

Fletcher W. Halliday

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Education

- Aug 2010 – Dec 2017 Ph.D. Biology, University of North Carolina, Chapel Hill.
“The community ecology of plant parasites: from coinfections to metacommunities.”
Advisor: Prof. Dr. Charles E. Mitchell
- Aug 2006 – May 2008 B.S. Honors, Distinction. Molecular Environmental Biology, University of California,
Berkeley.
“Bird migration and habitat degradation mediate parasite dynamics in the marine snail,
Cerithidea californica.”
Advisor: Prof. Dr. Wayne P. Sousa
- Aug 2003 – May 2006 General Education. Santa Rosa Junior College, Santa Rosa, CA, USA

Employment History

- Jan 2022 - Present Oberassistent (Senior Researcher). Department of Evolutionary Biology and
Environmental Studies, University of Zürich, Switzerland
- Feb 2019 – Dec 2021 Postdoctoral Research Associate. Department of Evolutionary Biology and
Environmental Studies, University of Zürich, Switzerland
Advisor: Prof. Dr. Anna-Liisa Laine
- Mar 2018 – Feb 2019 Postdoctoral Research Associate. Integrative Biology Department, University of South
Florida, FL, USA
Advisor: Prof. Dr. Jason R. Rohr
- Jan 2018 – Aug 2018 Postdoctoral Research Associate. Biology Department, University of North Carolina, NC,
USA
Advisor: Prof. Dr. Charles E. Mitchell
- Aug 2010 – Jan 2018 Teaching Assistant and Graduate Research Fellow. Biology Department. University of
North Carolina, NC, USA
- Aug 2008 – Aug 2010 Biologist: URS Corporation, Environmental Sciences Division, Oakland, CA, USA
- May 2007 – Dec 2009 Research Assistant: Department of Integrative Biology, UC Berkeley, Berkeley, CA,
USA

Prizes, Awards, & Fellowships

- 2021 Ambizione Fellowship (Swiss National Science Foundation CHF 907,120)
- 2018 Outstanding Student Paper Award (Ecological Society of America Disease Ecology Section)
- 2017 Alma Holland Beers Scholarship (Biology Department, University of North Carolina \$1,500)
- 2017 W.C. Coker Summer Fellowship (Biology Department, University of North Carolina \$1,500)
- 2017 W.C. Coker Fellowship in Botany (Biology Department, University of North Carolina \$11,000)
- 2016 Alma Holland Beers Scholarship (Biology Department, University of North Carolina \$1,750)
- 2016 W.C. Coker Summer Fellowship (Biology Department, University of North Carolina \$1,750)

- 2015-2016 Dissertation Completion Fellowship (University of North Carolina \$16,500)
- 2012 – 2015 Graduate Research Fellowship (US National Science Foundation \$132,000)
- 2014 Mycological Graduate Scholarship (Sonoma Mycological Association \$1,500)
- 2011 Honorable Mention: Graduate Research Fellowship (US National Science Foundation)
- 2010 – 2011 Mrs. Coker Botanical Graduate Research Fellowship (Biology Department, University of North Carolina \$22,000)

Grant-funded research

- 2022 – 2026 Disease risk under environmental change and biodiversity loss – causes and consequences. PI: Fletcher W. Halliday (SNSF CHF 907,120 [\$989,129 USD]).
I am sole PI of this grant, which is funded through the Swiss National Science Foundation Ambizione Fellowship Program.
- 2016 – 2021 Multispecies interactions in the microbiome: dynamic responses of parasite individuals, populations, and communities. PI: Charles E. Mitchell (USDA-NIFA AFRI \$2,500,000). Co-PIs: Ignazio Carbone, Corbin D. Jones, James Umbanhowar.
This project was funded by the joint National Science Foundation, National Institutes of Health, and United States Department of Agriculture program in the Ecology and Evolution of Infectious Diseases. I was an investigator on the project, provided preliminary data, and cowrote the proposal.
- 2014 Joint ecological effects of a fungal mutualist and viral coinfection; REU Supplement to the project, “The community ecology of viral pathogens - Causes and consequences of coinfection in hosts and vectors.” PI: Charles E. Mitchell (NSF Research Experience for Undergraduates Program \$6,250).
As “Graduate Mentor” on the project, I recruited and mentored an undergraduate student to carry out an independent research project. I also designed the project and wrote the proposal.
- 2013 Virus co-infections and the effects of host identity, community composition, and resource supply on colonization and invasion of herbaceous communities; REU Supplement to the project, “The community ecology of viral pathogens - Causes and consequences of coinfection in hosts and vectors.” PI: Charles E. Mitchell (NSF Research Experience for Undergraduates Program \$6,250).
I collaborated with Robert Heckman as the “Graduate Mentors” on the project. We co-designed the project and wrote the proposal.

Peer Reviewed Publications († denotes students that I have supervised)

- Halliday, FW, S Czyżewski†, A-L Laine. 2023. Intraspecific trait variation and changing life-history strategies explain host community disease risk along a temperature gradient. *Philosophical Transactions B*. DOI: 10.1098/rstb.2022.0019
- Sallinen, S, H Susi, FW Halliday, A-L Laine. 2022. Altered within- and between-host transmission under coinfection underpin parasite co-occurrence patterns in the wild. *Evolutionary Ecology*. DOI: 10.1007/s10682-022-10182-9
- Heckman, RW, FW Halliday, PA Wilfahrt. 2022. Nutrients and consumers impact tree colonization differently from performance in a successional old field. *Oecologia*. DOI: 10.1007/s00442-021-05096-2
- Halliday, FW*, M Jalo*†, A-L Laine. 2021. The effect of host community functional traits on plant disease risk varies along an elevational gradient. *eLife*. *joint first authorship, DOI: 10.7554/eLife.67340
- Sandel, B, C Pavelka, T Hayashi, L Charles, J Funk, FW Halliday, GS Kandlikar, AR Kleinhesselink, NJB Kraft, L Larios, T Madsen-McQueen, MJ Spasojevic. 2021. Predicting intraspecific trait variation among California’s grasses. *Journal of Ecology*. DOI: 10.1111/1365-2745.13673
- O’Keeffe, KR, FW Halliday, CD Jones, I Carbone, CE Mitchell. 2021. Parasites, niche modification, and the host microbiome: A field survey of multiple parasites. *Molecular Ecology*. DOI: 10.1111/mec.15892

- Halliday, FW***, RM Penczykowski*, B Barrés, JL Eck, E Numminen, A-L Laine. 2020. Facilitative priority effects drive parasite assembly under coinfection. *Nature Ecology & Evolution* *joint first authorship. DOI: 10.1038/s41559-020-01289-9
- Halliday, FW**, JR Rohr, A-L Laine. 2020. Biodiversity loss underlies the dilution effect of biodiversity. *Ecology Letters*. DOI: 10.1111/ele.13590 (*Featured on the cover; Top 10 most downloaded papers in 2021*)
- Halliday, FW**, RW Heckman, PA Wilfahrt, CE Mitchell. 2020. Eutrophication, biodiversity loss, and species invasions modify the relationship between host and parasite richness during host community assembly. *Global Change Biology*. DOI: 10.1111/gcb.15165
- Wilfahrt, PA, **FW Halliday**, RW Heckman. 2020. Initial richness, consumer pressure, and soil resources independently alter plant diversity and resource strategies during a multi-year successional field experiment. *Journal of Ecology*. DOI: 10.1111/1365-2745.13396
- Greischar, MA, HK Alexander, F Bashey, AI Bento, A Bhattacharya, M Bushman, LM Childs, DR Daversa, T Day, CL Faust, ME Gallagher, S Gandon, CK Glidden, **FW Halliday**, KA Hanley, T Kamiya, AF Read, P Schwabl, AR Sweeny, AT Tate, RN Thompson, N Wale, HJ Wearing, P Yeh, and N Mideo. 2020. Evolutionary consequences of feedbacks between within-host competition and disease control. *Evolution, Medicine, and Public Health*. DOI: 10.1093/emph/eoaa004
- JR Rohr, DJ Civitello, **FW Halliday**, PJ Hudson, KD Lafferty, CL Wood, EA Mordecai. 2020. Towards common ground in the biodiversity–disease debate. *Nature Ecology and Evolution*. DOI: 10.1038/s41559-019-1060-6
- Wilfahrt, PA, **FW Halliday**. 2020. Plant pathogen and invertebrate herbivory protocol. *in* Halbritter, AH, et al., Handbook for standardized field measurements in terrestrial global-change experiments. *Methods in Ecology and Evolution*. DOI: 10.1111/2041-210X.13331
- Halliday, FW**, JR Rohr. 2019. Measuring the shape of the biodiversity–disease relationship across systems reveals new findings and key gaps. *Nature Communications*. DOI: 10.1038/s41467-019-13049-w
- Heckman, RW, **FW Halliday**, CE Mitchell. 2019. A growth–defense trade-off is general among native and exotic grasses. *Oecologia*. DOI: 10.1007/s00442-019-04507-9
- Halliday, FW**, RW Heckman, PA Wilfahrt, CE Mitchell. 2019. Past is prologue: Host community assembly and the risk of infectious disease over time. *Ecology Letters*. DOI: 10.1111/ele.13176
- Halliday, FW**, J Umbanhowar, CE Mitchell. 2018. A host immune hormone modifies parasite species interactions and epidemics: insights from a field manipulation. *Proceedings of the Royal Society B*. 285: 20182075. DOI: 10.1098/rspb.2018.2075
- Halliday, FW**, RW Heckman, PA Wilfahrt, CE Mitchell. 2017. A multivariate test of disease risk reveals conditions leading to disease amplification. *Proceedings of the Royal Society B*. 284: 20171340. DOI: 10.1098/rspb.2017.1340
- Halliday, FW**, J Umbanhowar, CE Mitchell. 2017. Interactions among symbionts operate across scales to influence parasite epidemics. *Ecology Letters*. 20: 1285–1294. DOI: 10.1111/ele.12825 (*2018 Winner of the Ecological Society of America Disease Ecology section Outstanding Student Paper Award*)
- Heckman, RW, **FW Halliday**, PA Wilfahrt, CE Mitchell. 2017. Effects of native diversity, soil nutrients, and natural enemies on exotic invasion in experimental plant communities. *Ecology*. 98: 1409–1418. DOI: 10.1002/ecy.1796
- Coyle, JR, **FW Halliday**, B Lopez, K Palmquist, PA Wilfahrt, AH Hurlbert. 2014. Using trait and phylogenetic diversity to evaluate the generality of the stress–dominance hypothesis in eastern North American tree communities. *Ecography*. 37: 814–826. DOI: 10.1111/ecog.00473 (*Editor's Choice*)

Invited Presentations

- 2023 Ecological Society of America, Portland OR (In the Organized Oral Session, “Plant Disease Ecology: From Individuals to Landscapes”)
- 2022 University of Oulu Department of Ecology and Genetics
Oregon State University Department of Botany and Plant Pathology
- 2021 Verena - The Viral Emergence Research Initiative

- University of Zurich Seminar for Evolutionary Biology and Environmental Studies
- 2020 University of Neuchâtel Biology Seminar
- 2019 University of Zurich Behaviour, Ecology, Environment, and Evolution Seminar
CSU Monterey Bay School of Natural Sciences
- 2017 University of Virginia EBio Seminar
- 2016 UNC Biology Symposium (one of two graduate student speakers).
- 2015 Ecological Society of America, Baltimore MD (In the Organized Oral Session, “Integrating Host and Symbiont Community Ecology Across Scales”)

Contributed Presentations († denotes students that I have mentored)

- N Zurbuchen†, Domeignoz Horta, M Rechsteiner, A-L Laine, **FW Halliday**. 2023. Intraspecific trait variation, local adaptation, and environmental conditions as drivers of host disease risk along an elevation gradient. *Biology* 2023, Geneva, Switzerland (Poster)
- S Czyżewski†, B Sandel, A-L Laine, **FW Halliday**. 2022. Predicting intraspecific trait variation in mountain grassland communities: do disease and herbivory matter? 17th Eurasian Grassland Conference, Tolosa, Spain (Oral Presentation)
- Halliday, FW**, L Domeignoz Horta, M Rechsteiner, A-L Laine. 2022. Intraspecific trait variation, local adaptation, and the environment as drivers of host disease risk along an elevation gradient. International Association for Ecology, Geneva, Switzerland (Oral Presentation)
- Halliday, FW**. 2019. Biotic and abiotic drivers of disease risk in wild plant communities. Wild Plant Pathosystems, Schmitten, Germany (Oral Presentation)
- Halliday, FW**, & KR O’Keeffe. 2019. Drivers of foliar parasite metacommunity structure in California grasslands. Wild Plant Pathosystems, Schmitten, Germany (Poster)
- Jalo, M†, **FW Halliday**, & A-L Laine. 2019. How do elevation and biodiversity affect disease risk in natural plant populations? Wild Plant Pathosystems, Schmitten, Germany (Poster)
- Halliday, FW**, & JR Rohr. 2019. Evaluating the frequency and common drivers of within-host priority effects during coinfection. Ecology and Evolution of Infectious Diseases Conference, Princeton NJ (Poster)
- Halliday, FW**, J Umbanhowar, CE Mitchell. 2018. A defense hormone and viral infection modify parasite epidemics and within-host priority effects in a grass host. Ecology and Evolution of Infectious Diseases Conference, Glasgow SCT (Poster)
- Halliday, FW**, J Umbanhowar, CE Mitchell. 2016. Seasonal variation, within-host priority effects, and fungal interactions jointly influence parasite epidemics in a grass host. Wild Plant Pathosystems, Helsinki FI (Oral presentation)
- Halliday, FW**, J Umbanhowar, CE Mitchell. 2016. Seasonal variation, within-host priority effects, and fungal interactions jointly influence parasite community assembly in a grass host. Ecology and Evolution of Infectious Diseases, Ithaca NY (Oral Presentation)
- Halliday, FW**, CE Mitchell. 2014. Uncovering the structure of foliar parasite metacommunities in California grasslands. Ecological Society of America, Sacramento CA (Oral presentation)
- Rose-Person A†, Papper PD†, Graziani A, Cade J†, Cabanero D†, Pickett ZJ†, Boylan J† and **FW Halliday**. 2014. Examining the ecology of *Puccinia coronata*: An emerging infectious disease on the invasive grass, *Phalaris aquatica*, in northern California. Ecological Society of America Sacramento CA (Poster)
- Halliday, FW**, E Grason, VAG Bastazini, K Benes, HK Burgess, N Johnson, J Lefcheck, J Parrish 2014. Biodiverse Perspectives: Using online tools to foster communication among graduate students. North American Congress for Conservation Biology, Missoula MT (Poster)
- Halliday, FW**, RW Heckman, PA Wilfahrt, CE Mitchell. 2013. Effects of host diversity and resource availability on foliar parasite diversity. Ecological Society of America, Minneapolis MN (Poster)

Lefcheck, J, VG Bastazini, **FW Halliday (presenting author)**, HK Burgess, C Robinson, RL Nesteruk, CJ Maranto, J Parrish. 2013. BioDiverse Perspectives: Blogging to foster communication among graduate students. Ecological Society of America, Minneapolis MN (Poster)

Halliday, FW, RW Heckman, PA Wilfahrt, CE Mitchell. 2013. Effects of host diversity and resource availability on foliar parasite diversity. Evolution and Ecology of Infectious Diseases, State College PA (Poster)

Supervision of Junior Researchers

Aram Kübler. 2022 – Present (University of Zürich; MSc Student).

Nicolas Zurbuchen. 2022 – Present (University of Zürich; PhD Student).

Fiona Schwaller. 2022 – 2023 (ETH Zürich; MSc Student; co-advised with Jake Alexander) Thesis: Effects of elevation and roads on plant disease and herbivory: underlying abiotic and biotic drivers

Li Zhao. 2021 – 2022 (University of Zürich on exchange from Peking University, China; BSc Student) Thesis: Altitudinal Patterns of the Leaf Morphological Traits of Four Herbaceous Plant Species.

Szymon Czyzewski. 2021 – 2022 (University of Zürich; MSc Student). Thesis: Predicting plant community-level trait distributions across environmental gradients: do disease and herbivory matter?

Mikko Jalo. 2019 - 2020 (University of Helsinki; MSc Student; co-advised with Anna-Liisa Laine). Thesis: Disease risk decreases in diverse plant communities observed along an elevational gradient.

Ben Robb. 2014 (Wake Forest University; NSF Research Experience for Undergraduates Program).

Prahlada Papper. 2014 (Santa Rosa Junior College; Independent Student Researcher).

Robert Price. 2013 & 2014 (University of North Carolina; Independent Student Researcher).

Nguyen Huynh An “Markus” Le. 2013 (University of North Carolina; Summer Research Fellow and Honors Student). Thesis: Contributing Factors in Host Breadth of Fungal Plant Pathogens.

Kristina Jacobs. 2013 (Howard University; NSF Research Experience for Undergraduates Program).

Teaching activities

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| 2022 | Ecological Theories: The biodiversity-disease relationship. University of Zürich |
| 2019 – 2022 | Ecology and Evolution at the Heart of the Wicked Problems (with Anna-Liisa Laine, Jenalle Eck, Anna Norberg, Mikko Tiusanen, and Luiz Domeignoz-Horta). University of Zürich |
| 2016 – 2017 | Teaching Assistant: Introductory Ecology and Evolution. University of North Carolina |
| 2011 – 2012 | Teaching Assistant: Introductory Ecology and Evolution. University of North Carolina |

Scientific Meetings and Working Groups

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| 2022 – Present | Participant in BugNet, a global collaborative research network that aims to better understand the impact of invertebrate herbivores and pathogenic fungi on plant communities and ecosystems. |
| 2020 - Present | Participant in synthesis working group on priority effects at the Synthesis Centre (sDiv) of the German Centre for Integrative Biodiversity Research (iDiv). |
| 2023 | Organizer of the organized oral session of the 2023 annual Ecological Society of America conference, titled “When does history matter during community assembly?” with co-organizers Elle Barnes, Benjamin Delory, Tadashi Fukami, Chelsea Little, and Vicky Temperton |
| 2020 | Participant in the workshop, “Structural equation modeling - from theory to practice” at the University of Zürich |
| 2019 | Participant in NSF-funded Research Coordination Network Workshop: “Evolutionary Consequences of Feedbacks Between Within-host Competition and Disease Control” |

Institutional Responsibilities and Commissions of Trust

- 2012 - Present Peer review in the following journals: *Alpine Botany*, *American Naturalist*, *Basic and Applied Ecology*, *Ecology*, *Ecology Letters*, *Functional Ecology*, *Global Ecology and Biogeography*, *Journal of Applied Ecology*, *Journal of Ecology*, *Molecular Ecology*, *Nature Climate Change*, *Nature Communications*, *New Phytologist*, *Oecologia*, *Oikos*, *Plant Pathology*, *Trends in Ecology and Evolution*, *Trends in Parasitology*
- 2023 Ad hoc reviewer for the US National Science Foundation (NSF) Integrative Ecological Physiology Program (IEP)
- 2020 External grant reviewer for the Agence Nationale de la Recherche (ANR), France program: Maladies infectieuses et environnement.
- 2010 – 2018 Served in various leadership roles in the Biology Department at UNC, including student ambassador for graduate recruitment, Graduate Students Association representative for faculty meetings, and organizer of graduate research seminars.
- 2008 –2010 As a consultant for URS Corporation, I served as lead or coauthor on nine technical publications, including restoration and revegetation plans, annual monitoring reports, mitigation designs, endangered species act consultations, and wetland delineations throughout the state of California, USA

Outreach

- 2019 Contributor to Nature Ecology and Evolution Community Blog
- 2013 - 2016 Co-organizer and Managing Editor of BioDiverse Perspectives – a research blog, written by graduate students, that received over 100,000 page views and accolades from the California Academy of Science, The Nature Conservancy, and The National Science Foundation. I also represented BioDiverse Perspectives as a model for science communication at four national conferences, and wrote about my own research.
- 2011 - 2015 Developed and organized Santa Rosa Junior College-UNC Chapel Hill joint research program for undergraduates investigating host-pathogen ecology. This project exposed junior college-level students to ecological research by engaging them in a long-term research project. In 2014, we presented a poster of our research findings at the Ecological Society of America conference.
- 2013 - 2014 Editor at ScienceSeeker.org, a science collective aimed at organizing the entire range of science reporting, analysis, and discussion that take place through online blogs.

Active memberships in scientific societies

Ecological Society of America – Disease Ecology Section & Early Career Ecologist Section

British Ecological Society

Eurasian Dry Grassland Group – A working group of the International Association for Vegetation Science and a member of the European Forum for Nature Conservation and Pastoralism