

Andrea C Westerband, PhD

+61448941204 | a.westerband@westernsydney.edu.au | orcid.org/0000-0003-4065-9689 | www.andreawesterband.com

I investigate how plants cope with resource scarcity by studying variation in morphological and physiological properties to characterize ecological strategies. By combining large-scale field campaigns and greenhouse studies, my research examines how the environment influences trait-performance outcomes, intraspecific phenotypic variation, invasion success, and population dynamics.

I have a proven track record of publishing my work in high quality scientific journals, of successfully competing for research funding, and in being an effective teacher and mentor. I have an exceptional amount of teaching experience for someone at my academic level, and play an active role in service, science education and outreach.

I am a Puerto Rican-American based in Sydney, Australia. I am seeking a tenure-track assistant professorship (or equivalent) role, beginning in 2024.

Keywords: functional traits, intraspecific trait variation, invasive species, limiting resources, plant ecology, plant ecophysiology, plasticity, population dynamics, stress tolerance

EMPLOYMENT HISTORY

Postdoctoral Research Associate January 2022 – Present
Mentored by Ian J Wright
Hawkesbury Institute for the Environment, Western Sydney University, Australia
I am investigating the manner in which leaf and stem properties are coordinated with one another and how this impacts plant growth across resource gradients.

Postdoctoral Research Associate August 2018 – December 2022
Mentored by Ian J Wright
School of Natural Sciences, Macquarie University, Australia
Using principles of microeconomics, I determined that soil phosphorus, a key limiting nutrient, influences the optimization of photosynthesis in Australian plant species.

Postdoctoral Research Associate August 2016 – August 2018
Mentored by Kasey Barton and Tiffany Knight
Botany Department, University of Hawai'i at Mānoa, USA
I determined that climate strongly influences intraspecific trait variation across spatial scales, thus mediating invasion success across the Hawaiian Islands.

ACADEMIC QUALIFICATIONS

PhD, Advised by Carol C Horvitz May 2016
Department of Biology, University of Miami, USA
I developed a mathematical model that predicts how shifts in physiological properties impact the population growth rates of herbaceous plants growing in dynamic light environments.

BS, Summa Cum Laude May 2010
Environmental Biology, State University of New York, College of Environmental Science and Forestry, USA

PUBLICATIONS

- Fan, B., **Westerband, A.C.***, Wright, I.J., Gao, P., Ding, N., Ai, D., Tian, T. Zhao, X. Sun, K. Shifts in plant resource use strategies across climate and soil gradients in dryland steppe communities. *Plant and Soil* (Accepted)
*shared first authorship
- Westerband, A.C.**, Knight, T.M., Barton, K.E. 2023. A test of island plant syndromes using resource use traits. *Journal of Systematics and Evolution*. <https://doi.org/10.1111/jse.13032>
- Westerband, A.C.**, Wright, I.J., Maire, V., Paillassa, J., Prentice, I.C., Atkin, O.K., Bloomfield, K.J., Cernusak, L.A., Dong, N., Gleason, S.M., Guilherme Pereira, C., Lambers, H., Leishman, M.R., Malhi, Y., Nolan, R.H. 2023. Coordination of photosynthetic traits across soil and climate gradients. *Global Change Biology*, 29: 856-873. <https://doi.org/10.1111/gcb.16501>
- Lei, Z., **Westerband, A.**, Wright, I.J., He, Y., Zhang, W., Cai, X., Zhou, Z., Liu, F., Zhang, Y. 2022. Leaf trait covariation and controls on leaf mass per area (LMA) following cotton domestication. *Annals of Botany*, 130(2):231-243. <https://doi.org/10.1093/aob/mcac086>

- Westerband, A.**, Wright I.J., Eller, A.S.D., Cernusak, L.A., Reich, P.B., Perez-Priego, O., Chhajed, S.S., Hutley, L.B., Lehmann, C.E.R. 2022. Nitrogen concentration and physical properties are key drivers of woody tissue respiration. *Annals of Botany*, 129 (6): 633-646. <https://doi.org/10.1093/aob/mcac028>
- Liu, Z., Dong, N., Zhang, H., Zhao M., Ren, T., Liu C., **Westerband, A.**, He, N. 2021. Divergent long- and short-term responses to environmental gradients in specific leaf area of grassland species. *Ecological Indicators*, 130: 108058. <https://doi.org/10.1016/j.ecolind.2021.108058>.
- Barton, K., **Westerband, A.**, Ostertag, R., Stacy, E., Drake, D., Litton, C., Winter, K., Cordell, S., Fortini, L., Bennett, G., Krushelnycky, P., Kawelo, K., Feliciano, K., and Knight, T. 2021. Hawai'i forest review: Synthesizing the ecology, evolution, and conservation of a model system. *Perspectives in Plant Ecology, Evolution and Systematics*, 52: 125631. <https://doi.org/10.1016/j.ppees.2021.125631>
- Westerband, A.**, J. Funk, and K. Barton. 2021. Intraspecific trait variation in plants: a renewed focus on its role in ecological processes. *Annals of Botany*, 127(4): 397-410. <https://doi.org/10.1093/aob/mcab011>
- Westerband, A.**, T. Knight, and K. Barton. 2021. Intraspecific trait variation and reversals of trait strategies across key climate gradients in native Hawaiian plants and non-native invaders. *Annals of Botany*, 127 (4): 553-564. <https://doi.org/10.1093/aob/mcaa050>
- Paillassa, J., Wright, I.J., Prentice, I.C., Pepin, S., Smith, N.G., Ethier, G., **Westerband, A.C.**, Lamarque, L.J., Han, W., Cornwell, W.K. and Maire, V. 2020. When and where soil is important to modify the carbon and water economy of leaves. *New Phytologist*, 228: 121-135. <https://doi.org/10.1111/nph.16702>
- Westerband, A.**, T. Knight, and K. Barton. 2020. Intraspecific variation in seedling drought tolerance and associated traits in a critically endangered, endemic Hawaiian shrub. *Plant Ecology and Diversity*, 13(2): 159-174. <https://doi.org/10.1080/17550874.2020.1730459>
- Westerband, A.**, A. Kagawa-Viviani, K. Bogner, K. D. Beilman, T. Knight, and K. Barton. 2019. Seedling drought tolerance and functional traits vary in response to the timing of water availability in a keystone Hawaiian tree species. *Plant Ecology*, 220(3): 321-344. <https://doi.org/10.1007/s11258-019-00917-0>
- Westerband, A.**, and C. Horvitz. 2017. Photosynthetic rates influence the population dynamics of herbs in stochastic light environments. *Ecology*, 98: 370-381. <https://doi.org/10.1002/ecy.1664>
- Westerband, A.**, and C. Horvitz. 2017. Early life conditions and precipitation influence the performance of widespread understory herbs in variable light environments. *Journal of Ecology*, 105: 1298-1308. <https://doi.org/10.1111/1365-2745.12757>
- Westerband, A.**, and C. Horvitz. 2015. Interactions between plant size and canopy openness influence vital rates and life-history tradeoffs in two Neotropical understory herbs. *American Journal of Botany*, 102: 1290-1299. <https://doi.org/10.3732/ajb.1500041>
- Westerband, A.**, M. Dovčiak, G. LaQuay-Velazquez, J.S. Medeiros. 2015. Aspect influences soil moisture and species coexistence in semi-arid pinyon-juniper woodlands of the southwestern United States. *The Southwestern Naturalist*, 60: 21-29. <https://doi.org/10.1894/FMO-18.1>

PRESENTATIONS

Invited

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| Ecological Society of America, The Role of Intraspecific Trait Variation (ITV) in the Assembly of Ecological Communities | August 2023 |
| ComBio National Conference, Plant Biology Stream, Melbourne, Australia | September 2022 |
| ARC, Centre of Excellence for Plant Success in Nature and Agriculture, Virtual Lab | July 2022 |
| Sydney Plant Ecophysiology Group | Feb 2022, June 2019 |
| Department of Biological Sciences, Macquarie University | October 2018 |
| Department of Geography, University of Hawai'i at Mānoa | July 2017 |
| Department of Biology, University of Hawai'i at Mānoa | July 2017 |
| German Center for Integrative Biodiversity Research | September 2017 |
| Department of Botany, University of Hawai'i at Mānoa | Spring 2017 |
| Evolution and Conservation Biology Seminar, University of Hawai'i at Mānoa | Fall 2016 |

Attended but not invited

- Westerband A., Soil and climate properties jointly influence leaf traits in Australian plants. Ecol Soc of Australia, November 2020.
- Westerband A., Photosynthetic physiology of the Australian flora over key abiotic gradients: a test of least cost theory. Ecol Soc of Australia, November 2019.
- Westerband A., K. Barton, T. Knight. Leaf traits in native Hawaiian plants and invaders. Ecol Soc of America, 2018
- Westerband, A., K. Barton, T. Knight. Functional traits across a rainfall gradient. Ecol Soc of America, 2017.

CURRICULUM VITAE, AC Westerband

- Westerband, A., K. Barton, T. Knight. Functional trait responses of Hawaiian native and invasive plants across spatial scales and a precipitation gradient. Hawaii Ecosystems Meeting, June 2017.
- Westerband, A. Physiological responses to light are important predictors of growth in two understory herbs. Evol Demography Society, October 2015.
- Westerband, A. Size-dependent demographic responses demonstrate that forest-dwelling herbs do not always benefit from increasing light availability. Evol Demography Society, November 2014. *poster*
- Westerband, A. Linking light availability to plant morphological and physiological adaptations using preliminary data. Association for Tropical Biology and Conservation, June 2013. *poster*

FUNDING (TOTAL: \$101,585.64 USD or \$159,550AUD)

Amount	Agency (Award Dates)
\$ 60,255.64 [\$ 83,374.00 AUD]	Hermon Slade Foundation, AUS (2020-2023)
\$ 15,000.00	Vaughn-Jordan Foundation, USA (2013-2016)
\$ 4,200.00	Organization for Tropical Studies, Graduate Research Fellowship (2013-2015)
\$ 3,750.00	
\$ 3,750.00	
\$ 1,250.00	University of Miami, Department of Biology, Internal Research Funds (2012-2015)
\$ 1,080.00	
\$ 3,600.00	
\$ 1,200.00	
\$ 1,000.00	Heliconia Society International (2015)
\$ 5,000.00	University of Miami, College of Arts and Sciences Summer Award (2014)
\$ 1,500.00	University of Miami, Center for Latin American Studies (2013)

HIGHER DEGREE RESEARCH SUPERVISION

- Amy Smart, Macquarie University, COMPLETED 2019
 Thesis title: Biotic interactions affecting the reproductive success of Antarctic beech (*Nothofagus moorei*)
 I was invited to serve on Amy's committee as a supervisor in her final semester. I mentored Amy in statistics and writing and provided significant feedback on the writing of her thesis. Degree conferred January 2020.

TEACHING, SERVICE AND COMMUNITY OUTREACH

University-level teaching experience

- Co-convenor, Life Processes June – December 2021, 2022
 Department of Biology, Macquarie University
Led four lab-based practical classes for second-year students, spanning cell division, plant growth, symbioses, and plant hormones.
- Co-convenor, Plant Biology August – December 2020
 Department of Biology, Macquarie University
Developed and implemented lab-based practical classes for third-year students. Delivered lectures via Zoom. Assisted with course development, student inquiries, and marking assignments.
- Leader of practical classes, Diversity of Life March – April 2020
 Department of Biological Sciences, Macquarie University
Devised lab-based practical classes focusing on floral morphology and plant functional traits.
- Leader of practical classes and co-convenor, Plant Biology July – December 2019
 Department of Biology, Macquarie University
Developed and implemented lab- and field-based practical classes for third-year students, delivered lectures.

CURRICULUM VITAE, AC Westerband

Leader of practical classes, Ecology October 2018, 2019
Department of Biological Sciences, Macquarie University

Graduate Teaching Assistant, General Biology, Biodiversity, Ecology August 2010 – May 2016
Department of Biology, University of Miami, USA

Undergraduate Teaching Assistant, Zoology January 2009 – May 2009
State University of New York College of Environmental Science and Forestry, USA

Undergraduate Student Mentorship

Afnan Abbas and John Jones, PACE Students March 2023 – May 2023
Trained and supervised fieldwork and labwork on plant traits.

Jasmyn Garrick and Benjamin Reynolds, PACE students March 2022 – May 2022
Trained and supervised fieldwork and labwork on root traits.

Vidhika Kamboj, PACE student June 2021
Trained and supervised fieldwork and labwork on plant traits.

Andres Fantauzzi, Hannah Long, Vincent Hsu, and Joseph Marvin Spring 2016 - Fall 2014
Science Made Sensible science education program

Service to the scientific community at large

Guest handling editor, Special Issue in *Plants* Target date: August 2024
Special Issue Title: Trait-Environment Relationships in Plants: Acclimation and Adaptation

Review Editor, Forest Ecophysiology Section, *Frontiers in Forests and Global Change* September 2023

Guest handling editor, Special Issue in *Forests* February 2023
Special Issue Title: Drought Tolerance Traits and Growth Responses in Trees

Organiser, Sydney Plant Ecophysiology Research Group November 2020 – Present
Research group meets six times per year to discuss new and ongoing research in the local community. I select and coordinate the speakers, chair the discussion, and maintain the listserv

Co-organiser, Australian Society of Plant Scientists, NSW chapter meeting November 2021
I worked with Dr Kristine Crous at Western Sydney University to secure speakers.

Guest handling editor, Special Issue in *Annals of Botany*. Vol 127 (4) April 2021
Special Issue Title: Intraspecific variation in plant functional traits

Symposium moderator, Ecological Society of America Annual Conference August 2018
Symposium: “Downscaling, Extreme Events and Stochastic Population Models”

Reviewer for peer-reviewed scientific journals, N=45

American Journal of Botany, Annals of Botany, Biological Invasions, Ecology, Ecology and Evolution, Forests, Functional Ecology, Journal of Ecology, Nature Communications, New Phytologist, Plant Biology, Plant Ecology, Plant Physiology and Biochemistry, PLOS One, Proceedings of the Royal Society B, Scientific Reports

Departmental Service

Laboratory Manager, Ecology Labs at Macquarie University 2019 – 2022
10% of my second postdoctoral appointment was spent as lab manager for the Ecology Lab (wet/dry labs used by Ian Wright/Mark Westoby/Rachael Gallagher research groups). Carried out routine laboratory inspections, maintained facilities and chemical inventory, ordered supplies/equipment, trained personnel, and maintained WHS compliance

Panel member, ECR enabling scheme, Macquarie University 2020
Reviewed grant (\$2500AUD) applications from postdocs in the Faculty of Science and Engineering.

Panel member, PhD Progress Evaluation, Macquarie University 2019
Interviewed HDR students, evaluated progress, and provided recommendations towards completion.

Graduate Student Organiser, Friday Seminar Series 2014 – 2015
Department of Biology, University of Miami, USA

CURRICULUM VITAE, AC Westerband

Graduate Student Committee Chair, Distinguished Visiting Professor Program
Department of Biology, University of Miami, USA 2014

Graduate Student Organiser, Distinguished Visiting Professor Program
Department of Biology, University of Miami, USA 2013

Select Community Outreach Activities

Future Science Talks, Sydney: *Plant Resource Use in a Changing World* October 2023

Pint of Science, Sydney: *Plant Resource Use in a Changing World* May 2023

Podcast Interview, Branch Out, Hosted by the Royal Botanic Garden Sydney
The Plant World Economy May 2021

Educator, Science in the City at the Australian Museum of Science
Plant adaptations and symbioses, primary school August 2019

Educator, Expanding Your Horizons April 2017, 2018
Grades 6-8. Fostering women's engagement in science

Graduate student mentor, Science Made Sensible August 2014 – May 2016
Education program funded by the National Science Foundation (USA)
Fostered engagement of underrepresented minority groups in science

Educator, Girl Scouts for America Badge Day February 2014, April 2015

PROFESSIONAL DEVELOPMENT AND MEMBERSHIPS

HDR Supervisory Training (Course number HDR31) December 2020
Online training for supervision of higher degree research (HDR) students

Early Career Researcher Workshop June 2019
Introduction to higher degree research (HDR) Supervision

Scientific Teaching Tools to Promote Active Learning Spring 2018
Pedagogical techniques for scientific teaching

Organization for Tropical Studies: Tropical Biology, An Ecological Approach Summer 2011

Research Experience for Undergraduates (NSF, Sevilleta LTER) Summer 2009

Ecological Monitoring and Bioassessment Course Summer 2007

Active and previous society memberships

Ecological Society of Australia, Ecological Society of America, Evolutionary Demography Society, Botanical Society of America, Association for Tropical Biology and Conservation

TECHNICAL SKILLS

Highly Proficient: LiCor 6800, LiCor 6400 (and XT), porometer, R, RStudio, Minitab 17-20, ImageJ
Basic Proficiency: MATLAB, JMP, LaTeX, ArcGIS, FORTRAN90, Campbell Data Logger, Apogee Sensors,
Temperature and Humidity Sensors, Confocal Microscope, fluorometer, stable isotope analysis
Other: Valid US and AUS driver's license
Fully bilingual in Spanish (*Hispanic ethnicity*)

HONORS AND AWARDS

Ecological Society of America, Travel Award 2023

Outstanding Teaching Assistant, Department of Biology, University of Miami, USA 2015

Best oral presentation: Graduate Student Research Symposium, Department of Biology, Univ of Miami, USA 2015

Second place, best oral presentation: Graduate Student Research Symposium, Department of Biology, University of Miami, USA 2014

Best poster: Graduate Student Research Symposium, Department of Biology, Univ of Miami, USA 2013

Phyllis Roskins Memorial Award 2010
Recognition of outstanding academic performance for a woman in the biology curriculum

REFERENCES

Current postdoctoral supervisor (2018-Present)[Supervisor at Macquarie University as well]

Ian J Wright

Chief Scientist

Hawkesbury Institute of the Environment at Western Sydney University

+61 432 711 003

ian.j.wright@westernsydney.edu.au

Previous postdoctoral supervisor (2016-2018)

Kasey E Barton

Associate Professor

University of Hawaii at Manoa

(808) 956-8028

kbarton@hawaii.edu

PhD supervisor (2010-2016)

Carol C Horvitz

Professor Emeritus

University of Miami

(305) 807-6856

carolhorvitz@miami.edu