

Oscar J. Abelleira Martínez, Ph.D.

Assistant Professor
Department of Agro-Environmental Sciences
College of Agricultural Sciences
University of Puerto Rico, Mayagüez

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Curriculum Vitae

Research Areas: Tropical Forest Ecology, Silviculture, Natural Resource Management

Education

- 2011-2015 Ph.D. in Natural Resources, Joint Doctoral Program University of Idaho, USA, and Centro Agronómico Tropical de Investigación y Enseñanza (CATIE), Costa Rica. Advisor: Dr. Alex Fremier; co-advisor: Dr. Sven Günter
- 2004-2010 M.S. in Biology, Universidad de Puerto Rico, Río Piedras. Advisor: Dr. Ariel E. Lugo
- 2001-2003 B.S. in Environmental and Forest Biology (*Magna cum Laude*), State University of New York, College of Environmental Science and Forestry (SUNY-ESF), Syracuse, New York
- 1999-2001 Industrial Biotechnology Program, Universidad de Puerto Rico, Recinto Universitario de Mayagüez

Research and Education Appointments

- 2015-present Assistant Professor, Department of Agro-Environmental Sciences, College of Agricultural Sciences, University of Puerto Rico, Mayagüez. Contact: Dr. Elvin Román Paoli
- 2013-2014 Graduate Research Assistant, World Agroforestry Center. Review of methods for scaling-up community functional trait composition from plots to regions. Contact: Dr. Jenny Ordoñez

- 2013 Graduate Research Assistant, Bioersivity International. Application of InVEST ecosystem service models in seasonally Costa Rica. Contact: Dr. Fabrice DeClerck
- 2011-2015 Graduate Research Assistant, directed PhD dissertation research, University of Idaho and CATIE. Contact: Dr. Alex Fremier
- 2010-present Volunteer, International Institute of Tropical Forestry, United States Department of Agriculture, Forest Service. Restoration success of *Pterocarpus officinalis* in novel *Spathodea campanulata* wetland forests in Puerto Rico. Contact: Dr. Ariel E. Lugo
- 2010 Volunteer, San Diego State University. Research on CO₂ efflux from Kapuas River tributaries draining disturbed peatlands in, Borneo, Indonesia. Contact: Dr. Walter Oechel
- 2005-2010 Biological Sciences Technician, Student Career Employment Program, International Institute of Tropical Forestry, United States Department of Agriculture, Forest Service. Contact: Dr. Ariel E. Lugo
- 2004 Volunteer, Maracá Island, Brasil (*summer*). Assisted a graduate students in evaluating the effect of white-lipped peccaries on *Mauritia flexuosa* palm population recruitment. Contact: Dr. José Fragoso
- 2004 Field Technician, University of Nevada, Las Vegas. Research on landslides effects on carbon fluxes in the Luquillo Long-Term Experimental Research Station. Contact: Dr. Lawrence Walker
- 2003-2004 Research Support Specialist, State University of New York, College of Environmental Science and Forestry. Research on forest canopy photosynthesis, soil and stem carbon efflux, stem sap flux, and litter decomposition in the Luquillo Long-term Ecological Research Station, Puerto Rico. Contact: Dr. Charles Hall
- 2001 Undergraduate Research Assistant, Rutgers University, New Jersey. Research on benthic invertebrates of urban forested wetlands and their use as indicators of water quality. Contact: Dr. Joan Ehrenfeld

Publications

Abelleira Martínez, O.J., Fremier, A.K., Günter, S., Ramos Bendaña, Z.M., Vierling, L., Galbraith, S.G., Bosque Pérez, N.A. & Ordoñez, J.O. 2016. Scaling up functional traits for ecosystem services with remote sensing: Concepts and methods. *Ecology and Evolution* **6**: 4359-4371 (doi:10.1002/ece3.2201)

- Abelleira Martínez, O.J., E. J. Meléndez Ackerman, D. García Montiel, and J. A. Parrotta. 2015. Seed dispersal turns an experimental plantation on degraded land into a novel forest in urban northern Puerto Rico. *Forest Ecology and Management* **357**: 68-75.
- Abelleira Martínez, O.J. 2015. *Water use of reforested lands in dry tropical Costa Rica: A functional traits and ecosystem services approach*. Ph.D. dissertation. University of Idaho and CATIE.
- Rivera De Jesús, W, A. Ortiz Sotomayor, O.J. Abelleira Martínez, y J.C. Musa. 2013. Eficiencia en el uso de nutrientes en especies arbóreas utilizadas en áreas de mitigación en la ciénaga Las Cucharillas. *Perspectivas* **2**: 109-125
- Lugo, A.E., O.J. Abelleira Martínez, and J. Fonseca da Silva. 2012. Aboveground biomass, wood volume, nutrient stocks and leaf fall of novel forests compared to native tropical forests and tree plantations in Puerto Rico. *Bois et Forêts des Tropiques* **314**: 7-16
- Pérez, M., I. Sastre De Jesús, A.E. Lugo, and O.J. Abelleira Martínez. 2012. Bryophyte species diversity in secondary forests dominated by the introduced species *Spathodea campanulata* Beauv. in Puerto Rico. *Biotropica* **44**: 763-770
- Abelleira Martínez, O.J. 2011. Flooding and profuse flowering result in high litterfall in novel African tulip tree (*Spathodea campanulata* Beauv.) forests in northern Puerto Rico. *Ecosphere* **2**:105 (doi:10.1890/ES11-00165.1)
- Lugo, A.E., O.J. Abelleira, A. Collado, C.A. Viera, C. Santiago, D.O. Vélez, E. Soto, G. Amaro, G. Charón, H. Colón Jr., J. Santana, J.L. Morales, K. Rivera, L. Ortiz, L. Rivera, M. Maldonado, N. Rivera, and N.J. Vázquez. 2011. Allometry, biomass, and chemical content of the African tulip tree (*Spathodea campanulata*). *New Forests* **42**: 267-283
- Abelleira Martínez, O.J. 2010. Invasion by native tree species prevents biotic homogenization in novel forests of Puerto Rico. *Plant Ecology* **211**: 49-64
- Abelleira Martínez, O.J., M.A. Rodríguez, I. Rosario, N. Soto, A. López, and A.E. Lugo. 2010. Structure and species composition of novel forests dominated by an introduced species in northcentral Puerto Rico. *New Forests* **39**: 1-18
- Abelleira Martínez, O.J. 2009. *Ecology of novel forests dominated by the African tulip tree (Spathodea campanulata Beauv.) in northcentral Puerto Rico*. M.Sc. thesis, University of Puerto Rico, Rio Piedras
- Abelleira Martínez, O.J., y M. Sanfiorenzo de Orbeta. 2009. Regeneración boscosa en un parque urbano en Rio Piedras: recomendaciones para incrementar la

biodiversidad. *Acta Científica* **23**: 49-59

Abelleira Martínez, O.J. 2008. Observations on the fauna that visit *Spathodea campanulata* forests in Puerto Rico. *Acta Científica* **22**: 37-42

Abelleira Martínez, O.J., and A.E. Lugo. 2008. Post sugar cane succession in moist alluvial sites in Puerto Rico. In: Myster R. (editor), *Post-agricultural succession in the Neotropics*. Springer, New York, pp. 73-92

Viera Martínez, C.A., O.J. Abelleira Martínez, y A.E. Lugo. 2008. Estructura y química del suelo en un bosque de *Castilla elastica* en el carso del norte de Puerto Rico: resultados de una calicata. *Acta Científica* **22**: 29-36

Abelleira Martínez, O.J., y D.Y. Colón González. 2006. Comparación de método de muestreo en bosques secundarios aluviales: parcela vs. punto-cuadrante. *Acta Científica* **20**: 63-66

Lugo, A.E., O.J. Abelleira, S. Borges, L.J. Colón, S. Meléndez, and M.A. Rodríguez. 2006. Preliminary estimate of earthworm abundance and species richness in *Spathodea campanulata* Beauv. forests in northern Puerto Rico. *Caribbean Journal of Science* **42**: 325-330

PhD dissertation chapters for journal submission (2016)

Abelleira Martínez, O.J., J.D. Marshall, F.A. DeClerck, S. Günter, and A.K. Fremier. *In prep.* Transpiration in secondary forests and teak plantations in seasonally-dry Costa Rica: is there functional convergence in water use? *New Phytologist*

Abelleira Martínez, O.J., J.D. Marshall, S. Günter, F.A. DeClerck, and A.K. Fremier. *In prep.* Tradeoffs of water use and carbon sequestration in reforestation strategies sponsored by Payments for Ecosystem Services in seasonally dry Costa Rica. *Ecological Applications*

Other manuscripts in preparation (2016)

Abelleira Martínez, O.J., J.D. Marshall, S. Günter, and A.K. Fremier. *In prep.* Is there a relationship between water uptake depth and leaf phenology in secondary forests and teak plantations in seasonally dry Costa Rica? *Biotropica*

Abelleira Martínez, O.J. *In prep.* Spatial distribution of novel African tulip tree forests in Puerto Rico: Implications for conservation and food security. *Journal of Agriculture of the University of Puerto Rico*

Abelleira Martínez, O.J., and J.M.V. Fragoso. *In prep.* Stem traits of *Mauritia flexuosa* populations on contrasting water regimes in Maracá Island, Brazil. *Tropical Conservation Science*

Tavárez Vargas, H.S., O.J. Abelleira Martínez, Z.M. Ramos Bendaña, S. Günter, A.K. Fremier, L. Vierling, and L. Elbakidze. *In prep.* Alleviating water scarcity in seasonally dry rural Costa Rica: the value of ecosystem service co-benefits from reforestation. *Ecological Economics*

Oechel, W.C., O.J. Abelleira Martínez, G.Z. Anshari, H. Ikawa, W. McDowell, M. Metz, M. Neteler, M. Nuriman, and D. Rochini. *In prep.* Tropical riverine carbon loss and transport through a mosaic of land-use change in Borneo. *Science*

Presentations

Oral Abelleira Martínez, O.J. 2016. Manejo de bosques noveles para servicios ecosistémicos en Puerto Rico. *9^{no} Simposio Internacional sobre Manejo Sostenible de los Recursos Forestales*, Pinar del Rio, Cuba.

Poster Quiñones Rodríguez, N.P., and O.J. Abelleira Martínez. 2016. Estructura y composición del Bosque Comunitario de Rio Hondo, Mayagüez: Resultados preliminares. *Simposio: El Alcance de la Investigación y Labor Creativa de la UPRM y su Impacto en la Sociedad*, Universidad de Puersto Rico, Mayagüez, Puerto Rico.

Oral Abelleira Martínez, O.J. 2016. Manejo de bosques noveles para servicios ecosistémicos en Puerto Rico. *Taller: Mejores Prácticas para un Paisaje Sustentable*, Universidad de Puerto Rico, Mayagüez, Puerto Rico.

Oral Abelleira Martínez, O.J. 2016. Reforestation, ecosystem services and novel ecosystems: expanding the scope for undergraduates in Biology. *Seminario: Departamento de Biología*, Universidad de Puerto Rico, Mayagüez, Puerto Rico.

Oral Abelleira Martínez, O.J., S. Günter, J.D. Marshall, F.A. DeClerck, N. A. Bosque-Pérez, and A.K. Fremier. 2016. Convergence of tree to stand water use with biomass: Is there room for functional traits as indicators of water use? *2nd Puerto Rico Dry Forest Symposium*, Guánica, Puerto Rico.

Oral Abelleira Martínez, O.J., S. Günter, J.D. Marshall, F.A. DeClerck, and A.K. Fremier. 2015. Tradeoffs of water use and carbon sequestration in incentivized reforestation in the seasonally dry tropics. *2nd Conference on Water Resource Sustainability Issues in Tropical Islands*, Honolulu, Hawai'i.

Oral Abelleira Martínez, O.J. 2015. Bosque Comunitario de Rio Hondo: Primera asamblea comunitaria. *Ira Asamblea del Bosque Comunitario de Rio Hondo*, Centro Comunal Bo. Rio Hondo, Mayagüez, Puerto Rico.

Oral Abelleira Martínez, O.J. 2015. Spatial distribution of novel African tulip tree forests in northern Puerto Rico: Implications for land use policy. *1er Congreso de Ciencias Políticas y Sociedad*, Universidad de Puerto Rico, Mayagüez, Puerto Rico

Oral Galbraith, S.M., H. Tavárez, O. Abelleira, and N. A. Bosque Pérez. 2015 ¿Cómo el cambio del uso de terreno afecta los servicios ambientales y los residentes en la península de Nicoya? *Fondo Nacional de Financiamiento Forestal de Costa Rica*, San José, Costa Rica.

Poster Tavárez, H., O.J. Abelleira, Z. Ramos, L. Elbakidze, A.K. Fremier, S. Gunter, A. Chacón, and N.A. Bosque-Pérez. 2015. Aliviando la escasez de agua en la ruralia seca de Costa Rica: el valor de los servicios ecosistémicos co-beneficios de la reforestación. *Primer Congreso Internacional de Economía Ecológica en Puerto Rico*, Mayagüez, Puerto Rico.

Oral Abelleira Martínez, O.J., S. Günter, J.D. Marshall, F.A. DeClerck, and A.K. Fremier. 2014. Quantifying tradeoffs of water and carbon among PES-sponsored reforestation strategies in seasonally-dry Costa Rica. *24th World Congress of the*, Salt Lake City, Utah

Poster Abelleira Martínez, O.J., H. Tavárez, Z. Ramos Bendaña, S.M. Galbraith, A.K. Fremier, S. Günter, L. Elbakidze, L. Vierling, J. Ordoñez, F.A. DeClerck, and N.A. Bosque Pérez. 2014. Linking ecosystem service tradeoffs with perceived benefits from reforestation in human-modified tropical landscapes. *International Union of Forest Research Organizations Congress*, Salt Lake City, Utah

Oral Abelleira Martínez, O.J., Z. Ramos Bendaña, S.M. Galbraith, A.K. Fremier, S. Günter, N. Bosque Pérez, L.A. Vierling, and J. Ordoñez. 2014. Scaling-up spatial variation in functional traits to inform ecosystem service management: opportunities and challenges. *Annual Meeting of the University of Idaho NSF-IGERT*, Boise, Idaho

Oral Abelleira Martínez, O.J., H.S. Tavárez, Z. Ramos Bendaña, S.M. Galbraith, S. Günter, F.A. DeClerck, and A.K. Fremier. 2014. Linking ecosystem service tradeoffs with perceived benefits from reforestation in seasonally dry Costa Rica to inform PES. *Annual Conference of the Ecosystem Services Partnership*, San José, Costa Rica

Oral Abelleira Martínez, O.J. 2014. Water use of PES-sponsored reforestation in seasonally dry Costa Rica. *PhD Proposal Defense, Joint Doctoral Program, University of Idaho & CATIE*, Turrialba, Costa Rica

Oral Bosque-Pérez, N.A., S.M. Galbraith, H.S. Tavárez-Vargas, and O.J. Abelleira-Martínez. 2014. Assessment and valuation of ecosystem services: An interdisciplinary effort in the Nicoya Peninsula of Costa Rica. *Entomological Society of America Annual Meeting* (Invited presentation). Portland, Oregon

Poster Galbraith, S.M., O.J. Abelleira Martínez, N.A. Bosque Pérez, A.K. Fremier, S. Günter, and J. Ordoñez. 2013. Provisión de servicios ambientales en usos de terrenos auspiciados por el PSA en la península de Nicoya, Costa Rica. *Feria Agroforestal de la Península de Nicoya*, Guanacaste, Costa Rica

Poster Tavárez Vargas, H.S., Z. Ramos Bendaña, S.M. Galbraith, O.J. Abelleira Martínez, N.A. Bosque Pérez, A.K. Fremier, S. Günter, L. Elbakidze, A. Chacón, L. Vierling and J. Ordoñez. 2013. Servicios ambientales y percepción local de sus beneficios dentro de un paisaje tropical reforestado. *Feria Agroforestal de la Península de Nicoya*, Guanacaste, Costa Rica

Oral Ramos Bendaña, Z., O.J. Abelleira Martínez, S.M. Galbraith, and H.S. Tavárez Vargas. 2013. How can the spatial allocation of conservation instruments promote social-ecological resilience? Seminar: *Confronting “socio-ecological systems” and “territoire” as suitable lenses to tackle resilience issues*, Université de Montpellier and Bioversity, Montpellier, France

Oral Tavárez Vargas, H.S., O.J. Abelleira Martínez, S.M. Galbraith, Z. Ramos Bendaña, N.A. Bosque Pérez, L. Elbakidze, S. Günter, A. Fremier, L. Vierling, J. Ordoñez, A. Chacón, T. Hall, and JD Wulforst. 2013. Unknown tradeoffs: Understanding the value of ecosystem services in the Nicoya Peninsula, Costa Rica. *Annual Meeting of the University of Idaho NSF-IGERT*, CATIE, Turrialba, Costa Rica

Poster Burniske, G.R., Abelleira Martínez, O.J., S.M. Galbraith, N.A. Bosque Pérez, A.K. Fremier, S. Günter, and J. Ordoñez. 2013. Provision of environmental services for food security vs. financial benefits of teak plantations - what are the trade-offs? *Society of American Foresters National Convention*, Charleston, South Carolina

Poster Galbraith, S.M., O.J. Abelleira Martínez, N.A. Bosque Pérez, A.K. Fremier, S. Günter, and J. Ordoñez. 2013. Unknown tradeoffs: payments for water and pollination services in the Nicoya Peninsula, Costa Rica. *Annual Meeting of the Association for Tropical Biology and Conservation*, San José, Costa Rica

Oral Abelleira Martínez, O.J., M. Essen, S.M. Galbraith, Z. Ramos Bendaña, and H.S. Tavárez Vargas. 2012. Resilience of social-ecological systems: synergies and tradeoffs of land use in Hojancha, Costa Rica. *Annual Meeting of the University of Idaho NSF-IGERT*, Moscow, Idaho.

Poster Abelleira Martínez, O.J., A.K. Fremier, S. Günter, F.A. DeClerck, and J.D. Marshall. 2012. Water use of reforestation with teak plantations in Nicoya, Costa Rica: implications for droughts. *Annual Meeting of the University of Idaho NSF-IGERT*, Moscow, Idaho

Poster Abelleira Martínez, O.J. 2011. Flooding and profuse flowering result in high litterfall in novel African tulip tree (*Spathodea campanulata* Beauv.) forests in northern Puerto Rico. *Annual Meeting of the American Geophysical Union*, San Francisco, California

Poster Oechel, W.C., G. Anshari, O.J. Abelleira, H. Ikawa, W. Lawrence, M. Metz, M. Neteler, D. Rocchini, D. Zona. 2011. Effects land surface type, land use, and land use change on aquatic-atmosphere fluxes of CO² from tropical forests and peat lands of Borneo. *Annual Meeting of the American Geophysical Union*, San Francisco, California

Poster Oechel, W.C., G. Anshari, O.J. Abelleira, H. Ikawa, W. Lawrence, M. Metz, M. Neteler, and D. Rocchini. 2011. Effects land surface type, land use, and land use change on aquatic-atmosphere fluxes of CO² from tropical forests and peat lands of Borneo. *United Nations Food and Agriculture Organization GEO Carbon Conference*, Johor Bahru, Indonesia

Oral Abelleira Martínez, O.J. 2010. Invasion by native species prevents biotic homogenization in novel forests dominated by introduced *Spathodea campanulata* in Puerto Rico. *Annual Meeting of the Association for Tropical Biology and Conservation*, Bali, Indonesia

Oral Abelleira Martínez, O.J. 2009. Composición de especies de árboles en bosques de tulipán africano (*Spathodea campanulata* Beauv.) en el norte central de Puerto Rico. 2009. *Puerto Rico Karst Symposium, International Institute of Tropical Forestry, USDA Forest Service*, San Juan, Puerto Rico

Poster Abelleira Martínez, O.J. 2007. Characterization of emerging *Spathodea campanulata* forests in northcentral Puerto Rico. *Annual Meeting of the Association of Tropical Biology and Conservation*, Morelia, México

Poster Abelleira Martínez, O.J. 2006. Caracterización de los bosques nuevos de *Spathodea campanulata* en el norte de Puerto Rico. *Scientific Conference of the American Association for the Advancement of Science, Caribbean Division*, Bayamón, Puerto Rico

Oral Lugo, A.E., O.J. Abelleira Martínez, S. Borges, L.J. Colón, S. Meléndez, and M.A. Rodríguez. 2005. Earthworm density and species richness in *Spathodea campanulata* forests in northern Puerto Rico. *Second Latin-American Meeting on Oligochaeta Ecology and Taxonomy: Earthworms as Invasive Species*, San Juan, Puerto Rico

Awards and scholarships

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| 2016 | Novel forest silviculture in Puerto Rico: Restoring native tree species and food security (H-462; Hatch-EEA, UPRM; \$40,000) |
| 2014 | Travel Award, IUFRO 2014 Congress. Graduate and Professional Student Association, University of Idaho (\$667) |
| 2013 | Student Travel Award, IUFRO 2014 Congress. College of Natural Resources, University of Idaho (\$500) |

- 2012 Borlaug Fellow, US Agency for International Development. University of Idaho and CATIE (\$15,000)
- 2012 National Science Foundation EPSCOR Instrumentation Grant. University of Idaho. *Co-authored* with Alex Fremier, P.I. (\$43,000)
- 2011 Integrative Graduate Education and Research Traineeship Fellow, National Science Foundation, University of Idaho (\$110,000)
- 2010 Student Travel Award. Association for Tropical Biology and Conservation Meeting 2010, Bali, Indonesia (\$1,000)
- 2004 José Berrocal Environmental Studies Scholar, Ford Motor Company. University of Puerto Rico, Río Piedras (\$4,500)
- 2002 Undergraduate Mentoring in Forest Biology Scholar, National Science Foundation. State University of New York, College of Environmental Science and Forestry (\$3,000)
- 2001 Research in Science and Engineering Scholar. Rutgers University, New Jersey (\$3,000)

Teaching

- 2005-2009 Teaching Assistant; field instructor and summer course coordinator, *New forests research experience for high school students*, Alianza para el Aprendizaje de Ciencias y Matemáticas, Universidad de Puerto Rico, Río Piedras. Summer course for 12th grade students in forest ecology, field sampling, data analysis, and reporting. Contact: Dr. Ariel Lugo
- 2004 Teaching Assistant, *General Biology* (BIOL 3051), Biology Department, Universidad de Puerto Rico, Río Piedras. Contact: José Fontáñez
- 2002 Teaching Assistant, *Ecosystems* (EFB 516), State University of New York, College of Environmental Science and Forestry. Contact: Dr. Charles Hall

Advised students

- 2016 M.S. thesis advisor; Jennifer Rivera Sanantonio, UPRM.
- 2015 M.S. committee member; Cecilia Monclova Santana, UPRM.
- 2014 B.S. student project advisor; Anabel Molina, CATIE and Vrij

University, Netherlands

- 2011-2012 M.S. committee member; Wilmer Rivera de Jesús, Universidad Metropolitana, San Juan, Puerto Rico
- 2011 High school science project advisor; Luis Gabriel Rivera, Escuela Superior Fransisco Oller, Cataño, Puerto Rico
- 2008 High school science project advisor; Daniel Colón González, Escuela Superior University Gardens, San Juan, Puerto Rico
- 2007 B.S. student project advisor; Jaime Díaz, Universidad de Puerto Rico
- 2006 B.S. student project advisor; Dixon Irizarry Negrón, Universidad de Puerto Rico

Professional memberships

- 2011 American Geophysical Union, Student Section
- 2010 Ecological Society of America, Student Section
- 2009 Association for Tropical Biology and Conservation, Student Section

Editorial experience

Agricultural Science Research Journal, International Research Journals, India

Caribbean Naturalist, Eagle Hill Publications, USA

Plant Ecology, Springer, USA

Ecology and Society, The Resilience Alliance, Canada

Restoration Ecology, Wiley and Sons, USA

Media outreach

No son de aquí (1/4 episodes). Interview by Sylvia Gómez on the ecology of African tulip tree forests for a series of reports on the novel forests of Puerto Rico. Telemundo. Air date: April 19, 2010. Online: <http://www.telemundopr.com/cuidaloverde/>

Powering the future (1/4 episodes). Appearance in interview of Dr. Charles Hall on research of energetics of tropical forests applied to energy use of human societies. Discovery Channel. Air date: July 2010. Online:
<http://www.esf.edu/communications/view.asp?newsID=439>