

DAVID MARVIN

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EDUCATION

- Ph.D.** **University of Michigan**, Ann Arbor, MI (05/2014)
Department of Ecology and Evolutionary Biology.
Dissertation: “Disentangling the mechanisms and uncovering the scale of increasing liana size and abundance in neotropical forests”
- M.S.** **University of Michigan**, Ann Arbor, MI (9/2010)
Department of Ecology and Evolutionary Biology.
- B.A.** **Johns Hopkins University**, Baltimore, MD (5/2005)
Department of Psychology. Research/coursework focus on adolescent development.

APPOINTMENTS

- Global Ecology Fellow, **Carnegie Institution for Science**, Stanford University (02/2014-present)
- Supervised by Greg Asner, Department of Global Ecology.

PUBLICATIONS

- **Marvin, D.** & Asner, G.P. (*in review*). Branchfall dominates annual carbon flux across lowland Amazonian forests.
- **Marvin, D.**, Koh, L.P., Lynam, A., et al. (*in review*). Integrated technologies for large-scale field ecology and conservation.
- **Marvin, D.** & Asner, G.P. (2016). Spatially explicit analysis of field inventories for national forest carbon monitoring. *Carbon Balance and Management*, 11:9.
- **Marvin, D.**, Asner, G.P., & Schnitzer, S.A. (2016). Liana canopy cover mapped throughout a tropical forest with high-fidelity imaging spectroscopy. *Remote Sensing of Environment*, 176, 98-106.
- **Marvin, D.**, Winter, K., Burnham, R.J., & Schnitzer, S.A. (2015). No evidence that elevated CO₂ gives tropical lianas an advantage over tropical trees. *Global Change Biology*, 21, 2055-2069.
- **Marvin, D.**, Asner, G.P., Feret, J-B., Knapp, D.E., Anderson, C., Martin, R.E., Sinca, F.E., & Tupayachi, R. (2014). Amazonian landscapes and the bias in field studies of forest structure and biomass. *Proceedings of the National Academy of Sciences*, 111, E5224-E5232.
- Bradley, B.A., **Marvin, D.**, & Wilcove, D. (2011). Using expert knowledge to satisfy data needs: Mapping invasive plant distributions in the western U.S. *Western North American Naturalist*, 71(3), 302-315.
- **Marvin, D.**, Bradley, B.A., & Wilcove, D. (2009). A novel, web-based, ecosystem mapping tool using expert opinion. *Natural Areas Journal*, 29, 500-511.

FELLOWSHIPS, GRANTS, AND AWARDS

Total awarded: **\$264,800**

- NASA Earth and Space Science Fellowship** (2012-2014)
- National Science Foundation Graduate Research Fellowship** (2009-2014)
- Predoctoral Fellowship**, Smithsonian Tropical Research Institute (2011-2013)
- Ecology and Evolutionary Biology Grant**, University of Michigan (2009, 2010, 2011, 2012, 2013)
- Rackham International Research Award**, University of Michigan (2012)
- Rackham Graduate Student Research Grant**, University of Michigan (2009 and 2012)
- Short-term Fellowship**, Smithsonian Tropical Research Institute (2010 and 2011)

Emma J. Cole Fellowship, University of Michigan (2010)

Biosphere Atmosphere Research and Training Summer Fellowship, University of Michigan (2009)

Henry Allan Gleason Fellowship, University of Michigan (2009)

Woodrow Wilson Undergraduate Research Fellowship, Johns Hopkins University (2001-2005)

Psi Chi National Honor Society, Johns Hopkins University (2005)

RESEARCH EXPERIENCE

Carnegie Institution for Science, Stanford, CA

Global Ecology Fellow, Department of Global Ecology (02/2014-present)

- Investigating the effects of climate change and human activities on the biodiversity, structure, biomass, and function of Neotropical forests. Current projects include: using airborne remote sensing to uncover how species, functional traits, and forest structure vary across forest landscapes and regions of the western Amazon; understanding and quantifying uncertainties in the carbon cycle of tropical forests globally; mapping lianas at landscape-to-country scales in order to monitor their increasing abundance and uncover the drivers behind the increase.

Asner Lab collaboration, Department of Global Ecology (04/2013-01/2014)

- Collaboration with Greg Asner and the Carnegie Airborne Observatory team to develop a method to detect tropical liana canopy cover in Panama using advanced high-resolution hyperspectral imagery, including two months of training at the Carnegie Institution.

Smithsonian Tropical Research Institute (STRI), Republic of Panama.

Experimental Field Research Facility & Barro Colorado Nature Reserve (10/2010-12/2013)

- Experimentation on tropical liana and tree species growth and physiological response to elevated CO₂, seasonality, and soil nutrient availability; Assessment of landscape-scale liana abundance and distribution using both advanced remote sensing imagery and forest censuses.

University of Michigan, Ann Arbor, MI

UM Biological Station (05/2009-09/2009)

- Conducted a 6-week pilot study on the effects of elevated CO₂, light, and water on 2 species of temperate vines as part of the Biosphere Atmosphere Research and Training program.

Princeton University, Princeton, NJ

Research Assistant, Wilcove Lab (01/2007-07/2008)

- Mapped invasive plant abundance and distribution in the Southeast and Western US.
- Designed and developed a novel online mapping system to facilitate collection of expert plant abundance data that is quicker and less complex than geographic information systems.
- Created a network of over 300 regional experts through the online mapping system and mapped 30% of the Southeast United States for three invasive plant species.
- Analyzed long-term dataset of migratory bird routes to assess land use/land cover effects.

National Wildlife Federation, Washington, DC

Climate Change Campaign Fellow (10/2005-12/2006)

- Drafted testimony to the U.S. Senate Energy and Natural Resources Committee arguing for more funding to mitigate the effects of climate change on North American wildlife.
- Lobbied Congressional staff on the Climate Stewardship Act and climate change topics.
- Researched and analyzed legislation, emissions data, and scientific publications.
- Designed and produced media, donor, and educational outreach materials for the campaign.

TEACHING EXPERIENCE

University of Michigan, Ann Arbor, MI

Graduate Student Instructor:

- General Biology Lab (Winter 2009)
- General Ecology Lab (Fall 2008)

Columbia University, New York, NY

Two-day introductory statistical software programming workshop (January 2014)

PRESENTATIONS

- **Marvin, D.** & Asner, G.P. **Speaker.** Association of Tropical Biology and Conservation Annual Conference, Honolulu, HI, July 2015.
- **Marvin, D.** **Invited Speaker.** New Perspectives on Climbing Plants, The Linnean Society. London, UK. October, 2014.
- **Marvin, D.**, Asner, G.P., Martin, R.E., Knapp, D.E., Anderson, C., & Schnitzer, S.A. **Speaker.** Ecological Society of America Annual Conference, Sacramento, CA, Aug 2014
- **Marvin, D.**, Morrison, E., Quebbeman, A., Turner, B., & Winter, K. **Speaker,** Ecological Society of America Annual Conference, Minneapolis, WI, August 2013.
- **Marvin, D.**, Morrison, E., Quebbeman, A., Turner, B., & Winter, K. **Speaker,** Association of Tropical Biology and Conservation Annual Conference, Costa Rica, June 2013.
- **Marvin, D.**, Morrison, E., Quebbeman, A., Turner, B., & Winter, K. **Poster,** American Geophysical Union Annual Conference, San Francisco, CA, December 2012.
- **Marvin, D., Invited speaker,** Tupper Seminar Series, Smithsonian Tropical Research Institute, Panama, October 2012.
- **Marvin, D.**, Winter, K, Schnitzer, S.A., & Burnham, R.J. **Speaker,** Ecological Society of America Annual Conference, Portland, OR, August 2012.
- **Marvin, D.**, Winter, K, Schnitzer, S.A., & Burnham, R.J. **Invited speaker,** Association of Tropical Biology and Conservation Annual Conference, Brasil, June 2012.
- **Marvin, D.**, Winter, K, Schnitzer, S.A., & Burnham, R.J. **Poster,** Ecological Society of America Annual Conference, Austin, TX, August 2011.
- **Marvin, D. Invited speaker,** Barro Colorado Island Seminar Series, Smithsonian Tropical Research Institute, Panama, January 2011.
- **Marvin, D.** & Sondag B. **Poster,** Ecological Society of America Annual Conference, Pittsburg, PA, August 2010.
- **Marvin, D.** & Bradley, B.A. **Poster,** 2007 Mid-Atlantic Exotic Pest Plant Council annual conference, Philadelphia, PA.
- **Marvin, D.** & Bradley, B.A. **Poster,** 2007 Southeast Exotic Pest Plant Council annual conference, Athens, GA.
- **Marvin, D.** & Bradley, B.A. **Poster,** Ecological Society of America Annual Conference, San Jose, CA, August 2007.

SERVICE AND OUTREACH

- **Mentored** 14 undergraduate and post-undergraduate students in the field and in the laboratory, nine of whom are from underrepresented groups in science and seven of whom have continued on to graduate studies in ecology (4 PhD, 3 Masters).
- **Secondary school student outreach.** Presentation of my research, teaching climate change and its impact on tropical forests, and discussions about science and being a scientist to 5th through 12th grade students through the following programs:
 - *STRI Meet a Tropical Spy Program* (videoconference with 5th-9th grade American and Panamanian classrooms).
 - *Stanford Science Circle* (academic enrichment lecture for high school students).
 - *Children's Day School, Integrated Ecosystems Curriculum* (workshop with 8th grade San Francisco students visiting Stanford).
 - *Stanford Pre-Collegiate Science Conference* (workshop to expose high school students to current research in the STEM fields).
 - *Stanford SPLASH* (weekend teaching extravaganza to students in grade 7th-12th).
- **Carnegie Institution for Science** Seminar Series Committee (2014-2015) and Carnegie Institution Postdoc Association board (2015-2016).

- **Divest and Invest Campaign.** Co-founder and executive board member of a coalition of students, faculty, and alumni working to help the University of Michigan divest its fossil fuel industry financial assets and begin investing in clean energy technology (2013-2014).
- **Students for Environmental Action.** President (2003-2005) of Johns Hopkins University student group leading campaigns for positive environmental and clean energy change at the campus and local levels. Weekly outreach column in the student body newspaper; personally authored a dozen articles.
- **Reviewer:** *Remote Sensing of Environment, Journal of Tropical Ecology, Scientific Data, New Phytologist, Biological Conservation, Journal of Vegetation Science, Applied Vegetation Science, Restoration Ecology, Geoscience and Remote Sensing Letters, Remote Sensing, Ecological Engineering, Acta Amazonica, Biodiversity and Conservation, International Journal of Applied Earth Observation and Geoinformation*

RESEARCH CAPABILITIES

- Expertise with statistical software programming, remote sensing imagery analysis, GIS, and geospatial modeling, including the Natural Capital Project ecosystem service model suite.
- Proficiency with machine learning algorithms, mixed-effects models, and traditional statistical modeling and simulations.
- High performance (parallel) computation and big data programming/analysis.
- Elevated CO₂ growth chamber design, construction, and operation.
- DIY sensor (e.g., temp/PAR/humidity) and data collection/storage platform design and construction using Arduino microcontrollers.
- Field inventory plot (forest census) methods for both trees and lianas.
- Trained in the use of fixed-wing unmanned aerial vehicles (UAV) for forest imaging.

PROFESSIONAL REFERENCES

Gregory P. Asner, Professor
 Department of Global Ecology, Carnegie Institution for Science, Stanford, CA 94305
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Robyn J. Burnham, Associate Professor (Ph.D. Advisor)
 Department of Ecology and Evolutionary Biology, University of Michigan, Ann Arbor, MI 48109
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