MARIA GABRIELA (MAGA) GEI

Communication coordinator
Association of Tropical Biology and Conservation

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EDUCATION

University of Minnesota (St. Paul, Minnesota)
2008 – 2014 Doctor of Philosophy in Ecology, Evolution and Behavior
Advisor: Dr Jennifer S. Powers. *Committee members*: Sarah Hobbie, Rebecca Montgomery and Deborah Allan. *Dissertation*: Biological nitrogen fixation in tropical dry forests of Costa Rica: patterns and controls.

Universidad de Costa Rica (San José, Costa Rica)
2005 – 2007 Licenciatura en Botánica
Advisor: Dr Gerardo Avalos. *Thesis*: Plasticity in the allometry and root structure of arborescent palms through different successional stages and soil types at La Selva Biological Station.

Universidad de Costa Rica (San José, Costa Rica)
2000 – 2004 Bachelor of Science in Biology

EMPLOYMENT AND APPOINTMENTS

Association of Tropical Biology and Conservation
2017 – present Communication Coordinator

University of Minnesota (St. Paul, Minnesota)
2014 – 2017 Post-doctoral researcher, Department of Ecology, Evolution and Behavior

University of Minnesota (St. Paul, Minnesota)
2009, 2010, 2012 Laboratory Instructor

Organization for Tropical Studies (Costa Rica)
2006 – 2008 Teaching Assistant

AWARDS AND HONORS

2018 – 2019 Invited Member, United States Geological Survey Synthesis Group, Biological Nitrogen Fixation
2013 – 2014 Predoctoral Fellow, Smithsonian Institution and the Committee on Institutional Cooperation
2013 Davidson-Cristoph Award, Organization of Tropical Studies
2011 Organization for Tropical Studies Research Fellowship
2010 – 2012 UNESCO-L'ORÉAL Co-Sponsored Fellowship for Young Women in Life Sciences
2009 Sigerfoos Fellowship, Department of Ecology, Evolution and Behavior, University of Minnesota
2008 Netherlands Fellowship Master Programme Scholarship (declined)
2005 Research Experiences for Undergraduates, Organization for Tropical Studies, La Selva Biological Station, Costa Rica

ADDITIONAL TRAINING

2015	The Summer Soil Institute, Colorado State University, USA
2015	International Course on Functional Traits: a functional approach to biodiversity, from organisms to ecosystems, Université de Montréal, Canada
2012	Boreas Leadership Program, Institute on the Environment, University of Minnesota, USA
2010	Stable Isotopes in Ecology short course, University of Utah, Salt Lake City, USA
2009	Tropical Plant Systematics, graduate course by Organization for Tropical Studies, Costa Rica
2007	Tropical Ecology and Conservation, graduate course by Organization for Tropical Studies, Costa Rica
2007	Regional workshop on Red List categories and criteria for monitoring and conservation of vegetal species, Red Latinoamericana de Botánica San José, Costa Rica

PUBLICATIONS

Refereed articles

M.G. Gei, D.M.A. Rozendaal, L. Poorter, F. Bongers, J.I. Sprent, M.D. Garner, T.M. Aide, P. Balvanera, J.M. Becknell, P. Brancalion, G.A.L. Cabral, R.L. Chazdon, R.J. Cole, G. Dalla Colletta, M. das D. Magalhães Veloso, B. de Jong, J. Denslow, D.H. Dent, S.J. DeWalt, J.M. Dupuy, S.M. Durán, M.M. do Espírito Santo, G.W. Fernandes, Y.R. Ferreira Nunes, B. Finnegan, R. Gomes César, V. Granda Moser, J. Hall, J.L. Hernández-Stefanoni, A.B. Junqueira, D. Kennard, E. Lebrija-Trejos, S.G. Letcher, M. Lohbeck, E. Marín-Spiotta, M. Martínez-Ramos, J.A. Meave, D. Menge, F. Mora, R. Muñoz, R. Muscarella, S. Ochoa-Gaona, E. Orihuela-Belmonte, R. Ostertag, M. Peña-Claros, E.A. Pérez-García, D. Piotto, P.B. Reich, C. Reyes-García, J. Rodríguez-Velázquez, I.E. Romero-Pérez, L. Sanaphre-Villanueva, A. Sánchez-Azofeifa, N. Schwartz, A. Silva de Almeida, J. Silva de Almeida Cortez, W. Silver, V. Souza Moreno, B.W. Sullivan, N.G. Swenson, M. Uriarte, M. van Breugel, H. van der Wals, H.F.M. Vester, I.C.G. Vieira, J.K. Zimmerman, and J.S. Powers, Legume abundance along successional and rainfall gradients in Neotropical forests. *Nature Ecology and Evolution* **333**, doi:10.1038/s41559-018-0559-6 (2018).

C.M. Smith, **M.G. Gei**, E. Bergstrom, K.K. Becklund, J.M. Becknell, B.G. Waring, L.K. Werden and J.S. Powers. Effects of soil type and light height growth, biomass partitioning, and nitrogen dynamic of 22 species of tropical dry forest tree seedlings: comparisons between legumes and non-legumes. *American Journal of Botany* **104**: 399–410 (2017).

K. Allen, J. Dupuy, **M.G. Gei**, C. Hulshof, D. Medvigy, C. Pizano, B. Salgado Negret, C.M. Smith, A. Trierweiler, S. Van Bloem, B.G. Waring, X. Xu, and J.S. Powers. Are tropical dry forests uniquely vulnerable or resistant to drought? *Environmental Research Letters* **12**: 023001 (2017).

B.G. Waring, **M.G. Gei,** L. Rosenthal and J.S. Powers. Plant-microbe interactions along a soil fertility gradient in tropical dry forest. *Journal of Tropical Ecology* **1**: 1–10 (2016).

B.G. Waring, L. Álvarez Cansino, K.E. Barry, K.K. Becklund, S. Dale, **M.G. Gei**, A. Keller, O.R. Lopez, L. Markesteijn, S. Mangan, C.E. Riggs, M.E. Rodriguez-Ronderos, R.M. Segnitz, S.A. Schnitzer and J.S. Powers. Pervasive and strong effects of plant individuals and species on soil chemistry: a meta-analysis of individual plant "Zinke" effects. *Proceedings of the Royal Society B* **282** (2015).

J.S. Powers, K.K. Becklund, **M.G. Gei,** S. Iyengar, R. Meyer, C.S. O'Connell, E. Schilling, C.M. Smith, B.G. Waring and L.K. Werden. Nutrient effects on tropical dry forests: a mini-review from microbial to ecosystem scales. *Frontiers in Earth Science* **3**: 34 (2015).

M.G. Gei and J.S. Powers. The influence of seasonality and species effects on surface fine roots and nodulation in tropical legume plantations. *Plant and Soil* **388**: 187–196 (2015).

M.G. Gei and J.S. Powers. Nutrient cycling in tropical dry forests. In: Sanchez-Azofeifa G.A., J.S. Powers, G.W. Fernandes and M. Quesada, *Tropical Dry Forests in the Americas: Ecology, Conservation, and Management*, CRC Press, 141–154 (2013).

M.G. Gei and J.S. Powers. Do legumes and non-legumes tree species affect soil properties in unmanaged forests and plantations in Costa Rican dry forests? *Soil Biology and Biochemistry* **57**: 264–272 (2013).

A.G. Farji-Brener, D. Carvajal, **M.G. Gei**, J Olano & JD Sánchez. Direct and indirect effects of soil structure on the density of an antlion larva in a tropical dry forest. *Ecological Entomology* **33**: 183–188 (2007).

Articles in submission

M.G. Gei, S.C. Reed and J.S. Powers. Early Growth Strategies in Nitrogen-Fixing Legumes from Tropical Dry Forests *Biotropica* (in revision, April 18, 2018).

Conference abstracts

M.G. Gei. *What explains legume dominance throughout secondary succession in tropical dry and wet forests?* Symposium on "Linking terrestrial nitrogen fixation, element cycling, and biodiversity in a changing world". Ecological Society of America Meeting, Portland, Oregon, August 2017. Invited contribution

M.G. Gei, J.S. Powers, and the 2ndFOR Network. *Legume dominance across successional and rainfall gradients in the Neotropics*. 39th New Phytologist Symposium: Trait covariation, Exeter, United Kingdom, June 2017.

M.G. Gei, J.S. Powers, and the 2ndFOR Network. *Nitrogen fixation is not the only trait that determines the success of tropical legumes during secondary succession*. European Geophysical Union Meeting, Vienna, Austria, April 2017.

A. Trierweiler, X. Xu, **M.G. Gei,** J.S. Powers and D. Medvigy. *The role of nitrogen fixation in neotropical dry forests: insights from ecosystem modeling and field data.* American Geophysical Union Meeting, San Francisco, California, December 2016.

M.G. Gei, and J.S. Powers. *Distribution of legumes across successional gradients in the Neotropics.* Association for Tropical Biology and Conservation Meeting, Montpellier, France, June 2016.

M.G. Gei. *Nitrogen fixation and the role of legume species in tropical dry forests.* Workshop: The carbon sequestration potential of restoration, organized by Osa Conservation and the Bobolink Foundation, Osa Peninsula, Costa Rica, February 2016. Invited contribution

M.G. Gei and J.S. Powers. *The carbon cost of nitrogen fixation in tropical dry forests.* American Geophysical Union Meeting, San Francisco, California, December 2015.

M.G. Gei. *Nitrogen fixation in dry tropical forests*. Symposium on "Disrupted Nitrogen Cycling in the Tropics: Tracking the Effects of Global Change Impacts on N Biogeochemistry from Soil to Stream". Ecological Society of America Meeting, Baltimore, Maryland, August 2015. Invited contribution

M.G. Gei and J.S. Powers. *Estimating nitrogen fixation rates and controls in a tropical dry forest.* Ecological Society of America Meeting, Minneapolis, Minnesota, August 2013.

M.G. Gei and J.S. Powers. *What controls biological nitrogen fixation in the dry forests of Costa Rica?* Association for Tropical Biology and Conservation and Organization for Tropical Studies Meeting, San José, Costa Rica, June 2013.

M.G. Gei and J.S. Powers. *Biological Nitrogen Fixation In Tropical Dry Forests Of Costa Rica.* American Geophysical Union Meeting, San Francisco, California December 2012.

M.G. Gei and J.S. Powers. *Effects of nutrient and light availability on nitrogen fixation in tropical dryforest legume seedlings.* Ecological Society of America Meeting, Portland, Oregon, August 2012.

M.G. Gei and J.S. Powers. *Fijación de nitrógeno en el bosque seco de Costa Rica.* Open House iACG, Investigadores del Área de Conservación Guanacaste, Guanacaste, Costa Rica, May 2012. Awarded 2nd Best Student Poster.

M.G. Gei and J.S. Powers. *Nitrogen Dynamics in the tropical dry forests of Costa Rica.* Student Sustainability Symposium, Institute on the Environment, University of Minnesota, Saint Paul, Minnesota, October 2011.

M.G. Gei and J.S. Powers. *Nitrogen Dynamics in the tropical dry forests of Costa Rica.* CLIMMANNI and Interface Workshop on "Nutrient constraints on the net carbon balance", Keflavik, Iceland, June 2011.

M.G. Gei and J.S. Powers. *Legume species effects on soil chemistry in unmanaged forests and plantations in Costa Rican dry tropics.* Ecological Society of America Meeting, Pittsburgh, Pennsylvania, August 2010.

G. Ávalos, **M.G. Gei**, M. Fernandez and O. Sylvester. *Functional analysis of palm allometry: do morphological constraints determine palm distribution across light environments?* Association for Tropical Biology and Conservation Meeting, Morelia, México, July 2007.

M.G. Gei and G. Ávalos. *Plasticidad en la alometría y estructura de raíces de palmas arborescentes a través de diferentes estadios sucesionales y tipos de suelo en la Estación Biológica La Selva, Costa Rica.* Congreso Latinoamericano de Botánica, Santo Domingo, Dominican Republic June 2006.

TEACHING

University of Minnesota (St Paul, Minnesota)
Laboratory instructor, College of Biological Sciences
2009, 2010, 2012
General Biology. Graded assignments and exams, held office hours and taught lectures on general biology and evolution.

Duke University Talent Identification Program (Costa Rica)
Instructor
2009-2010
Tropical Biology. Taught lectures on tropical ecosystems, the history of tropical biology, and plant systematics. Led hands-on field research projects and wrote student evaluations.

Tropical Medicine and Ethnobiology. Taught lectures on tropical biology, the different ethnic groups of Costa Rica, the history of the social health system in Costa Rica, and the ethics of conducting interview-based research Led field research projects and wrote student evaluations .

Organization for Tropical Studies (Costa Rica)
Teaching assistant
2006-2008
Tropical Biology in a changing planet. Undergraduate semester abroad program. Taught about plant systematics during walks throughout different ecosystems of Costa Rica Helped with logistical issues of an itinerant three-month field course.

Ethnobiology. Undergraduate summer abroad program Helped with logistical issues and students with their ethnobiological projects translating their interviews to local people.

Universidad de Costa Rica (San José, Costa Rica)
Teaching assistant
2004-2005
Flora of Costa Rica. Helped lead and teach hand-on laboratories and field trips of plant identification at the family, genus and species level. Collected plants for laboratories and exams.

Biology of Plants. Prepared teaching materials and helped teaching main concepts about the structure of plants.

Guest lectures

Nitrogen fixation in tropical dry forests. GoldenGate College, Kathmandu, Nepal, July 20, 2016.

How do tropical trees get their fix? Twin Cities Tropical Environments Network, Institute on the Environment, University of Minnesota, April 2014.

Nitrogen fixation in dry forests of Costa Rica. Gamboa Seminar, Smithsonian Tropical Research Institute, Panama, November 2013.

Nitrogen fixation in tropical ecosystems: patterns and controls. Undergraduate summer program in Tropical Biology, Organization for Tropical Studies, Palo Verde, Costa Rica, June 2011.

Nutrient cycling in terrestrial ecosystems Tropical Ecology course, Universidad Veritas, San José, Costa Rica, July 2011.

Nitrogen fixation in a tropical dry forest. Programa de Educación Biológica, Área de Conservación Guanacaste, Costa Rica, April 2011.

Nutrient cycling in terrestrial ecosystems. Ecology course, Universidad Latina, San José, Costa Rica, April 2011.

Women in science in Costa Rica. Centro Educativo Anglo Americano, San José, Costa Rica, April 2011.

SERVICE AND OUTREACH

Workshop and conference organization

2016 "Success of tropical legumes and traits that contribute to their dominance". Symposium organizer, Association for Tropical Biology and Conservation Meeting, Montpellier, France, June 19-23.

2013 "Linking Nutrient and Carbon Cycles in Tropical Forests". Symposium organizer, Association for Tropical Biology and Conservation Meeting, San José, Costa Rica, June 23-27.

2012 Collaboration with Programa de Educación Biológica, Área de Conservación Guanacaste, in the project "Mural Bioalfabeticémonos" / Bioliteracy mural.

2010 "Implementing iACG: Building structures to link academic research, education, conservation and biodevelopment in the Area de Conservación Guanacaste". Spanish-English translator, St. Paul, USA, August 16-21.

Scientific reviewer

Arid Land Research and Management, *Biotropica*, *Ecology, Ecology Letters, Journal of Ecology*, *Oecologia*, *Tropical Conservation Science.*

RESEARCH GRANTS

External agencies

M.G. Gei, 2016. *Carbon costs of nitrogen fixation in tropical dry and wet forest legumes.* Emerging Challenges in Tropical Science Award, Organization for Tropical Studies, $5,390 USD.

M.G. Gei, 2012. *Patrones y controles en la fijación de nitrógeno en el bosque tropical seco de Costa Rica.* Fondo de Incentivos Ministerio de Ciencia y Tecnología de Costa Rica, ₡1,033,000 CRC.

Internal grants

J.S. Powers, **M.G. Gei**, 2014-2015. *The biogeography of tropical legumes: diversity, function, and distributions.* Grant-In-Aid Program, Office of the Vice President for Research, University of Minnesota $35,000 USD.

M.G. Gei, 2010. Thesis research grant, Graduate School, University of Minnesota, $1,500 USD.