Nelson Fernando **Pacheco Bueno**

PhD(c) in Environmental Engineering | MSc in Environmental Science and Technology

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Detail-oriented engineer with expertise in atmospheric and water modeling, and environmental treatment technologies. Skilled in geospatial data analysis and experienced in both independent and collaborative research. Passionate about climate-land feedbacks and global environmental challenges.

Education

Universitat Politècnica de Catalunya — *Barcelona, Spain*
Dust-DN Doctoral Network — *Apr 2025 - Present*
PhD Thesis: "Modeling super-coarse dust and its effect upon climate."

Universiteit Gent — *Ghent, Belgium*
Postgraduate Studies in Weather and Climate Modeling *Diploma* 🔗 — *Sep 2023 - Sep 2024*
Research project: "Extreme Temperature Changes in Belgium: A Study Using Extreme Value Analysis."

Master of Science in Environmental Science and Technology *Diploma* 🔗 — *Ghent, Belgium*
Master's thesis: "Modeling and Simulation of Greenhouse Gas Emissions from the Zwalm River Basin." — *Sep 2021 - Sep 2023*

Salesian Polytechnic University — *Cuenca, Ecuador*
Bachelor of Science Degree in Environmental Engineering *Diploma* 🔗 — *Sep 2008 - May 2014*
Final research project: "Creation of a Laboratory-scale Up-flow Experimental Fixed-bed Reactor to Determine the Full-scale Fundamental Design Parameters."

Awards and Scholarships

Marie Skłodowska-Curie Actions Doctoral Fellowship. Horizon Europe program · Grant No. 101168425. — *2025 - 2028*

Master Mind Scholarship. Flemish Ministry of Education and Training · (Full tuition fee waiver and yearly stipend) — *2021 - 2023*

Highest Ranking Graduate of the 2008-2013 Environmental Engineering class. Salesian Polytechnic University. — *2014*

"Highest Ranking High School Student" scholarship. Salesian Polytechnic University · (Full tuition fee waiver) — *2008 - 2013*

Academic and Research Experience

IDYC Co., Ltd. — *Cuenca, Ecuador*
Research Assistant — *Jan 2019 - Aug 2021*
Contributed to the research on the impact of urban mobility projects on the air quality status in Cuenca city.
Analyzed historical passive sampling and automatic air quality monitoring records through non-parametric techniques.
Authored and proofread a research paper for journal publication and presented the findings at an international conference.

Salesian Polytechnic University — *Cuenca, Ecuador*
Adjunct Assistant Lecturer - Undergraduate Environmental Engineering Program — *Sep 2014*
Planned and conducted intensive introductory biology and chemistry lectures for first-year undergraduate students.
Organized and led group discussions on professional and academic issues.

Research Assistant - Scientific Station — *Cuenca, Ecuador*
Applied a GIS-based fuzzy logic and multi-criteria analysis based on the Environmentally Sensitive Area Index (ESAI) approach. — *Feb 2014 - Aug 2014*
Collected site-specific observations and fulfilled local surveys throughout the Azuay Province to assess the map accuracy.
Wrote and managed the peer-review process for publication, while sharing the outcomes via poster and oral sessions.

Professional Experience

ALSO Space Consulting — *Brussels, Belgium*
Earth Observation Internship — *Dec 2024 - Mar 2025*
Preprocess and analyze satellite imagery and remote sensing data to promote Copernicus Service resources worldwide.
Assist with operational satellite data analysis tasks, document workflows, and disseminate findings to stakeholders in Latin America.
Draft presentations and reports summarising findings and outcomes of projects and analyses.

IDYC Co., Ltd. *Cuenca, Ecuador*

<small>ENVIRONMENTAL AUDITOR</small> *Dec 2016 - Aug 2021*

Supervised audit activities for the urban regeneration and paving program financed by the Development Bank of Latin America.
Executed on-site evaluations of environmental management and compliance with occupational safety and health regulations.
Produced monthly summaries, quarterly audit reports, and semi-annual environmental monitoring compendiums.

<small>AIR QUALITY AND NOISE CONSULTANT</small> *Guayaquil, Ecuador*

Supervised monthly maintenance of the air quality monitoring network. *Mar 2017 - Feb 2019*
Composed monthly reports including time-series meteorological and particulate matter records analysis.
Reviewed and examined scoring methodologies to develop pollution and air quality indices.
Developed the local strategic noise map and noise action plans.

<small>AIR EMISSIONS TECHNICAL ANALYST</small> *Guayaquil, Ecuador*

Preprocessed and analyzed station-based meteorological data. *Mar 2016 - Jan 2017*
Computed particulate matter emission rates for non-metallic mining and mobile sources.
Achieved dynamical downscaling of prognostic datasets using the Weather Research and Forecasting (WRF) model.
Assessed the impact of particulate matter emissions utilizing AERMOD dispersion model.

<small>ENVIRONMENTAL ENGINEER</small> *Guayaquil, Ecuador*

Quantified and compiled the official emissions inventory for criteria air pollutants. *May 2015 - Feb 2016*
Accomplished spatial data analysis for the air quality monitoring network design.
Conducted passive and active air sampling of criteria pollutants and environmental noise measurements.

<small>ENGINEER IN TRAINING</small> *Cuenca, Ecuador*

Conducted AERMOD simulations for the 3.6 GW Santiago hydroelectric feasibility study (70% of national energy demand). *Oct 2014 - May 2015*
Prepared a baseline report through particulate matter sampling and environmental noise measurements.
Executed environmental hazard and risk assessments using GIS techniques.

Publications

Pacheco-Bueno, N.P.*, Van Schaeybroeck, B., Van De Vyver, H., & Caluwaerts, S. *Extreme Temperature Changes in Belgium: An Extreme Value Analysis* [***First author**] *First draft*

Panique-Casso, D., **Pacheco-Bueno, N.P.***, Forio, M.A.E., Goethals, P., & Ho, L. *How do varying nitrogen fertilization rates affect crop yields and riverine N_2O emissions? A hybrid modeling study*, Water Research, 276, doi.org/10.1016/j.watres.2025.123242. [***First author, equal contribution**] *Feb 2025*

Pacheco, F.*, Armijos-Arcos, F., Espinoza, C., & Jerves-Cobo, R. *Influence of tram construction on nitrogen dioxide concentrations in the city of Cuenca-Ecuador*, Moving away from the threshold of environmental imbalance. Six Contributions to the Debate (1), Abya-Yala Publishing, ISBN: 978-9978-10-566-5, pp. 125-142. [Journal repository link]. [***First author**] *Jun 2021*

Portilla, F., Noguera, A., & **Pacheco, F**. *Multitemporal diagnostic of environmental regions sensible to desertification in the Azuay Province after 1982*, La Granja: Journal of Life Science, 20(2), pp. 36-44, doi: 10.17163.lgr.n20.2014.04. *Dec 2014*

Conferences

Jun 2019 **Pacheco, F**., Armijos-Arcos, F., Espinoza, C., & Jerves-Cobo, R. *Influence of tram construction on nitrogen dioxide concentrations in the city of Cuenca - Ecuador*. Talk given at the Second International Symposium on Environment (ISE 2019). *Cuenca, Ecuador*

May 2016 Portilla, F., Noguera, A., & **Pacheco, F**. *Multi-temporal analysis of desertification sensitivity in the Azuay Province since 1982*. Poster session presented at the International Conference on Regional Climate (ICRC)-CORDEX 2016. *Stockholm, Sweden*

Mar 2014 Portilla, F., Noguera, A., & **Pacheco, N**. *Desertification in the Azuay Province. Evidence of climate change*. Poster session presented at the Annual Congress on Meteorology and Air Quality (CAMCA 2014). *Quito, Ecuador*

Professional Training

Climatematch Academy *Certificate* ⬈ *USA (online)*

<small>COMPUTATIONAL TOOLS FOR CLIMATE SCIENCE (85 HOURS)</small> *Jul 2024*

Cutting-edge techniques with guided Python tutorials and collaborative research using real-world and modeled climate data.

Statistical Society of Ecuador *Certificate* ⬈ — *Guayaquil, Ecuador*

DATA SCIENCE TRAINING PROGRAM (200 HOURS) — *Mar 2018 - Feb 2019*

Linear regression, time series forecasting, Bayesian and non-parametric inference, data visualization, and machine learning.

National Institute of Technology (NIT) *Certificate* ⬈ — *Warangal, India*

NUMERICAL CLIMATE PREDICTION (100 HOURS) — *Jun 2018*

Climate systems introduction, numerical methods, and dynamical downscaling using the WRF model.

National Center for Atmospheric Research (NCAR) *Certificate* ⬈ — *Boulder, USA*

WRF DA TUTORIAL (THREE DAYS COURSE) — *Jul 2017*

WRF data assimilation system fundamentals (radiance and radar data assimilation) and practical sessions.

National Center for Atmospheric Research (NCAR) *Certificate* ⬈ — *Boulder, USA*

BASIC WRF TUTORIAL (FIVE DAYS COURSE) — *Jul 2017*

WRF modeling (preprocessing, dynamic and numeric physics, post-processing, and graphical tools) and hands-on exercises.

Trinity Consultants *Certificate* ⬈ — *Phoenix, USA*

AERMOD COMPUTER MODELING LAB (1.6 CEUS) — *Feb 2015*

Dispersion modeling essentials, meteorological and terrain data preprocessing, and results post-processing and interpretation.

Technical Skills

Coding — MATLAB (Simulink), R, SQL, Python, and Visual Basic.

Writing — Inkscape, LaTeX, MS Office, Markdown, literate programming and interactive applications (in Jupyter, RMarkdown and Shiny).

Software — AERMOD, AutoCAD, ArcGIS Pro, Google Earth Engine, OpenFOAM, QGIS, SWAT+, and WRF.

Languages — Spanish (native speaker), and English (C1 · TOEFL iBT: 100).

Extracurricular Activities

Student Representative of the MSc Program in Environmental Science and Technology. Universiteit Gent. *2021-2023*

Volunteer in the Peer Tutoring Program at the Department of Student Welfare. Salesian Polytechnic University *2010 - 2013*

President of the Environmental Engineering School Student Association. Salesian Polytechnic University. *2010*

References

Prof. Dr. Peter Goethals · Master's thesis supervisor & professor

Associate Professor of Applied Aquatic Ecology and Ecotechnology & Supervisor of the Aquatic Ecology research group (AECO)

Department of Animal Sciences and Aquatic Ecology · Universiteit Gent, Campus Coupure, Coupure Links 653 - block F, B-9000 Gent, Belgium.

✉ peter.goethals@ugent.be

Dr. Long Tuan Ho · Master's thesis advisor

Postdoctoral researcher

Department of Animal Sciences and Aquatic Ecology · Universiteit Gent, Campus Coupure, Coupure Links 653 - block F, B-9000 Gent, Belgium.

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Prof. Dr. Rubén Fernando Jerves Cobo · Employer & professor

Chief Executive Officer

Ingeniería, Diseño y Consultoría (IDYC Co., Ltd.) · Cámara de la Construcción Bldg., Fray V. Solano avenue - floor 202, Cuenca, Ecuador.

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PhD(c). Diego Gustavo Panique Casso · Master's thesis tutor

Doctoral researcher

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