Melissa Pastore

Melissa.Pastore@uvm.edu • 570-490-0878 • lispastore.weebly.com

EDUCATION

The University of Minnesota, St. Paul, MN
Ph.D. in Ecology, Evolution, and Behavior, August 2020
Cumulative GPA: 4.00
Dissertation title: Impacts of global changes on leaf-level physiology of plant functional groups and ecosystem carbon storage
Advisors: Drs. Sarah Hobbie and Peter Reich

Villanova University, Villanova, PA
M.S. in Biology, Sep. 2015
Cumulative GPA: 3.97
Thesis title: Nitrogen retention and greenhouse gas mitigation of a brackish marsh under global change
Advisor: Dr. Adam Langley

The Pennsylvania State University, University Park, PA
B.S. in Biology, Ecology Option, May 2013
Cumulative GPA: 3.67

RESEARCH EXPERIENCE

University of Vermont (Postdoctoral Associate, RSENR/Gund Institute for Env.) Sep. 2020 – present
Advisors: Drs. Carol Adair and Aimée Classen

- Investigating the role of changing wintertime dynamics, such as more frequent freeze-thaw cycles and reduced snowpack, in determining trends in carbon cycling across complex forest landscapes

University of Minnesota (Ph.D. Candidate) Sep. 2015 – Aug. 2020
Advisors: Drs. Sarah Hobbie and Peter Reich

- Investigated responses of leaf-level physiology in four grassland plant functional groups to elevated CO_2, enhanced soil nitrogen supply, warming, and reduced rainfall in a long-term, free air CO_2 enrichment field experiment of the Cedar Creek Ecosystem Science Reserve *(collaborator: Dr. Tali Lee)*
- Examined the role of global changes and plant species composition and diversity on long-term soil carbon and nitrogen fluxes and pools

Villanova University (M.S. Student) Sep. 2013 – Aug. 2015
Advisor: Dr. Adam Langley

- Investigated how elevated CO_2 and nitrogen addition affect ecosystem nitrogen retention and the balance between greenhouse gas emissions and carbon sequestration in a brackish marsh at the Smithsonian Environmental Research Center *(collaborator: Dr. Patrick Megonigal)*

Penn State University (Undergraduate Student) Sep. 2012 – May 2013
Advisor: Dr. David Eissenstat

- Compared patterns of leaf and root phenology in six temperate tree species, including gymnosperms and diffuse- and ring-porous angiosperms in the Rock Springs Common Garden Experiment *(collaborators: Drs. Luke McCormack and Katie Gaines)*

PUBLICATIONS

Pastore, MA, Hobbie, SH, Reich, PB. Sensitivity of grassland carbon pools to plant diversity, elevated CO_2, and soil nitrogen addition over 19 years. *In revision at Proceedings of the National Academy of Sciences (IF: 9.412).*

Reich, PB, Hobbie, SH, Lee, TD, Rich, R, **Pastore, MA**, Worm, K. Synergistic effects of four climate change drivers on terrestrial carbon cycling. *Nature Geoscience (IF: 13.566)*. 13:787-793 (2020). https://www.nature.com/articles/s41561-020-00657-1.

Pastore, MA, Lee, TD, Hobbie, SH, Reich, PB. Interactive effects of elevated CO_2, warming, reduced rainfall, and increased nitrogen on leaf gas exchange in five perennial grassland species. *Plant, Cell & Environment (IF: 6.173)*. 43: 1862-1878 (2020). https://onlinelibrary.wiley.com/doi/abs/10.1111/pce.13783?af=R.

Pastore, MA, Lee, TD, Hobbie, SH, Reich, PB. Strong photosynthetic acclimation and enhanced water-use efficiency in grassland functional groups persist over 21 years of CO_2 enrichment, independent of nitrogen supply. *Global Change Biology (IF: 8.555)*. 25: 3031-3044 (2019). https://onlinelibrary.wiley.com/doi/10.1111/gcb.14714.

Reich, PB, Hobbie, SH, Lee, TD, **Pastore, MA**. Unexpected reversal of C_3 vs C_4 grass response to elevated CO_2 during a 20-year field experiment. *Science (IF: 41.845)*. 360: 317-320 (2018). http://science.sciencemag.org/content/360/6386/317.abstract.

Science published two technical comments that address the above Reich et al. 2018 article. Each appears with a response from Reich, Hobbie, Lee, and **Pastore** in *Science* 361: eeau8982 and eaau1300 (2018). http://science.sciencemag.org/content/361/6407/eaau8982. http://science.sciencemag.org/content/361/6402/eaau1300.

Pastore, MA, Megonigal, JP, Langley, JA. Elevated CO_2 and nitrogen addition accelerate net carbon gain in a brackish marsh. *Biogeochemistry (IF: 3.406)*. 133: 73-87 (2017). https://link.springer.com/article/10.1007/s10533-017-0312-2.

Pastore, MA, Megonigal, JP, Langley, JA. Elevated CO_2 promotes long-term nitrogen accumulation only in combination with nitrogen addition. *Global Change Biology (IF: 8.555)*. 22: 391-403 (2016). https://onlinelibrary.wiley.com/doi/abs/10.1111/gcb.13112.

McCormack, ML, Gaines, KL, **Pastore, MA**, Eissenstat, DM. Early season root production in relation to leaf production among six diverse temperate tree species. *Plant and Soil (IF: 3.390)*. 389: 121-129 (2015). https://link.springer.com/article/10.1007/s11104-014-2347-7.

Pastore, MA. The impact of nitrogen eutrophication on Caribbean coral reefs: a review. *CONCEPT*. 37 (2014). https://concept.journals.villanova.edu/article/view/1725.

Non-refereed

Pastore, MA. "Marshes: Pollution Sponges of the Future." Web blog post. *Shorelines*. The Smithsonian Environmental Research Center. (Aug. 2014). https://sercblog.si.edu/marshes-pollution-sponges-of-the-future/.

PRESENTATIONS, POSTERS, AND OTHER PRODUCTION EXPERIENCES

Presentations:

Pastore, MA, Lee, TD, Hobbie, SH, Worm, K, Reich, PB. Species richness impacts total soil carbon more than 19 years of CO_2 enrichment or soil nitrogen addition. Ecological Society of America, Virtual. August 2020. https://eco.confex.com/eco/2020/meetingapp.cgi/Paper/87690.

Pastore, MA, Lee, TD, Hobbie, SH, Reich, PB. Photosynthesis over 21 of elevated CO_2 and nitrogen addition in four plant functional groups. Cedar Creek Ecosystem Science Reserve Science Symposium, St. Paul, MN. March 2019.

PRESENTATIONS, POSTERS, AND OTHER PRODUCTION EXPERIENCES (cont.)

Presentations (continued):

Pastore, MA, Megonigal, JP, Langley, JA. Ecosystem nitrogen retention in response to 8 years of exposure to elevated CO_2 and nitrogen pollution. Ecological Society of America, Baltimore, MD. July 2015. https://eco.confex.com/eco/2015/webprogram/Paper56260.html.

Pastore, MA, Megonigal, JP, Langley, JA. Nitrogen pollution reduced ^{15}N retention in a brackish marsh. Smithsonian Environmental Research Center's Global Change Symposium, Bryn Mawr, PA. February 2015.

Pastore, MA, Megonigal, JP, Langley, JA. Rising CO_2 levels and nitrogen pollution may affect the fate of nitrogen in marsh ecosystems. Smithsonian Environmental Research Center's Global Change Symposium, Edgewater, MD. February 2014.

Posters:

Pastore, MA, Lee, TD, Hobbie, SH, Reich, PB. The influence of climate change and environmental factors on leaf gas exchange responses to elevated CO_2 in five perennial grassland species. American Geophysical Union, San Francisco, CA. December 2019. https://ui.adsabs.harvard.edu/abs/2019AGUFM.B13H2606P/abstract.

Pastore, MA, Lee, TD, Hobbie, SH, Reich, PB. Photosynthetic responses of 14 grassland species to 21 years of free-air CO_2 enrichment and nitrogen addition. Long-Term Ecological Research All Scientists' Meeting, Asilomar, CA. October 2018.

Pastore, MA, Lee, TD, Hobbie, SH, Reich, PB. Photosynthetic responses of 14 grassland species to 20 years of free-air CO_2 enrichment and nitrogen addition. Ecological Society of America, New Orleans, LA. August 2018. https://eco.confex.com/eco/2018/meetingapp.cgi/Paper/73595.

Pastore, MA, Megonigal, JP, Langley, JA. Net greenhouse gas footprint of a brackish marsh under elevated CO_2 and nitrogen addition. Natural Resources Association of Graduate Students Research Symposium, St. Paul, MN. April 2016.

Pastore, MA, Megonigal, JP, Langley, JA. ^{15}N label retention in a tidal marsh in response to elevated CO_2 and nitrogen addition. Society of Wetland Scientists, Providence, RI. June 2015.

Invited Panelist:

Effects of sulfate geoengineering on ecosystems. Ecosystem Responses to Solar Radiation Management and Sulfate Geoengineering Interdisciplinary Symposium, St. Paul, MN. Nov. 1, 2019.

Media Interviews:

Pastore, Melissa. Interview by Roland Pease. BBC World Service: Science in Action. Radio. April 26, 2018. https://www.bbc.co.uk/programmes/w3cswmp8 (begins 07:48).

Pastore, Melissa. Interview by Volker Mrasek. Deustchlandfunk and Westdeutscher Rundfunk (German Public Radio). Radio. April 20, 2018. https://www1.wdr.de/mediathek/audio/wdr5/wdr5-leonardo-top-themen/audio-co-schadet-auch-pflanzen-100.html. https://www.deutschlandfunk.de/ueberraschender-klimaeffekt-pflanzen-reagieren-auf-mehr-co2.676.de.html?dram:article_id=416145.

FELLOWSHIPS AND GRANTS

University of Minnesota:

Philip C. Hamm Graduate Scholarship in the Plant Sciences (1500 USD)	2020
Darby and Geri Nelson Environmental Scholar Award (2500 USD)	2019
College of Biological Sciences Travel Grant (150 USD)	2019

FELLOWSHIPS AND GRANTS (continued)

University of Minnesota (continued):

Donald and Elizabeth Lawrence Research Scholarship (1500 USD)	2018
Carol H. and Wayne A. Pletcher Graduate Fellowship (5800 USD)	2018
College of Graduate Students Travel Grant Award (900 and 550 USD)	2019, 2018
Howard Hughes Medical Institute Diversity & Inclusion Teaching Fellowship	2018, 2017
EEB Graduate Travel Award (900 USD)	2019, 2018, 2017
EEB Research Grant (1500-2000 USD)	2018, 2017, 2016
EEB Program Summer Fellowship	2018, 2017, 2016

Villanova University:

Biology Graduate Fellowship	2015
Biology Summer Research Fellowship	2015, 2014
Graduate Student Summer Research Fellowship	2014

TEACHING AND PROFESSIONAL APPOINTMENTS

Postdoctoral Associate, Rubenstein School of Environment and Natural Resources Sep. 2020 – present
Postdoctoral Fellow, Gund Institute for Environment
University of Vermont

- Advisors: Drs. Carol Adair and Aimée Classen
- Conducting research that refines and evaluates forest soil carbon pools and fluxes across the Northeastern U.S. Investigating the role of changing wintertime dynamics (e.g., more frequent freeze-thaw cycles, reduced snowpack) in determining trends in carbon cycling across complex forest landscapes.

Teaching Assistantship – Biol 3004/3004H: Foundations of Biol. II, Univ. of Minn. Fall 2019

- Independent instructor for two ecotoxicology-focused sections per semester Spring 2019, Fall 2018,
- ~50 undergraduate students per semester Spring 2017, Fall 2016
- Course structured as working research lab; served as 'advisor' that helped students plan and execute their proposed research
- Mentored ~10 undergraduate student-led research projects per semester
- Trained students how to read primary literature, develop novel ideas, design and carry out experiments, troubleshoot methods, perform statistics, create figures, write a scientific paper, and create/present a scientific poster
- Graded assignments

Research Assistantship, University of Minnesota Spring 2020, Spring 2018

- Advisors: Drs. Sarah Hobbie and Peter Reich Summer 2020-2016
- Investigated responses of plant physiology and nutrient cycling to global changes

Teaching Assistantship – EEB 4609W/5609: Ecosystem Ecology, Univ. of Minn. Fall 2017

- Independent instructor for one undergraduate and one graduate discussion section
- ~25 students
- Guided students in writing scientific review papers and research grant proposals
- Assisted instructor (Dr. Sarah Hobbie) during lecture section
- Graded assignments

TEACHING AND PROFESSIONAL APPOINTMENTS (continued)

Teaching Assistantship – Biol 1961/1961H: Foundations of Biol. I, Univ. of Minn. Spring 2016, Fall 2015
- Independent instructor for one ecotoxicology-focused lab section per semester
- ~25 undergraduate students per semester
- Lab involved evolution-based experiments using *Pseudomonas*, behavior and toxicology experiments using zebrafish, and advanced tools such as protein and DNA analysis, PCR, and fluorescent microscopy
- Trained students in formulating novel scientific questions, experimental design, statistics, and writing a research proposal
- Graded assignments

Teaching Assistantship – Bio 2105: General Biology, Villanova University Spring 2015
- Independent instructor for two lab sections
- ~50 undergraduate students
- Graded assignments

Teaching Assistantship – MSE 2204: Human Physiology, Villanova University Spring 2014
- Assistant to instructor (Dr. Phil Stephens) for two lab sections
- ~40 undergraduate students
- Graded assignments

Teaching Assistantship – Bio 3055: Animal Physiology, Villanova University Spring 2014, Fall 2013
- Assistant to instructor (Dr. Phil Stephens) for two lab sections per semester
- ~40 undergraduate students per semester
- Graded assignments

Teaching Assistantship – Biol 427: Evolution, Penn State University Fall 2012
- Assistant to instructor (Dr. Blair Hedges)
- ~150 primarily undergraduate students
- Created and graded exams

MENTORING EXPERIENCE

Dara Coker, Undergraduate student at the University of Wisconsin-Eau Claire/Cedar Creek Intern *(mentored 2018-2020)*
- Trained student in using Licor-6400 to measure leaf-level gas exchange and a pressure chamber to measure leaf water potential in the field, how to use ImageJ, and how to prepare and run samples for CN analysis on an Elemental Analyzer
- Assisted student with experimental design and lab techniques for thesis project
- We are currently collaborating (with Dr. Tali Lee) to investigate effects of global changes on plant tissue chemistry

Claire Houlihan, Undergraduate student at the University of Minnesota *(mentored 2016-2018)*
- Trained student in basic lab skills and how to prepare/run samples for CN analysis on an Elemental Analyzer
- Currently an ER technician

Kelsey Ward, Undergraduate student at the University of Minnesota *(mentored 2016-2018)*
- Trained student in basic lab skills and how to prepare/run samples for CN analysis on an Elemental Analyzer
- Currently in Master's program in Public Health with focus on Environmental Health at the University of Minnesota

Valerie Gehn, Undergraduate student at the University of Wisconsin-Eau Claire/Cedar Creek Intern *(mentored summer 2017)*
- Trained student in using Licor-6400 to measure leaf-level gas exchange in the field
- Currently earning her Ph.D. in Botany at the University of Wisconsin-Madison

MENTORING EXPERIENCE (continued)

Graham Caron, High school student at Minnetonka High School *(mentored summer 2017)*
- Trained student in using Licor-6400 to measure leaf-level gas exchange in the field and how to prepare/run samples for CN analysis on an Elemental Analyzer

Amanda Donaldson, NASA NICE-T Gida (Our Earth Lodge) REU student *(co-mentored summer 2016)*
- Trained student in design and execution of experiments
- Advised student on project exploring plant community diversity and water-relations ecophysiology by setting up transects along a riparian to upland natural gradient
- Currently earning her Ph.D. in Earth Sciences at the University of California-Santa Cruz

Susan Webster, NASA NICE-T Gida (Our Earth Lodge) REU student *(co-mentored summer 2016)*
- Trained student in design and execution of experiments
- Advised student on project bridging Native and Western science, exploring differences in the tools, sources of authority, and attitudes toward the natural world of Western scientists and her Anishinaabe community

Allen J. Butterfield, NASA NICE-T Gida (Our Earth Lodge) REU student *(co-mentored summer 2016)*
- Trained student in design and execution of experiments
- Advised student on project investigating consequences of forest diversity on arbuscular mycorrhizal fungi diversity and abundance

Emmanuel Okematti, Undergraduate student at the University of Minnesota *(mentored 2016)*
- Trained student in basic lab skills and how to prepare samples for CN analysis on an Elemental Analyzer

Isaac Johnson, Undergraduate student at the University of Minnesota *(mentored 2016)*
- Trained student in basic lab skills and how to prepare samples for CN analysis on an Elemental Analyzer

OUTREACH AND SERVICE, PROFESSIONAL DEVELOPMENT, AND HONORS

Outreach and Service:

University of Minnesota Ecology Science Fair 2021
Served as judge for grade 4-12 student-driven investigations in ecology

Cedar Creek Ecosystem Science Reserve Outreach 2016 – 2019
Led talks, field tours, and outreach activities for K-12 and beyond

Midwest Coordinator for Science-Informed Leadership 2017 – 2018
Communicated with constituents, organized resources enabling citizens to contact their senators

EEB Department Orientation Handbook Developer 2017 – 2018
Developed orientation handbook and resource list for incoming graduate students

EEB Department Graduate Student President 2016 – 2017
Organized and oversaw graduate student meetings and departmental events

Cedar Creek "Weaving Our Communities" Together REU Mentor 2016
Mentored research projects of Native undergraduates (funded through NASA NICE-T grant)

Gida (Our Earth Lodge) STEM Camps 2016
Led science lessons and experiments with K-12 Native (Ojibwe) students, connected lessons to indigenous culture

Chelsea Heights Elementary Science Fair Mentor 2016
Taught students experimental design and scientific method, helped students perform experiments and create figures

EEB Department Seminar Facilitator at the University of Minnesota 2015 – 2016

Mifflinburg Intermediate School Outreach 2014 – 2015
Designed and led science lessons and experiments for 5th grade science education

Penn State Science-U STEM Camps 2011 – 2012
Mentor for K-12 STEM outreach camps

OUTREACH AND SERVICE, PROFESSIONAL DEVELOPMENT, AND HONORS (cont.)

Outreach and Service (continued):

Journal Review: Ecology, Ecological Applications, Climatic Change, Ecosphere, Biogeochemistry, Biogeosciences, CONCEPT Interdisciplinary Journal of Graduate Studies

Professional Development:

***Teaching in Higher Education* course at the University of Minnesota**	2020
***Designing and Delivering Online Learning* Certification at Univ. of Minn.**	2020
Institute on the Environment's Boreas Leadership Program at Univ. of Minn.	2015 – 2020
Emerge Bioscience Career Workshop Program	2019
Howard Hughes Medical Institute Diversity and Inclusion Training	2017 – 2018
College of Biological Sciences Classroom Writing Instruction Workshop	2015

Honors:

Society of Wetland Scientists Annual Meeting Poster Presentation Award	2015

MEMBERSHIP IN ASSOCIATIONS/PROFESSIONAL SOCIETIES

Recent Findings in Teaching and Learning Discussion Group	2019 – 2021
University of Minnesota Plant Physiological Ecology Group	2019 – 2020
American Geophysical Union	2019
Ecological Society of America	2015 – 2020
Society of Wetland Scientists	2015 – 2016
University of Minnesota EEB Women in Science Society	2015 – 2016

REFERENCES

Dr. Sarah Hobbie, *Professor*
Ecology, Evolution, and Behavior Department
University of Minnesota
1479 Gortner Ave.
St. Paul, MN 55108
(612) 625-6269
shobbie@umn.edu
Relationship: Ph.D. Advisor

Dr. Adam Langley, *Associate Professor*
Biology Department
Villanova University
800 E. Lancaster Ave.
Villanova, PA 19085
(610) 519-3102
adam.langley@villanova.edu
Relationship: M.S. Advisor

Dr. Peter Reich, *Professor*
Forest Resources Department
University of Minnesota
1479 Gortner Ave.
St. Paul, MN 55108
(612) 624-4270
preich@umn.edu
Relationship: Ph.D. Advisor

Dr. Tali Lee, *Professor*
Biology Department
University of Wisconsin-Eau Claire
346 Phillips Science Hall
Eau Claire, WI 54701
(715) 836-5087
leetd@uwec.edu
Relationship: Collaborator/Ph.D. Committee Member