

## Curriculum Vitae: Wilson Lara Henao

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### CONTACT INFORMATION

wilarhen@temple.edu  
Department of Geography & Urban Studies  
Temple University, College of Liberal Arts  
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1115 Polett Walk  
Philadelphia PA 19122

### RESEARCH INTERESTS

My research interests focuses on understanding relationships between forest ecosystems to land use and climate change. I am currently collaborating in developing a Decision Support System (DSS) for Biodiversity Conservation and Management in Colombia. This will facilitate the processing of Earth observations in one platform to inform biodiversity decision-making.

I have programmed packages in R to model relations between climate and tree growth implementing procedures of numerical ecology and techniques of image processing. I have used this software to study long-term effects of drought on Iberian Pine forests (Spain). I have also studied patterns in soil organic carbon in Andean forests (Colombia).

As a consultant, I have helped forest managers in Colombia to develop carbon sequestration projects under the Clean Development Mechanism (Kioto protocol).

### EDUCATION

**University of Valladolid, Spain** Sustainable Forest Management Research Institute (iuFOR), University of Valladolid-INIA, **Postgraduate Program:** Conservation and sustainable management of forest ecosystems, *Palencia*

*PhD in Forest Science* **2017**

- Thesis name: Analytic Integration for DendroClimatic Modeling in Forest Ecosystems
- Advisor: Dr. Felipe Bravo Oviedo
- Honors: *Cum Laude* (GPA: 4.0/4.0)

*M.Sc. in Forest Science* **2009**

- Thesis name: Effects of Drought on Biomass Growth of Mediterranean Pine Forests: *Pinus pinaster* Ait., and *Pinus sylvestris* L.
- Advisor: Dr Felipe Bravo Oviedo

**National University of Colombia** Department of Forestry, **Degree Program:** Forest Engineering. *Medellín, Antioquia*

*B.Sc. in Forestry* **2003**

- Thesis name: Edaphological study of soil organic carbon on successional forests of *Porce* river basin, Colombia
- Advisors: Dr. Jorge del Valle, and Dr Flavio Moreno

### FELLOWSHIPS

**NASA - GEO Work Programme 2017-19** *Postdoctoral Fellowship*, Temple University, year 2018

**Colciencias** National Program for Doctoral Studies Abroad, Number 568, year 2013

**University of Valladolid** Research collaboration grant, year 2012

**Research Center on Ecosystems and Global Change (C&B)** *Scholarship for master degree*, Decisión 9-01, year 2008

## INTERNSHIP

**Max Planck Institute for Biogeochemistry** Research Group of Theoretical Ecosystem Ecology, *Jena*, Germany. March 10th to September 24th, 2014

## PEER-REVIEWED PUBLICATIONS

- W. Lara, S. Bogino, and F. Bravo. Multilevel analysis of dendroclimatic series with the R-package BI0dry. *PLoS ONE*, 13(5):1–23, 2018
- L. Risio, W. Lara, S. Bogino, and F. Bravo. How aridity variations affect *Prosopis caldeni* growth in transitional forests in the semiarid argentinean pampas. *Dendrochronologia*, 50:126–133, 2018
- W. Lara, S. Bogino, and F. Bravo. R-Package BI0dry: DendroClimatic Modeling from Multilevel Ecological Data Series. *Biogeosci. Discuss.*, 2017. doi:10.5194/bg-2016-550. URL <http://www.biogeosciences-discuss.net/bg-2016-550/>
- W. Lara, F. Bravo, and C.A. Sierra. measuRing: An R package to measure tree-ring widths from scanned images. *Dendrochronologia*, 34:43 – 50, 2015a. ISSN 1125-7865. doi:10.1016/j.dendro.2015.04.002
- W. Lara, F. Bravo, and D.A. Maguire. Modeling patterns between drought and tree biomass growth from dendrochronological data: A multilevel approach. *Agric. For. Meteorol.*, 178-179:140 – 151, 2013. ISSN 0168-1923. doi:10.1016/j.agrformet.2013.04.017
- C. A. Sierra, J. I. del Valle, S. A. Orrego, F. H. Moreno, M. E. Harmon, M. Zapata, G. J. Colorado, M. A. Herrera, W. Lara, D. E. Restrepo, L. M. Berrouet, L. M. Loaiza, and J. F. Benjumea. Total carbon stocks in a tropical forest landscape of the porce region, colombia. *For. Ecol. Manage.*, 243(2-3):299 – 309, 2007. ISSN 0378-1127. doi:10.1016/j.foreco.2007.03.026
- C. Prieto, W. Lara, J. Riofrío, J. J. Diez, and F. Bravo. Multilevel approach for modeling growth and aridity in relation to health status of *Pinus pinaster* in Spain. *Agric. For. Meteorol.*, (under review)
- W. Lara, F. Bravo, and J. Alday. Sensitivity of Iberian Pine Growth to Phytoclimatic Variations: a Multinomial Analysis on the Spanish National Forest Inventory, a
- W. Lara, C. A. Sierra, C. Ordoñez, and F. Bravo. Multilevel <sup>13</sup>C signatures of drought-induced stress and diametric growth of *Pinus pinaster* during last 40 years, b

## SOFTWARE

- W. Lara and F. Bravo. BI0dry: Multilevel Modeling of Dendroclimatic Fluctuations. CRAN, December 2015. URL <https://cran.r-project.org/web/packages/BI0dry/index.html>
- W. Lara, C. Sierra, and F. Bravo. measuRing: Detection and Control of Tree-Ring Widths on Scanned Image Sect. Comprehensive R Archive Network (CRAN), March 2015b. URL <https://cran.r-project.org/web/packages/measuRing/index.html>

## BOOK CHAPTERS

- W. Lara, V. Gutiérrez, B. Zapata-Arbeláez, A. M. Santacruz, W. G. Laguado, A. Bustamante, A. Yepes, T. Black, and F. Arjona. Priority areas for implementing the CDM to forest restoration projects in conservation corridors of the Andes. In A. C. Newton and N. Tejedor, editors, *Principles and Practice of Forest Landscape Restoration: Case studies from the drylands of Latin America*, pages 292–293. IUCN. Gland, Switzerland, 2011. ISBN: 978-2-8317-1340-3

*Publications in Spanish are described using italics. An script in R for modeling spatial distribution for implementing energetic alternatives in non-interconnected regions was programmed:*

W. Lara, S. Flórez, and D. Tobón. Una Herramienta para la toma de decisiones de inversión en áreas rurales no interconectadas que contribuya al desarrollo sostenible. In David Tobón and Sergio Agudelo, editors, *Optimización de Herramientas Multiobjetivo para la Toma de Decisiones de Inversión en Sistemas Aislados Sostenibles de Energía*, chapter 8. Centro de Investigaciones y Consultorías (CIC), Facultad de Ciencias Económicas, Grupo de Microeconomía Aplicada (GMA) - Grupo de Energías Alternativas (GEA), 2008. URL <ftp://ftp.drivehq.com/cavasco/grupom/LIBROhmo.pdf>. ISBN 978-958-714-223-5

*The R script was implemented in a case study in Colombia:*

S. Flórez, W. Lara, and D. Tobón. Aplicación del Paquete Fupzn1.0 en la Gestión y Toma de Decisiones de Energización de Zonas no Interconectadas con el Software R. In David Tobón and Sergio Agudelo, editors, *Optimización de Herramientas Multiobjetivo para la Toma de Decisiones de Inversión en Sistemas Aislados Sostenibles de Energía*, chapter 9, pages 253–293. Centro de Investigaciones y Consultorías (CIC), Facultad de Ciencias Económicas, Grupo de Microeconomía Aplicada (GMA) - Grupo de Energías Alternativas (GEA), 2008. URL <https://ideas.repec.org/b/lde/bookgm/02.html>. ISBN 978-958-714-223-5

*Another script in R to model biomass stocks in forest ecosystems using growth equations and MOD-17 is described here:*

W. Lara. Determinación de la oferta de biomasa de los ecosistemas sin alterar su estructura. In David Tobón and Sergio Agudelo, editors, *Optimización de Herramientas Multiobjetivo para la Toma de Decisiones de Inversión en Sistemas Aislados Sostenibles de Energía*, chapter 3, pages 75–87. Centro de Investigaciones y Consultorías (CIC), Facultad de Ciencias Económicas, Grupo de Microeconomía Aplicada (GMA) - Grupo de Energías Alternativas (GEA), 2008. URL <https://ideas.repec.org/b/lde/bookgm/02.html>. ISBN 978-958-714-223-5

*The following book chapter summarizes some of my technical reports developed to improve estimations of greenhouse gas (GHG) emissions from LULUCF in Colombia:*

C. Posada, G. Buitrago, G. Arango, J. Alarcón, J. Rodríguez, L. Yepes, M. Cardona, and W. Lara. Módulo de Cambio en el Uso de la Tierra y Silvicultura. In *Estrategias de Reducción de Incertidumbre de las Variables Básicas en la Estimación de Gases de Efecto Invernadero (GEI)*, pages 1–81. Instituto de Hidrología, Meteorología y Estudios Ambientales (IDEAM) - Ministerio de Ambiente, Vivienda y Desarrollo Territorial - Programa de las Naciones Unidas para el Desarrollo (PNUD), 2006. ISBN 958-8067-18-9

*The next book chapter describes a study about modeling soil organic carbon stocks down to 4 m depth in inceptisols of successional forests in the Porce River Basin, Colombia. This study was part of my B.Sc. thesis:*

F. H. Moreno and W. Lara. Variación del carbono orgánico del suelo en bosques primarios intervenidos y secundarios. In S. A. Orrego, J. I. del Valle, and F. H. Moreno, editors, *Medición de la Captura de Carbono en Ecosistemas Forestales Tropicales de Colombia Contribuciones para la Mitigación del Cambio Climático*, pages 189–213. Universidad Nacional de Colombia Sede Medellín, DCF - Centro Andino para la Economía en el Medio Ambiente (CAEMA), 2003. ISBN 958-33-3969-5

W. Lara, D. Tobón, M. Zapata, and S. Agudelo. Aplicación del paquete funpzni 1.0 en la gestión y toma de decisiones de energización de zonas no interconectadas con r. In *Memorias Cuarto Simposio Nacional Forestal, Energías Alternativas, Bosques y Cambio Climático*. Universidad Nacional de Colombia, Sede Medellín. DCF, 2010. ISBN 978-958-719-587-3

*My B.Sc. Thesis was explained in both the annual forest meeting of IUFRO (English) and the first forest meeting of the National University of Colombia (Spanish)*

F. H. Moreno, W. Lara, and S. F. Overbauer. Differences in soil organic carbon with land use changes in tropical mountains of Colombia. In F. Bravo, editor, *Proceedings of the International Union of Forest Research Organization (IUFRO) Div. 4, International Meeting, Managing Forest Ecosystems: The Challenges of Climate Change*, Palencia, España, 2006. Universidad de Valladolid. ISBN-13: 978-84-611-0082-8. ISBN-10: 84-611-0082-4 (CD-ROM)

W. Lara and F. H. Moreno. Estudio del Carbono en Profundidad en Suelos de la Cuenca del Río Porce. In y J. D. León M. C. Díez, editor, *Primer Simposio Forestal DCF*, pages 58–66. Universidad Nacional de Colombia, Sede Medellín, DCF, 2003. ISBN 935267-7

WORKSHOPS AND SEMINARS *I was a training instructor in two IUFOR workshops for modeling forestry data using the R environment*

W. Lara. Curso de R: Procesamiento de conjuntos de datos forestales. Instituto Universitario de Investigación en Gestión Forestal Sostenible. E.T.S. de Ingenierías Agrarias, Palencia, Abril, 16,17 y 24 2015. Duración 12 horas

W. Lara. Matching Diameter Data from Consecutive National Forest Inventories in R environment: the case of Spanish Forest Inventory. International Seminar: Dealing with Error in Forest Modelling and Prediction: Measurement Error and Uncertainty. Sustainable Management Research Institute of University of Valladolid, Spain, September 2012

TEACHING **Catholic University of the East**, Program of environmental engineering, *Rionegro*, Colombia

*Assistant professor* **2002 - 2003; 2005; 2007**

- Subject: Multivariate statistics

TECHNICAL AND ADMINISTRATIVE EXPERIENCE **Research Center on Ecosystems and Global Change (C&B)**, *Medellín*, Colombia

*Administration* **2005 - 2007**

- Position: EXECUTIVE DIRECTOR
- Position: PRESIDENT OF EDITORIAL COMMITTEE. Newsletter CAMBIUM

*Consultancy* **2004 - 2005; 2010 - 2011**

- Position: DEVELOPER OF PROJECTS UNDER CLEAN DEVELOPMENT MECHANISM (CDM) FROM KIOTO PROTOCOL

**Institute of Hidrology, Meteorology and Environmental Studies (IDEAM)**, Minambiente *Bogotá*, Colombia

*Consultancy* **2003 - 2004.**

- Position: Forestry consultant
- Project: Climate Change II 00011937 (UNFCCC). Second stage of first national inventory of greenhouse gases to the UNFCCC (module LULUCF)

LANGUAGES

I write, listen, and speak in English correctly. My native language is Spanish.

REFERENCES

**Dr. Victor H. Gutiérrez** (e-mail: victorhugo@temple.edu; teléfono: +54 215 204 7692)

- Assistant professor
- Dr. Victor Gutiérrez was my director in C&B and will be my PI during a postdoctoral research in Temple University

**Dr. Felipe Bravo** (e-mail: fbravo@pvs.uva.es; teléfono: +34 979 108424)

- Professor, IUGFS
- Dr. Felipe Bravo was the director of my PhD thesis and is co-author of some papers

**Dr. Carlos A. Sierra** (e-mail: csierra@bgc-jena.mpg.de; teléfono: +49 3641 576133)

- Research group leader, Theoretical Ecosystem Ecology, Max Planck Institute for Biogeochemistry
- Dr. Carlos Sierra was director of my internship in Germany and is co-author of a paper

**Dr. Douglas A. Maguire** (e-mail: doug.maguire@oregonstate.edu; teléfono: +54 1737 4215)

- Associate Professor of Silviculture and Biometrics, Oregon State University
- Dr. Douglas Maguire is co-author of a paper



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