

Paul James CaraDonna

Department of Ecology & Evolutionary Biology (EEB), University of Arizona, Tucson, AZ, USA,
Center for Macroecology, Evolution and Climate, University of Copenhagen, Denmark,
& The Rocky Mountain Biological Laboratory (RMBL), Crested Butte, CO, USA
paulcaradonna@email.arizona.edu
+1.339.222.0006 (USA) or 45.28.43.47.40 (DK)

EDUCATION

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| 2016 | Ph.D. Ecology & Evolutionary Biology, University of Arizona
Advisor: Judie Bronstein |
| 2010 | B.Sc. Botany, Humboldt State University, <i>magna cum laude</i>
Advisors: Michael Mesler & Erik Jules |

ACADEMIC POSITIONS

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| 2015–2016 | NSF-Danish National Research Foundation GROW Research Fellow
Center for Macroecology, Evolution & Climate, University of Copenhagen, Denmark
Host: Nathan J. Sanders |
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PUBLICATIONS

CaraDonna, P. J. and J.A. Bain*. 2016. Frost sensitivity of leaves and flowers of subalpine plants is related to tissue type and phenology. *Journal of Ecology* 104: 55–64. *undergraduate co-author.

CaraDonna, P. J. and D.W. Inouye. 2015. Phenological responses to climate change do not exhibit phylogenetic signal in a subalpine plant community. *Ecology* 96: 355–361.

Rafferty, N.E., **P. J. CaraDonna**, J.L. Bronstein. 2015. Phenological shifts and the fate of mutualism. *Oikos* 124: 14–21. [Invited special issue paper on “Phenological change and ecological interactions”] [cover article]



CaraDonna, P. J.*, A.M. Iler* and D.W. Inouye. 2014. Shifts in flowering phenology reshape a subalpine plant community. *Proceedings of the National Academy of Sciences, USA* 111: 1619–1621. [Editors' Choice Article, *Science* 344: 236] *equal author contributions.



Rafferty, N.E., **P. J. CaraDonna**, L.A. Burkle, A.M. Iler, and J.L. Bronstein. 2013. Phenological overlap of interacting species in a changing climate: an assessment of available approaches. *Ecology & Evolution* 3: 3183–3193.

McKinney, A.M., **P. J. CaraDonna**, D.W. Inouye, W.A. Barr, C.D. Bertelsen, and N.M. Waser. 2012. Asynchronous changes in phenology of migrating Broad-tailed Hummingbirds and their early-season nectar resources. *Ecology* 93: 1987–1993. [cover article]

CaraDonna, P. J. and J. D. Ackerman. 2012. Reproductive assurance for a rewardless epiphytic orchid in Puerto Rico, *Pleurothallis ruscifolia* (Orchidaceae, Pleurothallidinae). *The Caribbean Journal of Science* 46 (2–3): 249–257.

Manuscripts in preparation, submitted, or in review:

CaraDonna, P. J., W.K. Petry, R.M. Brennan, J.L. Cunningham*, J.L. Bronstein, N.M. Waser, and N.J. Sanders. Within-season temporal dynamics of plant-pollinator interactions: patterns, consistency, and ecological constraints. *In preparation*. *undergraduate co-author

CaraDonna, P. J. Experimental warming in the field desynchronizes phenology, decreases body size, and increases mortality in an early season desert pollinator. *In preparation*.

GRANTS, FELLOWSHIPS & AWARDS

2015. Robert Hoshaw Memorial Scholarship Award, EEB, University of Arizona. \$2,000.
This award recognizes exceptional scholarship and is the highest award EEB gives to its graduate students.
2015. NSF/Danish National Research Foundation (DNRF) GROW Fellowship. \$23,000.
2015. Darwin-Wallace Biodiversity Scholarship, EEB, University of Arizona. \$1,000.
2015. Rocky Mountain Biological Laboratory Graduate Research Fellowship. \$250.
2014. Outstanding Scholarship Award, College of Science, University of Arizona. \$1,000.
Awarded to the top graduate student across all departments in the College of Science based on scholarship.
2014. Excellence in Research Award, EEB, University of Arizona.
Awarded to the top graduate student within the Dept. of Ecology & Evolutionary Biology based on scholarship.
2014. Darwin-Wallace Biodiversity Scholarship, EEB, University of Arizona. \$1,000.
2014. Harvard Communicating Science Conference (ComSciCon) Scholarship. \$400.
Awarded to 50 out of 900 applicants.
2014. Rocky Mountain Biological Laboratory Graduate Research Fellowship. \$800.
2013. Rocky Mountain Biological Laboratory Graduate Research Fellowship. \$400.
2013. Graduate Student Travel Award, Institute of the Environment, University of Arizona. \$500.
2012. NSF Graduate Research Fellowship Award. \$132,000.
2012. Rocky Mountain Biological Laboratory Snyder Fellowship. \$650.
2012. Galileo Circle Scholarship, University of Arizona. \$1,000.
2011. Graduate Student Fellowship, University of Arizona. \$8,000.
2010. Young Botanist Award, Botanical Society of America.
National recognition of academic achievement in botany.
2010. Dennis K. Walker Botany Award, Humboldt State University. \$1,000.
Awarded to the top graduating botany student at Humboldt State University.
2009. NSF REU Fellowship, El Verde Field Station and University of Puerto Rico. \$4,500.
2009. Eureka Sequoia Gardens Club Botany Scholarship, Humboldt State University. \$300.

INVITED SEMINARS

2016. Humboldt State University, Biology Seminar.
2016. UC Davis, Center for Population Biology Seminar.
2016. Chicago Botanic Garden, Plant Biology and Conservation Seminar.

PRESENTATIONS

CaraDonna, P.J. 2015. Effects of experimental warming in the field on an early season pollinator. *British Ecological Society Annual Meeting*, Edinburgh, Scotland.

CaraDonna, P.J. 2015. Beta-diversity of plant-pollinator community interactions: a three-year study from the Colorado Rocky Mountains. *Scandinavian Pollination Ecology Meeting*, Silkeborg, Denmark.

CaraDonna, P.J. 2015 Ecological timing, community context, species interactions and climate change. *Center for Macroecology, Evolution and Climate Seminar Series*, University of Copenhagen, Denmark.

CaraDonna, P.J. 2015. Within-season temporal dynamics of plant-pollinator interactions. *Ecological Society of America 100th Annual Meeting*, Baltimore, MD.

CaraDonna, P.J. 2015. Transformation, abstraction, and reassembly of information: an art-science exchange informs perceptions of nature. *More Than Pretty Pictures: The Aesthetics of Data Representation* [conference]. Aarhus Institute of Advanced Studies, Aarhus University, Denmark.

CaraDonna, P.J. 2015. Temporal dynamics of plant-pollinator community interactions. *Department of Ecology & Evolutionary Biology Noon-seminar*, University of Arizona, Tucson, AZ.

CaraDonna, P.J. 2014. Within-season temporal dynamics of plant-pollinator interactions. *Joint British Ecological Society & French Ecological Society Meeting*, Lille, France. [invited]

Rafferty, N.E., **P.J. CaraDonna**, and J.L. Bronstein. 2014. Characteristics predicted to predispose mutualisms to phenological mismatch. *Ecological Society of America 99th Annual Meeting*, Sacramento, CA.

CaraDonna, P.J. 2014. Exploring variation in phenological shifts: climate, seasonality, and phylogeny. *Department of Ecology & Evolutionary Biology Noon-seminar*, University of Arizona, Tucson, AZ.

Cunningham, J. L.,* and **P.J. CaraDonna**. 2014. Phenology and species interactions. *Día del Biólogo*, Universidad de la Sierra in Moctezuma, Mexico. [presentation in Spanish] [invited] *undergraduate researcher

CaraDonna, P.J., A.M. Iler, and D.W. Inouye. 2013. Change in flowering phenology, community patterns, and implications for pollinators. *Ecological Society of America 98th Annual Meeting*, Minneapolis, MN.

CaraDonna, P.J. 2013. Species-specific shifts in flowering phenology reshuffle community-level patterns. *Department of Ecology & Evolutionary Biology Noon-seminar*, University of Arizona, Tucson, AZ.

CaraDonna, P.J. 2012. Species-specific shifts in flowering phenology scale up to influence community-level patterns. *National Phenology Network*, Tucson, AZ.

CaraDonna, P.J. A. M. McKinney, D.W. Inouye, W.A. Barr, C.D. Bertelsen, and N.M. Waser. 2012. Asynchronous changes in phenology of migrating Broad-tailed Hummingbirds and their early-season nectar resources. *Ecological Society of America 97th Annual Meeting*, Portland, OR.

McKinney, A.M., **P.J. CaraDonna**, D.W. Inouye, W.A. Barr, C.D. Bertelsen, and N.M. Waser. 2012. Asynchronous changes in phenology of migrating Broad-tailed Hummingbird and their early-season nectar resources. *Botanical Society of America Annual Meeting*, Columbus, Ohio. [invited]

Rafferty, N.E., **P.J. CaraDonna**, L.A. Burkle, A.M. Iler, and J.L. Bronstein. 2012. Phenology of species interactions in a changing climate: an assessment and illustration of approaches. *Botanical Society of America Annual Meeting*, Columbus, Ohio. [invited]

CaraDonna, P.J. and J.D. Ackerman. 2010. Reproductive assurance for a rewardless epiphytic orchid in Puerto Rico: *Pleurothallis ruscifolia* (Orchidaceae, Pleurothallidinae). *Botanical Society of American Annual Conference*, Providence, RI.

CaraDonna, P.J. 2009. Reproductive biology of *Pleurothallis ruscifolia* (Orchidaceae) in Puerto Rico. *Friday Botany Talks Seminar Series*, Humboldt State University.

TEACHING

2015. Visual Design Principles for Scientists (workshop), RMBL Undergraduate Education Program.

2014. The Art of Scientific Observation (mini-course), RMBL Undergraduate Education Program.

2014. The Importance of Biological Timing (mini-course), RMBL Adult Education Program.

2013. Guest Lecture on Climate Change Ecology, Western State Colorado University Field Course.

2013. Experimental Design Workshop, RMBL Undergraduate Education Program.

2012. Guest Lecture on Climate Change Ecology, Conservation Biology (ECOL 406), University of Arizona.

2011–2013. Graduate Student Teaching Assistant, University of Arizona:

Plant Taxonomy Laboratory (ECOL 472/572)

Independently designed and taught the laboratory component of the course, including specimen collection and preparation, exams, and supplemental field trips.

Conservation Biology (ECOL/RNR 406/506)

Evolutionary Biology (ECOL 335)

Animal Behavior (ECOL 487/587)

2010. Substitute Teacher, Missoula County Public Schools, Missoula, MT.

2006. Teaching Assistant and Nature Program Coordinator, The Kids Club, Andover, MA.

MENTORING

2015. Katherine Wyatt (Yale University), RMBL Advanced Independent Research.

2015. Sander B. Boisen, Aarhus University Independent Research.

2014. Justin A. Bain (UC San Diego), RMBL Advanced Independent Research.

2014. Rachel E. Tsong, University of Arizona Senior Thesis Project*.

**Rachel was awarded the UA Ecology & Evolutionary Biology Excellence in Undergraduate Research Award in part because of this research – this is the department's highest honor for undergraduate research.*

2013. James L. Cunningham (University of Arizona), RMBL NSF REU*.

**James was awarded the UA Ecology & Evolutionary Biology Excellence in Undergraduate Research Award in part because of this research – this is the department's highest honor for undergraduate research.*

2012. Valerie Milici (Indiana University), RMBL Advanced Independent Research.

2010–2011. "Planting Science" Scientist Mentor, Botanical Society of America.

Student science project mentor (via online blogging interface) for Landmark H.S., Manhattan, NY, and Woodstock H.S., Woodstock, GA.

2010. Craig Connelly (College of the Holy Cross), Independent Research, University of Massachusetts.

SCIENCE OUTREACH & COMMUNICATION

2013– Director and Co-founder, The Art-Science Exchange Project, RMBL, Gothic, CO.

This artist in residency project seeks to enhance the intellectual collaboration between the arts and the sciences, with the primary goal of improving communication of complex biological phenomena to a broad audience.

2015. Scientific Adviser, Eisenhower International School Pollinator Garden, Tulsa, OK.

2013–2015. Science Writer/Columnist, Crested Butte News, Crested Butte, CO ($n = 14$ articles).

14. *There Is More to Being a Butterfly than Being a Butterfly*, September 2015
13. *Queens of the Rockies*, August 2015
12. *The Secret, Microscopic World of a Leaf*, August 2015
11. *The Cold Truth about Springtime Frost in the Rockies*, July 2015
10. *Roots – The Secret World of the Plant Underground*, August 2014
9. *Our Alpine Meadows are Buzzing with Cheaters and Robbers and Thieves*, August 2014
8. *The Frasera Flowering Forecast '14*, July 2014
7. *The Buzz About Bees*, July 2014
6. *Marmot Fights: Signs of Early Spring in the Mountains*, June 2014
5. *Secrets of the Naked Leaf and the Carbon Economy*, August 2013
4. *Good For Nothing Lazy Males*, August 2013
3. *What Are The Consequences of a Bad Flowering Year?* July 2013
2. *Mistimed Travel Plans: Mexico to Crested Butte*, July 2013
1. *A Gothic Drama*, June 2013

2014. Program on bees and pollination, Sam Hughes Middle School, Tucson, AZ.

2014. Program on bees and pollination, Mountain Roots Kids Camp, Crested Butte, CO.

2014. Program on bees and pollination, Tucson Magnet High School, Tucson, AZ.

2012, 2014. Scientist Judge, EEB Undergraduate Poster Session, University of Arizona, Tucson, AZ.

2011–2013. Presentation(s) on bees and pollination, RMBL Kids Camp Program.

2011, 2012. Preceptor, Arizona Insect Festival (public event), University of Arizona, Tucson, AZ.

2012. Presentation on pollination, Instituto de Educacion Secundaria Rio Nora, Pola de Siero, Spain.

MEDIA COVERAGE OF RESEARCH

Print: *New York Times*, *Los Angeles Times*, *High Country News*, *Earthweek – Dairy of the Planet*, and various local newspapers.

Online: *New York Times* (2), *National Geographic News* (2), *TIME Magazine*, *Los Angeles Times*, *Mother Jones/Climate Desk/Grist*, *Live Science*, *The Christian Science Monitor*, *High Country News* (2), *Scientific American*, *Climate Wire*, *French Tribune*, *Europa Press*, *Salon*, and other online media.

Press releases: *National Science Foundation* (3), *University of Maryland* (2), *University of Arizona*.

PROFESSIONAL SERVICE

Manuscript Reviewer

2016. *Ecology Letters*

2015. *Journal of Ecology*, *Global Change Biology*, *Functional Ecology*, *PLOS ONE*.

2014. *Ecology*, *Ecological Applications*, *Global Ecology & Biogeography*, *Biotropica*, *International Journal of Plant Sciences*.

2013. *Journal of Ecology*, *Naturwissenschaften*, *International Journal of Biometeorology* (3), *Environmental Entomology*.

2012. *Ecosphere*, *Journal of Pollination Ecology*.

Proposal Reviewer:

2012, 2013. NSF REU Applications, RMBL.

Professional Service:

2013–2014. RMBL Facilities Planning & Design Committee, Gothic, CO.

2013. Invited Member. Borderlands Restoration Initiative Working Group, Santa Rita Experimental Range, Pima, AZ.

2012. Invited Member. USA National Phenology Network Research Coordination Network Working Group, Milwaukee, WI.

PROFESSIONAL DEVELOPMENT

2015. Visual Design Principles for Scientific Data with Martin Kryzwinski, Aarhus University, Denmark.

2014. Communicating Science Workshop (ComSciCon), Harvard University, Cambridge, MA.

2014. Teaching Pedagogy Workshop with Dr. Edward Prather, University of Arizona, Tucson, AZ.

PROFESSIONAL MEMBERSHIPS

American Society of Naturalists

Ecological Society of America

British Ecological Society

Botanical Society of America

USA National Phenology Network