Susy Echeverría-Londoño, PhD

NSF Postdoctoral Associate
Macroecology and Macroevolution

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SUMMARY

I am a researcher focusing on the study of large-scale patterns of biodiversity, and the ecological and evolutionary processes that shape them. Throughout my career, I have gained extensive experience in data science, including data processing, data visualisation and advanced statistical and spatial analysis. I particularly enjoy exploring and analysing biological data through visualisation tools.

PROFESSIONAL EXPERIENCE

2018–present **Visiting scholar**, *University of Pittsburgh, Biological Sciences*, USA.

PI: Prof. Justin Kitzes.

Exploring and analysing time-series spatial points patterns from ca. 300 plant species to predict extinction risks.

2017–present **NSF Postdoctoral Associate**, *Kenyon College, Biology*, Gambier, USA.

PIs: Prof. Andrew Kerkhoff and Prof. Brian J. Enquist.

- Exploring and analysing the distribution of ca. 85000 plant species, including approximately 9 million geographic points.
- Researching the consequences of habitat stability on current patterns of plant diversity using distribution and phylogenetic relations of ca. 24000 plant species.
- Carrying out paleohabitat reconstructions using machine learning methods.
- Co-taught the BSc course "Global Ecology and Biogeography".
- Taught and organised lectures and assignments for the undergraduate ecoinformatics course, which include topics such as "Introduction to data science R", "Data managing and processing", "Data visualisation", "Spatial analysis and reproducibility" (see https://globalecologybiogeography.github.io/Ecoinformatics/).

2017 **Lecturer and demonstrator**, *Natural History Museum, Imperial College London*, UK.

Lectured and demonstrated for the course "Methods in Macroecology and Macroevolution" (MSc "Taxonomy and Biodiversity"), including topics such as "Phylogenetic approaches to studying diversification" and "Fossils in phylogenetics".

2013–2016 **Demonstrator**, *Imperial College London*, UK.

Demonstrated for the BSc courses "Computational Biostatistics", "Ecology and Evolution", "Biodiversity and Conservation Biology", "Introduction to R", "Fundamentals of Statistics in R", including topics such as "Phylogeny of mammals and pines", "IUCN red list", "Biodiversity among lineages and over time", "Delimiting species" and "Extinction risk patterns and correlates".

2011–2012 **Science teacher**, *New Cambridge school, Gimnasio pontevedra, La quinta del puente*, Bucaramanga, Colombia.

Taught biology for high school, middle school and primary school students.

2008–2010 **Teaching assistant**, *Universidad Industrial de Santander*, Bucaramanga, Colombia.

Assisted teaching for the course BSc "Systematics" and MSc course "Bioinformatics".

EDUCATION

2013–2017 **PhD in Life Science**, *Imperial College London, Natural History Museum*, London, UK.

Thesis: Diversification patterns of *Solanum* L. (Solanaceae), plant macroecology and responses to land-use change.

Supervisor: Prof. Andy Purvis. Co-supervisor Dr Sandra Knapp.

- Researched the dynamics of diversification of the megadiverse plant genus *Solanum* using a collation of geographical, genetic and taxonomic data along with phylogenetic comparative methods.
- Studied large-scale patterns of plant diversity and their responses to land-use change from data of a global collation of local field-based studies.
- Carried out large-scale evolutionary modelling exercise on an HPC Linux cluster.

2012–2013 **MRes in Biodiversity, Informatics and Genomics** (with distinction), *Imperial College London*, Silwood Park, UK.

Thesis: Modelling and projecting response of Colombian biodiversity to land-use change.

Supervisor: Prof. Andy Purvis.

2004–2010 **BSc in Biology** (with 1st class honours), *Universidad Industrial de Santander*, Bucaramanga, Colombia.

COMPUTER SKILLS

Programming	R (advanced)
	Python (intermediate)
	C++, shell, HPC cluster scripts (basic)
Data science	Cleaning, processing, visualisation, statistical analysis (advanced)
	GIS in R and ArcGIS (intermediate)
Version control	Git
OS	Linux/Unix, OS X, Windows
Typography	LaTeX, OpenOffice/LibreOffice

LANGUAGES

Spanish	Native
English	Full professional
Italian	Basic

PUBLICATIONS

2018 **Echeverría-Londoño, S.,** Enquist. B. J., Neves, D. M., Violle, C. and Kerkhoff, A. J. Plant functional diversity and the biogeography of biomes in North and South America, *Frontiers in Ecology and Evolution*, 6(DEC), 219.

2018 **Echeverría-Londoño, S,.** Särkinen, T., Fenton, I. S., Knapp, S. and Purvis, A. Dynamism and context dependency in the diversification of the megadiverse plant genus Solanum L. (Solanaceae), *bioRxiv ref.: 348961.*

2017 Isaacs, P., **Echeverría-Londoño, S.,** Urbina, N. and Purvis, A. Species composition and changes in land use: considerations under climatic change scenarios. Moreno, L. A., Andrade, G. I. and Ruíz-Contreras, L. F. (Editors). In *Biodiversity 2016. Status and Trends of Colombian Continental Biodiversity*, Instituto de Investigación de Recursos Biológicos Alexander von Humboldt, 106 p.

2017 Hudson, L. N., Newbold, T., Contu, S., Hill, S. L., Lysenko, I., De Palma, A., Diaz, S., **Echeverría-Londoño, S.,** ...and Purvis, A. The database of the PREDICTS (Projecting Responses of Ecological Diversity in Changing Terrestrial Systems) project, *Ecology and Evolution*, 7(1), 145–188.

2016 **Echeverría-Londoño, S.,** Newbold, T., Hudson, L. N., Hill, S. L., Contu, S., Lysenko, I., ...and Purvis, A. Modelling and projecting the response of Colombian biodiversity to land-use change, *Diversity and Distributions*, 22, 1099–1111.

2015 Newbold, T., Hudson, L. N., Hill, S. L., Contu, S., Lysenko, I., Senior, R. A., Bennet D. J., Choimes A., Collen, B., Day, J., De Palma, A., Diaz, S., **Echeverría-Londoño, S.,** ...and Purvis, A. Global effects of land use on local terrestrial biodiversity, *Nature*, 520(7545), 45–50.

2014 Newbold, T., Hudson, L. N., Contu, S., Hill, S. L., Lysenko, I., De Palma, A., Phillips, H., Senior, R. A., Bennet D. J., Booth, H., Choimes, A., Correia, D. L. P., Day, J., **Echeverría-Londoño, S.,** ...and Purvis, A. The PREDICTS database: a global database of how local terrestrial biodiversity responds to human impacts, *Ecology and Evolution*, 4(24), 4701–4735.

2011 **Echeverría-Londoño, S.** and Miranda-Esquivel, D. R. MartiTracks: A geometrical approach for identifying geographical patterns of distribution, *PLoS ONE*, 6(4), e18460.

2010 Miranda-Esquivel, D. R., Morales-Guerrero, A. M. and **Echeverría-Londoño, S.** ¿Cuántos somos? y ¿Cómo nos cuantificamos? In *Evolución "Historia de la Vida". Asociación Colombiana para el avance de la Ciencia ACAC.*

PRESENTATIONS AND POSTERS

2018 **Presentation**. Echeverría-Londoño, S., et al. Explosive diversification of *Solanum* L (Solanaceae) in the old world, *Three Rivers Evolution meeting*, Pittsburgh, USA.

2018 **Poster**. Echeverría-Londoño, S., et al. Plant functional diversity and the biogeography of biomes in North and South America, *Three Rivers Evolution meeting*, Pittsburgh, USA.

2018 **Poster**. Echeverría-Londoño, S., et al. Plant functional diversity and the biogeography of biomes in North and South America, *Botany 2018*, Rochester (MN), USA

2016 **VVIP presentation**. Echeverría-Londoño, S., et al. Modelling and projecting the response of Colombian biodiversity to land-use change, *State visit by the President of Colombia, Juan Manuel Santos, to the UK and the Prince of Wales*, Natural History Museum, London, UK

2016 **Presentation**. Echeverría-Londoño, S., et al. Modelling and projecting the response of Colombian biodiversity to land-use change, *First symposium of Colombian research in the UK*, Imperial College London, UK.

2016 **Presentation**. Echeverría-Londoño, S., Knapp, S. and Purvis, A. Explosive diversification of *Solanum* L (Solanaceae) in the old world, *BES macroecology meeting 2016*, University of Oxford, UK.

2016 **Presentation**. Echeverría-Londoño, S., Knapp, S. and Purvis, A. Diversification patterns of genus *Solanum*, *NHM students conference*, Natural History Museum, London, UK.

2015 **Poster**. Echeverría-Londoño, S., Knapp, S. and Purvis, A. Explosive diversification of *Solanum* L (Solanaceae) in the old world, *Systematics: The Science that Underpins Biology. The Systematic Association Biennal meeting*, University of Oxford, UK.

2015 **Presentation**. Echeverría-Londoño, S., Knapp, S. and Purvis, A. Explosive diversification of *Solanum* L (Solanaceae) in the old world, *EU Macroecology meeting*, Zoological museum of Copenhagen, Denmark.

2015 **Poster**. Echeverría-Londoño, S., Knapp, S. and Purvis, A. Diversification patterns of *Solanum*, *NHM students conference 2015*, Natural History Museum, London, UK.

2014 **Poster**. Echeverría-Londoño, S., Knapp, S. and Purvis, A. Diversification patterns of *Solanum*, *The London Evolutionary Research Network (LERN)*, Queen Mary University, London, UK.

2014 **Poster**. Echeverría-Londoño, S., Knapp, S. and Purvis, A. Patterns of lineage diversification in the genus Solanum L., *Plants Radiation meeting*, Institute of Systematic Botany, University of Zürich, Switzerland.

2013 **Presentation**. Echeverría-Londoño, S., et al. Modelling and projecting the responses of Colombian biodiversity to human impacts, *11th INTECOL conference*, London, UK.

2010 **Presentation**. Echeverría-Londoño, S. and Miranda-Esquivel, D. M. Panbiogeografía cuantitativa: un acercamiento geométrico, *III Congreso Colombiano de Zoología*, Medellín, Colombia.

2009 **Presentation**. Miranda-Esquivel, D. M., Echeverría-Londoño, S. and Morales-Guerrero, A. M. Todas las secuencias son iguales, pero unas son mas iguales que otras, *III Simposio red colombiana de Biología Evolutiva (Colevol)*, Cali, Colombia.

INVITED SEMINARS

2018 Ecology and Evolution seminars, *University of Pittsburgh, Biological Sciences*, USA.

2017 Monthly seminars, *Department of Biology, Kenyon College*, Gambier, USA.

2017 Ecosystems and Tropical Forest group lab seminar, *School of Geography and the Environment, University of Oxford*, UK.

2015 Ecology and Evolution seminar, *Royal Botanic Garden*, Edinburgh, UK.

SCHOLARSHIPS, AWARDS AND RECOGNITIONS

2018 NSF grant fund, $72,361, "RCN-UBE Incubator: The Biological and Environmental Data Education Network", *NSF*.

2016 Selected to present research to the (Nobel Peace Prize winning) President of Colombia and His Royal Highness the Prince of Wales, *Natural History Museum*, London, UK.

2013 Training and travel grant, £300, *British Ecology Society*.

2013 Bursary, £1,000, MRes in Biodiversity Informatics and Genomics, *Imperial College London*, Silwood Park, UK.

2012–2016 Postgraduate scholarship, £122,000, *Administrative Department of Science, Technology and Innovation of Colombia (Colciencias).*

2004–2009 Academic stimuli, biology program (highest GPA in I, II, IV, IX semesters), *Universidad Industrial de Santander*, Bucaramanga, Colombia.

OTHER ROLES AND RESPONSIBILITIES

2014 Outreach, *Science Uncovered at the Natural History Museum.* Presented the PREDICTS project found at www.predicts.org.uk and the Solanaceae source project found at www.solanaceaesource.org

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2015–2016 Secretary, *Latin American Society, Imperial College London*, UK. Responsible for running the fresher-fair, writing minutes and organizing dance sessions.

REFERENCES

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