

Courtenay A. Ray

University of Wyoming
Botany Department
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Education

University of California, Berkeley—2023, **Ph.D.**, Environmental Science, Policy, and Management; **Thesis:** Effects of microclimate, dispersal, species interactions, and environmental stochasticity on demography; **Advisor:** Benjamin Blonder

University of California, Santa Cruz—2016, **M.A.** Ecology and Evolutionary Biology
Thesis: Invading coastal California's forests: Impacts and best management practices for the perennial grass, *Ehrharta erecta*; **Advisor:** Ingrid Parker

University of Washington—2011, Double major **B.S.** in Biology: Evolution & Ecology and Earth & Space Sciences with emphasis in Biology

Everett Community College—2006, **Associate Degree** in Arts and Sciences

Appointments

University of Wyoming—2025-present, National Science Foundation Postdoctoral Research Fellow. **Supervisors:** Lauren Shoemaker & Lauren Hallett (University of Oregon).

University of Wyoming—2023-2025, Postdoctoral Research Associate, Botany Department, **Supervisor:** Lauren Shoemaker

Visiting positions

2022	Norwegian University of Science and Technology. Trondheim, Norway. Visitor, Plant ecology group (host: B. Graae).
2019	University of Oxford, Oxford, UK. Visitor, Salgo Team (host: R. Salguero-Gómez).
2014-2016	University of the Andes. Bogotá, Colombia. Visitor, Botany and systematics group (host: S. Madriñán).

Publications

Ray, C.A., Troy S.R., Xie, E.V., Belfry, G., Jenkins, T.M., de Valpine, P., and Blonder, B.W. **2026.** Alpine plant species interact via wind-driven seed dispersal and seed retention. *American Journal of Botany*. 10.1002/ajb2.70151.

Erkelenz, J., Geange, S.R., Atkinson, J., Anderson, E., Correia, M., Ahler, S.J., Bradler, P., Löwenstein, C.E., Elsy, A., Maré, C., Eshelman, S., Mauki, D., Guclu, C., Eckberg, J., Maitner, B., Gya, R., Töpper, J., Klanderud, K., Enquist, B.J., Michaletz, S.T., **Ray, C.A.**, von Oppen, J., Padullés Cubino, J., Halbritter, A.H., and Vandvik, V. **2025.** Intraspecific

functional trait responses to experimental warming vary with precipitation and growth form. *Journal of Vegetation Science*. 10.1111/jvs.70098.

Halbritter, A.H., Atkinson, J., Maré, C., Ahler, S.J., Andersen, E.A.S., Bradler, P.M., Correia, M., Elsy, A., Eshelman, S.E., Geange, S.R., Hayden, M., Mauki, D., Eckberg, J., Erkelenz, J., Guclu, C., Löwenstein, C.E., Maitner, B.S., Baumane, M., Dawson, H.R., Enquist, B., Garen, J.C., Holle, M.J.M., Chacon Labella, J., Lepley, K., Michaletz, S.T., Olivier, B., **Ray, C.A.**, von Oppen, J., Telford, R.J., and Vandvik, V. **2025**. Effects of warming, nitrogen and grazing on plant functional traits differ between alpine and sub-alpine grasslands.

Journal of Vegetation Science. 10.1111/jvs.70061.

Vandvik, V., Halbritter, A.H., Macias-Fauria, M., Maitner, B.S., Michaletz, S.T., Telford, R.J., Bison, N., Chacon-Labella, J., Cotner, S., Egelkraut, D., Garen, J., Gaudard, J., Geange, S.R., Rosati, M.A., Andersen, E.A.S., Ahler, S.J., Atkinson, J., Baumane, M., Bradler, P.M., Dawson, H.R., Eckberg, J., Elsy, A.D., Erkelenz, J., Eshelman, S.E., Guclu, C., Gullvåg, R., Gya, R., Hartford, S., Hayden, M.T., Holle, M.J.M., Kullberg, A.T., Lepley, K., Correia, M., Löwenstein, C.E., Maré, C., Mauki, D., Navarro, J., Oberholzer, B., Olivier, B., Olson, A.N., **Ray, C.A.**, von Oppen, J., Vorstenbosch, T., Wang, J.A., and Enquist, B.J. **2025**. Plant traits and associated ecological data from global change experiments and climate gradients in Norway. *Scientific Data*. 10.1038/s41597-025-05509-4.

Davidson, J.L., McKnight, K.R., Szojka, M., Gannon, D., Wisnoski, N.I., Werner, C.M., Liang, M., Seabloom, E.W., **Ray, C.**, DeSiervo, M.H., and Shoemaker, L.G. **2025**. Effects of disturbance and fertilization on plant community synchrony, biodiversity, and stability through succession. *Ecology Letters*. 10.1111/ele.70052.

Vanneste, T., Graae, B.J., Kyrkjeeide, M.O., Lindmo, S., Michelsen, O., Naranjo-Orrico, D.J., **Ray, C.A.**, Vandersteene, M., Verheyen, K., and De Frenne, P. **2024**. Two decades of increasing functional and phylogenetic richness in a mountaintop flora in central Norway. *Journal of Vegetation Science*. 10.1111/jvs.13299.

Lowman, H.E., DeSiervo, M., Hall Jr., R.O., Jahner, J.P., Jimoh, S.O., Laughlin, D.C., Patterson, A.C., Weiss-Lehman, C., Barbosa, C.C., Bell, K.L., Blaszcak, J.R., Buerkle, C.A., Carter, A., Collins, S.M., DeLeo, V., Dunkle, M., Gannon, D., Grames, E.M., Harrison, J.G., McFarlane, S.E., Oleksy, I., Powers, B.F., **Ray, C.**, Stears, A., Summers, B., Torrens, C.L., Trentman, M., Werner, C.M., and Shoemaker, L.G. **2024**. Reply to Hu: Postdoctoral consortia remove barriers to retention and effectively prepare participants for career advancement. *Proceedings of the National Academy of Sciences*. 121.45/e2418956121.

Blonder, B.W., Brodrick, P., Chadwick, K.D., Carroll, E., Cruz-de Hoyos, R., Exposito Alonso, M., Hateley, S., Moon, M., **Ray, C.A.**, Trang, H., and Walton, J. **2023**. Climate legacies interact with cytotype and sex to determine phenology in quaking aspen (*Populus tremuloides*). *New Phytologist*. 10.1111/nph.18850.

Blonder, B.W., Gaüzère, P., Iversen, L., Ke, P.J., Petry, W., **Ray, C.A.**, Salguero-Gómez, R., Sharpless, W., and Viole, C. **2023**. Predicting and controlling ecological communities via trait-mediated parameterizations of dynamical models. *Oikos*. 10.1111/oik.09415.

Ray, C.A., Kapás, R.E., Opedal, Ø.H., and Blonder, B.W. **2022**. Linking microenvironment modification to species interactions and demography in an alpine plant community. *Oikos*. 10.1111/oik.09235.

Blonder, B., Brodrick, P.G., Walton, J.A., Chadwick, K.D., Breckheimer, I.K., Marchetti, S., **Ray, C.A.**, and Mock, K. **2022**. Remote sensing of cytotype and its consequences for canopy damage in quaking aspen. *Global Change Biology*. 10.1111/gcb.16064.

Franzman, J., Brush, M., Umemura, K., **Ray, C.**, Blonder, B., and Harte, J. **2021**. Shifting macroecological patterns and static theory failure in a stressed alpine plant community. *Ecosphere*. 12:e03548.

Blonder, B., **Ray, C.A.**, Walton, J., Castaneda, M., Chadwick, K., Clyne, M., Gaüzère, P., Iversen, L., Lusk, M., Strimbeck, R., Troy, S., and Mock, K. **2021**. Cytotype and genotype predict mortality and recruitment in Colorado quaking aspen (*Populus tremuloides*). *Ecological Applications*. 10.1002/eap.2438.

Gaüzère, P., Morin, X., Violle, C., Capesta, I., **Ray, C.A.**, and Blonder, B. **2020**. Vacant yet invasible niches in forest community assembly. *Functional Ecology*. 10.1111/1365-2435.13614.

Gallagher, R.V.,..., **Ray, C.A.**, et al. **2020**. The Open Traits Network: Using Open Science principles to accelerate trait-based science across the Tree of Life. *Nature Ecology & Evolution*. 10.1038/s41559-020-1109-6.

Kattge, J.,..., **Ray, C.A.**, et al. **2020**. TRY plant trait database – enhanced coverage and open access. *Global Change Biology*. 10.1111/gcb.14904.

Weiss, K.C.B. and **Ray C.A.* 2019**. A framework of functional traits for ecological communities: Synthesizing taxonomic divides. *Ecography*. 10.1111/ecog.04387. *Shared first authorship. E4 award paper.

Ray, C.A., Sherman, J.J., Godinho, A.L., Hanson, N., and Parker, I.M. **2018**. Impacts and Best Management Practices for Erect Veldtgrass (*Ehrharta erecta*). *Invasive Plant Science and Management*. 10.1017/inp.2018.2.

Thompson, M.E., **Ray, C.A.**, and Donnelly, M.A. **2015**. Microhabitat use of recently metamorphosed Mexican Treefrogs in Palo Verde National Park, Guanacaste Province, Costa Rica. *Herpetological Review*. 46:168-170.

Chambers, M., David, G., **Ray, C.**, Leitner, B., and Pyle, P. **2011**. Habitats and conservation of molt-migrant birds in southeastern Arizona. *Southwestern Naturalist*. 56:204-211.

Book Review: CenTREAD Working Group (Cesar, R.G., Cohen, H., Crandall, S.G., Holl, K.D., **Ray, C.A.**, Reid, J.L.). **2013**. Restoring Tropical Forests: A Practical Guide by Elliott, S.D., Blakesley, D., and Hardwick, K. *International Forestry Review*. 15:270.

Pre-print

Rogers, H., Cavazos, B., Gawel, A.M., Karnish, A., **Ray, C.A.**, Rose, E., Thierry, H., and Fricke, E. Frugivore gut passage increases seed germination: an updated meta-analysis. *bioRxiv*. 462022.

Fellowships and awards

2025	Center for Controlled Environment Agriculture, U Wyoming: Seed grant : \$5,000 (Co-PI with PI Lauren Shoemaker)
2024	National Science Foundation: Postdoctoral Research Fellowship : \$240,000
2022	Environmental Science Policy and Management, UC Berkeley: William and Mary Liu Fellowship : \$17,000
2022	Rocky Mountain Biological Laboratory: RMBL Graduate Fellowship : \$500
2021	Environmental Policy, Science, and Management, UC Berkeley: Bryan Wilson Fellowship : \$3,100
2021	Environmental Policy, Science, and Management, UC Berkeley: William Carroll Smith Fellowship : \$2,000
2021	Rausser College, UC Berkeley: Dr. E. Ralph de Ong Student Support : \$1,300
2021	Sigma Xi, Berkeley Chapter: Grants in Aid of Research : \$500
2021	Rocky Mountain Biological Laboratory: Jean Langenheim Award : \$3,000
2020	Rocky Mountain Biological Laboratory: Jean Langenheim Award : \$3,000
2020	Colorado Native Plant Society: John Marr Grant : \$850
2019	Arizona State University: RTI Graduate Student Support : \$1,928
2019	Colorado Mountain Club: Kurt Gerstle Fellowship : \$2,000
2019	Rocky Mountain Biological Laboratory: Snyder Endowment Graduate Fellowship : \$645
2019	Arizona State University: College Graduate Excellence Award : \$100
2019	Arizona State University: Graduate College Travel Award : \$500
2019	Arizona State University: Graduate College Travel Award : \$500
2019	Arizona State University: Graduate Student Travel Award : \$400
2018	Arizona State University: Individual Travel Grant : \$446
2018	Arizona State University: Graduate Student Travel Award : \$400
2018	Arizona State University: Graduate College Fellowship : \$10,000
2017	Arizona State University: Doctoral Recruitment Award : \$5,000
2013	Organization for Tropical Studies: Post Course Award : \$500
2013	University of California, Santa Cruz: Chancellor's Graduate Intern
2012-2017	National Science Foundation: Graduate Research Fellowship : \$90,000
2007-2010	University of Washington: Husky Promise Student : Guaranteed full academic support and stipend
2006	Association of Women in Science: E. Robert Winter Memorial Scholarship : \$1,000

Professional service

Reviewer for: Ecology and Evolution, Perspectives in Plant Ecology, Evolution and Systematics, IUCN (International Union for Conservation of Nature)

Teaching and outreach

2024 Co-designed and led RILadies workshop on sparse modeling in ecology, Laramie, WY

2022 Guest biology instructor for two days at Richmond High School, Richmond, CA

2021 Weekly 7th grade science mentor at middle schools in the Berkeley Unified School District through the “Be a Scientist” program

2021 Graduate Student Instructor-Climate Change and the Future of CA, UC Berkeley

2018-2019 Instructor at Sky School, an inquiry-based science program that predominantly serves low-income public schools, Tucson, AZ

2018 Teaching Assistant- Animal Behavior, Arizona State University

2017 Teaching Assistant- Introductory Biology Laboratory, Arizona State University

2016 STEM Day volunteer at Bradley Elementary, Watsonville, CA

2015 Designed biology lessons for Santa Cruz Children’s Museum of Discovery

2015 Organized a weed pulling workshop on UC Santa Cruz campus

2014 Guest Lecturer in Plant Ecology, UC Santa Cruz

2014 Designed and led two workshops for middle school girls on seed dispersal, Expanding your Horizons Conference

2014 Lead demonstration on properties of liquid nitrogen-Cesar Chavez MS

2014 Teacher Assistant-Intro Biology and Plant Systematics, UC Santa Cruz

2013 Westlake Elementary Science Fair Judge, Santa Cruz, CA

2013 Santa Cruz County Science Fair Judge

2013 Teacher Assistant-Behavioral Ecology, UC Santa Cruz

Presentations

2025 American Society of Naturalists, Monterey, CA, Talk

2023 ESPM Distinguished Lecture, UC Berkeley, Berkeley, CA, Talk

2022 Jepson Herbarium Botany Lunch, UC Berkeley, Berkeley, CA, Talk

2019 British Ecological Society Meeting, Belfast, United Kingdom, Poster

2018 Ecological Society of America Meeting, New Orleans, LA, Talk

2017 Ecological Society of America Meeting, Portland, OR, Talk

2016 Missouri Botanical Garden Seminar, “Factors influencing pampas grass distributions in the Colombian páramos”, November 3rd, Invited talk

2016 Ecological Society of America Meeting, Ft. Lauderdale, FL, Talk

2016 UCSC Ecology and Evolution Graduate Symposium, Talk

2016 Graduate Student Symposium, UCSC, Talk

2015 Ecological Society of America Meeting, Baltimore, MD, Poster

2014 Graduate Student Symposium, UCSC, Poster

2013 University of California, Santa Cruz Plant Symposium, Talk

2013 California Botanical Society Centennial Celebration, Berkeley, CA, Talk

2013	UCSC Ecology and Evolution Graduate Symposium, Talk
2013	CA Invasive Plant Council Symposium, Lake Arrowhead, CA, Poster

Mentorship

Bachelor's thesis students

Emily Xie (UC Berkeley), Winner of Melis Medal - 2020-2021

Annika Rose-Person (UC Santa Cruz) - 2015-2016

Anna Godinho (UC Santa Cruz), Winner of Chancellor's Award - 2012-2013

Emilie Winfield (UC Santa Cruz) - 2012-2013

Nicole Hanson (UC Santa Cruz) - 2013-2014

Summer undergraduates

Michael Hensley (University of Wisconsin), Co-supervisor – 2021

Bella Banka (Tallahassee Community College), Co-supervisor – 2021

Nicole Smith (University of Michigan), Co-supervisor - 2020

Gavin Belfry (University of Tennessee), Co-supervisor - 2019-2020

Thomas Jenkins (University of Oxford), Main supervisor - 2019

Connie Webb (Western Washington University), Co-supervisor - 2019

Research/ lab project students

Kailynn Johnson (U Wyoming) – 2025-2026

Liberty Cleveland (U Wyoming) – 2024-2025

Elisabeth Koch (U Wyoming) – 2023-2024

Britney Wu (UC Berkeley) - 2021

Monica Antonio (UC Berkeley) - 2021

Brigitte Jaramillo (UC Berkeley) - 2020

Crystal Suazo (Arizona State University) - 2018-2019

Deidra Johnson (Arizona State University) - 2018-2019

Dustin Lord (Arizona State University) - 2019

Madison Lusk (Arizona State University) - 2019

Sydney Myers (Arizona State University) - 2019

Noah Weakly (Arizona State University) - 2018-2019

Otis Clyne (Arizona State University) - 2018

High School students

Liam Atkins (Summer field assistant) - 2021

Aidan Wells (Summer field assistant) - 2019-2020

One-on-one weekly science fair mentor (Watsonville High School, CA) - 2012-2013

Previous research

August 2016-2017

Research Associate, Rogers Lab, **Iowa State University**

Iowa and Mariana Islands

Supervisor: Dr. Haldre Rogers

Responsibilities: helped train and manage field crews in the Mariana Islands; oversaw data entry and organization; cleaned and assembled tidy datasets from long-term data

January-May 2012

Seedling Census Volunteer, **Institute for Tropical Ecosystem Studies**

Luquillo Forest Dynamics Plot, Puerto Rico

Supervisor: Chris Nytsch

Research objectives: examine the effects of land-use history and hurricanes on seedling germination, recruitment, and growth in tropical forests

June-October 2011

Independent Research Project, **University of Washington**

Advisor: Dr. Janneke Hille Ris Lambers

Topic: Differences in pollinator regimes along an elevation gradient in subalpine meadows in Mt. Rainier National Park

October-December 2011

Intern, **Stanford University**

Robinson Crusoe Island, Chile

Supervisor: Dr. Lis Nelis

Research objectives: measure synergistic interactions in invasive species across trophic levels

June-October 2011

Intern, **University of Washington**

Mount Rainier National Park, Washington

Supervisor: Dr. Janneke Hille Ris Lambers

Research objectives: determine how tree growth, tree mortality, seed production, and recruitment vary across large environmental gradients

March-June 2011

Intern, **Smithsonian Migratory Bird Center**

Island Scrub Jay Project, Santa Cruz Island, California

Supervisors: Dr. Scott Sillett, Michelle Desrosiers

Research objectives: monitor the stability of Island Scrub Jay populations and determine the frequency of extra-pair mating, the sex ratio and clutch size of nests, nest vegetation preferences, and sources of nest failure

April 2009-April 2010

Intern, **University of Washington**, Ecology of Bird Loss Project, Mariana Islands

Supervisors: Dr. Haldre Rogers, Dr. Joshua Tewksbury, Dr. Janneke Hille Ris Lambers

Research objectives: measure the effects birds have on seed dispersal, seedling recruitment, tree species diversity, insect control, and herbivory

July-September 2007

Intern, **Institute for Bird Populations**, Molt Migration and Stopover Project, SE Arizona

Supervisor: Peter Pyle

Research objectives: determine which migratory bird species stopover in the monsoon regions of Arizona and Mexico during fall migration to molt

May-July 2007

Intern, **Institute for Bird Populations**, Willow Flycatcher Project, Yosemite National Park

Supervisor: Bob Wilkerson

Research objectives: determine whether there are resident populations of Willow Flycatchers in Yosemite National Park

March-May 2007

Intern, **Point Reyes Bird Observatory**, Off-road Vehicles and Bird Populations, Mojave Desert

Supervisor: Christopher McCreedy

Research objectives: examine the effects of off-road vehicle usage in desert washes on avian species diversity, abundance, and breeding success

September-December 2006

Student Research Assistant, **University of Washington**, Song Sparrow Research, Seattle, WA

Supervisor: Dr. Michael Beecher

Research Objectives: determine if hatch-year song sparrows enhance their song repertoire by visiting the territories of older birds during their first winter.

March-June 2006

Intern, **Dartmouth College**, Trophic Cascades in Fragmented Coastal Sage Scrub Habitat, Southwest California

Supervisor: Dr. Eric Walters

Research Objectives: measure the effects of habitat fragmentation on avian nest success, natal dispersal in California towhees, and arthropod abundance

Specialty courses and workshops

2022	Plant Functional Traits Course 6, Aurland, Norway
2019	Using data provenance to create reproducible, transparent, and well-documented code-British Ecological Society, Belfast, United Kingdom
2019	Stage-based demographic models in ecology, evolution and conservation-Natural Environmental Research Council, Oxford, United Kingdom
2017	A Hands-On Short Course on Species Distribution Modeling in Conservation Using R: From Start to Finish-Ecological Society of America, Portland, Oregon
2014	Curso de Actualización en Taxonomía y Sistemática de Cyperaceae (Course on Taxonomic and Systematic Updates in Cyperaceae)-Bogota, Colombia
2013	OTS Tropical Biology: An Ecological Approach, Costa Rica
2010	University of Washington: Field Geology, Australian Outback
2010	University of Washington: Field Geology, Western Montana