Updated: 01/22/2026

Joseph K. Brown, Ph.D.

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Professional summary

I am a plant ecologist with a Ph.D. in Integrative Life Sciences, specializing in plant community dynamics, ecosystem function, and climate change. My research integrates field-based ecology with data science and probabilistic analysis to address questions at the interface of natural systems and human impacts. I bring this interdisciplinary expertise into the classroom through inquiry-based, hands-on instruction that emphasizes critical thinking, fieldwork, and project-driven learning. Committed to mentoring and inclusive pedagogy, I actively engage diverse student communities in ecological research and integrative science education.

Work and Education

Science positions

2025 - present	Visiting Assistant Professor, Lake Forest College, Lake Forest, IL
2022 - 2025	Postdoctoral Researcher, PNNL – Joint Global Change Research Institute, College Park, MD
2021 - 2022	Visiting Assistant Professor, Minnesota State University – Mankato, Mankato, MN

Education

2016 – 2021	Ph.D., Integrative Life Sciences. Virginia Commonwealth University, Richmond, VA **Dissertation:** *Plant Communities in Dynamic Systems: How Disturbance Influences Coastal Plant Community Structure and Function* **Advisor:** Julie Zinnert, Ph.D.
2014 – 2016	Master of Science, Biology. Virginia Commonwealth University, Richmond, VA **Advisor:** Julie Zinnert, Ph.D. and Don Young, Ph.D.
2009 – 2013	Bachelor of Science, Biology. Virginia Commonwealth University, Richmond, VA

Publications

**Denotes high school author

Accepted

10. **Brown, J.K.** Barrier Island Ecology and Dynamics. 2026*. Encyclopedia of Ecology 3rd Edition.*

9. **Brown, J.K.,** K. Dorheim, D. Mu**, A. Snyder, C. Tebaldi, and B.P. Bond-Lamberty. 2025. The effect of different climate sensitivity priors on projected climate: A probabilistic analysis. *Geophysical Research Letters, 52, e2024GL113505. DOI: https://doi.org/10.1029/2024GL113505 .*

8. **Brown, J.K.**, L. Pressburger, A. Snyder, K. Dorheim, S.J. Smith, C. Tebaldi, B.P. Bond-Lamberty. 2024 Matilda v1.0: An R package for probabilistic climate projections using a reduced complexity climate model. Submitted to *PLOS Climate* **3**(5) DOI: https://doi.org/10.1371/journal.pclm.0000295

7. **Brown, J.K.,** A. Moulton, J.C. Zinnert. 2022. Plant community re-organization and increased productivity due to multi-year nutrient enrichment of a coastal grassland. *PLOS One* **17**(7) DOI: https://doi.org/10.1371/ journal.pone.0270798

6. **Brown, J.K.,** J.C. Zinnert. 2021. Trait-based investigation reveals patterns of community response to nutrient enrichment in coastal mesic grassland. *Diversity* 13(1):19 DOI: https://doi.org/10.3390/d13010019

5. **Brown, J.K.,** J.C. Zinnert. 2020. Topography and disturbance influence trait-based community composition and productivity of adjacent habitats in a coastal system. *Ecosphere* **11**(5) DOI: https://doi.org/10.1002/ ecs2.3139

4. Stallins, J.A., L.C. Hsu, J.C. Zinnert, **J.K. Brown.** 2020. How bottom-up and top-down controls shape dune topographic variability along the U.S. Virginia barrier island coast and the inference of dune dynamical properties. *Journal of Coastal Conservation* **24**(30) DOI: https://doi.org/10.1007/s11852-020-00747-7

3. Goldstein, E.B., E.V. Mullins, R.G. Biel, **J.K. Brown**, S.D. Hacker, K.R. Jay, R.S. Mostow, P. Ruggiero, J.C. Zinnert, L.J. Moore. 2018. Literature-based latitudinal distribution and possible range shifts of two US east coast dune grass species (*Uniola paniculata* and *Ammophila breviligulata*). *PeerJ* DOI: https://doi.org/10.7717/ peerj.4932

2. **Brown, J.K.,** J.C. Zinnert. 2018. Mechanisms of surviving burial: Interspecific differences of similar species drives survival after sand deposition. *Ecosphere* **9**(3) DOI: https://doi.org/10.1002/ecs2.2162

1. **Brown, J.K.,** J.C. Zinnert, D.R. Young. 2018. Emergent interactions influence functional traits and success of dune building ecosystem engineers. *Journal of Plant Ecology* **11**(4) DOI: https://doi.org/10.1093/jpe/rtx033 ***Editor's Choice****

In Review

1. Tebaldi, C., B.C. O'Neill, N.S. Prime, M. Zhao, K.R. Dorheim, **J.K. Brown**. *In Review.* Implications of climate change impacts for emissions, land use, and scenario design. *Environmental Research Letters.*

Software

1. **Brown, J.K.**, B.P. Bond-Lamberty, L. Pressburger, Melat Ghebreselassie**. 2024. Matilda: A Probabilistic Framework for the Hector Simple Climate Model. R package version 1.0.0. https://github.com/JGCRI/matilda

Teaching experience

Instructor of Record

Lake Forest College

2026 (spring) Senior Seminar: Functional Trait Biology (BIOL 400)
2025-2026 Organismal Biology Lecture (BIOL 120)
2025-2026 Organismal Biology Lab (BIOX 120)
2025 (fall) Ecology and Evolution Lab (BIOX 220)

Minnesota State University, Mankato

2022 (spring) Plant Ecology (BIOL 443/543)
2022 (spring) General Biology II Lab (BIOL 106)
2021 (fall) General Biology II Lecture and Lab (BIOL 106)
2021 (fall) Flora of Minnesota (BIOL 442/542)

Graduate Teaching Appointments

Virginia Commonwealth University

2021 (spring) Biology Lab II (BIOZ 152)
2020 (fall) Quantitative Ecology (BIOL 606)
2020 (fall) Ecology Lab (BIOZ 317)
2018-19 Biology Lab II (BIOZ 152)
2014-15 Biology Lab II (BIOZ 152)

Mentor Experience

Research mentor:

2024 Mentor of PNNL High School Research Intern
Student: Melat Ghebreselassie
Project: Assessing climate model parameter sensitivity using Bayesian inference

2023 Mentor of PNNL High School Research Intern
Student: Derek Mu
Project: Propagating uncertainty in ECS to probabilistic projections of

future warming

2017 Mentor of VCU funded Environmental Scholars undergraduate
Student: Caroline Baucom
Project: Intraspecific functional trait changes in response to nutrient addition

2017 Mentor of NSF funded REU at VCR LTER
Student: Edward Long
Project: Root traits across barrier island plant communities

2016 Mentor of NSF funded REU at VCR LTER
Student: Grace Holmes

2015 Mentor of NSF funded REU at VCR LTER
Student: Taylor Price
Project: Plant community assembly across an environmental gradient

Committee member:

2021-2022 Allison Squires, Minnesota State University, Mankato
Thesis: Seasonal Resource Allocation and Accumulated Degree Day Estimation for Cuban Bulrush (*Oxycarum cubense*) in the Southeastern U.S.

2023-2025 Anne Sciolino, Virginia Commonwealth University
Thesis: Interspecies and Intraspecies Facilitative and Competitive Interactions Among Dune Grasses

Presentations

*Denotes undergraduate author
**Denotes high school author

Conferences and Workshops

21. **Brown, J.K.**, L. Pressburger, A. Snyder, K. Dorheim, S.J. Smith, C. Tebaldi, B.P. Bond-Lamberty. Matilda v1.0: Integrating parameter uncertainty and ensemble weighting with Hector for probabilistic climate projections. Department of Energy EESM PI Meeting 2024. Bethesda, MD. August 7 (poster).
20. M. Ghebreselassie**, **J.K. Brown**, B.P. Bond-Lamberty. Using ocean carbon uptake observation data for uncertainty estimation of the Hector simple climate model. 2024 PNNL High School Program Academic Year Symposium. Online. May 20 (oral).
19. **Brown, J.K.**, K. Dorheim, A. Snyder, C. Tebaldi, D. Mu**, B.P. Bond-Lamberty. 2023. Bridging the gap from evidence to projections: Assessing the influence of equilibrium climate sensitivity uncertainty on probabilistic temperature projections. American Geophysical Union Annual Meeting. San Francisco, CA. December 13 (poster).
18. Mu, D.**, **J.K. Brown**. B.P. Bond-Lamberty. 2023. Propagating uncertainty in equilibrium climate sensitivity to probabilistic climate projections of future warming. PNNL High School Research Intern Seminar. Online. August 24 (oral).

17. **Brown, J.K.**, L. Pressburger, B. Bond-Lamberty. 2022. Matilda v0.1: Developing a probabilistic framework for the Hector simple climate model. YouR_WEB Mini-Conference. Richland, WA. February 24 (oral).
16. **Brown, J.K**., J.C. Zinnert. 2021. How does barrier island shape and disturbance response impact island plant communities? Virginia Coast Reserve LTER All Scientist Meeting. Online. January 4 (poster).
15. **Brown, J.K.,** J.C. Zinnert. 2020. Functional traits inform mechanisms of plant community changes that emerge from nutrient enrichment in a coastal mesic grassland. Ecological Society of America. Online. August 5 (poster).
14. **Brown, J.K.**, J.C. Zinnert. 2019. Nutrient enrichment drives feedbacks between functional diversity and productivity in a coastal system. Ecological Society of America. Louisville, KY. August 13 (oral). 13. **Brown, J.K.**, A. Kirschner, B. Nettleton, J.C. Zinnert. 2018. Cross-scale connections explain disturbance response on Virginia Coast Reserve barrier island system. Long Term Ecological Research All Scientists Meeting. Pacific Grove, CA. October 2 (poster).
12. **Brown, J.K.**, J.C. Zinnert. 2018. Nutrient addition affects coastal grassland productivity and species dominance. Ecological Society of America Conference. New Orleans, LA. August 8 (oral).
11. Baucom, C.M.*, **J.K. Brown**, J.C. Zinnert. 2018. Trait variation in response to nutrient fertilization. Virginia Commonwealth University Undergraduate Research Symposium. Richmond, VA. April 25 (poster).
10. Long, E.A.*, **J.K. Brown**, J.C. Zinnert. 2018. Belowground functional trait distribution across coastal communities. Virginia Commonwealth Undergraduate Research Symposium. Richmond, VA. April 25 (poster).
9. **Brown, J.K.,** J.C. Zinnert. 2018. Using community patterns to investigate coastal resilience in a changing climate. Virginia Sea Grant Graduate Research Symposium. Glen Allen, VA. February 9 (poster).
8. Baucom, C.M.*, **J.K. Brown**, J.C. Zinnert. 2018. Trait variation in response to nutrient fertilization. Integrative Life Sciences Research Symposium. Richmond, VA. February 8 (poster).
7. **Brown, J.K.,** J.C. Zinnert. 2018. Using community patterns to investigate coastal resilience in a changing climate. Integrative Life Sciences Research Symposium. Richmond, VA. February 8 (poster).
6. **Brown, J.K.,** J.C. Zinnert. 2017. Importance of species composition to inform trait-based approaches of community assembly along an environmental stress gradient. Ecological Society of America Conference. Portland, OR. August 9 (oral).
5. **Brown, J.K.,** J.C. Zinnert, D.R. Young. 2017. Resource allocation drives variable mechanisms of survival after sand deposition. Association of Southeastern Biologists Annual Conference. Montgomery, AL. March 28 (oral)
4. **Brown, J.K.,** J.C. Zinnert, D.R. Young. 2016. Emergent interactions influence functional traits and success of dune building ecosystem engineers. Gordon Research Conference: Multiscale Plant Vascular Biology. Newry, ME. June 27 (poster).
3. **Brown, J.K.**, J.C. Zinnert, D.R. Young. 2016. Competition affects functional trait responses of dune grasses to abiotic stressors. 15th William and Mary Graduate Research Symposium.

Williamsburg, VA. March 18 (oral).

2. **Brown, J.K.**, A.L. Harris, J.C. Zinnert, D.R. Young. 2015. Physiological and functional traits of dune building grasses influence topographic structure. Long Term Ecological Research All Scientists Meeting. Estes Park, CO. August 30 (poster).
1. Zinnert, J.C., **J.K. Brown**, A.L. Harris, J.A. Thompson, D.R. Young. 2015. Functional traits explain ecosystem engineering in dune building grasses. Ecological Society of America Conference. Baltimore, MD. August 11 (poster).

Invited presentations

5. **Brown, J.K.** K. Dorheim, M. Ghebreselassie**, D. Mu**, A. Snyder, S. Smith, C. Tebaldi, and B. Bond-Lamberty. 2024. Unlocking new potential in simple climate modeling with parametric uncertainty and ensemble meritocracy. VCU Biology Seminar Series. Richmond, VA (oral).
4. **Brown, J.K.** 2024. Matilda V1.0 quick start. Joint Global Change Research Institute — GCAM Annual Meeting 2024 (workshop).
3. **Brown, J.K.** 2024. Introduction to Hector usage. Joint Global Change Research Institute — GCAM Annual Meeting 2024 (workshop).
2. **Brown, J.K.** 2021. Disturbance impacts on coastal plant community structure and function. Minnesota State University – Mankato Biological Sciences Research Seminar. Mankato, MN (oral).
1. **Brown, J.K.,** J.C. Zinnert. 2018. Stress and disturbance mediate community assembly processes in coastal ecosystems. Ecological responses to global change in Southeastern coastal ecosystems symposium. ASB Conference. Myrtle Beach, SC (oral).

Service and Honors

Service

2024-2025 Planning committee member for the GCAM (Global Change Analysis Model) Annual Meeting

Organized and scheduled online workshops and technical presentations. All workshops are now sustainably hosted on MSD-LIVE.

Contributed peer-review for the following journals:

Écoscience | *Ecosphere* | *Ecology and Evolution* | *Scientific Reports* | *Plant and Soil* | *Journal of Ecology* | Oecologia

Limited-Term Employee (LTE) Seminar Co-coordinator

Plan and recruit monthly LTE (post-bachelor, post-masters, post-doctorate) speakers to present recent work.

Limited-Term & Full-Time Equivalent Employee Lunch Chat Coordinator

Coordinate lunchtime meetings to connect LTEs with FTEs to discuss career development.

Lead organizer for Organized Oral Session at ESA 2018

Session title – A Coastal Perspective: The Role of Vegetation in Response and Resilience of Coastal Ecosystems to Extreme Events.
Lead writer of session proposal and session justification.
Led recruitment of 10 speakers from around the country.

Student representative on multiple promotion and tenure committees

Derek Johnson, *2015* | Gregory Walsh, *2017* | Karen Kester, *2019*

Attendee at annual Global Nutrient Network meeting in Minneapolis, MN, 2017

Graduate representative at NSF mid-term site review of VCR LTER, Oyster, VA, 2015

Presented the importance of ecological connectivity between dune and swale plant communities.

Poster Judge, Long Term Ecological Research All Scientists Meeting, Estes Park, CO 2015

Judged seven posters at the annual meeting of all LTER sites.

Five-year service award recipient at VCU

Recognized for providing service to VCU through on-campus employment for 5 years.

Honors

2018 **Outstanding Biology PhD Student in Ecology**

Presented by VCU College of Humanities and Sciences

2017 **Attendee at AAAS Catalyzing Advocacy in Science and Engineering Workshop**

Nominated and selected through VCU College of Humanities and Sciences

2016 **Outstanding Biology Masters Student in Ecology**

Presented by VCU College of Humanities and Sciences

Funding

Total since 2016: $7,250

2020 **Integrative Life Sciences Graduate Student Funding to ESA 2020**

Total amount awarded: $700 – Virtual due to COVID-19

2019 **ESA Student Section Student Travel Award**

Total amount awarded: $150

2019 **ESA Southeast Chapter Student Travel Award**

Total amount awarded: $300

2019 **Integrative Life Sciences Graduate Student Funding to ESA 2019**

Total amount awarded: $700

2018 **VCU Graduate School Travel Grant**

Total amount awarded: $300

2018 **Integrative Life Sciences Graduate Student Funding to ESA 2018**

Total amount awarded: $1,000

2018 **Open Access Publishing Fund – VCU Libraries**

Total amount awarded: $1,000

2017 **VCU Graduate School Travel Grant**

Total amount awarded: $300

2017 **Integrative Life Sciences Graduate Student Funding to ESA 2017**

Total amount awarded: $1,000

2016 **NSF Student Travel Grant to Gordon Research Conference**

Total amount awarded: $1,500

2016 **VCU Graduate School Travel Grant**

Total amount awarded: $300

2009-13 Undergraduate: **Mary Kay-Moore Scholarship for Young Adults with Cancer**

Total amount over four years: $4,750.

Outreach and Community Involvement

Outreach Events

How trees help us!

Science outreach presentation event for kindergarten classes at Cople Elementary School, Hague, VA.

Participant at VCR "See What Scientists See" @ At Altitude Photography, Cape Charles, VA

Local outreach event where scientists and the public discuss how they perceive aerial photos of coastal Virginia.

Contributor to NSF Long-Term Ecological Research ASM "Reflections" video

Participated as a student contributor to comment about connections and synthesis of the LTER network.

Student representative for congressional meetings through AAAS CASE Workshop, 2017.

I participated in meetings with staffers of Virginia congressional offices to advocate for science research.

Virginia Oyster Shell Recycling, VCU Richmond, VA, 2015.

Collected and recycled oyster shells from local restaurants in the Richmond area.

Organizations with Scientific Community

2018-2020 **Student Liaison Coordinator** for the ESA Student Section 2020

2018-2019 **ESA Southeast Chapter Student Liaison**

2018-2019 **Vice President** of the Society for Ecological Restoration @ VCU

2017-2018 **President** of the Society for Ecological Restoration @ VCU

2017-2018 **Leadership Member** of the National Science Policy Group @ VCU

2016-2017 **Secretary** of the Society for Ecological Restoration @ VCU.