

## CHRISTINA L. RICHARDS, Ph.D.

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### SCIENTIFIC CAREER

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- 2019 – MOPGA-GRI scholar, Institute of Evolution & Ecology, Plant Evolutionary Ecology, University of Tübingen, D-72076 Tübingen, Germany
- 2016 – Associate Professor. Department of Integrative Biology, University of South Florida, Tampa, FL.
- 2009 – 2016 Assistant Professor. Department of Integrative Biology, University of South Florida, Tampa, FL.
- 2007 – 2009 Senior Postdoctoral Associate. Center for Genomics and Systems Biology, New York University, New York, NY.
- 2004 – 2006 Postdoctoral Associate and Research Assistant Professor. Department of Ecology & Evolution, Stony Brook University.

### EDUCATION

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- 1999 – 2004 Ph.D.: University of Georgia, Athens, GA.  
Evolution in closely adjacent salt marsh environments.
- 1996 – 1997 Visiting graduate student. Moshe Shilo Center for Marine Biogeochemistry, Hebrew University of Jerusalem, Jerusalem, Israel.
- 1990 – 1995 Bachelor of Arts, Swarthmore College, Swarthmore, PA. Diploma in Biology.

### AWARDS & HONORS

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- 2018 Make Our Planet Great Again- German Research Initiative Scholar, Bonn, Germany
- 2017 Outstanding Faculty Award, University of South Florida. Tampa, Florida, USA.
- 2016 Fulbright U.S. Core Research Scholar. Université de Rennes 1, France.
- 2013 Teylers Tweede Genootschap Haarlem Medal of the Second Teyler Society for “A critical study of the importance of epigenetics for the understanding of heritable variation in ecology and evolution” with co-authors Bossdorf and Verhoeven. Haarlem, The Netherlands
- 2012 The paper “Invasion of diverse habitats by few Japanese knotweed genotypes is correlated with high epigenetic differentiation,” co-authored with Aaron Schrey and Massimo Pigliucci published in *Ecology Letters* was recommended by the Faculty of 1000 web site as one of the most noteworthy papers of 2012.
- 2008 The paper “Epigenetics for ecologists,” co-authored with Oliver Bossdorf and Massimo Pigliucci published in *Ecology Letters* was recommended by the Faculty of 1000 web site as one of the most noteworthy papers of 2008.

### PROFESSIONAL SOCIETIES

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American Association for the Advancement of Science: Member  
Sigma Xi: member  
Society for the Study of Evolution: Member

## GRANTS AND FELLOWSHIPS

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- Deutsche Forschungsgemeinschaft (DFG, German Research Foundation). PI with PIs Oliver Bossdorf and Bo Li. 1/20-12/22. Evolution of plant defenses during a plant invasion. 301,778 €.
- NIH/National Cancer Institute. PIs R.A. Gatenby, MD; J. Brown, PhD; A.I. Hashim, MD. co-PI C.L. Richards. 12/19-12/20 The tumor-host evolutionary arms race. Supplement to Parent Grant: U54CA193489, Cancer as a Complex Adaptive System. 172,000USD.
- Deutscher Akademischer Austausch Dienst (German Academic Exchange Service). PI C.L. Richards, 1/19-12/22. Genomics and epigenomics of plant invasions. Make Our Planet Great Again – German Research Initiative. 1,000,000 €.
- Australian Research Council. PI L. Kruuk co-Pis A. Nicotra, C.L. Richards. 9/17-9/20. Multi-trait plasticity in response to a changing climate, DP170101681. 459,500 AUD.
- National Science Foundation. PI C.L. Richards, 4/2017-1/2020. International-REU supplement to Collaborative Research: Effects of genetic diversity, epigenetic change, and root-associated fungal colonization on trait variation in the foundation plant *Spartina alterniflora*, IOS-1556820. 16,593 USD.
- Fulbright U.S. Scholar grant. PI C.L. Richards, 2016-2017. Enhancing the biology curriculum at University of South Florida and University of Rennes with ecological epigenetics: Merging ecology and epigenomics approaches to understand plant invasion. Collaborative research and teaching at the Université de Rennes 1 in France, with Professor Malika Ainouche and Dr. Armel Salmon. 15,600 Euros.
- National Science Foundation. PI C.L. Richards, 2/2016-1/2020. Collaborative Research: Effects of genetic diversity, epigenetic change, and root-associated fungal colonization on trait variation in the foundation plant *Spartina alterniflora*, IOS-1556820. 380,536 USD. Funded along with separate but collaborative grants by Randall Hughes (Northeastern University) and Catherine Gehring (Northern Arizona University).
- National Science Foundation. PI C.L. Richards, 6/2015-3/2017. International-REU supplement to *EAGER: Developing epigenetic genotyping-by-sequencing in the non-model invasive Japanese knotweed*, DEB-1419960. 44,999 USD.
- National Science Foundation. PI C.L. Richards, 3/2015-3/2017. Research Opportunity Award (ROA) supplement to *EAGER: Developing epigenetic genotyping-by-sequencing in the non-model invasive Japanese knotweed*, DEB-1419960. 25,000 USD.
- National Science Foundation. PI C.L. Richards, 3/2014-3/2017. *EAGER: Developing epigenetic genotyping-by-sequencing in the non-model invasive Japanese knotweed*. DEB-1419960. 149,996 USD.
- Australian Research Council. PI Nicotra, A., co-Pis C.L. Richards, M. van Kleunen & F. Valladares, 4/12-4/15. Phenotypic plasticity and plant water use in a changing climate: a multi-species, multi-site investigation. DP120100945, 270,000 AUD.
- USF Internal New Researchers Award 4/11-4/13. PI C.L. Richards, Comparative transcriptomics in natural *Spartina alterniflora* habitat contaminated by the BP *Deepwater Horizon* oil spill. Amount: 20,000 USD. (collaboration with Malika Ainouche, Université de Rennes1, France).
- National Evolutionary Synthesis Center (NESCent) catalysis meeting. PI C.L. Richards, co-Pis Bossdorf & Pigliucci), 4/09. What role does heritable epigenetic variation play in phenotypic evolution? 36,000 USD (estimated costs for 30 participants).
- New York Sea Grant. PI C.L. Richards, co-PI M. Pigliucci, 2/06- 2/07. Genetic Make-up of *Fallopia* Plant Species Invading Novel Coastal Habitats. 83,860 USD.
- Graduate Research Fellow, 5/01- 5/04. PI C.L. Richards, Genetic and physiological variation of three salt marsh plants at the Sapelo Island NERR. National Estuarine Research Reserve (NOAA). 51,500 USD.
- Georgia Sea Grant PI S.J. Franks, co-Pis C.L. Richards and E. Gonzales), 3/00. Genetic variation and restoration of sea oats (*Uniola paniculata* L.). 17,270 USD.
- Seven small grants, 1/99-5/04. PI C.L. Richards, For graduate research from Garden Club of America, University of Georgia Botany, GA DNR, GA Sea Grant and GC-LTER. 13,900 USD combined.

## PUBLICATIONS

**Citations: 7,147; h-Index: 31** (Google Scholar Scientific Publication Calculator, June 7, 2021)

\*postdoctoral advisee \*\*graduate student advisee \*\*\*undergraduate student \*\*\*\*high school student

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1. \*\*Mounger, J., M.L. Ainouche, O. Bossdorf, \*A. Cavé-Radet, B. Li, \*M. Parepa, A. Salmon, J. Yang & **C.L. Richards**. 2021. Epigenetics and the success of invasive species. *Philosophical Transactions of the Royal Society B*. 376: 20200117. <https://doi.org/10.1098/rstb.2020.0117>.
2. Zerebecki, R.A., E.E. Sotka, \*T.C. Hanley, K.L. Bell, C. Gehring, C.C. Nice, **C.L. Richards** & A.R. Hughes. *In press*. Repeated microgeographic genetic and trait divergence in a coastal foundation plant species. *The American Naturalist*.
3. McNew, S.M., M.T. Boquete, S.A.E. Espinoza-Ulloa, J.A. Andres, N.C.A.M. Wagemaker, S.A. Knutie, **C.L. Richards** & D.H. Clayton. 2021. Epigenetic effects of parasites and pesticides on captive and wild nestling birds. *Ecology and Evolution*. 00: 1–17. <https://doi.org/10.1002/ece3.7606>
4. \*Boquete M.T., I. Lang, M. Weidinger, **C.L. Richards** & C. Alonso. 2021. Heavy metal accumulation and tolerance in two terrestrial moss species with contrasting habitat specialization. *Environmental and Experimental Botany*. 182 (2021): 104336. doi.org/10.1016/j.envexpbot.2020.104336
5. \*\*Ibrahim-Hashim, A., K.A. Luddy, D. Abrahams, P.M. Enriquez-Navas, S. Damgaci, J. Yao, T. Chen, R.J. Gilles, C. O’Farrelly, **C.L. Richards**, J.S. Brown & R.A. Gatenby. 2021. Artificial selection for host resistance to tumor growth and subsequent cancer cell adaptations: an evolutionary arms race. *British Journal of Cancer* 124: 455-465. doi: 10.1038/s41416-020-01110-1
6. **Richards, C.L.** & M. Pigliucci. 2020. Epigenetic inheritance a decade into the Extended Evolutionary Synthesis. *Paradigm*. 38, 463-494. DOI: 10.30460/99624. <https://tinyurl.com/2020paradigm>
7. Chen, C., Z. Zheng, Y. Bao, H. Zhang, **C.L. Richards**, J. Li, Y. Chen, Y. Zhao, Z. Shen & C. Fu. 2020. Comparisons of natural and cultivated populations of *Corydalis yanhusuo* indicate divergent patterns of genetic and epigenetic variation. *Frontiers in Plant Science* 11:985-987. doi: 10.3389/fpls.2020.00985.
8. Sun, K.-K., W.-S. Yu, J.J. Jiang, **C.L. Richards**, E. Siemann, J. Ma, B. Li, & R.-T. Ju. 2020. Mismatches between the resources for adult herbivores and their offspring suggest invasive *Spartina alterniflora* is an ecological trap. *Journal of Ecology* 108(2): 719-732.
9. \*Boquete, M.T., N.C.A.M. Wagemaker, P. Vergeer, \*\*J. Mounger & **C.L. Richards**. 2020. Epigenetic approaches in non-model plants. *Methods in Molecular Biology*. Pp. 203-215. [https://doi.org/10.1007/978-1-0716-0179-2\\_14](https://doi.org/10.1007/978-1-0716-0179-2_14)
10. Paun, O., K.J.F. Verhoeven & **C.L. Richards**. 2019. Opportunities and limitations of reduced representation bisulfite sequencing in ecological epigenomics. *New Phytologist*. 221:738-742 doi: 10.1111/nph.15388
11. \*\*Alvarez, M., J. Ferreira de Carvalho, A. Salmon, M.L. Ainouche, A. Cavé-Radet, A. El Amrani, T.E. Foster, \*\*\*S. Moyer & **C.L. Richards**. 2018. Transcriptome response of the foundation plant *Spartina alterniflora* to the Deepwater Horizon oil spill. *Molecular Ecology* 27: 2986–3000. DOI: 10.1111/mec.14736
12. Banta, J.B. & **C.L. Richards**. 2018. Quantitative epigenetics and evolution. *Heredity* 121: 210–224. DOI: 10.1038/s41437-018-0114-x
13. Heer, K., \*\*J. Mounger, \*M.T. Boquete, **C.L. Richards** & L. Opgenoorth. 2018. The diversifying field of plant epigenetics. *New Phytologist*. 217: 988–992. <https://doi.org/10.1111/nph.14985>.
14. **Richards, C.L.**, C. Alonso, C. Becker, O. Bossdorf, E. Bucher, M. Colomé-Tatché, W. Durka, J. Engelhardt, B. Gaspar, A. Gogol-Döring, I. Grosse, T.P. van Gurp, K. Heer, I. Kronholm, C. Lampei, V. Latzel, M. Mirouze, L. Opgenoorth, O. Paun, S.J. Prohaska, S.A. Rensing, P.F. Stadler, E. Trucchi, K. Ullrich & K.J.F. Verhoeven. 2017. Ecological plant epigenetics: Evidence from model and non-model species, and the way forward. *Ecology Letters* 20: 1576–1590. DOI: 10.1111/ele.12858
15. \*\*Robertson, M.H., \*A.W Schrey, \*\*\*A. Shayter, \*\*\*C.J. Moss & **C.L. Richards**. 2017. Genetic and epigenetic variation in *Spartina alterniflora* following the Deepwater Horizon oil spill. *Evolutionary Applications: Special issue in Evolutionary Toxicology*. 10:792–801. DOI: 10.1111/eva.12482
16. \*\*Alvarez, M.<sup>1</sup>, \*\*C.M. Foust<sup>1</sup>, \*\*M.H. Robertson<sup>1</sup>, M.L. Ainouche, J. Ferreira de Carvalho, \*\*\*C.J. Meals, V. Preite, A. Salmon, \*\*\*A. Shayter, \*A.W Schrey, K.J.F. Verhoeven & **C.L. Richards**. 2016. Molecular response to challenging environmental conditions in *Spartina alterniflora*: an integrated approach. In: *Proceedings of the International Conference on Invasive Spartina*. Université de Rennes 1 Press, Rennes, France. pp. 59-64. <sup>1</sup>shared first authorship.
17. \*\*Foust, C.M., V. Preite, \*A.W. Schrey, \*\*M. Alvarez, \*\*M.H. Robertson, K.J.F. Verhoeven & **C.L. Richards**. 2016. Genetic and epigenetic differences associated with environmental gradients in replicate populations of two salt marsh perennials. *Molecular Ecology* 25: 1639–1652.

18. \*\*Robertson, M.H. & **C.L. Richards**. 2015 Opportunities and challenges of Next Generation Sequencing applications in ecological epigenetics. *Molecular Ecology* 24: 3799-3801.
19. \*\*Robertson, M.H. & **C.L. Richards**. 2015. Non-genetic inheritance in evolutionary theory - the importance of plant studies. *Non-Genetic Inheritance* 2: 3-11.
20. \*\*Alvarez, M., \*A.W. Schrey & **C.L. Richards**. 2015. Ten years of transcriptomics in wild populations: what have we learned about their ecology and evolution? *Molecular Ecology* 24: 710–725.
21. Nicotra, A.B., D. Segal, G.L. Hoyle, \*A.W. Schrey, K.J.F. Verhoeven & **C.L. Richards**. 2015. Adaptive plasticity in response to warming in an Australian alpine herb. *Ecology and Evolution* 5(3): 634–647.
22. \*\*Foust, C.M., \*A.W. Schrey & **C.L. Richards**. 2015. Population epigenetics. In: *Nuclear Functions in Plant Transcription, Signaling and Development*. Jin, H. & O. Pontes, eds. Springer-Verlag. Pp. 165-179.
23. \*Schrey, A.W., \*\*H.J. Kilvitis, J.A. Banta & **C.L. Richards**. 2015. Ecological epigenetics in integrative biology. In: *Integrative Biology*. L.B. Martin, C.K. Ghalambor & H.A. Woods, eds. John Wiley & Sons. Pp. 109-118.
24. \*Schrey, A.W., A.L. Liebl, **C.L. Richards** & L.B. Martin. 2014. Genetic evidence for human-facilitation of range expansion in Kenyan house sparrows (*Passer domesticus*). *Journal of Heredity* 105: 60-69.
25. \*\*Kilvitis, H.J., \*\*M. Alvarez, \*\*C.M. Foust, \*A.W. Schrey, \*\*M.H. Robertson & **C.L. Richards**. 2014. Ecological epigenetics. In: *Ecological Genomics*. C.R. Landry & N. Aubin-Horth, eds. Springer. Series: Advances in Experimental Medicine and Biology 781: 191-210.
26. Liebl, A.L., \*A.W. Schrey, **C.L. Richards** & L.B. Martin. 2013. Patterns of DNA methylation throughout a range expansion of an introduced songbird. *Integr Comp Biol* 53: 351-358.
27. \*Schrey, A.W., \*\*M. Alvarez, \*\*C.M. Foust, \*\*H.J. Kilvitis, J.D. Lee, A.L. Liebl, L.B. Martin, **C.L. Richards** & \*\*M.H. Robertson. 2013. Ecological Epigenetics: Beyond MS-AFLP. *Integr Comp Biol* 53: 340-350.
28. Ledón- Rettig, C.C., **C.L. Richards** & L.B. Martin. 2013. Epigenetics for behavioral ecologists. *Behavioral Ecology* 24: 311-324.
29. Ledón- Rettig, C.C., **C.L. Richards** & L.B. Martin. 2013. A place for behavior in ecological epigenetics. *Behavioral Ecology* 24: 329-330.
30. **Richards, C.L.**, \*A.W. Schrey & M. Pigliucci. 2012. Invasion of diverse habitats by few Japanese knotweed genotypes is correlated with high epigenetic differentiation. *Ecology Letters* 15: 1016-1025. *Recommended to Faculty of 1000 by Elena Alvarez-Buylla, Eugenio Azpeitia, Mariana Benítez, Dec 2012.*
31. **Richards**<sup>1</sup>, **C.L.**, U. Rosas<sup>1</sup>, J.A. Banta, \*\*\*\*N. Bhambra & M.D. Purugganan. 2012. Genome-wide patterns of *Arabidopsis* gene expression in nature. *PLoS Genetics* 8(4): e1002662. <sup>1</sup>shared first authorship.
32. Drenovsky<sup>1</sup>, R.E., B.J. Grewell<sup>1</sup>, C.M. D'Antonio, J.L. Funk, J.J. James, N. Molinari, I.M. Parker & **C.L. Richards**. 2012. A functional trait perspective on plant invasion: invasiveness to impacts in a changing world. *Annals of Botany* 110(1): 141-153. <sup>1</sup>shared first authorship.
33. **Richards, C.L.**, K.J.F. Verhoeven & O. Bossdorf. 2012. Evolutionary significance of epigenetic variation. In: *Plant Genome Diversity Volume 1*, J.F. Wendel, J. Greilhuber, J. Dolezel, I.J. Leitch (eds.), DOI 10.1007/978-3-7091-1130-7\_16. Pp. 257-274.
34. \*Schrey, A.W. & **C.L. Richards**. 2012. Within-genotype epigenetic variation enables broad niche width in a flower living yeast. *Molecular Ecology* 21: 2559-2561.
35. \*Schrey, A.W., **C.L. Richards**, V. Meller, V. Sollars & D.M. Ruden. 2012. The Role of Epigenetics in Evolution: The Extended Synthesis. *Genetics Research International* 2012, Article ID 286164.
36. \*Schrey, A.W., C.A.C. Coon, M.T. Grispo, M. Awad, T. Imboma, E.D. McCoy, H.R. Mushinsky, **C.L. Richards** & L.B. Martin. 2012. Epigenetic variation may compensate for decreased genetic variation with introductions: a case study using house sparrows (*Passer domesticus*) on two continents. *Genetics Research International* 2012, Article ID 979751.
37. **Richards, C.L.** & J.F. Wendel. 2011. The hairy problem of epigenetics in evolution. *New Phytologist* 191: 7-9.
38. Martin, L.B., A.L. Liebl, J.H. Trotter, **C.L. Richards**, K. McCoy & M.W. McCoy. 2011. Integrators: physiological determinants of phenotypic plasticity. *Integr Comp Biol* 51: 514–527.
39. Nicotra, A.B., O.K. Atkin, S.P. Bonser, A. Davidson, E.J. Finnegan, U. Mathesius, P. Poot, M.D. Purugganan, **C.L. Richards**, F. Valladares & M. van Kleunan. 2010. Plant phenotypic plasticity in a changing climate. *Trends in Plant Science* 15: 684-692.

40. **Richards, C.L.**, O. Bossdorf & K.J.F. Verhoeven. 2010. Understanding natural epigenetic variation. *New Phytologist* 187: 562-564.
41. **Richards, C.L.**, J.P. Wares & J.A. Mackie. 2010. Evaluating Adaptive Processes for Conservation and Management of Estuarine and Coastal Resources. *Estuaries and Coasts: Special Feature on Genetic Structure and Adaptation in Coastal Ecosystems* 33: 805-810.
42. **Richards, C.L.**, S.N. White, M.A. McGuire, S.J. Franks, L.A. Donovan & R. Mauricio. 2010. Plasticity, not adaptation to salt level, explains variation along a salinity gradient in a salt marsh perennial. *Estuaries and Coasts: Special Feature on Genetic Structure and Adaptation in Coastal Ecosystems* 33: 840-852.
43. **Richards, C.L.**, O. Bossdorf & M. Pigliucci. 2010. What role does heritable epigenetic variation play in phenotypic evolution? *Bioscience* 60: 232-237.
44. Bossdorf, O., D. Arcurri, **C.L. Richards** & M. Pigliucci. 2010. Experimental alteration of DNA methylation affects the phenotypic plasticity of ecologically relevant traits in *Arabidopsis thaliana*. *Evolutionary Ecology* 24: 541-553.
45. Caicedo, A.L., **C.L. Richards**, I.M. Ehrenreich & M.D. Purugganan. 2009. Complex rearrangements lead to novel chimeric gene fusion polymorphisms at the Arabidopsis MAF2-5 flowering time gene cluster. *Molecular Biology and Evolution* 26: 699-711.
46. **Richards, C.L.**, Y. Hanzawa, I.M. Ehrenreich, M. Katari, K.E. Engelmann & M.D. Purugganan. 2009. Perspectives on ecological and evolutionary systems biology. In: *Plant Systems Biology*. R.A. Gutierrez & G.M. Coruzzi, eds. *Annual Plant Reviews* 35: 331-351. Blackwell Publishing: Oxford, UK.
47. **Richards, C.L.**, R. Walls, J.P. Bailey, \*\*\*\*R. Parameswaran, \*\*\*\*T. George & M. Pigliucci. 2008. Plasticity in salt tolerance traits allows for invasion of salt marshes by Japanese knotweed s.l. (*Fallopia japonica* and *F. xbohemica*, Polygonaceae). *American Journal of Botany* 95: 931-942.
48. Bossdorf, O., **C.L. Richards** & M. Pigliucci. 2008. Epigenetics for ecologists. *Ecology Letters* 11: 106-115. *Recommended to Faculty of 1000 by Brian Neff, 22 February 2008.*
49. **Richards, C.L.**, O. Bossdorf, N.Z. Muth, J. Gurevitch & M. Pigliucci. 2006. Jack of all trades, master of some? On the role of phenotypic plasticity in plant invasions. *Ecology Letters* 9: 981-993.
50. **Richards, C.L.**, S.C. Pennings & L.A. Donovan. 2005. Habitat range and phenotypic variation in salt marsh plants. *Plant Ecology* 176: 263-273.
51. **Richards, C.L.**, J.L. Hamrick, L.A. Donovan & R. Mauricio. 2004. Unexpectedly high clonal diversity of two salt marsh perennials across a severe environmental gradient. *Ecology Letters* 7: 1155-1162.
52. Franks, S.J., **C.L. Richards**, E. Gonzales, \*\*\*J.E. Cousins & J.L. Hamrick. 2004. Multi-scale genetic analysis of *Uniola paniculata* (Poaceae): a coastal species with a linear, fragmented distribution. *American Journal of Botany* 91: 1345-1351.
53. Callaway, R.M., S.C. Pennings & **C.L. Richards**. 2003. Phenotypic plasticity and interactions among plants. *Ecology* 84: 1115-1128.
54. Pennings, S.C. & **C.L. Richards**. 1998. Effects of wrack burial in salt stressed habitats: *Batis maritima* in a southwest Atlantic marsh. *Ecography* 21: 630-638.

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#### MANUSCRIPTS IN REVIEW, IN REVISION & IN PREP

- \*\*Alvarez, M.<sup>1</sup>, \*\*M.H. Robertson<sup>1</sup>, T. van Gorp, C.A.M. Wagemaker, D. Giraud, M.L. Ainouche, A. Salmon, K.J.F. Verhoeven & **C.L. Richards**. *In revision*. Reduced representation characterization of genetic and epigenetic differentiation to oil pollution in the foundation plant *Spartina alterniflora*. On: *bioRxiv* 426569; doi: <https://doi.org/10.1101/426569>. <sup>1</sup>shared first authorship.
- \*\*Alvarez, M.<sup>1</sup>, \*\*N. Sheridan<sup>1</sup>, A.R. Hughes, D.B. Lewis, J. Mackie, A.F.P. Moore, S. Palmer, C.E. Proffitt, A.M. Reitzel, A.W. Schrey, S.E. Travis, S.N. White, L.M. Williams & **C.L. Richards**. *In revision*. Managing multiple levels of diversity for response to anthropogenic change in coastal systems.
- Geange, S.R., N.C. Aitken, T.N. Hayashi, M.M. Holloway-Phillips, Y. Liu, S. Matesanz, \*\*M.H. Robertson, **C.L. Richards**, A. Widdup, F. Valladares, M. van Kleunen & A.B. Nicotra. *In prep*. Does the individual matter? Quantifying intraspecific variation and phenotypic plasticity across alpine, semi-arid, and coastal plant communities.
- Guo, J., **C.L. Richards**, K.E. Holsinger, G.A. Fox, Z. Zhang & J.C. Zhao. *In review*. Genetic structure in patchy populations of a foundation plant: A case study of *Leymus chinensis* (Poaceae) using genetic and clonal diversity.

- \*Hanley, T.C., C.A. Gehring, R.J. Deckert, B. Mortazavi, **C.L. Richards** & A.R. Hughes. *In review*. Variation in plant-fungal interactions across tidal elevation in a salt marsh.
- Jiang, J.-J., Y.-J. Zhao, Y.-L. Guo, L. Gao, **C.L. Richards**, E. Siemann, J. Wu, B. Li, R.-T. Ju. *In review*. Restoration of native saltmarshes can reverse arthropod assemblages and trophic interactions changed by a plant invasion.
- Jung, J., F. Reis, **C.L. Richards** & O. Bossdorf. *In review*. Understanding plant microbiomes requires a G x E framework. <https://doi.org/10.32942/osf.io/bvpyc>; On: <https://ecoevorxiv.org/bvpyc/>
- \*\*Langanke, K.L., J.B. Lewis, G.A. Fox & **C.L. Richards**. *In prep*. Response to nitrogen and salinity conditions in *Rhizophora mangle* seedlings varies by site of origin.
- Lewis, D.B., K.L. Jimenez, A. Abd-Elrahman, M.G. Andreu, R.J. Northrop, C. Campbell, H. Flower, M.C. Rains & **C.L. Richards**. *In review*. Total and mobile fractions of carbon and nitrogen in surface soils across a mangrove salt marsh ecotone.
- \*\*Mounger, J.<sup>1</sup>, \*M.T. Boquete<sup>1</sup>, M. Schmid<sup>1</sup>, R. Granado, M.H. Robertson, S.A. Voors, K.L. Langanke, M.F. Alvarez, C.A.M. Wagemaker, A.W. Schrey, G.A. Fox, D.B. Lewis, C.F. Lira & **C.L. Richards**. *Invited in review*. Inheritance of methylation differences in the mangrove *Rhizophora mangle*. On: *bioRxiv* <https://doi.org/10.1101/2020.10.24.353482> <sup>1</sup>shared first authorship.
- \*\*Mounger, J.<sup>1</sup>, \*I. Van-riemsdijk<sup>1</sup>, M. Schmid, M.H. Robertson, C.A.M. Wagemaker, C. Gehring, A.R. Hughes, A. Salmon, M.L. Ainouche & **C.L. Richards**. *In prep*. Population epigenetics along an intertidal gradient of invasive *Spartina alterniflora* in France.
- Neinavaie, F., \*\*A. Ibrahim-Hashim, A.M. Kramer, J.S. Brown, **C.L. Richards**. *In review*. The genomic processes of biological invasions.
- Pressley, M., M. Salvioli, D.B. Lewis, **C.L. Richards**, J.S. Brown & K. Staňková. *In review*. Rapid evolution of drug resistance in cancer impacts the superiority of adaptive therapy over continuous therapy.
- Richards, C.L.**, L.A. Donovan & R. Mauricio. *In revision*. Selection on plant salt tolerance traits, but no local adaptation to contrasting salt marsh environments in a clonal plant.
- \*\*Robertson, M.H.<sup>1</sup>, \*\*M. Alvarez<sup>1</sup>, T. van Gurp, C.A.M. Wagemaker, F. Yu, D. Moraga Amador, W.G. Farmerie, K.J.F. Verhoeven & **C.L. Richards**. *In revision*. Combining epiGBS markers with long read transcriptome sequencing to assess epigenetic differentiation associated with habitat in *Reynoutria* (aka *Fallopia*). On: *bioRxiv* 317966 <https://doi.org/10.1101/2020.09.30.317966> <sup>1</sup>shared first authorship.
- Yuan, W., M. Pigliucci & **C.L. Richards**. *In revision*. Rapid phenotypic differentiation in Japanese knotweed *s.l.* invading novel habitat.

## REGIONAL, NATIONAL & INTERNATIONAL INVITED PRESENTATIONS

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2021. Stazione Zoologica Anton Dornh, Naples, Italy.
- 5/2021. Plant Population Biology Section of the Ecological Society of Germany, Austria and Switzerland (GfÖ), Prague, Czech Republic.
- 12/2020. The 4TH international symposium on grassland ecology and adaptive management. Shenyang, China.
- 12/2020. Department of Desert Ecology and the Life Science Department. University of Ben-Gurion, Israel.
- 5/2020. Black Forest Summer School 2020 Plant Ecological Epigenetics, Feldberg-Bärental, Germany
- 1/2020. University of South Bohemia, Ceske Budejovice, Czech Republic.
- 1/2020. Plant and Animal Genome conference, San Diego, CA USA.
- 11/2019. Danforth Plant Science Center, Saint Louis, MO USA.
- 10/2019. Leibniz Institute for Zoo and Wildlife Research, Berlin, Germany.
- 10/2019. Plant Genomes in a Changing Environment, Wellcome Trust Genome Campus, Hinxton, UK.
- 9/2019. Make Our Planet Great Again, kick off conference, Paris, France.
- 10/2018. Sfecologie 2018: International Conference on Ecological Sciences, Rennes, France.
- 06/2017. UMR CNRS 6553 EcoBio, Université de Rennes1, Rennes, France.
- 02/2017. Global Biodiversity Genomics Conference at Smithsonian's National Museum of Natural History. Washington DC, USA.
- 2/2017. Botanisches Institut, University of Cologne, Cologne, Germany.
- 09/2016. Workshop in Conservation and Gene Expression. Asilomar, CA, USA.

03/2016. Symposium: Challenge to the outdoor environment by the experimental plant physiology at the annual meeting of the Japanese Society of Plant Physiologists. Morioka, Japan.  
03/2016. Center for Ecological Research at Kyoto University. Kyoto, Japan.  
11/2015. Department of Biological Sciences, University of South Carolina.  
03/2015. Symposium and workshop: Evolution of plant phenotypes, from genomes to traits. International Center for Scientific Debate. Barcelona, Spain.  
03/2015. sEpiDiv workshop on Ecological Epigenetics. The Synthesis Centre for Biodiversity Sciences – sDiv. Leipzig-Halle, Germany.  
02/2015. Biology Department, Bowdoin College.  
02/2015. Department of Marine and Environmental Sciences, Northeastern University.  
01/2015. Department of Plant and Microbial Biology, University of California, Berkeley.  
07/2014. Institute of Evolutionary Biology and Environmental Studies. University of Zürich. Zürich, Switzerland.  
06/2014. SMBE Symposium on Plant Epigenomics: linking epigenetics to adaptation. Puerto Rico.  
12/2013. Division of Biology. Kansas State University.  
11/2013. Epigenomics of Common Diseases Conference, Wellcome Trust Genome Campus, Hinxton, Cambridge, UK.  
10/2013. Netherlands Institute of Ecology (NIOO-KNAW), Wageningen, the Netherlands.  
10/2013. Teylers Medal Ceremony, Teylers Museum at Haarlem, the Netherlands.  
8/2013. Congress of the European Society for Evolutionary Biology. Lisbon, Portugal.  
7/2013. Ecological & Evolutionary Genomics Gordon Research Conference. University of New England, Biddeford, ME.  
4/2013. Genomics and Gene Expression Symposium. University of Arizona NSF-IGERT Program in Comparative Genomics. Tucson, AZ.  
2/2013. Centre for Ecological and Evolutionary Synthesis. Oslo, Norway.  
12/2012. Australian National University, Canberra, Australia.  
11/2012. Global Change in the Mediterranean: Learning from experiences worldwide. Seville, Spain.  
7/2011. Symposium: Phenotypic plasticity in a changing climate. International Botanical Congress 2011, Melbourne, Australia.  
10/2010. Gulf Coast Ecology Working Group meeting. Tallahassee, FL.  
8/2010. Symposium: Plant invasions in a time of environmental change. Botanical Society of America. Providence, RI.  
4/2009. Symposium: Phenotypic plasticity in the age of 'omics. Australian National University, Canberra, Australia.  
2/2009. University of South Florida, Tampa, FL.  
10/2008. New York Botanical Gardens, Bronx, NY.  
4/2008. Stony Brook University, Stony Brook, NY.  
10/2006. Japanese knotweed workshop. Boyce Thompson Institute at Cornell University. Ithaca, NY.

## WORKING GROUPS

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**Invited participant**, NSF workshop on the future of plant sciences, Danforth Plant Center, Saint Louis, MO USA (by zoom) October 2020.  
**Invited participant**, sEpiDiv workshop on Ecological Epigenetics. The Synthesis Centre for Biodiversity Sciences – sDiv. Leipzig-Halle, Germany, March 2015.  
**Invited participant**, NSF RAPID funded Deep Horizon Oil Spill working group. Organized by Tom Miller, Florida State University. Sept. 2010.  
**Invited participant**, “Phenotypic plasticity in the age of the ‘omics.” Organized by A. Nicotra, Australian National University. April 2009.

## TEACHING ACTIVITIES

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### Courses Taught (Instructor of record):

Epigenetics (BSC 4933 / BSC 6932), 3 credit course, 5 semesters: Spring 2010-2014

Biology of Coastal Plants (BSC 4933 / BSC 6932), 3 credit course, 3 semesters: F 2010, 2012, Sp 2015  
Organic Evolution (PCB 4674 / BSC 6932), 3 credit course, 4 semesters: F 2013-2014, Sp 2016, 2018  
Biological Diversity (BSC 2011), 3 credit course: F 2017  
Evolution: the Extended Synthesis (BSC 4933 / BSC 6932), 1 credit seminar: Sp 2011  
Readings in Conservation Genetics (BSC 6932), 1 credit seminar: Sp 2018  
Grant writing (BSC 6932), 1 credit seminar: F 2012  
Ecology (PCB 4932 / BSC 6932), 1 credit seminar: Sp 2012

**Laboratory (and field) instructor**, 1999-2004 University of Georgia: 6 semesters, 6 Maymesters.

### **Mentoring:**

Post-doctoral Fellows:

Dr. Teresa Boquete - July 2016- 2019 from Universidad de Santiago de Compostela, Spain. Individual Fellowship through the Marie Skłodowska-Curie Research Fellowships program of the European Commission  
Dr. Armand Cavé-Radet – April 2020 – present, MOPGA-GRI and DFG/NSFC project  
Dr. Ramona Irimia – July 2020 – present, MOPGA-GRI project and DFG/NSFC project  
Dr. Madalin Parepa – January 2019 – present, MOPGA-GRI project and DFG/NSFC project  
Dr. Isolde van Riemsdijk – September 2020 – present, MOPGA-GRI project and DFG/NSFC project  
Dr. Aaron Schrey - Aug 2010- Aug 2012 now Assistant professor at Armstrong Atlantic University in Savannah, GA (2012- present)

Graduate students:

Mariano Alvarez- graduated PhD in 2016, now post-doctoral fellow at Duke University, Raleigh, NC  
Christy Foust- graduated PhD in 2015 now teaching in Pinellas County Public Schools  
Dr. Arig Ibrahim Hashim, advanced to candidacy 18 Nov 2019 (co-advised with Joel Brown, Moffitt Cancer Center)  
Kristen Langanke - graduated with Masters Fall 2017  
Jeannie Mounger - PhD student entered Fall 2016, candidacy Fall 2019  
Marta Robertson - graduated PhD in 2017  
Nancy Sheridan (co-advised by Aaron Schrey, Georgia Southern University Armstrong Campus)- PhD student entered Fall 2014, candidacy Fall 2018  
Sandy Voors – graduated with Masters Spring 2018

Undergraduates:

Genevieve Allen (U Tübingen) – Summer 2020 – present; Bachelor project in MOPGA  
Mariano Alvarez (USF) – Spring 2010 – Summer 2011; received travel grants to Summer Institute in Statistical Genetics at the University of Washington, PhD from USF, Post-doc at Duke Univ.  
Samantha Blonder (USF) – Summer 2015 – Spring 2016; grad school Florida Gulf Coast University  
Harper Cassady (USF) – Spring 2016 – Fall 2016  
Janine Cousins (UGA) – Spring 2001 – Spring 2003  
Jordan Dollbaum (USF) – Fall 2015 – present, IREU participant summer 2017 still undergrad USF IB  
Fatima Elkott (USF) – Summer 2019 – present; USF undergraduate worked on MOPGA field work  
Luther Fleury (USF) – Fall 2013 – Spring 2014; grad school  
Sandeep Gill (USF) – Fall 2015 – Spring 2016  
Renan Granado Chaves (U National do Rio de Janeiro) – Summer 2017 IREU student from Brazil  
Alicia Irvin (USF) – Spring 2013  
Rahil Ismail (USF) – Spring 2010 – Fall 2010  
Kristen Langanke (USF) – Spring 2015 – Summer 2015; finished Masters USF IB  
Krystal Lawrence (NYU) – Summer 2013  
Laura Lotero (USF) – Spring 14 – Spring 2015; now grad school USF Geosciences  
Bryan Lotici (USF) – Spring 2016 – Fall 2016, LECOM Bradenton  
Priscila Magalhães Galdino (U National do Rio de Janeiro) – Summer 2017 IREU student from Brazil  
Christina (Meals) Moss (USF) – Spring 2010 – Fall 2011, now PhD candidate USF CMMB



Jeannie Mounger (USF) – Spring 2015 – Spring 2016, now grad at USF.  
 Sydney Moyer (USF) – Spring 2014 – Spring 2015; now grad school University of Texas  
 Maria Nikolopoulos (St. Petersburg College) – Intern Summer 2015, volunteer Fall 2015-spring 2017  
 Shane Palmer (St. Petersburg College) – Intern Summer 2016, now undergrad at St. Petersburg College.  
 Conner Richardson (USF) – Summer 2019 – present; USF undergraduate worked on MOPGA field work  
 Christina Rogers (USF) – Spring 2010 – Spring 2011; USF undergraduate research grant, travel grant, travel grant to Summer Institute in Statistical Genetics (SISG) at the University of Washington  
 Olivia Santiago (USF) – Spring 2018 – Spring 2020  
 Stephen Savage (USF) – Spring 2017 – Spring 2018  
 Ashley Shayter (USF) – Spring 2010 – Summer 2011; now PhD from U Illinois  
 Luiza Silva Simoes (USF) – Fall 2017 – Summer 2019; now at Moffitt  
 Paige Spence (USF) – Fall 2010 – Spring 2011; selected to Boyce Thompson Institute summer REU, first prize for poster presentation at USF Undergrad Research Symposium.  
 Christopher Thaver (USF) – Fall 2010 – Spring 2011; USF Honors thesis  
 Matt Torres (USF) – Spring 2013 – Summer 2013  
 Sandra Voors (USF) – Fall 2012 – Summer 2015; Honors thesis, Summer IREU in Brazil, finished Masters USF IB.  
 Robert Zagorsky (USF) – Fall 2010 – Spring 2011  
 Michelle Ziadie (USF) – Spring 2014 – Summer 2015; PhD from UGA; now faculty in IB USF St Pete  
 Jamie Zolik (USF) – Fall 2015 – Fall 2016, graduated USF IB

#### High school students:

Radha Parameswaran (Stony Brook University) – Summer 2006  
 Tara George (Stony Brook University) – Summer 2006  
 Jinnatun Nesa (New York University) – Summer 2007

### ACADEMIC & COMMUNITY SERVICE

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- Co-organizer**, *International Conference on Invasive Spartina*. 2021 Fudan University, Shanghai, China. The fifth meeting of researchers interested the globally invasive *Spartina* species.
- Lead organizer**, *Darwin Day at USF*. 2010 -present. Hosted lectures, outreach and teaching workshops in collaboration with Departments of Philosophy, Anthropology, Geosciences at USF, and the Director of STEM Education at the Hillsborough County Public Schools serving approximately 500 high school students, and 100 teachers in the Hillsborough County Schools with mentoring among 5 faculty across ranks, and approximately 25 graduate and 25 undergraduate USF students.
- Frontiers for Young Minds** Blog about Darwin Day: “Celebrating the Importance of Evolution” by Faith Frings (USF Integrative Biology), Alex Levine (USF Philosophy), Lorena Madrigal (USF Anthropology), Larry Plank (Executive Director for Science Hillsborough County Schools), and Christina Richards (USF Integrative Biology). <https://blog.frontiersin.org/2021/02/12/children-in-science-celebrating-the-importance-of-evolution/>
- Co-organizer**, symposium “Plant epigenetics: from mechanisms to ecological relevance.” 40<sup>th</sup> New Phytologist Symposium, Vienna, Austria, 12 – 15 September 2017, <https://www.newphytologist.org/symposia/40>.
- Co-organizer**, symposium “Epigenetics and Evolutionary Processes,” annual meeting of the Society for the Study of Evolution. São Paulo, Brazil, June 2015.
- Co-organizer**, symposium “Plant Epigenomics: linking epigenetics to adaptation,” annual meeting of the Society for Molecular Biology and Evolution, Puerto Rico 2014. San Juan, Puerto Rico, June 2014.
- Co-organizer**, symposium “Ecological Epigenetics,” annual Society for Integrative and Comparative Biology meeting. San Francisco, CA, USA, Jan 2013.
- Lead co-organizer**, NESCent Catalysis Meeting “What role, if any, does heritable epigenetic variation play in phenotypic evolution?” with O. Bossdorf & M. Pigliucci, April 2009.
- Lead co-organizer**, session on “Causes and consequences of genetic variation in estuarine systems” for the meeting of the Estuarine Research Federation (ERF), Providence, 2007.
- NSF Panelist**, Fall 2010, Winter 2012, Winter 2013 (2), Winter 2014 (2), Winter 2015 (2), Spring 2016, Spring 2019

## EDITORIAL ACTIVITIES

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**Ad hoc reviewer:** (*Annals of Botany, Biological Invasions, Biology Letters, Ecological Applications, Ecology, Ecology Letters, Evolution, Evolutionary Ecology, Evolutionary Applications, Evolutionary Ecology Research, Functional Ecology, Genetics, International Journal of Plant Science, J. Ecology, J. Evolutionary Biology, J. Exp Botany, J. Plant Ecology, Molecular Ecology, New Phytologist, PLoS Genetics, PNAS, Oikos, Quarterly Review of Biology, Restoration Ecology, Weed Science, Wetlands, Florida, New Jersey and South Carolina Sea Grant, Campbell & Reece Biology textbook*. See [publons.com/a/457284/](http://publons.com/a/457284/)

**Co-organizer and guest editor,** Special Issue of *Genetics Research International*, publication 2012.

**Editor,** *Frontiers in Conservation Genomics* 2020 to the present.

**Lead co-organizer and guest editor,** Special Issue of *Estuaries and Coasts: Genetic structure and adaptation in coastal populations*, publication 2010.

## MEDIA COVERAGE

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- 2013 *Nature* highlighted my work and the symposium we organized on Ecological Epigenetics at the annual Society for Integrative and Comparative Biology meeting (1/9/2013). *Nature News*  
doi:10.1038/nature.2013.12179
- 2013 Interviewed and quoted in *Science* “Evolution Heresy? Epigenetics Underlies Heritable Plant Traits”  
9/6/2013, Vol. 341, Issue 6150, pp. 1055
- 2013 Blogs: <http://scitechdaily.com/epigenetics-are-important-to-evolutionary-success/>;  
<http://felixonline.co.uk/science/3128/the-epic-genetics-or-epigenetics-of-invasive-species/>

### Darwin Day Media Coverage:

Listed every year at <http://darwinday.org/>

2016: Featuring Dr. Gillian Barker, of the Rotman Institute of Philosophy

- Center for Inquiry: <http://centreforinquiry.ca/cfics-darwin-day-headquarters/>
- DarwinDay.org: <http://darwinday.org/event/usf-darwin-day-2016-2/>
- 10News: [http://events.wtsp.com/Darwin\\_Day\\_2015/324777456.html](http://events.wtsp.com/Darwin_Day_2015/324777456.html)

2015: Featuring Professor Evelyn Fox Keller, of MIT

- Florida Citizen's for Science <http://www.flascience.org/wp/?p=2264>
- DarwinDay.org: <http://darwinday.org/event/usf-darwin-day/>
- <http://tampa.eventful.com/events/usf-darwin-day-/E0-001-078261621-2>

2014: Featuring Professor and Curator Kevin Padian, of the University of California, Berkeley

- National Center for Science Education: <https://ncse.com/node/15352>
- National Center for Science Education: <https://ncse.com/node/15353>

2013: Featuring Professor Lee Dugatkin, of the University of Louisville

- WMNF radio interview 2/14/2013
- Florida Citizens for Science <http://www.flascience.org/wp/?p=1811>

2012: Featuring Dr. Eugenie Scott, of the National Center for Science Education (NCSE)

- Radio: WUSF University Beat with Mark L. Schreiner, Producer/Host  
[http://drupal6.wusf.usf.edu/radio/program/university\\_beat/episode/2012-02/engineering\\_scholarships\\_darwin\\_days#](http://drupal6.wusf.usf.edu/radio/program/university_beat/episode/2012-02/engineering_scholarships_darwin_days#) (direct link  
[http://drupal6.wusf.usf.edu/sites/default/files/storyaudio/UB\\_Darwin\\_Days\\_2-20-12.mp3](http://drupal6.wusf.usf.edu/sites/default/files/storyaudio/UB_Darwin_Days_2-20-12.mp3))
- <https://www.youtube.com/watch?v=DGLMrWvFCe4>
- Center for inquiry:  
[http://www.centerforinquiry.net/tampa/events/eugenie\\_scott\\_at\\_usf\\_for\\_darwin\\_day\\_lecture/](http://www.centerforinquiry.net/tampa/events/eugenie_scott_at_usf_for_darwin_day_lecture/)
- National Center for Science Education: <https://ncse.com/node/12430>
- National Center for Science Education: <https://ncse.com/node/12432>
- National Center for Science Education: <https://ncse.com/ncse-past-events?page=20>

2011: Featuring Biologist/Philosopher Professor Massimo Pigliucci

- Tampa Bay Times: <http://www.tampabay.com/blogs/moms/content/will-you-celebrate-darwin-day/2096957>
- The Examiner:  
<http://webcache.googleusercontent.com/search?q=cache:hRMwnRrJCbsJ:www.examiner.com/article/darwin-day-activities-around-tampa-bay-2011+&cd=3&hl=en&ct=clnk&gl=us>
- Center for Inquiry: [http://www.centerforinquiry.net/tampa%20events/darwin\\_day\\_events\\_in\\_tampa/](http://www.centerforinquiry.net/tampa%20events/darwin_day_events_in_tampa/)