complementary Plan (PNC) "SALPIAM" - Sustainability for the Environment and Citizens' Health in Port Cities in Italy

[11/2023 – Current]

As part of the national SALPIAM project, aimed at improving the quality of life in Italian port cities (Genoa, Piombino, Ancona, Cagliari, Civitavecchia, Bari, Brindisi) by reducing air pollution related to port activities, I contributed to the study of the mitigation capacity of urban greenery. In particular, I supported the University of Genoa and ARPAL in identifying the most effective plant species for capturing air pollutants emitted in port environments, with the goal of designing Nature-based Solutions to improve urban air quality.

 **Conference for Young BOTanists** – Genova, Italy

Member of the Organising Committee – CYBO 2025, Conference for Young BOTanists

[05/02/2025 – 07/02/2025]

Contributed to the planning and organisation of the conference, including coordination of participants and speakers, communication and event logistics, preparation of conference materials, and support for the management of scientific sessions.

 **University of Genova - Department of Earth, Environmental and Life Sciences (DISTAV)** – Genova, Italy

Website: <https://distav.unige.it/> | Name of unit or department: DISTAV - Department of Earth, Environmental and Life Sciences - Business or sector: Professional, scientific and technical activities

University Course Tutor - Geobotany and Elements of Applied Botany (Code - 84444 - BIO/03 - L-32)

[30/11/2023 – Current]

- Lectures on the basics of Microsoft Excel Software and the main statistical indices for environmental monitoring.
- Provided academic support to students through laboratory sessions on real scenarios.

- Collaborated with the course instructor to develop supplementary teaching materials and study resources.
- Monitored and evaluated student progress, offering constructive feedback and improvement suggestions.
- Facilitated classroom discussions and lab sessions, promoting a collaborative and inclusive learning environment.

 **University of Genova - Department of Architecture and Design** – Genova, Italy

University Course Tutor - Botany Applied to Architecture and Landscape (cod. 104752 - SSD BIO/03)

[01/04/2024]

- Provided academic support to students through laboratory sessions.
- Collaborated with the course instructor to develop supplementary teaching materials and study resources.
- Monitored and evaluated student progress, offering constructive feedback and improvement suggestions.
- Facilitated classroom discussions and lab sessions, promoting a collaborative and inclusive learning environment.

 **University of Genova - Comune di Genova** – Genova, Italy

Monitoring of the Gavoglio Urban Park

[10/2024]

- Monitoring the Nature-based Solutions located in the park.
- Calculation of CO2 removal and storage by the park's tree component.
- Collaboration in writing the report on the state of the park and the efficiency of its nature-based solutions.

 **Secondary school I.P.S.E.O.A. Marco Polo (GE)** – Genova, Italy

Substitute Teacher at I.P.S.E.O.A. Marco Polo (GE) - A031 Food Science

[14/02/2023 – 27/02/2023]

 **Festival della Scienza** – Genova, Italy

Science animator at "Festival della Scienza

- Conducting scientific, theoretical and practical workshops aimed mainly at students.
- Presentation and exhibition of navigation tools and techniques.
- Pollen and Allergy Exhibition/Laboratory in collaboration with ARPAL
- Editions 2020 - 2021 - 2022 - 2023

 **Dafne Cooperative** – Genova, Italy

Scientific Guide at the Acquario di Genova

[03/2018 – 10/2021]

- Guided tours with school groups and organised groups along the exhibition route
- Guided tours 'behind the scenes' in technical areas and areas not normally accessible to the public

 – Genova, Italy

Collaboration with Castello d'Albertis, the University of Genoa and the Hydrographic Institute of the Italian Navy

[02/2021]

- Creation of a video-documentary on the life of Captain d'Albertis
- Exposition of basic concepts regarding cartography, navigation and the necessary tools for orientation at sea.
- The videos, entitled "Caccia alla Rotta", were uploaded on the YouTube channel "Genova More Than This".
<https://www.youtube.com/watch?v=c9B-tzEjhkY&list=PLisNxdJaZJKsTdy9VyMHu6attS18G7i9c>

Substitute Teacher at "Istituto Comprensivo 'Lagaccio' "

- 25/4 - 27/4/2020
- 14/01/2021

PUBLICATIONS

[2025]

Experimental investigation of plants interactions with airborne pollutants in an atmospheric simulation chamber

This study investigated the capacity of three plant species (*Myrtus communis*, *Nerium oleander*, *Taxus baccata*) to capture NO₂, black carbon, and dust under controlled atmospheric conditions. Results revealed species-specific pollutant removal efficiencies, with *T. baccata* showing balanced performance across pollutants, *M. communis* excelling in black carbon uptake, and *N. oleander* in dust capture, highlighting the potential of vegetation in urban pollution mitigation strategies.

Authors: M. Bosio, F. Mazzei, M. Brunoldi, D. Massabó, V. Vernocchi, F. Parodi, P. Prati, E. Roccotiello | **Journal Name:** Atmospheric Environment: X | **Volume, Issue and Pages:** Volume 27, 2025, 100355 | **Publisher:** Elsevier

M. Bosio, F. Mazzei, M. Brunoldi, D. Massabó, V. Vernocchi, F. Parodi, P. Prati, E. Roccotiello, Experimental investigation of plants interactions with airborne pollutants in an atmospheric simulation chamber, Atm Env: X, Volume 27, 2025, 100355

Link: <https://www.sciencedirect.com/science/article/pii/S2590162125000450>

[2026]

An Automated and Standardized ImageJ-Based Workflow for Particle Counting on Leaf Surfaces Development of a standardized and automated ImageJ/Fiji-based workflow for the analysis of particulate matter deposited on leaf surfaces. The study integrates automated image calibration, preprocessing, particle detection, counting, size measurement, validation, and data export into a reproducible batch-processing pipeline. The methodology was validated against manual analyses and under controlled conditions, and its adaptability to different scanning electron microscopy systems was demonstrated. The workflow reduces operator-dependent variability and supports scalable and reproducible environmental monitoring.

Authors: Mattia Bosio, Lorena Zanni, Elisa Calamastro, Elisa Sanguineti, and Enrica Roccotiello | **Journal Name:** Urban Management for Innovation | **Publisher:** Springer

In press

[2026]

Gestire la qualità dell'aria attraverso il verde urbano: una heatmap per Genova Development of a data-driven geospatial model to assess the particulate matter (PM) removal capacity of urban vegetation. The study combined species-specific PM retention efficiency, assessed through Scanning Electron Microscopy (SEM), with vegetation structural parameters (canopy volume and Leaf Area Index, LAI) and spatial distribution data. The resulting geospatial model was used to develop a city-scale heatmap of vegetation-based PM removal capacity, with Genoa as the main case study and further applications in Barcelona and La Spezia to assess its transferability. The tool provides spatially explicit information to support urban green infrastructure planning and air-quality mitigation strategies.

Authors: Mattia Bosio, Federico Mazzei, Dario Massabò, Paolo Prati, Fulvio Amato, Lucia Bisceglia, Enrica Roccotiello | **Journal Name:** Notiziario della Società Botanica Italiana | **Publisher:** Società Botanica Italiana

In press

[2025]

Verde alla riscossa! Foglie capta polveri VS emissioni portuali Study investigating the capacity of urban tree and shrub species to capture atmospheric particulate matter (PM) in areas surrounding port-related emission sources. Leaves from 22 species were collected near six ARPAL air-quality monitoring stations and analysed by Scanning Electron Microscopy (SEM); deposited particles were quantified and measured using ImageJ. Significant interspecific differences in particle capture capacity were observed, with *Nerium oleander* and *Myrtus communis* showing the highest particle densities and *Taxus baccata* showing a particular capacity for fine particulate matter (PM_{2.5})

retention. The results support the selection of vegetation species for nature-based solutions aimed at mitigating particulate pollution in urban and port areas.

Authors: Mattia Bosio, Lucia Bisceglia, Enrica Roccotiello | **Journal Name:** Notiziario della Società Botanica Italiana - 2025 | **Publisher:** Società Botanica Italiana

[2024]

Porti Polverosi, Piante Portentose Study investigating the potential of urban vegetation to capture atmospheric particulate matter (PM) in the port area of Genoa. Vegetation surveys were conducted along pollution dispersion gradients, while leaf surfaces were analysed by Scanning Electron Microscopy (SEM) to assess particulate deposition and species-specific PM removal capacity. The study provides preliminary evidence supporting the selection of plant species for nature-based solutions aimed at mitigating air pollution in urban port environments.

Authors: Mattia Bosio, Enrica Roccotiello | **Journal Name:** Notiziario della Società Botanica Italiana - 2024 | **Publisher:** Società Botanica Italiana

[2022]

Foraging success is differently affected by local climate in two syntopic forest-dwelling salamanders This study investigated how rainfall, temperature, and body size influence foraging success in *Salamandrina perspicillata* and *Speleomantes strinatii*. Conducted across 11 populations in the Northern Apennines, the research revealed species-specific responses: *S. perspicillata* foraged more actively with warmer, wetter conditions, while *S. strinatii* was negatively affected by higher temperatures. These results highlight contrasting adaptive strategies to microclimatic variation among coexisting amphibians.

Authors: Rosa, G., Bosio, M., Salvidio, S., & Costa, A. | **Journal Name:** Ethology Ecology & Evolution | **Volume, Issue and Pages:** 35(4), 424–433 | **Publisher:** Taylor & Francis

Rosa, G., Bosio, M., Salvidio, S., & Costa, A. (2022). Foraging success is differently affected by local climate in two syntopic forest-dwelling salamanders. *Ethology Ecology & Evolution*, 35(4), 424–433.

Link: <https://doi.org/10.1080/03949370.2022.2094470>

CONFERENCES AND SEMINARS

[02/09/2026 – 05/09/2026] Reggio di Calabria, Italy

121st congress of the Italian Botanical Society & XII INTERNATIONAL PLANT SCIENCE CONFERENCE (IPSC) Oral Presentation - "Role of Urban Green in Particulate Matter Capture and Allergenic Risk Mitigation: A Multifactorial Approach for Sustainable Urban Green Infrastructure" - Scholarship recipient

[25/05/2026 – 28/05/2026] Trieste

50th Congress of the Italian Society of Epidemiology (AIE) Oral presentation - "Dal verde urbano agli strumenti geospaziali per la salute urbana: heatmap della capacità di rimozione del particolato a Genova"

[14/04/2026] Genova

SCIC - Smart City Italian Conference Oral presentation - "A spatial approach to functional urban green planning and management"

[02/02/2026] Genova

Exploring DISTAV Young Research Frontiers Oral presentation - "Functional green for port cities"

[05/12/2025] Genova

Scientific Meeting and Annual General Meeting of the Ligurian Branch of the Italian Botanical Society Oral presentation - "Gestire la qualità dell'aria attraverso il verde urbano: una heatmap per Genova"

[21/11/2025] Genova

Genova Smart Week 2025 Oral presentation - "Sostenibilità per l'ambiente e la salute dei cittadini nelle città portuali in Italia – Il caso studio di Genova"

[31/08/2025 – 05/09/2025] Lecce, LE, Italia

European Aerosol Conference (EAC 2025) Oral Presentation: "Plants Interactions with Airborne Pollutants by an Atmospheric Simulation Chamber "

[15/11/2024] Genova, Italy

Scientific Meeting and Annual Assembly of the Ligurian Section of the Italian Botanical Society Oral presentation: "Verde alla riscossa - Foglie captapolveri contro emissioni portuali"

[11/09/2024 – 13/09/2024] Teramo, IT

119th Congress of the Italian Botanical Society 2024 (X International Plant Science Conference) Oral Presentation: "Leaves as Allies for Air Pollution Mitigation in a Mediterranean Port City" - Scholarship recipient

[17/06/2024 – 21/06/2024] Mestre, Venezia, Italy

International IAS Summer School - Aerosol in Polar and Mountain Areas: Theoretical and Practical Aspects Poster Presentation: "Urban Foliage: Natural Allies in the Fight Against Air Pollution"

[28/05/2024 – 31/05/2024] Torino, Italy

PM2024 - National Conference on Atmospheric Particulate Matter

[16/04/2024 – 19/04/2024] Riccione, Italy

48th Congress of the Italian Association of Epidemiology Poster Presentation: "Plants in Ports: Allies Against Air Pollution"

[29/02/2024 – 01/03/2024] Milano, Italy

RespiraMi '24 Congress Poster Presentation: "Air Pollution Mitigation by Plants in Port Cities"

LANGUAGE SKILLS

Mother tongue(s): Italian

Other language(s):

English

LISTENING C1 READING C1 WRITING C1

SPOKEN PRODUCTION C1 SPOKEN INTERACTION C1

Spanish

LISTENING B1 READING B1 WRITING A2

SPOKEN PRODUCTION B1 SPOKEN INTERACTION B1

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

SKILLS

Good knowledge of ImageJ software / GIS Skills- Map processing, spatial analysis / Team-work oriented / Microsoft Office package: Microsoft Word, Excel, PowerPoint, Access / Good knowledge of R software / Basic skills on LaTeX.

DRIVING LICENCE

Driving Licence: A

Driving Licence: B

COMMUNICATION AND INTERPERSONAL SKILLS

Communication and interpersonal skills

- Developed strong presentation and public speaking skills through oral presentations and poster sessions at national and international conferences.
- Gained confidence and clarity in communicating complex scientific topics to diverse audiences.
- Strengthened interpersonal and networking abilities by engaging with experts during project meetings, workshops, and congresses, fostering effective collaboration and knowledge exchange.

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