

**Mark E. De Guzman**  
Postdoctoral Researcher  
Department of Environmental Science and Policy  
University of California, Davis  
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## EDUCATION

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**University of California, Riverside** June 2017  
Ph.D., Evolution, Ecology & Organismal Biology  
Advisor: Dr. Louis S. Santiago  
“Characterization of drought hydraulic strategies of Neotropical Lowland Forests”

**California State University, Bakersfield** June 2010  
B.Sc., Biology  
Advisors: Dr. R. Brandon Pratt and Dr. Anna L. Jacobsen  
“Leaf and canopy level carbon assimilation rates of post-fire resprouting chaparral shrub species that display different life history types”

## PROFESSIONAL EXPERIENCE

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| Postdoctoral Researcher, University of California – Davis      | Present     |
| Natural Resource Specialist, Oregon Department of Agriculture  | 2019        |
| Postdoctoral Researcher, Reed College                          | 2018        |
| Postdoctoral Researcher, University of Minnesota – Twin Cities | 2017        |
| Staff Researcher, Earth Research Institute, UC Santa Barbara   | Fall 2016   |
| Graduate Student Research and Teaching Assistant, UC Riverside | 2011 – 2017 |
| Biological Consultant, Brown Biological Consulting             | 2010 – 2011 |
| Undergraduate Researcher, CSU Bakersfield                      | 2009 – 2011 |
| Undergraduate Tutor, CSU Bakersfield                           | 2008 – 2009 |

## TECHNICAL SKILLS

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R proficiency – data wrangling (scripting, webscraping), geospatial analysis (choropleth), time series analysis, regression, multivariate analysis, phylogenetic independent contrasts, hierarchical models, bayesian  
Carbon dynamics – IRGA (LI-6400/6800/8100), Total-Nonstructural Carbohydrate, stable isotopes, dendroecology  
Plant-water relations – drought resistance, capacitance, water potential, turgor loss point, cuticular conductance, thermocouple psychrometry  
Remote sensing – NDVI, EVI

## PUBLICATIONS (+denotes undergraduate mentee)

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7. Acosta-Rangel A, Ávila-Lovera E, **De Guzman ME**, +Torres L, +Haro R, Arpaia M, Focht E, Santiago LS. (2018) Evaluation of leaf carbon isotopes and functional traits in avocado reveals water-use efficient cultivars. *Agriculture, Ecosystems & Environment* 263: 60-66.
6. Santiago LS, **De Guzman ME**, Baraloto C, Vogenberg J, +Brodie MA, Hérault B, Fortunel C, Bonal D (2018) Coordination and trade-offs among hydraulic safety, efficiency and

- drought avoidance traits in Amazonian rainforest canopy tree species. *New Phytologist* 218: 1015-1024.
5. **De Guzman ME**, Santiago LS, Schnitzer SA, Álvarez-Cansino L. (2017) Trade-offs between water transport capacity and drought resistance in neotropical canopy liana and tree species. *Tree Physiology* 37: 1404-1414.
  4. Santiago LS, Bonal D, **De Guzman ME**, Ávila-Lovera E (2016) Drought survival strategies of tropical trees. In: Goldstein G, Santiago LS (eds) *Tropical Tree Physiology*. Springer, Switzerland, pp 243-258
  3. Santiago LS, Pasquini SC, **De Guzman ME** (2015) Physiological implications of the liana growth form. In: Schnitzer SA, Bongers F, Burnham R, Putz FE (eds) *Ecology of Lianas*. John Wiley & Sons, Oxford, UK, pp 288-298
  2. Pivovarov AL, Pasquini SC, **De Guzman ME**, Alstad KP, Stemke JS, Santiago LS (2015) Multiple strategies for drought survival among woody plant species. *Functional Ecology* 30: 517-526.
  1. Tobin MF, Pratt RB, Jacobsen AL, **De Guzman ME** (2013) Xylem vulnerability to cavitation can be accurately characterized in species with long vessels using a centrifuge method. *Plant Biology* 15: 496-504.

*In revision, in review, or in prep*

- Ramirez AR, **De Guzman ME**, Dawson TE, Ackerly DD. Plant hydraulic traits reveal islands as refugia from worsening drought. *In revision – Conservation Physiology*
- De Guzman ME**, Acosta-Rangel A, Winter K, Meinzer FC, Bonal D, Santiago LS. Hydraulic traits of Neotropical canopy liana and tree species across a broad range of wood density: implications for drought mortality models. *In review – Tree Physiology*.

## **FELLOWSHIPS, GRANTS, AND AWARDS**

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|   |             |
|---|-------------|
| Labex-CEBA Thematic School: Tropical Rainforest Functional Ecology            | 2016        |
| Devirian Graduate Student Research Award                                      | 2015        |
| Community Foundation Travel Grant to California Desert Symposium              | 2012        |
| Smithsonian Tropical Research Institute Internship                            | 2012        |
| Best Poster in Ecology and Evolution, SoCal Academy of Sciences Conference    | 2012        |
| Dean's Distinguished Fellowship Award   | 2011 – 2012 |
| Li-Cor Prize Outstanding Talk in EcoPhysiology – Botanical Society of America | 2010        |
| Maximizing Access to Research Career U-STAR                                   | 2009 – 2010 |
| Ronald E. McNair Post-Baccalaureate Achievement Program                       | 2007 – 2010 |
| Student Preparation for Academic Research Careers                             | 2008        |

## **TEACHING EXPERIENCE**

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|  |                          |
|--|--------------------------|
| Teaching Assistant: Spring Wildflowers                 | Spring 2015              |
| Teaching Assistant: Introduction to Organismal Biology | 2013 – 2015 (3 quarters) |
| Teaching Assistant: Plant Physiology                   | Fall 2013                |
| Teaching Assistant: Foundations of Plant Biology       | 2012 – 2014 (3 quarters) |

## **PROFESSIONAL DEVELOPMENT**

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|   |      |
|---|------|
| American Association of Pesticide Safety Educators – Exam Development | 2019 |
| North Santiam Watershed Council meeting                               | 2019 |

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| Oregon Department of Agriculture cross-training: Python and ArcGIS | 2019 |
| Oregon Rulemaking/Public Comments on Aminocyclopyrachlor           | 2019 |
| Canopy Research Tree Climbing – Reed College                       | 2018 |
| Li-6800 Training – Li-Cor Biosciences                              | 2018 |
| University Teaching Program – UC Riverside                         | 2015 |

## PROFESSIONAL AFFILIATIONS

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Association for Tropical Biology and Conservation  
 Botanical Society of America  
 Ecological Society of America

## PEER REVIEW REFEREE

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CLEAN – Soil, Air, Water; Ecology; Frontiers in Plant Science; New Phytologist; Tree Physiology

## COMMUNITY OUTREACH AND SERVICE

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|   |                |
|---|----------------|
| Middle/High School Science Fair Judge                   | 2012 – Present |
| Biology Graduate Student Association representative     | 2015 – 2016    |
| Native vegetation restoration in collaboration with BLM | 2009           |
| CSU Bakersfield Biology Club                            | 2007 – 2009    |

## PUBLISHED ABSTRACTS (\*denotes high school mentee, +denotes undergraduate mentee)

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29. Prather H, **De Guzman ME**, Aldrich J, Brase CE, Chavez SH, Kiel S, Price G, Simard Q, Moffett K, Shandas V, Rosenstiel TN, Ramirez AR (2019) Forest responses to climate change are predicted by acclimation of xylem hydraulics to urban heat islands. American Geophysical Union, San Francisco, California, USA
28. Santiago LS, Acosta-Rangel A, Avila-Lovera E, Bucior E, **De Guzman ME**, Meinzer FC, Pivovarov AL, Winter K (2019) Predicting drought responses of tropical woody plants through coordination among drought survival traits. American Geophysical Union, San Francisco, California, USA
27. +Boving I, **De Guzman ME**, +de Mello-Folsom J, Ramirez A (2019) A tale of two pines: contrasting fire effects on plant hydraulic function in Ponderosa pine and Lodgepole pine. 104<sup>th</sup> Annual Meeting of the Ecological Society of America, Louisville, Kentucky, USA
26. +Bull EE, \*Hunsberger C, **De Guzman ME**, Ramirez A (2019) Effects of air pollution on cuticular conductance and gas exchange in *Sequoiadendron giganteum* trees in an urban environment. 104<sup>th</sup> Annual Meeting of the Ecological Society of America, Louisville, Kentucky, USA
25. +Zhu E, **De Guzman ME**, Salladay RA, Moritz MA, Ramirez A (2019) Remote Sensing of Fire and Drought Responses in Bigcone Douglas-fir, *Pseudotsuga macrocarpa*. 104<sup>th</sup> Annual Meeting of the Ecological Society of America, Louisville, Kentucky, USA

24. \*Rodolf P, **De Guzman ME**, \*Post-Leon P, \*de Mello-Folsom J, Ramirez A (2019) Facilitation of bigcone Douglas-fire seedling recruitment by a co-occurring species canyon live oak. 104<sup>th</sup> Annual Meeting of the Ecological Society of America, Louisville, Kentucky, USA
23. **De Guzman ME**, \*Aldrich J, Prather HM, Shandas V, Rosenstiel TN, Moffett KB, Ramirez A (2019) Urban heat shifts cavitation resistance of *Pseudotsuga menziesii* trees in Portland, Oregon. 104<sup>th</sup> Annual Meeting of the Ecological Society of America, Louisville, Kentucky, USA
22. Ávila-Lovera E, **De Guzman ME**, \*Torres L, \*Haro R, Santiago LS (2017) Woody plant responses to extreme drought in California: characterizing species-level drought survival mechanisms. 102<sup>nd</sup> Annual Meeting of the Ecological Society of America, Portland, Oregon, USA
21. Santiago LS, **De Guzman ME**, Acosta-Rangel A, Baraloto C, Bonal D (2017) Drought vulnerability of Neotropical canopy trees and lianas. . Association for Tropical Biology & Conservation Conference, Merida, Mexico
20. Santiago LS, **De Guzman ME**, Bonal D, Baraloto C, Vogenberg J (2016) Hydraulic traits of Amazonian canopy tree species: Empirical parameterizations for Earth System Models. AGU Fall Meeting, San Francisco, California, USA.
19. **De Guzman ME**, Santiago LS, Bonal D, Vogenberg J, \*Brodie MA, Baraloto C, Fortunel C (2016) Hydraulic strategies of vessel occluding plants in lowland tropical forest. Association for Tropical Biology & Conservation Conference, Montpellier, France.
18. \*Torres M, Ávila-Lovera E, **De Guzman ME**, \*Torres L, Santiago LS (2016) Drought resistance of tropical relict species in subtropical arid shrublands of Southern California. Association for Tropical Biology & Conservation Conference, Montpellier, France.
17. Santiago LS, Bonal D, **De Guzman ME**, Stahl C, Ávila-Lovera E (2016) Drought survival strategies of tropical trees. Association for Tropical Biology & Conservation Conference, Montpellier, France.
16. \*Torres L, Ávila-Lovera E, **De Guzman ME**, Santiago LS (2016) Hydraulic characteristics as a survival trait in woody plant species found in California's chaparral region. 10<sup>th</sup> Annual Undergraduate Research, Scholarship, and Creative Activity Symposium, Riverside, California, USA.
15. **De Guzman ME**, Santiago LS, Bonal D, Vogenberg J, \*Brodie MA, Baraloto C (2015) Hydraulic strategies of vessel occluding plants in lowland tropical forest. EDGE Symposium, Riverside, California, USA.
14. **De Guzman ME**, Santiago LS, Schnitzer SA, Álvarez-Cansino L (2015) Comparative physiology of lianas and trees: Can hydraulic strategies explain increasing liana abundance in tropical forest? Association for Tropical Biology & Conservation Conference, Honolulu, Hawaii, USA.
13. \*Khan O, **De Guzman ME** (2014) Does the difference in wood density between evergreen and deciduous woody shrubs affect their drought tolerance? Synopsis Science & Technology Championship, San Jose, California, USA.
12. \*Brodie MA, **De Guzman ME**, Pivovarov AL, Santiago LS (2013) Water use and xylem cavitation resistance in two invasive *Tamarix* species in a Mojave desert riparian ecosystem. Southern California Conference for Undergraduate Research (SCCUR), Whittier, California, USA
11. Swanson AC, **De Guzman ME**, Jenerette GD, Santiago LS, Allen EB, Allen MF (2013) Dynamics and importance of inorganic carbon in California desert ecosystems. Soil Ecology Society, Camden, New Jersey, USA

10. **De Guzman ME**, Álvarez-Cansino L, Santiago LS, Schnitzer SA (2013) Comparative physiology of trees and lianas using the plant hydraulic framework. Evolution, Ecology and Organismal Biology Recruitment Seminar, Riverside, California, USA
9. Pivovarov AL, **De Guzman ME**, Yates L, Hill G, Santiago LS (2012) Hydraulic strategies of woody plant species in the San Geronio Wilderness. California Desert Symposium, Redlands, California, USA
8. **De Guzman ME**, Álvarez-Cansino L, Santiago LS, Schnitzer SA (2012) Comparative physiology of trees and lianas using the plant hydraulic framework. Introduction to Neotropical Research and Culture, Smithsonian Tropical Research Institute, Panama City, Panama, Panama
7. **De Guzman ME**, Virk S, Santiago LS (2012) The role of sapwood capacitance in hydraulic strategies of desert chaparral shrubs. Southern California Academy of Sciences Conference, Los Angeles, California, USA
6. Tobin MF, Traugh CA, Jacobsen AL, Whitelock CC, Barrera S, **De Guzman ME**, Del Rio SR, Pratt RB (2011) Relationships among water transport, biomechanics, and storage for stem xylem of 32 shrub species of the chaparral community. 96<sup>th</sup> Ecological Society of America Annual Convention, Austin, Texas, USA
5. Santiago LS, Alstad KP, **De Guzman ME**, Pasquini SC, Pivovarov AL (2011) Consequences of drought-induced vegetation change for water cycling along a desert-shrubland gradient, International Mediterranean Ecosystems Conference (MEDECOS), Los Angeles, California, USA
4. **De Guzman ME**, Tobin MF, Jacobsen AL, O'Mara HP, Pratt RB (2010) Leaf and canopy level carbon assimilation rates of post-fire resprouting chaparral shrub species that display different life history types. Botanical Society of America Annual Meeting, Providence, Rhode Island, USA
3. **De Guzman ME**, Tobin MF, Jacobsen AL, O'Mara HP, Pratt RB (2009) Leaf and canopy level carbon assimilation rates of post-fire resprouting chaparral shrub species that display different life history types. Southern California Conference for Undergraduate Research (SCCUR), Dominguez Hills, California, USA
2. **De Guzman ME**, Kloock CT (2009) Fluorescence as potential function to control permeability of exoskeleton to water vapor. California McNair Scholars Symposium, Berkeley, California, USA
1. **De Guzman ME**, Kloock CT (2008) Camouflage as potential function of scorpion fluorescence. Southern California Conference for Undergraduate Research (SCCUR), Pomona, California, USA